Bratcher, Mike, EMNRD

From: Sent:

Hale, Aaron [Aaron.Hale@tetratech.com] Wednesday, October 12, 2011 4:35 PM

To:

Bratcher, Mike, EMNRD

Cc:

Franklin, Tom K.; Grubbs, Robert; Tavarez, Ike

Subject:

SM Energy Parkway 36 State #001

Attachments:

SM Energy - Parkway 36 State #1 - Remediation Work Plan.pdf

Hello Mike -

Here is a work plan for a chloride spill from an unknown and unauthorized transport truck. I will put the hard copy in the mail for you tomorrow. Please let me know if you have any questions. We will probably try to work this one into our schedule sometime end of next week.

Thank you

Aaron M. Hale, P.G. | Project Manager III Office: 432 682.4559 | Cell: 432.634.7287 Aaron.Hale@tetratech.com

Tetra Tech | MMI

1910 N Big Spring Street | Midland, TX 79705 | www.tetratech.com

PLEASE NOTE. This message, including any attachments, may include privileged, confidential and/or inside information. Any distribution or use of this communication by anyone other than the intended recipient is strictly prohibited and may be unlawful. If you are not the intended recipient, please notify the sender by replying to this message and then delete it from your system

		SITE INFORMATION	
<u> </u>	1	Report Type: Work Plan	
General Site In	formation:		
		rkway 36 State #001 👙 🕖 💥 💢 🕟 👙 😘 😘 🛠 🛠 🛠 🐣	DESTRUCTION OF THE
Company:	Commence of the state of SN	Energy Company	
	ship and Range 🤭 🦫 Se	ction 36, T19S, R29E	
		dy County 61872° N, 104.03101° W	
County:	* 🎸 🐪 📜 Ed	dy County	
GPS:	32°	61872° N, 104.03101° W 🚿 🚎 🚉 💥 💢 👯 🔭 🖎	The section range was a section of the section of t
Surface Owner	r: Sta	te	
Mineral Owner	· · · · · · · · · · · · · · · · · · ·	m the intersection of Hwy 360 and Co Rd 235, follow Co Rd 23	
		. Turn south on caliche road and go approximatly 1.1 miles. S	
Release Data:	.4 444	To the state of th	The second secon
Date Released:	8/9	/2011	
Date Released: Type Release:	8/9 Pro	/2011 oduced Water	
Date Released: Type Release: Source of Conta	8/9 Pro amination: Un	/2011 oduced Water know and unauthorized transport truck	
Date Released: Type Release: Source of Conta Fluid Released:	8/9 Pro amination: Un	/2011 oduced Water know and unauthorized transport truck 5 bbls	
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Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft () () () () () () () () () (0
WellHead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source, >1,000 ft., Private >200 ft:	.0	
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft. 10 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	() () () () () () () () () ()	The state of the s

Acceptab	ile Soil RRAL (m	g/kg)
Benzene	Total BTEX	TPH
游型河10世代 中	\$ \f(\) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	5,000 _{/51}



October 10, 2011

Mr. Mike Bratcher Environmental Engineer Oil Conservation Division, District 2 1301 W. Grand Avenue Artesia, New Mexico 88210

Re: Work Plan for the SM Energy Company
Parkway Delaware Unit 36 State #001
Unit F, Section 36, Township 19 South, Range 29 East
Eddy County, New Mexico

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by SM Energy Company (SM Energy) to assess an unauthorized produced water release at the Parkway Delaware Unit 36 State #001 located in Unit F, Section 36, Township 19 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.61872°, W 104.03101°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on August 9, 2011. Approximately 125 barrels of produced water were released into the pasture from an unknown and unauthorized transport truck. No barrels of produced water were recovered. The initial C-141 is enclosed in Appendix A.

Hydrology

The New Mexico Office of the State Engineers (OSE) Website listed two water wells within a half mile of the site. These wells (identified by the OSE as CP 00742 and CP 00703) had reported depths to water at 115 feet below ground surface (bgs).

The New Mexico Oil Conservation Division (OCD) regional groundwater gradient map for Eddy County shows the depth to groundwater in this section at approximately 100 feet.



According to the Geology and Ground-Water Resources of Eddy County, New Mexico (Report 3), the Rustler Formation is present in most of the area east of the Pecos River. The Rustler Formation consists of anhydrite, gypsum, interbedded sandy clays and shales, and irregular beds of dolomite.

Regulatory

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

On August 17, 2011, Tetra Tech personnel collected soils samples up to 2.5 feet bgs, utilizing a hand auger at five locations within the spill area (identified as AH-1, AH-2, AH-3, AH-4 and AH-5). The spill area was estimated to cover approximately 7,938 square feet. Soil sampling stopped in each location when auger refusal occurred. Soil samples were submitted for laboratory analysis of TPH by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by SM method 4500. The results of the sampling are summarized in Table 1. The laboratory analytical data indicated that chloride impact was limited to the upper 1.0 foot to 1.5 foot of soil. BTEX and TPH concentrations were not detected at the surface level.

All sample locations had chloride concentrations that decreased with depth. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B.

Work Plan

The proposed excavation plan is intended to minimize disruption to the facility while removing surficial chloride impacted soils. The area around AH-1, AH-2, AH-3, AH-4 and AH-5 will be excavated to a depth not likely to exceed 1 to 2 feet bgs. Once excavation has been concluded the site will be backfilled with clean soils. Soils excavated from all areas will be transported under manifest for proper disposal.

Once the remedial activities are performed, a closure report with a final C-141 will be submitted for the soils at the site. If you require any additional



information or have any questions or comments concerning this work plan, please call at (432) 682-4559.

