TETRA TECH

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

Tetra Tech
1910 North Big Spring, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

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

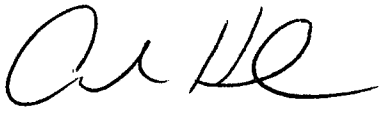
A work plan was submitted and approved by NMOCD. Tetra Tech personal were on site on September 14, 2011 through October 3, 2011 to oversee the removal of impacted material as discussed in the approved work plan. The areas of AH-1 through AH-3 were excavated to a depth of 1-4' bgs. The areas of AH-6 and 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

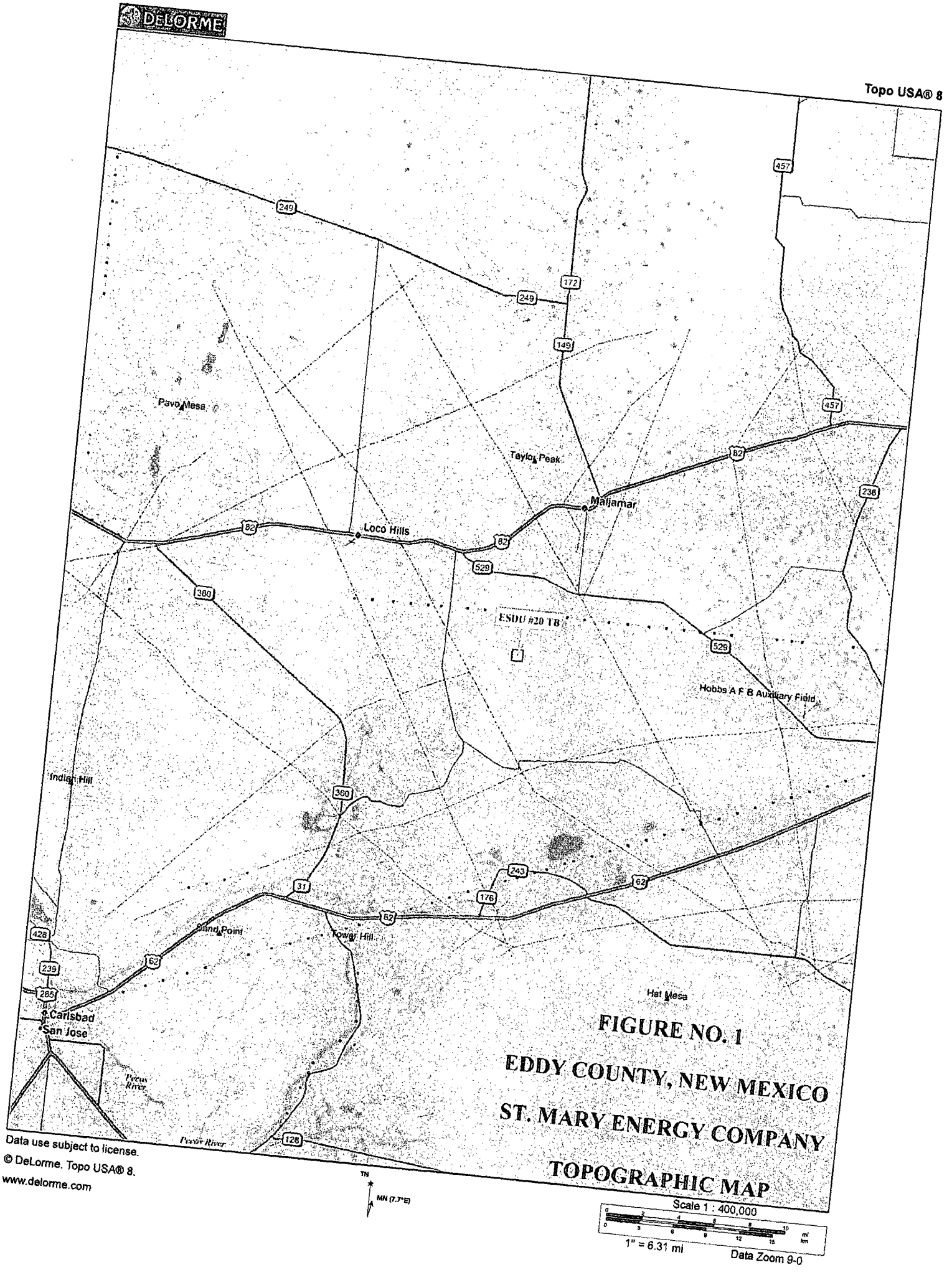
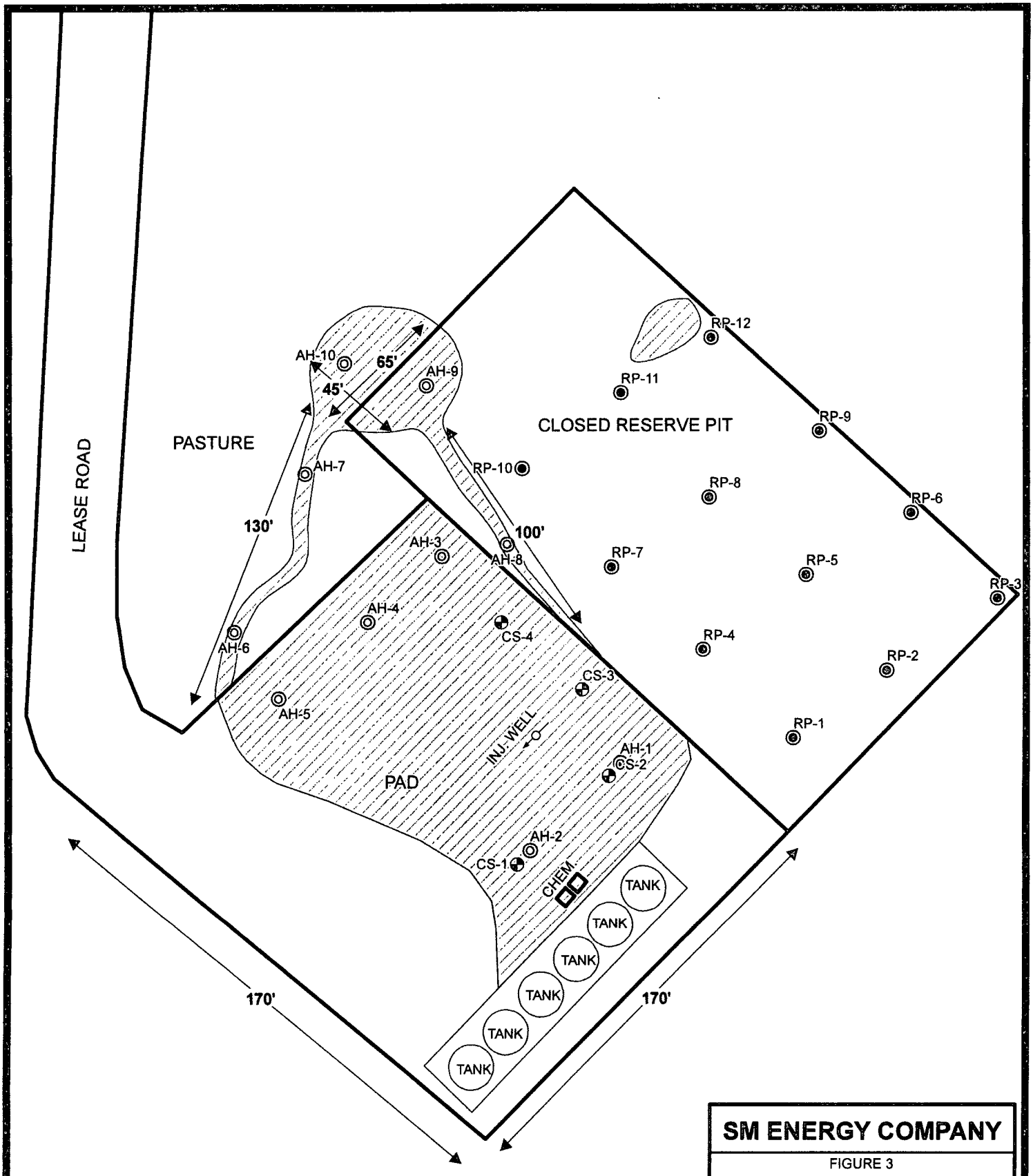


