

SITE INFORMATION

Report Type: Work Plan

General Site Information:

Site:	Parkway Delaware Unit # 704					
Company:	SM Energy Company					
Section, Township and Range	Unit G	Sec 35	T19S	R 29 E		
Lease Number:	API No. 30-015-30028					
County:	Eddy County					
GPS:	32.61370° N			104.03831° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	Northeast of Carlsbad, from the intersection of 360 and CR238, head N on CR238 for 6.8 miles and turn east. Travel the lease road for 0.38 miles and turn south and back west to injection well # 704 arriving at the site.					

Release Data:

Date Released:	7/11/2014
Type Release:	Produced Water
Source of Contamination:	2" ball valve failure on injection line
Fluid Released:	25 bbls
Fluids Recovered:	10 bbls

Official Communication:

Name:	Lisa Hunt		Tom Elliott
Company:	SM Energy Company		Tetra Tech
Address:	6301 Holiday Hill Road		4000 North Big Spring
P.O. Box	Bldg 1		STE 401
City:	Midland Texas, 79707		Midland, Texas 79705
Phone number:	(432) 848-4833		(432) 682-4559
Fax:			
Email:	lhunt@sm-energy.com		tom.elliott@tetrattech.com

Ranking Criteria

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

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



October 7, 2013

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

Re: Work Plan for SM Energy Company, Parkway Delaware Unit # 704, Section 35, Township 19S, Range 29E, Eddy County, New Mexico

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by SM Energy Company (SM Energy) to assess a spill from Parkway Delaware Unit Well #704, located in Section 35, Township 19S, Range 29E, Eddy County, New Mexico (Site). The spill site coordinates are N 32.61370°, W 104.03831°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico Oil Conservation Division (NMOCD) Form C-141 Initial Report, the leak was discovered on July 11, 2014. The spill was caused from a 2" ball valve failure on an injection line, and approximately twenty five (25) barrels (bbls) of produced water was released. SM Energy vacuumed the free standing fluids and recovered 10 bbls of fluid.

The spill impacted an area of approximately 20' x 100' on the pad and 150' x 160' off the pad in a former reserve pit. The spill area is shown on Figure 3. The initial Form C-141 is enclosed in Appendix A.

Groundwater

The New Mexico State Engineers Well Report listed one well in Section 35 with an average depth of 110' and wells in Sections 34 and 36 with reported depths of 60' and 115', respectively. The well report is shown in Appendix B.

Tetra Tech

1910 North Big Spring, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



Previously, Tetra Tech personnel supervised the installation of a temporary well (TMW-1) in Section 35 to establish groundwater quality and depth in this section. During the installation, the well drilled dry. The well was drilled through fine grain sand with gypsum layers and red shale to a total depth of 140', to the top of a black and gray shale formation (blue shale). The well was measured two days later and showed a depth to groundwater of 121' TOC.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the 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

On August 5, 2014, Tetra Tech personnel inspected and sampled the spill area. A total of eight (8) auger holes (AH-1 through AH-8) were installed using a stainless steel hand auger to assess the impacted areas. Two (2) auger holes (AH-1 and AH-2) were installed on the pad, while the remaining (6) auger holes were installed in the suspected former reserve pit. Samples on the pad were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Samples in the former reserve pit were only analyzed by TPH and BTEX. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Analytical Results

Referring to Table 1, auger hole (AH-3) was above the RRAL for TPH, with a concentration of 10,994 mg/kg, at a depth of 0-1' below surface, however declined to 14.8 mg/kg at 1-1.5' below surface. All other auger holes were below the RRAL for BTEX and TPH.



Elevated chloride concentrations were detected in auger holes (AH-1 and AH-2) on the pad, while the remaining auger holes were not analyzed for chlorides due to the presence of the former reserve pit. Auger hole (AH-1) exhibited chloride concentrations of 16,600 mg/kg at 0-1', however declined to <20.0 and 448 mg/kg at 3'-3.5' and 3.5'-4', respectively. Auger hole (AH-2) exhibited chloride concentrations of 15,200 mg/kg at 0-1' and declined to 8,430 mg/kg at 3'-3.5', below surface. Auger hole (AH-2) was not vertically defined due to auger refusal at 3.5' below surface.

Work Plan

SM Energy proposes to remove impacted material as highlighted (green) in Table 1 and shown on Figure 4. A backhoe trench will be installed to further delineate the depth of chloride impact in the area of AH-2. Tetra Tech will field screen and collect soil samples during the excavation. Based on the results, the impacted soil will be excavated to the appropriate depth. If delineation suggests deeper impact and the area cannot be excavated, the areas will be excavated to a depth of approximately 3-4', capped with a 40 mil liner (or capped with clay) and backfilled with clean soil. The excavated soil will be hauled to a proper disposal facility.

Impacted soil around oil and gas equipment, structures or lines may not be feasible or practical to be removed due to safety concerns. In addition if a dense formation is encountered that cannot be penetrated, Tetra Tech will excavate to necessary practicable depths as determined on site and install a 40 mil liner or cap the remaining impacted soils with clay.

Upon completion, a final report will be submitted to the NMOCD. If you have any questions or require any additional information regarding this work plan, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH, Inc.

A handwritten signature in blue ink, appearing to read 'Tom Elliott'.

