

MAR 1,6 2012

February 17, 2012

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

Re: Closure Report for SM Energy Company ESDU #20 SWD Unit A, 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 Energy) to assess a spill from the ESDU #20 SWD located in Unit A, Section 24, Township 18 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.736941°, W 103.81544°. 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 November 11, 2009. Approximately 200 barrels of produced water was released from an injection line leak at the wellhead. The final C-141 is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 24. However, well records in the vicinity of the site and indicate the depth to water is greater than 300' below grade surface (bgs). The groundwater data is included in Appendix B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum



hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Results

On November 19, 2009, Tetra Tech personnel inspected the spill area, which migrated to two locations. The first location was on the northeast corner of the tank battery pad and measured approximately 120' by 150'. The second area was northeast of the pad and measured approximately 45' by 65'. The two areas were connected by two narrow channels approximately 100' in length.

During the initial assessment a total of ten (10) auger holes (AH-1 through AH-10) were installed using a stainless steel hand auger to assess the impacted soils in the spill area. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. All of the samples analyzed were below the RRAL for both BTEX and TPH. Elevated chloride concentrations were detected in the shallow soils from auger holes AH-1 through AH-5 and AH-7. Deeper chloride concentrations were observed in AH-6, A-8, AH-9 and AH-10. AH-9 and AH-10 had elevated chloride concentrations in the lower samples collected. Upon review of aerial photographs, it was observed that AH-8 and AH-9 appear to be in the closed reserve pit and that AH-10 is just off the edge of the reserve pit. The results of the sampling are summarized in Table 1. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The location of the borehole and auger hole locations are shown on Figure 3.

Remediation and Closure Activities

A work plan was submitted and approved by NMOCD. Tetra Tech personal were on site on September 14, 2011 through October 3, 2011 to oversee the removal of impacted material as discussed in the approved work plan. The areas of AH-1 through AH-3 were excavated to a depth of 1-4' bgs. The areas of AH-6 and AH-7 were excavated to a depth of 3' bgs, and the area of AH-8 was excavated to a depth of 3' bgs (Figure 4). Approximately 596 cubic yards of impacted soil were transported offsite for disposal at Lea Land, Inc. of Hobbs, New Mexico. Based on the results (including several confirmation samples), the excavation was backfilled with clean material to surface grade and a 2.5' dike has been built on the east and north sides of the pad to prevent further runoff impact to the native dunes.

In addition to the spill area, the BLM requested that SM Energy restore the former reserve pit location. Tetra Tech collected samples to a depth of 4' bgs in 12 locations thru out the former reserve pit to evaluate potential chloride concentrations (Figure 4 and Table 2). Laboratory data for the chloride samples indicated that if observed, the maximum detected chloride concentration (720 mg/kg) should not prohibit vegetation growth. Additional topsoil (1.5 to 2') was imported to the former reserve pit location and contoured to match the surrounding land surface. A mixture of BLM #2 and



#4 seed mix was applied to this area as well as other construction affected areas off of the pad.

Based on the remediation performed, SM Energy requests closure of the site. If you have any questions or comments concerning the assessment or the remediation activities performed at the site, please call me at (432) 682-4559.

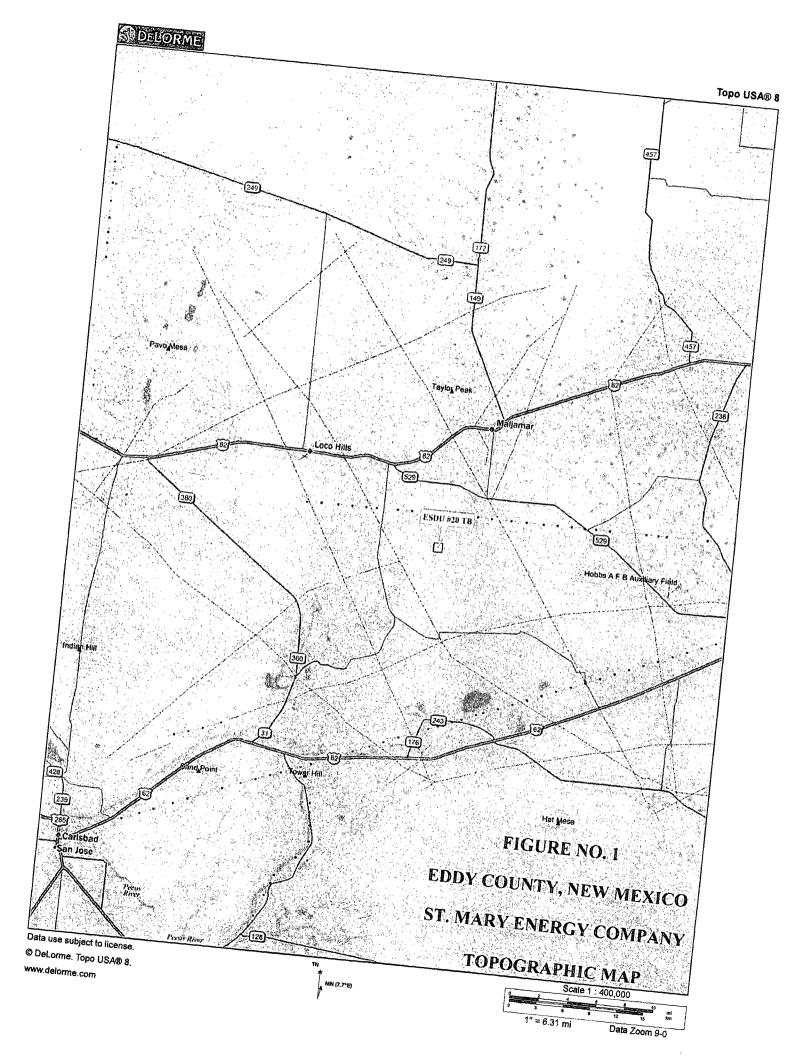
Respectfully submitted, **TETRA TECH, INC.**

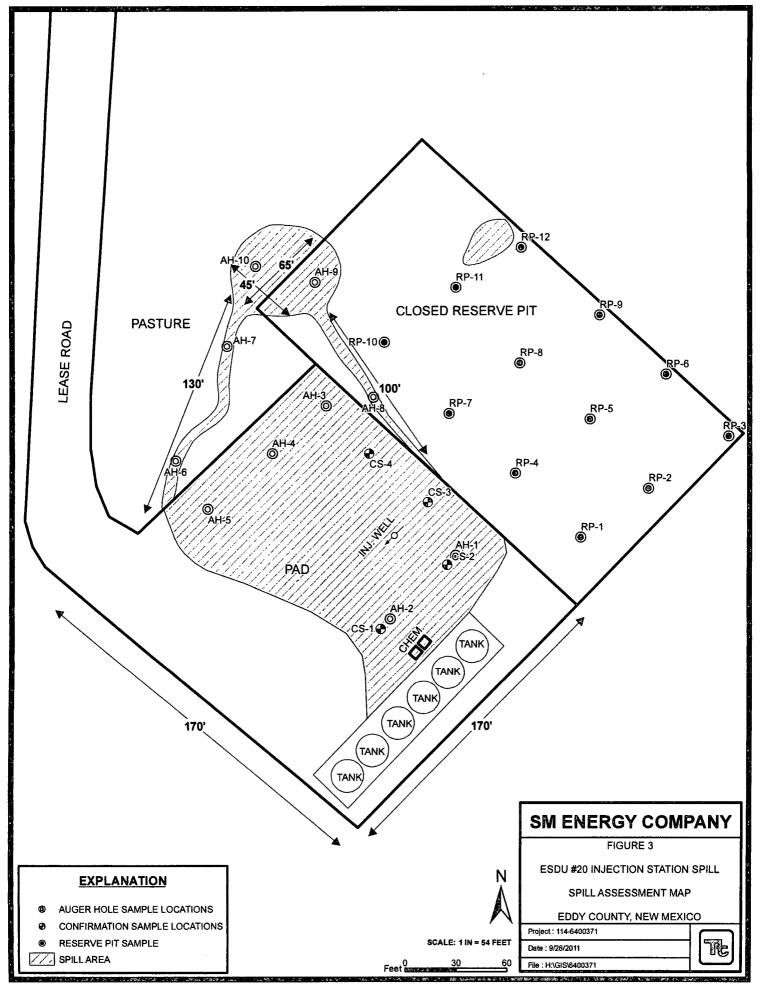
Aaron Hale Senior Project Manager

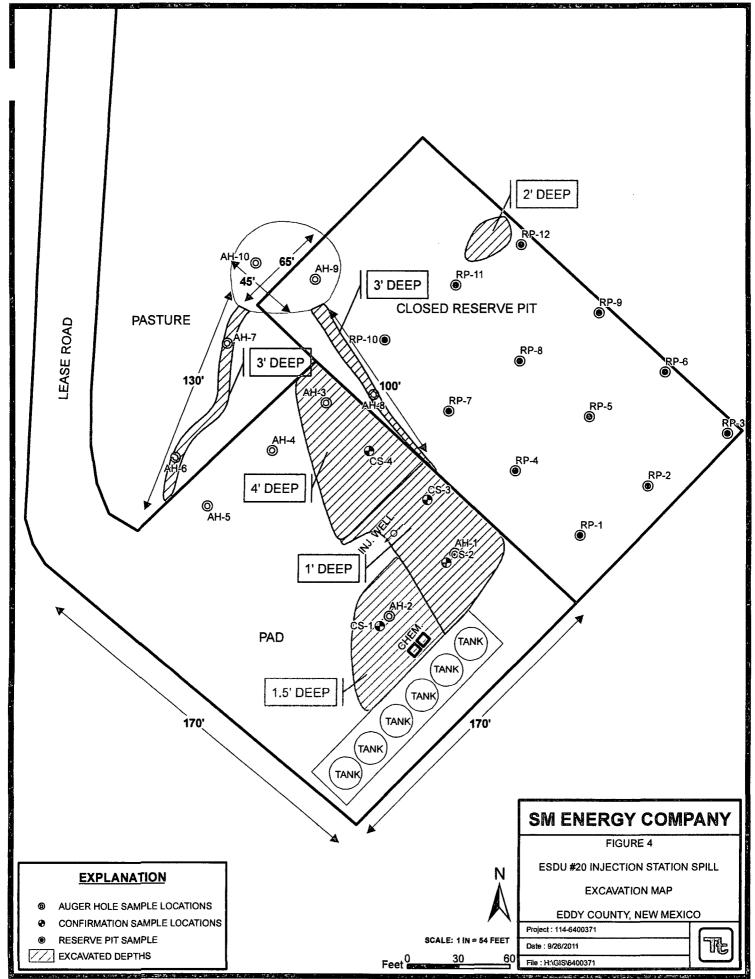
cc: Mark Bondy – SM Energy Don Riggs – SM Energy Terry Gregston – BLM, Carlsbad .