FIGURE NO. 1

EDDY COUNTY, NEW MEXICO

ST. MARY ENERGY COMPANY

TOPOGRAPHIC MAP



EXPLANATION

- AUGER HOLE SAMPLE LOCATIONS
- CONFIRMATION SAMPLE LOCATIONS
- RESERVE PIT SAMPLE
- SPILL AREA

N

SCALE: 1 IN = 54 FEET

Feet 0 30 60

SM ENERGY COMPANY

FIGURE 3

ESDU #20 INJECTION STATION SPILL

SPILL ASSESSMENT MAP

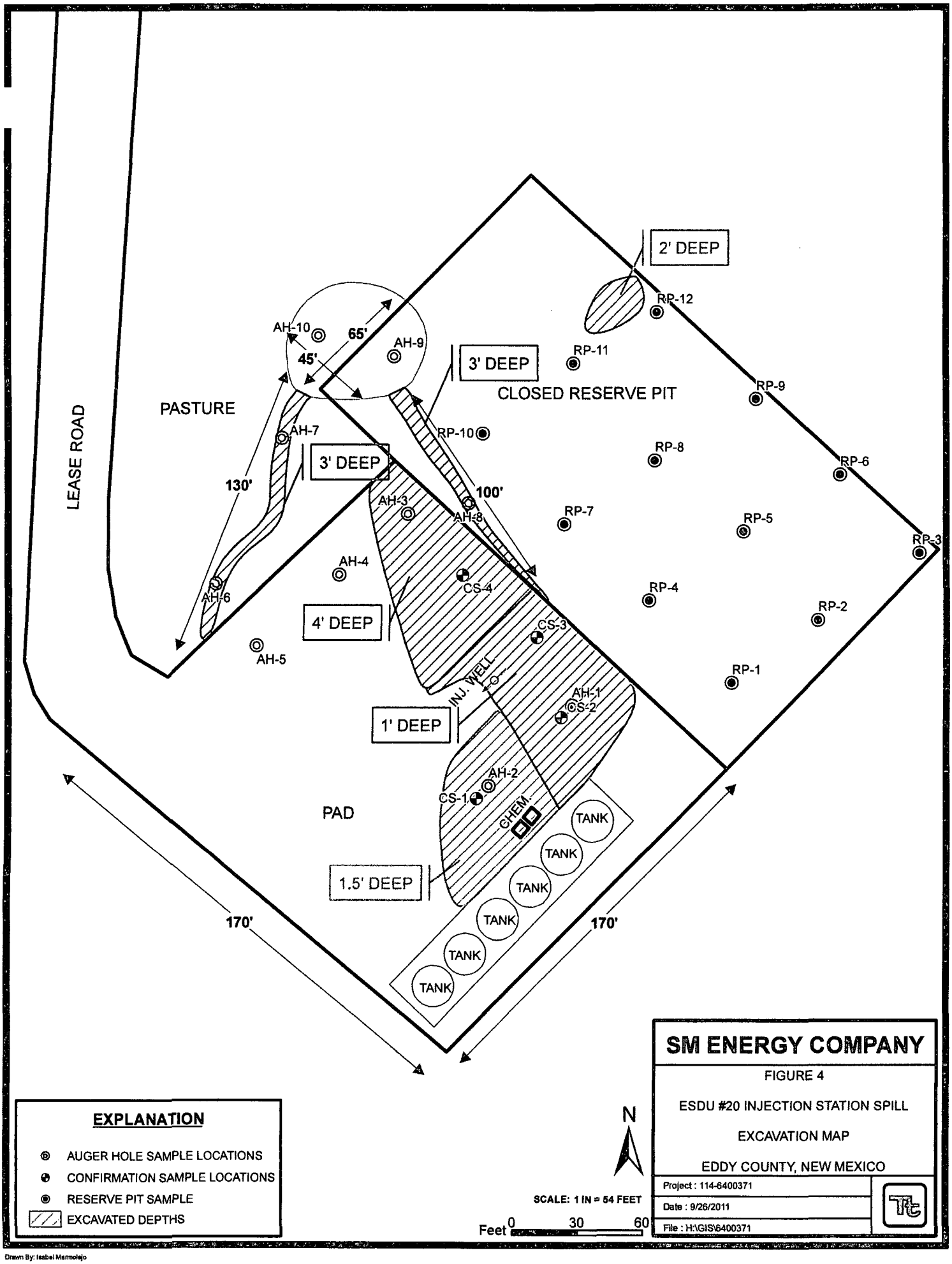
EDDY COUNTY, NEW MEXICO

Project : 114-6400371

Date : 9/26/2011

File : H:\GIS\6400371

Drawn By: Isabel Marmolejo



Drawn By: Isabel Marmolejo

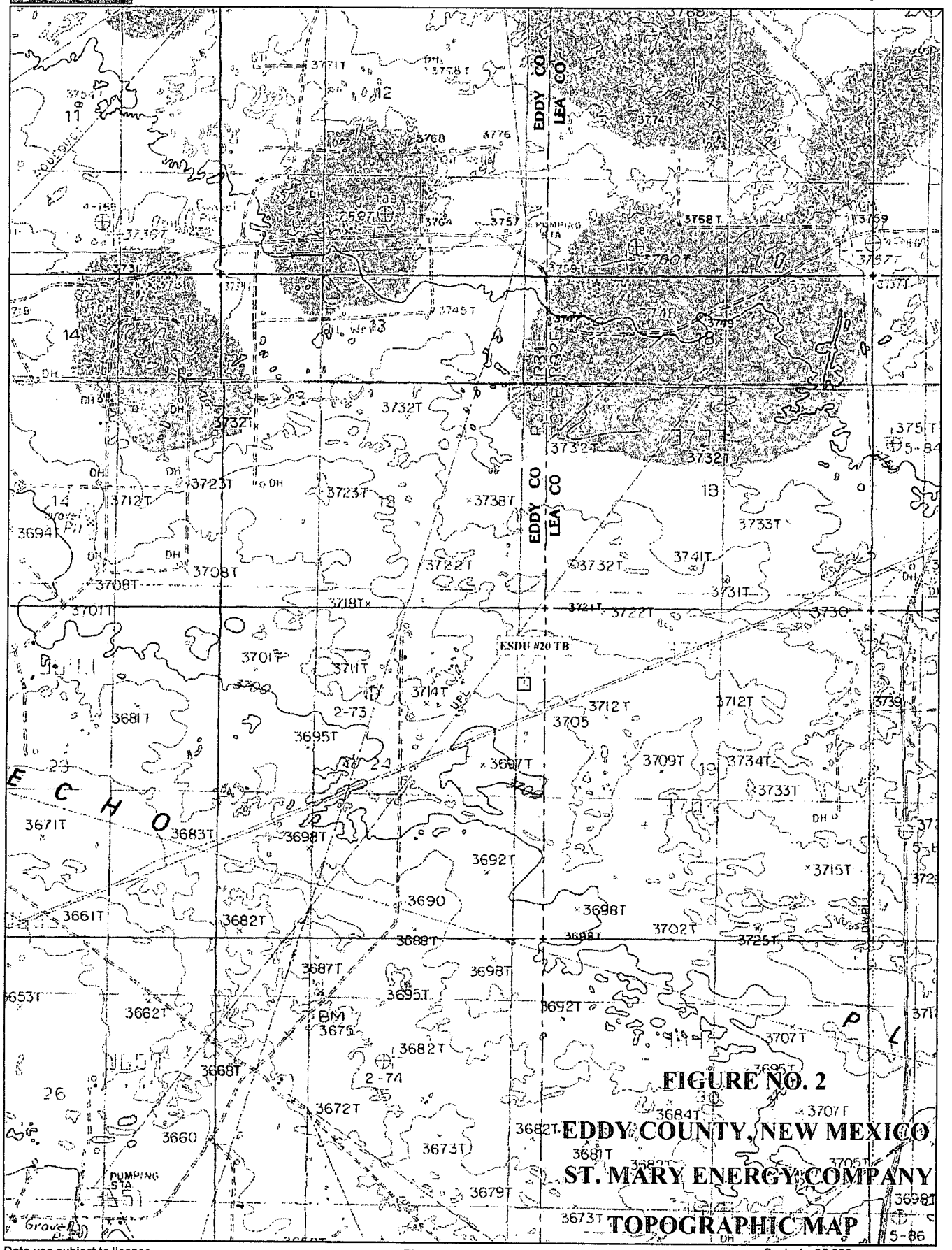


FIGURE NO. 2

EDDY COUNTY, NEW MEXICO

ST. MARY ENERGY COMPANY

TOPOGRAPHIC MAP

TN

MN (7.7°E)

Scale 1 : 25,000

1" = 2,083.3 ft

Data Zoom 13-0

TABLES

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

Sample ID	Date Sampled	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total					
AH-1	11/20/2009	0-1'		X	<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	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		-	-	-	-	-	-	-	319
AH-2	11/20/2009	0-1'		X	<1.00	<50.0	<50.0	-	-	-	-	6,440
	11/20/2009	1-1.5'		X	-	-	-	-	-	-	-	<200
	11/20/2009	2-2.5'	X		-	-	-	-	-	-	-	<200
AH-3	11/20/2009	0-1'		X	<1.00	<50.0	<50.0	-	-	-	-	3,160
	11/20/2009	1-1.5'		X	-	-	-	-	-	-	-	436
	11/20/2009	2-2.5'		X	-	-	-	-	-	-	-	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'	X		-	-	-	-	-	-	-	<200

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

Sample ID	Date Sampled	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total					
AH-5	11/20/2009	0-1'	X		<1.00	<50.0	<50.0	-	-	-	-	1,070
	11/20/2009	1-1.5'	X		-	-	-	-	-	-	-	<200
	11/20/2009	2-2.5'	X		-	-	-	-	-	-	-	<200
	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	-	-	-	-	-	-	-	5,290
	11/20/2009	2-2.5'		X	-	-	-	-	-	-	-	8,170
	11/20/2009	3-3.5		X	-	-	-	-	-	-	-	<200
	11/20/2009	4-4.5'	X		-	-	-	-	-	-	-	479
	11/20/2009	5-5.5'	X		-	-	-	-	-	-	-	<200
	11/20/2009	6-5.5'	X		-	-	-	-	-	-	-	1,430
