SITE INFORMATION **Report Type: Closure Report** General Site Information: Site: East Shugart Delaware Unit (ESDU) #34 **SM Energy Company** Company: Section, Township and Range Sec 24 **T18S** R 31 E Unit G Lease Number: 30-15-41615 County: **Eddy County** GPS: 32.73664° N 103.82076° W Surface Owner: Federal Mineral Owner: From the intersection of HWY 529 and 126A, travel south on 126A for 4.33 mi. Turn right and Directions: head west on lease road for 1.10 miles, then turn south for 0.98miles to T - intersection. Turn right and travel north for 0.25 mi. Turn right and travel 420ft east to spill location in pasture. **Release Data:** Date Released: 9/18/2013 Type Release: Produced Water Source of Contamination: **Injection Line** Fluid Released: 11.93 bbls Fluids Recovered: 0 bbls Official Communication: Name: Vickie Martinez Tom Elliott Tetra Tech Company: SM Energy Company Address: 3300 N A St. Suite 200 4000 N. Big Spring P.O. Box Suite 401 City: Midland Texas, 79705 Midland, Texas Phone number: (432) 688-1709 (432) 682-4559 Fax: (432) 688-1701 vmartinez@sm-energy.com tom.elliott@tetratech.com Email: **Ranking Criteria** Depth to Groundwater: Site Data Ranking Score <50 ft 20 50-99 ft 10 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 Surfa

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		
	-			_
	Accepta	ble Soil RRAL (r	ng/kg)	
	Benzene	Total BTEX	TPH	
	10	50	5.000	



October 7, 2014

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

Re: Closure Report for the SM Energy Company, East Shugart Delaware Unit #34, Unit G, Section 24, Township 18 South, Range 31 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by SM Energy Company (SM) to assess a spill from the East Shugart Delaware Unit (ESDU) #34 located in Unit G, Section 24, Township 18 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.73664°, W 103.82076°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak occurred on September 18, 2013, and released approximately twelve (12) barrels of produced fluid from an injection line. To alleviate the problem, SM personnel repaired the injection line. Zero (0) barrels of standing fluids were recovered. The spill over sprayed in the pasture measuring 160' x 195' with the majority of the spill pooling in an area measuring 40' X 45'. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 12. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 400' below surface. The groundwater data is shown in Figure B.



Regulatory

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

Soil Assessment and Analytical Results

On September 20, 2013, Tetra Tech personnel inspected and sampled the spill area. Two (2) auger holes (AH-1 and AH-2) were installed using a stainless steel hand auger, and six (6) surface samples were taken to assess the impacted soils. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The auger hole and surface sample locations are shown on Figure 3.

Referring to Table 1, none of the samples exceeded the RRAL for TPH, BTEX, and Benzene. However, elevated chloride concentrations were detected in AH-1, AH-2 and S-1. Auger hole (AH-1) was not vertically defined, but showed chloride concentrations of 1,480 mg/kg at 4.0' below surface. AH-2 showed a chloride high of 14,300 mg/kg at 1.0', but declined with depth to a concentration of 346 mg/kg at 4.0' below surface. S-1 had a chloride concentration of 5,920 mg/kg at 1.0'. The remaining areas did not show a significant chloride impact to the soils.

Site Remediation and Conclusion

From September 3 through 5, 2014, Tetra Tech personnel supervised the excavation of the impacted soils. In order to remove the chloride impacted soils, the area was excavated to a depth of 4.0' to 8.0' below grade. To define the extents, backhoe trenches (T-1 and T-2) were installed in some of the impacted areas (AH-1 & S-1) to define extents. The excavated areas are highlighted in Table 1 and shown on Figure 4.



Referring to Table 1, backhoe trenches (T-1 and T-2) were vertically defined for chlorides of 191 mg/kg and <20.0 mg/kg at depths of 8.0-8.5' and 6-6.5' respectively, below ground surface. In addition, confirmation samples were also collected at the bottom of the excavation. Confirmation samples (CS-1 and CS-3) collected in the areas of AH-1 and S-1 had chloride concentrations of <20.0 mg/kg at 8.0' and 6.0, respectively, below ground surface. Confirmation sample (CS-2) collected in the area of AH-2 had chloride concentrations of 49.0 mg/kg at 4.0' below ground surface.

Based on the results, the excavation was backfilled with clean material to surface grade. Approximately 420 cubic yards of soil were removed and transported to the Lea Land facility for proper disposal.

