

SITE INFORMATION

Report Type: Closure Report 1RP-4959

General Site Information:

Site:	Madera 19 Federal 1					
Company:	Marathon Oil Permian, LLC					
Section, Township and Range	Unit L	Sec. 19	T 26S	R 35E		
Lease Number:	API No. 30-025-36645					
County:	Lea County					
GPS:	32.026836° N			103.411465° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of NM 3 and Beckham Rd in rural Lea County, travel west on Beckham Rd for approximately 9.3 miles , turn northwest onto leaes road for 0.60 miles, turn south onto lease road for 0.10 mi to location.					

Release Data:

Date Released:	1/31/2018
Type Release:	Condensate & Produced Water
Source of Contamination:	500 bbl tank
Fluid Released:	150 bbls
Fluids Recovered:	0 bbls

Official Communication:

Name:	Callie Karrigan		Ike Tavaréz
Company:	Marathon Oil Permian, LLC.		Tetra Tech
Address:	2423 Bonita St.		4000 N. Big Spring
			Ste 401
City:	Carlsbad, NM 88220		Midland, Texas
Phone number:	(575) 297-0956		(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	150'-175'
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



June 18, 2018

NMOCD grants
closure to 1RP-4959.

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

Re: Closure Report for the Marathon Oil Company, Madera 19 Federal #1, Unit L, Section 19, Township 26 South, Range 35 East, Lea County, New Mexico. 1RP-4959.

Ms. Yu:

Tetra Tech, Inc. (Tetra Tech) was contacted by Marathon Oil Company (Marathon) to investigate and assess a release that occurred at the Madera 19 Federal #1, Unit L, Section 19, Township 26 South, Range 35 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.026836°, W 103.411465°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on January 31, 2018, and released approximately 150 barrels of condensate and produced water due to tank leak. None of the fluids were recovered. The release occurred inside the facility berm from a leaking tank bottom and remained on the facility pad, impacting an area measuring approximately 40' x 110'. The initial C-141 form is included in Appendix A.

Groundwater

No wells are listed within Section 19 in the New Mexico Office of the State Engineers database, the USGS National Water Information System, or the Geology and Groundwater Conditions in Southern Lea County, NM (Report 6). However, the State Engineers database lists a well in Section 24, approximately 5.2 miles east of the site, with a reported depth to water of 250' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 150' and 175' 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 5,000 mg/kg.

Soil Assessment and Remediation Activities

During the assessment and remediation activities, selected samples collected were submitted to the laboratory for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B, and chloride by EPA method 300.0. Copies of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The laboratory results are summarized in Table 1. The sample locations are shown on Figure 3.

Initial Assessment

On February 8, 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of three (3) auger holes (AH-1, AH-2 and AH-3) were installed in the spill footprint to total depths between 5.0' and 5.5' below surface.

Referring to Table 1, none of the samples analyzed showed benzene concentrations above the RRAL. However, the areas of auger holes (AH-1, AH-2 and AH-3) showed total BTEX concentrations of 691 mg/kg, 729 mg/kg, and 622 mg/kg at 0-1' below surface, respectively. The BTEX concentrations then declined with depth to below the RRAL at 1.0-1.5' below surface.

Additionally, elevated TPH concentrations were detected at 0-1' below surface, with concentrations of 17,300 mg/kg (AH-1), 14,020 mg/kg (AH-2), and 12,120 mg/kg (AH-3). The TPH concentrations then declined with depth to below the RRAL at 1.0-1.5' below surface, with concentrations of 530 mg/kg (AH-1), 18.2 mg/kg (AH-2), and 1,136 mg/kg (AH-3). In addition, none of the samples collected showed chloride concentrations above the 600 mg/kg threshold.

Initial Excavation and Additional Sampling

Based on the results from the initial assessment, a work plan dated February 26, 2018 was submitted and approved, which detailed the proposed excavation of the areas of auger holes (AH-1, AH-2, and AH-3) to approximately 1.0' below surface.



On March 8, 2018, the proposed work plan was implemented. During the excavation activities, two (2) bottom hole samples (North bottom hole and South bottom hole) and six sidewall (6) confirmation samples (North sidewall, South sidewall, Northeast sidewall, Northwest sidewall, Southeast sidewall, and Southwest sidewall) were collected for evaluation.

Referring to Table 1, the areas of North and South Bottom holes showed TPH and total BTEX concentrations exceeding the RRALs. The sidewall sample (Northeast sidewall) showed a total BTEX concentration of 83.4 mg/kg. None of the remaining sidewall samples showed TPH or total BTEX concentrations above the thresholds. Additionally, none of the confirmation samples showed benzene concentrations above 10 mg/kg or chloride concentrations above the 600 mg/kg threshold.

Based on the laboratory results, the area was excavated to 2.0' below surface and the area of sidewall sample (Northeast sidewall) was expanded to remove the impacted soils. Additional confirmation samples were collected at North bottom hole, South bottom hole, and Northeast sidewall. The area of sidewall (Northeast sidewall) showed a total BTEX concentration below the RRAL of 0.922 mg/kg. However, the bottom hole samples collected at 2.0' BEB exceeded the RRALs for TPH (North bottom hole) and total BTEX (North bottom hole and South bottom hole). All of the material excavated was hauled to proper disposal.

Trench Installation - Additional Investigation

On March 20, 2018, three (3) backhoe trenches (Trench 1, Trench 2, and Trench 3) were installed inside the release footprint to total depths between 8.0' and 10.0' below the excavation bottom (BEB), in an attempt to vertically define the extents of the hydrocarbon impact. All of the trenches showed bottom samples above the RRAL for TPH and total BTEX concentrations and these areas were not vertically defined. None of the samples collected showed benzene concentrations above 10 mg/kg or chloride concentrations above 600 mg/kg.

Borehole Installation

Based on the laboratory results, Tetra Tech corresponded with the NMOCD and proposed installing boreholes in the release area in order to vertically define the extents of the hydrocarbon impact. On March 26, 2018, three (3) boreholes (BH-1, BH-2, and BH-3) were installed in the 2.0' excavation bottom to total depths ranging from 14'-15' (BH-2 and BH-3) and 34'-35' (BH-1) below the excavation bottom.

Referring to Table 1, the area of borehole (BH-3) did not show any TPH, benzene, or total BTEX concentrations above the RRALs. The area of borehole (BH-2) showed TPH and total BTEX highs of 6,219 mg/kg (TPH) and 337 mg/kg (BTEX) at 6.0'-7.0' BEB. The elevated TPH and total BTEX concentrations in the area declined with depth to below the RRALs at 9-10' BEB. The area of borehole (BH-1) showed elevated TPH and total BTEX concentrations to 14-15' BEB, which then declined with depth below the RRALs at 24-25' BEB. None of the samples collected at boreholes (BH-1, BH-2, and BH-3) detected benzene concentrations above the RRAL.

Remediation Activities

Based on the results of the investigation, the NMOCD was contacted and provided the assessment data and discussed proposed activities for the site. As approved by the NMOCD, Tetra Tech proposed the removal of the impacted soil to the appropriate depth and the remediation of the excavated material onsite. As proposed, the stockpile remediation consisted of segregating the excavated material into 40 to 50 cubic yards stockpiles to work the soils below the RRAL. Once achieved, the material would be placed back into the excavation.

On March 27, 2018, the area of borehole (BH-3) was excavated to approximately 5' below surface, the area of borehole (BH-2) was excavated to approximately 10.0', and the area of borehole (BH-1) was excavated to approximately 20.0' below surface. To ensure proper removal of the impacted soils, bottom hole samples (South, and Middle) were collected. The area of North Trench (5' BEB) was collected to confirm the spike detected in Trench 3 at approximately 10.0' below surface.

Referring to Table 1, bottom hole South sample collected at 20.0' below surface showed TPH and benzene concentrations below the laboratory reporting limit and a total BTEX concentration of 0.00558 mg/kg. The area of bottom hole Middle collected at 10.0' below surface detected a TPH concentration of 2,440 mg/kg, a benzene concentration of <0.0994 mg/kg, and a total BTEX concentration of 48.0 mg/kg. Additionally, the North Trench (5' BEB) showed a TPH concentration of 857 mg/kg, a benzene concentration of <0.00199 mg/kg, and a total BTEX concentration of 0.466 mg/kg.

Stockpile Remediation

Once the excavation depths were achieved, the removed material was segregated into approximately 40-50 cubic yard stockpiles on the pad, worked and then sampled for evaluation. A total of thirty-five (35) stockpile samples (Stockpile #1 through Stockpile #35) were collected and submitted to the laboratory for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. Copies of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The laboratory results are summarized on Table 2.

Referring to Table 2, none of the samples collected showed TPH or benzene concentrations above the RRALs. However, Stockpile #1, Stockpile #4, Stockpile #11, Stockpile #20, and Stockpile #25 detected total BTEX concentrations of 56.2 mg/kg, 56.6 mg/kg, 57.7 mg/kg, 55.5 mg/kg, and 53.1 mg/kg, respectively. These stockpiles were re-worked on the pad and resampled for TPH and BTEX, which showed the concentrations declined below the RRAL. The remaining stockpile samples showed total BTEX concentrations below 50 mg/kg. Based on the laboratory data, the stockpiled material was then used to backfill the excavation, as approved.



Conclusion and Recommendations

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

Respectfully submitted,
TETRA TECH

A handwritten signature in blue ink that reads 'Clair Gonzales'.

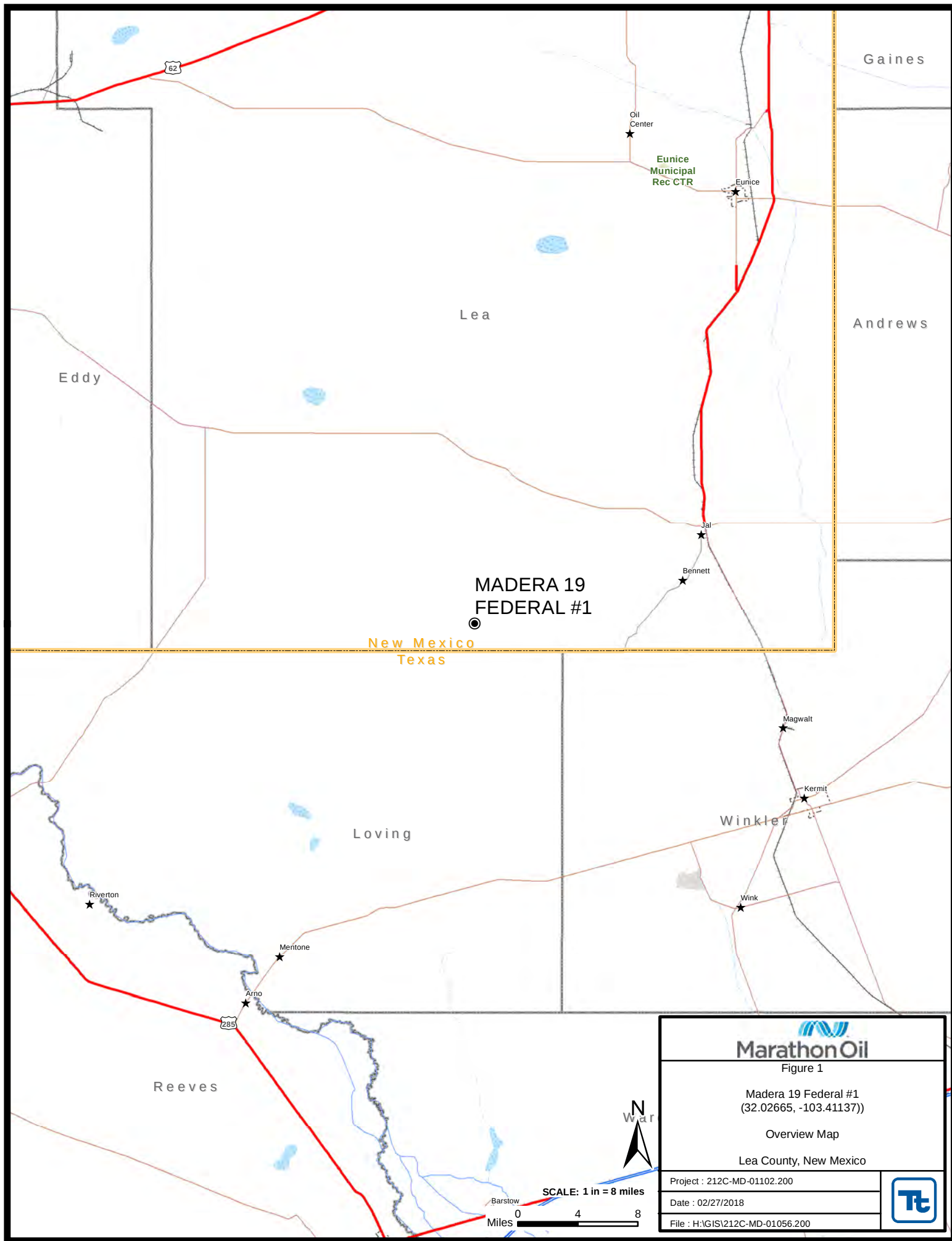
Clair Gonzales,
Project Manager

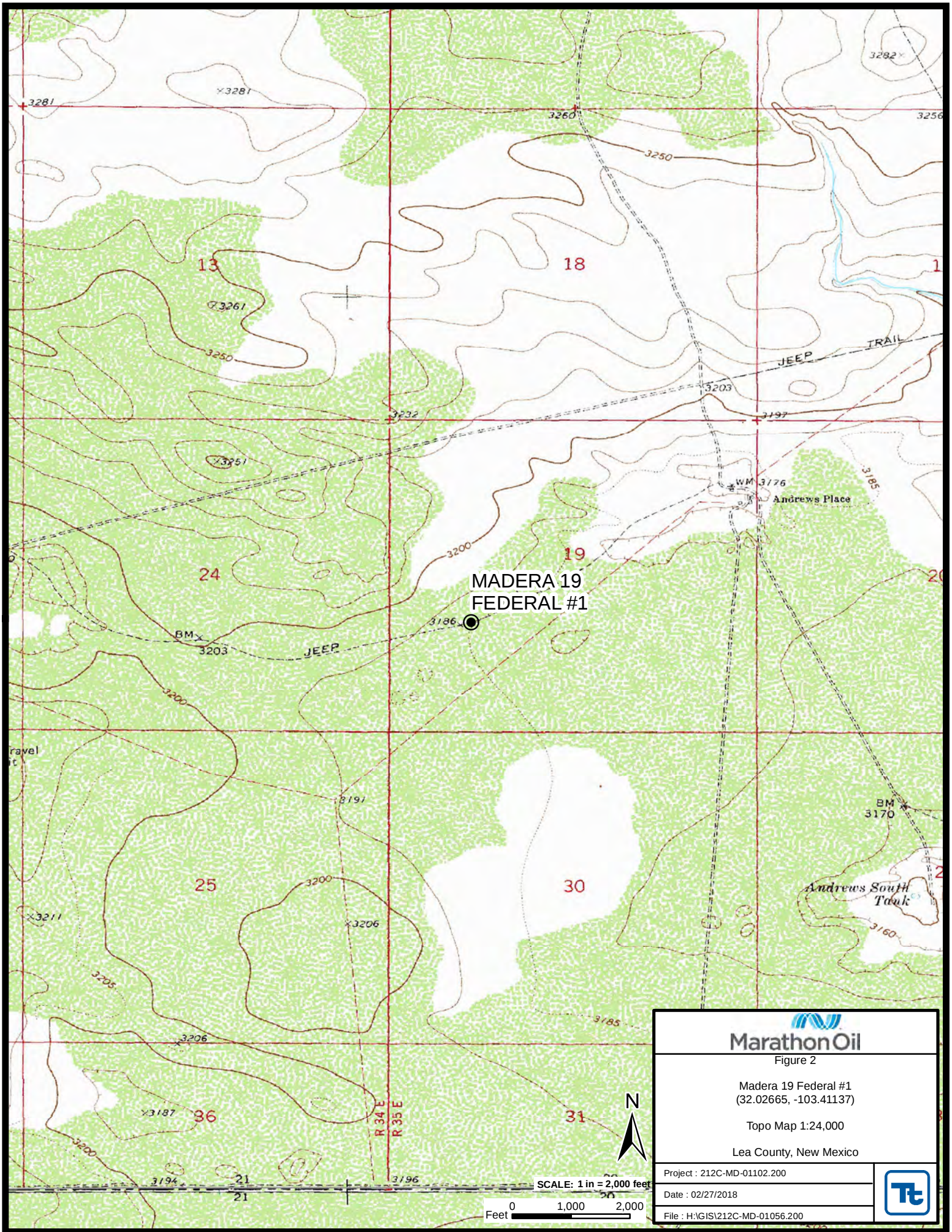
A handwritten signature in blue ink that reads 'Ike Tavaréz'.

Ike Tavaréz,
Senior Project Manager, P.G.

cc: Shelly Tucker - BLM
Callie Karrigan - Marathon

Figures





Marathon Oil

Figure 2

Madera 19 Federal #1
(32.02665, -103.41137)

Topo Map 1:24,000

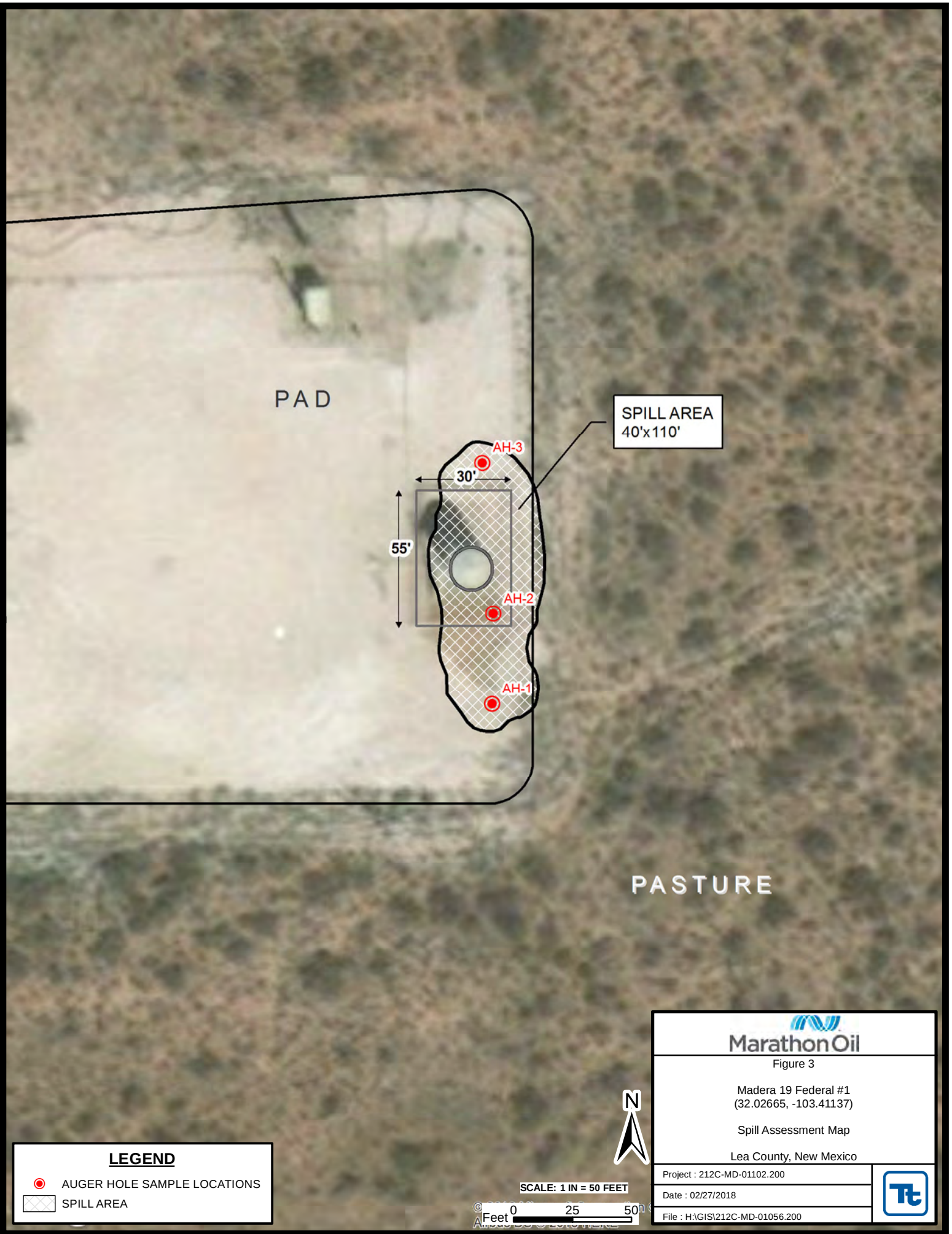
Lea County, New Mexico

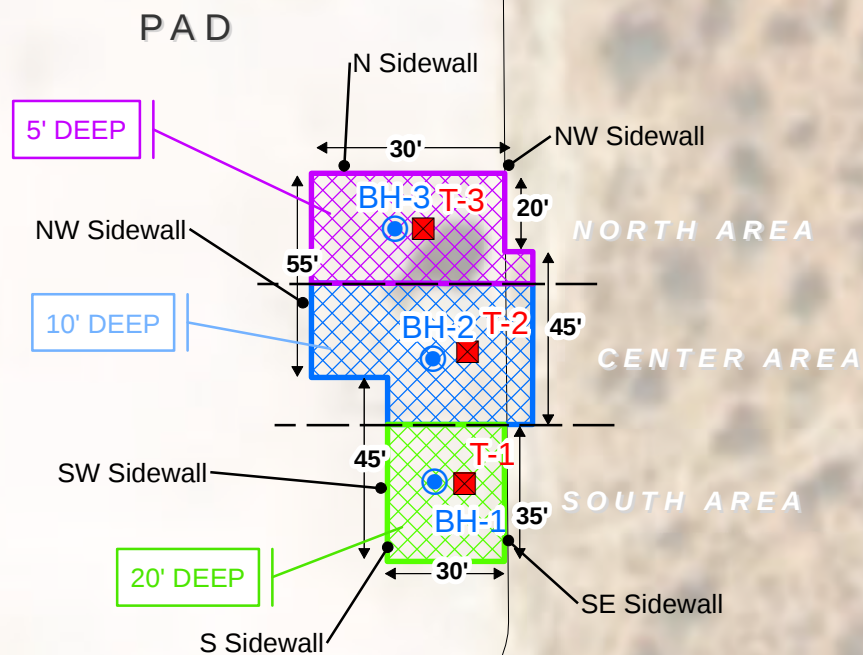
Project : 212C-MD-01102.200

Date : 02/27/2018

File : H:\GIS\212C-MD-01056.200







PASTURE

LEGEND

- BORE HOLE SAMPLE LOCATIONS
- TRENCH SAMPLE LOCATIONS
- EXCAVATED AREAS



SCALE: 1 IN = 49 FEET

So Feet 0 25 50

USDA, USGS, AERGRID, IGN, and the GIS User Community



Marathon Oil

Figure 4

Madera 19 Federal #1
(32.02665, -103.41137)