Tom Elliott
Project Manager

cc: SM Energy Company – File Copy
BLM – Jim Amos

FIGURES

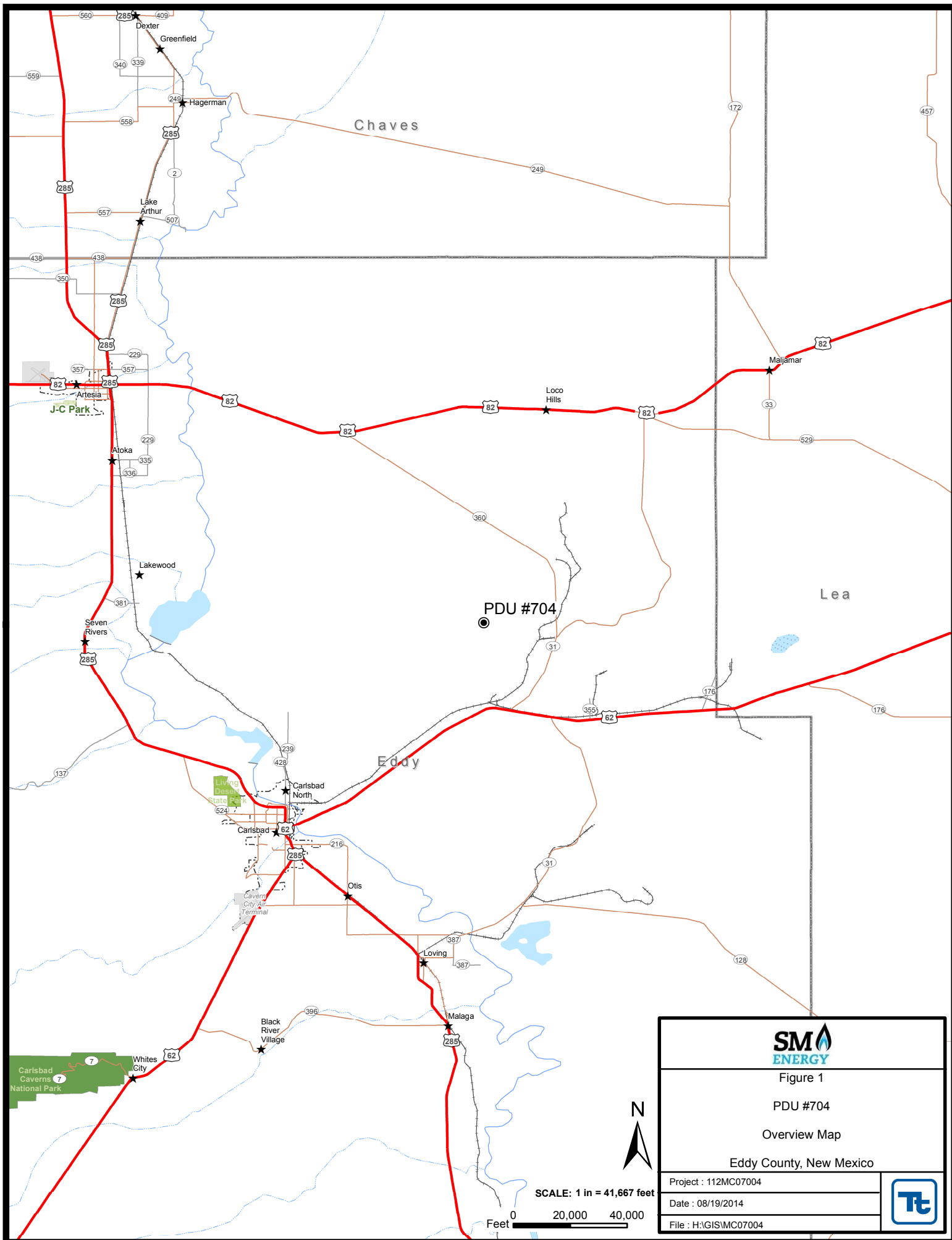


Figure 1

PDU #704

Overview Map

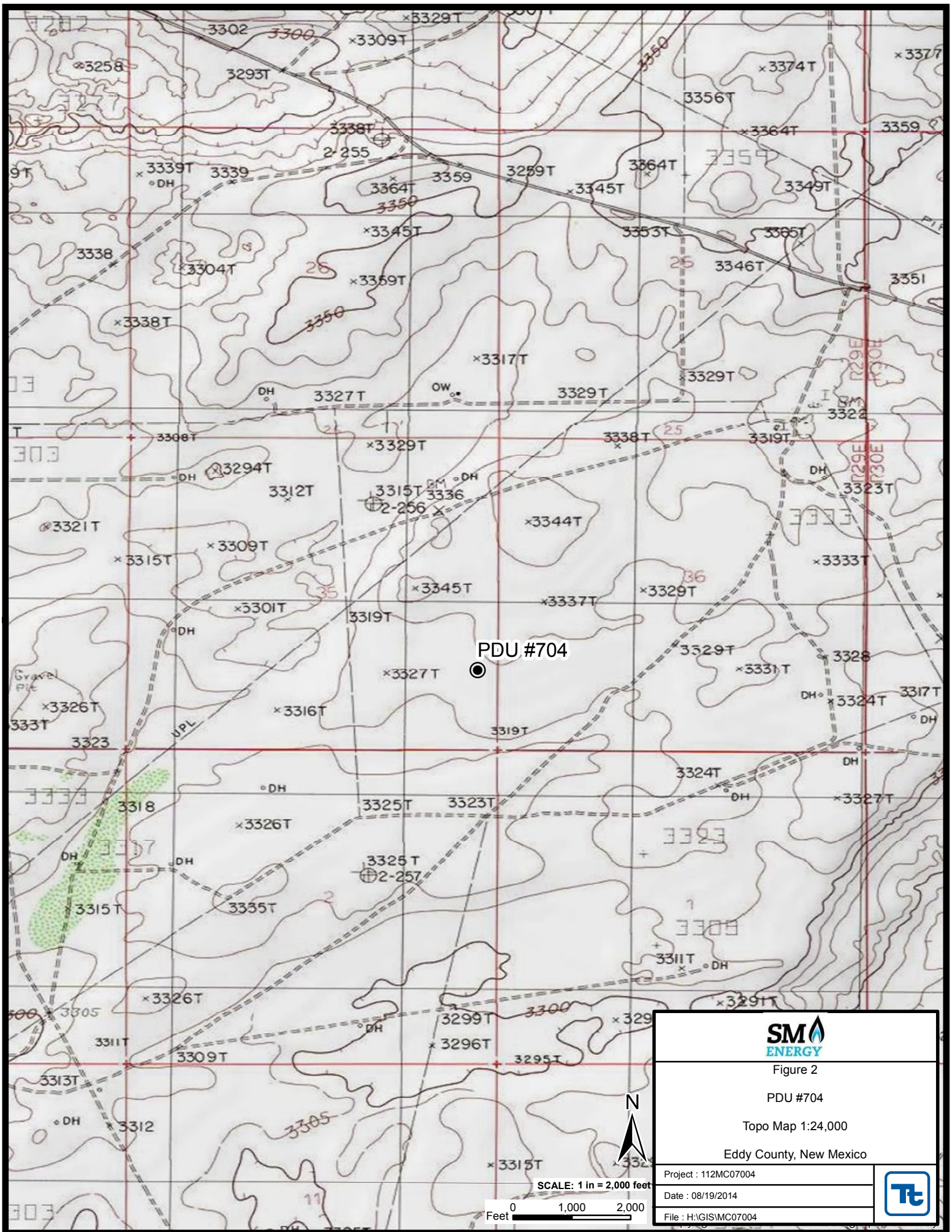
Eddy County, New Mexico

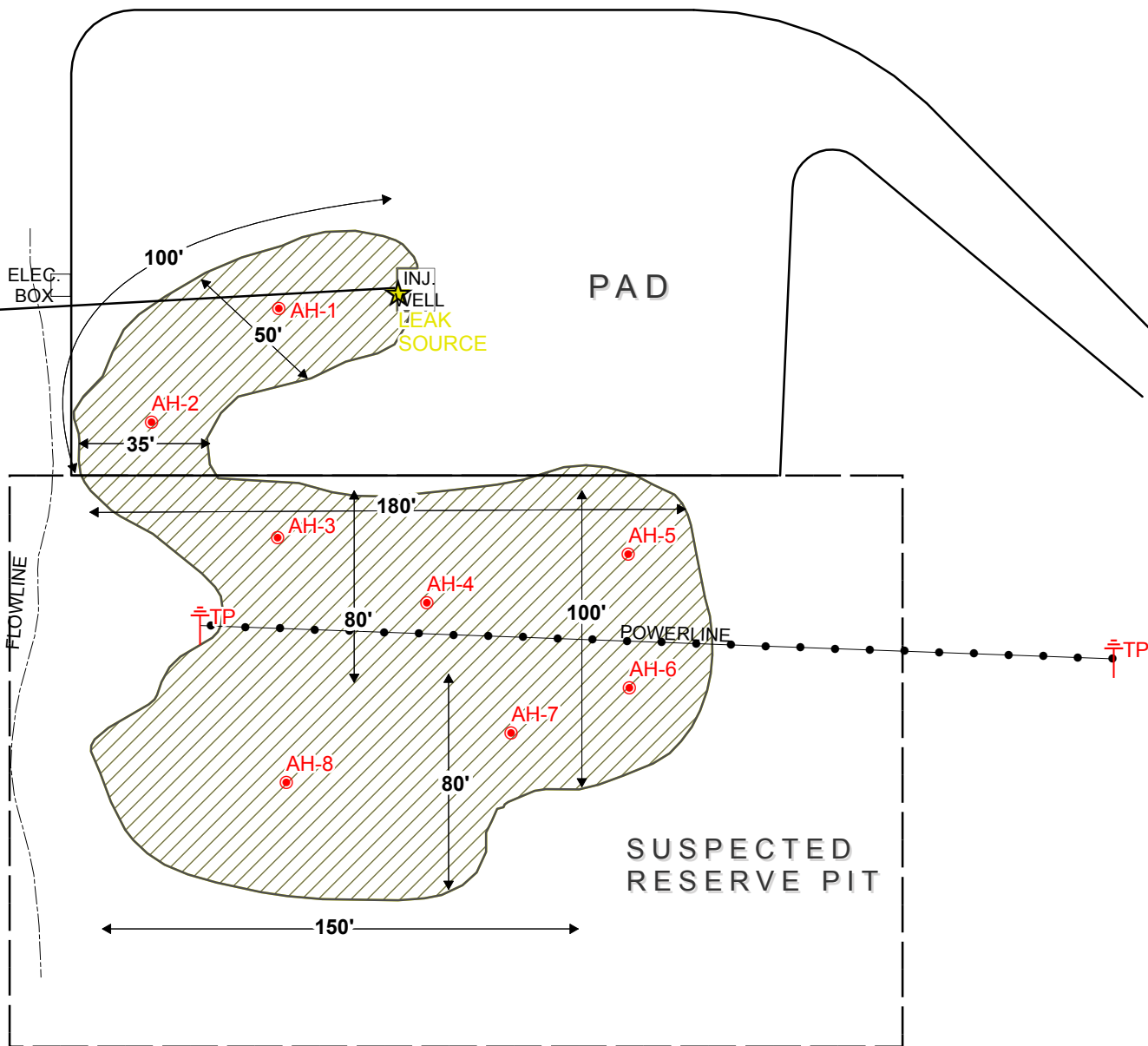
Project : 112MC07004

Date : 08/19/2014

File : H:\GIS\MC07004







EXPLANATION

- AUGER HOLE SAMPLE LOCATIONS
- ★ LEAK SOURCE
- ↑ TRANSFER POLE
- ▨ SPILL AREA



SCALE: 1 IN = 63 FEET

Feet 0 20 40



Figure 3

PDU #704

Spill Assessment Map

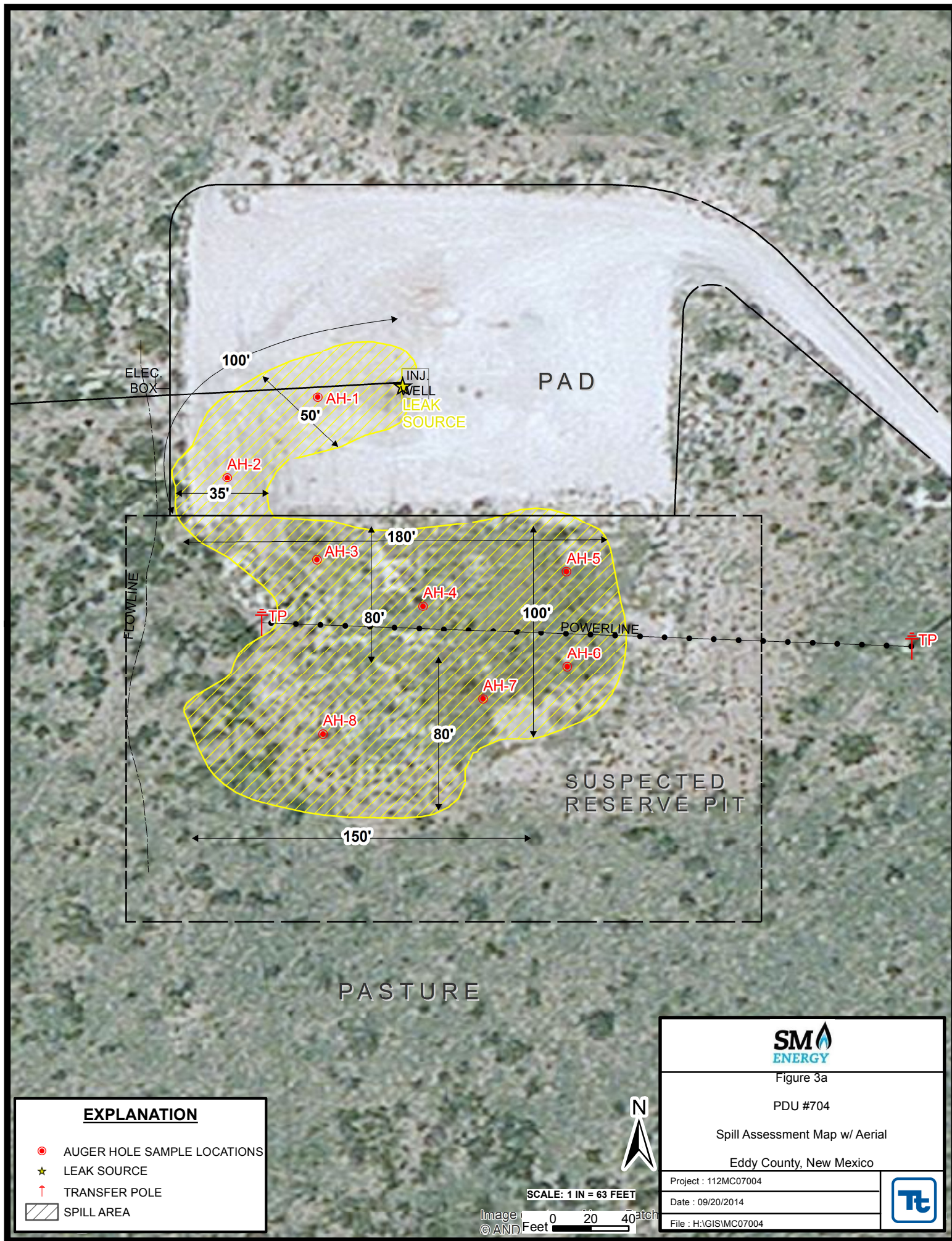
Eddy County, New Mexico

Project : 112MC07004

Date : 09/20/2014

File : H:\GIS\MC07004





EXPLANATION

- AUGER HOLE SAMPLE LOCATIONS
- ★ LEAK SOURCE
- ↑ TRANSFER POLE
- ▨ SPILL AREA



Figure 3a

PDU #704

Spill Assessment Map w/ Aerial

Eddy County, New Mexico

Project : 112MC07004

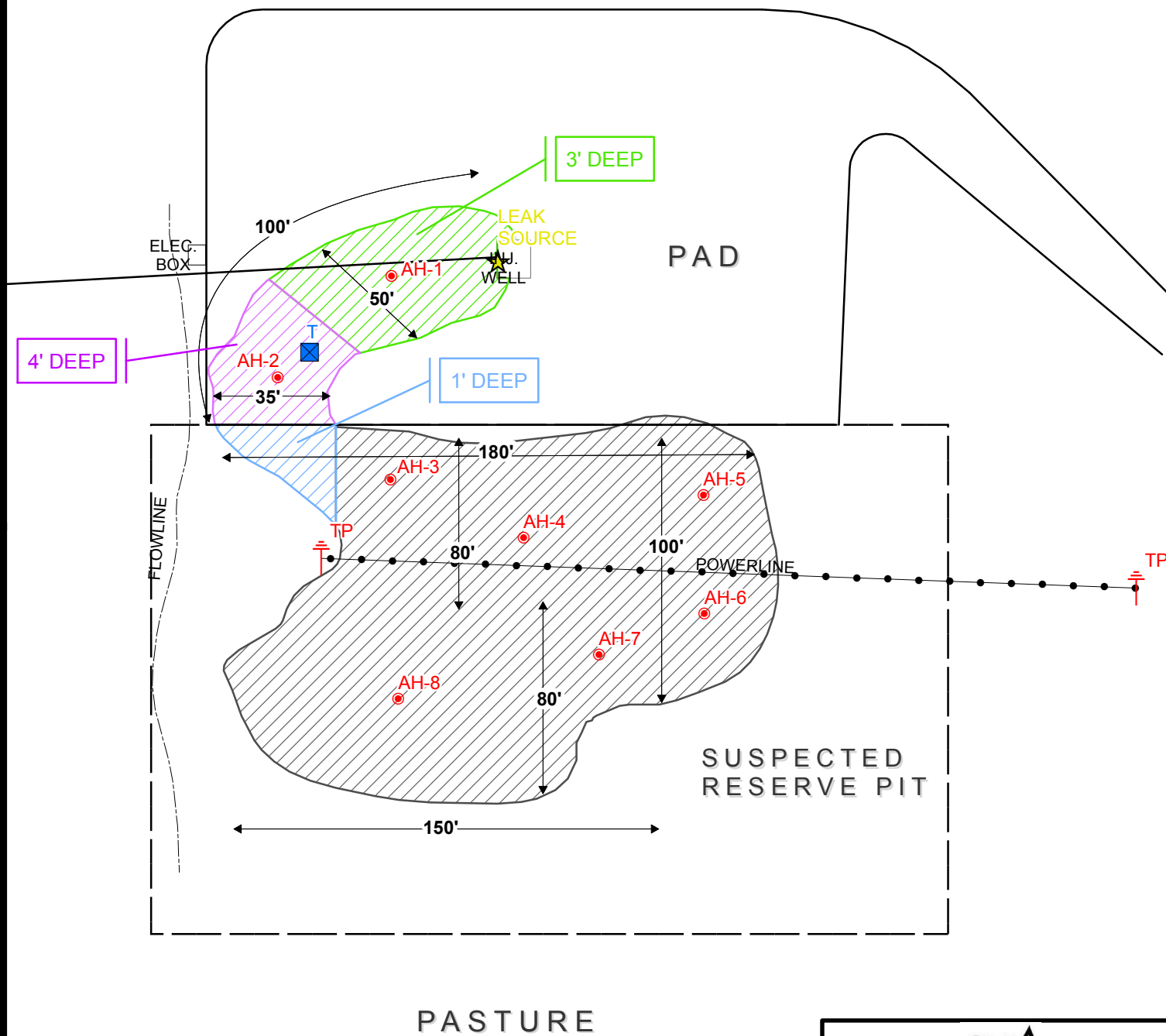
Date : 09/20/2014

File : H:\GIS\MC07004



SCALE: 1 IN = 63 FEET

Image © AND Feet 0 20 40



EXPLANATION

- AUGER HOLE SAMPLE LOCATIONS
- ★ LEAK SOURCE
- PROPOSED TRENCH LOCATION
- † TRANSFER POLE
- ▨ PROPOSED EXCAVATION AREAS

SCALE: 1 IN = 63 FEET

Feet 0 20 40



Figure 4

PDU #704

Proposed Excavation Areas & Depths Map

Eddy County, New Mexico

Project : 112MC07004

Date : 09/20/2014

File : H:\GIS\MC07004



TABLES

Table 1
SM Energy
PDU #704
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
AH-1	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	16,600
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	6,170
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	2,090
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	3.5-4	-	X		-	-	-	-	-	-	-	-	448
AH-2 Trench	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	15,200
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	7,350
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	2,940
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	8,430
AH-3	8/5/2014	0-1	-	X		894	10,100	10,994	<0.100	<0.100	<0.100	38.4	38.4	-
	"	1-1.5	-	X		14.8	<50.0	14.8	-	-	-	-	-	-
AH-4	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	-
AH-5	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	-
AH-6	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	-
AH-7	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	-
AH-8	8/5/2014	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	-

(-) Not Analyzed

(BEB) Below Excavation Bottom

Proposed Excavation Depths

PHOTOGRAPHS

SM Energy Company
PDU # 704
Eddy County, New Mexico



Photo 1. Injection well release point.



Photo 2. View looking west at area of AH-1 and AH-2.

SM Energy Company
PDU # 704
Eddy County, New Mexico



Photo 3. View looking south at area of AH-3 on edge of former reserve pit.