FIGURES

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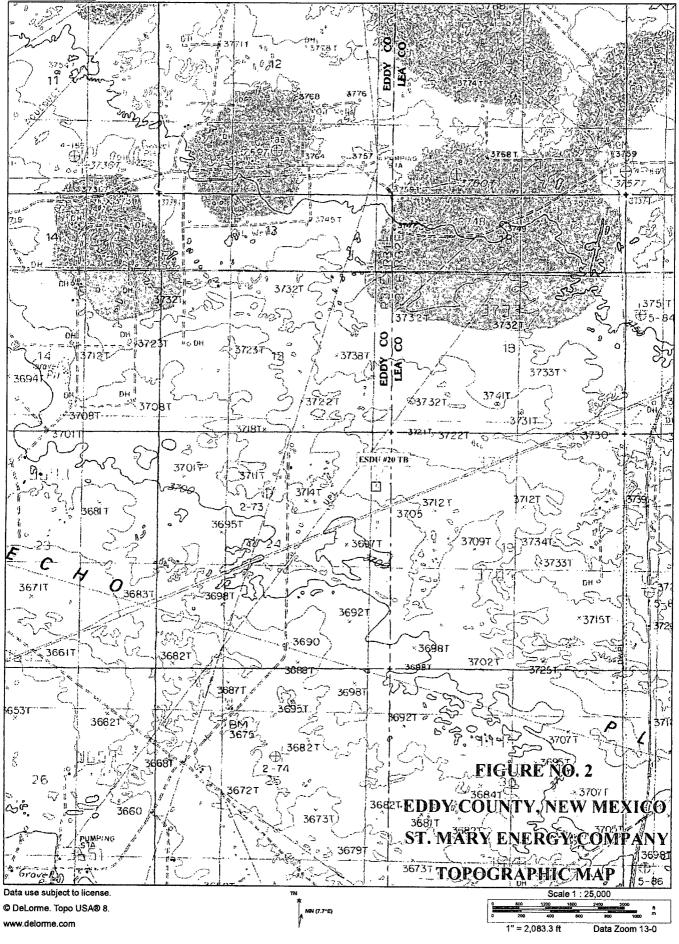






Drawn By: Isabel Marmolej

DELORME



TABLES

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Table 1 ST. MARY ESDU #20 SWD EDDY COUNTY, NEW MEXICO

1

Sample	Date	Sample	Soil S	Status	-	TPH (mg/kg	1)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
D	Sampled	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	-11/20/2009	0-1		X	<1.00	< <u>\$</u> 50.0		<0.0100	<0.0100	<0.0100	⊷<0.0100 s	2,410
	11/20/2009	1-1.5'	x		-	-	. -	-		-	-	285
	11/20/2009	2-2.5'	x		-	-	-	-	-	-	-	813
	11/20/2009	3-3.5'	x			-	-	-	-	-	-	913
	11/20/2009	4-4.5'	X		-	-	-	-	-	_		634
	11/20/2009	5-5.5'	x			-	-		<u> </u>			319
AH-2	1.1/20/2009	0-1		* X	<1.00	<50.0	<50.0		<u>د</u>			6,440
	11/20/2009	1-1.5										<200
	11/20/2009	2-2.5'	x		-	-	-	-	-	-	-	<200
AH-3	11/20/2009	0-1		× × ×	<1.00	< 5 0.0	<50.0					3,160
7410	11/20/2009	1-1.5		X								436
	11/20/2009	1. 1. 1. 1. 1. 2 P		X	THE P.			1.1.5-4-4-			and the second sec	213
AH-4	11/20/2009	0-1'	x	[<1,00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	<200
	11/20/2009	1-1.5'	x		-	-	-	-	-	-	-	263
	11/20/2009	2-2.5'	x		-	-	-		-	-	-	768
	11/20/2009	3-3.5'	X		-	-	-	-	-	-	-	420
	11/20/2009	4-4.5'	х		-	-	-	-	-	-	-	<200

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Table 1 ST. MARY ESDU #20 SWD EDDY COUNTY, NEW MEXICO

Sample	Date	Sample	Soil	Status		TPH (mg/kg))	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
ID	Sampled	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-5	11/20/2009	0-1'	х		<1.00	<50.0	<50.0	-	•	-	-	1,070
	11/20/2009	1-1.5'	x		-	-	-		-	-	•	<200
	11/20/2009	2-2.5'	х		-	-	-	-	-	-	-	<200
<u> </u>	11/20/2009	3-3.5'	x		-	-	-	-	-	-	-	<200
AH-6	11/20/2009	0-1		X	<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	3,720
	11/20/2009	1 .1.5		X			با برد می وسه م سرم بر ا					5,290
	11/20/2009	2:2.5		X				a Child	a a star star star star star star star s			8,170
	11/20/2009	3-3.5		X		A. C. W. AND		المراجع المراجع منابع المراجع ال		10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	Strate Strate	<200
	11/20/2009	4-4.5'	x		-	-		-	-	-	-	479
	11/20/2009	5-5.5'	х		-	-	-	-	-	-	-	<200
	11/20/2009	6-5.5'	x			-	_	-		-	-	1,430
AH-7	11/20/2009	: €0-1'∰^		×	1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	6,010
	11/20/2009	1-1.5		X								2540
	11/20/2009	2-2.5		Χ						State State		255
_	11/20/2009	3-3.5	and a start of the	X								<200
	11/20/2009	4-4.5'	x		-	-	-	-	-	_	-	<200

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Table 1 ST. MARY ESDU #20 SWD EDDY COUNTY, NEW MEXICO

Sample	Date	Sample	Soil	Status	-	TPH (mg/kg	j)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
ID	Sampled	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-8	11/20/2009	0-1	之後又對	X	<1.00	<50.0	≥ ≥50.0∔	<0.0100	<0.0100	<0.0100	<0.0100	7,740
	11/20/2009	1-1.5		X					a sure we			6000
	11/20/2009	2-2.5		X								2,560
	11/20/2009	3-3.5'		X								1,440
	11/20/2009	4-4.5'	х			-	-	-	-	-	-	<200
	11/20/2009	5-5.5'	x		-	-	-	_	-	-	-	957
	11/20/2009	6-6.5'	x		-	-	-	-	-	-	-	3,430
	11/20/2009	7-7.5'	х		-	-	-	-	-	-	-	6,340
	11/20/2009	8-8.5'	x		-	-	-	-	-	-	-	8830
AH-9	11/20/2009	0-1'	x		<1.00	<50.0	<50.0	-	-	-	-	579
	11/20/2009	1-1.5'	х		-	-	-		-	-	-	272
	11/20/2009	2-2.5'	х		-	-	-	-	-	-	-	644
	11/20/2009	3-3.5'	x		-	-	-	-	-	-	-	2,720
	11/20/2009	4-4.5'	x		-	-	-	-	-		-	7,410
AH-10	11/20/2009	0-1'	x		<1.00	<50.0	<50.0	_	-	-	-	297
	11/20/2009	1-1.5'	x	İ	-		-		-	-	_	<200
	11/20/2009	2-2.5'	X		-	-	-	-	-	-	-	<200
	11/20/2009	3-3.5'	x		-	-	-	-	-	-	<u> </u>	1,380
										1		

(-) Not Analyzed

Table 2 Saint Mary ESDU #20 SWD

Eddy County, New Mexico

Sample ID	Sample Date	Comple Donth (ft)	Denth (DED)	Soi	l Status	Chlorido (ma/ka)
	Sample Date	Sample Depth (ft)		In-Situ	Removed	Chloride (mg/kg)
RP-1	9/14/2011	0-1'		Х		<200
	31	1-2'		Х		<200
	4	2-3'		Х		<200
	"	3-4'		X		<200
RP-2	9/14/2011	0-1'	<u> </u>	X		<200
·····	11	1-2'		X	· · · · · · · · · · · · · · · · · · ·	<200
	n	2-3'	<u> </u>	X		<200
	11	3-4'		X		<200
RP-3	9/14/2011	0-1'	1	X		<200
	11	1-2'	†	X		<200
	11	2-3'		X		<200
······································	11	3-4'		X		<200
RP-4	9/14/2011	0-1'		Х		587
	8	1-2'		X		316
		2-3'		X		336
	"	3-4'		X		206
RP-5	9/14/2011	0-1'	<u> </u>	X		<200
	"	1-2'		<u>^</u>		<200
	11	2-3'		X		<200
·	16	3-4'	<u>†</u>			<200

Table 2 Saint Mary ESDU #20 SWD

Eddy County, New Mexico

Sample ID	Sample Date	Samala Depth (ft)	Denth (RER)	Soi	l Status	Chlorido (mg/kg)
Sample ID	Sample Date	Sample Depth (ft)		In-Situ	Removed	Chloride (mg/kg)
RP-6	9/14/2011	0-1'		X		<200
······································	"	1-2'		X		<200
	li	2-3'		Х		<200
	"	3-4'		Х		<200
RP-7	9/14/2011	0-1'	TT	X		<200
	a	1-2'		Х		<200
······································	0	2-3'		X	·····	239
······································	8	3-4'		X	······································	425
RP-8	9/14/2011	0-1'	T 1	X		<200
	15	1-2'	1 1	X		288
	13	2-3'		X		264
	"	3-4'		X	······································	<200
RP-9	9/14/2011	0-1'	1 1	X	<u></u>	<200
	11	1-2'		X		<200
		2-3'		X		<200
	"	3-4'		X		200
RP-10	9/14/2011	0-1'	1	X		<200
	4	1-2'	1	X		<200
	u	2-3'	1	X		<200
	11	3-4'		X		529

Table 2 Saint Mary ESDU #20 SWD

Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Donth (REP)	So	il Status	Chloride (mg/kg)
Sample ID	Sample Date	Sample Depth (It)	Depth (BEB)	In-Situ	Removed	Chionde (ing/kg)
RP-11	9/14/2011	0-1		Х		387
	н	1-2'		X		534
	11	2-3'		Х		509
	0	3-4'		X		720
RP-12	9/14/2011	0-1'	T	X	l	<200
	"	1-2'		X		<200
	u u	2-3'		X		<200
	u	3-4'		X		<200
AH-Pasture-1	9/26/2011	0-1			X	25,000
		1-1.5			X	16,100
		2-2.5			. X	7,810
	11	3-3.5'		Х		27,500
	"	4-4.5'		X		27,700
CS-4	9/26/2011	4'		X	· · ·	1,810
	13	5'	1	X		3,180
	"	6'		X		202
CS-5	9/26/2011	0-1'		X		<200
	"	1-2'	1	<u> </u>		377
<u> </u>	н	2-3'		x		<200
······································	"	3-4'		<u> </u>		<200