Excavated Area & Depth Map

Lea County, New Mexico

Project : 212C-MD-01102.200

Date : 05/15/2018

File : H:\GIS\212C-MD-01102.200



Tables

Table 1
Marathon Oil Company
Madera 19 Federal #1
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Excavation Bottom (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						
South Excavation															
AH-1	2/8/2018	0-1	-		X	8,940	8,360	-	17,300	2.41	161	27.1	500	691	161
	"	1-1.5	-		X	56.3	474	-	530	<0.00199	0.0570	0.0381	0.942	1.04	61.5
	"	2-2.5	-		X	-	-	-	-	-	-	-	-	-	54.8
	"	3-3.5	-		X	-	-	-	-	-	-	-	-	-	50.0
	"	4-4.5	-		X	-	-	-	-	-	-	-	-	-	38.8
	"	4.5-5.0	-		X	-	-	-	-	-	-	-	-	-	437
South Bottomhole	3/9/2018	-	1.0		X	7,150	7,260	350	14,800	4.61	95.9	28.1	489	615	413
	3/14/2018	-	2.0		X	1,800	2,080	41.4	3,921	<1.00	34.4	10.2	151	196	-
Trench 1 (South)	3/20/2018	2	2		X	1,800	4,330	114	6,244	<1.00	18.2	7.56	82.2	108	80
	"	4	2		X	2,160	3,070	52.4	5,282	<1.00	12.9	<1.00	239	252	192
	"	6	2		X	1,990	2,380	39.4	4,409	<1.00	8.03	<1.00	144	152	80
	"	8	2		X	6,210	5,420	123.0	11,753	<5.00	103	27.7	481	612	160
BH-1 (South)	3/26/2018	2-3	2		X	3,610	7,120	344	11,074	<1.00	51.8	18.0	233	303	-
	"	6-7	2		X	2,710	3,730	148	6,588	<1.00	18.9	14.1	270	303	-
	"	14-15	2		X	2,780	3,380	129	6,289	<1.00	45.5	18.3	245	308	-
	"	24-25	2	X		<10.0	38.6	<10.0	38.6	<0.050	0.239	<0.050	0.439	0.678	-
	"	29-30	2	X		<10.0	105	<10.0	105	<0.050	0.070	<0.050	0.214	<0.300	-
	"	34-35	2	X		<10.0	108	<10.0	108	<0.050	<0.050	<0.050	<0.150	<0.300	-
Bottomhole South #1	3/29/2018	0-1	5		X	8,780	9,240	<74.9	18,020	<2.01	13.7	8.72	204	226	-
Bottomhole South #2	3/29/2018	0-1	5		X	1,510	2,370	<150	3,880	<0.998	14.7	8.6	207	230	-
Bottomhole South	4/2/2018	-	15-16		X	859	938	29	1,830	<0.100	6.28	2.66	47.1	56.0	-
Bottomhole South	4/6/2018	-	20'	X		<15.0	<15.0	<15.0	<15.0	<0.00201	<0.00201	<0.00201	0.00558	0.00558	-

Table 1
Marathon Oil Company
Madera 19 Federal #1
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Excavation Bottom (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						
Middle Excavation															
AH-2	2/8/2018	0-1	-		X	8,660	5,360	-	14,020	3.21	188	27.3	510	729	143
	"	1-1.5	-		X	<15.0	18.2	-	18.2	<0.00201	0.00271	<0.00201	0.0141	0.0168	52.8
	"	2-2.5	-		X	-	-	-	-	-	-	-	-	-	26.3
	"	3-3.5	-		X	-	-	-	-	-	-	-	-	-	54.5
	"	4-4.5	-		X	-	-	-	-	-	-	-	-	-	68.9
	"	5-5.5	-		X	-	-	-	-	-	-	-	-	-	<4.90
Trench 2 (Middle)	3/20/2018	2	2		X	245	473	<10.0	718	<0.050	2.58	1.53	21.0	25.0	64
	"	4	2		X	<10.0	<10.0	<10.0	<10.0	<0.050	0.143	<0.050	0.422	0.565	176
	"	6	2		X	1,020	1,370	27.6	2,418	<0.500	6.10	3.95	69	79.1	96
	"	8	2		X	2,470	2,740	50.1	5,260	<1.00	27.5	12.5	209	249.0	112
BH-2 (Middle)	3/26/2018	2-3	2		X	247	786	30.8	1,064	<0.050	1.70	1.17	13.5	16.3	-
	"	6-7	2		X	2,610	3,480	129	6,219	3.88	71.6	18.9	243	337	-
	"	9-10	2		X	267	900	25.4	1,192	0.060	1.16	0.660	8.78	10.7	-
	"	14-15	2	X		<10.0	37.5	<10.0	37.5	<0.050	<0.050	<0.050	0.228	<0.300	-
Bottomhole Middle	3/29/2018	0-6"	10		X	1,100	1,340	<15.0	2,440	<0.0994	3.03	2.43	42.5	48.0	-
North Excavation															
AH-3	2/8/2018	0-1	-		X	6,450	5,670	-	12,120	7.94	203	22.6	388	622	<4.90
	"	1-1.5	-		X	300.0	836	-	1,136	<0.101	0.324	0.289	7.62	8.23	<4.91
	"	2-2.5	-		X	-	-	-	-	-	-	-	-	-	13.4
	"	3-3.5	-		X	-	-	-	-	-	-	-	-	-	18.9
	"	4-4.5	-		X	-	-	-	-	-	-	-	-	-	40.6
	"	5-5.5	-		X	-	-	-	-	-	-	-	-	-	45.7
North Bottomhole	3/8/2018	-	1.0		X	3,700	3,520	138	7,360	<0.398	31.3	12.1	194	238	174
	3/14/2018	-	2.0		X	4,820	7,030	147	11,997	<2.00	63.0	25.3	399	487	-
Trench 3 (North)	3/20/2018	2	2		X	312	2,710	76.9	3,099	<0.050	1.13	<0.050	7.02	8.15	240
	"	4	2		X	724	2,260	41.4	3,025	<0.200	1.65	3.34	39.1	44	160
	"	6	2	X		1,130	1,590	26.9	2,747	<0.500	4.11	4.35	87.1	95.6	80
	"	8	2	X		3,660	4,070	86.5	7,817	<2.00	35.5	21.6	434	491	160
BH-3 (North)	3/26/2018	2-3	2		X	18.1	335	<10.0	353	<0.050	0.099	0.208	0.481	0.788	-
	"	4-5	2		X	512	1,750	45.0	2,307	<0.200	2.59	4.89	34.9	42.4	-
	"	6-7	2	X		<10.0	121	<10.0	121	<0.500	<0.050	0.062	0.432	0.494	-
	"	9-10	2	X		<10.0	142	<10.0	142	<0.050	<0.050	<0.050	0.310	0.310	-
	"	14-15	2	X		<10.0	44.5	<10.0	44.5	<0.500	<0.500	<0.500	<0.150	<0.300	-
North Trench @ 5' (BEB) confirmation	4/6/2018	10'	5	X		174	660	22.8	857	<0.00199	0.00980	0.00878	0.447	0.466	-
South Sidewall	3/9/2018	-	-	X		<15.0	92.9	<15.0	92.9	<0.00200	0.00516	<.00200	0.0320	0.0372	11.4
North Sidewall	3/9/2018	-	-	X		<15.0	92.9	<15.0	92.9	<0.00200	0.00516	<.00200	0.0320	0.0372	11.4
Northeast Sidewall	3/9/2018	-	-		X	1,160	1,370	83.5	2,610	0.250	15.3	4.19	63.7	83.4	<4.94
	3/14/2018	-	-	X		-	-	-	-	<0.050	0.205	0.100	0.617	0.922	-
Northwest Sidewall	3/9/2018	-	-	X		423	1,350	78	1,850	<0.00200	0.0166	0.0462	0.246	0.309	11.4
Southeast Sidewall	3/9/2018	-	-	X		<14.9	<14.9	<14.9	<14.9	<0.00199	0.00309	<0.00199	0.0118	0.0149	<4.99
Southwest Sidewall	3/9/2018	-	-	X		89.5	595	27.5	712	<0.00200	0.00968	0.0255	0.0168	0.0520	<4.95

(-)

Not Analyzed

Excavated Depths

Table 2
Marathon Oil Company
Madera 19 Federal #1
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)
			In-Situ	Removed	GRO	DRO	ORO	Total					
Stockpile #1	3/28/2018	-	X		1,690	1,870	62.8	3,623	<0.0504	4.46	2.11	49.6	56.2
	4/2/2018	-	X		-	-	-	-	<0.00202	0.0564	0.00942	0.702	0.768
Stockpile #2	3/28/2018	-	X		1,180	1,780	63.1	3,023	<0.0200	1.78	0.990	41.6	44.4
Stockpile #3	3/28/2018	-	X		1300	2010	70.3	3,380	<0.0996	3.46	1.62	43.6	48.7
Stockpile #4	3/28/2018	-	X		1290	2010	72.0	3,370	<0.100	4.49	2.05	50.1	56.6
	4/2/2018	-	X		-	-	-	-	<0.00199	0.0296	<0.00199	0.583	0.613
Stockpile #5	3/28/2018	-	X		1340	2210	79.9	3630	<0.100	3.70	1.65	44.1	49.5
Stockpile #6	3/28/2018	-	X		725	1130	40.8	1900	<0.101	2.25	0.754	24.9	27.9
Stockpile #7	3/28/2018	-	X		508	988	32.0	1530	<0.0996	0.938	0.400	14.5	15.9
Stockpile #8	3/28/2018	-	X		626	1170	42.7	1840	<0.100	1.49	0.380	17.4	19.3
Stockpile #9	3/28/2018	-	X		431	888	32.3	1350	<0.0996	0.773	0.233	11.5	12.5
Stockpile #10	3/28/2018	-	X		812	1110	40.4	1960	<0.0998	2.49	0.899	25.1	28.5
Stockpile #11	3/28/2018	-	X		1370	1440	52.1	2,860	<0.100	6.42	1.97	49.3	57.7
	4/2/2018	-	X		-	-	-	-	<0.00201	0.00566	<0.00201	0.580	0.586
Stockpile #12	3/28/2018	-	X		646	1000	36.2	1680	<0.101	2.21	0.745	23.6	26.6
Stockpile #13	4/3/2018	-	X		588	1,610	<15.0	2,200	<0.100	0.363	0.222	14.8	15.4
Stockpile #14	4/3/2018	-	X		603	1,650	<15.0	2,250	<0.100	1.02	0.506	16.6	18.1
Stockpile #15	4/3/2018	-	X		606	1,620	<14.9	2,230	<0.0998	1.89	0.509	21.9	24.3
Stockpile #16	4/3/2018	-	X		299	1,360	<15.0	1,660	<0.501	0.141	0.139	4.59	4.87
Stockpile #17	4/3/2018	-	X		417	1,670	17.7	2,100	<0.00201	0.0177	0.00684	0.704	0.729
Stockpile #18	4/3/2018	-	X		758	2,030	<15.0	2,790	<0.0498	1.73	0.646	18.1	20.5
Stockpile #19	4/3/2018	-	X		968	1,970	<15.0	2,940	<0.0499	1.56	0.670	19.2	21.5

Table 2
Marathon Oil Company
Madera 19 Federal #1
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)
			In-Situ	Removed	GRO	DRO	ORO	Total					
Stockpile #20	4/3/2018	-		X	1,170	2,190	<15.0	3,360	<0.100	4.72	1.75	49.0	55.5
	4/6/2018	-	X		1,030	1,590	47.6	2,670	<0.0998	1.73	0.521	28.1	30.3
Stockpile #21	4/3/2018	-	X		1,250	2,510	<15.0	3,760	<0.0504	2.63	0.893	25.0	28.6
Stockpile #22	4/4/2018	-	X		659	1,240	41.8	1,940	<0.00201	0.0286	0.0139	0.592	0.635
Stockpile #23	4/4/2018	-	X		1,030	1,550	52.3	2,630	<0.00202	0.0481	0.0113	0.527	0.586
Stockpile #24	4/4/2018	-	X		1,170	1,680	55.9	2,910	<0.00199	0.0493	0.0197	0.608	0.677
Stockpile #25	4/6/2018	-	X		918	1,340	40.2	2,300	<0.0994	3.76	2.38	47.0	53.1
	4/11/2018	-	X		241	1,660	30.8	1,930	<0.00200	0.0614	0.00511	0.725	0.792
Stockpile #26	4/6/2018	-	X		1,060	1,730	58.7	2,850	<0.100	3.00	1.45	34.5	39.0
Stockpile #27	4/6/2018	-	X		945	1,340	42.4	2,330	<0.0990	2.79	1.17	32.7	36.6
Stockpile #28	4/6/2018	-	X		998	1,530	44.9	2,570	<0.0998	1.53	0.873	26.4	28.8
Stockpile #29	4/6/2018	-	X		1,240	1,690	51.6	2,980	<0.102	3.21	1.25	39.7	44.2
Stockpile #30	4/6/2018	-	X		1,230	1,710	55.4	3,000	<0.0992	4.03	1.70	42.5	48.2
Stockpile #31	4/6/2018	-	X		1,130	1,900	59.2	3,090	<0.0996	3.28	1.33	37.4	42.0
Stockpile #32	4/6/2018	-	X		1,010	1,800	58.2	2,870	<0.0994	1.90	0.792	28.9	31.6
Stockpile #33	4/6/2018	-	X		929	1,750	53.6	2,730	<0.100	1.60	0.523	27.0	29.1
Stockpile #34	4/6/2018	-	X		1,290	2,100	61.6	3,450	<0.0998	3.28	1.51	39.1	43.9
Stockpile #35	4/6/2018	-	X		1,300	2,100	59.5	3,460	<0.101	3.88	1.65	42.4	47.9

(-) Not Analyzed

Stockpiles Worked Onsite and Remediated Below RRALs

Photos

Marathon Oil Permian, LLC.
Madera 19 Federal 1
Lea County, New Mexico



View West – Excavated Area of BH-1



View South – Excavated Area of BH-2

Marathon Oil Permian, LLC.
Madera 19 Federal 1
Lea County, New Mexico



View South – Excavated area of BH-3



View South – Excavation Area

Marathon Oil Permian, LLC.
Madera 19 Federal 1
Lea County, New Mexico



View North – Excavation Area



View North – Backfilled Excavation Area

Marathon Oil Permian, LLC.
Madera 19 Federal 1
Lea County, New Mexico



View North – Backfilled Excavation Area



View South – Backfilled Excavation Area

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised April 3, 2017

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 Permian LLC	Contact Callie Karrigan
Address 2423 Bonita St, Carlsbad, NM 88220	Telephone No. 405-202-1028 (cell) 575-297-0956 (office)
Facility Name: Madera 19 Federal I	Facility Type Oil and gas production facilities

Surface: Owner: Federal	Mineral: Owner:	API No. : 33-025-36645
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LOCATION OF RELEASE

Unit Letter L	Section 19	Township 26S	Range 35E	Feet from the	North/South Line	Feet from the	East/West Line	County LEA
------------------	---------------	-----------------	--------------	---------------	------------------	---------------	----------------	---------------

Latitude 32.026836 .Longitude -103.411465

NATURE OF RELEASE

Type of Release: Condensate and Produced Water	Volume of Release 150 bbls	Volume Recovered None
Source of Release: 500 bbl tank	Date and Hour of Occurrence unknown	Date and Hour of Discovery 1/31/2018 12:00 pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Olivia Yu	
By Whom? Callie Karrigan	Date and Hour 1/31/2018 5:40 pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

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

Describe Cause of Problem and Remedial Action Taken.*

A tank leak resulted in releasing 150 bbls onto the pad. The tank was strapped to identify remaining fluid level and then hauled off. No standing fluids were observed.

Describe Area Affected and Cleanup Action Taken.*

Condensate and produced water overfilled secondary containment (approximately 56'x33') and an additional area (approximately 49'x33'). A third party will collect soil samples and assess spill 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: Callie Karrigan		OIL CONSERVATION DIVISION	
Printed Name: Raquel Chacon		Approved by Environmental Specialist:	
Title: HES Professional - Environmental	Approval Date:	Expiration Date:	
E-mail Address: cnkarrigan@marathonoil.com	Conditions of Approval:		Attached ☐
Date: Phone: 405-202-1028 (cell) 575-297-0956 (office)			

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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 October 10, 2003

Submit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company Marathon Oil Permian, LLC.	Contact Callie Karrigan	
Address 2423 Bonita St, Carlsbad, NM 88220	Telephone No. (575)297-0956	
Facility Name Madera 19 Federal 1	Facility Type Production Facility	
Surface Owner: Federal	Mineral Owner	API No. 33-025-36645

LOCATION OF RELEASE

Unit Letter L	Section 19	Township 26S	Range 35E	Feet from the	North/South Line	Feet from the	East/West Line	County Lea
-------------------------	----------------------	------------------------	---------------------	---------------	------------------	---------------	----------------	----------------------

Latitude N 32.026836° Longitude W 103.411465°

NATURE OF RELEASE

Type of Release: Condensate and Produced Water	Volume of Release 150 bbls	Volume Recovered 0 bbls
Source of Release: 500 bbl tank	Date and Hour of Occurrence unknown	Date and Hour of Discovery 01/31/2018 12:00pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Olivia Yu - NMOCD	
By Whom? Callie Karrigan	Date and Hour 01/31/2018 540 pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	
If a Watercourse was Impacted, Describe Fully.* N/A		

APPROVED

By Olivia Yu at 2:09 pm, Sep 13, 2018

Describe Cause of Problem and Remedial Action Taken.*

A tank leak resulted in the release of 150 bbls of fluids onto the pad area. Condensate and produced water overfilled the secondary containment and migrated onto the pad.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected site and collected samples to define spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal or where worked onsite and used to backfill the excavation, once laboratory data showed the soils were below the RRALs. Site was then brought up to surface grade with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review.

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: 	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez	Approved by District Supervisor: 	
Title: Project Manager	Approval Date: 9/13/2018	Expiration Date: xx/xx/xxxx
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval: BLM approval	Attached ☐
Date: 06/18/18	Phone: (432) 682-4559	

* Attach Additional Sheets If Necessary

1RP-4959

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Marathon - Madera 19 Federal 1
Lea County, New Mexico

25 South			34 East		
6	5	4	3	2	1
					260
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

25 South			35 East		
6	5	4	3	108	2
	165				
7	8	9	10	11	12
18	17	16	15	14	13
230					
19	20	21	22	23	24
		218			
30	29	28	27	26	25
80					
31	32	33	34	35	36

25 South			36 East		
6	295	5	4	3	2
7	8	9	10	300	11
			180		12
18	17	16	15	14	13
			120		
19	20	21	22	23	24
				53.7	455
30	29	28	27	26	25
31	32	33	80	34	35
				36	

26 South			34 East		
6	160	5	4	3	2
175					
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

26 South			35 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

26 South			36 East		
6	5	4	3	2	1
7	8	9	175	10	11
			177		12
18	17	16	15	14	13
220					
19	20	21	22	23	24
198				151	
30	29	28	27	26	25
31	32	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)
 Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

(R=POD has been replaced,

O=orphaned,

C=the file is closed)

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
C 03795 POD1	C		LE	4	4	3	24	26S	35E	658419	3544221	496	250	246
J 00005 POD1			LE	2	2	2	13	26S	35E	659200	3547174*	601	230	371

Average Depth to Water: **240 feet**

Minimum Depth: **230 feet**

Maximum Depth: **250 feet**

Record Count: 2

PLSS Search:

Township: 26S **Range:** 35E

*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.

2/26/18 1:33 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C

Analytical Report 576035

for
Tetra Tech- Midland

Project Manager: Ike Tavaréz

Madera la Fed. 1

21-FEB-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):

Texas (T104704295-17-15), 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 (T104704400-17-13)

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)



21-FEB-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **576035**

Madera la Fed. 1

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) 576035. 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. 576035 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

Madera la Fed. 1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH 1 (0-1)	S	02-08-18 00:00		576035-001
AH 1 (1-1.5)	S	02-08-18 00:00		576035-002
AH 1 (2-2.5)	S	02-08-18 00:00		576035-003
AH 1 (3-3.5)	S	02-08-18 00:00		576035-004
AH 1 (4-4.5)	S	02-08-18 00:00		576035-005
AH 1 (4.5-5)	S	02-08-18 00:00		576035-006
AH 2 (0-1)	S	02-08-18 00:00		576035-007
AH 2 (1-1.5)	S	02-08-18 00:00		576035-008
AH 2 (2-2.5)	S	02-08-18 00:00		576035-009
AH 2 (3-3.5)	S	02-08-18 00:00		576035-010
AH 2 (4-4.5)	S	02-08-18 00:00		576035-011
AH 2 (5-5.5)	S	02-08-18 00:00		576035-012
AH 3 (0-1)	S	02-08-18 00:00		576035-013
AH 3 (1-1.5)	S	02-08-18 00:00		576035-014
AH 3 (2-2.5)	S	02-08-18 00:00		576035-015
AH 3 (3-3.5)	S	02-08-18 00:00		576035-016
AH 3 (4-4.5)	S	02-08-18 00:00		576035-017
AH 3 (5-5.5)	S	02-08-18 00:00		576035-018



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera la Fed. 1

Project ID:
Work Order Number(s): 576035

Report Date: 21-FEB-18
Date Received: 02/09/2018

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3040996 BTEX by EPA 8021B

Surrogate 1,4-Difluorobenzene recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 575590-005 S, 575590-005 SD, 576035-002.

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

Samples affected are: 576035-002.

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

Batch: LBA-3041032 TPH By SW8015 Mod

Lab Sample ID 576035-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Gasoline Range Hydrocarbons recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Diesel Range Organics recovered above QC limits in the Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 576035-001, -002, -007, -008, -013, -014.

The Laboratory Control Sample for Gasoline Range Hydrocarbons, Diesel Range Organics is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3041091 BTEX by EPA 8021B

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

Batch: LBA-3041576 Inorganic Anions by EPA 300/300.1

Lab Sample ID 576035-002 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered above QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 576035-001, -002, -003, -004, -005, -006, -007, -008, -009.

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



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera la Fed. 1

Project ID:

Work Order Number(s): 576035

Report Date: 21-FEB-18

Date Received: 02/09/2018

Batch: LBA-3041591 Inorganic Anions by EPA 300/300.1

Lab Sample ID 576035-010 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered above QC limits in the Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 576035-010, -011, -012, -013, -014, -015, -016, -017, -018.