Photo 4. View looking east at area of AH-4, AH-5 and AH-6.

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 August 8, 2011

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	SM ENERGY COMPANY	Contact	LISA HUNT
Address	6301 Holiday Hill Rd. Bldg 1 Midland, TX 79707	Telephone No.	(432)848-4833
Facility Name	Parkway Delaware Unit #704	Facility Type	Injection well - Federal
Surface Owner	BLM	Mineral Owner	
		API No.	30-015-30028

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
I	35	19S	29E	1450	S	330	E	Eddy

Latitude _____ Longitude _____

NATURE OF RELEASE

Type of Release	Produced Water	Volume of Release	25 bbl	Volume Recovered	10 bbl
Source of Release	Injection line	Date and Hour of Occurrence	7/11/14	Date and Hour of Discovery	1/11/14 7:30a
Was Immediate Notice Given?	☒ Yes ☐ No ☐ Not Required	If YES, To Whom?	Jim Amos		
By Whom?	Kerry Culbertson	Date and Hour	7/11/14 2:30 pm		
Was a Watercourse Reached?	☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

2" ball valve on injection line failed due to corrosion & 25 bbls produced water spilled on location. Remediation began immediately. All free standing fluid was recovered by vacuum truck & hauled to disposal.

Describe Area Affected and Cleanup Action Taken.*

20 ft x 100 ft. Tetra Tech has been notified to conduct soil sampling.

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: LISA HUNT	Approved by Environmental Specialist:		
Title: REGULATORY TECHNICIAN	Approval Date:	Expiration Date:	
E-mail Address: LHUNT@SM-ENERGY.COM	Conditions of Approval:		Attached ☐
Date: 07/14/2014	Phone: (432)848-4833		

* Attach Additional Sheets If Necessary

APPENDIX B

Water Well Data
Average Depth to Groundwater (ft)
SM Energy - PDU #704
Eddy County, New Mexico

18 South			28 East		
6	5	4	3	2	1
		108		55	
7	8	81	9	10	11
49	69				
18	17	16	15	80	14
19	20	21	22	23	24
		226			
30	137	29	28	27	26
31	32	33	34	35	36
				65	

18 South			29 East		
6	5	4	3	2	1
7	8	9	10	95	11
18	17	16	15	14	13
19	20	21	22	23	24
					158
30	29	28	27	26	25
31	32	33	34	35	36

18 South			30 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	44
30	29	28	27	26	25
31	32	33	34	35	36

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

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

19 South			30 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
90					
31	32	33	34	35	36
115					

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

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

20 South			30 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

- New Mexico State Engineers Well Reports
- USGS Well Reports
- Geology and Groundwater Conditions in Southern Eddy, County, NM
- NMOCD - Groundwater Data
- Field water level
- New Mexico Water and Infrastructure Data System

APPENDIX C

Report Date: August 19, 2014
112MC07004

Work Order: 14080801
SME/PDU #704

Page Number: 1 of 4
Eddy Co, NM

Summary Report

Tom Elliott
Tetra Tech
1901 N. Big Spring St.
Midland, TX 79705

Report Date: August 19, 2014

Work Order: 14080801

Project Location: Eddy Co, NM
Project Name: SME/PDU #704
Project Number: 112MC07004

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
370823	AH-1 0-1'	soil	2014-08-05	00:00	2014-08-07
370824	AH-1 1-1.5'	soil	2014-08-05	00:00	2014-08-07
370825	AH-1 2-2.5'	soil	2014-08-05	00:00	2014-08-07
370826	AH-1 3-3.5'	soil	2014-08-05	00:00	2014-08-07
370827	AH-1 3.5-4'	soil	2014-08-05	00:00	2014-08-07
370828	AH-2 0-1'	soil	2014-08-05	00:00	2014-08-07
370829	AH-2 1-1.5'	soil	2014-08-05	00:00	2014-08-07
370830	AH-2 2-2.5'	soil	2014-08-05	00:00	2014-08-07
370831	AH-2 3-3.5'	soil	2014-08-05	00:00	2014-08-07
370832	AH-3 0-1'	soil	2014-08-05	00:00	2014-08-07
370833	AH-3 1-1.5'	soil	2014-08-05	00:00	2014-08-07
370838	AH-4 0-1'	soil	2014-08-05	00:00	2014-08-07
370843	AH-5 0-1'	soil	2014-08-05	00:00	2014-08-07
370848	AH-6 0-1'	soil	2014-08-05	00:00	2014-08-07
370854	AH-7 0-1'	soil	2014-08-05	00:00	2014-08-07
370860	AH-8 0-1'	soil	2014-08-05	00:00	2014-08-07

Sample - Field Code
370823 - AH-1 0-1'
370828 - AH-2 0-1'
370832 - AH-3 0-1'
370833 - AH-3 1-1.5'
370838 - AH-4 0-1'
370843 - AH-5 0-1'
370848 - AH-6 0-1'
370854 - AH-7 0-1'
370860 - AH-8 0-1'

Sample: 370823 - AH-1 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
Chloride		16600 mg/Kg	1.66 %
DRO		<50.0 mg/Kg	0.00 %

Sample: 370824 - AH-1 1-1.5'

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		6170 mg/Kg	0.617 %

Sample: 370825 - AH-1 2-2.5'

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		2090 mg/Kg	0.209 %

Sample: 370826 - AH-1 3-3.5'

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		<20.0 mg/Kg	0.00 %

Sample: 370827 - AH-1 3.5-4'

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		448 mg/Kg	0.0448 %

Sample: 370828 - AH-2 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
Chloride		15200 mg/Kg	1.52 %
DRO		<50.0 mg/Kg	0.00 %

Sample: 370829 - AH-2 1-1.5'

Report Date: August 19, 2014
112MC07004

Work Order: 14080801
SME/PDU #704

Page Number: 3 of 4
Eddy Co, NM

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		7350 mg/Kg	0.735 %

Sample: 370830 - AH-2 2-2.5'

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		2940 mg/Kg	0.294 %

Sample: 370831 - AH-2 3-3.5'

Param	Flag	Dry Weight	Dry Weight (%)
Chloride		8430 mg/Kg	0.843 %

Sample: 370832 - AH-3 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.100 mg/Kg	0.00 %
Toluene		<0.100 mg/Kg	0.00 %
Ethylbenzene		<0.100 mg/Kg	0.00 %
Xylene		38.4 mg/Kg	0.00384 %
DRO		10100 mg/Kg	1.01 %

Sample: 370833 - AH-3 1-1.5'

Param	Flag	Dry Weight	Dry Weight (%)
DRO		<50.0 mg/Kg	0.00 %

Sample: 370838 - AH-4 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
DRO		<50.0 mg/Kg	0.00 %

Sample: 370843 - AH-5 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %

continued . . .

sample 370843 continued ...

Param	Flag	Dry Weight	Dry Weight (%)
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
DRO		<50.0 mg/Kg	0.00 %

Sample: 370848 - AH-6 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
DRO		<50.0 mg/Kg	0.00 %

Sample: 370854 - AH-7 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
DRO		<50.0 mg/Kg	0.00 %

Sample: 370860 - AH-8 0-1'

Param	Flag	Dry Weight	Dry Weight (%)
Benzene		<0.0200 mg/Kg	0.00 %
Toluene		<0.0200 mg/Kg	0.00 %
Ethylbenzene		<0.0200 mg/Kg	0.00 %
Xylene		<0.0200 mg/Kg	0.00 %
DRO		<50.0 mg/Kg	0.00 %



6701 Aberdeen Avenue, Suite 9
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Certifications

WBENC: 237019

HUB: 1752439743100-86536
NCTRCA WFWB38444Y0909

DBE: VN 20657

NELAP Certifications

Lubbock: T104704219-08-TX
LELAP-02003
Kansas E-10317

El Paso: T104704221-08-TX
LELAP-02002

Midland: T104704392-08-TX

Analytical and Quality Control Report

Tom Elliott
Tetra Tech
1901 N. Big Spring St.
Midland, TX, 79705

Report Date: August 18, 2014

Work Order: 14080801



Project Location: Eddy Co, NM
Project Name: SME/PDU #704
Project Number: 112MC07004

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
370823	AH-1 0-1'	soil	2014-08-05	00:00	2014-08-07
370824	AH-1 1-1.5'	soil	2014-08-05	00:00	2014-08-07
370825	AH-1 2-2.5'	soil	2014-08-05	00:00	2014-08-07
370826	AH-1 3-3.5'	soil	2014-08-05	00:00	2014-08-07
370827	AH-1 3.5-4'	soil	2014-08-05	00:00	2014-08-07
370828	AH-2 0-1'	soil	2014-08-05	00:00	2014-08-07
370829	AH-2 1-1.5'	soil	2014-08-05	00:00	2014-08-07
370830	AH-2 2-2.5'	soil	2014-08-05	00:00	2014-08-07
370831	AH-2 3-3.5'	soil	2014-08-05	00:00	2014-08-07
370832	AH-3 0-1'	soil	2014-08-05	00:00	2014-08-07
370833	AH-3 1-1.5'	soil	2014-08-05	00:00	2014-08-07

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
370838	AH-4 0-1'	soil	2014-08-05	00:00	2014-08-07
370843	AH-5 0-1'	soil	2014-08-05	00:00	2014-08-07
370848	AH-6 0-1'	soil	2014-08-05	00:00	2014-08-07
370854	AH-7 0-1'	soil	2014-08-05	00:00	2014-08-07
370860	AH-8 0-1'	soil	2014-08-05	00:00	2014-08-07

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

This report consists of a total of 30 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.