AH-7	11/20/2009	0-1'		X	<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'		X	-	-	-	-	-	-	-	255
	11/20/2009	3-3.5'		X	-	-	-	-	-	-	-	<200
	11/20/2009	4-4.5'	X		-	-	-	-	-	-	-	<200

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

Sample ID	Date Sampled	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total					
AH-8	11/20/2009	0-1'		X	<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	7,740
	11/20/2009	1-1.5'		X	-	-	-	-	-	-	-	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'	X		-	-	-	-	-	-	-	<200
	11/20/2009	5-5.5'	X		-	-	-	-	-	-	-	957
	11/20/2009	6-6.5'	X		-	-	-	-	-	-	-	3,430
	11/20/2009	7-7.5'	X		-	-	-	-	-	-	-	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'	X		-	-	-	-	-	-	-	272
	11/20/2009	2-2.5'	X		-	-	-	-	-	-	-	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		-	-	-	-	-	-	-	<200
	11/20/2009	2-2.5'	X		-	-	-	-	-	-	-	<200
	11/20/2009	3-3.5'	X		-	-	-	-	-	-	-	1,380

(-) Not Analyzed

Excavated Depths

Table 2
Saint Mary
ESDU #20 SWD
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		Chloride (mg/kg)
				In-Situ	Removed	
RP-1	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		<200
RP-2	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		<200
RP-3	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		<200
RP-4	9/14/2011	0-1'		X		**587**
	"	1-2'		X		**316**
	"	2-3'		X		**336**
	"	3-4'		X		**206**
RP-5	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		<200

Table 2
Saint Mary
ESDU #20 SWD
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		Chloride (mg/kg)
				In-Situ	Removed	
RP-6	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		<200
RP-7	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		**239**
	"	3-4'		X		**425**
RP-8	9/14/2011	0-1'		X		<200
	"	1-2'		X		**288**
	"	2-3'		X		**264**
	"	3-4'		X		<200
RP-9	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		**200**
RP-10	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	3-4'		X		**529**