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



Certificate of Analysis Summary 576035

Tetra Tech- Midland, Midland, TX

Project Name: Madera la Fed. 1



Project Id:

Contact: Ike Tavarez

Project Location: Lea County New Mexico

Date Received in Lab: Fri Feb-09-18 10:54 am

Report Date: 21-FEB-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	576035-001	576035-002	576035-003	576035-004	576035-005	576035-006
	Field Id:	AH 1 (0-1)	AH 1 (1-1.5)	AH 1 (2-2.5)	AH 1 (3-3.5)	AH 1 (4-4.5)	AH 1 (4.5-5)
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00
BTEX by EPA 8021B	Extracted:	Feb-14-18 10:00	Feb-12-18 17:00				
	Analyzed:	Feb-14-18 12:55	Feb-12-18 21:37				
	Units/RL:	mg/kg RL	mg/kg RL				
		2.41 2.02	<0.00199 0.00199				
Benzene		161 2.02	0.0570 0.00199				
Toluene		27.1 2.02	0.0381 0.00199				
Ethylbenzene		382 4.04	0.659 0.00398				
m,p-Xylenes		118 2.02	0.283 0.00199				
o-Xylene		500 2.02	0.942 0.00199				
Total Xylenes		691 2.02	1.04 0.00199				
Total BTEX							
Inorganic Anions by EPA 300/300.1	Extracted:	Feb-19-18 11:00	Feb-19-18 11:00	Feb-19-18 11:00	Feb-19-18 11:00	Feb-19-18 11:00	Feb-19-18 11:00
	Analyzed:	Feb-19-18 15:02	Feb-19-18 16:16	Feb-19-18 17:02	Feb-19-18 17:07	Feb-19-18 17:12	Feb-19-18 17:18
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		163 4.91	61.5 4.90	54.8 4.90	50.0 5.00	38.8 4.90	437 4.99
TPH By SW8015 Mod	Extracted:	Feb-13-18 07:00	Feb-13-18 07:00				
	Analyzed:	Feb-14-18 03:56	Feb-13-18 11:05				
	Units/RL:	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons		8940 74.9	56.3 15.0				
Diesel Range Organics		8360 74.9	474 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 576035

Tetra Tech- Midland, Midland, TX

Project Name: Madera la Fed. 1



Project Id:

Contact: Ike Tavarez

Project Location: Lea County New Mexico

Date Received in Lab: Fri Feb-09-18 10:54 am

Report Date: 21-FEB-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	576035-007	576035-008	576035-009	576035-010	576035-011	576035-012
	Field Id:	AH 2 (0-1)	AH 2 (1-1.5)	AH 2 (2-2.5)	AH 2 (3-3.5)	AH 2 (4-4.5)	AH 2 (5-5.5)
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00
BTEX by EPA 8021B	Extracted:	Feb-14-18 10:00	Feb-12-18 17:00				
	Analyzed:	Feb-14-18 12:18	Feb-12-18 21:18				
	Units/RL:	mg/kg RL	mg/kg RL				
	Benzene	3.21 2.00	<0.00201 0.00201				
	Toluene	188 2.00	0.00271 0.00201				
Ethylbenzene		27.3 2.00	<0.00201 0.00201				
m,p-Xylenes		386 3.99	0.00947 0.00402				
o-Xylene		124 2.00	0.00460 0.00201				
Total Xylenes		510 2.00	0.0141 0.00201				
Total BTEX		729 2.00	0.0168 0.00201				
Inorganic Anions by EPA 300/300.1	Extracted:	Feb-19-18 11:00	Feb-19-18 11:00	Feb-19-18 11:00	Feb-19-18 14:00	Feb-19-18 14:00	Feb-19-18 14:00
	Analyzed:	Feb-19-18 17:28	Feb-19-18 17:41	Feb-19-18 17:46	Feb-19-18 18:18	Feb-19-18 18:34	Feb-19-18 18:39
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
	Chloride	143 4.92	52.8 4.96	26.3 4.94	54.5 4.92	68.9 5.00	<4.90 4.90
TPH By SW8015 Mod	Extracted:	Feb-13-18 07:00	Feb-13-18 07:00				
	Analyzed:	Feb-14-18 07:20	Feb-13-18 11:45				
	Units/RL:	mg/kg RL	mg/kg RL				
	Gasoline Range Hydrocarbons	8660 74.9	<15.0 15.0				
	Diesel Range Organics	5360 74.9	18.2 15.0				

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 576035

Tetra Tech- Midland, Midland, TX

Project Name: Madera la Fed. 1



Project Id:

Contact: Ike Tavarez

Project Location: Lea County New Mexico

Date Received in Lab: Fri Feb-09-18 10:54 am

Report Date: 21-FEB-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	576035-013	576035-014	576035-015	576035-016	576035-017	576035-018
	Field Id:	AH 3 (0-1)	AH 3 (1-1.5)	AH 3 (2-2.5)	AH 3 (3-3.5)	AH 3 (4-4.5)	AH 3 (5-5.5)
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00	Feb-08-18 00:00
BTEX by EPA 8021B	Extracted:	Feb-14-18 10:00	Feb-14-18 10:00				
	Analyzed:	Feb-14-18 12:36	Feb-14-18 15:43				
	Units/RL:	mg/kg RL	mg/kg RL				
	Benzene	7.94 2.00	<0.101 0.101				
	Toluene	203 2.00	0.324 0.101				
Ethylbenzene		22.6 2.00	0.289 0.101				
m,p-Xylenes		301 4.01	5.30 0.201				
o-Xylene		87.4 2.00	2.32 0.101				
Total Xylenes		388 2.00	7.62 0.101				
Total BTEX		622 2.00	8.23 0.101				
Inorganic Anions by EPA 300/300.1	Extracted:	Feb-19-18 14:00	Feb-19-18 14:00	Feb-19-18 14:00	Feb-19-18 14:00	Feb-19-18 14:00	Feb-19-18 14:00
	Analyzed:	Feb-19-18 18:44	Feb-19-18 18:50	Feb-19-18 19:05	Feb-19-18 19:11	Feb-19-18 19:16	Feb-19-18 19:21
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
	Chloride	<4.90 4.90	<4.91 4.91	13.4 4.90	18.9 5.00	40.6 4.90	45.7 4.90
TPH By SW8015 Mod	Extracted:	Feb-13-18 07:00	Feb-13-18 07:00				
	Analyzed:	Feb-14-18 07:41	Feb-13-18 12:25				
	Units/RL:	mg/kg RL	mg/kg RL				
	Gasoline Range Hydrocarbons	6450 74.8	300 15.0				
	Diesel Range Organics	5670 74.8	836 15.0				

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Kelsey Brooks
Project Manager

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: Madera la Fed. 1

Work Orders : 576035,

Lab Batch #: 3040996

Sample: 576035-008 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/12/18 21:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	80-120	
4-Bromofluorobenzene	0.0281	0.0300	94	80-120	

Lab Batch #: 3040996

Sample: 576035-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/12/18 21:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0225	0.0300	75	80-120	**
4-Bromofluorobenzene	0.0583	0.0300	194	80-120	**

Lab Batch #: 3041032

Sample: 576035-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/13/18 11:05

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.6	99.7	96	70-135	
o-Terphenyl	52.3	49.9	105	70-135	

Lab Batch #: 3041032

Sample: 576035-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/13/18 11:45

SURROGATE RECOVERY STUDY

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

Lab Batch #: 3041032

Sample: 576035-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/13/18 12:25

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.9	102	70-135	
o-Terphenyl	50.5	50.0	101	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: Madera la Fed. 1

Work Orders : 576035,

Lab Batch #: 3041032

Sample: 576035-001 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 03:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	117	99.9	117	70-135	
o-Terphenyl	54.5	50.0	109	70-135	

Lab Batch #: 3041032

Sample: 576035-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 07:20

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.8	102	70-135	
o-Terphenyl	55.3	49.9	111	70-135	

Lab Batch #: 3041032

Sample: 576035-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 07:41

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.5	99.7	83	70-135	
o-Terphenyl	45.4	49.9	91	70-135	

Lab Batch #: 3041091

Sample: 576035-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 12:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3041091

Sample: 576035-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 12:36

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	80-120	
4-Bromofluorobenzene	0.0333	0.0300	111	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: Madera la Fed. 1

Work Orders : 576035,

Lab Batch #: 3041091

Sample: 576035-001 / SMP

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 12:55

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	80-120	
4-Bromofluorobenzene	0.0324	0.0300	108	80-120	

Lab Batch #: 3041091

Sample: 576035-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 15:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0338	0.0300	113	80-120	

Lab Batch #: 3040996

Sample: 7639096-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/12/18 19:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0241	0.0300	80	80-120	
4-Bromofluorobenzene	0.0258	0.0300	86	80-120	

Lab Batch #: 3041032

Sample: 7639062-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/13/18 09:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.1	100	96	70-135	
o-Terphenyl	50.1	50.0	100	70-135	

Lab Batch #: 3041091

Sample: 7639146-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/14/18 11:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	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: Madera la Fed. 1

Work Orders : 576035,

Lab Batch #: 3040996

Sample: 7639096-1-BKS / BKS

Project ID:

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/12/18 18:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0312	0.0300	104	80-120	
4-Bromofluorobenzene	0.0271	0.0300	90	80-120	

Lab Batch #: 3041032

Sample: 7639062-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/13/18 09:22

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	61.7	50.0	123	70-135	

Lab Batch #: 3041091

Sample: 7639146-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/14/18 09:34

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	0.0292	0.0300	97	80-120	

Lab Batch #: 3040996

Sample: 7639096-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/12/18 18:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0242	0.0300	81	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3041032

Sample: 7639062-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/13/18 09:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	100	106	70-135	
o-Terphenyl	52.1	50.0	104	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: Madera la Fed. 1

Work Orders : 576035,

Lab Batch #: 3041091

Sample: 7639146-1-BSD / BSD

Project ID:

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/14/18 09:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0242	0.0300	81	80-120	
4-Bromofluorobenzene	0.0287	0.0300	96	80-120	

Lab Batch #: 3040996

Sample: 575590-005 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/12/18 18:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0137	0.0300	46	80-120	**
4-Bromofluorobenzene	0.0248	0.0300	83	80-120	

Lab Batch #: 3041032

Sample: 576035-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 04:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	100	106	70-135	
o-Terphenyl	50.5	50.0	101	70-135	

Lab Batch #: 3041091

Sample: 575871-010 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 10:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0284	0.0300	95	80-120	

Lab Batch #: 3040996

Sample: 575590-005 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/12/18 19:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0127	0.0300	42	80-120	**
4-Bromofluorobenzene	0.0262	0.0300	87	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: Madera la Fed. 1

Work Orders : 576035,

Lab Batch #: 3041032

Sample: 576035-001 SD / MSD

Project ID:

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 04:38

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	99.9	100	70-135	
o-Terphenyl	50.5	50.0	101	70-135	

Lab Batch #: 3041091

Sample: 575871-010 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/14/18 10:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0257	0.0300	86	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	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.



BS / BSD Recoveries



Project Name: Madera la Fed. 1

Work Order #: 576035

Analyst: ALJ

Date Prepared: 02/12/2018

Project ID:

Date Analyzed: 02/12/2018

Lab Batch ID: 3040996

Sample: 7639096-1-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	<0.00201	0.101	0.100	99	0.100	0.112	112	11	70-130	35	
Toluene	<0.00201	0.101	0.0986	98	0.100	0.107	107	8	70-130	35	
Ethylbenzene	<0.00201	0.101	0.103	102	0.100	0.112	112	8	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.210	104	0.200	0.227	114	8	70-135	35	
o-Xylene	<0.00201	0.101	0.102	101	0.100	0.111	111	8	71-133	35	

Analyst: ALJ

Date Prepared: 02/14/2018

Date Analyzed: 02/14/2018

Lab Batch ID: 3041091

Sample: 7639146-1-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	0.105	104	0.100	0.103	103	2	70-130	35	
Toluene	<0.00202	0.101	0.101	100	0.100	0.0967	97	4	70-130	35	
Ethylbenzene	<0.00202	0.101	0.107	106	0.100	0.102	102	5	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.218	108	0.201	0.207	103	5	70-135	35	
o-Xylene	<0.00202	0.101	0.105	104	0.100	0.100	100	5	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: Madera la Fed. 1

Work Order #: 576035

Analyst: OJS

Lab Batch ID: 3041576

Units: mg/kg

Date Prepared: 02/19/2018

Sample: 7639421-1-BKS

Batch #: 1

Project ID:

Date Analyzed: 02/19/2018

Matrix: Solid

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	273	250	273	109	250	275	110	1	90-110	20	

Analyst: OJS

Date Prepared: 02/19/2018

Date Analyzed: 02/19/2018

Lab Batch ID: 3041591

Sample: 7639422-1-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	267	250	267	107	250	274	110	3	90-110	20	

Analyst: ARM

Date Prepared: 02/13/2018

Date Analyzed: 02/13/2018

Lab Batch ID: 3041032

Sample: 7639062-1-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	<15.0	1000	1050	105	1000	913	91	14	70-135	35	
Diesel Range Organics	<15.0	1000	1150	115	1000	985	99	15	70-135	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



Form 3 - MS / MSD Recoveries



Project Name: Madera la Fed. 1

Work Order # : 576035

Project ID:

Lab Batch ID: 3040996

QC- Sample ID: 575590-005 S

Batch #: 1 Matrix: Soil

Date Analyzed: 02/12/2018

Date Prepared: 02/12/2018

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	0.0763	76	0.100	0.0805	81	5	70-130	35	
Toluene	<0.00200	0.0998	0.0622	62	0.100	0.0652	65	5	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0479	48	0.100	0.0515	52	7	71-129	35	X
m,p-Xylenes	<0.00399	0.200	0.0943	47	0.200	0.102	51	8	70-135	35	X
o-Xylene	<0.00200	0.0998	0.0476	48	0.100	0.0509	51	7	71-133	35	X

Lab Batch ID: 3041091

QC- Sample ID: 575871-010 S

Batch #: 1 Matrix: Soil

Date Analyzed: 02/14/2018

Date Prepared: 02/14/2018

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	0.100	0.0974	97	0.101	0.0892	88	9	70-130	35	
Toluene	0.0132	0.100	0.0903	77	0.101	0.0800	66	12	70-130	35	X
Ethylbenzene	<0.00200	0.100	0.0849	85	0.101	0.0709	70	18	71-129	35	X
m,p-Xylenes	0.00487	0.200	0.172	84	0.201	0.138	66	22	70-135	35	X
o-Xylene	<0.00200	0.100	0.0843	84	0.101	0.0656	65	25	71-133	35	X

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

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

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

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



Form 3 - MS / MSD Recoveries



Project Name: Madera la Fed. 1

Work Order # : 576035

Project ID:

Lab Batch ID: 3041576

QC- Sample ID: 576035-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 02/19/2018

Date Prepared: 02/19/2018

Analyst: OJS

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	163	246	417	103	246	403	98	3	90-110	20	

Lab Batch ID: 3041576

QC- Sample ID: 576035-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 02/19/2018

Date Prepared: 02/19/2018

Analyst: OJS

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	61.5	245	337	112	245	334	111	1	90-110	20	X

Lab Batch ID: 3041591

QC- Sample ID: 576035-010 S

Batch #: 1 Matrix: Soil

Date Analyzed: 02/19/2018

Date Prepared: 02/19/2018

Analyst: OJS

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	54.5	246	306	102	246	344	118	12	90-110	20	X

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

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

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

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



Form 3 - MS / MSD Recoveries



Project Name: Madera la Fed. 1

Work Order # : 576035

Project ID:

Lab Batch ID: 3041032

QC- Sample ID: 576035-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 02/14/2018

Date Prepared: 02/13/2018

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	8940	1000	8750	0	999	9300	36	6	70-135	35	X
Diesel Range Organics	8360	1000	9490	113	999	9860	150	4	70-135	35	X

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

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

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



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

576035

Site Manager: Ike Tavaras

1000

Project #: 212c-MD-01102 (Task 200)

Sampler Signature: Sterling B Mike C

Comments: IF TPH exceeds 5,000 mg/kg, Benzene exceeds 10 mg/kg or Total BTEX exceeds 50 mg/kg run deeper samples

DATE		YEAR:	SAMPLING	MATRIX	PRESERVATIVE METHOD
TIME					
WATER					
SOIL					
CL					
NO ₃					
CE					
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

Received by: _____ Date: _____ Time: _____

Received by: W. J. Lee Date: 2/9/18 Time: 1054

Received by:	Date:	Time:
--------------	-------	-------

LAB USE ONLY

Standard

Sample Temperature

☐ **RUSH:** Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRAP- Report

Temp: 2.7 IR ID: R-8

 $CF:(0-6:-0.2^{\circ}C)$

(6-23: +0.2°C)

Corrected Temp: 7.5

ORIGINAL COPY

(Circle) HAND DELIVERED FEDEX UPS Tracking #



576035

ORIGINAL COPY



XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 02/09/2018 10:54:00 AM

Work Order #: 576035

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)?	2.5
#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: 02/09/2018

Checklist reviewed by:

Kelsey Brooks

Date: 02/11/2018

Analytical Report 578928

for
Tetra Tech- Midland

Project Manager: Ike Tavaréz

Madera 19 Fed #1

212C-MD-01102.200

13-MAR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



13-MAR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **578928**

Madera 19 Fed #1

Project Address: Lea County, NM

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) 578928. 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. 578928 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.

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



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera 19 Fed #1

Project ID: 212C-MD-01102.200
Work Order Number(s): 578928

Report Date: 13-MAR-18
Date Received: 03/12/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3043503 BTEX by EPA 8021B

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

Samples affected are: 578928-006.

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

Dilutions necessitated due to poor resolution of internal standards caused by matrix interference.

Batch: LBA-3043522 TPH By SW8015 Mod

Lab Sample ID 578928-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).

Diesel Range Organics (DRO), Gasoline Range Hydrocarbons (GRO) 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: 578928-001, -002, -003, -004, -005, -006, -007, -008.

The Laboratory Control Sample for Gasoline Range Hydrocarbons (GRO), Diesel Range Organics (DRO) is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3043536 BTEX by EPA 8021B

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



Certificate of Analysis Summary 578928

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Fed #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavaréz

Project Location: Lea County, NM

Date Received in Lab: Mon Mar-12-18 11:11 am

Report Date: 13-MAR-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	578928-001	578928-002	578928-003	578928-004	578928-005	578928-006
	Field Id:	N-Bottom Hole (1' Deep)	S-Bottom Hole (1' Deep)	N-SW	S-SW	NE-SW	NW-SW
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Mar-08-18 16:40	Mar-09-18 13:05	Mar-09-18 16:10	Mar-09-18 15:20	Mar-09-18 15:50	Mar-09-18 16:35
BTEX by EPA 8021B	Extracted:	Mar-12-18 11:30	Mar-13-18 08:00	Mar-12-18 11:30	Mar-12-18 11:30	Mar-12-18 11:30	Mar-12-18 11:30
	Analyzed:	Mar-12-18 17:00	Mar-13-18 10:49	Mar-12-18 13:56	Mar-12-18 14:15	Mar-12-18 16:22	Mar-12-18 14:34
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.398 0.398	1.64 0.996	<0.00202 0.00202	<0.00200 0.00200	0.250 0.199	<0.00200 0.00200
Toluene		31.3 0.398	95.9 0.996	0.00882 0.00202	0.00516 0.00200	15.3 0.199	0.0166 0.00200
Ethylbenzene		12.1 0.398	28.1 0.996	<0.00202 0.00202	<0.00200 0.00200	4.19 0.199	0.0462 0.00200
m,p-Xylenes		151 0.795	383 1.99	0.0221 0.00403	0.0216 0.00401	50.0 0.398	0.192 0.00401
o-Xylene		43.1 0.398	106 0.996	0.00848 0.00202	0.0104 0.00200	13.7 0.199	0.0543 0.00200
Total Xylenes		194 0.398	489 0.996	0.0306 0.00202	0.0320 0.00200	63.7 0.199	0.246 0.00200
Total BTEX		238 0.398	615 0.996	0.0394 0.00202	0.0372 0.00200	83.4 0.199	0.309 0.00200
Inorganic Anions by EPA 300/300.1	Extracted:	Mar-12-18 16:00	Mar-12-18 16:00	Mar-12-18 16:00	Mar-12-18 16:00	Mar-12-18 16:00	Mar-12-18 16:00
	Analyzed:	Mar-13-18 15:21	Mar-13-18 15:44	Mar-13-18 16:48	Mar-13-18 15:55	Mar-13-18 16:53	Mar-13-18 16:16
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		174 4.94	413 4.95	<4.93 4.93	11.4 5.00	<4.94 4.94	<4.96 4.96
TPH By SW8015 Mod	Extracted:	Mar-12-18 17:00	Mar-12-18 17:00	Mar-12-18 17:00	Mar-12-18 17:00	Mar-12-18 17:00	Mar-12-18 17:00
	Analyzed:	Mar-12-18 20:54	Mar-13-18 06:03	Mar-12-18 22:13	Mar-12-18 22:33	Mar-12-18 22:53	Mar-12-18 23:13
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		3700 15.0	7150 74.8	<15.0 15.0	<15.0 15.0	1160 15.0	423 15.0
Diesel Range Organics (DRO)		3520 15.0	7260 74.8	41.7 15.0	92.9 15.0	1370 15.0	1350 15.0
Oil Range Hydrocarbons (ORO)		138 15.0	350 74.8	<15.0 15.0	<15.0 15.0	83.5 15.0	77.8 15.0
Total TPH		7360 15.0	14800 74.8	41.7 15.0	92.9 15.0	2610 15.0	1850 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 578928

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Fed #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavaréz

Project Location: Lea County, NM

Date Received in Lab: Mon Mar-12-18 11:11 am

Report Date: 13-MAR-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	578928-007	578928-008				
	Field Id:	SE-SW	SW-SW				
	Depth:						
	Matrix:	SOIL	SOIL				
	Sampled:	Mar-09-18 13:55	Mar-09-18 12:25				
BTEX by EPA 8021B	Extracted:	Mar-12-18 11:30	Mar-12-18 11:30				
	Analyzed:	Mar-12-18 14:54	Mar-12-18 15:13				
	Units/RL:	mg/kg RL	mg/kg RL				
Benzene		<0.00199 0.00199	<0.00200 0.00200				
Toluene		0.00309 0.00199	0.00968 0.00200				
Ethylbenzene		<0.00199 0.00199	0.0255 0.00200				
m,p-Xylenes		0.00814 0.00398	0.00464 0.00399				
o-Xylene		0.00366 0.00199	0.0122 0.00200				
Total Xylenes		0.0118 0.00199	0.0168 0.00200				
Total BTEX		0.0149 0.00199	0.0520 0.00200				
Inorganic Anions by EPA 300/300.1	Extracted:	Mar-12-18 16:00	Mar-12-18 16:00				
	Analyzed:	Mar-13-18 16:21	Mar-13-18 16:27				
	Units/RL:	mg/kg RL	mg/kg RL				
Chloride		<4.99 4.99	<4.95 4.95				
TPH By SW8015 Mod	Extracted:	Mar-12-18 17:00	Mar-12-18 17:00				
	Analyzed:	Mar-12-18 23:33	Mar-12-18 23:52				
	Units/RL:	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<14.9 14.9	89.5 15.0				
Diesel Range Organics (DRO)		<14.9 14.9	595 15.0				
Oil Range Hydrocarbons (ORO)		<14.9 14.9	27.5 15.0				
Total TPH		<14.9 14.9	712 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