Dr. Blair Leftwich, Director
Dr. Michael Abel, Project Manager

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project SME/PDU #704 were received by TraceAnalysis, Inc. on 2014-08-07 and assigned to work order 14080801. Samples for work order 14080801 were received intact at a temperature of 4.1 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	96788	2014-08-11 at 08:37	114537	2014-08-13 at 12:19
BTEX	S 8021B	96950	2014-08-15 at 07:35	114640	2014-08-18 at 07:36
Chloride (Titration)	SM 4500-Cl B	96805	2014-08-08 at 11:20	114462	2014-08-11 at 12:10
Chloride (Titration)	SM 4500-Cl B	96805	2014-08-08 at 11:20	114463	2014-08-11 at 13:15
TPH DRO - NEW	S 8015 D	96780	2014-08-08 at 17:23	114433	2014-08-11 at 08:44
TPH DRO - NEW	S 8015 D	96868	2014-08-13 at 10:26	114556	2014-08-14 at 08:05
TPH GRO	S 8015 D	96788	2014-08-11 at 08:37	114542	2014-08-13 at 13:00
TPH GRO	S 8015 D	96950	2014-08-15 at 07:35	114641	2014-08-15 at 07:44

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

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14080801 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

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Eddy Co, NM

Analytical Report

Sample: 370823 - AH-1 0-1'

Laboratory: Midland
Analysis: BTEX
QC Batch: 114537
Prep Batch: 96788

Analytical Method: S 8021B
Date Analyzed: 2014-08-13
Sample Preparation: 2014-08-11

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.22	mg/Kg	1	2.00	111	70 - 130
4-Bromofluorobenzene (4-BFB)		1.90	mg/Kg	1	2.00	95	70 - 130

Sample: 370823 - AH-1 0-1'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 114462
Prep Batch: 96805

Analytical Method: SM 4500-Cl B
Date Analyzed: 2014-08-11
Sample Preparation: 2014-08-08

Prep Method: N/A
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		16600	mg/Kg	10	4.00

Sample: 370823 - AH-1 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 114433
Prep Batch: 96780

Analytical Method: S 8015 D
Date Analyzed: 2014-08-11
Sample Preparation: 2014-08-08

Prep Method: N/A
Analyzed By: SC
Prepared By: SC

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

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Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		120	mg/Kg	1	100	120	70 - 130

Sample: 370823 - AH-1 0-1'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 114542
Prep Batch: 96788

Analytical Method: S 8015 D
Date Analyzed: 2014-08-13
Sample Preparation: 2014-08-11

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.05	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)		1.87	mg/Kg	1	2.00	94	70 - 130

Sample: 370824 - AH-1 1-1.5'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 114462
Prep Batch: 96805

Analytical Method: SM 4500-Cl B
Date Analyzed: 2014-08-11
Sample Preparation: 2014-08-08

Prep Method: N/A
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		6170	mg/Kg	10	4.00

Sample: 370825 - AH-1 2-2.5'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 114462
Prep Batch: 96805

Analytical Method: SM 4500-Cl B
Date Analyzed: 2014-08-11
Sample Preparation: 2014-08-08

Prep Method: N/A
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		2090	mg/Kg	10	4.00

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Sample: 370826 - AH-1 3-3.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2014-08-11	Analyzed By:	AK
QC Batch:	114462	Sample Preparation:	2014-08-08	Prepared By:	AK
Prep Batch:	96805				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<20.0	mg/Kg	5	4.00

Sample: 370827 - AH-1 3.5-4'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2014-08-11	Analyzed By:	AK
QC Batch:	114462	Sample Preparation:	2014-08-08	Prepared By:	AK
Prep Batch:	96805				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		448	mg/Kg	5	4.00

Sample: 370828 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2014-08-13	Analyzed By:	AK
QC Batch:	114537	Sample Preparation:	2014-08-11	Prepared By:	AK
Prep Batch:	96788				

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.06	mg/Kg	1	2.00	103	70 - 130
4-Bromofluorobenzene (4-BFB)		1.90	mg/Kg	1	2.00	95	70 - 130

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Sample: 370828 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2014-08-11	Analyzed By:	AK
QC Batch:	114462	Sample Preparation:	2014-08-08	Prepared By:	AK
Prep Batch:	96805				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		15200	mg/Kg	10	4.00

Sample: 370828 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2014-08-11	Analyzed By:	SC
QC Batch:	114433	Sample Preparation:	2014-08-08	Prepared By:	SC
Prep Batch:	96780				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		113	mg/Kg	1	100	113	70 - 130

Sample: 370828 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2014-08-13	Analyzed By:	AK
QC Batch:	114542	Sample Preparation:	2014-08-11	Prepared By:	AK
Prep Batch:	96788				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.09	mg/Kg	1	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)		1.86	mg/Kg	1	2.00	93	70 - 130

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Sample: 370829 - AH-2 1-1.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2014-08-11	Analyzed By:	AK
QC Batch:	114463	Sample Preparation:	2014-08-08	Prepared By:	AK
Prep Batch:	96805				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		7350	mg/Kg	10	4.00

Sample: 370830 - AH-2 2-2.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2014-08-11	Analyzed By:	AK
QC Batch:	114463	Sample Preparation:	2014-08-08	Prepared By:	AK
Prep Batch:	96805				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		2940	mg/Kg	10	4.00

Sample: 370831 - AH-2 3-3.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2014-08-11	Analyzed By:	AK
QC Batch:	114463	Sample Preparation:	2014-08-08	Prepared By:	AK
Prep Batch:	96805				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		8430	mg/Kg	10	4.00

Sample: 370832 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2014-08-18	Analyzed By:	AK
QC Batch:	114640	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.100	mg/Kg	5	0.0200
Toluene		<0.100	mg/Kg	5	0.0200

continued . . .

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sample 370832 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Ethylbenzene		<0.100	mg/Kg	5	0.0200
Xylene		38.4	mg/Kg	5	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		8.59	mg/Kg	5	10.0	86	70 - 130
4-Bromofluorobenzene (4-BFB)		13.8	mg/Kg	5	10.0	138	70 - 130

Sample: 370832 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2014-08-11	Analyzed By:	SC
QC Batch:	114433	Sample Preparation:	2014-08-08	Prepared By:	SC
Prep Batch:	96780				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		10100	mg/Kg	5	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		314	mg/Kg	5	100	314	70 - 130

Sample: 370832 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2014-08-15	Analyzed By:	AK
QC Batch:	114641	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		894	mg/Kg	5	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		8.62	mg/Kg	5	10.0	86	70 - 130
4-Bromofluorobenzene (4-BFB)		27.3	mg/Kg	5	10.0	273	70 - 130

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Sample: 370833 - AH-3 1-1.5'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2014-08-14	Analyzed By:	SC
QC Batch:	114556	Sample Preparation:	2014-08-13	Prepared By:	SC
Prep Batch:	96868				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		108	mg/Kg	1	100	108	70 - 130

Sample: 370833 - AH-3 1-1.5'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2014-08-15	Analyzed By:	AK
QC Batch:	114641	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		14.8	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.02	mg/Kg	1	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)		2.23	mg/Kg	1	2.00	112	70 - 130

Sample: 370838 - AH-4 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2014-08-18	Analyzed By:	AK
QC Batch:	114640	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

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Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.00	mg/Kg	1	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)		1.85	mg/Kg	1	2.00	92	70 - 130

Sample: 370838 - AH-4 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2014-08-11	Analyzed By:	SC
QC Batch:	114433	Sample Preparation:	2014-08-08	Prepared By:	SC
Prep Batch:	96780				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		130	mg/Kg	1	100	130	70 - 130

Sample: 370838 - AH-4 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2014-08-15	Analyzed By:	AK
QC Batch:	114641	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.04	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)		1.83	mg/Kg	1	2.00	92	70 - 130

Sample: 370843 - AH-5 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2014-08-18	Analyzed By:	AK
QC Batch:	114640	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

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Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.91	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)		1.84	mg/Kg	1	2.00	92	70 - 130

Sample: 370843 - AH-5 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2014-08-11	Analyzed By:	SC
QC Batch:	114433	Sample Preparation:	2014-08-08	Prepared By:	SC
Prep Batch:	96780				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		126	mg/Kg	1	100	126	70 - 130