Respectfully submitted, **TETRA TECH, INC.**

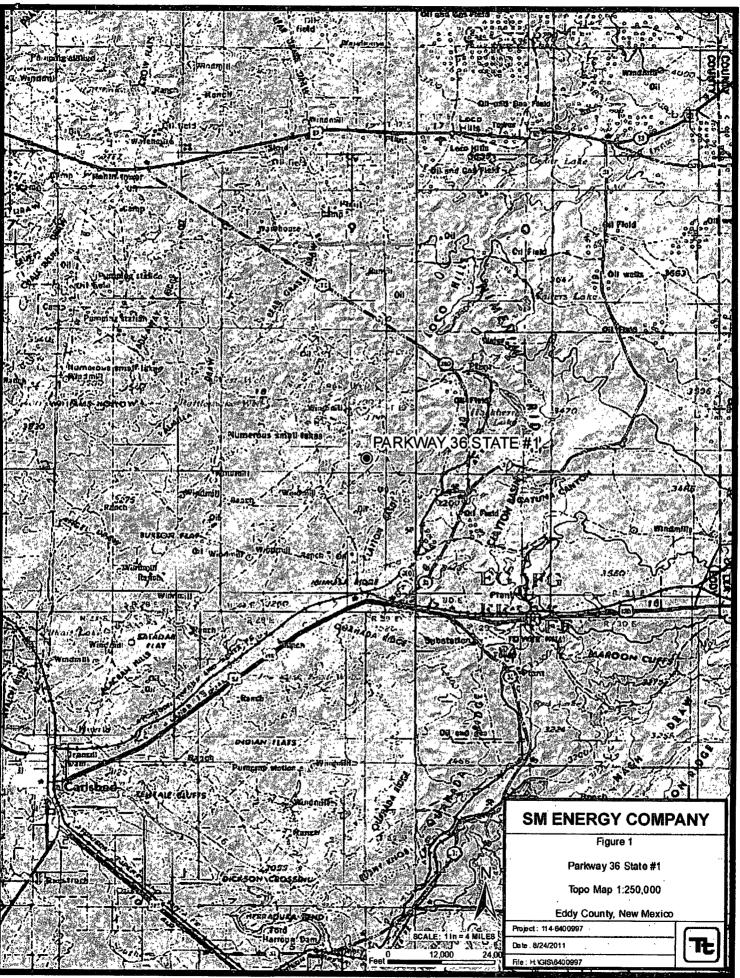
Aaron Hale

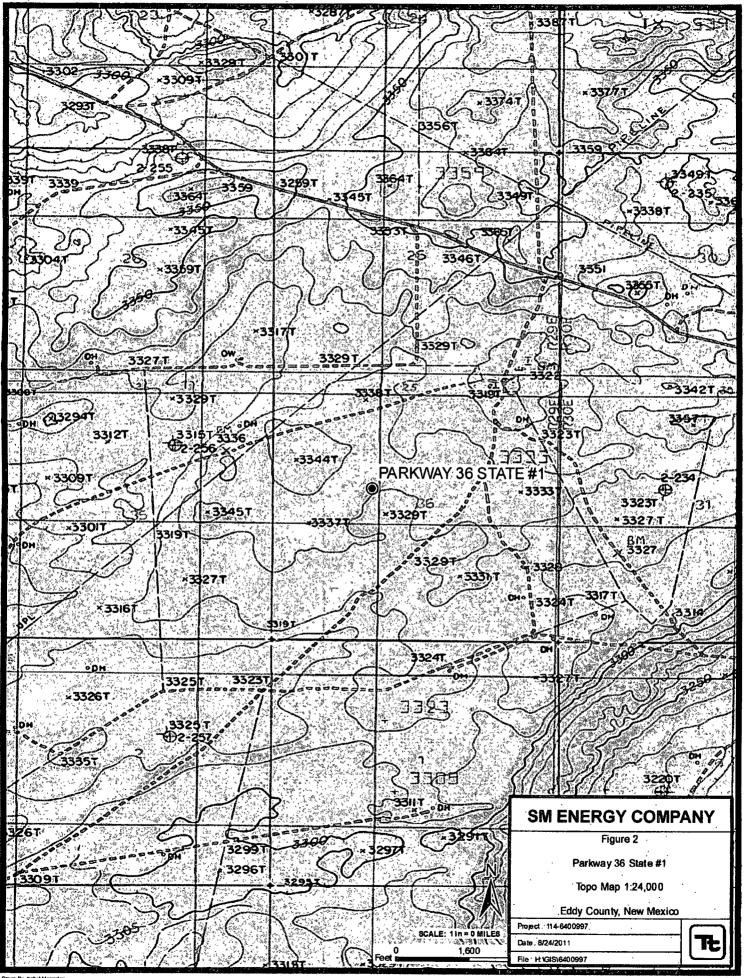
Senior Project Manager

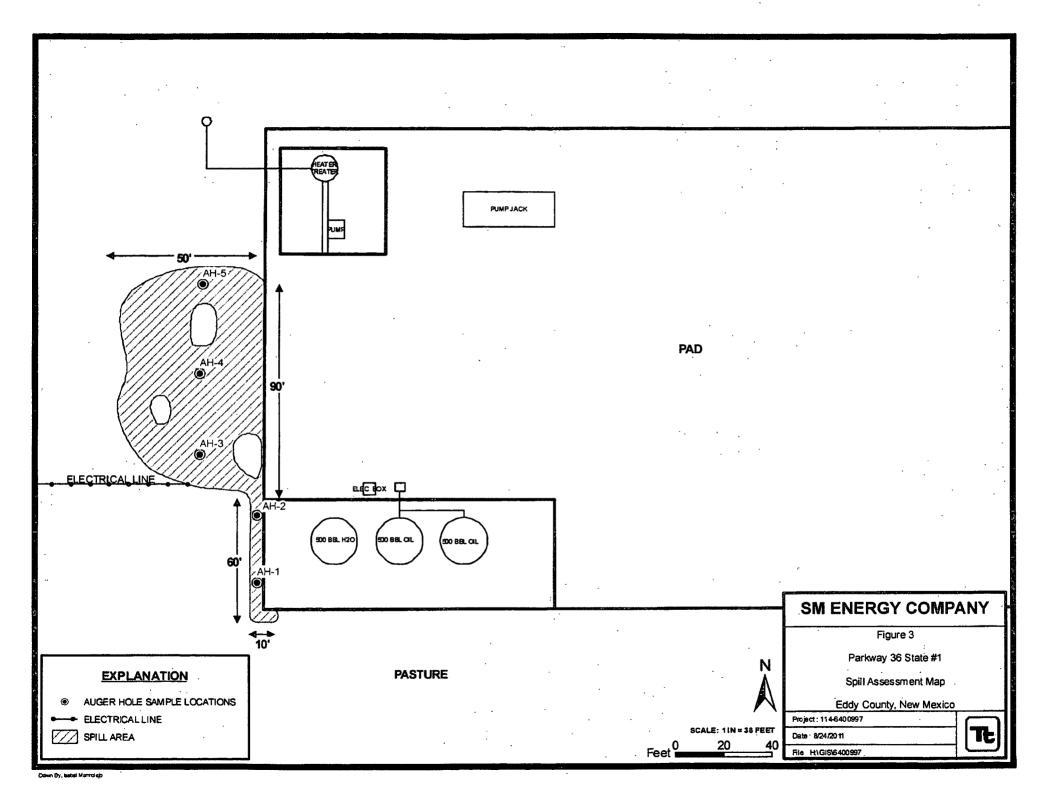
cc: Chad McNeely - SM Energy Company

Don Riggs – SM Energy Company Mark Bondy – SM Energy Company

FIGURES







TABLES

Table 1 SM Energy PDU 36 State #001

Eddy County, New Mexico

Sample	Cample Date	Sample	Soil	Status	T	PH (mg/k	(g)	Benzene	Toluene	Ethlybenzene	Xylene	Total BTEX	Chloride
ID	Sample Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	8/17/2011	0-1	X		<2.00	<50.0	<50:0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,870
,	Ħ	1-1.5'	Х		-	-	-	-	-	•	•	•	217
	2	2-2.5'	Х		•	-	-	<u>-</u>	-	_	• .	-	<200
AH-2	8/17/2011	0-1'	X		<2.00°	ं<50.0°	< 50:0 :		<0.0200	<0.0200	<0.0200	<0.0200	4,020
	i a	1-1.5'	Χ		**************************************	-	<u> </u>	-	Te graph to gat a ways	-	-	the state our residence	<200
	ti	1.5-2'	Х				<u>.</u>	•	· •	· · · · · · · · · · · · · · · · · · ·	•	-	216
					·		-, -,						
АН-3	8/17/2011	0-1	X		<2:00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	10,200
	a ·	1-1.5'	Х		-		•	•	, .	•			<200
	a	2-2.5'	X		. , . -	-	•		:	-	-	•.	<200
	•	_			,	•		• •	<u> </u>			-	-
AH-4	8/17/2011	∴0-1'	X		.<2.00	<50.0.·	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,360 🦪
,	0	\$ 1 <u>-</u> 1:5'	X						1777				8,980
	ii	2-2.5'	Х		-	-	•	-	-	-	•	-	<200
AH-5	8/17/2011	0-1"	X		<2.00	< 5 0.0	*. ₹5 0.0 ₪	≑<0.0200 €	<0.0200	<0.0200	<0.0200	<0.0200	5,850
,	n	1-1.5'	Χ	(10.700 700	-	-	-	-	-	-		•	<200
•	ti -	2-2.5'	Х		•	•	+	. =	-	•	-	•	<200
												-	