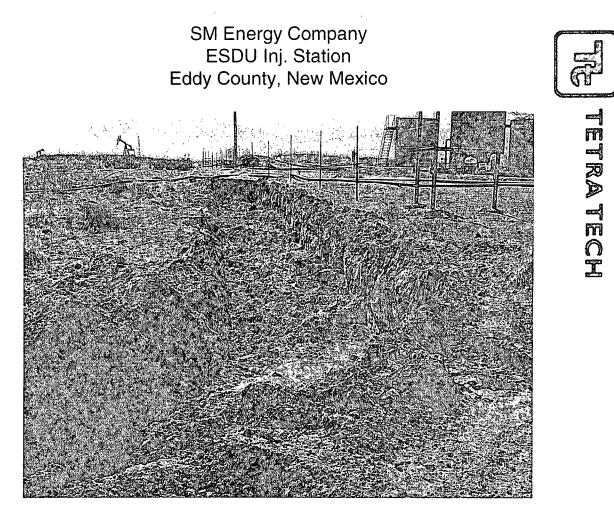
BEB

Below Excavation Bottom

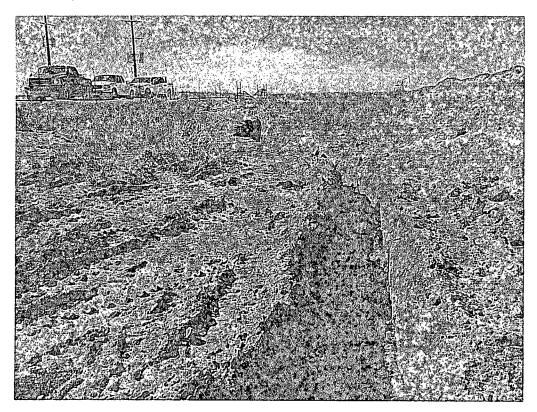


Excavated Depth

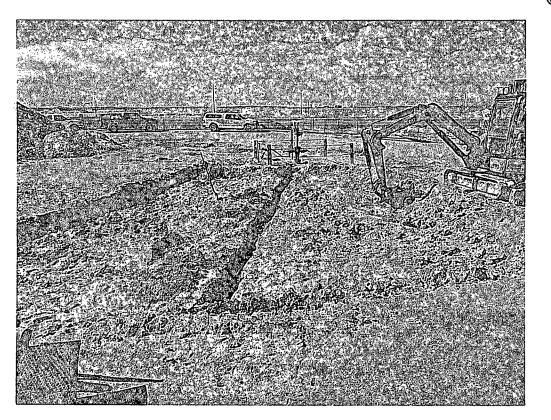
PHOTOGRAPHS



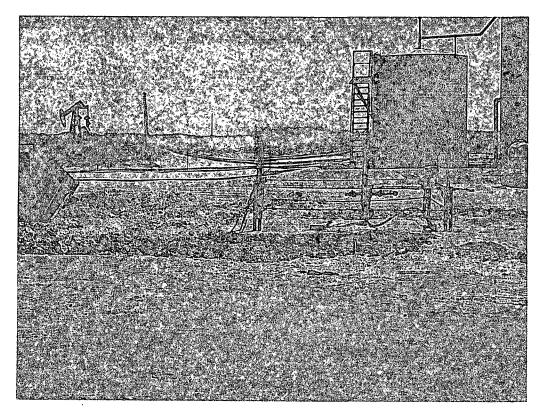
View West - AH-8



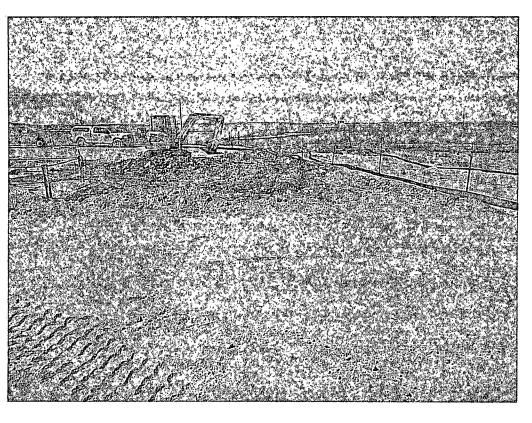
View North – AH-7 & 6



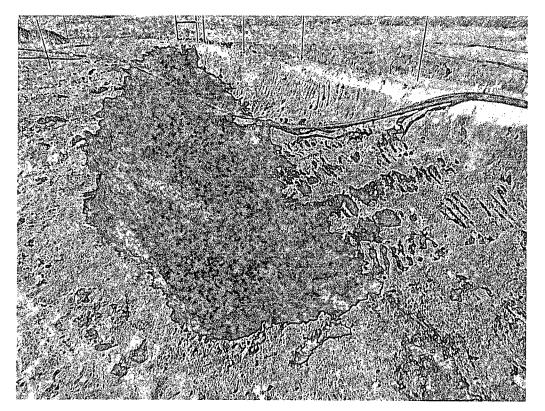
View North – AH-2



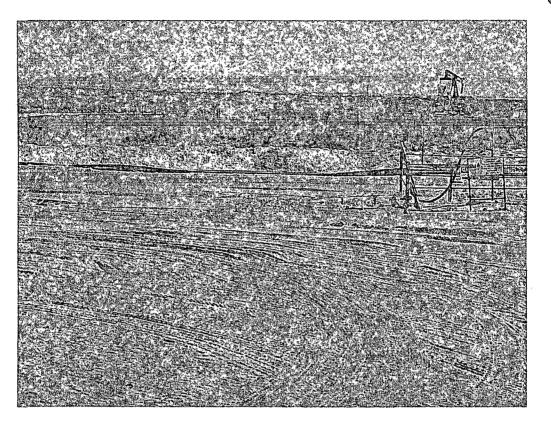
View South – AH-1

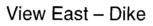


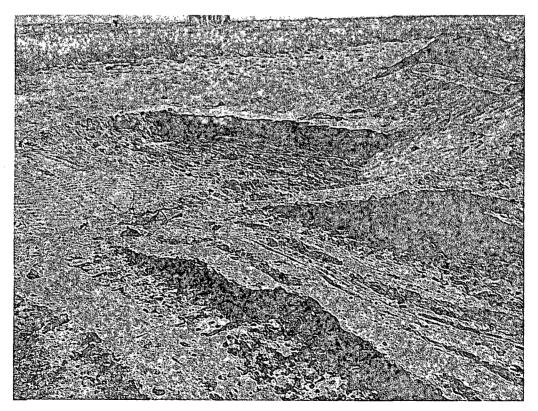
View North – AH-1



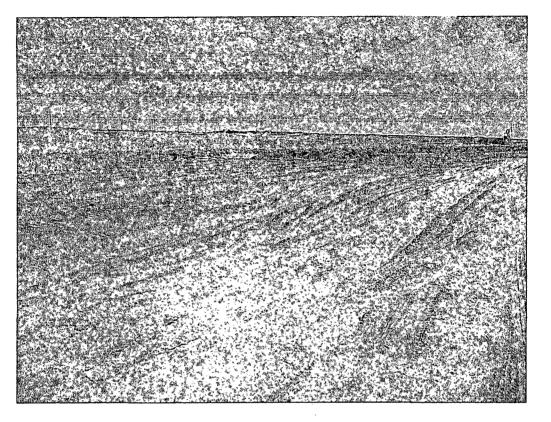
View North – AH-3



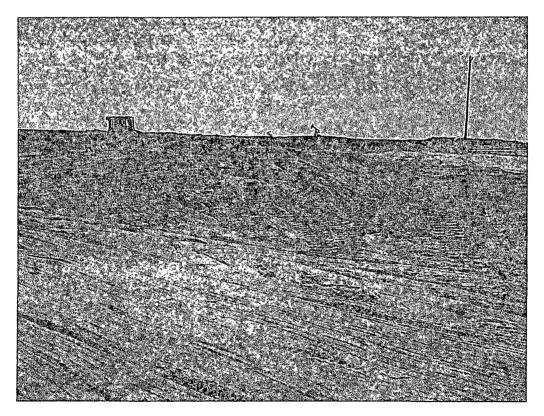




View East - Backfill of Reserve Pit



View North East - Backfill of Reserve Pit



View South – Backfill of Reserve Pit

APPENDIX A

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

Form C-141 Revised October 10, 2003

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

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 St. Mary Land & Exploration Co. Contact Donna Huddleston Address 3300 N. A Street, Bldg. 7, Ste. 200 Midland, Tx Telephone No. (432) 688-1789 Facility Name ESDU Injection Station Facility Type Injection Station Mineral Owner: BLM

Surface Owner: BLM

Lease No.

LOCATION OF RELEASE

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

Latitude N 32.736941° Longitude W 103.81544°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 200 bbls		ecovered 0 bbls
Source of Release: Injection line at the Wellhead.	Date and Hour of Occurrence	Date and H	Iour of Discovery
	11/11/2009	11/11/2009	9 6:30 p.m.
Was Immediate Notice Given?	If YES, To Whom?		
🛛 Yes 🔲 No 🗌 Not Required	Jim Amos-BLM & Darold Gray-	NMOCD	
By Whom? Bill Hearne	Date and Hour 11/11/2009 8:2	5 p.m.	
Was a Watercourse Reached?	If YES, Volume Impacting the Wa	tercourse.	
🗌 Yes 🖾 No	N/A		
If a Watercourse was Impacted, Describe Fully.*			· · · · · · · · · · · · · · · · · · ·
N/A			
Describe Cause of Problem and Remedial Action Taken.*			
Discovered steel (IPC) 2 3/8" 8rd X 2" 11 1/2 V thread changeover had fai			
Closed trunk line valve, feeding injection line lateral, to shut off leak. Bro	oke out failed connection and replaced	1 with stainle	ss steel changeover.
Describe Area Affected and Cleanup Action Taken.*		<u></u>	
Tetra Tech inspected site and collected samples to define the spills extent.			
Site was then brought up to surface grade with clean backfill material. Tet	ra Tech prepared closure report and s	ubmitted to N	IMOCD for review.
I hereby certify that the information given above is true and complete to the	e best of my knowledge and understa	and that pursu	ant to NMOCD rules and
regulations all operators are required to report and/or file certain release n			
public health or the environment. The acceptance of a C-141 report by the			
should their operations have failed to adequately investigate and remediate			
or the environment. In addition, NMOCD acceptance of a C-141 report d	pes not relieve the operator of responsi	sibility for co	mpliance with any other
federal, state, or local laws and/or regulations.		LINKONI	
	OIL CONSERV	VATION I	DIVISION
Signature:			
	Approved by District Supervisor:		
Printed Name: Aaron Hale	Approved by District Supervisor.		
Title: Project Manager	Approval Date:	Expiration D	ate:
E-mail Address: aaron.hale@tetratech.com	Conditions of Approval:		
· · · · · · · · · · · · · · · · · · ·	conditions of Approval.		Attached
Date: Phone: (432) 682-4559			

* Attach Additional Sheets If Necessary

APPENDIX B

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Water Well Data Average Depth to Groundwater (ft) SM ENERGY - ESDU Injection Station Eddy County, New Mexico

18 South

	17 Sc	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	29	28	27	26	25
31	32	33	34	35	36

	18 Sc	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	29	28	27	26	25
31	32	33	34	35	36

_	17 Sc	outh	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 SITE

31 East

SITE

	17 Sc	outh	32	East
6	5	4 82	3	2 60
	ľ	Aaliam	17 5	
7	8	9	10	11 70
				88
18	17	16	15	14
19	20	21	22	23
30 180	29	28	27	26
dry 31				
31	32	33	34	35
Brown				

	18 Sc	outh	1	32	East
6	5	4	65	3	2
7 460 82	8	9		10	11
18	17	16 84		15	14
19	20 164	21		22 429	23
30	29	28		27	26
31	32	33		34 11 7	35

	19 Sc	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

	19	South		31 Eas	t
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	28 180	27	26	25
31	32	33 101	34	35	36 1 30

31	32	33	34	35
			117	
			•••	
	19 Sc	outh	32	East
6	5	4	3	2
7	8 365	9	10	11
18	17	16	15	14
19	20	21	22	23
102	345			
30	29	28	27	26
31	32	33	34	35
			250	

New Mexico State Engineers Well Reports

USGS Well Reports

Geology and Groundwater Conditions in Southern Eddy, County, NM

NMOCD - Groundwater Data

APPENDIX C



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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Oklahoma ISO 17025 Kansas

Analytical and Quality Control Report

Aaron Hale Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: September 22, 2011

Work Order: 11091548

Project Location: Eddy Co., NM Project Name: St. Mary/ESDU #20 SWD Project Number: 114-6400371

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
277394	RP-1 0-1'	soil	2011-09-14	00:00	2011-09-15
277395	RP-1 1-2'	soil	2011-09-14	00:00	2011-09-15
277396	RP-1 2-3'	soil	2011-09-14	00:00	2011-09-15
277397	RP-1 3-4'	soil	2011-09-14	00:00	2011-09-15
277398	RP-2 0-1'	soil	2011-09-14	00:00	2011-09-15
277399	RP-2 1-2'	soil	2011-09-14	00:00	2011-09-15
277400	RP-2 2-3'	soil	2011-09-14	00:00	2011-09-15
277401	RP-2 3-4'	soil	2011-09-14	00:00	2011-09-15
277402	RP-3 0-1'	soil	2011-09-14	00:00	2011-09-15
277403	RP-3 1-2'	soil	2011-09-14	00:00	2011-09-15
277404	RP-3 2-3'	soil	2011-09-14	00:00	2011-09-15
277405	RP-3 3-4'	soil	2011-09-14	00:00	2011-09-15
277406	RP-4 0-1'	soil	2011-09-14	00:00	2011-09-15
277407	RP-4 1-2'	soil	2011-09-14	00:00	2011-09-15
277408	RP-4 2-3'	soil	2011-09-14	00:00	2011-09-15
277409	RP-4 3-4'	soil	2011-09-14	00:00	2011-09-15
277410	RP-5 0-1'	soil	2011-09-14	00:00	2011-09-15
277411	RP-5 1-2'	soil	2011-09-14	00:00	2011-09-15