Sample: 370843 - AH-5 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2014-08-15	Analyzed By:	AK
QC Batch:	114641	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.00	mg/Kg	1	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)		1.83	mg/Kg	1	2.00	92	70 - 130

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Sample: 370848 - AH-6 0-1'

Laboratory: Midland

Analysis: BTEX

QC Batch: 114640

Prep Batch: 96950

Analytical Method: S 8021B

Date Analyzed: 2014-08-18

Sample Preparation: 2014-08-15

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)		1.82	mg/Kg	1	2.00	91	70 - 130

Sample: 370848 - AH-6 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 114433

Prep Batch: 96780

Analytical Method: S 8015 D

Date Analyzed: 2014-08-11

Sample Preparation: 2014-08-08

Prep Method: N/A

Analyzed By: SC

Prepared By: SC

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		114	mg/Kg	1	100	114	70 - 130

Sample: 370848 - AH-6 0-1'

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 114641

Prep Batch: 96950

Analytical Method: S 8015 D

Date Analyzed: 2014-08-15

Sample Preparation: 2014-08-15

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

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Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.06	mg/Kg	1	2.00	103	70 - 130
4-Bromofluorobenzene (4-BFB)		1.87	mg/Kg	1	2.00	94	70 - 130

Sample: 370854 - AH-7 0-1'

Laboratory: Midland
Analysis: BTEX
QC Batch: 114640
Prep Batch: 96950

Analytical Method: S 8021B
Date Analyzed: 2014-08-18
Sample Preparation: 2014-08-15

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.98	mg/Kg	1	2.00	99	70 - 130
4-Bromofluorobenzene (4-BFB)		1.82	mg/Kg	1	2.00	91	70 - 130

Sample: 370854 - AH-7 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 114433
Prep Batch: 96780

Analytical Method: S 8015 D
Date Analyzed: 2014-08-11
Sample Preparation: 2014-08-08

Prep Method: N/A
Analyzed By: SC
Prepared By: SC

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		120	mg/Kg	1	100	120	70 - 130

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Sample: 370854 - AH-7 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2014-08-15	Analyzed By:	AK
QC Batch:	114641	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.06	mg/Kg	1	2.00	103	70 - 130
4-Bromofluorobenzene (4-BFB)		1.86	mg/Kg	1	2.00	93	70 - 130

Sample: 370860 - AH-8 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2014-08-18	Analyzed By:	AK
QC Batch:	114640	Sample Preparation:	2014-08-15	Prepared By:	AK
Prep Batch:	96950				

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<0.0200	mg/Kg	1	0.0200
Ethylbenzene		<0.0200	mg/Kg	1	0.0200
Xylene		<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.88	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)		1.70	mg/Kg	1	2.00	85	70 - 130

Sample: 370860 - AH-8 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2014-08-11	Analyzed By:	SC
QC Batch:	114433	Sample Preparation:	2014-08-08	Prepared By:	SC
Prep Batch:	96780				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

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Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		112	mg/Kg	1	100	112	70 - 130

Sample: 370860 - AH-8 0-1'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 114641
Prep Batch: 96950

Analytical Method: S 8015 D
Date Analyzed: 2014-08-15
Sample Preparation: 2014-08-15

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)		1.67	mg/Kg	1	2.00	84	70 - 130

Method Blank (1) QC Batch: 114433

QC Batch: 114433
Prep Batch: 96780

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: SC
Prepared By: SC

Parameter	Flag	MDL Result	Units	RL
DRO		<7.41	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		98.8	mg/Kg	1	100	99	70 - 130

Method Blank (1) QC Batch: 114462

QC Batch: 114462
Prep Batch: 96805

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: AK
Prepared By: AK

Parameter	Flag	MDL Result	Units	RL
Chloride		<3.85	mg/Kg	4

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Method Blank (1) QC Batch: 114463

QC Batch: 114463
Prep Batch: 96805

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: AK
Prepared By: AK

Parameter	Flag	MDL Result	Units	RL
Chloride		<3.85	mg/Kg	4

Method Blank (1) QC Batch: 114537

QC Batch: 114537
Prep Batch: 96788

Date Analyzed: 2014-08-13
QC Preparation: 2014-08-11

Analyzed By: AK
Prepared By: AK

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.00533	mg/Kg	0.02
Toluene		<0.00645	mg/Kg	0.02
Ethylbenzene		<0.0116	mg/Kg	0.02
Xylene		<0.00874	mg/Kg	0.02

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.14	mg/Kg	1	2.00	107	70 - 130
4-Bromofluorobenzene (4-BFB)		1.95	mg/Kg	1	2.00	98	70 - 130

Method Blank (1) QC Batch: 114542

QC Batch: 114542
Prep Batch: 96788

Date Analyzed: 2014-08-13
QC Preparation: 2014-08-11

Analyzed By: AK
Prepared By: AK

Parameter	Flag	MDL Result	Units	RL
GRO		<2.32	mg/Kg	4

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.09	mg/Kg	1	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)		1.90	mg/Kg	1	2.00	95	70 - 130

Method Blank (1) QC Batch: 114556

QC Batch: 114556
Prep Batch: 96868

Date Analyzed: 2014-08-14
QC Preparation: 2014-08-13

Analyzed By: SC
Prepared By: SC

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Parameter	Flag	MDL Result	Units	RL
DRO		<7.41	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		98.5	mg/Kg	1	100	98	70 - 130

Method Blank (1) QC Batch: 114640

QC Batch: 114640 Date Analyzed: 2014-08-18 Analyzed By: AK
Prep Batch: 96950 QC Preparation: 2014-08-15 Prepared By: AK

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.00533	mg/Kg	0.02
Toluene		<0.00645	mg/Kg	0.02
Ethylbenzene		<0.0116	mg/Kg	0.02
Xylene		<0.00874	mg/Kg	0.02

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.94	mg/Kg	1	2.00	97	70 - 130
4-Bromofluorobenzene (4-BFB)		1.77	mg/Kg	1	2.00	88	70 - 130

Method Blank (1) QC Batch: 114641

QC Batch: 114641 Date Analyzed: 2014-08-15 Analyzed By: AK
Prep Batch: 96950 QC Preparation: 2014-08-15 Prepared By: AK

Parameter	Flag	MDL Result	Units	RL
GRO		<2.32	mg/Kg	4

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.01	mg/Kg	1	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)		1.78	mg/Kg	1	2.00	89	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 114433 Date Analyzed: 2014-08-11 Analyzed By: SC
Prep Batch: 96780 QC Preparation: 2014-08-08 Prepared By: SC

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Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	216	mg/Kg	1	250	<7.41	86	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	233	mg/Kg	1	250	<7.41	93	70 - 130	8	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	100	110	mg/Kg	1	100	100	110	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 114462
Prep Batch: 96805

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: AK
Prepared By: AK

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	2540	mg/Kg	5	2500	<19.2	102	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	2490	mg/Kg	5	2500	<19.2	100	85 - 115	2	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 114463
Prep Batch: 96805

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: AK
Prepared By: AK

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	2600	mg/Kg	5	2500	<19.2	104	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	2550	mg/Kg	5	2500	<19.2	102	85 - 115	2	20

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

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Laboratory Control Spike (LCS-1)

QC Batch: 114537
Prep Batch: 96788

Date Analyzed: 2014-08-13
QC Preparation: 2014-08-11

Analyzed By: AK
Prepared By: AK

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	1.91	mg/Kg	1	2.00	<0.00533	96	70 - 130
Toluene	1.81	mg/Kg	1	2.00	<0.00645	90	70 - 130
Ethylbenzene	1.83	mg/Kg	1	2.00	<0.0116	92	70 - 130
Xylene	5.58	mg/Kg	1	6.00	<0.00874	93	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	2.25	mg/Kg	1	2.00	<0.00533	112	70 - 130	16	20
Toluene	2.22	mg/Kg	1	2.00	<0.00645	111	70 - 130	20	20
Ethylbenzene	2.45	mg/Kg	1	2.00	<0.0116	122	70 - 130	29	20
Xylene	7.36	mg/Kg	1	6.00	<0.00874	123	70 - 130	28	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.05	2.07	mg/Kg	1	2.00	102	104	70 - 130
4-Bromofluorobenzene (4-BFB)	2.00	1.87	mg/Kg	1	2.00	100	94	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 114542
Prep Batch: 96788

Date Analyzed: 2014-08-13
QC Preparation: 2014-08-11

Analyzed By: AK
Prepared By: AK

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	20.3	mg/Kg	1	20.0	<2.32	102	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	18.7	mg/Kg	1	20.0	<2.32	94	70 - 130	8	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.98	2.02	mg/Kg	1	2.00	99	101	70 - 130
4-Bromofluorobenzene (4-BFB)	1.94	2.03	mg/Kg	1	2.00	97	102	70 - 130

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Laboratory Control Spike (LCS-1)

QC Batch: 114556
Prep Batch: 96868

Date Analyzed: 2014-08-14
QC Preparation: 2014-08-13

Analyzed By: SC
Prepared By: SC

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	225	mg/Kg	1	250	<7.41	90	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	225	mg/Kg	1	250	<7.41	90	70 - 130	0	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	103	103	mg/Kg	1	100	103	103	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 114640
Prep Batch: 96950