(--) Not Analyzed

Proposed Excavation Depths

APPENDIXA

.

District |
1625 N. French Dr., Hobbs, NM 88240
District III
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. Francis Dr. Santa Re. NM 87506

State of New Mexico Energy Minerals and Natural Resources

0597

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

1220 S St. Francis Dr., Santa Fe, NM 87505 Santa Fe, NM 87505 Release Notification and Corrective Action **OPERATOR** X Initial Report **Final Report** Name of Company SM ENERGY COMPANY Contact VICKIE MARTINEZ Telephone No. (432)688-1709 Address 3300 N "A" ST BLDG 7-200 MIDLAND, TX 79705 Facility Name PARKWAY 36 STATE #001 Facility Type BATTERY Surface Owner COMMISSIONER OF PUBLIC LIMINES! Owner COMMISSIONER OF PUBLIC LANDSase No. 30-015-26112 LOCATION OF RELEASE Unit Letter Feet from the East/West Line County Section Township Range Feet from the North/South Line F 36 **EDDY** 198 29E Longitude Latitude NATURE OF RELEASE Volume of Release 125 Type of Release PRODUCED WATER Volume Recovered () Source of Release UNKNOWN Date and Hour of Occurrence 8/9/1 Date and Hour of Discovery 8/9/11 Was Immediate Notice Given? If YES, To Whom? X Yes No Not Required MIKE BRATCHER By Whom? BILL HEARNE Date and Hour 8/9/11 1:58 PM Was a Watercourse Reached? If YES, Volume Impacting the Watercourse. T Yes X No If a Watercourse was Impacted, Describe Fully,* Describe Cause of Problem and Remedial Action Taken.* SOMETIME BETWEEN 8/8/11 AND 8/9/11 AN UNKNOWN WATER TRANSPORT TRUCK BACKED UP TO LOCATION AND DUMPED A LOAD IN PASTURE NEAR SM ENERGY'S PARKWAY 36 STATE #001 Describe Area Affected and Cleanup Action Taken.* AFFECTED AREA - PASTURE LAND 36'X126' WHICH EQUALLED 7938 SQ FT AREA CLEAN UP ACTION TAKEN - NO WATER RECOVERED AND WILL TURN OVER TO TETRA TECH ENVIRONMENTAL FOR ASSESSMENT AND CLEAN UP 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. OIL CONSERVATION DIVISION Signature: Approved by District Supervisor: Printed Name: VICKIE MARTINEZ Title: ENGINEER TECH II **Expiration Date:** Approval Date E-mail Address: VMARTINEZ@SM-ENERGY.COM Conditions of Approval: Attached

Date: 08/10/2011

Phone: (432)688-1709

^{*} Attach Additional Sheets If Necessary

APPENDIX B



200 East Sunset Food Cortain

1: Para Texas 70922 18902 Basin Street, Stimo 41 -M diano Toxas 79700 30.5 Har is "arkeray, 5 , to 110. "I Worth Tukas 7010V

URG•ER9•3443

B15 * 665 * 3643 732*9-9*3301 FAX 432 • 589 • 61- 3

817*214*5268

ir Mail, lahi⊉tianeana ysicicoit.

Certifications

NELAP DoD LELAP Kansas Oklahoma ISO 17025 WBE HUB NCTRCA $_{ m DBE}$

Analytical and Quality Control Report

Aaron Hale

Tetra Tech

1910 N. Big Spring Street

Midland, TX, 79705

Report Date: August 24, 2011

Work Order:

11081826

Project Location: Eddy Co., NM

SM Energy/PDU 36 State #001 Project Name:

Project Number: 114-6400997

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
274908	AH-1 0-1'	soil	2011-08-17	00:00	2011-08-18
274909	AH-1 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274910	AH-1 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274911	AH-2 0-1'	' soil	2011-08-17	00:00	. 2011-08-18
274912	AH-2 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274913	AH-2 1.5-2'	soil	2011-08-17	00:00	2011-08-18
274914	AH-3 0-1'	soil	2011-08-17	00:00	2011-08-18
274915	AH-3 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274916	AH-3 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274917	AH-4 0-1'	soil	2011-08-17	00:00	2011-08-18
274918	AH-4 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274919	AH-4 2-2.5'	soil	2011-08-17	00:00	2011-08-18
274920	AH-5 0-1'	soil	2011-08-17	00.00	2011-08-18
274921	AH-5 1-1.5'	soil	2011-08-17	00:00	2011-08-18
274922	AH-5 2-2.5'	soil	2011-08-17	00:00	2011-08-18

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 27 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

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

Report Contents

Case Narrative	
Analytical Report	
Sample 274908 (AH-1 0-1')	
Sample 274909 (AH-1 1-1.5')	
Sample 274910 (AH-1 2-2.5')	
Sample 274911 (AH-2 0-1')	
Sample 274912 (AH-2 1-1.5')	
Sample 274913 (AH-2 1.5-2')	
Sample 274914 (AH-3 0-1')	
Sample 274915 (AH-3 1-1.5')	
Sample 274916 (AH-3 2-2.5')	
Sample 274917 (AH-4 0-1')	
Sample 274918 (AH-4 1-1.5')	
Sample 274919 (AH-4 2-2.5')	
Sample 274920 (AH-5 0-1')	
Sample 274920 (AH-5 0-1)	
Sample 274922 (AH-5 2-2.5')	
Sample 274922 (Art-5 2-2.5)	
Method Blanks	
QC Batch 84101 - Method Blank (1)	
QC Batch 84102 - Method Blank (1)	
QC Batch 84108 - Method Blank (1)	
QC Batch 84136 - Method Blank (1)	
QC Batch 84205 - Method Blank (1)	
GO Datell 04200 - Method Dialik (1)	
Laboratory Control Spikes	
QC Batch 84101 - LCS (1)	
QC Batch 84102 - LCS (1)	
QC Batch 84108 - LCS (1)	
QC Batch 84136 - LCS (1)	
QC Batch 84205 - LCS (1)	
QC Batch 84101 - MS (1)	
QC Batch 84102 - MS (1)	
QC Batch 84108 - MS (1)	
QC Batch 84136 - MS (1)	
QC Batch 84205 - MS (1)	
♥○ Daten 04200 * 1415 (1)	
Calibration Standards	
QC Batch 84101 - CCV (1)	
QC Batch 84101 - CCV (2)	
QC Batch 84102 - CCV (1)	
QC Batch 84102 - CCV (2)	
QC Batch 84102 - CCV (2)	
QC Batch 84108 - CCV (3)	
QC Batch 84136 - ICV (1)	