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Madera 19 Fed #1

Work Orders : 578928,

Lab Batch #: 3043503

Sample: 578928-003 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 13:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0222	0.0300	74	70-130	
4-Bromofluorobenzene	0.0342	0.0300	114	70-130	

Lab Batch #: 3043503

Sample: 578928-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 14:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0241	0.0300	80	70-130	
4-Bromofluorobenzene	0.0294	0.0300	98	70-130	

Lab Batch #: 3043503

Sample: 578928-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 14:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0214	0.0300	71	70-130	
4-Bromofluorobenzene	0.107	0.0300	357	70-130	**

Lab Batch #: 3043503

Sample: 578928-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 14:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0214	0.0300	71	70-130	
4-Bromofluorobenzene	0.0354	0.0300	118	70-130	

Lab Batch #: 3043503

Sample: 578928-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 15:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0218	0.0300	73	70-130	
4-Bromofluorobenzene	0.0376	0.0300	125	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: Madera 19 Fed #1

Work Orders : 578928,

Lab Batch #: 3043503

Sample: 578928-005 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 16:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0223	0.0300	74	70-130	
4-Bromofluorobenzene	0.0320	0.0300	107	70-130	

Lab Batch #: 3043503

Sample: 578928-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 17:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0316	0.0300	105	70-130	
4-Bromofluorobenzene	0.0382	0.0300	127	70-130	

Lab Batch #: 3043522

Sample: 578928-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 20:54

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	48.5	49.9	97	70-135	

Lab Batch #: 3043522

Sample: 578928-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 22:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.7	99.7	93	70-135	
o-Terphenyl	47.5	49.9	95	70-135	

Lab Batch #: 3043522

Sample: 578928-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 22:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.0	99.9	99	70-135	
o-Terphenyl	48.8	50.0	98	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: Madera 19 Fed #1

Work Orders : 578928,

Lab Batch #: 3043522

Sample: 578928-005 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 22:53

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	100	113	70-135	
o-Terphenyl	49.2	50.0	98	70-135	

Lab Batch #: 3043522

Sample: 578928-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 23:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.8	109	70-135	
o-Terphenyl	45.4	49.9	91	70-135	

Lab Batch #: 3043522

Sample: 578928-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 23:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	89.6	99.6	90	70-135	
o-Terphenyl	44.2	49.8	89	70-135	

Lab Batch #: 3043522

Sample: 578928-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 23:52

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.6	99.7	100	70-135	
o-Terphenyl	44.0	49.9	88	70-135	

Lab Batch #: 3043522

Sample: 578928-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/13/18 06:03

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.2	99.7	95	70-135	
o-Terphenyl	47.3	49.9	95	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: Madera 19 Fed #1

Work Orders : 578928,

Project ID: 212C-MD-01102.200

Lab Batch #: 3043536

Sample: 578928-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/13/18 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	0.0229	0.0300	76	70-130	
4-Bromofluorobenzene	0.0343	0.0300	114	70-130	

Lab Batch #: 3043503

Sample: 7640672-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/12/18 09:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	70-130	
4-Bromofluorobenzene	0.0331	0.0300	110	70-130	

Lab Batch #: 3043522

Sample: 7640686-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/12/18 19:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.7	100	86	70-135	
o-Terphenyl	46.5	50.0	93	70-135	

Lab Batch #: 3043536

Sample: 7640690-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/13/18 08:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0264	0.0300	88	70-130	
4-Bromofluorobenzene	0.0324	0.0300	108	70-130	

Lab Batch #: 3043503

Sample: 7640672-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/12/18 06:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0257	0.0300	86	70-130	
4-Bromofluorobenzene	0.0357	0.0300	119	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: Madera 19 Fed #1

Work Orders : 578928,

Lab Batch #: 3043522

Sample: 7640686-1-BKS / BKS

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/12/18 20:15

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.8	100	98	70-135	
o-Terphenyl	46.0	50.0	92	70-135	

Lab Batch #: 3043536

Sample: 7640690-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/13/18 06:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	70-130	
4-Bromofluorobenzene	0.0330	0.0300	110	70-130	

Lab Batch #: 3043503

Sample: 7640672-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/12/18 07:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	70-130	
4-Bromofluorobenzene	0.0355	0.0300	118	70-130	

Lab Batch #: 3043522

Sample: 7640686-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/12/18 20:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	45.2	50.0	90	70-135	

Lab Batch #: 3043536

Sample: 7640690-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/13/18 07:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	70-130	
4-Bromofluorobenzene	0.0346	0.0300	115	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: Madera 19 Fed #1

Work Orders : 578928,

Lab Batch #: 3043503

Sample: 578649-001 S / MS

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 07:34

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	0.0359	0.0300	120	70-130	

Lab Batch #: 3043522

Sample: 578928-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 21:15

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.5	99.9	100	70-135	
o-Terphenyl	53.2	50.0	106	70-135	

Lab Batch #: 3043536

Sample: 578597-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/13/18 07:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	70-130	
4-Bromofluorobenzene	0.0341	0.0300	114	70-130	

Lab Batch #: 3043503

Sample: 578649-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 07:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0262	0.0300	87	70-130	
4-Bromofluorobenzene	0.0387	0.0300	129	70-130	

Lab Batch #: 3043522

Sample: 578928-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/12/18 21:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.7	99.8	97	70-135	
o-Terphenyl	53.1	49.9	106	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: Madera 19 Fed #1

Work Orders : 578928,

Project ID: 212C-MD-01102.200

Lab Batch #: 3043536

Sample: 578597-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/13/18 07:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0256	0.0300	85	70-130	
4-Bromofluorobenzene	0.0380	0.0300	127	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Madera 19 Fed #1

Work Order #: 578928

Project ID: 212C-MD-01102.200

Analyst: ALJ

Date Prepared: 03/12/2018

Date Analyzed: 03/12/2018

Lab Batch ID: 3043503

Sample: 7640672-1-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	0.0909	90	0.100	0.0883	88	3	70-130	35	
Toluene	<0.00202	0.101	0.0972	96	0.100	0.0942	94	3	70-130	35	
Ethylbenzene	<0.00202	0.101	0.111	110	0.100	0.109	109	2	70-130	35	
m,p-Xylenes	<0.00403	0.202	0.219	108	0.200	0.214	107	2	70-130	35	
o-Xylene	<0.00202	0.101	0.106	105	0.100	0.105	105	1	70-130	35	

Analyst: ALJ

Date Prepared: 03/13/2018

Date Analyzed: 03/13/2018

Lab Batch ID: 3043536

Sample: 7640690-1-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	0.0768	77	0.100	0.0766	77	0	70-130	35	
Toluene	<0.00199	0.0994	0.0824	83	0.100	0.0825	83	0	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.0953	96	0.100	0.0962	96	1	70-130	35	
m,p-Xylenes	<0.00398	0.199	0.189	95	0.200	0.190	95	1	70-130	35	
o-Xylene	<0.00199	0.0994	0.0951	96	0.100	0.0959	96	1	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: Madera 19 Fed #1

Work Order #: 578928

Project ID: 212C-MD-01102.200

Analyst: OJS

Date Prepared: 03/12/2018

Date Analyzed: 03/13/2018

Lab Batch ID: 3043580

Sample: 7640646-1-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	271	108	250	244	98	10	90-110	20	

Analyst: ARM

Date Prepared: 03/12/2018

Date Analyzed: 03/12/2018

Lab Batch ID: 3043522

Sample: 7640686-1-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	914	91	1000	909	91	1	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	825	83	1000	813	81	1	70-135	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



Form 3 - MS / MSD Recoveries



Project Name: Madera 19 Fed #1

Work Order #: 578928

Project ID: 212C-MD-01102.200

Lab Batch ID: 3043503

QC- Sample ID: 578649-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 03/12/2018

Date Prepared: 03/12/2018

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	<0.00199	0.0996	0.0584	59	0.100	0.0656	66	12	70-130	35	X
Toluene	<0.00199	0.0996	0.0607	61	0.100	0.0664	66	9	70-130	35	X
Ethylbenzene	<0.00199	0.0996	0.0666	67	0.100	0.0704	70	6	70-130	35	X
m,p-Xylenes	<0.00398	0.199	0.131	66	0.200	0.138	69	5	70-130	35	X
o-Xylene	<0.00199	0.0996	0.0651	65	0.100	0.0709	71	9	70-130	35	X

Lab Batch ID: 3043536

QC- Sample ID: 578597-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 03/13/2018

Date Prepared: 03/13/2018

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	0.100	0.0674	67	0.101	0.0563	56	18	70-130	35	X
Toluene	<0.00200	0.100	0.0640	64	0.101	0.0594	59	7	70-130	35	X
Ethylbenzene	<0.00200	0.100	0.0617	62	0.101	0.0613	61	1	70-130	35	X
m,p-Xylenes	<0.00401	0.200	0.113	57	0.202	0.113	56	0	70-130	35	X
o-Xylene	<0.00200	0.100	0.0602	60	0.101	0.0585	58	3	70-130	35	X

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

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

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

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



Form 3 - MS / MSD Recoveries



Project Name: Madera 19 Fed #1

Work Order # : 578928

Project ID: 212C-MD-01102.200

Lab Batch ID: 3043580

QC- Sample ID: 578928-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 03/13/2018

Date Prepared: 03/12/2018

Analyst: OJS

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	174	247	444	109	247	442	109	0	90-110	20	

Lab Batch ID: 3043522

QC- Sample ID: 578928-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 03/12/2018

Date Prepared: 03/12/2018

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)	3700	999	3980	28	998	3700	0	7	70-135	35	X
Diesel Range Organics (DRO)	3520	999	3420	0	998	3200	0	7	70-135	35	X

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

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

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

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



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

570020

ANALYSIS REQUEST

Site Manager:
Ike Tavaraz

Project Location:
Lea County, NM

Project #: 212C-MD-01102.200

Invoice to:
Tetra Tech, Inc.

Receiving Laboratory: Xenco Laboratories

Sampler Signature:

Comments:
N/A[illegible]

Date: Time:

Date: _____ Time: _____

Date: _____ Time: _____

LAB USE
ONLY

REMARKS:

Sample Temperature

☒ 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: 5.7 IR ID: R-8
CF: (0-6: -0.2°C)

Corrected Temp:

Final 1.000



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 03/12/2018 11:11:00 AM

Work Order #: 578928

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)?	5.5
#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

TPH in bulk container

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Katie Lowe

Date: 03/12/2018

Checklist reviewed by:

Date: 03/12/2018

Analytical Report 580725

for Tetra Tech- Midland

Project Manager: Ike Tavaréz

Marathon - Madera 19 Federal #1

212C-MD-01102.200

30-MAR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



30-MAR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **580725**

Marathon - Madera 19 Federal #1

Project Address: Lea Co., NM

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) 580725. 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. 580725 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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



Sample Cross Reference 580725



Tetra Tech- Midland, Midland, TX

Marathon - Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Stockpile #1 Composite	S	03-28-18 00:00		580725-001
Stockpile #2 Composite	S	03-28-18 00:00		580725-002
Stockpile #3 Composite	S	03-28-18 00:00		580725-003
Stockpile #4 Composite	S	03-28-18 00:00		580725-004
Stockpile #5 Composite	S	03-28-18 00:00		580725-005
Stockpile #6 Composite	S	03-28-18 00:00		580725-006
Stockpile #7 Composite	S	03-28-18 00:00		580725-007
Stockpile #8 Composite	S	03-28-18 00:00		580725-008
Stockpile #9 Composite	S	03-28-18 00:00		580725-009
Stockpile #10 Composite	S	03-28-18 00:00		580725-010
Stockpile #11 Composite	S	03-28-18 00:00		580725-011
Stockpile #12 Composite	S	03-28-18 00:00		580725-012



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Marathon - Madera 19 Federal #1

Project ID: 212C-MD-01102.200
Work Order Number(s): 580725

Report Date: 30-MAR-18
Date Received: 03/29/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3045220 BTEX by EPA 8021B

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

Samples affected are: 580725-002.

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

Samples analyzed at a dilution due to poor resolution of internal standard caused by matrix interference.



Certificate of Analysis Summary 580725

Tetra Tech- Midland, Midland, TX

Project Name: Marathon - Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Thu Mar-29-18 09:55 am

Report Date: 30-MAR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	580725-001	580725-002	580725-003	580725-004	580725-005	580725-006
	Field Id:	Stockpile #1 Composite	Stockpile #2 Composite	Stockpile #3 Composite	Stockpile #4 Composite	Stockpile #5 Composite	Stockpile #6 Composite
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00
BTEX by EPA 8021B	Extracted:	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00
	Analyzed:	Mar-29-18 13:30	Mar-29-18 13:52	Mar-29-18 14:33	Mar-29-18 14:54	Mar-29-18 16:50	Mar-29-18 17:09
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.0504 0.0504	<0.0200 0.0200	<0.0996 0.0996	<0.100 0.100	<0.100 0.100	<0.101 0.101
Toluene		4.46 0.0504	1.78 0.0200	3.46 0.0996	4.49 0.100	3.70 0.100	2.25 0.101
Ethylbenzene		2.11 0.0504	0.990 0.0200	1.62 0.0996	2.05 0.100	1.65 0.100	0.754 0.101
m,p-Xylenes		37.9 D 0.199	31.0 D 0.202	32.8 0.199	37.7 0.200	32.9 0.200	18.5 0.201
o-Xylene		11.7 D 0.0996	10.6 D 0.101	10.8 0.0996	12.4 0.100	11.2 0.100	6.40 0.101
Total Xylenes		49.6 0.0996	41.6 0.101	43.6 0.0996	50.1 0.100	44.1 0.100	24.9 0.101
Total BTEX		56.2 0.0504	44.4 0.0200	48.7 0.0996	56.6 0.100	49.5 0.100	27.9 0.101
TPH By SW8015 Mod	Extracted:	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00
	Analyzed:	Mar-29-18 10:54	Mar-29-18 10:14	Mar-29-18 10:35	Mar-29-18 10:56	Mar-29-18 11:16	Mar-29-18 11:36
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		1690 15.0	1180 15.0	1300 14.9	1290 15.0	1340 15.0	725 15.0
Diesel Range Organics (DRO)		1870 15.0	1780 15.0	2010 14.9	2010 15.0	2210 15.0	1130 15.0
Oil Range Hydrocarbons (ORO)		62.8 15.0	63.1 15.0	70.3 14.9	72.0 15.0	79.9 15.0	40.8 15.0
Total TPH		3620 15.0	3020 15.0	3380 14.9	3370 15.0	3630 15.0	1900 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.

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 580725

Tetra Tech- Midland, Midland, TX

Project Name: Marathon - Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Thu Mar-29-18 09:55 am

Report Date: 30-MAR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	580725-007	580725-008	580725-009	580725-010	580725-011	580725-012
	Field Id:	Stockpile #7 Composite	Stockpile #8 Composite	Stockpile #9 Composite	Stockpile #10 Composite	Stockpile #11 Composite	Stockpile #12 Composite
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00	Mar-28-18 00:00
BTEX by EPA 8021B	Extracted:	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00
	Analyzed:	Mar-29-18 17:28	Mar-29-18 17:47	Mar-29-18 16:30	Mar-29-18 18:06	Mar-29-18 18:25	Mar-29-18 18:45
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.0996 0.0996	<0.100 0.100	<0.0996 0.0996	<0.0998 0.0998	<0.100 0.100	<0.101 0.101
Toluene		0.938 0.0996	1.49 0.100	0.773 0.0996	2.49 0.0998	6.42 0.100	2.21 0.101
Ethylbenzene		0.400 0.0996	0.380 0.100	0.233 0.0996	0.899 0.0998	1.97 0.100	0.745 0.101
m,p-Xylenes		10.8 0.199	13.0 0.201	8.42 0.199	18.9 0.200	37.4 0.201	17.8 0.202
o-Xylene		3.74 0.0996	4.44 0.100	3.04 0.0996	6.19 0.0998	11.9 0.100	5.80 0.101
Total Xylenes		14.5 0.0996	17.4 0.100	11.5 0.0996	25.1 0.0998	49.3 0.100	23.6 0.101
Total BTEX		15.9 0.0996	19.3 0.100	12.5 0.0996	28.5 0.0998	57.7 0.100	26.6 0.101
TPH By SW8015 Mod	Extracted:	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00	Mar-29-18 10:00
	Analyzed:	Mar-29-18 11:57	Mar-29-18 12:17	Mar-29-18 12:38	Mar-29-18 12:58	Mar-29-18 14:04	Mar-29-18 14:44
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		508 15.0	626 15.0	431 15.0	812 14.9	1370 15.0	646 15.0
Diesel Range Organics (DRO)		988 15.0	1170 15.0	888 15.0	1110 14.9	1440 15.0	1000 15.0
Oil Range Hydrocarbons (ORO)		32.0 15.0	42.7 15.0	32.3 15.0	40.4 14.9	52.1 15.0	36.2 15.0
Total TPH		1530 15.0	1840 15.0	1350 15.0	1960 14.9	2860 15.0	1680 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.

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Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Marathon - Madera 19 Federal #1

Work Orders : 580725,

Project ID: 212C-MD-01102.200

Lab Batch #: 3045206

Sample: 580725-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 10:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.0	99.8	83	70-135	
o-Terphenyl	35.9	49.9	72	70-135	

Lab Batch #: 3045206

Sample: 580725-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 10:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.6	99.6	89	70-135	
o-Terphenyl	40.7	49.8	82	70-135	

Lab Batch #: 3045206

Sample: 580725-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 10:54

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.2	99.8	90	70-135	
o-Terphenyl	36.7	49.9	74	70-135	

Lab Batch #: 3045206

Sample: 580725-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 10:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	87.6	99.9	88	70-135	
o-Terphenyl	38.0	50.0	76	70-135	

Lab Batch #: 3045206

Sample: 580725-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 11:16

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.6	99.7	95	70-135	
o-Terphenyl	41.2	49.9	83	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 - Madera 19 Federal #1

Work Orders : 580725,

Project ID: 212C-MD-01102.200

Lab Batch #: 3045206

Sample: 580725-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 11:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	84.7	99.9	85	70-135	
o-Terphenyl	38.2	50.0	76	70-135	

Lab Batch #: 3045206

Sample: 580725-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 11:57

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.5	99.8	84	70-135	
o-Terphenyl	38.4	49.9	77	70-135	

Lab Batch #: 3045206

Sample: 580725-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 12:17

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.2	100	90	70-135	
o-Terphenyl	43.8	50.0	88	70-135	

Lab Batch #: 3045206

Sample: 580725-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 12:38

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.2	99.8	79	70-135	
o-Terphenyl	37.3	49.9	75	70-135	

Lab Batch #: 3045206

Sample: 580725-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 12:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.8	99.6	81	70-135	
o-Terphenyl	38.6	49.8	78	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 - Madera 19 Federal #1

Work Orders : 580725,

Lab Batch #: 3045220

Sample: 580725-001 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 13:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	70-130	
4-Bromofluorobenzene	0.0346	0.0300	115	70-130	

Lab Batch #: 3045220

Sample: 580725-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 13:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	70-130	
4-Bromofluorobenzene	0.0400	0.0300	133	70-130	**

Lab Batch #: 3045206

Sample: 580725-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 14:04

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	87.4	99.7	88	70-135	
o-Terphenyl	40.4	49.9	81	70-135	

Lab Batch #: 3045220

Sample: 580725-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 14:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0257	0.0300	86	70-130	
4-Bromofluorobenzene	0.0386	0.0300	129	70-130	

Lab Batch #: 3045206

Sample: 580725-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 14:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.1	99.7	79	70-135	
o-Terphenyl	38.0	49.9	76	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 - Madera 19 Federal #1

Work Orders : 580725,

Lab Batch #: 3045220

Sample: 580725-004 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 14:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	70-130	
4-Bromofluorobenzene	0.0377	0.0300	126	70-130	

Lab Batch #: 3045220

Sample: 580725-001 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 15:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0252	0.0300	84	70-130	
4-Bromofluorobenzene	0.0270	0.0300	90	70-130	

Lab Batch #: 3045220

Sample: 580725-002 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 16:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	70-130	
4-Bromofluorobenzene	0.0365	0.0300	122	70-130	

Lab Batch #: 3045220

Sample: 580725-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 16:30

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	70-130	
4-Bromofluorobenzene	0.0316	0.0300	105	70-130	

Lab Batch #: 3045220

Sample: 580725-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 16:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	70-130	
4-Bromofluorobenzene	0.0382	0.0300	127	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



Form 2 - Surrogate Recoveries

Project Name: Marathon - Madera 19 Federal #1

Work Orders : 580725,

Lab Batch #: 3045220

Sample: 580725-006 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 17:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	70-130	
4-Bromofluorobenzene	0.0376	0.0300	125	70-130	

Lab Batch #: 3045220

Sample: 580725-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 17:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	70-130	
4-Bromofluorobenzene	0.0344	0.0300	115	70-130	

Lab Batch #: 3045220

Sample: 580725-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 17:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0249	0.0300	83	70-130	
4-Bromofluorobenzene	0.0366	0.0300	122	70-130	

Lab Batch #: 3045220

Sample: 580725-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 18:06

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	0.0341	0.0300	114	70-130	

Lab Batch #: 3045220

Sample: 580725-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 18:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	70-130	
4-Bromofluorobenzene	0.0369	0.0300	123	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 - Madera 19 Federal #1

Work Orders : 580725,

Lab Batch #: 3045220

Sample: 580725-012 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 18:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	70-130	
4-Bromofluorobenzene	0.0381	0.0300	127	70-130	

Lab Batch #: 3045206

Sample: 7641726-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/29/18 08:52

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	72.8	100	73	70-135	
o-Terphenyl	38.8	50.0	78	70-135	

Lab Batch #: 3045220

Sample: 7641736-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/29/18 10:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0287	0.0300	96	70-130	
4-Bromofluorobenzene	0.0243	0.0300	81	70-130	

Lab Batch #: 3045220

Sample: 7641736-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/29/18 08:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	70-130	
4-Bromofluorobenzene	0.0260	0.0300	87	70-130	

Lab Batch #: 3045206

Sample: 7641726-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/29/18 09:12

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	72.9	100	73	70-135	
o-Terphenyl	41.4	50.0	83	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 - Madera 19 Federal #1

Work Orders : 580725,

Project ID: 212C-MD-01102.200

Lab Batch #: 3045220

Sample: 7641736-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/29/18 09:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	70-130	
4-Bromofluorobenzene	0.0279	0.0300	93	70-130	

Lab Batch #: 3045206

Sample: 7641726-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/29/18 09:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	73.0	100	73	70-135	
o-Terphenyl	37.3	50.0	75	70-135	

Lab Batch #: 3045220

Sample: 580687-003 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 09:38

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	0.0264	0.0300	88	70-130	

Lab Batch #: 3045206

Sample: 580630-003 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 17:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	77.8	99.9	78	70-135	
o-Terphenyl	38.6	50.0	77	70-135	

