SITE INFORMATION Report Type: Closure Report General Site Information: Choctaw State #1 Tank Battery Site: Company: COG Operating LLC T-17-S Unit A Sec. 16 R-31-E Section, Township and Range Lease Number: API 30-015-24011 **Eddy County** County: GPS: 32.83896° N 103.86962° W Surface Owner: State Mineral Owner: Intersection of 529 and Hwy 82, travel east on Hwy 82 1.0 mi (CR-233), left 0.8 mi, right at Y 0.4 Directions: mi, pass building on right 0.1 mi, turn left 0.5 mi to location Release Data: 2/21/2012 Date Released: Produced Fluids Type Release: Source of Contamination: Gasket on vic clamp failed Fluid Released: 17 bbls Fluids Recovered: 15 bbls Official Communication: Name: Pat Ellis Ike Tavarez Company: COG Operating, LLC Tetra Tech 1910 N. Big Spring Address: 550 W. Texas Ave. Ste. 1300 P.O. Box City: Midland Texas, 79701 Midland, Texas (432) 682-4559 Phone number: (432) 686-3023 Fax: (432) 684-7137 Email: pellis@conchoresources.com ike.tavarez@tetratech.com

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

🖳 Acceptable Soil RRAL (mg/kg) 📖 Total BTEX

50

TPH

5,000

Benzene

10



RECEIVED SEP 06 2012 NMOCD ARTESIA

July 26, 2012

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

Closure Report for the COG Operating LLC., Choctaw State #1 Re: Tank Battery, Unit A, Section 16, Township 17 South, Range 31 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill located at the Choctaw State #1 Tank Battery, Unit A, Section 16, Township 17 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.83896°, W 103.86962°. 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 February 21, 2012, and released approximately seventeen (17) barrels of produced water due to a ruptured gasket on a vic clamp. To alleviate the problem, COG replaced the gasket. Approximately 15 barrels of produced fluids were recovered. The entire spill remained within the firewalls of the facility and impacted area measuring approximately 10' x 120' and 15' x 55'. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 16. One well was listed in Section 34 with a recorded depth of 271' bgs by the Geology and Groundwater Resources of Eddy County, New Mexico (Report 3). According to the NMOCD groundwater map, the average depth to

Tetra Tech



groundwater in this area is 300' below surface. The groundwater well report data is shown 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 Analytical Results

On March 7, 2012, Tetra Tech personnel inspected and sampled the spill area. Five (5) auger holes (AH-1 through AH-5) were installed using a stainless steel hand auger to assess the impacted soils. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The spill area and auger hole locations are shown on Figure 3.

Referring to Table 1, all of the submitted samples were below the RRAL for TPH and BTEX. A shallow chloride impact was detected at the site ranging from 1,360 mg/kg to 14,400 mg/kg at depths from 0-1' to 1-1.5' below surface. The deeper samples showed a significant chloride decline with depth.

Closure Activities

Based on the approved work plan, Tetra Tech personnel supervised the excavation of the site. The final excavation depth of the soil remediation was met as stated in the approved work plan. The excavation depths ranged from 1.0' to 1.5' below surface.

A total of 120 cubic yards of soil were excavated and hauled to R 360 for proper disposal. The excavated area and depths are highlighted in Table 1 and shown on Figure 4.



Based on the remedial activities performed, COG requests closure of the site. A copy of the C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the remedial activities, please call at (432) 682-4559.