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
277412	RP-5 2-3'	soil	2011-09-14	00:00	2011-09-15
277413	RP-5 3-4'	soil	2011-09-14	00:00	2011-09-15
277414	RP-6 0-1'	soil	2011-09-14	00:00	2011-09-15
277415	RP-6 1-2'	soil	2011-09-14	00:00	2011-09-15
277416	RP-6 2-3'	soil	2011-09-14	00:00	2011-09-15
277417	RP-6 3-4'	soil	2011-09-14	00:00	2011-09-15
277418	RP-7 0-1'	soil	2011-09-14	00:00	2011-09-15
277419	RP-7 1-2'	soil	2011-09-14	00:00	2011-09-15
277420	RP-7 2-3'	soil	2011-09-14	00:00	2011-09-15
277421	RP-7 3-4'	soil	2011-09-14	00:00	2011-09-15
277422	RP-8 0-1'	soil	2011-09-14	00:00	2011-09-15
277423	RP-8 1-2'	soil	2011-09-14	00:00	2011-09-15
277424	RP-8 2-3'	soil	2011-09-14	00:00	2011-09-15
277425	RP-8 3-4'	soil	2011-09-14	00:00	2011-09-15
277426	RP-9 0-1'	soil	2011-09-14	00:00	2011-09-15
277427	RP-9 1-2'	soil	2011-09-14	00:00	2011-09-15
277428	RP-9 2-3'	soil	2011-09-14	00:00	2011-09-15
277429	RP-9 3-4'	soil	2011-09-14	00:00	2011-09-15
277430	RP-10 0-1'	soil	2011-09-14	00:00	2011-09-15
277431	RP-10 1-2'	soil	2011-09-14	00:00	2011-09-15
277432	RP-10 2-3'	soil	2011-09-14	00:00	2011-09-15
277433	RP-10 3-4'	soil	2011-09-14	00:00	2011-09-15
277434	RP-11 0-1'	soil	2011-09-14	00:00	2011-09-15
277435	RP-11 1-2'	soil	2011-09-14	00:00	2011-09-15
277436	RP-11 2-3'	soil	2011-09-14	00:00	2011-09-15
277437	RP-11 3-4'	soil	2011-09-14	00:00	2011-09-15
277438	RP-12 0-1'	soil	2011-09-14	00:00	2011-09-15
277439	RP-12 1-2'	soil	2011-09-14	00:00	2011-09-15
277440	RP-12 2-3'	soil	2011-09-14	00:00	2011-09-15
277441	RP-12 3-4'	soil	2011-09-14	00:00	2011-09-15

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

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

Michael Abort

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

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Case Narrative

Samples for project St. Mary/ESDU #20 SWD were received by TraceAnalysis, Inc. on 2011-09-15 and assigned to work order 11091548. Samples for work order 11091548 were received intact at a temperature of 17.6 C.

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

		Prep	Prep	\mathbf{QC}	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	72038	2011-09-16 at 09:45	84840	2011-09-19 at 16:09
Chloride (Titration)	SM 4500-Cl B	72038	2011-09-16 at 09:45	84841	2011-09-19 at 16:09
Chloride (Titration)	SM 4500-Cl B	72038	2011-09-16 at 09:45	84842	2011-09-19 at 16:11
Chloride (Titration)	SM 4500-Cl B	72038	2011-09-16 at 09:45	84897	2011-09-21 at 16:13
Chloride (Titration)	SM 4500-Cl B	72038	2011-09-16 at 09:45	84898	2011-09-21 at 16:14
Chloride (Titration)	SM 4500-Cl B	72038	2011-09-16 at 09:45	84899	2011-09-21 at 16:15

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 11091548 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.

Report Date: September 22, 2011 114-6400371

Work Order: 11091548 St. Mary/ESDU #20 SWD Page Number: 6 of 30 Eddy Co., NM

Analytical Report

Sample: 277394 - RP-1 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84840 72038	Analytical Method: Date Analyzed: Sample Preparation:		SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
	ا ر ت	a ,	RL	** */		77
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277395 - RP-1 1-2'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84840 72038	Analytical Method: Date Analyzed: Sample Preparation:		SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277396 - RP-1 2-3'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84840 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Report Date: September 22, 2011 114-6400371		Work Order: 11091548 St. Mary/ESDU #20 SWD			Page Number: 7 c Eddy Co.,		
Sample: 27	7397 - RP-1 3-4'						
Laboratory:	Midland						
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	•	
QC Batch:	84840	Date An	alyzed:	2011-09-19	Analyzed By:	AR	
Prep Batch:	72038	Sample	Preparation:	2011-09-16	Prepared By:	\mathbf{AR}	
			\mathbf{RL}				
Parameter	Flag	Cert	Result	Units	Dilution	RL	
Chloride	υ		<200	mg/Kg	50	4.00	

Sample: 277398 - RP-2 0-1'

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date An	alyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample 1	Preparation:	2011-09-16	Prepared By:	AR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	Ŭ		<200	mg/Kg	50	4.00

Sample: 277399 - RP-2 1-2'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84840 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	ÁR
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277400 - RP-2 2-3'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84841	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

Report Date: Septem 114-6400371	ıber 22, 2011		Vork Order: 11091 Mary/ESDU #20		Page Numb Edd	er: 8 of 30 y Co., NM
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277401 - RP-2 3-4'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84841 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
		-	RL			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	<u>ں</u>		<200	mg/Kg	50	4.00

Sample: 277402 - RP-3 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84841 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	ÁR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277403 - RP-3 1-2'

Chloride	U		<200	mg/Kg	50	4.00
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	72038	Samp	le Preparation:	2011-09-16	Prepared By:	AR
QC Batch:	84841	Date	Analyzed:	2011-09-19	Analyzed By:	AR
Analysis:	Chloride (Titration)	Analy	tical Method:	SM 4500-Cl B	Prep Method:	N/A
Laboratory:	Midland					

114-6400371	e: September 22, 2011	Work Order: St. Mary/ESDU		Page Number: Eddy Co	
Sample: 27	7404 - RP-3 2-3'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84841	Date Analyzed:	2011-09-19	Analyzed By:	\mathbf{AR}
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR
		RL			
Parameter	Flag	Cert Result	Units	Dilution	\mathbf{RL}
Chloride	U	<200	mg/Kg	50	4.00
Sample: 27	7405 - RP-3 3-4'				
Laboratory:	Midland				
- Laboratory: Analysis:	Midland Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 84841	Date Analyzed:	2011-09-19	Analyzed By:	AR
Laboratory: Analysis: QC Batch:	Midland Chloride (Titration)	•	2011-09-19	-	
Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 84841	Date Analyzed:	2011-09-19 2011-09-16	Analyzed By:	AR
- Laboratory:	Midland Chloride (Titration) 84841	Date Analyzed: Sample Preparation:	2011-09-19 2011-09-16	Analyzed By:	AR

Sample: 277406 - RP-4 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84841 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	ÁR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride			587	mg/Kg	50	4.00

Sample: 277407 - RP-4 1-2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84841	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

Report Date: Septem 114-6400371	Report Date: September 22, 2011 114-6400371		Work Order: 11091548 St. Mary/ESDU #20 SWD			r: 10 of 30 y Co., NM
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride			316	mg/Kg	50	4.00

Sample: 277408 - RP-4 2-3'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84841 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
D (<i>a</i> ,	RL	** **	DU	Dř
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			336	mg/Kg	50	4.00

Sample: 277409 - RP-4 3-4'

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84841	Date Analyzed:		2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:		2011-09-16	Prepared By:	AR
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride			206	mg/Kg	50	4.00

Sample: 277410 - RP-5 0-1'

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84842	Date Analyzed:		2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:		2011-09-16	Prepared By:	AR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	υ		<200	mg/Kg	50	4.00

Report Date: September 22, 2011 114-6400371		Work Order: 1 St. Mary/ESDU	Page Number: 11 of 30 Eddy Co., NM		
Sample: 27	7411 - RP-5 1-2'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84842	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR
		RL			
Parameter	Flag	Cert Result	Units	Dilution	\mathbf{RL}
Chloride	υ	<200	mg/Kg	50	4.00
Sample: 27	7412 - RP-5 2-3'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84842	Date Analyzed:	2011-09-19	Analyzed By:	ÁR
				• • •	

Prep Batch: 7203	38	Sample	Preparation:	2011-09-16	Prepared By:	AR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277413 - RP-5 3-4'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84842 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277414 - RP-6 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84842	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

Report Date: Septem 114-6400371	ber 22, 2011		Work Order: 11091548 Mary/ESDU #20 SWD		Page Number: 12 of 3 Eddy Co., NM	
			RL	TT	D 11 //	Dr
Parameter	Flag	Cert	\mathbf{Result}	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277415 - RP-6 1-2'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84842 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR.
Denemeter	Flor	Cont	RL	Ť T 14		זת
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

*

Sample: 277416 - RP-6 2-3'

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analyti	cal Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84842	Date A	nalyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample	Preparation:	2011-09-16	Prepared By:	AR
			RL			
Parameter	\mathbf{Flag}	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277417 - RP-6 3-4'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84842 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-19 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
Donomotor	The r	Cant	RL	TT - 1 - 1	D11 ()	DI
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 27	7418 - RP-7 0-1'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Metho	od: SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84842	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparat	ion: 2011-09-16	Prepared By:	AR
			RL		
Parameter	Flag	Cert Re	sult Units	Dilution	RL
Chloride	ບ	<	200 mg/Kg	50	4.00
- Laboratory:					()
Laboratory: Analysis: QC Batch:		Analytical Metho Date Analyzed: Sample Preparati	2011-09-19	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Laboratory: Analysis: QC Batch:	Midland Chloride (Titration) 84842	Date Analyzed:	2011-09-19 ion: 2011-09-16	Analyzed By:	AR
-	Midland Chloride (Titration) 84842	Date Analyzed: Sample Preparat	2011-09-19	Analyzed By:	AR
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84842 72038	Date Analyzed: Sample Preparat	2011-09-19 ion: 2011-09-16 RL	Analyzed By: Prepared By:	AR AR RI
Laboratory: Analysis: QC Batch: Prep Batch: Parameter <u>Chloride</u>	Midland Chloride (Titration) 84842 72038 Flag	Date Analyzed: Sample Preparat	2011-09-19 ion: 2011-09-16 RL sult Units	Analyzed By: Prepared By: Dilution	AR AR

QC Batch: 84897 Date Analyzed: 2011-09-21 Analyzed By: AR Prep Batch: 72038 Sample Preparation: 2011-09-16 Prepared By: AR Parameter Flag Cert Result Units Dilution RL	Chloride			239	mg/Kg	50	4.00
5 5 5 5	Parameter	Flag	Cert		Units	Dilution	RL
	QC Batch: Prep Batch:	84897 72038			2011-09-21 2011-09-16	vv	

Sample: 277421 - RP-7 3-4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84897	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
	r.ag	Cert	nesuit	Units	Dilution	nD
Chloride			425	mg/Kg	50	4.00

Sample: 277422 - RP-8 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84897 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
			\mathbf{RL}			
Parameter	\mathbf{Flag}	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277423 - RP-8 1-2'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84897 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride			288	mg/Kg	50	4.00

Sample: 277424 - RP-8 2-3'