Table 2
Saint Mary
ESDU #20 SWD
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		Chloride (mg/kg)
				In-Situ	Removed	
RP-11	9/14/2011	0-1'		X		**387**
	"	1-2'		X		**534**
	"	2-3'		X		**509**
	"	3-4'		X		**720**
RP-12	9/14/2011	0-1'		X		<200
	"	1-2'		X		<200
	"	2-3'		X		<200
	"	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**
	"	3-3.5'		X		**27,500**
	"	4-4.5'		X		**27,700**
CS-4	9/26/2011	4'		X		**1,810**
	"	5'		X		**3,180**
	"	6'		X		**202**
CS-5	9/26/2011	0-1'		X		<200
	"	1-2'		X		**377**
	"	2-3'		X		<200
	"	3-4'		X		<200

BEB Below Excavation Bottom

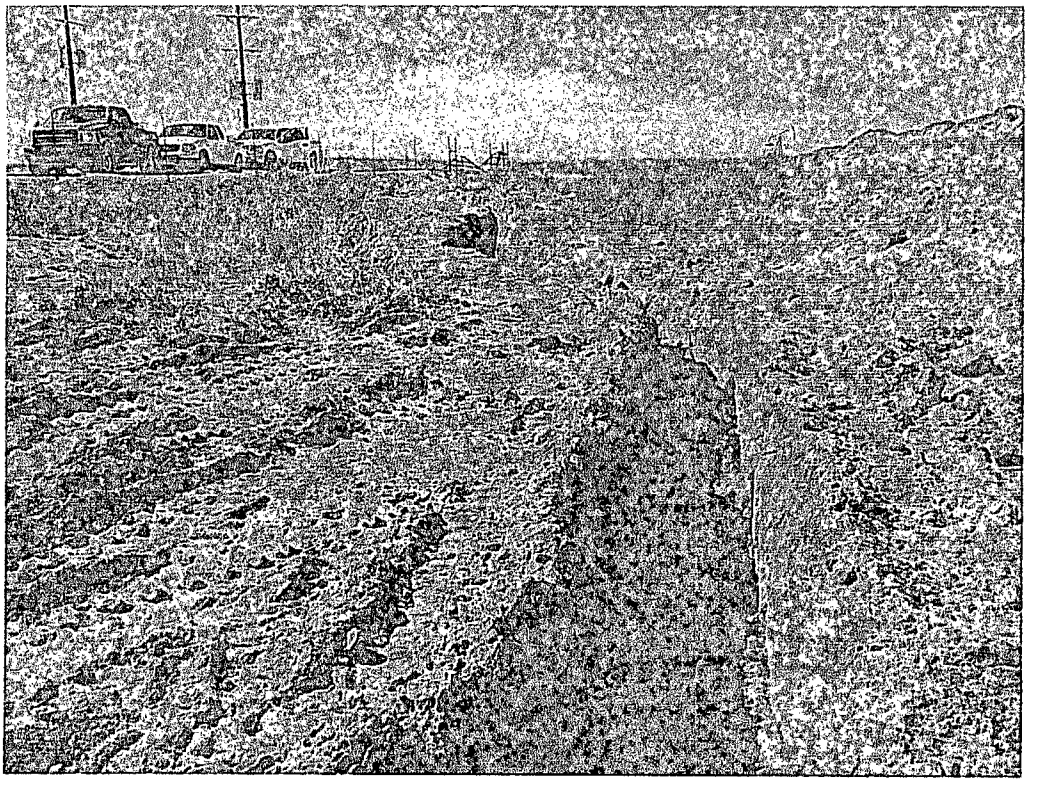
Excavated Depth

PHOTOGRAPHS

SM Energy Company
ESDU Inj. Station
Eddy County, New Mexico

TETRA TECH

View West – AH-8

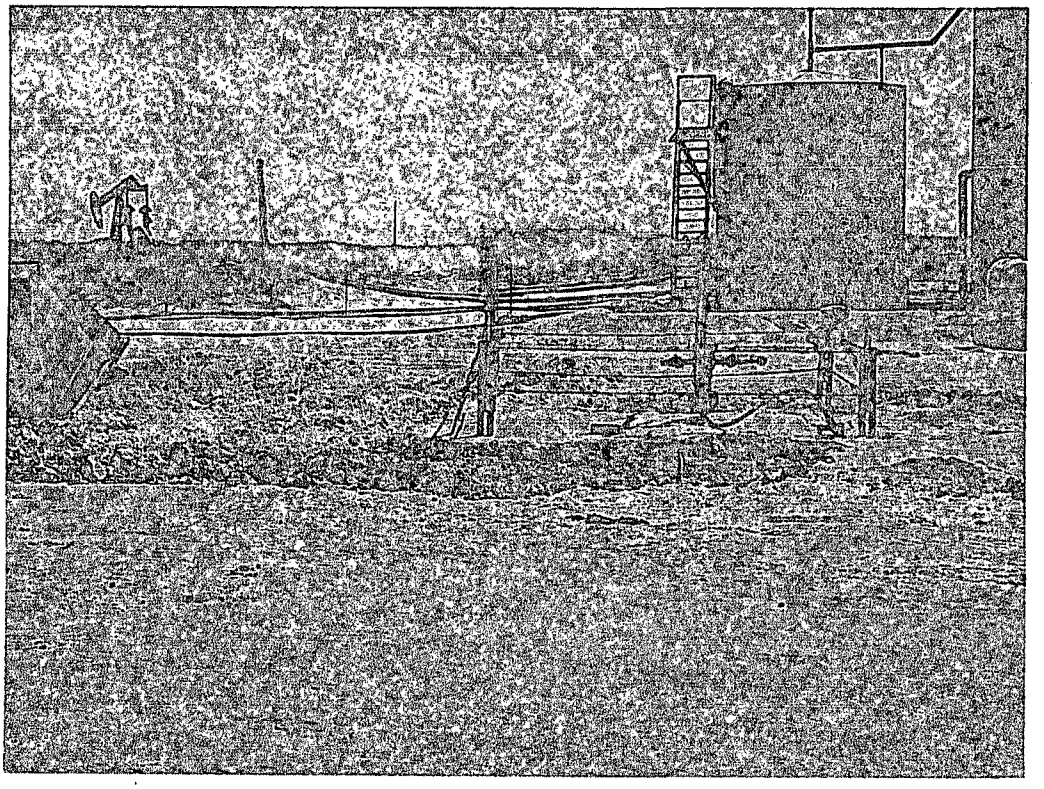


View North – AH-7 & 6

SM Energy Company
ESDU Inj. Station
Eddy County, New Mexico

TETRA TECH

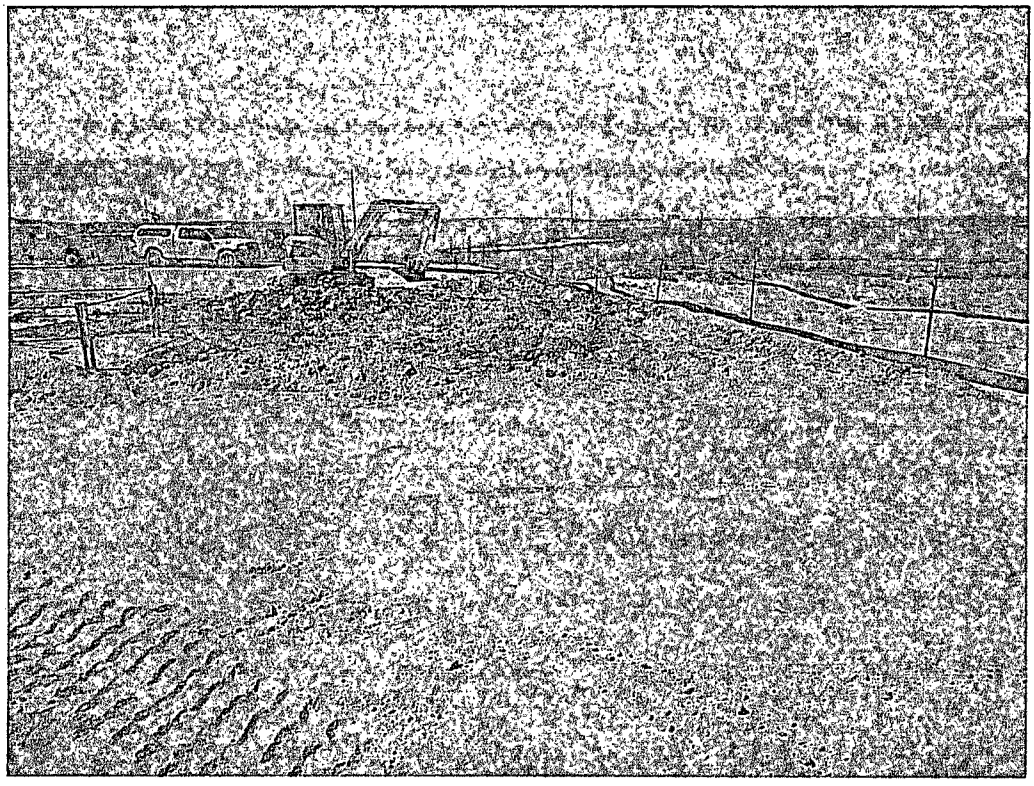
View North – AH-2



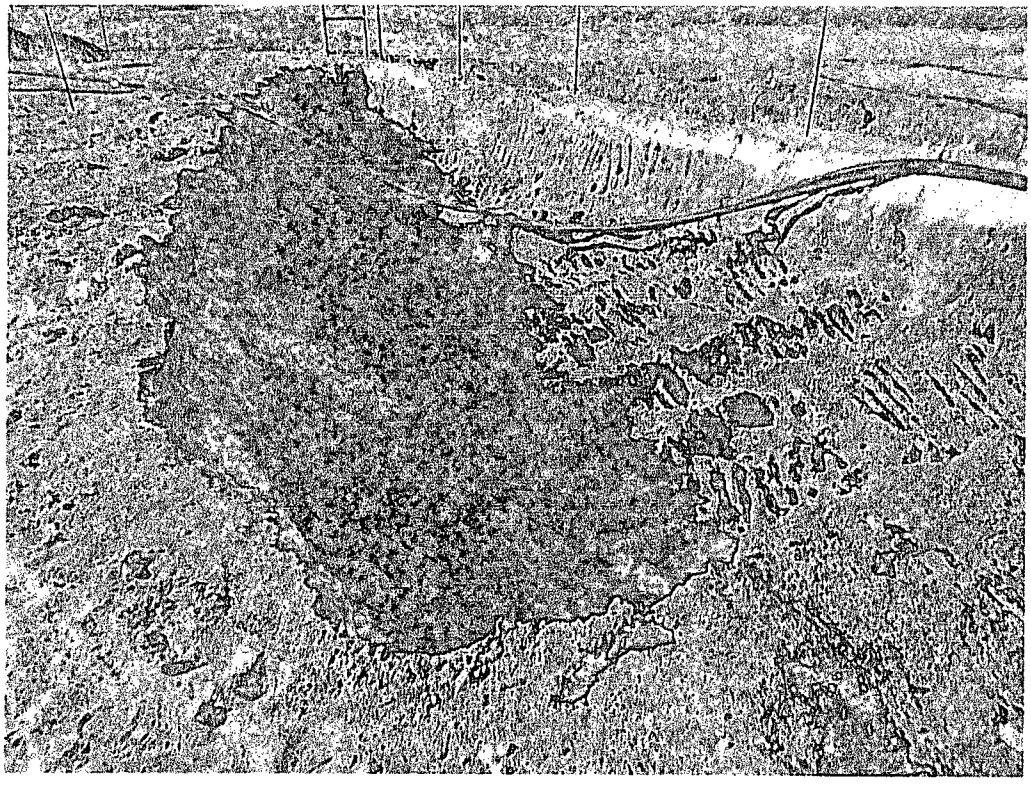
View South – AH-1

SM Energy Company
ESDU Inj. Station
Eddy County, New Mexico

TETRA TECH



View North – AH-1



View North – AH-3

SM Energy Company
ESDU Inj. Station
Eddy County, New Mexico

TETRA TECH

View East – Dike

View East – Backfill of Reserve Pit

SM Energy Company
ESDU Inj. Station
Eddy County, New Mexico

TETRA TECH

View North East – Backfill of Reserve Pit

View South – Backfill of Reserve Pit

APPENDIX A

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company **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**

Surface Owner: BLM	Mineral 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
A	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	Volume Recovered 0 bbls
Source of Release: Injection line at the Wellhead.	Date and Hour of Occurrence 11/11/2009	Date and Hour of Discovery 11/11/2009 6:30 p.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? **Jim Amos-BLM & Darold Gray-NMOCD**	