Lab Batch #: 3045220

Sample: 580687-003 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 09:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	70-130	
4-Bromofluorobenzene	0.0276	0.0300	92	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 - Madera 19 Federal #1

Work Orders : 580725,

Lab Batch #: 3045206

Sample: 580630-003 SD / MSD

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/29/18 18:12

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	75.8	99.8	76	70-135	
o-Terphenyl	35.2	49.9	71	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Marathon - Madera 19 Federal #1

Work Order #: 580725

Project ID: 212C-MD-01102.200

Analyst: ALJ

Date Prepared: 03/29/2018

Date Analyzed: 03/29/2018

Lab Batch ID: 3045220

Sample: 7641736-1-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	<0.00201	0.101	0.102	101	0.100	0.101	101	1	70-130	35	
Toluene	<0.00201	0.101	0.0993	98	0.100	0.0999	100	1	70-130	35	
Ethylbenzene	<0.00201	0.101	0.0972	96	0.100	0.0971	97	0	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.199	99	0.201	0.198	99	1	70-130	35	
o-Xylene	<0.00201	0.101	0.0996	99	0.100	0.0999	100	0	70-130	35	

Analyst: ARM

Date Prepared: 03/29/2018

Date Analyzed: 03/29/2018

Lab Batch ID: 3045206

Sample: 7641726-1-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	818	82	1000	854	85	4	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	802	80	1000	825	83	3	70-135	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Marathon - Madera 19 Federal #1

Work Order # : 580725

Project ID: 212C-MD-01102.200

Lab Batch ID: 3045220

QC- Sample ID: 580687-003 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 03/29/2018

Date Prepared: 03/29/2018

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	0.0534	54	0.0994	0.0528	53	1	70-130	35	X
Toluene	0.00201	0.0998	0.0525	51	0.0994	0.0516	50	2	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0506	51	0.0994	0.0487	49	4	70-130	35	X
m,p-Xylenes	0.00640	0.200	0.106	50	0.199	0.102	48	4	70-130	35	X
o-Xylene	<0.00200	0.0998	0.0516	52	0.0994	0.0502	51	3	70-130	35	X

Lab Batch ID: 3045206

QC- Sample ID: 580630-003 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 03/29/2018

Date Prepared: 03/29/2018

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	842	84	998	780	78	8	70-135	20	
Diesel Range Organics (DRO)	<15.0	999	764	76	998	751	75	2	70-135	20	

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

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

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

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

Analysis Request of Chain of Custody Record

Page 7 of 7



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 Tavaroz

Project Name:

Madera 19 Federal #1

Project Location:

(county, state) Lea Co. NM

Project #:

212C-MD-01102.200

Invoice to:

Tetra Tech

Receiving Laboratory:

Xenico

Sampler Signature:

Shirley P. Kelly

Comments:

SAMPLE IDENTIFICATION

LAB #
(LAB USE ONLY)

SAMPLING

YEAR: 2017

DATE

TIME

MATRIX

PRESERVATIVE METHOD

WATER
SOIL
HCL
HNO₃
ICE
None

CONTAINERS

FILTERED (Y/N)

Stock pile # 11 Composite
Stock pile # 12 Composite3-28-18
3-28-18X
X
X
X
X
None1
1X
XX
X

BTX 8021B BTX 8260B

TPH TX1005 (Ext to C35)

TPH 8015M (GRO - DRO - ORO)

PAH 8270C

Total Metals Ag As Ba Cd Cr Pb Se Hg

TCLP Metals Ag As Ba Cd Cr Pb Se Hg

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC/MS Vol. 8260B / 624

GC/MS Semi. Vol. 8270C/625

PCB's 8082 / 608

NORM

PLM (Asbestos)

Chloride

Chloride Sulfate TDS

General Water Chemistry (see attached list)

Anion/Cation Balance

Hold

Relinquished by:

Date: Time:

Relinquished by:

Date: Time:

Relinquished by:

Date: Time:

Received by:

Date: Time:

Received by:

Date: Time:

Received by:

Date: Time:

Date: Time:

Date: Time:

Date: Time:

Date: Time:

Date: Time:

Date: Time:

LAB USE ONLY

Sample Temperature

REMARKS:

STANDARD

RUSH: Same Day

Rush Charges Authorized

Special Report 1 mile or more

Temp: -5.0 IR ID: R-8

CF: (0.6: 0.2°C)

(6-23: +0.2°C)

Corrected Temp: -5.2

ORIGINAL COPY

(Circle or Specify Method No.)

580725



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 03/29/2018 09:55:00 AM

Work Order #: 580725

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)?	-5.2
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6* Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	N/A

TPH received in bulk containers

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Katie Lowe

Date: 03/29/2018

Checklist reviewed by:

Jessica Kramer

Date: 03/29/2018

Analytical Report 580928

for Tetra Tech- Midland

Project Manager: Ike Tavaréz

Marathon - Madera 19 Federal #1

212C-MD-01102.200

02-APR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



02-APR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **580928**

Marathon - Madera 19 Federal #1

Project Address: Lea

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) 580928. 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. 580928 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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



Sample Cross Reference 580928



Tetra Tech- Midland, Midland, TX

Marathon - Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Bottomhole Central @ 0-6", 10' BEB	S	03-29-18 00:00		580928-001
Bottomhole South #1 @ 0-1', 5' BEB	S	03-29-18 00:00		580928-002
Bottomhole South #2 @ 0-1', 5' BEB	S	03-29-18 00:00		580928-003



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Marathon - Madera 19 Federal #1

Project ID: 212C-MD-01102.200
Work Order Number(s): 580928

Report Date: 02-APR-18
Date Received: 03/30/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3045438 BTEX by EPA 8021B

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

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

Samples affected are: 580928-003.

Dilutions based upon poor resolution of internal standard.



Certificate of Analysis Summary 580928

Tetra Tech- Midland, Midland, TX

Project Name: Marathon - Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea

Date Received in Lab: Fri Mar-30-18 11:03 am

Report Date: 02-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	580928-001	580928-002	580928-003			
	Field Id:	Bottomhole Central @ 0-6"	Bottomhole South #1 @ 0-1'	Bottomhole South #2 @ 0-1'			
	Depth:						
	Matrix:	SOIL	SOIL	SOIL			
	Sampled:	Mar-29-18 00:00	Mar-29-18 00:00	Mar-29-18 00:00			
BTEX by EPA 8021B	Extracted:	Mar-30-18 11:15	Mar-30-18 11:15	Mar-30-18 11:15			
	Analyzed:	Mar-30-18 12:23	Mar-30-18 19:31	Mar-30-18 13:36			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Benzene		<0.0994 0.0994	<2.01 2.01	<0.998 0.998			
Toluene		3.03 0.0994	13.7 2.01	14.7 0.998			
Ethylbenzene		2.43 0.0994	8.72 2.01	8.64 0.998			
m,p-Xylenes		32.0 0.199	141 4.02	147 2.00			
o-Xylene		10.5 0.0994	62.6 2.01	59.7 0.998			
Total Xylenes		42.5 0.0994	204 2.01	207 0.998			
Total BTEX		48.0 0.0994	226 2.01	230 0.998			
TPH By SW8015 Mod	Extracted:	Apr-01-18 10:00	Apr-01-18 10:00	Apr-01-18 10:00			
	Analyzed:	Apr-02-18 12:28	Apr-02-18 13:47	Apr-02-18 14:14			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Gasoline Range Hydrocarbons (GRO)		1100 15.0	8780 74.9	1510 150			
Diesel Range Organics (DRO)		1340 15.0	9240 74.9	2370 150			
Oil Range Hydrocarbons (ORO)		<15.0 15.0	<74.9 74.9	<150 150			
Total TPH		2440 15.0	18000 74.9	3880 150			

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

Jessica Kramer

Jessica Kramer
Project Assistant

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

SDL Sample Detection Limit

LOD Limit of Detection

PQL Practical Quantitation Limit

MQL Method Quantitation Limit

LOQ Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample

BLK

Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample

BKSD/LCSD

Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate

MS

Matrix Spike

MSD: Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Marathon - Madera 19 Federal #1

Work Orders : 580928,

Project ID: 212C-MD-01102.200

Lab Batch #: 3045438

Sample: 580928-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/30/18 12:23

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	0.0373	0.0300	124	70-130	

Lab Batch #: 3045438

Sample: 580928-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/30/18 13:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0229	0.0300	76	70-130	
4-Bromofluorobenzene	0.0484	0.0300	161	70-130	**

Lab Batch #: 3045438

Sample: 580928-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/30/18 19:31

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	70-130	
4-Bromofluorobenzene	0.0341	0.0300	114	70-130	

Lab Batch #: 3045471

Sample: 580928-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/02/18 12:28

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	120	99.9	120	70-135	
o-Terphenyl	56.4	50.0	113	70-135	

Lab Batch #: 3045471

Sample: 580928-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/02/18 13:47

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	99.8	123	70-135	
o-Terphenyl	60.4	49.9	121	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 - Madera 19 Federal #1

Work Orders : 580928,

Lab Batch #: 3045471

Sample: 580928-003 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/02/18 14:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.7	100	100	70-135	
o-Terphenyl	42.5	50.0	85	70-135	

Lab Batch #: 3045438

Sample: 7641863-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/30/18 10:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	70-130	
4-Bromofluorobenzene	0.0235	0.0300	78	70-130	

Lab Batch #: 3045471

Sample: 7641866-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/02/18 06:49

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	100	100	70-135	
o-Terphenyl	51.5	50.0	103	70-135	

Lab Batch #: 3045438

Sample: 7641863-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/30/18 08:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	70-130	
4-Bromofluorobenzene	0.0272	0.0300	91	70-130	

Lab Batch #: 3045471

Sample: 7641866-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/02/18 07:15

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	53.3	50.0	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 - Madera 19 Federal #1

Work Orders : 580928,

Project ID: 212C-MD-01102.200

Lab Batch #: 3045438

Sample: 7641863-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/30/18 08:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0291	0.0300	97	70-130	
4-Bromofluorobenzene	0.0293	0.0300	98	70-130	

Lab Batch #: 3045471

Sample: 7641866-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/02/18 07:43

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	106	100	106	70-135	
o-Terphenyl	52.2	50.0	104	70-135	

Lab Batch #: 3045438

Sample: 580894-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/30/18 08:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0306	0.0300	102	70-130	
4-Bromofluorobenzene	0.0311	0.0300	104	70-130	

Lab Batch #: 3045471

Sample: 580869-049 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/02/18 08:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	111	99.9	111	70-135	
o-Terphenyl	53.1	50.0	106	70-135	

Lab Batch #: 3045438

Sample: 580894-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/30/18 09:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0285	0.0300	95	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 - Madera 19 Federal #1

Work Orders : 580928,

Lab Batch #: 3045471

Sample: 580869-049 SD / MSD

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/02/18 09:00

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.7	110	70-135	
o-Terphenyl	52.8	49.9	106	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Marathon - Madera 19 Federal #1

Work Order #: 580928

Project ID: 212C-MD-01102.200

Analyst: ALJ

Date Prepared: 03/30/2018

Date Analyzed: 03/30/2018

Lab Batch ID: 3045438

Sample: 7641863-1-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	<0.00200	0.0998	0.0926	93	0.100	0.0908	91	2	70-130	35	
Toluene	<0.00200	0.0998	0.0917	92	0.100	0.0892	89	3	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0897	90	0.100	0.0889	89	1	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.184	92	0.201	0.181	90	2	70-130	35	
o-Xylene	<0.00200	0.0998	0.0943	94	0.100	0.0933	93	1	70-130	35	

Analyst: ARM

Date Prepared: 04/01/2018

Date Analyzed: 04/02/2018

Lab Batch ID: 3045471

Sample: 7641866-1-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	1040	104	1000	1020	102	2	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1080	108	1000	1050	105	3	70-135	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Marathon - Madera 19 Federal #1

Work Order # : 580928

Project ID: 212C-MD-01102.200

Lab Batch ID: 3045438

QC- Sample ID: 580894-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 03/30/2018

Date Prepared: 03/30/2018

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	0.0786	79	0.100	0.0747	75	5	70-130	35	
Toluene	<0.00200	0.0998	0.0771	77	0.100	0.0732	73	5	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0769	77	0.100	0.0727	73	6	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.158	79	0.200	0.148	74	7	70-130	35	
o-Xylene	<0.00200	0.0998	0.0806	81	0.100	0.0754	75	7	70-130	35	

Lab Batch ID: 3045471

QC- Sample ID: 580869-049 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/02/2018

Date Prepared: 04/01/2018

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	1010	101	997	1030	103	2	70-135	20	
Diesel Range Organics (DRO)	<15.0	999	1060	106	997	1070	107	1	70-135	20	

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

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

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

Analysis Request of Custody Record



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4558
Fax (432) 682-3946

Page 1 of 1

Client Name:

Marathon

Site Manager:

Ike Tavaréz

Project Name:

Madera 19 Federal #1

Project Location: (county, state)

Lea County, NM

Project #:

212C-MD-01102-200

Invoice to:

Tetra Tech

Receiving Laboratory:

Xenco

Sampler Signature:

Jonathan P. Kelly

Comments:

SAMPLE IDENTIFICATION

LAB #
(LAB USE ONLY)

YEAR: 2017	SAMPLING		MATRIX		PRESERVATIVE METHOD		# CONTAINERS	FILTERED (Y/N)
	DATE	TIME	WATER	SOIL	HCL	HNO ₃	ICE	None
	3-29-18	—	X	X	X	X	X	1
	3-29-18	—	X	X	X	X	X	1
	3-29-18	—	X	X	X	X	X	1

Hold

(Circle or Specify Method No.)

580928

ANALYSIS REQUEST

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	

LAB USE ONLY

Sample Temperature

REMARKS:

☐ STANDARD

☒ RUSH: Same Day (24 hr) 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

ORIGINAL COPY

(Circle) HAND DELV

Temp: 1.6 IR ID: R-8

CF: (0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: 1.4



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 03/30/2018 11:03:00 AM

Work Order #: 580928

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)?	1.4
#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:

Connie Hernandez

Date: 03/30/2018

Checklist reviewed by:

Jessica Kramer

Date: 03/30/2018

Analytical Report 581078

for Tetra Tech- Midland

Project Manager: Ike Tavaréz

Madera 19 Federal #1

212c-MD-01102-200

03-APR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



03-APR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **581078**

Madera 19 Federal #1

Project Address: Lea CO.,NM

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) 581078. 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. 581078 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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



Sample Cross Reference 581078



Tetra Tech- Midland, Midland, TX

Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Stockpile #1 Composite #2	S	04-02-18 00:00		581078-001
Stockpile #4 Composite #2	S	04-02-18 00:00		581078-002
Stockpile #11 Composite #2	S	04-02-18 00:00		581078-003
Bottomhole South @ 15-16	S	04-02-18 00:00		581078-004



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera 19 Federal #1

Project ID: 212c-MD-01102-200
Work Order Number(s): 581078

Report Date: 03-APR-18
Date Received: 04/03/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3045540 TPH By SW8015 Mod

Diesel Range Organics (DRO), Gasoline Range Hydrocarbons (GRO) RPD was outside laboratory control limits.

Samples in the analytical batch are: 581078-004

Batch: LBA-3045561 BTEX by EPA 8021B

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

Samples affected are: 581078-002.

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

Lab Sample ID 581078-003 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: 581078-001, -002, -003, -004.

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 581078

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Federal #1



Project Id: 212c-MD-01102-200

Contact: Ike Tavarez

Project Location: Lea CO.,NM

Date Received in Lab: Tue Apr-03-18 08:49 am

Report Date: 03-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	581078-001	581078-002	581078-003	581078-004		
	Field Id:	Stockpile #1 Composite #2	Stockpile #4 Composite #2	Stockpile #11 Composite #2	Bottomhole South @ 15-16		
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL		
	Sampled:	Apr-02-18 00:00	Apr-02-18 00:00	Apr-02-18 00:00	Apr-02-18 00:00		
BTEX by EPA 8021B	Extracted:	Apr-03-18 09:00	Apr-03-18 09:00	Apr-03-18 09:00	Apr-03-18 09:00		
	Analyzed:	Apr-03-18 12:33	Apr-03-18 12:52	Apr-03-18 11:42	Apr-03-18 13:32		
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Benzene		<0.00202 0.00202	<0.00199 0.00199	<0.00201 0.00201	<0.100 0.100		
Toluene		0.0564 0.00202	0.0296 0.00199	0.00566 0.00201	6.28 0.100		
Ethylbenzene		0.00942 0.00202	<0.00199 0.00199	<0.00201 0.00201	2.66 0.100		
m,p-Xylenes		0.485 0.00404	0.367 0.00398	0.433 0.00402	35.6 0.201		
o-Xylene		0.217 0.00202	0.216 0.00199	0.147 0.00201	11.5 0.100		
Total Xylenes		0.702 0.00202	0.583 0.00199	0.580 0.00201	47.1 0.100		
Total BTEX		0.768 0.00202	0.613 0.00199	0.586 0.00201	56.0 0.100		
TPH By SW8015 Mod	Extracted:				Apr-03-18 09:00		
	Analyzed:				Apr-03-18 10:49		
	Units/RL:				mg/kg RL		
Gasoline Range Hydrocarbons (GRO)					859 15.0		
Diesel Range Organics (DRO)					938 15.0		
Oil Range Hydrocarbons (ORO)					28.5 15.0		
Total TPH					1830 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

Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

SDL Sample Detection Limit

LOD Limit of Detection

PQL Practical Quantitation Limit

MQL Method Quantitation Limit

LOQ Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample

BLK

Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample

BKSD/LCSD

Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate

MS

Matrix Spike

MSD: Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Madera 19 Federal #1

Work Orders : 581078,

Lab Batch #: 3045540

Sample: 581078-004 / SMP

Project ID: 212c-MD-01102-200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 10:49

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	73.2	99.8	73	70-135	
o-Terphenyl	36.2	49.9	73	70-135	

Lab Batch #: 3045561

Sample: 581078-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 11:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0258	0.0300	86	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

Lab Batch #: 3045561

Sample: 581078-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 12:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	70-130	
4-Bromofluorobenzene	0.0350	0.0300	117	70-130	

Lab Batch #: 3045561

Sample: 581078-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 12:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	70-130	
4-Bromofluorobenzene	0.0416	0.0300	139	70-130	**

Lab Batch #: 3045561

Sample: 581078-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 13:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	70-130	
4-Bromofluorobenzene	0.0350	0.0300	117	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: Madera 19 Federal #1

Work Orders : 581078,

Lab Batch #: 3045540

Sample: 7641929-1-BLK / BLK

Project ID: 212c-MD-01102-200

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/03/18 09:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.3	100	88	70-135	
o-Terphenyl	46.5	50.0	93	70-135	

Lab Batch #: 3045561

Sample: 7641952-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/03/18 11:23

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	70-130	
4-Bromofluorobenzene	0.0267	0.0300	89	70-130	

Lab Batch #: 3045561

Sample: 7641952-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/03/18 09:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	70-130	
4-Bromofluorobenzene	0.0291	0.0300	97	70-130	

Lab Batch #: 3045540

Sample: 7641929-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/03/18 09:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	100	109	70-135	
o-Terphenyl	47.3	50.0	95	70-135	

Lab Batch #: 3045561

Sample: 7641952-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/03/18 09:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	70-130	
4-Bromofluorobenzene	0.0299	0.0300	100	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: Madera 19 Federal #1

Work Orders : 581078,

Project ID: 212c-MD-01102-200

Lab Batch #: 3045540

Sample: 7641929-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/03/18 10:21

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	129	100	129	70-135	
o-Terphenyl	62.1	50.0	124	70-135	

Lab Batch #: 3045561

Sample: 581078-003 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 10:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	70-130	
4-Bromofluorobenzene	0.0338	0.0300	113	70-130	

Lab Batch #: 3045540

Sample: 580999-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 11:42

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	99.9	104	70-135	
o-Terphenyl	46.0	50.0	92	70-135	

Lab Batch #: 3045561

Sample: 581078-003 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 10:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	70-130	
4-Bromofluorobenzene	0.0309	0.0300	103	70-130	

Lab Batch #: 3045540

Sample: 580999-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/03/18 12:05

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.3	99.9	93	70-135	
o-Terphenyl	42.6	50.0	85	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Madera 19 Federal #1

Work Order #: 581078

Project ID: 212c-MD-01102-200

Analyst: ALJ

Date Prepared: 04/03/2018

Date Analyzed: 04/03/2018

Lab Batch ID: 3045561

Sample: 7641952-1-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	<0.00200	0.0998	0.124	124	0.100	0.121	121	2	70-130	35	
Toluene	<0.00200	0.0998	0.118	118	0.100	0.115	115	3	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.116	116	0.100	0.113	113	3	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.239	120	0.201	0.231	115	3	70-130	35	
o-Xylene	<0.00200	0.0998	0.118	118	0.100	0.114	114	3	70-130	35	

Analyst: ARM

Date Prepared: 04/03/2018

Date Analyzed: 04/03/2018

Lab Batch ID: 3045540

Sample: 7641929-1-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	901	90	1000	1150	115	24	70-135	20	F
Diesel Range Organics (DRO)	<15.0	1000	942	94	1000	1190	119	23	70-135	20	F

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: Madera 19 Federal #1

Work Order # : 581078

Project ID: 212c-MD-01102-200

Lab Batch ID: 3045561

QC- Sample ID: 581078-003 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/03/2018

Date Prepared: 04/03/2018

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	<0.00202	0.101	0.0783	78	0.100	0.0795	80	2	70-130	35	
Toluene	0.00566	0.101	0.0662	60	0.100	0.0690	63	4	70-130	35	X
Ethylbenzene	<0.00202	0.101	0.0535	53	0.100	0.0510	51	5	70-130	35	X
m,p-Xylenes	0.433	0.202	0.392	0	0.201	0.352	0	11	70-130	35	X
o-Xylene	0.147	0.101	0.165	18	0.100	0.146	0	12	70-130	35	X

Lab Batch ID: 3045540

QC- Sample ID: 580999-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/03/2018

Date Prepared: 04/03/2018

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	1020	102	999	926	93	10	70-135	20	
Diesel Range Organics (DRO)	<15.0	999	1100	110	999	1040	104	6	70-135	20	

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

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

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

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

Analysis Request of Custody Record

Page 1 of 1



Tetra Tech, Inc.

 4000 N. Big Spring Street, Ste
 401 Midland, Texas 79705
 Tel (432) 882-4559
 Fax (432) 882-3946

Client Name:

Marathon

Site Manager:

Ike Tavarez

Project Name:

Madera 19 Federal #1

Project Location:

(county,
state) Lea Co., NM

Project #:

212C-MD-01102.200

Invoice to:

Tetra Tech

Receiving Laboratory:

Xenco

Sampler Signature:

Comments:

Fush - Same day

SAMPLE IDENTIFICATION

LAB #
(LAB USE ONLY)

SAMPLING

YEAR: 2017

DATE TIME

MATRIX

PRESERVATIVE METHOD

WATER SOIL HCL HNO₃ ICE None

CONTAINERS

FILTERED (Y/N)

BTX 8021B BTX 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

ANALYSIS REQUEST

(Circle or Specify Method No.)