QC Batch 84136 - CCV (1)	 	
Appendix		
Laboratory Certifications	 	
Standard Flags	 	

Case Narrative

Samples for project SM Energy/PDU 36 State #001 were received by TraceAnalysis, Inc. on 2011-08-18 and assigned to work order 11081826. Samples for work order 11081826 were received intact at a temperature of 3.4 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	71411	2011-08-19 at 10:58	84101	2011-08-19 at 10:58
Chloride (Titration)	SM 4500-Cl B	71416	2011-08-19 at 15:42	84136	$2011-08-22$ at $16\cdot26$
Chloride (Titration)	$\mathrm{SM}\ 4500\text{-}\mathrm{Cl}\ \mathrm{B}$	71416	2011-08-19 at 15:42	84205	$2011-08-24$ at $12\cdot 20$
TPH DRO - NEW	S 8015 D	71417	2011-08-19 at 09:19	84108	2011-08-19 at 09·19
TPH GRO	S 8015 D	71411	2011-08-19 at 10:58	84102	2011-08-19 at 10:58

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 proparation 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 11081826 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.

114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 6 of 27 Eddy Co., NM

Analytical Report

Sample: 274908 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 84101 Prep Batch: 71411

Analytical Method:

S 8021B Date Analyzed: 2011-08-19 Sample Preparation: 2011-08-19 Prep Method: S 5035 Analyzed By: MEPrepared By:

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene	v	1	< 0 0200	mg/Kg	1	0.0200
Toluene	υ	. 1	< 0.0200	${ m mg/Kg}$	1	0.0200
Ethylbenzene	U	1	< 0.0200	${ m mg/Kg}$	1	0.0200
Xylene	Ŭ	1	< 0.0200	${ m mg/Kg}$	1	0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.79	mg/Kg	1	. 2 00	140	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.53	mg/Kg	1	2.00	126	70 6 - 179

Sample: 274908 - AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 84136 Prep Batch: 71416

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-08-22 Sample Preparation. 2011-08-19

Prep Method: N/A Analyzed By: ARPrepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			4870	mg/Kg	100	4.00

Sample: 274908 - AH-1 0-1'

Laboratory:

Analysis¹

Midland TPH DRO - NEW

QC Batch: 84108 Prep Batch: 71417 Analytical Method: Date Analyzed:

S 8015 D 2011-08-19 Sample Preparation: 2011-08-19 Prep Method: N/A Analyzed By: kg Prepared By:

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

114-6400997

Work Order: 11081826 SM

Work Order: 11081826		Page Number: 7 of 27
I Energy/PDU 36 State #001	•	Eddy Co., NM
· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·

•		*				Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			86.1	mg/Kg	1	100	86	67.5 - 147.1

Sample: 274908 - AH-1 0-1'

Laboratory:

Midland

Analysis: QC Batch

TPH GRO

Analytical Method:

S 8015 D

Prep Method: S 5035

2.00

84102

Date Analyzed: Sample Preparation:

2011-08-19 2011-08-19 Analyzed By: MEPrepared By: $M\dot{E}$

Prep Batch: 71411

Flag

RL

Dilution RL

Parameter	Flag	Cert	Result	Units
GRO	U	1	< 2.00	mg/Kg

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.47	mg/Kg	1	2.00	124	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.14	${ m mg/Kg}$	1	2.00	107	22.4 - 149

Sample: 274909 - AH-1 1-1.5'

Laboratory.

Midland

Analysis: Chloride (Titration) 84136

Analytical Method:

SM 4500-Cl B 2011-08-22

Prep Method: N/A Analyzed By: AR.

QC Batch: Prep Batch: 71416

Date Analyzed: Sample Preparation.

Result

217

2011-08-19

Prepared By: AR.

50

Parameter

Chloride

RL

Cert

Dilution RL

4.00

Sample: 274910 - AH-1 2-2.5'

Laboratory:

Midland

84136

Analysis: QC Batch:

Prep Batch: 71416

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-08-22

Prep Method: N/A Analyzed By: ARPrepared By: AR

Sample Preparation: 2011-08-19

Units

mg/Kg

continued ...

Report Date: August 24, 2011 114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001

Page Number: 8 of 27 Eddy Co , NM

 $sample\ 274910\ continued$. .

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 274911 - AH-2 0-1'

Laboratory: Midland

Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035 QC Batch: 84101 Date Analyzed: 2011-08-19 Analyzed By: ME Prep Batch: 71411 Sample Preparation: 2011-08-19 Prepared By: ME

Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene	U	1	< 0.0200	mg/Kg	1	0.0200
Toluene	U	1	< 0.0200	mg/Kg	1	0.0200
Ethylbenzene	υ ,	1	< 0.0200	mg/Kg	1	0.0200
Xylene	U	1	< 0.0200	$_{ m mg/Kg}$	1	0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.74	mg/Kg	1	2.00	137	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.50	${ m mg/Kg}$	1	2.00	125	70.6 - 179

Sample: 274911 - AH-2 0-1'

Laboratory: Midland

Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 84136 Date Analyzed: 2011-08-22 Analyzed By: AR Prep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride		*	4020	mg/Kg	100	4.00

Report Date: August 24, 2011 Work Order: 11081826 Page Number: 9 of 27 114-6400997 SM Energy/PDU 36 State #001 Eddy Co., NM

Sample: 274911 - AH-2 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A QC Batch: 84108 Date Analyzed: 2011-08-19 Analyzed By: kg Prep Batch: 71417 Sample Preparation: 2011-08-19 Prepared By: kg

Flag Dilution Surrogate Cert Result Units Amount Recovery Limits 100 67.5 - 147.1 n-Tricosane 91.4 mg/Kg 91 1

Sample: 274911 - AH-2 0-1'

Laboratory: Midland

Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035 QC Batch: 84102 Date Analyzed: 2011-08-19 Analyzed By: ME Prep Batch: 71411 Sample Preparation: 2011-08-19 Prepared By: ME

Spike Percent Recovery Units Dilution Surrogate Flag Cert Result Amount Recovery Limits mg/Kg Trifluorotoluene (TFT) 2.40 2.00 120 30 - 134.6 ï 2.10 mg/Kg 2.00 22.4 - 149 4-Bromofluorobenzene (4-BFB) 1 105

Sample: 274912 - AH-2 1-1.5'

Laboratory. Midland

Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method· N/A Analyzed By: QC Batch: 84136 Date Analyzed: 2011-08-22 ARPrep Batch: 71416 2011-08-19 Sample Preparation: Prepared By: AR

114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 10 of 27 Eddy Co., NM

Sample: 274913 - AH-2 1.5-2'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205 Prep Batch: 71416 Analytical Method:

SM 4500-Cl B 2011-08-24

Prep Method: N/A Analyzed By: AR

Date Analyzed: Sample Preparation:

2011-08-19

Prepared By: AR.