Midland					
Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
84897	Date An	alyzed:	2011-09-21	Analyzed By:	AR
72038	Sample I	Preparation:	2011-09-16	Prepared By:	
		RL			
\mathbf{Flag}	Cert	Result	Units	Dilution	\mathbf{RL}
		264	mg/Kg	50	4.00
	Chloride (Titration) 84897 72038	Chloride (Titration)Analytic84897Date An72038Sample I	Chloride (Titration)Analytical Method:84897Date Analyzed:72038Sample Preparation:RLFlagCertResult	Chloride (Titration)Analytical Method:SM 4500-Cl B84897Date Analyzed:2011-09-2172038Sample Preparation:2011-09-16RLFlagCertResultUnits	Chloride (Titration)Analytical Method:SM 4500-Cl BPrep Method:84897Date Analyzed:2011-09-21Analyzed By:72038Sample Preparation:2011-09-16Prepared By:RLFlagCertResultUnitsDilution

Report Date 114-6400371	e: September 22, 2011	Work Order: 1 St. Mary/ESDU 3		Page Number: 1 Eddy C	
Sample: 27	7425 - RP-8 3-4'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84897	Date Analyzed:	2011-09-21	Analyzed By:	\mathbf{AR}
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR
		RL			
Parameter	Flag	Cert Result	Units	Dilution	\mathbf{RL}
Chloride	υ	<200	mg/Kg	50	4.00
Sample: 27	7426 - RP-9 0-1'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84897	Date Analyzed:	2011-09-21	Analyzed By:	\mathbf{AR}

Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
84897	Date An	alyzed:	2011-09-21	Analyzed By:	AR
72038	Sample	Preparation:	2011-09-16	Prepared By:	AR
		\mathbf{RL}			
Flag	Cert	Result	Units	Dilution	\mathbf{RL}
υ		<200	mg/Kg	50	4.00
	84897 72038 Flag	84897 Date An 72038 Sample Flag Cert	84897 Date Analyzed: 72038 Sample Preparation: RL Flag Cert Result	84897 Date Analyzed: 2011-09-21 72038 Sample Preparation: 2011-09-16 RL Flag Cert Result Units	84897 Date Analyzed: 2011-09-21 Analyzed By: 72038 Date Analyzed: 2011-09-16 Prepared By: RL RL Flag Cert Result Units Dilution

Sample: 277427 - RP-9 1-2'

Prep Batch: 72038 Sample Preparation: 2011-09-16 Prepared By: AR	QC Batch:84897Date Analyzed:2011-09-21Analyzed By:ARPrep Batch:72038Sample Preparation:2011-09-16Prepared By:AR	Parameter	Flag	Cert	RL Besult	Units	Dilution	BL
	Prep Batch:72038Sample Preparation:2011-09-16Prepared By:AR	Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Prep Batch: 72038 Sample Preparation: 2011-09-16 Prepared By: .		D				TT 1/		

Sample: 277428 - RP-9 2-3'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84897	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

Report Date: Septem 114-6400371	ıber 22, 2011		ork Order: 11091 1ary/ESDU #20		Page Numbe Edd	r: 16 of 30 y Co., NM
_		<i></i>	RL			~~~~
Parameter	Flag	Cert	\mathbf{Result}	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 277429 - RP-9 3-4'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84897 72038	Date Ana	l Method: lyzed: reparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			200	mg/Kg	50	4.00

Sample: 277430 - RP-10 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84898 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	AR.
			\mathbf{RL}			
Parameter	\mathbf{Flag}	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride	υ		<200	mg/Kg	50	4.00

Sample: 277431 - RP-10 1-2'

QC Batch: 84	bloride (Titration) 4898 2038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			\mathbf{RL}			
Parameter	Flag	Cert	\mathbf{Result}	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

Sample: 27		St. M.	ary/ESDU #	.091548 ≰20 SWD	Page Number: 1 Eddy Co	
	7432 - RP-10 2-3'					
Laboratory:	Midland					
Analysis:	Chloride (Titration)		al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84898	Date Ana		2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample P	reparation:	2011-09-16	Prepared By:	AR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	RI
			<200	mg/Kg	50	4.00
•	7433 - RP-10 3-4'			m8/ m8		4.0
Sample: 27 Laboratory: Analysis: QC Batch:		Date Ana	l Method:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	N/A
Sample: 27 Laboratory: Analysis: QC Batch:	7433 - RP-10 3-4' Midland Chloride (Titration) 84898	Date Ana	ıl Method: ılyzed:	SM 4500-Cl B 2011-09-21	Prep Method: Analyzed By:	N/A AR
	7433 - RP-10 3-4' Midland Chloride (Titration) 84898	Date Ana	l Method: lyzed: reparation:	SM 4500-Cl B 2011-09-21	Prep Method: Analyzed By:	N/A AR

Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84898	Date An	alyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample 1	Preparation:	2011-09-16	Prepared By:	AR
			\mathbf{RL}			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride			387	mg/Kg	50	4.00

Sample: 277435 - RP-11 1-2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84898	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
	F lag	Uert				
Chloride			534	mg/Kg	50	4.00

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Sample: 277436 - RP-11 2-3'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84898 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	,
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride	T lag		<u>509</u>	mg/Kg	50	4.00

Sample: 277437 - RP-11 3-4'

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84898	Date An	alyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample 1	Preparation:	2011-09-16	Prepared By:	AR
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride			720	mg/Kg	50	4.00

Sample: 277438 - RP-12 0-1'

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84898	Date An	alyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample I	Preparation:	2011-09-16	Prepared By:	AR
			RL			
			nL			
Parameter	Flag	Cert	\mathbf{Result}	Units	Dilution	RL
Chloride	υ		<200	mg/Kg	50	4.00

114-6400371	Date: September 22, 2011 Work Order: 11 0371 St. Mary/ESDU #				
Sample: 27	7439 - RP-12 1-2'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84898	Date Analyzed:	2011-09-21	Analyzed By:	\mathbf{AR}
Prep Batch:	72038	Sample Preparation	2011-09-16	Prepared By:	AR
		R	ı		
Parameter	Flag	Cert Resu	Units	Dilution	RL
	Flag υ	Cert Resu <20		Dilution 50	
Chloride Sample: 27 Laboratory:	7440 - RP-12 2-3' Midland	<20	mg/Kg	50	4.00
- Laboratory: Analysis:	7440 - RP-12 2-3' Midland Chloride (Titration)	<20 Analytical Method:	mg/Kg SM 4500-Cl B	50 Frep Method:	4.00
Chloride Sample: 27 Laboratory: Analysis: QC Batch:	7440 - RP-12 2-3' Midland	<20	5 mg/Kg SM 4500-Cl B 2011-09-21	50	
Chloride Sample: 27 Laboratory: Analysis: QC Batch:	v 7440 - RP-12 2-3' Midland Chloride (Titration) 84899 72038	<20 Analytical Method: Date Analyzed: Sample Preparatior R	M 4500-Cl B 2011-09-21 2011-09-16	50 Prep Method: Analyzed By:	4.00 N/A AR
Chloride Sample: 27 Laboratory:	v 7440 - RP-12 2-3' Midland Chloride (Titration) 84899	<20 Analytical Method: Date Analyzed: Sample Preparation	M 4500-Cl B 2011-09-21 2011-09-16	50 Prep Method: Analyzed By:	4.00 N/A AR

Sample: 277441 - RP-12 3-4'

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Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 84899 72038	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-09-21 2011-09-16	Prep Method: Analyzed By: Prepared By:	A R
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride	U		<200	mg/Kg	50	4.00

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Method Blank (1)	QC Batch: 84840				
QC Batch: 84840 Prep Batch: 72038		Date Analyzed: QC Preparation:	2011-09-19 2011-09-16	Analyzed By: Prepared By:	AR AR
Parameter Chloride	Flag	Cert	MDL Result <3.85	Units mg/Kg	RL 4
Method Blank (1)	QC Batch: 84841				
QC Batch: 84841 Prep Batch: 72038	QU Daten. 04041	Date Analyzed: QC Preparation:	2011-09-19 2011-09-16	Analyzed By: Prepared By:	AR AR
Parameter Chloride	Flag	Cert	MDL Result <3.85	Units mg/Kg	<u></u>
Method Blank (1)	QC Batch: 84842				
QC Batch: 84842 Prep Batch: 72038		Date Analyzed: QC Preparation:	2011-09-19 2011-09-16	Analyzed By: Prepared By:	AR AR
			MDL		

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

Method Blank (1)	QC Batch: 84897			
QC Batch: 84897	Date Analyzed:	2011-09-21	Analyzed By: AR	
Prep Batch: 72038	QC Preparation:	2011-09-16	Prepared By: AR	

Report Date: September 22, 2011 114-6400371			rder: 11091548 ESDU #20 SWD	Page Number: 21 of 30 Eddy Co., NM	
Parameter Chloride	Flag	Cert	MDL Result <3.85	Units mg/Kg	RL 4
Method Blank (1)	QC Batch: 84898				
QC Batch: 84898 Prep Batch: 72038		Date Analyzed: QC Preparation:	2011-09-21 2011-09-16	Analyzed By: Prepared By:	AR AR
Parameter	Flag	Cert	$egin{array}{c} { m MDL} \\ { m Result} \end{array}$	Units	RL
Chloride	<u>_</u>		<3.85	mg/Kg	4
Method Blank (1)	QC Batch: 84899				
QC Batch: 84899 Prep Batch: 72038		Date Analyzed: QC Preparation:	2011-09-21 2011-09-16	Analyzed By: Prepared By:	AR AR
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 84840 Prep Batch: 72038			te Analyzed Preparatio		1-09-19 1-09-16				alyzed E pared B	0
Param	F	С	LCS Result	Units	Dil.	Spike Amount		atrix sult	Rec.	Rec. Limit
Chloride		<u> </u>	93.5	mg/Kg		100		3.85	94	85 - 115
Percent recovery is based on th	ne spike res	ult RPI				ike duplice				
I creent recovery is based on th	ie spike ree			ni uic st	nic and st	nke uupnez	LUC ICOU			
		LCSI			Spike	Matrix		Rec.		RPD
Param	<u> </u>	-	1000	Dil.	Amount	Result	Rec.	Limit	RPD	
Chloride		105	mg/Kg	1	100	<3.85	$105_{$	85 - 115	5 12	20
Percent recovery is based on th										
Laboratory Control Spike QC Batch: 84841 Prep Batch: 72038			e Analyzed: Preparation		1-09-19 1-09-16				alyzed B pared B	•
Laboratory Control Spike QC Batch: 84841 Prep Batch: 72038 Param			Preparation LCS Result	n: 2011 Units	L-09-16 Dil.	Spike Amount	Re	Pre trix sult	pared B Rec.	y: AR Rec. Limit
Laboratory Control Spike QC Batch: 84841 Prep Batch: 72038	(LCS-1)	QC	Preparation LCS Result	n: 201	L-09-16 Dil.		Re	Pre trix	pared B	y: AR Rec.
Laboratory Control Spike QC Batch: 84841 Prep Batch: 72038 Param	(LCS-1) F	QC C ult. RPI	Preparation LCS Result 95.0 D is based o	n: 201 Units mg/Kg	Dil. 1 Dike and sp	Amount 100 ike duplica	Re: <3	Pre sult 1 3.85 llt.	pared B Rec.	y: AR Rec. Limit 85 - 115
Laboratory Control Spike QC Batch: 84841 Prep Batch: 72038 Param Chloride Percent recovery is based on th	(LCS-1) F ne spike res	QC C ult. RPI LCSE	Preparation LCS Result 95.0 D is based o	n: 2011 Units mg/Kg n the sp	Dil. Dil. 1 Dike and sp Spike	Amount 100 ike duplica Matrix	Res <3 ate resu	Pre sult 1 3.85 llt. Rec.	pared B Rec. 95	y: AR Rec. Limit 85 - 115 RPD
LaboratoryControl SpikeQC Batch:84841Prep Batch:72038ParamChloride	(LCS-1) F	QC C ult. RPI	Preparation LCS Result 95.0 D is based o	n: 201 Units mg/Kg	Dil. 1 Dike and sp	Amount 100 ike duplica	Re: <3	Pre sult 1 3.85 llt.	pared B Rec. 95 RPD	y: AR Rec. Limit 85 - 115 RPD