By Whom? Bill Hearne	Date and Hour 11/11/2009 8:25 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. 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 ½ V thread changeover had failed due to external corrosion. Shut down injection pumps and closed off tanks. Closed trunk line valve, feeding injection line lateral, to shut off leak. Broke out failed connection and replaced with stainless steel changeover.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected site and collected samples to define the spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review.

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

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Aaron Hale	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: aaron.hale@tetratech.com	Conditions of Approval:	Attached ☐
Date: Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

APPENDIX B

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

17 South 30 East

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

17 South 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	**271** 34	35	**SITE** 36

17 South 32 East

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

Maljamar

18 South 30 East

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

18 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 **400**
18	17	16	15	14 **317**	13
19	20	21	22	23	24 SITE
30	29	28	27	26	25
31	32	33	34	35 **261**	36

18 South 32 East

6	5	**65** 4	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 **117**	35

19 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30 **90**	29	28	27	26	25
31 **115**	32	33	34	35	36

19 South 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 **180**	27	26	25
31	32	33 **101**	34	35	36 **130**

19 South 32 East

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

New Mexico State Engineers Well Reports
USGS Well Reports
Geology and Groundwater Conditions in Southern Eddy, County, NM
NMOCD - Groundwater Data

APPENDIX C

TRACEANALYSIS, INC.

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200 East Sunset Road, Suite E | El Paso, Texas 79922 | 888•588•3443 | 915•585•3443 | FAX 915•585•4944
5002 Basin Street, Suite A1 | Midland, Texas 79703 | | 432•689•6301 | FAX 432•689•6313
6015 Harris Parkway, Suite 110 | Ft. Worth, Texas 76132 | | 817•201•5260 |
E-Mail: lab@traceanalysis.com

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: 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.