RL

4.00

RLUnits Dilution Parameter Flag Cert Result Chloride 216 mg/Kg 50

Sample: 274914 - AH-3 0-1'

Laboratory.

Midland

Analysis: BTEX QC Batch: 84101 Prep Batch: 71411

Analytical Method:

Sample Preparation:

Date Analyzed:

S 8021B 2011-08-19 2011-08-19 Prep Method: S 5035

Analyzed By: MEPrepared By: ME

Parameter	Flag	Cert	Result .	Units	Dilution	RL
Benzene	U	1	< 0.0200	mg/Kg	1	0.0200
Toluene	U	1	< 0.0200	${ m mg/Kg}$	1	0.0200
Ethylbenzene	U	1	< 0.0200	mg/Kg	1	0.0200
Xylene .	U	1 ,	< 0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.74	mg/Kg	1	2.00	137	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.51	mg/Kg	1	2.00	126	70.6 - 179

Sample: 274914 - AH-3 0-1'

Laboratory: Analysis:

QC Batch:

Prep Batch:

Midland

71416

Chloride (Titration) 84205

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2011-08-24

Prep Method: N/A Analyzed By: AR

Prepared By:

2011-08-19 RL

RLDilution

AR

Parameter Flag Cert Result Units Chloride 10200 100 4.00 mg/Kg

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 11 of 27 Eddy Co., NM

Sample: 274914 - AH-3 0-1'

Laboratory: Midland

114-6400997

Analysis: QC Batch:

TPH DRO - NEW

84108 Prep Batch: 71417

Analytical Method: Date Analyzed.

S 8015 D 2011-08-19 Sample Preparation: 2011-08-19 Prep Method: N/A

Analyzed By: kg Prepared By:

RL

Parameter	Flag	Cert	Result	Units	Dilution	RL
DRO	U	1	< 50.0	$_{ m ing/Kg}$	1	50.0

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			87.2	mg/Kg	1	100	87	67.5 - 147.1

Sample: 274914 - AH-3 0-1'

Laboratory: Analysis:

QC Batch:

Midland TPH GRO 84102 Prep Batch: 71411

Analytical Method: Date Analyzed:

S 8015 D 2011-08-19 Sample Preparation: 2011-08-19 Prep Method: S 5035

Analyzed By: MEPrepared By: ME

RL

Parameter	Flag	Cert	Result	· Units	Dilution	RL
GRO	U	1	< 2.00	mg/Kg	1	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.42	mg/Kg		2.00	121	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.10	${ m mg/Kg}$	1	2.00	105	22.4 - 149

Sample: 274915 - AH-3 1-1.5'

Laboratory: Analysis:

Midland

Chloride (Titration) QC Batch: 84205 Prep Batch: 71416

Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B 2011-08-24 2011-08-19

Prep Method: N/A Analyzed By: AR

AR

Prepared By:

RL

Flag Result Dilution RLParameter Cert Units Chloride < 200 mg/Kg 50 4.00 Report Date: August 24, 2011 114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 12 of 27 Eddy Co., NM

Sample: 274916 - AH-3 2-2.5'

Laboratory: Analysis

Midland

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B

Prep Method: N/A Analyzed By: AR.

QC Batch:

2011-08-24

AR.

Prep Batch:

8420571416

Sample Preparation:

2011-08-19

Prepared By:

RL

Dilution Units RLParameter Flag Cert Result Chloride <200 50 4.00 mg/Kg

Sample: 274917 - AH-4 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch: 84101 Prep Batch: 71411

Analytical Method. Date Analyzed:

Sample Preparation:

S 8021B 2011-08-19 2011-08-19 Prep Method: S 5035

Analyzed By: MEPrepared By: ME

RLParameter Units Dilution RLFlag Cert Result Benzene 0.0200 U < 0.0200 mg/Kg Toluene < 0.0200 mg/Kg 1 0.0200U Ethylbenzene mg/Kg 0.0200 < 00200 1 U mg/Kg 0.0200 Xylene < 0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.39	mg/Kg	1	2.00	120	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.21	mg/Kg	1	2.00	110	70.6 - 179

Sample: 274917 - AH-4 0-1'

Laboratory:

Prep Batch:

Analysis: QC Batch: Midland

84205

71416

Chloride (Titration)

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2011-08-24

Units

mg/Kg

Prep Method. N/A Analyzed By: AR. Prepared By: AR

RLParameter Flag Cert Result Chloride 4360

2011-08-19

Dilution RL100 4.00

Work Order. 11081826 SM Energy/PDU 36 State #001

Sample: 274917 - AH-4 0-1'

Laboratory:

114-6400997

Midland

Analysis: QC Batch: 84108 Prep Batch: 71417

TPH DRO - NEW Analytical Method:

Date Analyzed: 2011-08-19 Sample Preparation: 2011-08-19

Prep Method: S 8015 D Analyzed By: Prepared By:

RL

Parameter Cert Result Units Dilution RLFlag DRO < 50.0 50.0 U 1 ' mg/Kg

						Spike	Percent	Recovery
Surrogate	 Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			87.1	mg/Kg	1	100	87	67.5 - 147.1

Sample: 274917 - AH-4 0-1'

Laboratory:

Midland

Analysis: TPH GRO QC Batch: 84102 Prep Batch: 71411

Analytical Method: Date Analyzed:

S 8015 D 2011-08-19 Sample Preparation: 2011-08-19

Prep Method: S 5035

Page Number: 13 of 27

Eddy Co., NM

N/A

kg

kg

Analyzed By. MEPrepared By: ME

RLFlag Parameter Cert Result Units Dilution RL $\overline{\text{GRO}}$ < 2.00 2.00 mg/Kg U 1

		*			D.1.	Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.09	mg/Kg	1	2.00	104	30 - 134.6
4-Bromofluorobenzene (4-BFB)	1		1.86	$_{ m mg/Kg}$	1	2.00	93	22.4 - 149

Sample: 274918 - AH-4 1-1.5'

Laboratory: Midland

Chloride (Titration)

Analysis: QC Batch: 84205 Prep Batch: 71416

Analytical Method: SM 4500-Cl B 2011-08-24 Date Analyzed:

2011-08-19

Prep Method: N/A Analyzed By: AR. Prepared By: AR

RLFlag Parameter Cert Result Units Dilution RLChloride 8980 100 4.00 mg/Kg

Sample Preparation:

Work Order: 11081826 SM Energy/PDU 36 State #001 114-6400997

Page Number: 14 of 27 Eddy Co., NM

Sample: 274919 - AH-4 2-2.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 84205 Prep Batch: 71416 Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-08-24 Sample Preparation 2011-08-19

Prep Method: N/A Analyzed By: ARPrepared By: AR

RL

Result RLParameter Flag Cert Units Dilution Chloride < 200 50 4.00mg/Kg

Sample: 274920 - AH-5 0-1'

Midland Laboratory:

Analysis: BTEX QC Batch: 84101 Prep Batch: 71411

Analytical Method: S 8021B Date Analyzed: 2011-08-19 Sample Preparation: 2011-08-19

Prep Method: S 5035 Analyzed By: MEPrepared By: ME

RLParameter Flag Cert Result Units Dilution. RLBenzene < 0.0200 mg/Kg 1 0.0200 U Toluene < 0.0200 mg/Kg1 0.0200 U mg/KgEthylbenzene < 0.0200 1 0.0200U mg/Kg 1 0.0200 Xylene < 0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.71	mg/Kg	1	2.00	136	82.8 - 143.1
4-Bromofluorobenzene (4-BFB)			2.48	mg/Kg	1	2.00	124	70.6 - 179

Sample: 274920 - AH-5 0-1'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 84205 Prep Batch: 71416

Analytical Method: SM 4500-Cl B Date Analyzed: 2011-08-24 Sample Preparation: 2011-08-19

Prep Method: N/A Analyzed By: AR. Prepared By: AR

RLRLParameter Flag Cert Result Units Dilution Chloride 5850 mg/Kg 100 4.00

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 15 of 27 Eddy Co., NM

Sample: 274920 - AH-5 0-1'

Laboratory:

114-6400997

Midland

Analysis: TPH DRO - NEW

QC Batch: 84108 Prep Batch: 71417 Analytical Method: Date Analyzed:

S 8015 D 2011-08-19 Prep Method: N/A

Sample Preparation: 2011-08-19

Analyzed By: kg Prepared By: kg

. RL

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

						Spike	Percent	Recovery
Surrogate	\mathbf{F} lag	Cert	Result	$_{ m Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane			89.5	mg/Kg	1	100	90	67.5 - 147.1

Sample: 274920 - AH-5 0-1'

Laboratory:

Midland

Analysis: TPH GRO QC Batch: 84102 Prep Batch: 71411 Analytical Method: Date Analyzed:

Sample Preparation:

S 8015 D 2011-08-19 2011-08-19 Prep Method. S 5035

Analyzed By ME Prepared By: ME

m RL

Surrogate	Flag	Cert	Result	Units	Dilution.	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.38	mg/Kg	1	2.00	119	30 - 134.6
4-Bromofluorobenzene (4-BFB)			2.09	${ m mg/Kg}$	1	-2.00	104	22.4 - 149

Sample: 274921 - AH-5 1-1.5'

Laboratory: Analysis:

Midland

Analysis: Chloride (Titration) QC Batch: 84205 Prep Batch: 71416 Analytical Method:
Date Analyzed:
Sample Preparation:

SM 4500-Cl B 2011-08-24 2011-08-19 Prep Method: N/A Analyzed By: AR Prepared By: AR

Report Date: August 24, 2011 Work Order: 11081826 Page Number: 16 of 27 SM Energy/PDU 36 State #001114-6400997 Eddy Co., NM Sample: 274922 - AH-5 2-2.5' Laboratory Midland Analysis. Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 84205 Date Analyzed: 2011-08-24 Analyzed By: ARPrep Batch: 71416 Sample Preparation: 2011-08-19 Prepared By: RLParameter Flag Cert Result Units Dilution RLChloride <200 mg/Kg 50 4.00 U

114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 17 of 27 Eddy Co., NM

Method Blanks

Method Blank (1)

QC Batch: 84101

QC Batch: Prep Batch: 71411

84101

Date Analyzed: QC Preparation: 2011-08-19

2011-08-19

Analyzed By: ME

Prepared By: ME

			MDL	•	
Parameter	Flag	Cert	Result	Units	RL
Benzene		1	< 0.0118	mg/Kg	0.02
Toluene		1	< 0.00600	mg/Kg	0.02
Ethylbenzene		1	< 0.00850	${ m mg/Kg}$	0.02
Xylene		1	< 0.00613	mg/Kg	0.02

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.10	mg/Kg	1	2.00	105	65.9 - 111.8
4-Bromofluorobenzene (4-BFB)			2.07	mg/Kg	1	$2.00_{.}$	104	48.4 - 123.1

Method Blank (1)

QC Batch: 84102

QC Batch: 84102Prep Batch: 71411

2011-08-19 Date Analyzed: QC Preparation: 2011-08-19 Analyzed By: ME Prepared By: ME

			MDL		
Parameter	Flag	Cert	Result	Units	RL
GRO		1	< 0.753	mg/Kg	2

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.88	mg/Kg	1	2.00	94	67.6 - 150
4-Bromofluorobenzene (4-BFB)			1.77	mg/Kg	1	2 00	88	52 4 - 130

Method Blank (1)

QC Batch: 84108

QC Batch: 84108 Prep Batch: 71417

2011-08-19 Date Analyzed: QC Preparation: 2011-08-19

Analyzed By: kg Prepared By: kg

114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 18 of 27

				*		MDL		
Parameter		F	lag	Cert	R	esult	Units	RL
DRO				1	<	<14.5	mg/Kg	50
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			83.7	$_{ m mg/Kg}$	1	100	84	52.7 - 133.8

Method Blank (1)

QC Batch: 84136

QC Batch: 84136 Prep Batch: 71416

2011-08-22 Date Analyzed: QC Preparation: 2011-08-19 Analyzed By: AR.

Prepared By: AR.

MDL Flag Cert Result

Parameter Units RL< 3.85 Chloride ıng/Kg

Method Blank (1)

QC Batch: 84205

QC Batch: 84205Prep Batch: 71416

Chloride

Date Analyzed: 2011-08-24 QC Preparation: 2011-08-19 Analyzed By: AR Prepared By:

MDLParameter Flag Cert Result

< 3.85

RLUnits mg/Kg . 4

114 - 6400997

Work Order: 11081826 SM Energy/PDU 36 State #001

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 84101 Prep Batch: 71411 - Date Analyzed: 2011-08-19 QC Preparation: 2011-08-19 Analyzed By: ME Trepared By: ME

Page Number: 19 of 27

Eddy Co., NM

,	T.	~	LCS	TT	D.11	Spike	Matrix	D	Rec.
Param	F.	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec .	Limit
Benzene		1	1.99	mg/Kg	1	2.00	< 0.0118	100	77.4 - 121 7
Toluene		1	2.16	mg/Kg	1	2 00	< 0.00600	108	88.6 - 121.6
Ethylbenzene		1	2.23	mg/Kg	1	2.00	< 0.00850	112	74.3 - 117.9
Xvlene		1	6.71	mg/Kg	1	6.00	< 0.00613	112	73.4 - 118.8

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

				LCSD			Spike	Matrix		Rec.		RPD
Param	•	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene			1	2.06	mg/Kg	1	2.00	< 0.0118	103	77.4 - 121.7	3	20
Toluene			1	2.23	${ m mg/Kg}$	1	2.00	< 0.00600	112	88.6 - 121.6	3	20
Ethylbenzene			1	2.28	${ m mg/Kg}$	1	2.00	< 0.00850	114	74.3 - 117.9	2	20
Xylene			1	6.90	mg/Kg	1	6.00	< 0.00613	115	73.4 - 118.8	3	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	${ m Amount}$	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.22	2.17	mg/Kg	1	2.00	111	108	65 5 - 116.7
4-Bromofluorobenzene (4-BFB)	2.38	2.36	mg/Kg	1	2.00	119	118	56.2 - 132.1