581078

Relinquished by:

Date: Time:

4-3-18 8:49am

Received by:

Date: Time:

4/11/18 8:00

Relinquished by:

Date: Time:

Received by:

Date: Time:

Relinquished by:

Date: Time:

Received by:

Date: Time:

LAB USE ONLY

Sample Temperature

REMARKS:

STANDARD

☒ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Push Charges Authorized

☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED

ORIGINAL COPY

Temp: -0.9 IR ID: R-8

CF: (0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: -0.7



XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 04/03/2018 08:49:00 AM

Work Order #: 581078

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)?	.7
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	Yes
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	N/A
#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

TPH was received in bulk containers.

*** 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: 04/03/2018

Checklist reviewed by:

Jessica Kramer

Date: 04/03/2018

Analytical Report 581420

**for
Tetra Tech- Midland**

**Project Manager: Ike Tavaréz
Marathon-Madera 19 Federal #1
212C-MD-01102-200
05-APR-18**

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-18-24), 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)



05-APR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **581420**

Marathon-Madera 19 Federal #1

Project Address: Lea Co NM

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) 581420. 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. 581420 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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



Sample Cross Reference 581420



Tetra Tech- Midland, Midland, TX

Marathon-Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Stockpile #22 Composite	S	04-04-18 00:00		581420-001
Stockpile #23 Composite	S	04-04-18 00:00		581420-002
Stockpile #24 Composite	S	04-04-18 00:00		581420-003



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Marathon-Madera 19 Federal #1

Project ID: 212C-MD-01102-200
Work Order Number(s): 581420

Report Date: 05-APR-18
Date Received: 04/05/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3045814 BTEX by EPA 8021B

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



Certificate of Analysis Summary 581420

Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Madera 19 Federal #1



Project Id: 212C-MD-01102-200

Contact: Ike Tavarez

Project Location: Lea Co NM

Date Received in Lab: Thu Apr-05-18 10:00 am

Report Date: 05-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	581420-001	581420-002	581420-003			
	Field Id:	Stockpile #22 Composite	Stockpile #23 Composite	Stockpile #24 Composite			
	Depth:						
	Matrix:	SOIL	SOIL	SOIL			
	Sampled:	Apr-04-18 00:00	Apr-04-18 00:00	Apr-04-18 00:00			
BTEX by EPA 8021B	Extracted:	Apr-05-18 10:00	Apr-05-18 10:00	Apr-05-18 10:00			
	Analyzed:	Apr-05-18 11:57	Apr-05-18 12:16	Apr-05-18 12:55			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Benzene		<0.00201 0.00201	<0.00202 0.00202	<0.00199 0.00199			
Toluene		0.0286 0.00201	0.0481 0.00202	0.0493 0.00199			
Ethylbenzene		0.0139 0.00201	0.0113 0.00202	0.0197 0.00199			
m,p-Xylenes		0.436 0.00402	0.394 0.00403	0.455 0.00398			
o-Xylene		0.156 0.00201	0.133 0.00202	0.153 0.00199			
Total Xylenes		0.592 0.00201	0.527 0.00202	0.608 0.00199			
Total BTEX		0.635 0.00201	0.586 0.00202	0.677 0.00199			
TPH By SW8015 Mod	Extracted:	Apr-05-18 12:00	Apr-05-18 12:00	Apr-05-18 12:00			
	Analyzed:	Apr-05-18 14:13	Apr-05-18 14:34	Apr-05-18 14:55			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Gasoline Range Hydrocarbons (GRO)		659 15.0	1030 15.0	1170 15.0			
Diesel Range Organics (DRO)		1240 15.0	1550 15.0	1680 15.0			
Oil Range Hydrocarbons (ORO)		41.8 15.0	52.3 15.0	55.9 15.0			
Total TPH		1940 15.0	2630 15.0	2910 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

Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

SDL Sample Detection Limit

LOD Limit of Detection

PQL Practical Quantitation Limit

MQL Method Quantitation Limit

LOQ Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample

BLK

Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample

BKSD/LCSD

Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate

MS

Matrix Spike

MSD: Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Marathon-Madera 19 Federal #1

Work Orders : 581420,

Lab Batch #: 3045814

Sample: 581420-001 / SMP

Project ID: 212C-MD-01102-200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 11:57

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	70-130	
4-Bromofluorobenzene	0.0382	0.0300	127	70-130	

Lab Batch #: 3045814

Sample: 581420-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 12:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	70-130	
4-Bromofluorobenzene	0.0334	0.0300	111	70-130	

Lab Batch #: 3045814

Sample: 581420-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 12:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	70-130	
4-Bromofluorobenzene	0.0377	0.0300	126	70-130	

Lab Batch #: 3045830

Sample: 581420-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 14:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.7	105	70-135	
o-Terphenyl	49.0	49.9	98	70-135	

Lab Batch #: 3045830

Sample: 581420-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 14:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	116	99.9	116	70-135	
o-Terphenyl	49.8	50.0	100	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-Madera 19 Federal #1

Work Orders : 581420,

Lab Batch #: 3045830

Sample: 581420-003 / SMP

Project ID: 212C-MD-01102-200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 14:55

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	46.5	49.9	93	70-135	

Lab Batch #: 3045814

Sample: 7642116-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/05/18 11:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	70-130	
4-Bromofluorobenzene	0.0256	0.0300	85	70-130	

Lab Batch #: 3045830

Sample: 7642101-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/05/18 13:09

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.7	100	93	70-135	
o-Terphenyl	43.3	50.0	87	70-135	

Lab Batch #: 3045814

Sample: 7642116-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/05/18 09:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0313	0.0300	104	70-130	
4-Bromofluorobenzene	0.0314	0.0300	105	70-130	

Lab Batch #: 3045830

Sample: 7642101-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/05/18 13:31

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.1	100	97	70-135	
o-Terphenyl	48.5	50.0	97	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-Madera 19 Federal #1

Work Orders : 581420,

Lab Batch #: 3045814

Sample: 7642116-1-BSD / BSD

Project ID: 212C-MD-01102-200

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/05/18 09:42

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0301	0.0300	100	70-130	
4-Bromofluorobenzene	0.0297	0.0300	99	70-130	

Lab Batch #: 3045830

Sample: 7642101-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/05/18 13:52

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	99.2	100	99	70-135	
o-Terphenyl	49.3	50.0	99	70-135	

Lab Batch #: 3045814

Sample: 581096-004 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 10:01

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0274	0.0300	91	70-130	
4-Bromofluorobenzene	0.0278	0.0300	93	70-130	

Lab Batch #: 3045830

Sample: 581096-005 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 15:36

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	109	99.8	109	70-135	
o-Terphenyl	53.5	49.9	107	70-135	

Lab Batch #: 3045814

Sample: 581096-004 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 10:20

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0276	0.0300	92	70-130	
4-Bromofluorobenzene	0.0304	0.0300	101	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-Madera 19 Federal #1

Work Orders : 581420,

Lab Batch #: 3045830

Sample: 581096-005 SD / MSD

Project ID: 212C-MD-01102-200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/05/18 15:57

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	124	100	124	70-135	
o-Terphenyl	47.7	50.0	95	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Marathon-Madera 19 Federal #1

Work Order #: 581420

Project ID: 212C-MD-01102-200

Analyst: ALJ

Date Prepared: 04/05/2018

Date Analyzed: 04/05/2018

Lab Batch ID: 3045814

Sample: 7642116-1-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	<0.00201	0.100	0.127	127	0.101	0.120	119	6	70-130	35	
Toluene	<0.00201	0.100	0.120	120	0.101	0.113	112	6	70-130	35	
Ethylbenzene	<0.00201	0.100	0.115	115	0.101	0.108	107	6	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.238	118	0.202	0.223	110	7	70-130	35	
o-Xylene	<0.00201	0.100	0.117	117	0.101	0.111	110	5	70-130	35	

Analyst: ARM

Date Prepared: 04/05/2018

Date Analyzed: 04/05/2018

Lab Batch ID: 3045830

Sample: 7642101-1-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	859	86	1000	897	90	4	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	910	91	1000	951	95	4	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-Madera 19 Federal #1

Work Order # : 581420

Project ID: 212C-MD-01102-200

Lab Batch ID: 3045814

QC- Sample ID: 581096-004 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/05/2018

Date Prepared: 04/05/2018

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	<0.00202	0.101	0.0537	53	0.0994	0.0583	59	8	70-130	35	X
Toluene	<0.00202	0.101	0.0365	36	0.0994	0.0414	42	13	70-130	35	X
Ethylbenzene	<0.00202	0.101	0.0248	25	0.0994	0.0327	33	27	70-130	35	X
m,p-Xylenes	0.00869	0.202	0.0597	25	0.199	0.0707	31	17	70-130	35	X
o-Xylene	0.00436	0.101	0.0315	27	0.0994	0.0399	36	24	70-130	35	X

Lab Batch ID: 3045830

QC- Sample ID: 581096-005 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/05/2018

Date Prepared: 04/05/2018

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)	91.9	998	1020	93	1000	990	90	3	70-135	20	
Diesel Range Organics (DRO)	743	998	1860	112	1000	1880	114	1	70-135	20	

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

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

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

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

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

Ike Targree

212C-MD-01102 200

Signature: *[Handwritten Signature]*

old

☐ Special Report Limits or TRRP Report

Temp: 8.4 IR ID: R-8
CF: (0-6: -0.2°C)

(6-23: +0.2°C)
Corrected Temp: 8.4



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 04/05/2018 10:00:00 AM

Work Order #: 581420

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)?	8.6
#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

Brianna Teel

Date: 04/05/2018

Checklist reviewed by:

Jessica Kramer

Jessica Kramer

Date: 04/05/2018

Analytical Report 581780

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

Madera 19 Federal #1

212C-MD-01102.200

10-APR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



10-APR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **581780**

Madera 19 Federal #1

Project Address: Lea Co., NM

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) 581780. 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. 581780 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,

Julian Martinez

Project Manager

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

Certified and approved by numerous States and Agencies.

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Sample Cross Reference 581780



Tetra Tech- Midland, Midland, TX

Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
South Bottomhole @ 20'	S	04-06-18 00:00		581780-001
Stockpile #20 Composite #2	S	04-06-18 00:00		581780-002
Stockpile #25 Composite	S	04-06-18 00:00		581780-003
Stockpile #26 Composite	S	04-06-18 00:00		581780-004
Stockpile #27 Composite	S	04-06-18 00:00		581780-005
Stockpile #28 Composite	S	04-06-18 00:00		581780-006
Stockpile #29 Composite	S	04-06-18 00:00		581780-007
Stockpile #30 Composite	S	04-06-18 00:00		581780-008
Stockpile #31 Composite	S	04-06-18 00:00		581780-009
Stockpile #32 Composite	S	04-06-18 00:00		581780-010
Stockpile #33 Composite	S	04-06-18 00:00		581780-011
Stockpile #34 Composite	S	04-06-18 00:00		581780-012
Stockpile #35 Composite	S	04-06-18 00:00		581780-013



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera 19 Federal #1

Project ID: 212C-MD-01102.200
Work Order Number(s): 581780

Report Date: 10-APR-18
Date Received: 04/09/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3046117 BTEX by EPA 8021B

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



Certificate of Analysis Summary 581780

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Mon Apr-09-18 11:07 am

Report Date: 10-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	581780-001	581780-002	581780-003	581780-004	581780-005	581780-006
	Field Id:	South Bottomhole @ 20'	Stockpile #20 Composite #2	Stockpile #25 Composite	Stockpile #26 Composite	Stockpile #27 Composite	Stockpile #28 Composite
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00
BTEX by EPA 8021B	Extracted:	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30
	Analyzed:	Apr-09-18 14:06	Apr-09-18 14:28	Apr-09-18 15:01	Apr-09-18 16:19	Apr-09-18 17:00	Apr-09-18 17:19
	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	<0.0998 0.0998	<0.0994 0.0994	<0.100 0.100	<0.0990 0.0990	<0.0998 0.0998
Toluene		<0.00201 0.00201	1.73 0.0998	3.76 0.0994	3.00 0.100	2.79 0.0990	1.53 0.0998
Ethylbenzene		<0.00201 0.00201	0.521 0.0998	2.38 0.0994	1.45 0.100	1.17 0.0990	0.873 0.0998
m,p-Xylenes		0.00558 0.00402	20.7 0.200	34.1 0.199	25.3 0.200	24.4 0.198	19.4 0.200
o-Xylene		<0.00201 0.00201	7.39 0.0998	12.9 0.0994	9.23 0.100	8.28 0.0990	6.99 0.0998
Total Xylenes		0.00558 0.00201	28.1 0.0998	47.0 0.0994	34.5 0.100	32.7 0.0990	26.4 0.0998
Total BTEX		0.00558 0.00201	30.3 0.0998	53.1 0.0994	39.0 0.100	36.6 0.0990	28.8 0.0998
TPH By SW8015 Mod	Extracted:	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00
	Analyzed:	Apr-09-18 12:23	Apr-09-18 12:45	Apr-09-18 13:07	Apr-09-18 13:29	Apr-09-18 13:50	Apr-09-18 14:11
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	1030 15.0	918 15.0	1060 14.9	945 15.0	998 15.0
Diesel Range Organics (DRO)		<15.0 15.0	1590 15.0	1340 15.0	1730 14.9	1340 15.0	1530 15.0
Oil Range Hydrocarbons (ORO)		<15.0 15.0	47.6 15.0	40.2 15.0	58.7 14.9	42.4 15.0	44.9 15.0
Total TPH		<15.0 15.0	2670 15.0	2300 15.0	2850 14.9	2330 15.0	2570 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.

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Julian Martinez
Project Manager



Certificate of Analysis Summary 581780

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Mon Apr-09-18 11:07 am

Report Date: 10-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	581780-007	581780-008	581780-009	581780-010	581780-011	581780-012
	Field Id:	Stockpile #29 Composite	Stockpile #30 Composite	Stockpile #31 Composite	Stockpile #32 Composite	Stockpile #33 Composite	Stockpile #34 Composite
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00	Apr-06-18 00:00
BTEX by EPA 8021B	Extracted:	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30	Apr-09-18 11:30
	Analyzed:	Apr-09-18 17:39	Apr-09-18 17:58	Apr-09-18 18:17	Apr-09-18 18:36	Apr-09-18 18:55	Apr-09-18 19:15
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.102 0.102	<0.0992 0.0992	<0.0996 0.0996	<0.0994 0.0994	<0.100 0.100	<0.0998 0.0998
Toluene		3.21 0.102	4.03 0.0992	3.28 0.0996	1.90 0.0994	1.60 0.100	3.28 0.0998
Ethylbenzene		1.25 0.102	1.70 0.0992	1.33 0.0996	0.792 0.0994	0.523 0.100	1.51 0.0998
m,p-Xylenes		29.4 0.204	31.8 0.198	27.9 0.199	21.5 0.199	20.0 0.200	29.1 0.200
o-Xylene		10.3 0.102	10.7 0.0992	9.50 0.0996	7.41 0.0994	6.97 0.100	9.96 0.0998
Total Xylenes		39.7 0.102	42.5 0.0992	37.4 0.0996	28.9 0.0994	27.0 0.100	39.1 0.0998
Total BTEX		44.2 0.102	48.2 0.0992	42.0 0.0996	31.6 0.0994	29.1 0.100	43.9 0.0998
TPH By SW8015 Mod	Extracted:	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00	Apr-09-18 12:00
	Analyzed:	Apr-09-18 14:32	Apr-09-18 14:52	Apr-09-18 15:13	Apr-09-18 16:15	Apr-09-18 16:36	Apr-09-18 16:56
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		1240 15.0	1230 15.0	1130 15.0	1010 15.0	929 15.0	1290 15.0
Diesel Range Organics (DRO)		1690 15.0	1710 15.0	1900 15.0	1800 15.0	1750 15.0	2100 15.0
Oil Range Hydrocarbons (ORO)		51.6 15.0	55.4 15.0	59.2 15.0	58.2 15.0	53.6 15.0	61.6 15.0
Total TPH		2980 15.0	3000 15.0	3090 15.0	2870 15.0	2730 15.0	3450 15.0

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Version: 1.0%

Julian Martinez
Project Manager



Certificate of Analysis Summary 581780

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Mon Apr-09-18 11:07 am

Report Date: 10-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	581780-013					
	Field Id:	Stockpile #35 Composite					
	Depth:						
	Matrix:	SOIL					
	Sampled:	Apr-06-18 00:00					
BTEX by EPA 8021B	Extracted:	Apr-09-18 11:30					
	Analyzed:	Apr-09-18 19:34					
	Units/RL:	mg/kg RL					
	Benzene	<0.101 0.101					
	Toluene	3.88 0.101					
	Ethylbenzene	1.65 0.101					
	m,p-Xylenes	31.7 0.202					
	o-Xylene	10.7 0.101					
	Total Xylenes	42.4 0.101					
	Total BTEX	47.9 0.101					
TPH By SW8015 Mod	Extracted:	Apr-09-18 12:00					
	Analyzed:	Apr-09-18 17:17					
	Units/RL:	mg/kg RL					
	Gasoline Range Hydrocarbons (GRO)	1300 14.9					
	Diesel Range Organics (DRO)	2100 14.9					
	Oil Range Hydrocarbons (ORO)	59.5 14.9					
	Total TPH	3460 14.9					

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Julian Martinez
Project Manager

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Madera 19 Federal #1

Work Orders : 581780,

Project ID: 212C-MD-01102.200

Lab Batch #: 3046091

Sample: 581780-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 12:23

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	87.1	99.8	87	70-135	
o-Terphenyl	42.9	49.9	86	70-135	

Lab Batch #: 3046091

Sample: 581780-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 12:45

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.7	105	70-135	
o-Terphenyl	47.3	49.9	95	70-135	

Lab Batch #: 3046091

Sample: 581780-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 13:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.7	102	70-135	
o-Terphenyl	48.5	49.9	97	70-135	

Lab Batch #: 3046091

Sample: 581780-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 13:29

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.6	107	70-135	
o-Terphenyl	48.5	49.8	97	70-135	

Lab Batch #: 3046091

Sample: 581780-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 13:50

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.9	108	70-135	
o-Terphenyl	50.8	50.0	102	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: Madera 19 Federal #1

Work Orders : 581780,

Project ID: 212C-MD-01102.200

Lab Batch #: 3046117

Sample: 581780-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 14:06

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	0.0319	0.0300	106	70-130	

Lab Batch #: 3046091

Sample: 581780-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 14:11

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	99.8	104	70-135	
o-Terphenyl	49.5	49.9	99	70-135	

Lab Batch #: 3046117

Sample: 581780-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 14:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0221	0.0300	74	70-130	
4-Bromofluorobenzene	0.0342	0.0300	114	70-130	

Lab Batch #: 3046091

Sample: 581780-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 14:32

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.9	106	70-135	
o-Terphenyl	48.4	50.0	97	70-135	

Lab Batch #: 3046091

Sample: 581780-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 14:52

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.4	99.7	97	70-135	
o-Terphenyl	48.5	49.9	97	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: Madera 19 Federal #1

Work Orders : 581780,

Lab Batch #: 3046117

Sample: 581780-003 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 15:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	70-130	
4-Bromofluorobenzene	0.0388	0.0300	129	70-130	

Lab Batch #: 3046091

Sample: 581780-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 15:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.9	100	94	70-135	
o-Terphenyl	48.3	50.0	97	70-135	

Lab Batch #: 3046091

Sample: 581780-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 16:15

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.4	99.8	99	70-135	
o-Terphenyl	48.3	49.9	97	70-135	

Lab Batch #: 3046117

Sample: 581780-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 16:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0217	0.0300	72	70-130	
4-Bromofluorobenzene	0.0359	0.0300	120	70-130	

Lab Batch #: 3046091

Sample: 581780-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 16:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.1	100	92	70-135	
o-Terphenyl	46.0	50.0	92	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: Madera 19 Federal #1

Work Orders : 581780,

Project ID: 212C-MD-01102.200

Lab Batch #: 3046091

Sample: 581780-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 16:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.3	99.9	97	70-135	
o-Terphenyl	49.6	50.0	99	70-135	

Lab Batch #: 3046117

Sample: 581780-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 17:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	70-130	
4-Bromofluorobenzene	0.0372	0.0300	124	70-130	

Lab Batch #: 3046091

Sample: 581780-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 17:17

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.3	99.6	96	70-135	
o-Terphenyl	47.8	49.8	96	70-135	

Lab Batch #: 3046117

Sample: 581780-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 17:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0255	0.0300	85	70-130	
4-Bromofluorobenzene	0.0377	0.0300	126	70-130	

Lab Batch #: 3046117

Sample: 581780-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 17:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	70-130	
4-Bromofluorobenzene	0.0389	0.0300	130	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: Madera 19 Federal #1

Work Orders : 581780,

Lab Batch #: 3046117

Sample: 581780-008 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 17:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0230	0.0300	77	70-130	
4-Bromofluorobenzene	0.0369	0.0300	123	70-130	

Lab Batch #: 3046117

Sample: 581780-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 18:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0247	0.0300	82	70-130	
4-Bromofluorobenzene	0.0347	0.0300	116	70-130	

Lab Batch #: 3046117

Sample: 581780-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 18:36

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	0.0374	0.0300	125	70-130	

Lab Batch #: 3046117

Sample: 581780-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 18:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0224	0.0300	75	70-130	
4-Bromofluorobenzene	0.0374	0.0300	125	70-130	

Lab Batch #: 3046117

Sample: 581780-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 19:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	70-130	
4-Bromofluorobenzene	0.0379	0.0300	126	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: Madera 19 Federal #1

Work Orders : 581780,

Lab Batch #: 3046117

Sample: 581780-013 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 19:34

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	70-130	
4-Bromofluorobenzene	0.0376	0.0300	125	70-130	

Lab Batch #: 3046091

Sample: 7642268-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.0	100	96	70-135	
o-Terphenyl	49.8	50.0	100	70-135	

Lab Batch #: 3046117

Sample: 7642285-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 11:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	70-130	
4-Bromofluorobenzene	0.0288	0.0300	96	70-130	

Lab Batch #: 3046117

Sample: 7642285-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:12

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	0.0334	0.0300	111	70-130	

Lab Batch #: 3046091

Sample: 7642268-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	129	100	129	70-135	
o-Terphenyl	60.9	50.0	122	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: Madera 19 Federal #1

Work Orders : 581780,

Lab Batch #: 3046117

Sample: 7642285-1-BSD / BSD

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	70-130	
4-Bromofluorobenzene	0.0322	0.0300	107	70-130	

Lab Batch #: 3046091

Sample: 7642268-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:57

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.3	100	97	70-135	
o-Terphenyl	46.6	50.0	93	70-135	

Lab Batch #: 3046117

Sample: 581430-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 09:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	70-130	
4-Bromofluorobenzene	0.0332	0.0300	111	70-130	

Lab Batch #: 3046091

Sample: 581762-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 10:40

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.5	99.7	95	70-135	
o-Terphenyl	42.8	49.9	86	70-135	

Lab Batch #: 3046117

Sample: 581430-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 10:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	70-130	
4-Bromofluorobenzene	0.0320	0.0300	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: Madera 19 Federal #1

Work Orders : 581780,

Project ID: 212C-MD-01102.200

Lab Batch #: 3046091

Sample: 581762-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 11:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.8	102	70-135	
o-Terphenyl	47.1	49.9	94	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Madera 19 Federal #1

Work Order #: 581780

Project ID: 212C-MD-01102.200

Analyst: ALJ

Date Prepared: 04/09/2018

Date Analyzed: 04/09/2018

Lab Batch ID: 3046117

Sample: 7642285-1-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	<0.00200	0.100	0.118	118	0.101	0.118	117	0	70-130	35	
Toluene	<0.00200	0.100	0.114	114	0.101	0.113	112	1	70-130	35	
Ethylbenzene	<0.00200	0.100	0.114	114	0.101	0.115	114	1	70-130	35	
m,p-Xylenes	<0.00401	0.200	0.236	118	0.202	0.235	116	0	70-130	35	
o-Xylene	<0.00200	0.100	0.117	117	0.101	0.117	116	0	70-130	35	

Analyst: ARM

Date Prepared: 04/09/2018

Date Analyzed: 04/09/2018

Lab Batch ID: 3046091

Sample: 7642268-1-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	1060	106	1000	995	100	6	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1160	116	1000	1130	113	3	70-135	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Madera 19 Federal #1

Work Order # : 581780

Project ID: 212C-MD-01102.200

Lab Batch ID: 3046117

QC- Sample ID: 581430-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/09/2018

Date Prepared: 04/09/2018

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	0.0701	70	0.0994	0.0979	98	33	70-130	35	
Toluene	<0.00201	0.100	0.0589	59	0.0994	0.0825	83	33	70-130	35	X
Ethylbenzene	<0.00201	0.100	0.0523	52	0.0994	0.0672	68	25	70-130	35	X
m,p-Xylenes	<0.00402	0.201	0.0949	47	0.199	0.135	68	35	70-130	35	X
o-Xylene	<0.00201	0.100	0.0478	48	0.0994	0.0680	68	35	70-130	35	X

Lab Batch ID: 3046091

QC- Sample ID: 581762-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/09/2018

Date Prepared: 04/09/2018

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	997	810	81	998	831	83	3	70-135	20	
Diesel Range Organics (DRO)	30.4	997	848	82	998	922	89	8	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.