Based on the remediation activities performed at this location, SM Energy requests closure for this site. The C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted, TETRA TECH

ille

Tom Elliott Project Manager

cc: SM Energy – File Copy Jim Amos - BLM

FIGURES





Drawn By: Isabel Marmolejo







Drawn By: Isabel Marmolejo

TABLES

Table 1 SM Energy ESDU #34 Eddy County, New Mexico

Sample ID	Sample Date	Sample	Soil	Status		FPH (mg/k	<u>g)</u>	Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride
Sample 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	9/20/2013	0-1		Х	<4.00	149	149	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,200
	II	1-1.5		Х	-	-	-	-	-	-	-	-	2,290
	"	2-2.5		Х	-	-	-	-	-	-	-	-	4,600
	II.	3-3.5		Х	-	-	-	-	-	-	-	-	3,420
	11	4-4.5		Х	-	-	-	-	-	-	-	-	1,480
T_1	0/3/2014	6-6 5		× ×	_	_	_			_	_	_	10.000
1-1	9/3/2014	7-7.5										-	0 100
		8.8.5	X	^	-	-	-	-	-	-	-	-	101
CS-1	9/5/2014	0.0.5	X										<20.0
00-1	3/3/2014	0	~		-		-	_		_	-	-	<20.0
AH-2	9/20/2013	0-1		Х	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	7,950
	"	1-1.5		Х	-	-	-	-	-	-	-	-	14,300
	"	2-2.5		Х	-	-	-	-	-	-	-	-	2,950
	I	3-3.5		Х	-	-	-	-	-	-	-	-	1,980
	"	4-4.5	Х		-	-	-	-	-	-	-	-	346
	"	5-5.5	Х		-	-	-	-	-	-	-	-	542
CS-2	9/5/2014	4	х		-	-	-	-	-	-	-	-	49
S-1	9/20/2013	0-1		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	5,920
T-2	9/3/2014	1-1.5		Х	-	-	-	-	-	-	-	-	909
	"	2-2.5		Х	-	-	-	-	-	-	-	-	1,150
	"	3-3.5		Х	-	-	-	-	-	-	-	-	766
	н	4-4.5		Х	-	-	-	-	-	-	-	-	3,270
	n	5-5.5		Х	-	-	-	-	-	-	-	-	1,710
	"	6-6.5	Х		-	-	-	-	-	-	-	-	<20.0
	"	7-7.5	Х		-	-	-	-	_	-	-	-	<20.0
00.4	0/5/0044		v	-					1		1		.00.0
CS-1	9/5/2014	6	X	<u> </u>	-	-	-	-	-	-		-	<20.0
S-2	9/20/2013	0-1	Х		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0
S-3	9/20/2013	1	Х		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	75.3

Table 1 SM Energy ESDU #34 Eddy County, New Mexico

	Comula ID Comula Data	Sample Soil Status		Status	TPH (mg/kg)		Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride	
Sample ID	Sample Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	/kg) (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
S-4	9/20/2013	0-1	Х		<4.00	<50.0	<50.0	<0.0200	< 0.0200	<0.0200	<0.0200	<0.0200	<20.0
	1	1				1	1	l.	ŀ	1	1	ŀ	1
S-5	9/20/2013	1	Х		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	30.1
S-6	9/20/2013	0-1	Х		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0

(-) Not Analyzed

Excavation Depths

T-1 Backhoe Trench

CS Confirmation Samples

PHOTOGRAPHS

SM Energy Company ESDU #34 Eddy County, New Mexico



View West – Area of AH-1.



View North – Area of AH-1, AH-2 and S-1.

SM Energy Company ESDU #34 Eddy County, New Mexico



View Northwest- Backfill



View North – Backfill

APPENDIX A

State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised August 8, 2011

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

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

			Rel	ease Notifi	catio	n and Co	orrective A	ction				
						OPERA	FOR		X Initi	al Report		Final Report
Name of Co	Ompany SN	A ENERGY	COMPA	NY		Contact VIC	KIE MARTIN	ΈZ				
Facility Na	mc ESDU	<u> 31 KEET, B</u> 34	LDG 7-2	00 MIDLAND,	<u>TX 79</u>	Todephone I	No. (432)688-1	709				
Surface Ou				t a cashahadda ann 1 C		rucinty ryp	C WELL					
Surface Ow	HEL BOKE	AU OF LA	ND MAN	IAGIENTEMETAL C	Jwner [BUREAU O	F LAND MAN.	AGEMI	NTPI No	.30-015-4	615]
Lec. s. e.			1	LOCA	TIO	N OF RE	LEASE					
Onit Letter	Section	Township	Range	Feet from the	North/	South Line	Feet from the	East/V	Vest Line	County		
0	24	185	31E	1500	NOR	ГН	2020	EAST		EDDY		1
			La	titude		Longitud	e					
				NAT	URE	OF RELI	EASE					
Type of Relea	ase SPILL					Volume of	Release 11.93 B	BLS	Volume R	ecovered ()	BBLS	
Source of Rei Was Immedia	ease INJE	CTION LIN liven?	E			Date and H	our of Occurrenc	e 9/18/1	DatsanBN	Novit Svildige	:62e RA	8AME
			Yes 🗌	No 🗌 Not Re	quired	BLM-JAN	wnom? IES AMOS AN		CD-MIK	EBRATC	HER	
By Whom? N	ATHAN	LUOMA				Date and H	our 9/18/13 5:0	0 PM				
Was a Watercourse Reached?												
If a Watercou	rsa was Im	anted Decer	ha Fully #									
N/A	ise was tinj	Jacicu, Descri	be runy.*									
Describe Caus	e of Proble	m and Remed	lial Action	Taken.*								
BELOW TH	E GROUT	OCATION, ND CAUSIN	DOZER	TRACKS SUN	K INT() SOFT GR	OUND AND C	UT AN	INJ LINI	E BURIED	8 INC	HES
				••								
Describe Area	Affected a	nd Cleanup A	ction Take	n.*								
AREA AFFE	CTED W	AS 110' X 2	13'. REN	MOVED CONT	AMIN	ATED SOIL	AND BRUSH	AND	IAULED	TO A PER	MITT	ED
THOLETT.		Len Ioor		L SUILS SAMP	LES A	ND SENT	ULAB AND	WEAR	E WAITI	NG ON RE	SULT	'S.
L hereby certify	/ that the in	formation giv	en aboue i	o true and com-la	40.40.41.4	h						
regulations all	operators a	re required to	report and	lor file certain rel	ease not	tifications and	nowledge and un	iderstand	that pursu	ant to NMO ses which m	CD rul	es and
public health o	r the enviro	nment. The a	cceptance	of a C-141 report	by the	NMOCD mai	ked as "Final Re	port" doe	es not relie	ve the operation	tor of li	ability
or the environm	nent. In add	dition, NMOC	CD accepta	nvestigate and rem ince of a C-141 re	port doe	contamination s not relieve	that pose a threa the operator of re	at to grou sponsibi	and water, : lity for cor	surface wate	r, hum h anv c	an health
federal, state, o	r local laws	and/or regula	ations.		·	· · · · · · · · · · · · · · · · · · ·						liser
\	I MIL	1 110	744	100			OIL CONS	ERVA	TION E	DIVISION	4	
Signature: V	un	l m	vur	ULS_								
Printed Name:	VICKIE M	IARTINEZ		0	A	Approved by Environmental Specialist:						
Title: ENGIN	<u>NEER TEO</u>	CH II			A	oproval Date:		Ex	piration Ds	ite:		
E-mail Address	VMART	INF7@SM	ENEDON	/ COM								
- man /tuuress		ITTLLUGSIVI-	DIVERUI		-	maitions of A	.pproval:			Attached [