Sample	Description	Matrix	Date Taken	Time Taken	Date 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

Sample	Description	Matrix	Date Taken	Time Taken	Date 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.

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.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis 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.

Analytical Report

Sample: 277394 - RP-1 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277395 - RP-1 1-2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	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:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277397 - RP-1 3-4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277398 - RP-2 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277399 - RP-2 1-2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	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

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

Sample: 277401 - RP-2 3-4'

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

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

Sample: 277402 - RP-3 0-1'

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

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

Sample: 277403 - RP-3 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

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

Sample: 277404 - 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277405 - RP-3 3-4'

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

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

Sample: 277406 - RP-4 0-1'

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

Parameter	Flag	Cert	Result	RL Units	Dilution	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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**316**	mg/Kg	50	4.00

Sample: 277408 - RP-4 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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**336**	mg/Kg	50	4.00

Sample: 277409 - RP-4 3-4'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**206**	mg/Kg	50	4.00

Sample: 277410 - RP-5 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

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

Sample: 277411 - 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

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

Sample: 277412 - 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277413 - RP-5 3-4'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	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

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

Sample: 277415 - RP-6 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

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

Sample: 277416 - RP-6 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277417 - RP-6 3-4'

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

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

Sample: 277418 - RP-7 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

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

Sample: 277419 - RP-7 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

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

Sample: 277420 - RP-7 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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**239**	mg/Kg	50	4.00

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**425**	mg/Kg	50	4.00

Sample: 277422 - RP-8 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277423 - RP-8 1-2'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**288**	mg/Kg	50	4.00

Sample: 277424 - RP-8 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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**264**	mg/Kg	50	4.00

Sample: 277425 - 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277426 - 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277427 - RP-9 1-2'

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

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

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

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

Sample: 277429 - RP-9 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

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

Sample: 277430 - RP-10 0-1'

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

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

Sample: 277431 - RP-10 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

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

Sample: 277432 - RP-10 2-3'

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

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

Sample: 277433 - RP-10 3-4'

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

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**529**	mg/Kg	50	4.00

Sample: 277434 - RP-11 0-1'

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

Parameter	Flag	Cert	Result	RL Units	Dilution	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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**534**	mg/Kg	50	4.00

Sample: 277436 - RP-11 2-3'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**509**	mg/Kg	50	4.00

Sample: 277437 - RP-11 3-4'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**720**	mg/Kg	50	4.00

Sample: 277438 - RP-12 0-1'

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

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

Sample: 277439 - 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:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277440 - RP-12 2-3'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84899	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Sample: 277441 - RP-12 3-4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	84899	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	Sample Preparation:	2011-09-16	Prepared By:	AR

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

Method Blanks

Method Blank (1) QC Batch: 84840

QC Batch:	84840	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	QC Preparation:	2011-09-16	Prepared By:	AR

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

Method Blank (1) QC Batch: 84841

QC Batch:	84841	Date Analyzed:	2011-09-19	Analyzed By:	AR
Prep Batch:	72038	QC Preparation:	2011-09-16	Prepared By:	AR

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

Method Blank (1) QC Batch: 84842

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

Parameter	Flag	Cert	MDL 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

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

Method Blank (1) QC Batch: 84898

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

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

Method Blank (1) QC Batch: 84899

QC Batch:	84899	Date Analyzed:	2011-09-21	Analyzed By:	AR
Prep Batch:	72038	QC Preparation:	2011-09-16	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 84840 | Date Analyzed: 2011-09-19 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			93.5	mg/Kg	1	100	<3.85	94	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			105	mg/Kg	1	100	<3.85	105	85 - 115	12	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: 84841 | Date Analyzed: 2011-09-19 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			95.0	mg/Kg	1	100	<3.85	95	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			106	mg/Kg	1	100	<3.85	106	85 - 115	11	20

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

Laboratory Control Spike (LCS-1)

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			98.0	mg/Kg	1	100	<3.85	98	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			105	mg/Kg	1	100	<3.85	105	85 - 115	7	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: 84897 | Date Analyzed: 2011-09-21 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			96.2	mg/Kg	1	100	<3.85	96	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			104	mg/Kg	1	100	<3.85	104	85 - 115	8	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: 84898 | Date Analyzed: 2011-09-21 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			94.8	mg/Kg	1	100	<3.85	95	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			106	mg/Kg	1	100	<3.85	106	85 - 115	11	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: 84840 | Date Analyzed: 2011-09-19 | Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	98.5	98	85 - 115	2011-09-19

Standard (CCV-1)

QC Batch: 84840 | Date Analyzed: 2011-09-19 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2011-09-19

Standard (ICV-1)

QC Batch: 84841 | Date Analyzed: 2011-09-19 | Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	97.7	98	85 - 115	2011-09-19

Standard (CCV-1)

QC Batch: 84841 | Date Analyzed: 2011-09-19 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	102	102	85 - 115	2011-09-19

Laboratory Control Spike (LCS-1)

QC Batch: 84899 | Date Analyzed: 2011-09-21 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			95.6	mg/Kg	1	100	<3.85	96	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			105	mg/Kg	1	100	<3.85	105	85 - 115	9	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: 277399

QC Batch: 84840 | Date Analyzed: 2011-09-19 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			9960	mg/Kg	100	10000	<385	100	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10600	mg/Kg	100	10000	<385	106	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: 277409

QC Batch: 84841 | Date Analyzed: 2011-09-19 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	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.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10700	mg/Kg	100	10000	<385	105	79.4 - 120.6	7	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: 277419

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

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10200	mg/Kg	100	10000	<385	102	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			11000	mg/Kg	100	10000	<385	110	79.4 - 120.6	8	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: 277429

QC Batch: 84897 | Date Analyzed: 2011-09-21 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			9760	mg/Kg	100	10000	<385	96	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	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

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			9760	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.

Param	F	C	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

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

Matrix Spike (MS-1) Spiked Sample: 277441

QC Batch: 84899 | Date Analyzed: 2011-09-21 | Analyzed By: AR
Prep Batch: 72038 | QC Preparation: 2011-09-16 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10100	mg/Kg	100	10000	<385	101	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10700	mg/Kg	100	10000	<385	107	79.4 - 120.6	6	20

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

Standard (ICV-1)

QC Batch: 84842 | Date Analyzed: 2011-09-19 | Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2011-09-19

Standard (CCV-1)

QC Batch: 84842 | Date Analyzed: 2011-09-19 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.7	100	85 - 115	2011-09-19

Standard (ICV-1)

QC Batch: 84897 | Date Analyzed: 2011-09-21 | Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2011-09-21

Standard (CCV-1)

QC Batch: 84897 | Date Analyzed: 2011-09-21 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.1	99	85 - 115	2011-09-21

Standard (ICV-1)

QC Batch: 84898 | Date Analyzed: 2011-09-21 | Analyzed By: AR

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 Analyzed: 2011-09-21 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2011-09-21