Tetra Tech, Inc.

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

581780

Client Name:

Marathon

Site Manager:

Ike Tavaraz

Project Name:

Mudera 19 Federal #1

Project Location:

Lea Canyon NM

Project #:

212C-MD-0102.200

Invoice to:

Tetra Tech

Receiving Laboratory:

Xenco

Sampler Signature:

Marathon P. Kelly

Comments:

SAMPLE IDENTIFICATION

LAB #
(LAB USE ONLY)

SAMPLING

MATRIX

PRESERVATIVE METHOD

DATE

TIME

WATER

SOIL

HCL

HNO₃

ICE

CONTAINERS

FILTERED (Y/N)

Hold

ANALYSIS REQUEST (Circle or Specify Method No.)

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

Relinquished by:

Date: Time:

4/1/18 11:07

Received by:

Date: Time:

4/1/18 11:07

Relinquished by:

Date: Time:

4/1/18 11:07

Received by:

Date: Time:

4/1/18 11:07

Relinquished by:

Date: Time:

4/1/18 11:07

Received by:

Date: Time:

4/1/18 11:07

LAB USE ONLY

REMARKS:

Sample Temperature

☒ Rush
☐ Rush Charges Authorized
☐ Special Report Limits or TRRP Report

ORIGINAL COPY

Temp: 7.4
CF: (0.6: -0.2°C)
(6-23: +0.2°C)
IR ID: R-8

Corrected Temp: 2.7



1501780

He Taverer

ANALYSIS REQUEST
or Specify Method

212c-mp-81162.200

Tetra Tech

Xenos

Sd/- Shri P. K. Ad

SAMPLE IDENTIFICATION

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

Stack pile # 32 Composite
Stack pile # 33 Composite
Stack pile # 34 Composite
Stack pile # 35 Composite

4/2/18 11:07



4/9/18 11:07

10

LAB USE ONLY

☒ PUSH: Same Day 24 hrs 48 hr 72 hr

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

ORIGINAL COPY

Temp: 2.2

IR ID:R-8

FEDEX UPS Tracking #:

Corrected Temp.



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 04/09/2018 11:07:00 AM

Work Order #: 581780

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

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

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Brianna Teel

Date: 04/09/2018

Checklist reviewed by:

Jessica Kramer

Jessica Kramer

Date: 04/09/2018

Analytical Report 581781

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

Madera 19 Federal #1

212C-MD-01102.200

10-APR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



10-APR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **581781**

Madera 19 Federal #1

Project Address: Lea Co., NM

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) 581781. 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. 581781 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,

Julian Martinez

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

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Sample Cross Reference 581781



Tetra Tech- Midland, Midland, TX

Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
North Section Trench @ 5' (5'BEB)	S	04-06-18 00:00		581781-001



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera 19 Federal #1

Project ID: 212C-MD-01102.200
Work Order Number(s): 581781

Report Date: 10-APR-18
Date Received: 04/09/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3046117 BTEX by EPA 8021B

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

Samples affected are: 581781-001.

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



Certificate of Analysis Summary 581781

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Mon Apr-09-18 11:07 am

Report Date: 10-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	581781-001					
	Field Id:	North Section Trench @ 5' (S					
	Depth:						
	Matrix:	SOIL					
	Sampled:	Apr-06-18 00:00					
BTEX by EPA 8021B	Extracted:	Apr-09-18 11:15					
	Analyzed:	Apr-09-18 13:42					
	Units/RL:	mg/kg RL					
	Benzene	<0.00199 0.00199					
	Toluene	0.00980 0.00199					
Ethylbenzene		0.00878 0.00199					
m,p-Xylenes		0.302 0.00398					
o-Xylene		0.145 0.00199					
Total Xylenes		0.447 0.00199					
Total BTEX		0.466 0.00199					
TPH By SW8015 Mod	Extracted:	Apr-09-18 12:00					
	Analyzed:	Apr-09-18 17:38					
	Units/RL:	mg/kg RL					
	Gasoline Range Hydrocarbons (GRO)	174 15.0					
	Diesel Range Organics (DRO)	660 15.0					
Oil Range Hydrocarbons (ORO)		22.8 15.0					
Total TPH		857 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

Julian Martinez
Project Manager

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

****** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Madera 19 Federal #1

Work Orders : 581781,

Lab Batch #: 3046117

Sample: 581781-001 / SMP

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 13:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0219	0.0300	73	70-130	
4-Bromofluorobenzene	0.0439	0.0300	146	70-130	**

Lab Batch #: 3046091

Sample: 581781-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 17:38

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.8	101	70-135	
o-Terphenyl	51.8	49.9	104	70-135	

Lab Batch #: 3046091

Sample: 7642268-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.0	100	96	70-135	
o-Terphenyl	49.8	50.0	100	70-135	

Lab Batch #: 3046117

Sample: 7642285-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 11:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	70-130	
4-Bromofluorobenzene	0.0288	0.0300	96	70-130	

Lab Batch #: 3046117

Sample: 7642285-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:12

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	0.0334	0.0300	111	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: Madera 19 Federal #1

Work Orders : 581781,

Lab Batch #: 3046091

Sample: 7642268-1-BKS / BKS

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	129	100	129	70-135	
o-Terphenyl	60.9	50.0	122	70-135	

Lab Batch #: 3046117

Sample: 7642285-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	70-130	
4-Bromofluorobenzene	0.0322	0.0300	107	70-130	

Lab Batch #: 3046091

Sample: 7642268-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/09/18 09:57

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.3	100	97	70-135	
o-Terphenyl	46.6	50.0	93	70-135	

Lab Batch #: 3046117

Sample: 581430-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 09:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0296	0.0300	99	70-130	
4-Bromofluorobenzene	0.0332	0.0300	111	70-130	

Lab Batch #: 3046091

Sample: 581762-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 10:40

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.5	99.7	95	70-135	
o-Terphenyl	42.8	49.9	86	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: Madera 19 Federal #1

Work Orders : 581781,

Project ID: 212C-MD-01102.200

Lab Batch #: 3046117

Sample: 581430-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 10:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	70-130	
4-Bromofluorobenzene	0.0320	0.0300	107	70-130	

Lab Batch #: 3046091

Sample: 581762-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/09/18 11:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.8	102	70-135	
o-Terphenyl	47.1	49.9	94	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: Madera 19 Federal #1

Work Order #: 581781

Project ID: 212C-MD-01102.200

Analyst: ALJ

Date Prepared: 04/09/2018

Date Analyzed: 04/09/2018

Lab Batch ID: 3046117

Sample: 7642285-1-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	<0.00200	0.100	0.118	118	0.101	0.118	117	0	70-130	35	
Toluene	<0.00200	0.100	0.114	114	0.101	0.113	112	1	70-130	35	
Ethylbenzene	<0.00200	0.100	0.114	114	0.101	0.115	114	1	70-130	35	
m,p-Xylenes	<0.00401	0.200	0.236	118	0.202	0.235	116	0	70-130	35	
o-Xylene	<0.00200	0.100	0.117	117	0.101	0.117	116	0	70-130	35	

Analyst: ARM

Date Prepared: 04/09/2018

Date Analyzed: 04/09/2018

Lab Batch ID: 3046091

Sample: 7642268-1-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	1060	106	1000	995	100	6	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1160	116	1000	1130	113	3	70-135	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Madera 19 Federal #1

Work Order # : 581781

Project ID: 212C-MD-01102.200

Lab Batch ID: 3046117

QC- Sample ID: 581430-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/09/2018

Date Prepared: 04/09/2018

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	0.0701	70	0.0994	0.0979	98	33	70-130	35	
Toluene	<0.00201	0.100	0.0589	59	0.0994	0.0825	83	33	70-130	35	X
Ethylbenzene	<0.00201	0.100	0.0523	52	0.0994	0.0672	68	25	70-130	35	X
m,p-Xylenes	<0.00402	0.201	0.0949	47	0.199	0.135	68	35	70-130	35	X
o-Xylene	<0.00201	0.100	0.0478	48	0.0994	0.0680	68	35	70-130	35	X

Lab Batch ID: 3046091

QC- Sample ID: 581762-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/09/2018

Date Prepared: 04/09/2018

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	997	810	81	998	831	83	3	70-135	20	
Diesel Range Organics (DRO)	30.4	997	848	82	998	922	89	8	70-135	20	

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

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

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

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

Tel (432) 682-4559
Fax (432) 682-3946

Mars Jhon

Ike Tamaro 2

Madera 19 Federal #1

Lea Co., NM

Project #:

212C-MD-01102, 200

Tetra Tech

Xelco**Sampler Signature:**

Comments:

re: Shanthi N. Nay

ORIGINAL COPY

ANALYSIS REQUEST

(Circle or Specify Method No.)

Hold

Final 1.000



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 04/09/2018 11:07:00 AM

Work Order #: 581781

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

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

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Brianna Teel

Date: 04/09/2018

Checklist reviewed by:

Jessica Kramer

Jessica Kramer

Date: 04/09/2018

Analytical Report 582068

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

Madera 19 Federal #1

212C-MD-01102.200

12-APR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):

Texas (T104704215-18-24), 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)



12-APR-18

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **582068**

Madera 19 Federal #1

Project Address: Lea Co., NM

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) 582068. 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. 582068 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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



Sample Cross Reference 582068



Tetra Tech- Midland, Midland, TX

Madera 19 Federal #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Stockpile #25 Composite #2	S	04-11-18 00:00		582068-001



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Madera 19 Federal #1

Project ID: 212C-MD-01102.200
Work Order Number(s): 582068

Report Date: 12-APR-18
Date Received: 04/12/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3046466 BTEX by EPA 8021B

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



Certificate of Analysis Summary 582068

Tetra Tech- Midland, Midland, TX

Project Name: Madera 19 Federal #1



Project Id: 212C-MD-01102.200

Contact: Ike Tavarez

Project Location: Lea Co., NM

Date Received in Lab: Thu Apr-12-18 09:15 am

Report Date: 12-APR-18

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	582068-001					
	Field Id:	Stockpile #25 Composite #2					
	Depth:						
	Matrix:	SOIL					
	Sampled:	Apr-11-18 00:00					
BTEX by EPA 8021B	Extracted:	Apr-12-18 09:30					
	Analyzed:	Apr-12-18 11:24					
	Units/RL:	mg/kg RL					
	Benzene	<0.00200 0.00200					
	Toluene	0.0614 0.00200					
	Ethylbenzene	0.00511 0.00200					
	m,p-Xylenes	0.522 0.00399					
	o-Xylene	0.203 0.00200					
	Total Xylenes	0.725 0.00200					
	Total BTEX	0.792 0.00200					
TPH By SW8015 Mod	Extracted:	Apr-12-18 10:00					
	Analyzed:	Apr-12-18 11:31					
	Units/RL:	mg/kg RL					
	Gasoline Range Hydrocarbons (GRO)	241 15.0					
	Diesel Range Organics (DRO)	1660 15.0					
	Oil Range Hydrocarbons (ORO)	30.8 15.0					
	Total TPH	1930 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

Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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



Form 2 - Surrogate Recoveries

Project Name: Madera 19 Federal #1

Work Orders : 582068,

Project ID: 212C-MD-01102.200

Lab Batch #: 3046466

Sample: 582068-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/12/18 11:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0265	0.0300	88	70-130	
4-Bromofluorobenzene	0.0390	0.0300	130	70-130	

Lab Batch #: 3046457

Sample: 582068-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/12/18 11:31

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.7	102	70-135	
o-Terphenyl	50.9	49.9	102	70-135	

Lab Batch #: 3046466

Sample: 7642499-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/12/18 09:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	70-130	
4-Bromofluorobenzene	0.0242	0.0300	81	70-130	

Lab Batch #: 3046457

Sample: 7642444-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/12/18 23:55

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.0	100	95	70-135	
o-Terphenyl	49.3	50.0	99	70-135	

Lab Batch #: 3046457

Sample: 7642444-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/12/18 00:22

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	100	121	70-135	
o-Terphenyl	56.7	50.0	113	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: Madera 19 Federal #1

Work Orders : 582068,

Lab Batch #: 3046466

Sample: 7642499-1-BKS / BKS

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/12/18 07:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	70-130	
4-Bromofluorobenzene	0.0303	0.0300	101	70-130	

Lab Batch #: 3046457

Sample: 7642444-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/12/18 00:50

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	117	100	117	70-135	
o-Terphenyl	57.9	50.0	116	70-135	

Lab Batch #: 3046466

Sample: 7642499-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 04/12/18 08:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	70-130	
4-Bromofluorobenzene	0.0299	0.0300	100	70-130	

Lab Batch #: 3046457

Sample: 581958-013 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/12/18 03:06

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	118	99.8	118	70-135	
o-Terphenyl	52.7	49.9	106	70-135	

Lab Batch #: 3046466

Sample: 581958-010 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/12/18 08:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	70-130	
4-Bromofluorobenzene	0.0297	0.0300	99	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: Madera 19 Federal #1

Work Orders : 582068,

Lab Batch #: 3046457

Sample: 581958-013 SD / MSD

Project ID: 212C-MD-01102.200

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/12/18 03:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	117	99.9	117	70-135	
o-Terphenyl	53.0	50.0	106	70-135	

Lab Batch #: 3046466

Sample: 581958-010 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 04/12/18 08:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	70-130	
4-Bromofluorobenzene	0.0311	0.0300	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: Madera 19 Federal #1

Work Order #: 582068

Project ID: 212C-MD-01102.200

Analyst: ALJ

Date Prepared: 04/12/2018

Date Analyzed: 04/12/2018

Lab Batch ID: 3046466

Sample: 7642499-1-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	<0.00201	0.101	0.108	107	0.101	0.108	107	0	70-130	35	
Toluene	<0.00201	0.101	0.103	102	0.101	0.104	103	1	70-130	35	
Ethylbenzene	<0.00201	0.101	0.103	102	0.101	0.103	102	0	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.211	105	0.202	0.209	103	1	70-130	35	
o-Xylene	<0.00201	0.101	0.108	107	0.101	0.106	105	2	70-130	35	

Analyst: ARM

Date Prepared: 04/11/2018

Date Analyzed: 04/12/2018

Lab Batch ID: 3046457

Sample: 7642444-1-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	1070	107	1000	1060	106	1	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1110	111	1000	1090	109	2	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: Madera 19 Federal #1

Work Order # : 582068

Project ID: 212C-MD-01102.200

Lab Batch ID: 3046466

QC- Sample ID: 581958-010 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/12/2018

Date Prepared: 04/12/2018

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	<0.00199	0.0994	0.0878	88	0.0998	0.0932	93	6	70-130	35	
Toluene	<0.00199	0.0994	0.0814	82	0.0998	0.0833	83	2	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.0725	73	0.0998	0.0746	75	3	70-130	35	
m,p-Xylenes	<0.00398	0.199	0.145	73	0.200	0.148	74	2	70-130	35	
o-Xylene	<0.00199	0.0994	0.0757	76	0.0998	0.0746	75	1	70-130	35	

Lab Batch ID: 3046457

QC- Sample ID: 581958-013 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/12/2018

Date Prepared: 04/11/2018

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	998	1020	102	999	1020	102	0	70-135	20	
Diesel Range Organics (DRO)	<15.0	998	1110	111	999	1120	112	1	70-135	20	

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

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

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

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



582048

ORIGINAL COPY

Temp: 5.4 IR ID: R-8
CF: (0.6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 5.2

March 28, 2018

IKE TAVAREZ

TETRA TECH

1910 N. BIG SPRING STREET

MIDLAND, TX 79705

RE: MARATHON / MADERA 19 FED #1

Enclosed are the results of analyses for samples received by the laboratory on 03/26/18 15:03.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-17-10. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
28-Mar-18 08:31

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH #1 (2-3') 1.5' BEB	H800851-02	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #1 (6-7') 1.5' BEB	H800851-04	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #1 (14-15') 1.5' BEB	H800851-06	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #1 (24-25') 1.5' BEB	H800851-08	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #1 (29-30') 1.5' BEB	H800851-09	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #1 (34-35') 1.5' BEB	H800851-10	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #2 (2-3') 2' BEB	H800851-15	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #2 (6-7') 2' BEB	H800851-17	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #2 (9-10') 2' BEB	H800851-18	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #2 (14-15') 2' BEB	H800851-19	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #3 (2-3') 2' BEB	H800851-26	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #3 (4-5') 2' BEB	H800851-27	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #3 (6-7') 2' BEB	H800851-28	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #3 (9-10') 2' BEB	H800851-29	Soil	26-Mar-18 00:00	26-Mar-18 15:03
BH #3 (14-15') 2' BEB	H800851-30	Soil	26-Mar-18 00:00	26-Mar-18 15:03

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #1 (2-3') 1.5' BEB H800851-02 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<1.00		1.00	mg/kg	1000	8032607	MS	26-Mar-18	8021B	
Toluene*	51.8		1.00	mg/kg	1000	8032607	MS	26-Mar-18	8021B	
Ethylbenzene*	18.0		1.00	mg/kg	1000	8032607	MS	26-Mar-18	8021B	
Total Xylenes*	233		3.00	mg/kg	1000	8032607	MS	26-Mar-18	8021B	
Total BTEX	303		6.00	mg/kg	1000	8032607	MS	26-Mar-18	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 134 % 72-148 8032607 MS 26-Mar-18 8021B

Petroleum Hydrocarbons by GC FID

S-04

GRO C6-C10*	3610		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	7120		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	344		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	

Surrogate: 1-Chlorooctane 356 % 41-142 8032606 MS 27-Mar-18 8015B

Surrogate: 1-Chlorooctadecane 172 % 37.6-147 8032606 MS 27-Mar-18 8015B

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #1 (6-7') 1.5' BEB

H800851-04 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<1.00		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Toluene*	18.9		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	14.1		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	270		3.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Total BTEX	303		6.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			139 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

S-04

GRO C6-C10*	2710		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	3730		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	148		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			279 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			204 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #1 (14-15') 1.5' BEB

H800851-06 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<1.00		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Toluene*	45.5		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	18.3		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	245		3.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Total BTEX	308		6.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			127 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

S-04

GRO C6-C10*	2780		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	3380		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	129		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctane			258 %	41-142		8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane			196 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #1 (24-25') 1.5' BEB

H800851-08 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	0.239		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	0.439		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	0.678		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			107 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	38.6		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			90.8 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			97.2 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #1 (29-30') 1.5' BEB H800851-09 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	0.070		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	0.214		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			108 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	105		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			89.8 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			99.1 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #1 (34-35') 1.5' BEB H800851-10 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			101 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	108		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctane			94.4 %	41-142		8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane			102 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #2 (2-3') 2' BEB H800851-15 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

S-04

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Toluene*	1.70		0.050	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Ethylbenzene*	1.17		0.050	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Total Xylenes*	13.5		0.150	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Total BTEX	16.3		0.300	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			158 %	72-148		8032607	MS	26-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	247		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	786		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	30.8		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctane			129 %	41-142		8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane			133 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #2 (6-7') 2' BEB H800851-17 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	3.88		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Toluene*	71.6		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	18.9		1.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	243		3.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
Total BTEX	337		6.00	mg/kg	1000	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			126 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

S-04

GRO C6-C10*	2610		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	3480		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	129		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			253 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			202 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #2 (9-10') 2' BEB H800851-18 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	0.060		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	1.16		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	0.660		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	8.78		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	10.7		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			139 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	267		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	900		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	25.4		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			128 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			124 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #2 (14-15') 2' BEB

H800851-19 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	0.228		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			104 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	37.5		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			94.5 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			97.5 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #3 (2-3') 2' BEB

H800851-26 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	0.099		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	0.208		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	0.481		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	0.788		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			122 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	18.1		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	335		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			88.9 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			97.8 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #3 (4-5') 2' BEB H800851-27 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

S-04

Benzene*	<0.200		0.200	mg/kg	200	8032607	MS	27-Mar-18	8021B	
Toluene*	2.59		0.200	mg/kg	200	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	4.89		0.200	mg/kg	200	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	34.9		0.600	mg/kg	200	8032607	MS	27-Mar-18	8021B	
Total BTEX	42.4		1.20	mg/kg	200	8032607	MS	27-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			186 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

S-04

GRO C6-C10*	512		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	1750		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	45.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctane			164 %	41-142		8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane			141 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #3 (6-7') 2' BEB