Date: 09/26/2013

* Attach Additional Sheets If Necessary

Phone: (432)688-1709

State of New Mexico **Energy Minerals and Natural Resources**

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

Form C-141 Revised October 10, 2003

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

Release Notification and Corrective Action

			OPERATOR		Initial Report	Final Report
Name of Company	SM Energy Company	7	Contact		Lisa Hunt	
Address 6301 Holida	y Hill Rd, Bldg 1 Midland	i, TX 79707	Telephone No.	(4	32) 848-4833	
Facility Name	ESDU #34		Facility Type	V	Vell	
Surface Owner: BLM		Mineral Owner	:: BLM		Lease No. (API#) 30-0)15-41615

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	24	18S	31E	1500	North	2020	East	Eddy

Latitude N 32.73664° Longitude W 103.82076°

NATURE OF RELEASE

Type of Release: Spill (Produced Water)	Volume of Release 11.93 bbls	Volume Recovered 0 bbls							
Source of Release: Injection Line	Date and Hour of Occurrence	Date and Hour of Discovery							
	9/18/13 5:00 PM	Same							
Was Immediate Notice Given?	If YES, To Whom?								
\boxtimes Yes \square No \square Not Required	Jim Amos with BLM /	Mike Bratcher with NMOCD							
By Whom? Nathan Luoma	Date and Hour 9/18/2013 5:00 P.M	И.							
Was a Watercourse Reached?	If YES, Volume Impacting the Wate	ercourse.							
🗌 Yes 🖾 No	N/A								
If a Watercourse was Impacted, Describe Fully.*									
Describe Cause of Problem and Remedial Action Taken.*									
While building the location, dozer tracks sunk into soft ground and cut a fi	berglass injection line buried 8 inches	below the ground, causing a spill.							
Describe Area Affected and Cleanup Action Taken.*									
Describe Area Affected and Cleanup Action Taken.* Tetra Tech personnel inspected the site and collected samples to define spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. The site was then brought up to surface grade with clean backfill material. Tetra Tech prepared a closure report and submitted to NMOCD for review.									

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

	OIL CONSERVATION DIVISION					
Signature: Printed Name: Tom Elliott as agent for SM Energy	Approved by District Supervisor:					
Title: Project Manager	Approval Date:	Expiration D	Date:			
E-mail Address: Tom.Elliott@TetraTech.com	Conditions of Approval:		Attached			
Date: 9-26-2014 Phone: (432) 682-4559						
Attach Additional Sheats If Necessary						

* Attach Additional Sheets If Necessary

APPENDIX B

Water Well Data Average Depth to Groundwater (ft) SM Energy - ESDU #34 Eddy County, New Mexico

	17 So	outh	30	East	
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20 80	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

	18 So	outh	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	24
30	29	28	27	26	25
31	32	33	34	35	36

	19 So	outh	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 90	29	28	27	26	25
31 115	32	33	34	35	36

	17 So	uth	31	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	34 271	35	36

15 <mark>98</mark>

18 South

19 South

SITE

31 East

31 East

12 Site

	17 Sc	outh	32	East	
6	5	4 82	3	2 60	1 225
	N	laljam	4 75		
7	8	9	10 132	11 70	12
				88	120
18	17	16	15	14	13
19	20	21	22	23	24
30 180	29	28	27	26	25
dry					
31	32	33	34	35	36