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:	84842	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	QC Preparation:	2011-09-16	Prepared By:	AR

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				LCS			Spike	M	atrix		Rec.
Param		\mathbf{F}	С	Result	Units	Dil.	Amount	Re	esult F	lec.	Limit
Chloride				98.0	mg/Kg	1	100	<	3.85	98	85 - 11
Percent recovery is based on	the spike	resu	lt. RPI) is based	on the sp	pike and sp	ike duplica	ate resu	ult.		
			LCSE)		Spike	Matrix		Rec.		RPL
Param	F	С	Result		Dil.	Amount	Result	Rec.	Limit	RPD	Limi
Chloride			105	mg/Kg	<u>5 1</u>	100	<3.85	105	85 - 115	7	20
Laboratory Control Spike	e (LCS-1	l)		e Analyzed		1-09-21				lyzed B	
Prep Batch: 72038			QU.	Preparatio	511: 201	1-09-16			Fre	pared B	y: AR
				LCS			Spike	Ma	atrix		Rec.
Param		F	С	Result	Units	Dil.	Amount	Re	esult F	lec.	Limit
NL1				96.2	mg/Kg	1	100	<	3.85	96	85 - 11
Jilloride											
	the spike	resu	lt. RPI) is based	on the sp	oike and sp	ike duplica	ate resu	ılt.		
Percent recovery is based on	the spike		lt. RPI LCSD		on the sp	oike and sp Spike	ike duplica Matrix	ate resu	ılt. Rec.		RPL
Percent recovery is based on Param	the spike F	resu C	LCSD Result	tUnits	Dil.	Spike Amount	Matrix Result	Rec.		RPD	Limi
Chloride Percent recovery is based on Param Chloride Percent recovery is based on	F	C	LCSD Result 104	t Units mg/Kg	Dil.	Spike Amount 100	Matrix Result <3.85	Rec.	Rec. Limit 85 - 115	RPD 8	
Percent recovery is based on Param	F the spike	C resu	LCSD Result 104 It. RPI	t Units mg/Kg	Dil. ; 1 on the sp d: 201	Spike Amount 100	Matrix Result <3.85	Rec.	Rec. Limit 85 - 115 alt. Anal		Limi 20 y: AR
Percent recovery is based on Param Chloride Percent recovery is based on Laboratory Control Spike QC Batch: 84898 Prep Batch: 72038	F the spike	C resu	LCSD Result 104 It. RPI Dat	t Units mg/Kg) is based e Analyzeo Preparatio LCS	Dil. ; 1 on the sp d: 201: pn: 201:	Spike Amount 100 bike and sp 1-09-21 1-09-16	Matrix Result <3.85 ike duplica Spike	Rec. 104 ute resu	Rec. Limit 85 - 115 alt. Anal Prep	8 yzed B ared B	y: AR y: AR Rec.
Percent recovery is based on Param Chloride Percent recovery is based on Laboratory Control Spike QC Batch: 84898 Prep Batch: 72038 Param	F the spike	C resu	LCSD Result 104 It. RPI	t Units mg/Kg) is based e Analyzeo Preparatio LCS Result	Dil. ; 1 on the sp d: 201 on: 201 Units	Spike Amount 100 vike and sp 1-09-21 L-09-16 Dil.	Matrix Result <3.85 ike duplica Spike Amount	Rec. 104 tte resu Ma Re	Rec. Limit 85 - 115 alt. Anal Prep strix	8 yzed B ared By ec.	Limi 20 y: AR y: AR Rec. Limit
Percent recovery is based on Param Chloride Percent recovery is based on Laboratory Control Spike QC Batch: 84898 Prep Batch: 72038 Param Chloride	F the spike	C resu .) F	LCSD Result 104 It. RPD Date QC C	t Units mg/Kg) is based of e Analyzeo Preparatio LCS Result 94.8	Dil. 1 on the sp 1: 201 on: 201 Units mg/Kg	Spike Amount 100 bike and sp 1-09-21 1-09-16 Dil. 1	Matrix Result <3.85 ike duplica Spike Amount 100	Rec. 104 tte resu Ma Re <3	Rec. Limit 85 - 115 Ilt. Anal Prep sult R 3.85 9	8 yzed B ared By ec.	Limi 20 y: AR y: AR Rec. Limit
Percent recovery is based on Param Chloride Percent recovery is based on Laboratory Control Spike QC Batch: 84898 Prep Batch: 72038 Param	F the spike	C resu .) F	LCSD Result 104 It. RPI Dat QC C	t Units mg/Kg) is based of e Analyzed Preparation LCS Result 94.8) is based of	Dil. 1 on the sp 1: 201 on: 201 Units mg/Kg	Spike Amount 100 vike and sp 1-09-21 1-09-16 Dil. 1 vike and sp	Matrix Result <3.85 ike duplica Spike Amount 100 ike duplica	Rec. 104 tte resu Ma Re <3	Rec. Limit 85 - 115 alt. Anal Prep asult R 3.85 9 alt.	8 yzed B ared By ec.	Limi 20 y: AR y: AR Rec. Limit 85 - 115
Percent recovery is based on Param Chloride Percent recovery is based on Laboratory Control Spike QC Batch: 84898 Prep Batch: 72038 Param Chloride	F the spike	C resu .) F	LCSD Result 104 It. RPD Date QC C	t Units mg/Kg) is based of e Analyzec Preparatio LCS Result 94.8) is based of	Dil. 1 on the sp 1: 201 on: 201 Units mg/Kg	Spike Amount 100 bike and sp 1-09-21 1-09-16 Dil. 1	Matrix Result <3.85 ike duplica Spike Amount 100	Rec. 104 tte resu Ma Re <3	Rec. Limit 85 - 115 Ilt. Anal Prep sult R 3.85 9	8 yzed B ared By ec.	Limi 20 y: AR y: AR Rec. Limit

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Calibration Standards

Standard (ICV-1)

QC Batch:	84840			Date A	nalyzed:	2011-09-19		Analy	zed By: AR
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	98.5	98	85 - 115	2011-09-19

Standard (CCV-1)

QC Batch:	84840			Date A	nalyzed: 2	011-09-19		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	102	102	85 - 115	2011-09-19

Standard (ICV-1)

QC Batch:	84841			Date A	analyzed:	2011-09-19		Analy	zed By: AR
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	97.7	98	85 - 115	2011-09-19

Standard (CCV-1)

QC Batch:	84841			Date A	nalyzed: 2	011-09-19		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	D /
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	102	102	85 - 115	2011-09-19

Report Date: September 22 114-6400371	, 2011					11091548 J #20 SW	D		Page N		Co., NM
Laboratory Control Spik	e (LCS-1	1)									
QC Batch: 84899 Prep Batch: 72038				ate Analyze C Preparat		1-09-21 1-09-16				lyzed By bared By	
2		-	a	LCS	TT 1.		Spike		itrix		Rec.
Param Chloride		F	C	Result 95.6	Units	Dil.	Amount 100			lec.	Limit 85 - 115
· · · · · · · · · · · · · · · · · · ·			1. DI		mg/Kg					96	80 - 110
Percent recovery is based on	the spike	e rest	ult. RI	PD is based	on the s	pike and s	pike duplic	ate resu	ut.		
			LCS	SD		Spike	Matrix		Rec.		RPD
Param	F	С	Res			Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10	5 mg/K	g 1	100	<3.85	105	85 - 115	9	20
	Spiked Sa		e: 2773								
QC Batch: 84840	Spiked Sa		e: 2773 Da		ed: 201	1-09-19 1-09-16				lyzed Bj pared By	
QC Batch: 84840	Spiked Sa		e: 2773 Da	99 ate Analyze C Preparati	ed: 201		Snike	Matri	Prep	ared By	r: AR
QC Batch: 84840	-		e: 2773 Da	99 ate Analyze	ed: 201	1-09-16	Spike Amount	Matriz	Prep x	oared By	
QC Batch: 84840 Prep Batch: 72038 Param	-	mple	e: 2773 Da Qu	99 ate Analyze C Preparati MS Result	ed: 201 ion: 201	1-09-16	•		Prep x t Rec.	pared By	r: AR Rec. Jimit
QC Batch: 84840 Prep Batch: 72038 Param Chloride		mple F	e: 2773 Di Qi C	99 ate Analyze C Preparati MS Result 9960	d: 201 ion: 201 Units mg/Kg	1-09-16 Dil. 100	Amount 10000	Result <385	Prep x t Rec. 100	pared By	r: AR Rec.
QC Batch: 84840 Prep Batch: 72038 Param Chloride		mple F	e: 2773 D: Q C	99 ate Analyze C Preparati MS Result 9960 PD is based	d: 201 ion: 201 Units mg/Kg	1-09-16 Dil. 100 pike and sj	Amount 10000 pike duplic	Result <385	Prep x t Rec. 100 lt.	pared By	r: AR Rec.
QC Batch: 84840 Prep Batch: 72038 Param Chloride Percent recovery is based on	the spike	mple F ; rest	e: 2773 Da Qu C Llt. RF	99 ate Analyze C Preparati MS Result 9960 PD is based	d: 201 ion: 201 Units mg/Kg on the sp	Dil. 100 jike and sp Spike	Amount 10000 pike duplic Matrix	Result <385 ate resu	Prep x t Rec. 100 llt. Rec.	pared By I 79.4	r: AR Rec. Jimit - 120.6 RPD
QC Batch: 84840 Prep Batch: 72038 Param Chloride Percent recovery is based on Param		mple F	e: 2773 Da Qu C Lit. RF MSD Resul	99 ate Analyze C Preparati MS Result 9960 PD is based t Units	d: 201 ion: 201 Units mg/Kg on the sp Dil. 4	Dil. 100 Dike and sp Spike	Amount 10000 pike duplic Matrix Result F	Result <385 ate resu Rec.	Prep x t Rec. 100 llt. Rec. Limit	Pared By I 79.4 RPD	r: AR Rec. Jimit - 120.6 RPD Limit
QC Batch: 84840 Prep Batch: 72038 Param Chloride Percent recovery is based on Param Chloride	the spike	mple F rest	e: 2773 Di Q C Ilt. RF MSD Resul 10600	99 ate Analyze C Preparati MS Result 9960 PD is based t Units) mg/Kg	ed: 201 ion: 201 Units mg/Kg on the sp Dil. 4 100	Dil. Dil. 100 Dike and sy Spike Imount 10000	Amount 10000 pike duplic Matrix Result F <385 1	Result <385	Prep x t Rec. 	pared By I 79.4	r: AR Rec. Jimit - 120.6 RPD
QC Batch: 84840 Prep Batch: 72038 Param Chloride Percent recovery is based on Param Chloride Percent recovery is based on	the spike	F F C rest	e: 2773 Di Q C ult. RF MSD Resul 10600 ult. RF	99 ate Analyze C Preparati MS Result 9960 PD is based t Units D mg/Kg PD is based	ed: 201 ion: 201 Units mg/Kg on the sp Dil. 4 100	Dil. Dil. 100 Dike and sy Spike Imount 10000	Amount 10000 pike duplic Matrix Result F <385 1	Result <385	Prep x t Rec. 	Pared By I 79.4 RPD	r: AR Rec. Limit - 120.6 RPD Limit
QC Batch: 84840 Prep Batch: 72038 Param Chloride Percent recovery is based on Param Chloride Percent recovery is based on	the spike F the spike	F F C rest	e: 2773 Di Qu C ult. RF MSD Resul 10600 ult. RF : 27740 Di	99 ate Analyze C Preparati MS Result 9960 PD is based t Units D mg/Kg PD is based	d: 201 ion: 201 Units mg/Kg on the sp Dil. 4 100 on the sp d: 201	Dil. Dil. 100 Dike and sy Spike Imount 10000	Amount 10000 pike duplic Matrix Result F <385 1	Result <385	Prep x t Rec. llt. Rec. Limit 14 - 120.6 llt.	Pared By I 79.4 RPD	r: AR Rec. imit - 120.6 RPD Limit 20

.