H800851-28 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	0.062		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	0.432		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	0.494		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			110 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	121		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctane			91.9 %	41-142		8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane			102 %	37.6-147		8032606	MS	27-Mar-18	8015B	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #3 (9-10') 2' BEB

H800851-29 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	---------	----------	--------	-------

Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total Xylenes*	0.310		0.150	mg/kg	50	8032607	MS	27-Mar-18	8021B	
Total BTEX	0.310		0.300	mg/kg	50	8032607	MS	27-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			112 %	72-148		8032607	MS	27-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	142		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			87.6 %	41-142		8032606	MS	27-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			95.7 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

BH #3 (14-15') 2' BEB

H800851-30 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	---------	----------	--------	-------

Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8032607	MS	26-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			111 %	72-148		8032607	MS	26-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
DRO >C10-C28*	44.5		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctane			105 %	41-142		8032606	MS	27-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane			118 %	37.6-147		8032606	MS	27-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

Volatile Organic Compounds by EPA Method 8021 - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 8032607 - Volatiles

Blank (8032607-BLK1)

Prepared & Analyzed: 26-Mar-18

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.105		mg/kg	0.100		105	72-148			

LCS (8032607-BS1)

Prepared & Analyzed: 26-Mar-18

Benzene	1.64	0.050	mg/kg	2.00		82.0	79.5-124			
Toluene	1.92	0.050	mg/kg	2.00		96.1	75.5-127			
Ethylbenzene	2.01	0.050	mg/kg	2.00		101	77.7-125			
Total Xylenes	5.89	0.150	mg/kg	6.00		98.2	70.9-124			
Surrogate: 4-Bromofluorobenzene (PID)	0.104		mg/kg	0.100		104	72-148			

LCS Dup (8032607-BSD1)

Prepared & Analyzed: 26-Mar-18

Benzene	1.61	0.050	mg/kg	2.00		80.4	79.5-124	1.88	6.5	
Toluene	1.89	0.050	mg/kg	2.00		94.5	75.5-127	1.68	7.02	
Ethylbenzene	1.98	0.050	mg/kg	2.00		99.2	77.7-125	1.53	7.83	
Total Xylenes	5.77	0.150	mg/kg	6.00		96.2	70.9-124	2.12	7.78	
Surrogate: 4-Bromofluorobenzene (PID)	0.100		mg/kg	0.100		100	72-148			

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
28-Mar-18 08:31

Petroleum Hydrocarbons by GC FID - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 8032606 - General Prep - Organics

Blank (8032606-BLK1)

Prepared & Analyzed: 26-Mar-18

GRO C6-C10	ND	10.0	mg/kg						
DRO >C10-C28	ND	10.0	mg/kg						
EXT DRO >C28-C35	ND	10.0	mg/kg						
EXT DRO >C28-C36	ND	10.0	mg/kg						
Total TPH C6-C28	ND	10.0	mg/kg						
Surrogate: 1-Chlorooctane	44.7		mg/kg	50.0		89.4		41-142	
Surrogate: 1-Chlorooctadecane	49.8		mg/kg	50.0		99.7		37.6-147	

LCS (8032606-BS1)

Prepared & Analyzed: 26-Mar-18

GRO C6-C10	193	10.0	mg/kg	200		96.5		76.5-133	
DRO >C10-C28	209	10.0	mg/kg	200		105		72.9-138	
Total TPH C6-C28	402	10.0	mg/kg	400		101		78-132	
Surrogate: 1-Chlorooctane	50.5		mg/kg	50.0		101		41-142	
Surrogate: 1-Chlorooctadecane	53.7		mg/kg	50.0		107		37.6-147	

LCS Dup (8032606-BSD1)

Prepared & Analyzed: 26-Mar-18

GRO C6-C10	207	10.0	mg/kg	200		103		76.5-133	6.97	20.6
DRO >C10-C28	238	10.0	mg/kg	200		119		72.9-138	13.0	20.6
Total TPH C6-C28	445	10.0	mg/kg	400		111		78-132	10.2	18
Surrogate: 1-Chlorooctane	51.1		mg/kg	50.0		102		41-142		
Surrogate: 1-Chlorooctadecane	60.0		mg/kg	50.0		120		37.6-147		

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager



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 Tavaraz	
Project Name: Medera 19 Federal #1		Project #: 2100-MD-01102 Task #200	
Project Location: Medera 19 Federal #1 (county, state) Lee County, NM		Project #: 2100-MD-01102 Task #200	
Invoice to: Tetra Tech		Sampler Signature: Mike C. Tera K	
Receiving Laboratory: Cardinal Labs		Comments: 24 hr Rush	
LAB # H200851		LAB USE ONLY	
SAMPLE IDENTIFICATION		SAMPLING	
DATE		TIME	
YEAR: 2017		DATE	
TIME		MATRIX	
WATER		SOIL	
HCL		HNO ₃	
ICE		None	
# CONTAINERS		PRESERVATIVE METHOD	
FILTERED (Y/N)		None	
1 BH #1 (6-1) 1.5' B _{EB}		3/26/18	
2 BH #1 (2-3) 1.5' B _{EB}		X	
3 BH #1 (4-5) 1.5' B _{EB}		X	
4 BH #1 (6-7) 1.5' B _{EB}		X	
5 BH #1 (9-10) 1.5' B _{EB}		X	
6 BH #1 (14-15) 1.5' B _{EB}		X	
7 BH #1 (19-20) 1.5' B _{EB}		X	
8 BH #1 (24-25) 1.5' B _{EB}		X	
9 BH #1 (29-30) 1.5' B _{EB}		X	
10 BH #1 (34-35) 1.5' B _{EB}		X	
Relinquished by: [Signature]		Received by: [Signature]	
Date: 3/26/18		Date: 3/26/18	
Time: 2:45		Time: 2:45	
Relinquished by: [Signature]		Received by: [Signature]	
Date: 3/26/18		Date: 3/26/18	
Time: 2:45		Time: 2:45	
Relinquished by: [Signature]		Received by: [Signature]	
Date: 3/26/18		Date: 3/26/18	
Time: 2:45		Time: 2:45	
LAB USE ONLY		ANALYSIS REQUEST	
Sample Temperature		(Circle or Specify Method No.)	
#75		BTEX 8021B BTEX 8260B	
2.30/2.75		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	
REMARKS:			
☐ STANDARD			
☒ RUSH: Same Day (24 hr) 48 hr 72 hr			
☐ Rush Charges Authorized			
☐ Special Report Limits or TRRP Report			

ORIGINAL COPY

(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

Client Name:

Munich

Site Manager:

Ike Tavares

Project Name:

Modern 19 Fedma #1

Project Location:

Lea Co, MN

Project #:

212C-000-01102 Task # 200

Invoice to:

Tetra Tech

Receiving Laboratory:

Cardinal Labs

Sampler Signature:

Mike C, Tom K

Comments:

24 hr Rush

LAB #

LAB USE ONLY

SAMPLE IDENTIFICATION

LAB #

LAB USE ONLY

SAMPLING

YEAR: 2017

DATE

TIME

MATRIX

WATER

SOIL

HCL

HNO₃

ICE

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

ANALYSIS REQUEST

(Circle or Specify Method No.)

Relinquished by:

Date:

Time:

Received by:

Date:

Time:

Relinquished by:

Date:

Time:

Received by:

Date:

Time:

Relinquished by:

Date:

Time:

Received by:

Date:

Time:

LAB USE ONLY

REMARKS:

STANDARD

RUSH:

Same Day

24 hr

48 hr

72 hr

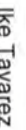
Rush Charges Authorized

Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY

Tel (432) 682-4559
Fax (432) 682-3946



Hold

1



Tetra Tech, Inc.

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

[illegible]

March 15, 2018

IKE TAVAREZ

TETRA TECH

1910 N. BIG SPRING STREET

MIDLAND, TX 79705

RE: MARATHON / MADERA 19 FED #1

Enclosed are the results of analyses for samples received by the laboratory on 03/14/18 13:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-17-10. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
15-Mar-18 09:08

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NORTH BOTTOM (3')	H800741-01	Soil	14-Mar-18 10:20	14-Mar-18 13:00
NORTH BOTTOM (4')	H800741-02	Soil	14-Mar-18 10:25	14-Mar-18 13:00
NORTH BOTTOM (5')	H800741-03	Soil	14-Mar-18 10:30	14-Mar-18 13:00
SOUTH BOTTOM (3')	H800741-04	Soil	14-Mar-18 10:40	14-Mar-18 13:00
SOUTH BOTTOM (4')	H800741-05	Soil	14-Mar-18 10:45	14-Mar-18 13:00
SOUTH BOTTOM (5')	H800741-06	Soil	14-Mar-18 10:50	14-Mar-18 13:00
NORTH EAST SIDEWALL (5')	H800741-07	Soil	14-Mar-18 11:00	14-Mar-18 13:00

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

NORTH BOTTOM (3')

H800741-01 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	---------	----------	--------	-------

Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<2.00	2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Toluene*	70.1	2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	27.3	2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	443	6.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total BTEX	541	12.0	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)		101 %		72-148	8031401	MS	14-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

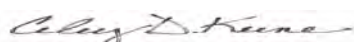
S-04

GRO C6-C10*	4640	10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	7160	10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	175	10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
Surrogate: 1-Chlorooctane		363 %		41-142	8031406	MS	14-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane		167 %		37.6-147	8031406	MS	14-Mar-18	8015B	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

NORTH BOTTOM (4')

H800741-02 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<2.00		2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Toluene*	82.6		2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	30.7		2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	479		6.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total BTEX	592		12.0	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			103 %	72-148		8031401	MS	14-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

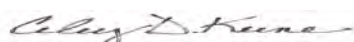
S-04

GRO C6-C10*	5420		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	7280		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	177		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			376 %	41-142		8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			165 %	37.6-147		8031406	MS	14-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

NORTH BOTTOM (5')

H800741-03 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<2.00		2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Toluene*	80.9		2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	34.4		2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	545		6.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total BTEX	660		12.0	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			103 %	72-148		8031401	MS	14-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

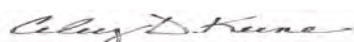
S-04

GRO C6-C10*	5340		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	6540		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	137		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			353 %	41-142		8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			151 %	37.6-147		8031406	MS	14-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

SOUTH BOTTOM (3')

H800741-04 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Toluene*	2.28		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	16.7		0.150	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total BTEX	19.0		0.300	mg/kg	50	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			129 %	72-148		8031401	MS	14-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	244		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	469		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			103 %	41-142		8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			72.6 %	37.6-147		8031406	MS	14-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

SOUTH BOTTOM (4')

H800741-05 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Toluene*	1.05		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	11.2		0.150	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total BTEX	12.2		0.300	mg/kg	50	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			123 %	72-148		8031401	MS	14-Mar-18	8021B	

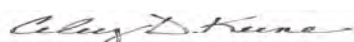
Petroleum Hydrocarbons by GC FID

GRO C6-C10*	203		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	424		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			104 %	41-142		8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			79.5 %	37.6-147		8031406	MS	14-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

SOUTH BOTTOM (5')

H800741-06 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Toluene*	0.089		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	1.28		0.150	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total BTEX	1.37		0.300	mg/kg	50	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			98.9 %	72-148		8031401	MS	14-Mar-18	8021B	

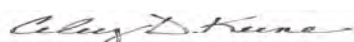
Petroleum Hydrocarbons by GC FID

GRO C6-C10*	16.1		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	93.6		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			94.4 %	41-142		8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			77.8 %	37.6-147		8031406	MS	14-Mar-18	8015B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
15-Mar-18 09:08**NORTH EAST SIDEWALL (5')****H800741-07 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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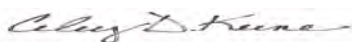
Cardinal Laboratories**Volatile Organic Compounds by EPA Method 8021**

Benzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Toluene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			<i>91.6 %</i>	<i>72-148</i>		<i>8031401</i>	<i>MS</i>	<i>14-Mar-18</i>	<i>8021B</i>	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

Volatile Organic Compounds by EPA Method 8021 - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8031401 - Volatiles

Blank (8031401-BLK1)

Prepared & Analyzed: 14-Mar-18

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.0915		mg/kg	0.100		91.5	72-148			

LCS (8031401-BS1)

Prepared & Analyzed: 14-Mar-18

Benzene	2.05	0.050	mg/kg	2.00		103	79.5-124			
Toluene	2.09	0.050	mg/kg	2.00		105	75.5-127			
Ethylbenzene	2.05	0.050	mg/kg	2.00		102	77.7-125			
Total Xylenes	6.21	0.150	mg/kg	6.00		104	70.9-124			
Surrogate: 4-Bromofluorobenzene (PID)	0.0912		mg/kg	0.100		91.2	72-148			

LCS Dup (8031401-BS1)

Prepared & Analyzed: 14-Mar-18

Benzene	2.00	0.050	mg/kg	2.00		99.9	79.5-124	2.69	6.5	
Toluene	2.02	0.050	mg/kg	2.00		101	75.5-127	3.66	7.02	
Ethylbenzene	2.00	0.050	mg/kg	2.00		99.9	77.7-125	2.43	7.83	
Total Xylenes	6.08	0.150	mg/kg	6.00		101	70.9-124	2.13	7.78	
Surrogate: 4-Bromofluorobenzene (PID)	0.0910		mg/kg	0.100		91.0	72-148			

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:08

Petroleum Hydrocarbons by GC FID - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8031406 - General Prep - Organics

Blank (8031406-BLK1)

Prepared & Analyzed: 14-Mar-18

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C35	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	45.9		mg/kg	50.0		91.7	41-142			
Surrogate: 1-Chlorooctadecane	37.3		mg/kg	50.0		74.6	37.6-147			

LCS (8031406-BS1)

Prepared & Analyzed: 14-Mar-18

GRO C6-C10	183	10.0	mg/kg	200		91.5	76.5-133			
DRO >C10-C28	171	10.0	mg/kg	200		85.6	72.9-138			
Total TPH C6-C28	354	10.0	mg/kg	400		88.5	78-132			
Surrogate: 1-Chlorooctane	46.4		mg/kg	50.0		92.8	41-142			
Surrogate: 1-Chlorooctadecane	42.2		mg/kg	50.0		84.4	37.6-147			

LCS Dup (8031406-BSD1)

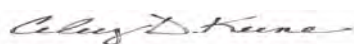
Prepared & Analyzed: 14-Mar-18

GRO C6-C10	183	10.0	mg/kg	200		91.6	76.5-133	0.0563	20.6	
DRO >C10-C28	163	10.0	mg/kg	200		81.4	72.9-138	5.04	20.6	
Total TPH C6-C28	346	10.0	mg/kg	400		86.5	78-132	2.38	18	
Surrogate: 1-Chlorooctane	46.9		mg/kg	50.0		93.8	41-142			
Surrogate: 1-Chlorooctadecane	41.3		mg/kg	50.0		82.7	37.6-147			

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager



101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

ANALYSIS REQUEST

[illegible]

PLEASE NOTE: Liability and Damages. Customer hereby and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the services. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits, incurred by client, its subsidiaries, affiliates or successors, arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above listed remedies or otherwise.

Relinquished By:	Date:	Received By:	Phone Result:	☐ Yes	☐ No	Add'l Phone #:
<i>Det. [Signature]</i>	<i>3/14/18</i>	<i>[Signature]</i>	Fax Result:	☐ Yes	☐ No	Add'l Fax #:
Time:	<i>3:00</i>		REMARKS:			
Date:			<i>24hr Rush</i>			
Time:						

Delivered By: (Circle One)	#75	Sample Condition	CHECKED BY: (Initials)
Sampler - UPS - Bus - Other:	2.90 2.850	Cool ☐ Intact ☒ Yes ☐ Yes ☒ No ☐ No ☐	<i>[Signature]</i>

March 15, 2018

IKE TAVAREZ

TETRA TECH

1910 N. BIG SPRING STREET

MIDLAND, TX 79705

RE: MARATHON / MADERA 19 FED #1

Enclosed are the results of analyses for samples received by the laboratory on 03/14/18 13:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-17-10. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
15-Mar-18 09:00

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NORTH BOTTOM (2.0')	H800740-01	Soil	14-Mar-18 10:15	14-Mar-18 13:00
SOUTH BOTTOM (2.0')	H800740-02	Soil	14-Mar-18 10:35	14-Mar-18 13:00
NORTH EAST SIDEWALL	H800740-03	Soil	14-Mar-18 10:55	14-Mar-18 13:00

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:00

NORTH BOTTOM (2.0')

H800740-01 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<2.00	2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Toluene*	63.0	2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	25.3	2.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	399	6.00	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Total BTEX	487	12.0	mg/kg	2000	8031401	MS	14-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)		100 %		72-148	8031401	MS	14-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

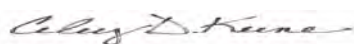
S-04

GRO C6-C10*	4820	10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	7030	10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	147	10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
Surrogate: 1-Chlorooctane		365 %		41-142	8031406	MS	14-Mar-18	8015B	
Surrogate: 1-Chlorooctadecane		172 %		37.6-147	8031406	MS	14-Mar-18	8015B	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:00

SOUTH BOTTOM (2.0')

H800740-02 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Volatile Organic Compounds by EPA Method 8021

Benzene*	<1.00		1.00	mg/kg	1000	8031401	MS	14-Mar-18	8021B	
Toluene*	34.4		1.00	mg/kg	1000	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	10.2		1.00	mg/kg	1000	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	151		3.00	mg/kg	1000	8031401	MS	14-Mar-18	8021B	
Total BTEX	196		6.00	mg/kg	1000	8031401	MS	14-Mar-18	8021B	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			102 %	72-148		8031401	MS	14-Mar-18	8021B	

Petroleum Hydrocarbons by GC FID

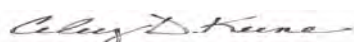
S-04

GRO C6-C10*	1800		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
DRO >C10-C28*	2080		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
EXT DRO >C28-C36	41.4		10.0	mg/kg	1	8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctane</i>			173 %	41-142		8031406	MS	14-Mar-18	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>			103 %	37.6-147		8031406	MS	14-Mar-18	8015B	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
15-Mar-18 09:00**NORTH EAST SIDEWALL****H800740-03 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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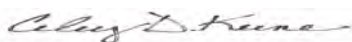
Cardinal Laboratories**Volatile Organic Compounds by EPA Method 8021**

Benzene*	<0.050		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Toluene*	0.205		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Ethylbenzene*	0.100		0.050	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total Xylenes*	0.617		0.150	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Total BTEX	0.922		0.300	mg/kg	50	8031401	MS	14-Mar-18	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			94.7 %		72-148	8031401	MS	14-Mar-18	8021B	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:00

Volatile Organic Compounds by EPA Method 8021 - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8031401 - Volatiles

Blank (8031401-BLK1)

Prepared & Analyzed: 14-Mar-18

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.0915		mg/kg	0.100		91.5	72-148			

LCS (8031401-BS1)

Prepared & Analyzed: 14-Mar-18

Benzene	2.05	0.050	mg/kg	2.00		103	79.5-124			
Toluene	2.09	0.050	mg/kg	2.00		105	75.5-127			
Ethylbenzene	2.05	0.050	mg/kg	2.00		102	77.7-125			
Total Xylenes	6.21	0.150	mg/kg	6.00		104	70.9-124			
Surrogate: 4-Bromofluorobenzene (PID)	0.0912		mg/kg	0.100		91.2	72-148			

LCS Dup (8031401-BS1)

Prepared & Analyzed: 14-Mar-18

Benzene	2.00	0.050	mg/kg	2.00		99.9	79.5-124	2.69	6.5	
Toluene	2.02	0.050	mg/kg	2.00		101	75.5-127	3.66	7.02	
Ethylbenzene	2.00	0.050	mg/kg	2.00		99.9	77.7-125	2.43	7.83	
Total Xylenes	6.08	0.150	mg/kg	6.00		101	70.9-124	2.13	7.78	
Surrogate: 4-Bromofluorobenzene (PID)	0.0910		mg/kg	0.100		91.0	72-148			

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: MARATHON / MADERA 19 FED #1
Project Number: 212C-MD-01102.200
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
15-Mar-18 09:00

Petroleum Hydrocarbons by GC FID - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8031406 - General Prep - Organics

Blank (8031406-BLK1)

Prepared & Analyzed: 14-Mar-18

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C35	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	45.9		mg/kg	50.0		91.7	41-142			
Surrogate: 1-Chlorooctadecane	37.3		mg/kg	50.0		74.6	37.6-147			

LCS (8031406-BS1)

Prepared & Analyzed: 14-Mar-18

GRO C6-C10	183	10.0	mg/kg	200		91.5	76.5-133			
DRO >C10-C28	171	10.0	mg/kg	200		85.6	72.9-138			
Total TPH C6-C28	354	10.0	mg/kg	400		88.5	78-132			
Surrogate: 1-Chlorooctane	46.4		mg/kg	50.0		92.8	41-142			
Surrogate: 1-Chlorooctadecane	42.2		mg/kg	50.0		84.4	37.6-147			

LCS Dup (8031406-BSD1)

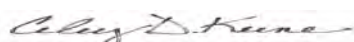
Prepared & Analyzed: 14-Mar-18

GRO C6-C10	183	10.0	mg/kg	200		91.6	76.5-133	0.0563	20.6	
DRO >C10-C28	163	10.0	mg/kg	200		81.4	72.9-138	5.04	20.6	
Total TPH C6-C28	346	10.0	mg/kg	400		86.5	78-132	2.38	18	
Surrogate: 1-Chlorooctane	46.9		mg/kg	50.0		93.8	41-142			
Surrogate: 1-Chlorooctadecane	41.3		mg/kg	50.0		82.7	37.6-147			

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analysis Request of Chain of Custody Record



TETRA TECH

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

CLIENT NAME: **H800740**

SITE MANAGER: **Jeff Lauer**

PROJECT NO.: **212-MD-01102**

PROJECT NAME: **Wachobert / Wadner 19 feet**

LAB I.D. NUMBER: **200**

MATRIX
COMP.
GRAB

SAMPLE IDENTIFICATION
Wachobert / Wadner 19 feet #1

NUMBER OF CONTAINERS

FILTERED (Y/N)

HCL

HNO3

ICE

NONE

PRESERVATIVE METHOD

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

PAGE: 1 OF: 1
ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	PRESERVATIVE METHOD
1	3/14	10:15	S			North bottom (2.0')	1						
2	3/14	10:35	S			South bottom (2.0')	1						
3	3/14	10:55	S			North east side ball	1						

RELINQUISHED BY: (Signature)

RELINQUISHED BY: (Signature)

RELINQUISHED BY: (Signature)

RECEIVING LABORATORY:

CITY: **Midland**

CONTACT: **State**

STATE: **TX**

PHONE: **2.90**

ZIP: **79705**

REMARKS: **2.90**

Date: **3/14/08**

Time: **13:00**

Time: **13:00**

Time: **13:00**

Time: **13:00**

Time: **13:00**

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SAMPLE SHIPPED BY: (Print & Mail)

Date: **3/14/08**

Time: **13:00**

Time: **13:00**

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Date: **3/14/08**

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