	18 S	outh	3	32 Eas	t
6	5	4 65	3	2	1
7 460 82	8	9	10	11	12
18	17	16 84	15	14	1:
19	20 164	21	22 429	23	24
30	29	28	27	26	2
31	32	33	34 117	35	36

	19 South		3	32 Eas	t
6	5	4	3	2	1
7	8 365	9	10	11	12
18	17	16	15	14	13 135 dry
19 1 02	20 345	21	22	23	24
30	29	28	27	26	25
31	32	33	34 250	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

Summary Report

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

Report Date: September 17, 2014

Work Order: 14090901

Project Location:	Eddy Co, NM
Project Name:	SME/ESDU #34
Project Number:	112MC07170

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
373938	T-1 (AH-1) 6-6.5'	soil	2014-09-03	00:00	2014-09-08
373939	T-1 (AH-1) 7-7.5'	soil	2014-09-03	00:00	2014-09-08
373940	T-1 (AH-1) 8-8.5'	soil	2014-09-03	00:00	2014-09-08
373941	T-2 (S1) 1-1.5'	soil	2014-09-03	00:00	2014-09-08
373942	T-2 (S1) 2-2.5'	soil	2014-09-03	00:00	2014-09-08
373943	T-2 (S1) 3-3.5'	soil	2014-09-03	00:00	2014-09-08
373944	T-2 (S1) 4-4.5'	soil	2014-09-03	00:00	2014-09-08
373945	T-2 (S1) 5-5.5'	soil	2014-09-03	00:00	2014-09-08
373946	T-2 (S1) 6-6.5'	soil	2014-09-03	00:00	2014-09-08
373947	T-2 (S1) 7-7.5'	soil	2014-09-03	00:00	2014-09-08

Sample: 373938 - T-1 (AH-1) 6-6.5'

Param	Flag	Result	Units	RL
Chloride		10000	mg/Kg	4

Sample: 373939 - T-1 (AH-1) 7-7.5'

Param	Flag	Result	Units	RL
Chloride		9190	m mg/Kg	4

Sample: 373940 - T-1 (AH-1) 8-8.5'

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: September 17, 2014		Work Order: 14090901	Page	Page Number: 2 of 2	
Param	Flag	Result	Units	RL	
Chloride	0	191	m mg/Kg	4	
Sample: 373941 .	- T-2 (S1) 1-1 5'				
			TT */	זת	
Param Chlorido	Flag	Result	Units mg/Kg	<u></u>	
		505	mg/ng	T	
Sample: 373942 -	- T-2 (S1) 2-2.5'				
Param	Flag	Result	Units	RL	
Chloride		1150	m mg/Kg	4	
Sample: 373943 - Param Chloride	- T-2 (S1) 3-3.5' Flag	Result 766	Units mg/Kg	RL 4	
Sample: 373944 -	- T-2 (S1) 4-4.5'				
Param	Flag	Result	Units	RL	
Chloride		3270	m mg/Kg	4	
Sample: 373945 -	- T-2 (S1) 5-5.5'				
Param	Flag	Result	Units	RL	
Chloride	~	1710	m mg/Kg	4	
Sample: 373946 -	- T-2 (S1) 6-6.5'				
Param	Flag	Result	Units	RL	
Chloride		<20.0	mg/Kg	4	
Sample: 373947 -	- T-2 (S1) 7-7.5'				
Param	Flag	Result	Units	RL	
Chloride	<u> </u>	<20.0	m mg/Kg	4	

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Summary Report

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

Report Date: September 17, 2014

Work Order: 14090902

Project Location:Eddy Co, NMProject Name:SME/ESDU #34Project Number:112MC07170

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
373948	CS 1 (AH-1) 8'	soil	2014-09-05	00:00	2014-09-08
373949	CS 2 (AH-2) 4'	soil	2014-09-05	00:00	2014-09-08
373950	CS 3 (S-1) 6'	soil	2014-09-05	00:00	2014-09-08

Sample: 373948 - CS 1 (AH-1) 8'

Param	Flag	Result	Units	RL
Chloride		<20.0	m mg/Kg	4

Sample: 373949 - CS 2 (AH-2) 4'

Param	Flag	Result	Units	RL
Chloride		49.0	m mg/Kg	4

Sample: 373950 - CS 3 (S-1) 6'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

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Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

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

Report Date: September 17, 2014

Work Order: 14090901

Project Location: Eddy Co, NM **Project** Name: SME/ESDU #34 Project Number: 112MC07170