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			10000	mg/Kg	100	10000	<385	98	79.4 - 120.6

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

Report Date: September 22, 114-6400371	2011				rk Order: 11091548 ary/ESDU #20 SWD					Page Number: 25 of 30 Eddy Co., NM			
Param Chloride	F	С	MSD Result 10700	Units	Dil.	Spike Amount 10000	Matrix Result <385	Rec.	Liı	ec. nit 120.6	RPD 7	RPD Limit	
Percent recovery is based on t	he spik	e res		mg/Kg) is based						120.0		20	
	ne spik	C 1C3	uit. iti 1	15 00500	on me	spike and	spike dup	ncase i	court.				
Matrix Spike (MS-1) Spike (MS-1)	oiked Sa	mple	e: 277419)									
QC Batch: 84842				e Analyze)11-09-19				-	yzed By		
Prep Batch: 72038			QC	Preparati	ion: 20)11-09-16				Prepa	ared By:	AR	
				MS			Spike	M	atrix		F	lec.	
Param		\mathbf{F}	C F	Result	Units	Dil.	Amount		esult	Rec.		imit	
Chloride			1	0200	mg/Kg	100	10000	<	385	102	79.4	- 120.6	
Percent recovery is based on t	he spik	e res	ult. RPI) is based	on the	spike and	spike dup	licate 1	result.				
			MSD			Spike	Matrix		Re	ec.		RPD	
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Lir		RPD	Limit	
Chloride			11000	mg/Kg	100	10000	<385	110	79.4 -	120.6	8	20	
Percent recovery is based on t Matrix Spike (MS-1) Sp	_		ult. RPI e: 277429		on the	spike and	spike dup	licate 1	result.				
					J. 0(11 00 01				A		4.0	
QC Batch: 84897 Prep Batch: 72038				e Analyze Preparati)11-09-21)11-09-16					vzed By: wred By:		
•			·	MS			Spike	Ma	atrix	•	-	lec.	
Param		F	C F	lesult	Units	Dil.	Amount		sult	Rec.		mit	
Chloride				9760	mg/Kg	100	10000		385	96	70.4	- 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}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10400	mg/Kg	100	10000	<385	102	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: 277439

QC Batch:	84898	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	QC Preparation:	2011-09-16	Prepared By:	AR

Report Date: September 114-6400371	22, 2011				-	r: 1109154 DU #20 SV	-		Page N	umber: 2 Eddy (26 of 30 20., NM
Param		F	C	MS Result	Units	Dil.	Spike Amount	Re	trix sult Rec.	L	lec. imit
Chloride				9760	mg/Kg	100	10000	<:	385 98	79.4	- 120.6
Percent recovery is based	on the spi	ke re	sult. RP	D is based	d on the	spike and	spike dup	licate r	esult.		
Param	F	`С	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10300	mg/Kg	; 100	10000	<385	103	79.4 - 120.6	5	20
Matrix Spike (MS-1) QC Batch: 84899 Prep Batch: 72038	Spiked S	Samp		l1 .te Analyz C Preparat)11-09-21)11-09-16				yzed By ared By:	
Param		F	С	MS Result	Units	Dil.	Spike Amount	-	trix sult Rec.		lec. imit
Chloride				10100	mg/Kg	100	10000	<3	385 101	79.4	- 120.6
Percent recovery is based	on the spi	ke re	sult. RP	D is based	d on the	spike and	spike dup	licate r	esult.		
			MSD			Spike	Matrix		Rec.		RPD
Param Chloride	Ŧ	C		Units mg/Kg	Dil.	Spike Amount 10000	Matrix Result <385	Rec.	Rec. Limit 79.4 - 120.6	RPD 6	

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

Report Date: Se 114-6400371	eptember 22,	2011			Order: 11091548 ESDU #20 SV			mber: 28 of 3 Eddy Co., NI
Standard (ICV	V-1)							
QC Batch: 848	342		Date A	nalyzed:	2011-09-19		Analy	zed By: AR
				ICVs	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2011-09-1
Standard (CC	V-1)							
QC Batch: 848	342		Date A	nalyzed:	2011-09-19		Analy	zed By: AR
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.7	100	85 - 115	2011-09-1
Standard (ICV QC Batch: 848	·		Date A	nalyzed:	2011-09-21		Analy	zed By: AR
•					1031	1011	·	v
				ICVs	ICVs	ICVs	Percent	D. /-
Param	Flag	Cert	Units	True Conc.	Found Conc.	Percent	Recovery Limits	Date
Chloride	riag	Cert	mg/Kg	100	101	Recovery 101	85 - 115	Analyzec 2011-09-2
. <u></u>	37.1)							
Standard (CC QC Batch: 848	,		Date A	nalyzed:	2011-09-21		Analy	zed By: AR
			2000 1	-			-	
				CCVs	CCVs	CCVs	Percent	
D		a i	TT	True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units mg/Kg	<u>Conc.</u> 100	<u>Conc.</u> 99.1	Recovery 99	Limits 85 - 115	Analyzed 2011-09-2
Chloride								

Standard (ICV-1)

QC Batch: 84898

Date Analyzed: 2011-09-21

Analyzed By: AR

Report Date: 5 114-6400371	September 22,	2011			ler: 11091548 SDU #20 SW	E	0	mber: 29 of 30 Eddy Co., NM
Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2011-09-21

Standard (CCV-1)

QC Batch:	84898			Date A	nalyzed: 2	2011-09-21		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
	ě.				True	Found	Percent	Recovery	Date
Param		Flag	Cert	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	101	101	85 - 115	2011-09-21

Standard (ICV-1)

QC Batch:	84899			Date A	nalyzed:	2011-09-21		Analy	zed By: AR
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	101	101	85 - 115	2011-09-21

Standard (CCV-1)

QC Batch:	84899			Date A	nalyzed: 2	2011-09-21		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	99.4	99	85 - 115	2011-09-21

Report Date: September 22, 2011 114-6400371 Work Order: 11091548 St. Mary/ESDU #20 SWD Page Number: 30 of 30 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

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.
- 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.

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397						RP-1		1	5-4'																								
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5002 Basin Street, Suite Ail 6015 Harris Parkway, Suite 110 - Ft. Worth, Texas 76132

HUB NCTRCA DBE

Midland, lexas 79703 E-Mail: latv@traceanalysis.com

NELAP

432 • 689 • 6301 FAX 432+689+6313 817+201+5260

Kansas

Certifications

Oklahoma ISO 17025

Analytical and Quality Control Report

DoD LELAP

Aaron Hale Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

WBE

Report Date: October 10, 2011

Work Order: 11093030

Project Location: Eddy Co., NM Project Name: St. Mary/ESDU #20 SWD Project Number: 114-6400371

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
278741	CS-4 4'	soil	2011-09-26	00:00	2011-09-30
278742	CS-4 5'	soil	2011-09-26	00:00	2011-09-30
278743	CS-4 6'	soil	2011-09-26	00:00	2011-09-30
278744	CS-5 0-1'	soil	2011-09-28	00:00	2011-09-30
278745	CS-5 1-2'	soil	2011-09-28	00:00	2011-09-30
278746	CS-5 2-3'	soil	2011-09-28	00:00	2011-09-30
278747	CS-5 3-4'	soil	2011-09-28	00:00	2011-09-30

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

Michael abel

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

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Case Narrative

Samples for project St. Mary/ESDU #20 SWD were received by TraceAnalysis, Inc. on 2011-09-30 and assigned to work order 11093030. Samples for work order 11093030 were received intact at a temperature of 4.0 C.

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

		Prep	Prep	\mathbf{QC}	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	72450	2011-10-06 at 10:23	85366	2011-10-07 at 13:19
Chloride (Titration)	SM 4500-Cl B	72450	2011-10-06 at 10:23	85367	2011-10-07 at 13:20

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 11093030 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.

Report Date: October 10, 2011 114-6400371

Analytical Report

Sample: 278741 - CS-4 4'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85366 72450	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	ÁR
			\mathbf{RL}			
Parameter	\mathbf{Flag}	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride		· · · · · · · · · · · · · · · · · · ·	1810	mg/Kg	100	4.00

Sample: 278742 - CS-4 5'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85366 72450	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	,
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride			3180	mg/Kg	100	4.00

Sample: 278743 - CS-4 6'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85366 72450	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	\mathbf{RL}
Chloride			202	mg/Kg	50	4.00

Report Date: October 114-6400371	10, 2011		rk Order: 11 ry/ESDU #		Page Number: 6 Eddy Co	
Sample: 278744 - C	5-5 0-1'					
Laboratory: Midland						
Analysis: Chloride	(Titration)	Analytica	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch: 85366		Date Analyzed:		2011-10-07	Analyzed By:	AR
Prep Batch: 72450		Sample F	reparation:	2011-10-06	Prepared By:	AR
			\mathbf{RL}			
n (Flag	Cert	Result	Units	Dilution	RL
Parameter	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	••••				
Parameter Chloride	U		<200	mg/Kg	50	4.00
Chloride	U		<200	mg/Kg	50	4.00
Chloride Sample: 278745 - C	U		<200	mg/Kg	50	4.00
Chloride Sample: 278745 - C Laboratory: Midland	U		<200	mg/Kg SM 4500-Cl B	50 Prep Method:	4.00 N/A
Chloride Sample: 278745 - C Laboratory: Midland Analysis: Chloride	U 5-5 1-2'		l Method:			
Chloride Sample: 278745 - C Laboratory: Midland Analysis: Chloride QC Batch: 85366	U 5-5 1-2'	Analytica Date Ana	l Method:	SM 4500-Cl B	Prep Method:	N/A
Chloride Sample: 278745 - CS Laboratory: Midland Analysis: Chloride QC Batch: 85366	U 5-5 1-2'	Analytica Date Ana	l Method: lyzed:	SM 4500-Cl B 2011-10-07	Prep Method: Analyzed By:	N/A AR
Chloride Sample: 278745 - C Laboratory: Midland Analysis: Chloride QC Batch: 85366	U 5-5 1-2'	Analytica Date Ana	l Method: lyzed: 'reparation:	SM 4500-Cl B 2011-10-07	Prep Method: Analyzed By:	N/A AR

Sample: 278746 - CS-5 2-3'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85367 72450	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	AR
-		~	RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Sample: 278747 - CS-5 3-4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85367	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Report Date: October 10, 2011 114-6400371			ork Order: 110930 ary/ESDU #20 S	Page Number: 7 of 1 Eddy Co., NM		
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<200	mg/Kg	50	4.00

Report Date: October 10, 2011 114-6400371

Work Order: 11093030 St. Mary/ESDU #20 SWD

Method Blanks

Method Blank (1)	QC Batch: 85366				
QC Batch: 85366 Prep Batch: 72450		Date Analyzed: QC Preparation:	2011-10-07 2011-10-06	Analyzed By: Prepared By:	AR AR
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4
Method Blank (1)	QC Batch: 85367				
QC Batch: 85367		Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch: 72450		QC Preparation:	2011-10-06	Prepared By:	AR
			MDL		
Parameter	Flag	Cert	Result	Units	\mathbf{RL}
Chloride			<3.85	mg/Kg	4