Standard (ICV-1)

QC Batch: 84899 Date Analyzed: 2011-09-21 Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2011-09-21

Standard (CCV-1)

QC Batch: 84899 Date Analyzed: 2011-09-21 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.4	99	85 - 115	2011-09-21

Appendix

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory 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 #: 11091548

Analysis Request of Chain of Custody Record

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

PAGE: 1 of 5

CLIENT NAME: St. Mary

SITE MANAGER: Aaron Hale

PROJECT NO.: 114-6400371

PROJECT NAME: FSDU # 20 2nd Eddy Co NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
277394	9/14		S		X	RP-1 0-1'	1																	X				
395						RP-1 1-2'																						
396						RP-1 2-3'																						
397						RP-1 3-4'																						
398						RP-2 0-1'																						
399						RP-2 1-2'																						
400						RP-2 2-3'																						
401						RP-2 3-4'																						
402						RP-3 0-1'																						
403	↓		↓		↓	RP-3 1-2'	↓																	↓				

RELINQUISHED BY: (Signature) — Date: 9-15-11 Time: 1500
RECEIVED BY: (Signature) — Date: 9/15/11 Time: 15:00
SAMPLED BY: (Print & Initial) TF — Date: 9-14-11 Time:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: OTHER:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
TETRA TECH CONTACT PERSON: Aaron Hale — Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 17.6° cintact

REMARKS: All tests-Midland

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

TWO #: 1104154B

Analysis Request of Chain of Custody Record

PAGE: 2 OF: 5

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: St. Mary

SITE MANAGER: Aaron Hale

PROJECT NO.: 114-6400371

PROJECT NAME: ESDU # 20 SWD Eddy Co NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD.: TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC:MS Vol. 8240/8260/624	GC:MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
277404	9/14		S		X	RP-3 2-3'	1																	X				
405						RP-3 3-4'																						
406						RP-4 0-1'																						
407						RP-4 1-2'																						
408						RP-4 2-3'																						
409						RP-4 3-4'																						
410						RP-5 0-1'																						
411						RP-5 1-2'																						
412						RP-5 2-3'																						
413						RP-5 3-4'																						

RELINQUISHED BY: (Signature) Date: 9-15-11 Time: 1500

RECEIVED BY: (Signature) Date: 9/15/11 Time: 1500

SAMPLED BY: (Print & Initial) TF Date: 9-14-11 Time:

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS

AIRBILL #:

OTHER:

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

RECEIVING LABORATORY: Trace

ADDRESS:

CITY: Midland STATE: TX ZIP:

CONTACT: PHONE:

RECEIVED BY: (Signature)

DATE: TIME:

TETRA TECH CONTACT PERSON: Aaron Hale

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 17.6°c intact

REMARKS:

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

SWD #: 1104548

Analysis Request of Chain of Custody Record

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: St. Mary

SITE MANAGER: Aaron Hale

PROJECT NO.: 114-640037

PROJECT NAME: ESDU #20 SWD

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC-MS Vol. 8240/8260/624	GC-MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
277414	9/14		S		X	RP-6 Eddy Co NM 0-1'	1																	X				
415						RP-6 1-2'																						
416						RP-6 2-3'																						
417						RP-6 3-4'																						
418						RP-7 0-1'																						
419						RP-7 1-2'																						
420						RP-7 2-3'																						
421						RP-7 3-4'																						
422						RP-8 0-1'																						
423						RP-8 1-2'																						

RELINQUISHED BY: (Signature) Date: 9-15-11 Time: 1500

RECEIVED BY: (Signature) Date: 9/15/11 Time: 15:00

SAMPLED BY: (Print & Initial) TF Date: 9-14-11 Time:

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS

AIRBILL #:

OTHER:

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

RECEIVING LABORATORY: Trace

ADDRESS:

CITY: Midland STATE: TX ZIP:

CONTACT: PHONE:

RECEIVED BY: (Signature)

DATE: TIME:

TETRA TECH CONTACT PERSON: Aaron Hale

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 17.6°C intact

REMARKS:

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

WO #: 11091548

Analysis Request of Chain of Custody Record

PAGE: 4 OF: 5

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

CLIENT NAME: St. Mary

SITE MANAGER: Aaron Hale

PROJECT NO.: 114-6400371

PROJECT NAME: ESDU #20 SWD

Eddy Co NM

ANALYSIS REQUEST (Circle or Specify Method No.)

Preservative method columns: HCL, HNO3, ICE, NONE

Analysis columns: BTEX 8021B; TPH 8015 MOD. TX1005 (Ext. to C35); PAH 8270; RCRA Metals Ag As Ba Cd Cr Pb Hg Se; TCLP Metals Ag As Ba Cd Vr Pd Hg Se; TCLP Volatiles; TCLP Semi Volatiles; RCI; GC.MS Vol. 8240/8260/624; GC.MS Semi. Vol. 8270/625; PCB's 8080/608; Pest. 808/608; Chloride; Gamma Spec.; Alpha Beta (Air); PLM (Asbestos); Major Anions/Cations, pH, TDS

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	Chloride
277424	9/14		S		X	RP-8 2-3'	1		X
425	↓		↓		↓	RP-8 3-4'	↓		↓
426	↓		↓		↓	RP-9 0-1'	↓		↓
427	↓		↓		↓	RP-9 1-2'	↓		↓
428	↓		↓		↓	RP-9 2-3'	↓		↓
429	↓		↓		↓	RP-9 3-4'	↓		↓
430	↓		↓		↓	RP-10 0-1'	↓		↓
431	↓		↓		↓	RP-10 1-2'	↓		↓
432	↓		↓		↓	RP-10 2-3'	↓		↓
433	↓		↓		↓	RP-10 3-4'	↓		↓

RELINQUISHED BY: (Signature) [signature] Date: 9-15-11 Time: 1500
RECEIVED BY: (Signature) [signature] Date: 9/15/11 Time: 1500

SAMPLED BY: (Print & Initial) Date: Time:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS **HAND DELIVERED** (circled) UPS
AIRBILL #:
OTHER:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:

TETRA TECH CONTACT PERSON: Aaron Hale

Results by:

RUSH Charges Authorized: Yes No

RECEIVING LABORATORY: Trace
RECEIVED BY: (Signature)
ADDRESS:
CITY: Midland STATE: Tx ZIP:
CONTACT: PHONE: DATE: TIME:

SAMPLE CONDITION WHEN RECEIVED: 17.6°c intact

REMARKS:

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

& WO #: 1109548

Analysis Request of Chain of Custody Record

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

PAGE: 5 OF: 5

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: St. Mary

SITE MANAGER: Aaron Hale

PROJECT NO.: 114-640037

PROJECT NAME: ESDU #20 SWD

Eddy Co NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
277434	9/14		S		X	RP-11 0-1'	1																	X				
435						RP-11 1-2'																						
436						RP-11 2-3'																						
437						RP-11 3-4'																						
438						RP-12 0-1'																						
439						RP-12 1-2'																						
440						RP-12 2-3'																						
441						RP-12 3-4'																						

RELINQUISHED BY: (Signature) Date: 9-15-11 Time: 1500
RECEIVED BY: (Signature) Date: 9/15/11 Time: 15:00
SAMPLED BY: (Print & Initial) TF Date: 9-14-11 Time:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS
AIRBILL #:
OTHER:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
TETRA TECH CONTACT PERSON: Aaron Hale
Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 17.6°C intact
REMARKS:

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

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
200 East Sunset Road, Suite E El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260
E-Mail: lab@traceanalysis.com

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: 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.