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

			Date	1 ime	Date
Sample	Description	Matrix	Taken	Taken	Received
373938	T-1 (AH-1) 6-6.5'	soil	2014-09-03	00:00	2014-09-08
373939	T-1 (AH-1) 7-7.5'	soil	2014-09-03	00:00	2014-09-08
373940	T-1 (AH-1) 8-8.5'	soil	2014-09-03	00:00	2014-09-08
373941	T-2 (S1) 1-1.5'	soil	2014-09-03	00:00	2014-09-08
373942	T-2 (S1) 2-2.5'	soil	2014-09-03	00:00	2014-09-08
373943	T-2 (S1) 3-3.5'	soil	2014-09-03	00:00	2014-09-08
373944	T-2 (S1) 4-4.5'	soil	2014-09-03	00:00	2014-09-08
373945	T-2 (S1) 5-5.5'	soil	2014-09-03	00:00	2014-09-08
373946	T-2 (S1) 6-6.5'	soil	2014-09-03	00:00	2014-09-08
373947	T-2 (S1) 7-7.5'	soil	2014-09-03	00:00	2014-09-08

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

Blain Lepturch

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Case Narrative

Samples for project SME/ESDU #34 were received by TraceAnalysis, Inc. on 2014-09-08 and assigned to work order 14090901. Samples for work order 14090901 were received intact at a temperature of 9.9 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	97574	2014-09-11 at 14:16	115382	2014-09-11 at 15:35
Chloride (Titration)	SM 4500-Cl B $$	97605	2014-09-12 at $10:43$	115418	2014-09-12 at $12:09$

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 14090901 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Analytical Report

Sample: 373938 - T-1 (AH-1) 6-6.5'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 115382 97574	Anal Date Samp	ytical Method: Analyzed: ble Preparation:	SM 4500-Cl B 2014-09-11 2014-09-11	Prep Method: Analyzed By: Prepared By:	N/A MM MM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			10000	mg/Kg	10	4.00

Sample: 373939 - T-1 (AH-1) 7-7.5'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 115382 97574	Analytic Date An Sample	cal Method: aalyzed: Preparation:	SM 4500-Cl B 2014-09-11 2014-09-11	Prep Method: Analyzed By: Prepared By:	N/A MM MM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			9190	m mg/Kg	10	4.00

Sample: 373940 - T-1 (AH-1) 8-8.5'

Laboratory:	Midland							
Analysis:	Chloride (Titration	ı)	Analytical M	ethod:	SM 4500-Cl $\stackrel{\scriptstyle <}{\scriptstyle \sim}$	В	Prep Method:	N/A
QC Batch:	115382		Date Analyze	ed:	2014-09-11		Analyzed By:	MM
Prep Batch:	97574		Sample Prepa	aration:	2014-09-11		Prepared By:	MM
				DI				
			-	ΠL				
Parameter		Flag	Cert	Result	Ur	nits	Dilution	RL
Chloride				191	mg/	Kg	5	4.00

Report Date: September 17, 2014 Work Order: 14090901 112MC07170 SME/ESDU #34				4090901 #34	Page Number: Eddy C	6 of 13 o, NM
Sample: 37	3941 - T-2 (S1) 1-1.5'					
Laboratory: Analysis:	Midland Chloride (Titration)	Analytic	cal Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch: Prep Batch:	115382 97574	Date Analyzed:20Sample Preparation:20		2014-09-11 2014-09-11	Analyzed By: Prepared By:	MM MM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			909	m mg/Kg	5	4.00
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 115382 97574	Analytic Date An Sample	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2014-09-11 2014-09-11	Prep Method: Analyzed By: Prepared By:	N/A MM MM
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			1150	mg/Kg	5	4.00
Sample: 37 Laboratory: Analysis: QC Batch: Prep Batch:	3943 - T-2 (S1) 3-3.5' Midland Chloride (Titration) 115382 97574	Analytic Date An Sample	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2014-09-11 2014-09-11	Prep Method: Analyzed By: Prepared By:	N/A MM MM

RLParameterFlagCertResultUnitsDilutionRLChloride766mg/Kg54.00

Sample: 373944 - T-2 (S1) 4-4.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	115418	Date Analyzed:	2014-09-12	Analyzed By:	MМ
Prep Batch:	97605	Sample Preparation:	2014-09-12	Prepared By:	MM

Report Date: September 17, 2014 112MC07170		W	Vork Order: 14090 SME/ESDU #34	Page Number: 7 of 13 Eddy Co, NM		
Parameter	Flag	Cort	RL	Unita	Dilution	DI
1 arameter	Flag	Cert	Result	Ullits	Dilution	
Chloride			3270	m mg/Kg	5	4.00

Sample: 373945 - T-2 (S1) 5-5.5'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 115418 97605	Ana Date Sam	lytical Method: e Analyzed: ple Preparation:	SM 4500-Cl B 2014-09-12 2014-09-12	Prep Method: Analyzed By: Prepared By:	N/A MM MM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			1710	m mg/Kg	5	4.00

Sample: 373946 - T-2 (S1) 6-6.5'

Laboratory:	Midland						
Analysis:	Chloride (Titration	n)	An	alytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	115418		Da	te Analyzed:	2014-09-12	Analyzed By:	MM
Prep Batch:	97605		Sar	mple Preparation:	2014-09-12	Prepared By:	MM
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		U		<20.0	mg/Kg	5	4.00

Sample: 373947 - T-2 (S1) 7-7.5'