Date Analyzed: 2014-08-18
QC Preparation: 2014-08-15

Analyzed By: AK
Prepared By: AK

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	1.86	mg/Kg	1	2.00	<0.00533	93	70 - 130
Toluene	2.02	mg/Kg	1	2.00	<0.00645	101	70 - 130
Ethylbenzene	2.11	mg/Kg	1	2.00	<0.0116	106	70 - 130
Xylene	6.42	mg/Kg	1	6.00	<0.00874	107	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	1.82	mg/Kg	1	2.00	<0.00533	91	70 - 130	2	20
Toluene	1.94	mg/Kg	1	2.00	<0.00645	97	70 - 130	4	20
Ethylbenzene	2.07	mg/Kg	1	2.00	<0.0116	104	70 - 130	2	20
Xylene	6.23	mg/Kg	1	6.00	<0.00874	104	70 - 130	3	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.93	1.96	mg/Kg	1	2.00	96	98	70 - 130
4-Bromofluorobenzene (4-BFB)	1.89	1.91	mg/Kg	1	2.00	94	96	70 - 130

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Laboratory Control Spike (LCS-1)

QC Batch: 114641
Prep Batch: 96950

Date Analyzed: 2014-08-15
QC Preparation: 2014-08-15

Analyzed By: AK
Prepared By: AK

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	19.7	mg/Kg	1	20.0	<2.32	98	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	17.5	mg/Kg	1	20.0	<2.32	88	70 - 130	12	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.95	1.94	mg/Kg	1	2.00	98	97	70 - 130
4-Bromofluorobenzene (4-BFB)	1.90	1.90	mg/Kg	1	2.00	95	95	70 - 130

Matrix Spike (MS-1) Spiked Sample: 370823

QC Batch: 114433
Prep Batch: 96780

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: SC
Prepared By: SC

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	239	mg/Kg	1	250	<7.41	96	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	248	mg/Kg	1	250	<7.41	99	70 - 130	4	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	112	118	mg/Kg	1	100	112	118	70 - 130

Matrix Spike (MS-1) Spiked Sample: 370534

QC Batch: 114462
Prep Batch: 96805

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: AK
Prepared By: AK

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Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	2340	mg/Kg	5	2500	<19.2	94	78.9 - 121

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	2490	mg/Kg	5	2500	<19.2	100	78.9 - 121	6	20

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

Matrix Spike (MS-1) Spiked Sample: 370830

QC Batch: 114463
Prep Batch: 96805

Date Analyzed: 2014-08-11
QC Preparation: 2014-08-08

Analyzed By: AK
Prepared By: AK

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	5100	mg/Kg	10	2500	2941	86	78.9 - 121

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	5390	mg/Kg	10	2500	2941	98	78.9 - 121	6	20

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

Matrix Spike (MS-1) Spiked Sample: 370550

QC Batch: 114537
Prep Batch: 96788

Date Analyzed: 2014-08-13
QC Preparation: 2014-08-11

Analyzed By: AK
Prepared By: AK

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	2.18	mg/Kg	1	2.00	<0.00533	109	70 - 130
Toluene	2.11	mg/Kg	1	2.00	<0.00645	106	70 - 130
Ethylbenzene	2.18	mg/Kg	1	2.00	<0.0116	109	70 - 130
Xylene	6.55	mg/Kg	1	6.00	<0.00874	109	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	2.09	mg/Kg	1	2.00	<0.00533	104	70 - 130	4	20
Toluene	2.00	mg/Kg	1	2.00	<0.00645	100	70 - 130	5	20
Ethylbenzene	2.07	mg/Kg	1	2.00	<0.0116	104	70 - 130	5	20
Xylene	6.25	mg/Kg	1	6.00	<0.00874	104	70 - 130	5	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.99	1.97	mg/Kg	1	2	100	98	70 - 130
4-Bromofluorobenzene (4-BFB)	1.94	1.87	mg/Kg	1	2	97	94	70 - 130

Matrix Spike (MS-1) Spiked Sample: 370550

QC Batch: 114542
Prep Batch: 96788

Date Analyzed: 2014-08-13
QC Preparation: 2014-08-11

Analyzed By: AK
Prepared By: AK

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	19.9	mg/Kg	1	20.0	<2.32	100	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	23.5	mg/Kg	1	20.0	<2.32	118	70 - 130	17	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.00	1.98	mg/Kg	1	2	100	99	70 - 130
4-Bromofluorobenzene (4-BFB)	1.91	1.90	mg/Kg	1	2	96	95	70 - 130

Matrix Spike (MS-1) Spiked Sample: 370833

QC Batch: 114556
Prep Batch: 96868

Date Analyzed: 2014-08-14
QC Preparation: 2014-08-13

Analyzed By: SC
Prepared By: SC

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	176	mg/Kg	1	250	16.4	64	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	213	mg/Kg	1	250	16.4	79	70 - 130	19	20

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

continued ...

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matrix spikes continued ...

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	109	103	mg/Kg	1	100	109	103	70 - 130

Matrix Spike (MS-1) Spiked Sample: 371431

QC Batch: 114640
Prep Batch: 96950

Date Analyzed: 2014-08-18
QC Preparation: 2014-08-15

Analyzed By: AK
Prepared By: AK

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	1.84	mg/Kg	1	2.00	<0.00533	92	70 - 130
Toluene	1.98	mg/Kg	1	2.00	<0.00645	99	70 - 130
Ethylbenzene	2.07	mg/Kg	1	2.00	<0.0116	104	70 - 130
Xylene	6.25	mg/Kg	1	6.00	<0.00874	104	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	1.64	mg/Kg	1	2.00	<0.00533	82	70 - 130	12	20
Toluene	1.79	mg/Kg	1	2.00	<0.00645	90	70 - 130	10	20
Ethylbenzene	1.88	mg/Kg	1	2.00	<0.0116	94	70 - 130	10	20
Xylene	5.68	mg/Kg	1	6.00	<0.00874	95	70 - 130	10	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.89	1.90	mg/Kg	1	2	94	95	70 - 130
4-Bromofluorobenzene (4-BFB)	1.82	1.81	mg/Kg	1	2	91	90	70 - 130

Matrix Spike (MS-1) Spiked Sample: 371431

QC Batch: 114641
Prep Batch: 96950

Date Analyzed: 2014-08-15
QC Preparation: 2014-08-15

Analyzed By: AK
Prepared By: AK

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	19.5	mg/Kg	1	20.0	<2.32	98	70 - 130

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

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Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	20.8	mg/Kg	1	20.0	<2.32	104	70 - 130	6	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.93	1.89	mg/Kg	1	2	96	94	70 - 130
4-Bromofluorobenzene (4-BFB)	1.88	1.86	mg/Kg	1	2	94	93	70 - 130

Standard (CCV-1)

QC Batch: 114433

Date Analyzed: 2014-08-11

Analyzed By: SC

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	205	82	80 - 120	2014-08-11

Standard (CCV-2)

QC Batch: 114433

Date Analyzed: 2014-08-11

Analyzed By: SC

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	217	87	80 - 120	2014-08-11

Standard (ICV-1)

QC Batch: 114462

Date Analyzed: 2014-08-11

Analyzed By: AK

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	100	100	85 - 115	2014-08-11

Standard (CCV-1)

QC Batch: 114462

Date Analyzed: 2014-08-11

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	100	100	85 - 115	2014-08-11

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Standard (ICV-1)

QC Batch: 114463

Date Analyzed: 2014-08-11

Analyzed By: AK

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2014-08-11

Standard (CCV-1)

QC Batch: 114463

Date Analyzed: 2014-08-11

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	99.0	99	85 - 115	2014-08-11

Standard (CCV-2)

QC Batch: 114537

Date Analyzed: 2014-08-13

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/kg	0.100	0.109	109	80 - 120	2014-08-13
Toluene		mg/kg	0.100	0.101	101	80 - 120	2014-08-13
Ethylbenzene		mg/kg	0.100	0.0966	97	80 - 120	2014-08-13
Xylene		mg/kg	0.300	0.290	97	80 - 120	2014-08-13

Standard (CCV-3)

QC Batch: 114537

Date Analyzed: 2014-08-13

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/kg	0.200	0.163	82	80 - 120	2014-08-13
Toluene		mg/kg	0.200	0.160	80	80 - 120	2014-08-13
Ethylbenzene		mg/kg	0.200	0.176	88	80 - 120	2014-08-13
Xylene		mg/kg	0.600	0.525	88	80 - 120	2014-08-13

Standard (CCV-2)

QC Batch: 114542

Date Analyzed: 2014-08-13

Analyzed By: AK

Report Date: August 18, 2014
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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	0.944	94	80 - 120	2014-08-13

Standard (CCV-3)

QC Batch: 114542

Date Analyzed: 2014-08-13

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	1.53	153	80 - 120	2014-08-13