Sample	Description	Matrix	Date Taken	Time Taken	Date 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.

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.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis 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.

Analytical Report

Sample: 278741 - CS-4 4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**1810**	mg/Kg	100	4.00

Sample: 278742 - CS-4 5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**3180**	mg/Kg	100	4.00

Sample: 278743 - CS-4 6'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**202**	mg/Kg	50	4.00

Sample: 278744 - CS-5 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

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

Sample: 278745 - CS-5 1-2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**377**		mg/Kg	50	4.00

Sample: 278746 - CS-5 2-3'

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

Parameter	Flag	Cert	Result	RL	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

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

Method Blanks

Method Blank (1) QC Batch: 85366

QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	QC Preparation:	2011-10-06	Prepared By:	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

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 85366 | Date Analyzed: 2011-10-07 | Analyzed By: AR
Prep Batch: 72450 | QC Preparation: 2011-10-06 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			93.3	mg/Kg	1	100	<3.85	93	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			95.1	mg/Kg	1	100	<3.85	95	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	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 Spike (MS-1) Spiked Sample: 278745

QC Batch: 85366 | Date Analyzed: 2011-10-07 | Analyzed By: AR
Prep Batch: 72450 | QC Preparation: 2011-10-06 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			9920	mg/Kg	100	10000	<385	95	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10500	mg/Kg	100	10000	<385	101	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: 278828

QC Batch: 85367 | Date Analyzed: 2011-10-07 | Analyzed By: AR
Prep Batch: 72450 | QC Preparation: 2011-10-06 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10900	mg/Kg	100	10000	948	100	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			11600	mg/Kg	100	10000	948	106	79.4 - 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 Analyzed: 2011-10-07 | Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	104	104	85 - 115	2011-10-07

Standard (CCV-1)

QC Batch: 85366 | Date Analyzed: 2011-10-07 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	96.2	96	85 - 115	2011-10-07

Standard (ICV-1)

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

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2011-10-07

Standard (CCV-1)

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

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.9	100	85 - 115	2011-10-07

Appendix

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory 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#11093030

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

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

CLIENT NAME: St Mary Land & Exploration
SITE MANAGER: Aaron Hale
PROJECT NO.: 114-6400371
PROJECT NAME: ESDU #20 SWD Eddy Co NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC:MS Vol. 8240/8260/624	GC:MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
278741	9/26		S		X	CS-4 4'	1					X												X				
742	9/26					CS-4 5'																						
743	9/26					CS-4 6'																						
744	9/28					CS-5 0-1'																						
745	9/28					CS-5 1-2'																						
746	9/28					CS-5 2-3'																						
747	9/28		↓		↓	CS-5 3-4'	↓					↓												↓				

RELINQUISHED BY: (Signature)	Date: 9-30-11 Time: 12:27	RECEIVED BY: (Signature)	Date: 9.30.11 Time: 12:27
SAMPLED BY: (Print & Initial) TT	Date: 9-28-11 Time:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS	AIRBILL #: OTHER:		
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
TETRA TECH CONTACT PERSON: Aaron Hale	Results by: RUSH Charges Authorized: Yes No		
RECEIVING LABORATORY: Trace ADDRESS: CITY: Midland STATE: TX ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) DATE: TIME:		
SAMPLE CONDITION WHEN RECEIVED: 4.0°C	REMARKS: 4°C		

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

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1299
200 East Sunset Road, Suite E El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260
E-Mail: lab@traceanalysis.com

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., 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.

Sample	Description	Matrix	Date Taken	Time Taken	Date 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.

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

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- Sample 278444 (AH-Pasture 1 1-1.5') . . . 5
- Sample 278445 (AH-Pasture 1 2-2.5') . . . 5
- Sample 278446 (AH-Pasture 1 3-3.5') . . . 5
- Sample 278447 (AH-Pasture 1 4-4.5') . . . 6

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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.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis 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:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**25000**	mg/Kg	100	4.00

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

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**16100**	mg/Kg	100	4.00

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

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**7810**	mg/Kg	100	4.00

Sample: 278446 - AH-Pasture 1 3-3.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**27500**	mg/Kg	100	4.00

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

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	Sample Preparation:	2011-10-06	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**27700**	mg/Kg	100	4.00

Method Blanks

Method Blank (1) QC Batch: 85366

QC Batch:	85366	Date Analyzed:	2011-10-07	Analyzed By:	AR
Prep Batch:	72450	QC Preparation:	2011-10-06	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 85366 | Date Analyzed: 2011-10-07 | Analyzed By: AR
Prep Batch: 72450 | QC Preparation: 2011-10-06 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			93.3	mg/Kg	1	100	<3.85	93	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	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.

Matrix Spike (MS-1) Spiked Sample: 278745

QC Batch: 85366 | Date Analyzed: 2011-10-07 | Analyzed By: AR
Prep Batch: 72450 | QC Preparation: 2011-10-06 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			9920	mg/Kg	100	10000	<385	95	79.4 - 120.6

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10500	mg/Kg	100	10000	<385	101	79.4 - 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 Analyzed: 2011-10-07 | Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	104	104	85 - 115	2011-10-07

Standard (CCV-1)

QC Batch: 85366 | Date Analyzed: 2011-10-07 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	96.2	96	85 - 115	2011-10-07

Appendix

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
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-	HUB	1752439743100-86536	TraceAnalysis
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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 # 1109271 8

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME:	SITE MANAGER:
St. Mary	Aaron Hale

PROJECT NO.:	PROJECT NAME:
114-6400371	ESDU #20 SWD Eddy Co NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
278443	9/26		S		X	AH - Pasture 1 0-1'	1					X												X				
444						AH - Pasture 1 1-1.5'																							
445						AH - Pasture 1 2-2.5'																							
446						AH - Pasture 1 3-3.5'																							
447	↓		↓		↓	AH - Pasture 1 4-4.5'	↓					↓												↓				

RELINQUISHED BY: (Signature)	Date: 9/27/11 Time: 2:00 P.M.	RECEIVED BY: (Signature)	Date: 9/27/11 Time: 14:00
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:

SAMPLED BY: (Print & Initial) AH TF — Date: 9-26-11 Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

TETRA TECH CONTACT PERSON: Aaron Hale — Results by:

RECEIVING LABORATORY: Trace — RECEIVED BY: (Signature)
ADDRESS:
CITY: Midland STATE: Tx ZIP:
CONTACT: PHONE: DATE: TIME:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 2 6 1°C intact

REMARKS: All tests - Midland

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