Midland					
Chloride (Titration)	Anal	ytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
115418	Date	Analyzed:	2014-09-12	Analyzed By:	MM
97605	Sam	ple Preparation:	2014-09-12	Prepared By:	MM
		BL			
Flag	Cert	Result	Units	Dilution	\mathbf{RL}
8 U		<20.0	mg/Kg	5	4.00
	Midland Chloride (Titration) 115418 97605 Flag	Midland Chloride (Titration) Anal 115418 Date 97605 Samp Flag Cert	Midland Chloride (Titration) 115418 97605 RL Flag U V Sample Preparation:	MidlandAnalytical Method:SM 4500-Cl BChloride (Titration)Analytical Method:2014-09-12115418Date Analyzed:2014-09-1297605Sample Preparation:2014-09-12RLFlagCertResultUnitsu< 20.0	$\begin{array}{c c} \mbox{Midland} & & & & & & & & & & & & & & & & & & \\ \mbox{Chloride (Titration)} & & & & & & & & & & & & & & & & & & &$

Method Blanks

Method Blank (1)	QC Batch: 115382				
QC Batch: 115382 Prep Batch: 97574		Date Analyzed: QC Preparation:	2014-09-11 2014-09-11	Analyzed By: Prepared By:	MM MM
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	m mg/Kg	4
Method Blank (1)	QC Batch: 115418				
QC Batch: 115418		Date Analyzed:	2014-09-12	Analyzed By:	MM
Prep Batch: 97605		QC Preparation:	2014-09-12	Prepared By:	MM
			MDL		
Parameter	Flag	Cert	Result	Units	RL
Chloride			<3.85	mg/Kg	4

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch:	115382			Date	Analyzed	l: 201	4-09-11			Ana	ulyzed By	: MM
Prep Batch:	97574			QC 1	Preparatio	on: 201	4-09-11			Pre	pared By:	MM
					LCS			Spike	Ma	atrix		Rec.
Param			F	С	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride					2870	$\mathrm{mg/Kg}$	5	2500	<	19.2	115	85 - 115
Percent recov	very is based on the s	spike	resu	lt. RPD	is based of	on the sp	pike and sp	oike duplic	ate resi	ult.		
				LCSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride				2780	$\mathrm{mg/Kg}$	5	2500	$<\!19.2$	111	85 - 11	53	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: Prep Batch:	115418 97605		D: Q	ate Analyz C Preparat	ed: 2014- tion: 2014-	-09-12 -09-12		A P	nalyzed i repared i	By: MM By: MM
Param		F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride				2680	mg/Kg	5	2500	<19.2	107	85 - 115
Percent recov	very is based on the spil	ke resu	ılt. RF	PD is based	l on the spi	ke and s	pike duplicat	e result.		
			LCS	D		Spike	Matrix	Ree	з.	RPD

Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2680	$\mathrm{mg/Kg}$	5	2500	<19.2	107	85 - 115	0	20

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

Matrix Spikes

Matrix Spike (1	MS-1) Spiked	Sample	e: 373943								
QC Batch: 115 Prep Batch: 975	382 74		Date QC	e Analyze Preparati	d: 20 ion: 20	14-09-11 14-09-11			Analy Prepa	zed By: red By:	MM MM
_		_		MS			Spike	Ma	atrix		Rec.
Param		F,	C I	Result	Units	Dil.	Amount	Re	esult Rec	. <u> </u>	Jimit
Chloride	1 1 1	1	1	3490	mg/Kg	0	2500	. (00 109	18.	9 - 121
Percent recovery	s based on the spi	ke res	ult. RPD	1s based	on the s	spike and s	spike dupli	cate re	sult.		
			MSD			Spike	Matrix		Rec.		RPD
Param]	F C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			3540	mg/Kg	5	2500	766	111	78.9 - 121	1	20
Matrix Spike (I	MS-1) Spiked	Sample	e: 373949								
QC Batch: 115	418		Date	e Analyze	d: 20	14-09-12			Analy	zed By:	MM
Prep Batch: 976	05		$\rm QC$	Preparati	ion: 20	14-09-12	G .1	м	Prepa	red By:	MM
Daram		г	C I	MS	Unita	Dil	Spike	Ma De	atrix Sult Pog	Ţ	Rec.
Chloride		Г	0 1	2490	mg/Kg	5	2500	100	$\frac{1000}{49}$ 98	$\frac{1}{78}$	$\frac{11110}{9 - 121}$
Percent recovery	s based on the spi	ke res	ult. RPD	is based	on the s	pike and s	pike dupli	cate re	sult.		
			MSD			Spike	Matrix		Rec.		RPD
Param]	F C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2390	mg/Kg	5	2500	49	94	78.9 - 121	4	20

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

Calibration Standards

Standard (CCV-1)

QC Batch:	115382			Date A	Analyzed:	2014-09-11		Analyz	zed By: MM
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	99.0	99	85 - 115	2014-09-11

Standard (CCV-2)

QC Batch:	115382			Date A	analyzed:	2014-09-11		Analyz	zed By: MM
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	101	101	85 - 115	2014-09-11

Standard (ICV-1)

QC Batch:	115418			Date A	analyzed:	2014-09-12		Analy	zed By: MM
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2014-09-12

Standard (CCV-1)

QC Batch:	115418			Date A	Analyzed: 2	2014-09-12		Analyz	ed By: MM
					CCVs	CCVs Found	CCVs Democrat	Percent	Data
					True	rouna	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2014-09-12

Work Order: 14090901 SME/ESDU #34 Page Number: 12 of 13 Eddy Co, NM

Appendix

Report Definitions

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

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

Standard Flags

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

Attachments

Report Date: September 17, 2014 112MC07170

Work Order: 14090901 SME/ESDU #34 Page Number: 13 of 13 Eddy Co, NM

The scanned attachments will follow this page.