Standard (CCV-1)

QC Batch: 114556

Date Analyzed: 2014-08-14

Analyzed By: SC

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	223	89	80 - 120	2014-08-14

Standard (CCV-2)

QC Batch: 114556

Date Analyzed: 2014-08-14

Analyzed By: SC

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	234	94	80 - 120	2014-08-14

Standard (CCV-1)

QC Batch: 114640

Date Analyzed: 2014-08-18

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/kg	0.100	0.0971	97	80 - 120	2014-08-18
Toluene		mg/kg	0.100	0.102	102	80 - 120	2014-08-18
Ethylbenzene		mg/kg	0.100	0.102	102	80 - 120	2014-08-18
Xylene		mg/kg	0.300	0.309	103	80 - 120	2014-08-18

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Standard (CCV-2)

QC Batch: 114640

Date Analyzed: 2014-08-18

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/kg	0.100	0.0976	98	80 - 120	2014-08-18
Toluene		mg/kg	0.100	0.0997	100	80 - 120	2014-08-18
Ethylbenzene		mg/kg	0.100	0.0987	99	80 - 120	2014-08-18
Xylene		mg/kg	0.300	0.300	100	80 - 120	2014-08-18

Standard (CCV-3)

QC Batch: 114640

Date Analyzed: 2014-08-18

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/kg	0.100	0.0903	90	80 - 120	2014-08-18
Toluene		mg/kg	0.100	0.0942	94	80 - 120	2014-08-18
Ethylbenzene		mg/kg	0.100	0.0925	92	80 - 120	2014-08-18
Xylene		mg/kg	0.300	0.280	93	80 - 120	2014-08-18

Standard (CCV-1)

QC Batch: 114641

Date Analyzed: 2014-08-15

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	1.07	107	80 - 120	2014-08-15

Standard (CCV-2)

QC Batch: 114641

Date Analyzed: 2014-08-15

Analyzed By: AK

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	0.958	96	80 - 120	2014-08-15

Standard (CCV-3)

QC Batch: 114641

Date Analyzed: 2014-08-15

Analyzed By: AK

Report Date: August 18, 2014
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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	0.922	92	80 - 120	2014-08-15

14080801

Analysis Request of Chain of Custody Record

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Or: 4

ANALYSIS REQUEST
(Circle or Specify Method No.)**TETRA TECH**1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946CLIENT NAME: SM Energy SITE MANAGER: Tom ElliottPROJECT NO.: 112MCO7004 PROJECT NAME: PD4 # 704 Edley CapataLAB I.D. NUMBER: 2014 DATE: 8/5 TIME: 11:00 AM SAMPLE IDENTIFICATION: 824MATRIX: S COMPARISON: 1 GRAB: 1 FILTERED (Y/N): 1 NUMBER OF CONTAINERS: 1PRESERVATIVE METHOD: ICE HNO3 HCL NONE

PAH 8270	TPH 8015 MOD. TX1005 (Ext. to C35)	STEX 8021B	PCB's 8080/608	GC/MS Vol. 8240/8260/624	GC/MS Semi. Vol. 8270/625	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
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RELINQUISHED BY: (Signature) [Signature] Date: 8/5/14 Time: 11:00 AMRELINQUISHED BY: (Signature) [Signature] Date: 8/5/14 Time: 11:00 AMRELINQUISHED BY: (Signature) [Signature] Date: 8/5/14 Time: 11:00 AMRECEIVING LABORATORY: Tetra ADDRESS: Midland STATE: TX ZIP: 79705 PHONE: (432) 682-4559 DATE: 8/5/14 TIME: 11:00 AMSAMPLE CONDITION WHEN RECEIVED: 4.1REMARKS: 2 Run deeper samples if Benzene exceeds 10 mg/kg or Total Hex Exceeds 50 mg/kg or if TDH exceeds 1,000 mg/kg

Project Manager retains Pink copy - Accounting receives Gold copy.

EX-1005 1,000 mg/kg

Analysis Request of Chain of Custody Record

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ANALYSIS REQUEST
(Circle or Specify Method No.)



TETRA TECH

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

CLIENT NAME: SM Energy SITE MANAGER: Tan Elliott

PROJECT NO.: 112mc07024 sm/ PD4 # 704 Eddy G. Am

LAB I.D. NUMBER DATE TIME SAMPLE IDENTIFICATION

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP	GRAB	NUMBER OF CONTAINERS	PRELIMINARY METHOD	RESERVATIVE METHOD
833	8/5		S	X	AH3 (1-1.5')	1	HCL	NONE
834					(2-2.5')	1	HCL	ICE
835					(3-3.5')	1	HCL	HNO3
836					(4-4.5')	1	HCL	ICE
837					AH3 (5-5.5')	1	HCL	NONE
838					AH4 (0-1')	1	HCL	ICE
839					AH4 (1-1.5')	1	HCL	HNO3
840					(2-2.5')	1	HCL	ICE
841					(3-3.5')	1	HCL	HNO3
842					(4-4.5')	1	HCL	NONE

RELINQUISHED BY: (Signature) Date: 8/14/14 RECEIVED BY: (Signature) Date: 8/14/14

RELINQUISHED BY: (Signature) Date: 8/14/14 RECEIVED BY: (Signature) Date: 8/14/14

RELINQUISHED BY: (Signature) Date: 8/14/14 RECEIVED BY: (Signature) Date: 8/14/14

RECEIVING LABORATORY: TACE RECEIVED BY: (Signature) Date: 8/14/14

CITY: STATE: ZIP: PHONE: DATE: TIME:

SAMPLE CONDITION WHEN RECEIVED: 4/10 REMARKS:

PAH 8270	
RCRA Metals Ag As Ba Cd Cr Pb Hg Se	
TCRP Metals Ag As Ba Cd Vr Pd Hg Se	
TCRP Volatiles	
TCRP 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	

TPH 8015 MOD. TX1005 (Ext. to C35)	
BTEX 8021B	

SAMPLED BY: (Print & Initial) Date: 8/14/14 Time: 14:55

SAMPLE SHIPPED BY: (Circle) Date: 8/14/14 Time: 14:55

FEDEX DELIVERED UPS

TETRA TECH CONTACT PERSON: Ton

Results by:

RUSH Charges Authorized: Yes No

14080801

Analysis Request of Chain of Custody Record

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ANALYSIS REQUEST
(Circle or Specify Method No.)

4

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

CLIENT NAME: <u>SM Energy</u>		SITE MANAGER: <u>Tom Elliott</u>	
PROJECT NO.: <u>112 MC07004</u>		PROJECT NAME: <u>PDY #704 Eddy Co. Area</u>	
LAB I.D. NUMBER	DATE	TIME	MATRIX
843	8/5		S
844			
845			
846			
847			
848			
849			
850			
851			
852			

GRAB	SAMPLE IDENTIFICATION
X	AH 5 (0-1')
	11-1.5'
	12-2.5'
	13-3.5'
	14-4.5'
	AH 6 (0-1')
	11-1.5'
	12-2.5'
	13-3.5'
	14-4.5'

NUMBER OF CONTAINERS	DATE	TIME	SIGNATURE
1	8/7/14	16:35	[Signature]
1			
1			
1			
1			
1			
1			
1			
1			
1			
1			

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
[Signature]	8/7/14	16:35	[Signature]
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
[Signature]			
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
[Signature]			

RECEIVING LABORATORY:	ADDRESS:	CITY:	STATE:	ZIP:
410				
CONTACT:	PHONE:	DATE:	TIME:	REMARKS:

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 Cr Pb 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	

SAMPLED BY: (Print & Initial)	DATE: 8/7/14	TIME: 16:35
SAMPLE SHIPPED BY: (Circle)	AIRBILL #:	
FEDEX	BUS	
HAND DELIVERED	UPS	
TETRA TECH CONTACT PERSON:	OTHER:	
Tom		
Results by:		
RUSH Charges Authorized:	Yes	No

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

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:		SITE MANAGER:		PROJECT NAME:		PROJECT NO.:	
LAB I.D. NUMBER		DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION
853	8/5	2014		S	X	X	AA16 (5-5.5')
854							AA17 (0-1')
855							(1-1.5')
856							(2-2.5')
857							(3-3.5')
858							(4-4.5')
859							(5-5.5')
860							AA18 (0-1')
861							(1-1.5')
22.5' sample not taken per CR.							
RELINQUISHED BY: (Signature)		Date:	Time:	RECEIVED BY: (Signature)		Date:	Time:
RELINQUISHED BY: (Signature)		Date:	Time:	RECEIVED BY: (Signature)		Date:	Time:
RELINQUISHED BY: (Signature)		Date:	Time:	RECEIVED BY: (Signature)		Date:	Time:
RECEIVING LABORATORY:		RECEIVED BY: (Signature)					
CITY:		STATE:		ZIP:		DATE:	
CONTACT:		PHONE:		TIME:		REMARKS:	
SAMPLE CONDITION WHEN RECEIVED:		410					

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