Laboratory Control Spike (LCS-1)

QC Batch: 84102 Prep Batch: 71411 Date Analyzed: 2011-08-19 QC Preparation: 2011-08-19 Analyzed By: ME Prepared By: ME

			LCS			$_{ m Spike}$	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1	17.4	mg/Kg	1	20.0	< 0.753	87	60.9 - 95.4

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. $continued \dots$

Report Date: August 24, 2011 114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 20 of 27 Eddy Co., NM

control spikes continued	ontrol	spikes	: continued			
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D	F	C	LCSD	11	D:1	Spike	Matrix	Dan	Rec.	RPD	RPD Limit
Param	r	C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
			LCSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO		1	17.8	mg/Kg	1	20.0	< 0.753	89	60.9 - 95.4	2	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	$\mathbf{A}\mathbf{mount}$	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.05	2.07	mg/Kg	1	2.00	102	104	61.9 - 142
4-Bromofluorobenzene (4-BFB)	2.09	1.84	mg/Kg	1	2.00	104	92	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch:

84108

'Date Analyzed:

2011-08-19

Analyzed By: kg

Prep Batch: 71417

QC Preparation: 2011-08-19

Prepared By: kg

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	D_1 l.	Amount	Result	Rec.	Limit
DRO		1	228	mg/Kg	1	250	<14.5	91	64.5 - 146.9

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	238	mg/Kg	1	250	<14.5	95	64.5 - 146.9	4	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	89.1	91.4	mø/Kø	1	100	89	91	65.3 - 135.8

Laboratory Control Spike (LCS-1)

QC Batch: 84136 Prep Batch: 71416 Date Analyzed: 2011-08-22 QC Preparation: 2011-08-19

Analyzed By: AR. Prepared By. AR.

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	-		92.2	mg/Kg	1	100	< 3.85	92	85 - 115

Report Date: August 24, 2011 114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 21 of 27 Eddy Co., NM

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			103	mg/Kg	1	100	< 3.85	103	85 - 115	11	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. 84205 Prep Batch: 71416 Date Analyzed: 2011-08-24 QC Preparation: 2011-08-19

Analyzed By: AR. Prepared By: AR.

•			LCS			Spike	Matrix		Rec.
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride			95.9	mg/Kg	1	100	< 3.85	96	85 - 115

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
Chloride			108	mg/Kg	1	100	< 3.85	108	85 - 115	12	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: 274943

QC Batch: 84101 Prep Batch: 71411 Date Analyzed: 2011-08-19. QC Preparation: 2011-08-19

Analyzed By: ME Prepared By: ME

•				MS			Spike	Matrix		Rec.
Param		F	$^{\rm C}$	Result	Units	Dil .	Amount	Result	Rec.	$_{ m Limit}$
Benzene	•	_	1	1.88	mg/Kg	1	2.00	< 0.0118	94	69.4 - 123.6
Toluene		•	1	$2\ 14$	${ m mg/Kg}$	1	2.00	< 0.00600	107	75.4 - 134.3
Ethylbenzene	•		1	2.34	$_{ m mg/Kg}$	1	2.00	< 0.00850	117	58.8 - 133.7
Xylene			1	7.15	mg/Kg	1	6.00	< 0.00613	119	57 - 134.2

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

•				MSD			Spike	· Matrix		Rec.		RPD
Param	•	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene			1	1.83	mg/Kg	1	2 00	< 0.0118	92	69.4 - 123.6	3	20
Toluene			1	2.08	mg/Kg	1	2.00	< 0.00600	104	75.4 - 134.3	3	20
Ethylbenzene			1	2.28	mg/Kg	1	2.00	< 0.00850	114	58.8 - 133.7	3	20
Xylene			1	6.92	mg/Kg	1	6.00	< 0.00613	115	57 - 134.2	3	20

Report Date August 24, 2011 114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 22 of 27 Eddy Co, NM

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	$\mathbf{D}_{1}\mathbf{l}$	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.68	2.44	mg/Kg	1	2	134	122	79.4 - 141.1
4-Bromofluorobenzene (4-BFB)	2.55	2.29	${ m mg/Kg}$	1	2	128	114	71 - 167

Matrix Spike (MS-1)

Spiked Sample: 274920

QC Batch:

84102

Date Analyzed:

2011-08-19

Analyzed By: ME

Prep Batch: 71411

QC Preparation: 2011-08-19

Prepared By: ME

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{L}_{\mathbf{l}}\mathbf{m}\mathbf{i}\mathbf{t}$
GRO		1	17.4	mg/Kg	1	. 20.0	< 0.753	87	61.8 - 114

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

			MSD			Spike	Matrix		Rec .		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO		1	16.6	mg/Kg	1	20.0	< 0.753	83	61.8 - 114	5	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	. Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Trifluorotoluene (TFT)	2.39	2.27	mg/Kg	1	2	120	114	29.4 - 161.7
4-Bromofluorobenzene (4-BFB)	2.25 .	2.13	mg/Kg	1	2	112	106	37.3 - 162

Matrix Spike (MS-1)

Spiked Sample: 274920

QC Batch:

84108

Date Analyzed:

2011-08-19

Analyzed By: · kg

Prep Batch: 71417

QC Preparation: 2011-08-19

Prepared By· kg

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1	217	${ m mg/Kg}$	1	250	<14.5	87	38.8 - 153.3

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	218	mg/Kg	1	250	<14.5	87	38.8 - 153.3	0	20

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

114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 23 of 27 Eddy Co., NM

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	83.9	85.2	mg/Kg	1	100	84	85	54.6 - 149.8

Matrix Spike (MS-1)

Spiked Sample: 274912

QC Batch: 84136

Date Analyzed

2011-08-22

Analyzed By: AR.

Prepared By: AR.

Prep Batch: 71416

QC Preparation: 2011-08-19

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	R.esult	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			10100	mg/Kg	100	10000	<385	101	79.4 - 120.6

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10700	mg/Kg	100	10000	<385	107	79.4 - 120.6	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: 274922

QC Batch: Prep Batch: 71416

84205

Date Analyzed:

2011-08-24

Analyzed By: AR.

QC Preparation: 2011-08-19

Prepared By: AR.