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

(432) 682-4559 • Fax (432) 682-3946 LIENT NAME: SM ENOROY ROJECT NO:: 1200 170 SM ENORE: 1200 170 SM ENORY COMPLEX 432 682-3946 PF ROJECT NO:: 1200 170 SM ENORY COMPLEX 432 682-3946 PF ROJECT NO:: 1200 170 SM ENORY COMPLEX 432 682-3946 PF		1 HG 26			
	ИОМВЕЯ ОF СОИТАІИЕЯS HUO3 HUO3 HUO3 HUO3 HUO3 HUO3 HUO3 HUO3	TPH 8015 MOD. TX1005 (Ex PAH 8270 TCLP Metals Ag As Ba Cd Vr Pd TCLP Volatiles TCLP Semi Volatiles	CEP 36M 40130162 BCB/s 8080/608 GC/W2 26M! A0I: 8240/8260/625 BCB/s 8080/608 BCI HCI HCI HCI HCI HCI HCI HCI H	damma opec. Alpha Beta (Air) PLM (Asbestos) Major Anone/Cations, pH, TDS	
12938 9/2 S X T-1 (AH 1) 10 - 10.5 11N	X N1		X		
939 (11 (7-7.5' 11)			~		
340) / / 8, 8-2, ///					
941)) T-2(5 2) 1'-1.5'					
942 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					
943 1 1 3'- 3.5'					
ayy / /// 4.5' ///					
945 / 11 5'-5.5' 11/					
94b 1 1 6 - 6.5 11					
$\frac{d\mu}{d\mu} = \frac{1}{2} $					
	Date: 4/S//4		Garca (AG)	Date: Time:	
El NOUSHED BY (Signature) Date: (3/8/)// BRETED BY (Signature) Date: (3/8/)// BRETED BY (Signature) D		SAMPLE SHIPPEI	D BY: (Circle) BUS	AIRBILL #: OTUED:	0
ELNQUISHED BY: (Signature) Date: RECEIVED BY: (Signature) D Time: Time: Time	Date: Time:	HEND DELIVER	IED UPS NTACT PERSON:	Results by:	1
ECEIVING LABORATORY: TALE RECEIVED BY: (Signature)				RUSH Charges Authorized:	T
ITY: Miklowsh Statte: N zip. Zip. Date: Da	TIME:	JEANE		Yes	

ŝ retall Laboratory Please fill out all copies -



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Certifications

WBE HUB **NCTRCA** DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

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

Report Date: September 17, 2014

Work Order: 14090902

Project Location: Eddy Co, NM **Project** Name: SME/ESDU #34 Project Number: 112MC07170

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
373948	CS 1 (AH-1) 8'	soil	2014-09-05	00:00	2014-09-08
373949	CS 2 (AH-2) 4'	soil	2014-09-05	00:00	2014-09-08
373950	CS 3 (S-1) 6'	soil	2014-09-05	00:00	2014-09-08

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

sturd

Dr. Blair Leftwich, Director James Taylor, Assistant Director Brian Pellam, Operations Manager

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Case Narrative

Samples for project SME/ESDU #34 were received by TraceAnalysis, Inc. on 2014-09-08 and assigned to work order 14090902. Samples for work order 14090902 were received intact at a temperature of 9.9 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	97605	2014-09-12 at 10:43	115418	2014-09-12 at 12:09

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 14090902 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

Analytical Report

Sample: 373948 - CS 1 (AH-1) 8'

Laboratory:	Midland								
Analysis:	Chloride (Titration)			nalyt	ical Method:	SM 4500-Cl B $$]	Prep Method:	N/A
QC Batch:	115418			Date Analyzed:		2014-09-12		Analyzed By:	MM
Prep Batch:	97605	Sample P			e Preparation:	2014-09-12]	Prepared By:	
					RL				
Parameter		Flag	Cer	t	Result	Unit	s Dil	ution	RL
Chloride		U			<20.0	mg/K	g	5	4.00

Sample: 373949 - CS 2 (AH-2) 4'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 115418 97605	Analytic Date An Sample	al Method: aalyzed: Preparation:	SM 4500-Cl B 2014-09-12 2014-09-12	Prep Method: Analyzed By: Prepared By:	N/A MM MM
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			49.0	mg/Kg	5	4.00

Sample: 373950 - CS 3 (S-1) 6'

laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B $$	Prep Method:	N/A
QC Batch:	115418	Date Analyzed:	2014-09-12	Analyzed By:	MM
Prep Batch:	97605	Sample Preparation:	2014-09-12	Prepared By:	MM
		RL			
Parameter	Flag	Cert Result	Units	Dilution	RL
Chloride	U	<20.0	m mg/Kg	5	4.00
QC Batch: Prep Batch: Parameter Chloride	115418 97605 	Date Analyzed: Sample Preparation: RL Cert Result <20.0	2014-09-12 2014-09-12 Units mg/Kg	Analyzed By: Prepared By: Dilution 5	M M