Report Date: October 10, 2011 114-6400371

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

Prep Batch: 724	0	Q	C Preparat	ion: 2011-1	10-06			Prepared	By: AR
Param	F	С	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			93.3	mg/Kg	1	100	<3.85	93	85 - 115

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			102	mg/Kg	1	100	<3.85	102	85 - 115	9	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:	85367	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	QC Preparation:	2011-10-06	Prepared By:	AR

				LCS			Spike	Matrix		Rec.
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}
Chloride		 		95.1	mg/Kg	1	100	<3.85	95	85 - 115
	 1	 *1	1. D.					•		

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}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			104	mg/Kg	1	100	<3.85	104	85 - 115	9	20

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

Matrix Spik	æ (MS-1)	Spiked Sample: 278745		
QC Batch: Prep Batch:		Date Analyzed: QC Preparation:	 Analyzed By: Prepared By:	

Report Date: October 10, 2011 Work Order: 11093030 114-6400371 St. Mary/ESDU #20 SWD										Page Number: 10 of 12 Eddy Co., NM		
Param		F	C	MS Result	Units	Dil.	Spike Amount		atrix esult	Rec.		lec. mit
Chloride				9920	mg/Kg	100	10000	<	385	95	79.4	- 120.6
Percent recovery is based o	n the spil	ce res	sult. RP	D is based	d on the	spike and	spike dup	licate 1	result.			
Param	F	С	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Re Lir		RPD	RPD Limit
Chloride			10500	mg/Kg	100	10000	<385	101	79.4 -	120.6	6	20
Matrix Spike (MS-1) QC Batch: 85367 Prep Batch: 72450	Spiked S	ampl	Dat	8 te Analyz Preparat)11-10-07)11-10-06					yzed By: ared By:	
Param		\mathbf{F}	C I	MS Result	Units	Dil.	Spike Amount		atrix esult	Rec.	R	
Chloride						DII.	1 ****** (4***0			1000.	\mathbf{Li}	ec. mit
Chioride				10900	mg/Kg		10000		948	100		
Percent recovery is based o	n the spik	te res			mg/Kg	100	10000	9				mit
Percent recovery is based o			sult. RPI MSD	D is based	mg/Kg l on the	100 spike and Spike	10000 spike dup Matrix	g licate 1	result. Re	100 ec.	79.4	mit - 120.6 RPD
	n the spik F	c res	sult. RPI		mg/Kg l on the Dil.	100 spike and	10000 spike dup	9	result.	100 ec. nit		mit - 120.6

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

Report Date: October 10, 2011 114-6400371

Calibration Standards

Standard (ICV-1)

QC Batch:	85366			Date A	nalyzed:	2011-10-07		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	104	104	85 - 115	2011-10-07		

Standard (CCV-1)

QC Batch:	85366			Date A	analyzed: 2	011-10-07		Analy	Analyzed By: AR		
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date		
					intue	round	rercent	necovery	Date		
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride		·		mg/Kg	100	96.2	96	85 - 115	2011-10-07		

Standard (ICV-1)

QC Batch:	85367		Date Analyzed: 2011-10-07					Analy	zed By: AR
					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	2011-10-07

Standard (CCV-1)

QC Batch:	85367			Date A	nalyzed: 2	011-10-07		Analyzed By: AR			
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date		
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed		
Chloride				mg/Kg	100	99.9	100	85 - 115	2011-10-07		

Page Number: 12 of 12 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

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.
- 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

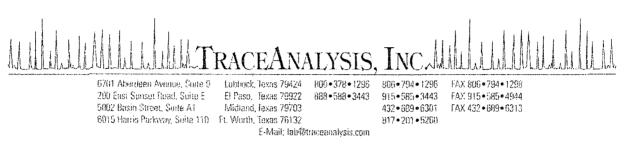
The scanned attachments will follow this page.

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

Wo#(1093030			
Analysis Request of Chain of Cus	tody Record	PAGE:	OF:
		ANALYSIS REQUEST	
TETRATECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946		Circle or Specify Method (Circle or Specify Method) 第日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日	
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St Mary Land a Exploration Armon Hale		MOD. AG As blattles Vol. 827 Vol. 827 8 8	tions
114-6400371 ESDU # 20 5WD		5 MC 1 Vola 8244 1 Vola 8244 1 Vola 82.0 82.0 82.0 1 Vola	stos) ns/C
LAB I.D. NUMBER DATE TIME KEY SAMPLE IDENTIFICATION		BTEX 8021B TPH 8015 MOD. TX10 PAH 8270 RCRÅ Metals Ag As Ba (TCLP Vinetals Ag As Ba (TCLP Vinities TCLP Voi attiles TCLP Semi volatiles RCI GC.MS Voi. 8240/8260/624 GC.MS Voi. 8240/8260/624 GC.MS Semi. Voi. 8270/621 Pest. 808/608 Pest. 808/608	Alpha Beta (Alf) PLM (Asbestos) Major Anions/Catlons, pH, TDS
278741 9/200 3 × 05-4 4'	1 1		
742 9126 05-4 5			
743 9/240 05-4 6'			
744 9/28 02-5 0-1			
745 9/28			
746 9/28 6-5 2.3			
747 9/28 1 0 0 05-5 3-4'			
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RELINQUISHED BY: (Signature) Date: RECEIVED BY: (Signature) Time:	Date: Time:	FEDEX BUS	AIRBILL #:
RELINQUISMED BY: (Signature) Dete: RECEIVED BY: (Signature)	Date:	HAND DELIVERED UPS	OTHER:
RECEIVING LABORATORY: Track Received BY: (Signature) ADDRESS: CITY: Midland STATE: The ZIP:		- Loon Hale	RUSH Charges Authorized:
CONTACT: DATE: DATE: DATE: DATE:	TIME:	L	Yes No
4.0°C	··		4°C

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

.



Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Aaron Hale Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: October 10, 2011

Work Order: 11092718

Project Location:Eddy Co., NMProject Name:St. Mary/ESDU #20 SWDProject Number:114-6400371

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
278443	AH-Pasture 1 0-1'	soil	2011-09-26	00:00	2011-09-27
278444	AH-Pasture 1 1-1.5'	soil	2011-09-26	00:00	2011-09-27
278445	AH-Pasture 1 2-2.5'	soil	2011-09-26	00:00	2011-09-27
278446	AH-Pasture 1 3-3.5'	soil	2011-09-26	00:00	2011-09-27
278447	AH-Pasture 1 4-4.5'	soil	2011-09-26	00:00	2011-09-27

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.

Michael april

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

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Case Narrative

Samples for project St. Mary/ESDU #20 SWD were received by TraceAnalysis, Inc. on 2011-09-27 and assigned to work order 11092718. Samples for work order 11092718 were received intact at a temperature of 26.1 C.

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

		Prep	Prep	\mathbf{QC}	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	72450	2011-10-06 at 10:23	85366	2011-10-07 at 13:19

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 11092718 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.

Samples not on ice.

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: 278443 - AH-Pasture 1 0-1'

Laboratory: Analysis: QC Batch: Prep Batch:	Analysis: Chloride (Titration)		al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	AR
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	\mathbf{RL}
Chloride			25000	mg/Kg	100	4.00

Sample: 278444 - AH-Pasture 1 1-1.5'

Laboratory:MidlandAnalysis:Chloride (Titration)QC Batch:85366Prep Batch:72450		Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			16100	mg/Kg	100	4.00

Sample: 278445 - AH-Pasture 1 2-2.5'

Laboratory: Analysis: QC Batch: Prep Batch:	Analysis: Chloride (Titration) QC Batch: 85366		al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	ÁR
			RL			
Parameter	Flag	Cert	\mathbf{Result}	Units	Dilution	\mathbf{RL}
Chloride			7810	mg/Kg	100	4.00

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Sample: 27	8446 - AH-Pasture 1 3-3.5	,				
Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Ar	alyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:			Preparation:	2011-10-06	Prepared By:	AR
			\mathbf{RL}			
Parameter	Flag	Cert	\mathbf{Result}	Units	Dilution	\mathbf{RL}
Chloride	<u>, , , , , , , , , , , , , , , , , , , </u>		27500	mg/Kg	100	4.00

Sample: 278447 - AH-Pasture 1 4-4.5'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 85366 72450	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2011-10-07 2011-10-06	Prep Method: Analyzed By: Prepared By:	ÁR
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride		······································	27700	mg/Kg	100	4.00

Work Order: 11092718 St. Mary/ESDU #20 SWD Page Number: 7 of 10 Eddy Co., NM

Method Blanks

Method Blank (1)	QC Batch: 85366				
QC Batch: 85366 Prep Batch: 72450		Date Analyzed: QC Preparation:	2011-10-07 2011-10-06	Analyzed By: Prepared By:	
Parameter	Flor	Cert	MDL Result	Units	RL
Chloride	Flag	Cert	< <u></u>	mg/Kg	4

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 85366 Prep Batch: 72450				e Analyze Preparat		1-10-07 1-10-06				yzed By ared By	
				LCS			Spike	Mat	rix		Rec.
Param		F	C	Result	Units	Dil.	Amour			ec.	Limit
Chloride				93.3	mg/Kg	1	100	<3.	85 9	03 8	35 - 115
Percent recovery is based on the	spike	resul	lt. RPI) is based	on the s	oike and s	spike dupli	cate result	t.		
			LCSI)		Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Resul	t Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			102	mg/K	g 1	100	<3.85	102	85 - 115	9	20
Percent recovery is based on the	spike	resul	lt. RPI) is based	on the s	oike and s	spike dupli	cate resul	t.	_	
Matrix Spike (MS-1) Spike	d San	nple:	27874	5							
QC Batch: 85366			Dat	e Analyze	d: 201	1-10-07			Anal	yzed By	: AR
Prep Batch: 72450			\mathbf{QC}	Preparati	on: 201	1-10-06			Prepa	ared By:	AR
Param	F	N	C I	MS Result	Units	Dil.	Spike Amount	Matrix	Pee		lec. imit
Chloride	T		<u> </u>			100	10000	Result	Rec.		
					mg/Kg			<385	95	19.4	- 120.6
Percent recovery is based on the s	spike	resul	lt. RPI) is based	on the sp	oike and s	pike dupli	cate result	5.		
			MSD			Spike '	Matrix		Rec.		RPD
Param	F	C	Result	Units	Dil. A	mount	Result 1	Rec.	Limit	RPD	Limit
Chloride			10500	mg/Kg	100	10000	<385	101 79.4	4 - 120.6	6	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:	85366			Date A	nalyzed:	2011-10-07		Analy	zed By: AR
					ICVs	ICVs	ICVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	104	104	85 - 115	2011-10-07

Standard (CCV-1)

QC Batch:	85366			Date A	nalyzed:	2011-10-07		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	96.2	96	85 - 115	2011-10-07

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Appendix

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.
- $\label{eq:Qc} \mbox{Calibration check outside of laboratory limits}.$
- 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.

\sim WO#	11092718										•								
Analysis Requ	est of Chain of Custody	R	ec	0	rd		_							GE:	1		_,F:	_1	<u> </u>
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CLIENT NAME: St. Mary	SITE MANAGER:	ERS	PF		ERVATI	VE	TX1005		Ba			0/624	70/62				s, pH,		
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LAB I.D. NUMBER DATE TIME XILL BRUG 2011 VICE	せっつ らいつ Eddy Co MAN SAMPLE IDENTIFICATION	I I NUMBER OF CONTAINERS FILTERED (Y/N)	НС	HN03	ICE NONE		BTEX 8021B TPH 8015 MOD.	PAH 8270	HCRA Metals /	TCLP Volatiles	TCLP Semi Vol	HUI GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/60 Pest. 808/608	Chloride	damma spec. Alpha Beta (Air)	PLM (Asbestos) Major Anions/Cations,		
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