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride		***	8670	mg/Kg	100	10000	<385	87	79.4 - 120.6

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

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			9470	mg/Kg	100	10000	<385	95	79.4 - 120.6	9	20

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

Report Date: August 24, 2011 114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001

Calibration Standards

Standard (CCV-1)

QC Batch: 84101

Date Analyzed: 2011-08-19

Analyzed By: ME

Page Number: 24 of 27

Eddy Co., NM

Param	· Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.0954	95	80 - 120	2011-08-19
Toluene		1	$_{ m mg/Kg}$	0.100	0.102	102	80 - 120	2011-08-19
Ethylbenzene		1	mg/Kg	0.100	0.106	106	80 - 120	2011-08-19
Xylene		1	$_{ m mg/Kg}$	0.300	0.320	107	80 - 120	2011-08-19

Standard (CCV-2)

QC Batch: 84101

Date Analyzed: 2011-08-19

Analyzed By: ME

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag '	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/Kg	0.100	0.0984	98	80 - 120	2011-08-19
Toluene		1	mg/Kg	0.100	0.108	108	.80 - 120	2011-08-19
Ethylbenzene		1	mg/Kg	0.100	0.107	107	80 - 120	2011-08-19
Xylene		1 ,	${ m mg/Kg}$	0.300	0.325	108	80 - 120	2011-08-19

Standard (CCV-1)

QC Batch: 84102

Date Analyzed: 2011-08-19

Analyzed By: ME

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	1.04	104	80 - 120	2011-08-19

Standard (CCV-2)

QC Batch. 84102

Date Analyzed: 2011-08-19

Analyzed By: ME

114-6400997

Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 25 of 27 Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
	1 105	CCLU						
GRO		1	${ m mg/Kg}$	1.00	1.02	102	80 - 120	2011-08-19

Standard (CCV-2)

QC Batch: 84108

Date Analyzed: 2011-08-19

Analyzed By: kg

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	254	102	80 - 120	2011-08-19

Standard (CCV-3)

QC Batch: 84108

Date Analyzed. 2011-08-19

Analyzed By: kg

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	237	95	80 - 120	2011-08-19

Standard (ICV-1)

QC Batch: 84136

Date Analyzed: 2011-08-22

Analyzed By: AR.

				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	.		mg/Kg	100	101	101	85 - 115	2011-08-22

Standard (CCV-1)

QC Batch: 84136

Date Analyzed: 2011-08-22

Analyzed By: AR

Report Date: August 24, 2011 114-6400997 Work Order: 11081826 SM Energy/PDU 36 State #001 Page Number: 26 of 27 Eddy Co., NM

				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	98.9	99	85 - 115	2011-08-22

Standard (ICV-1)

QC Batch: 84205

Date Analyzed: 2011-08-24

Analyzed By: AR

				ICVs	ICVs	1CVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc	Conc.	Recovery	Limits	Λ nalyzed
Chloride			mg/Kg	100	102	102	85 - 115	2011-08-24

Standard (CCV-1)

QC Batch: 84205

Date Analyzed: 2011-08-24

Analyzed By: AR

				CCVs	$\rm CCVs$	CCVs	Percent	
				True	Found	Percent	R.ecovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	97.8	98	85 - 115	2011-08-24

Report Date: August 24, 2011 Work Order: 11081826 Page Number: 27 of 27 SM Energy/PDU 36 State #001 114-6400997

Eddy Co., NM

Appendix

Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number "	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-10-TX	Midland

Standard Flags

- Description
- Analyte detected in the corresponding method blank above the method detection
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits
- U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

JS818011:# OUNS

An	alvs	sis F	?e	αu	est of Chain of Custody	/ F	?e	C	or	d									PAG	E:				OF:		۷	
				7			_	_								(Cir				REG			Vo.)				
					TETRA TECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946							- [15 (EXT. 10 C:35)	៦	Vr Pd Hg									SOL			
CLIENT NA	ME: SM E				SITE MANAGER:	ERS			ESEF	RVATIV	VE	2	60014	Ba Cd	Ba			0/624	8270/625				İ	s, pH, TDS			
PROJECT N)1 -		PRO		TNAME: TENTSY PDU 3C State # 001	CONTAINERS	€ E						3	s Ag As	Is Ag As	Volatiles				8 8		j.	(Air)	s/Cations			
LAB I.D. NUMBER	DATE ZOII	TIME	MATRIX	GRAB	Feldy a. Nom	NUMBER OF	FILTERED (Y/N)	HNO3	OE CE	NONE	ľ	BTEX 8023B	PAH 8270	RCRA Metals Ag /	TCLP Metals A	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol.	Pest. 808/608	Chloride	Gamma Spe	Alpha Beta (Air)	rLivi (Asbestos) Major Anions/Cations,			
274908	8/17		3	Х	A4-1 0-1				X			X	(X						
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915					AH-3 1-1.5'	\prod			\prod																		
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ADDRESS. CITY: CONTACT:	Hand	STATE:_	77	PHON	ZIP: DATE:	TIMI	E:						1			14			,					USH Courthonz	harge ed:	No _	
SAMPLE COND	TION WHEN	RECEIVED:	 		REMARKS: If this TPH exceeds 1000 mg/kg run aboratory retains Yellow copy - Return Orginal copy to Tet	Luzi	و سر	unj	oks	1	It: Xxy	ru Us	1876 10	ex ms	IKG	eds Vu	50	deri	5/k	45 34	о- p	Br	n 24	ne			
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2588811:# aux

Analysis Red	quest of Chain of Custod	ly Record	PAGE: Z OF: Z
7 and your 1 loc			ANALYSIS REQUEST (Circle or Specify Method No.)
	TETRATECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946	·	d Cr Pb Hg Se d Vr Pd Hg Se TDS
CLIENT NAME: SM Energy	SITE MANAGER: Aaron Hale	PRESERVATIVE METHOD	TX1005 Ba Cd Ba Cd 770/625 770/625
PROJECT NO.: PRO	SM Energy PDU 36 Sale # OOI	CONTAIL	NOD A S A G A S S A G A S S A G A S S A G A S S A G A S S A G A G
LAB I.D. DATE TIME XX BY GWOO	Eddy a. NM	NUMBER OF CONTAINERS FILTERED (Y/N) HCL HNO3 ICE NONE ODDITANA	ETEX 8021B > (EH 8015 MOD> TX1005 PAH 8270 RCHA Metals Ag As Ba Cd Ci TCLP Wetals Ag As Ba Cd V 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 Chlorida Gamma Spec. Alpha Beta (Air) PLM (Asbestos) Major Anions/Cations, pH, TDS
274918 8/17 5	X AH-4 XX1-1.5'	11 X	X
919 / //	AH-4 212.5		
920	AH-5 0-1		
921	AH-5 1-1.5'		
922 +	# AH-5 2-2,5'	* *	
RELINQUISHED BY: (Signature)	Date: 8/18/11 RECEIVED BY: (Signature)	Date: 8/18/1 Time: 14,4	SAMPLED BY. (Print & Initial) 11/1F Time:
RELINQUISHED BY: (Signature)	Date: REPSYZO BY: (Signature)	Date: Time:	SAMPLE SHIPPED BY: (Circle) FEDEX BUS AIRBILL #:
RELINQUISHED BY: (Signature)	Date: RECEIVED BY: (Signature) Time:	Date:	HAND DELIVERED UPS OTHER: TETRA TECH CONTACT PERSON Results by:
RECEIVING LABORATORY: 774627 ADDRESS: CITY: MILITARY STATE. 774 CONTACT: P	RECEIVED BY: (Signature)	TIME:	Agran Hala RUSH Charges Authorized: Yes No
	REMARKS: If that TPH exercise in my/ks run s - Laboratory retains Yellow copy - Return Orginal copy to I		