Method Blanks

Method Bla	ank (1)	QC Batch: 115418				
QC Batch: Prep Batch:	$\frac{115418}{97605}$		Date Analyzed: QC Preparation:	2014-09-12 2014-09-12	Analyzed By: Prepared By:	MM MM
				MDL		
Parameter		Flag	Cert	Result	Units	RL
Chloride				<3.85	m mg/Kg	4

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	115418 97605			Date QC I	Analyzed Preparatio	: 201 m: 201	4-09-12 4-09-12			Ana Prej	lyzed By pared By	: MM : MM
Param			F	CI	LCS Result	Units	Dil.	Spike Amount	Ma Re	atrix esult	Rec.	Rec. Limit
Chloride					2680	mg/Kg	5	2500	<	19.2	107	85 - 115
Percent recov	very is based on the s	pike	resu	lt. RPD	is based o	on the sp	pike and sp	ike duplic	ate resi	ult.		
				LCSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride				2680	mg/Kg	5	2500	<19.2	107	85 - 115	5 0	20

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

Matrix Spikes

Matrix Spike (MS-1)	Spiked San	nple	: 373949								
QC Batch: 115418 Prep Batch: 97605			Date QC	e Analyze Preparati	d: 20 on: 20	14-09-12 14-09-12			Anal Prep	lyzed By: bared By:	MM MM
				MS			Spike	Ma	atrix		Rec.
Param]	ſ	C I	Result	Units	Dil.	Amount	Re	esult Re	ec. 1	Limit
Chloride				2490	mg/Kg	5	2500	2	49 9	8 78	9 - 121
Percent recovery is based or	n the spike	resu	ılt. RPD	is based	on the s	spike and s	pike dupli	cate re	sult.		
			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2390	mg/Kg	5	2500	49	94	78.9 - 121	4	20

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

Calibration Standards

Standard (ICV-1)

QC Batch: 115418		Date A	Date Analyzed:			Analyz	Analyzed By: MM		
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2014-09-12

Standard (CCV-1)

QC Batch:	115418			Date A	Analyzed:	2014-09-12		Analy	rzed By: MM
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2014-09-12

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Appendix

Report Definitions

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

Laboratory Certifications

	Certifying	Certification	Laboratory					
\mathbf{C}	Authority	Number	Location					
-	NCTRCA	WFWB384444Y0909	TraceAnalysis					
-	DBE	VN 20657	TraceAnalysis					
-	HUB	1752439743100-86536	TraceAnalysis					
-	WBE	237019	TraceAnalysis					

Standard Flags

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

Attachments

Report Date: September 17, 2014 112MC07170

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The scanned attachments will follow this page.

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

	AGE: OF: ANALYSIS REGULEST	(Circle or Specify Method No.)		иоиE ВТЕХ 8021В ПРН 8015 РАН 8270 ВСЕА Метаl ТСLР Матаl СС.М5 56mi РСВ'5 8080/ Всл.М5 Vol. 8 GC.M5 56mi РСВ'5 8080/ Вса Сболбе Сболбе Сатта 506/ Сболбе Сатта 506/ Сболбе Сатба 506/ Сболбе Сатба 506/ Сболбе Сатта 506/ Сотта 506/ Со							12:00 BY: (Print& Initial) Date: 12:00 Date: Time:	FEDEX BIPPED BY: (Circle) AIRBILL #:	TETRA TECH CONTACT PERSON: Results by:	Tom ElliotT RUSH Charges	Jewichitch Authorized: No		anager retains Pink copy - Accounting receives Gold copy.		
e 0505041	Analysis Request of Chain of Custody Record		1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946	CLIENT NAME: SM ENGroy SITE MANAGER: DIG 11:0-14 B PRESERVA	PROJECT NO.:UPROJECT NAME: $ 12mc07170$ SM $\mathbb{P}No.cmu$ $\mathbb{ESD}u \# 34$	LABI.D. LABI.D. NUMBER DATE TIME TIME TIME SAMPLE IDENTIFICATION NUMBER 2014 ADVIE SAMPLE IDENTIFICATION	373948 9/5 S K CS I (AH I) 8' IN K	949 CSA (AH Z) 4' IIN X	920 CS3 (\$\$ S-1) 6' 11 M				RELINQUYSHED BY: (Signature) Date: 715/17 RECEIVED BX:400781005 Date: 41	RELINOUISHED BY: CSUMMARY Date: 1/ 2/14 DetCENTED BY: 450ENTED BY: 45100 Date: 7/10.1	RELINQUISHED BY: (Signature) Date: D	RECEIVING LABORATORY: I PAC ATRIVIS RECEIVED BY: (Signature)	CITY: Much Contact: Variate: Variation ZIP: Date: Date: The Date: Time:	sample condition when received: Remarks: $9.5 \circ$	Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Ma