Respectfully submitted,

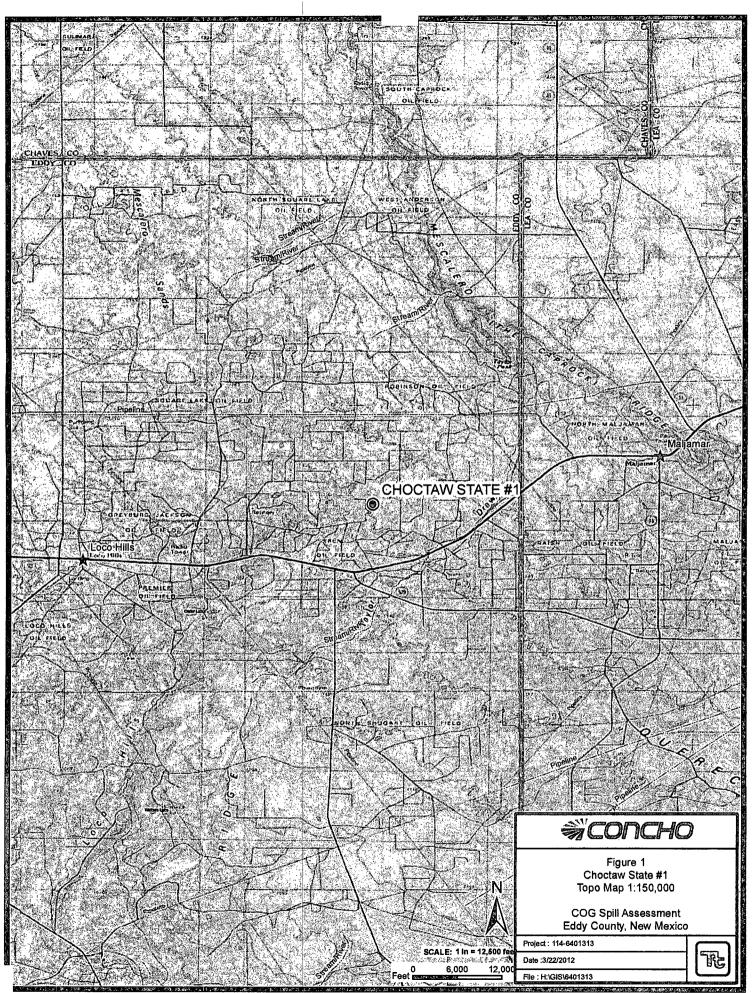
TETRA/TECH

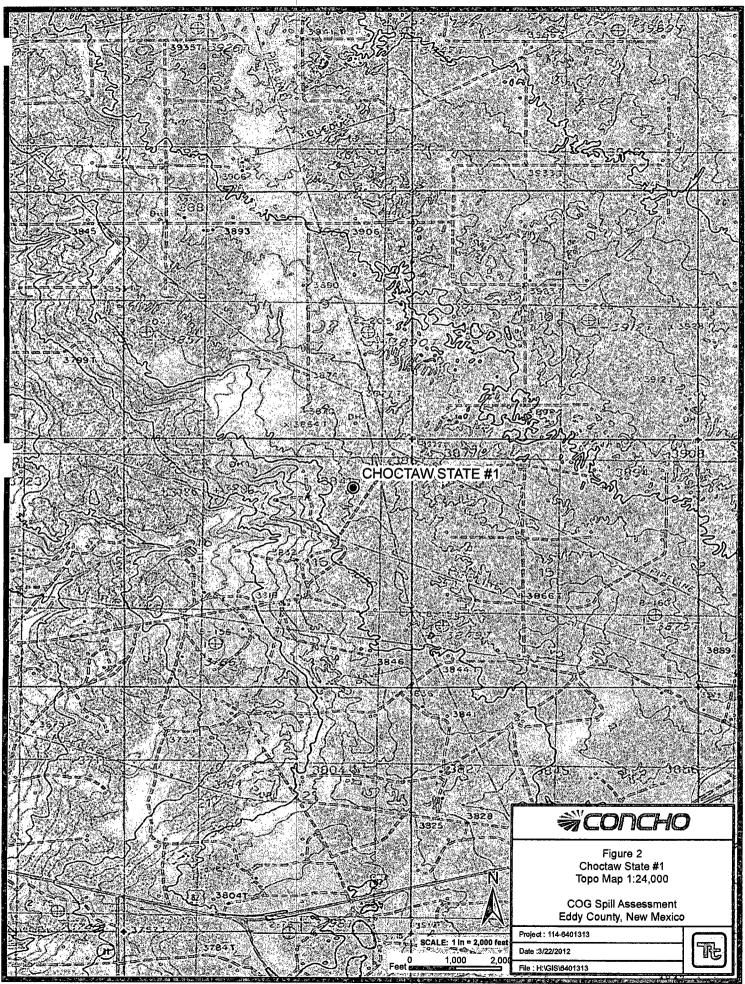
tke Tavarez PG

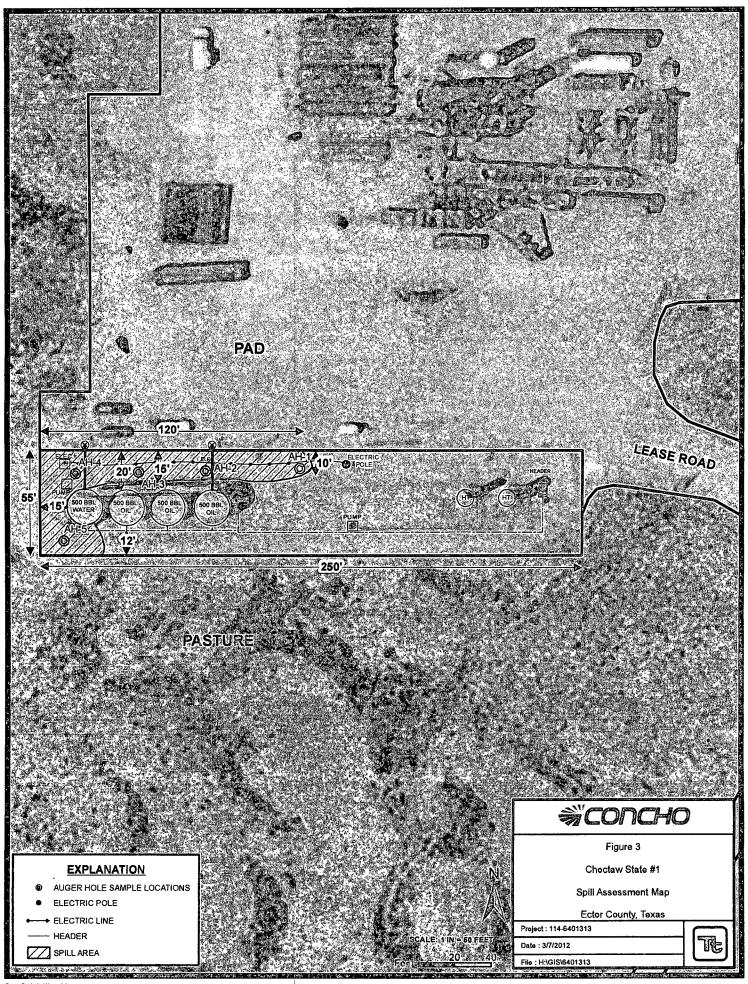
Sr. Project Manager

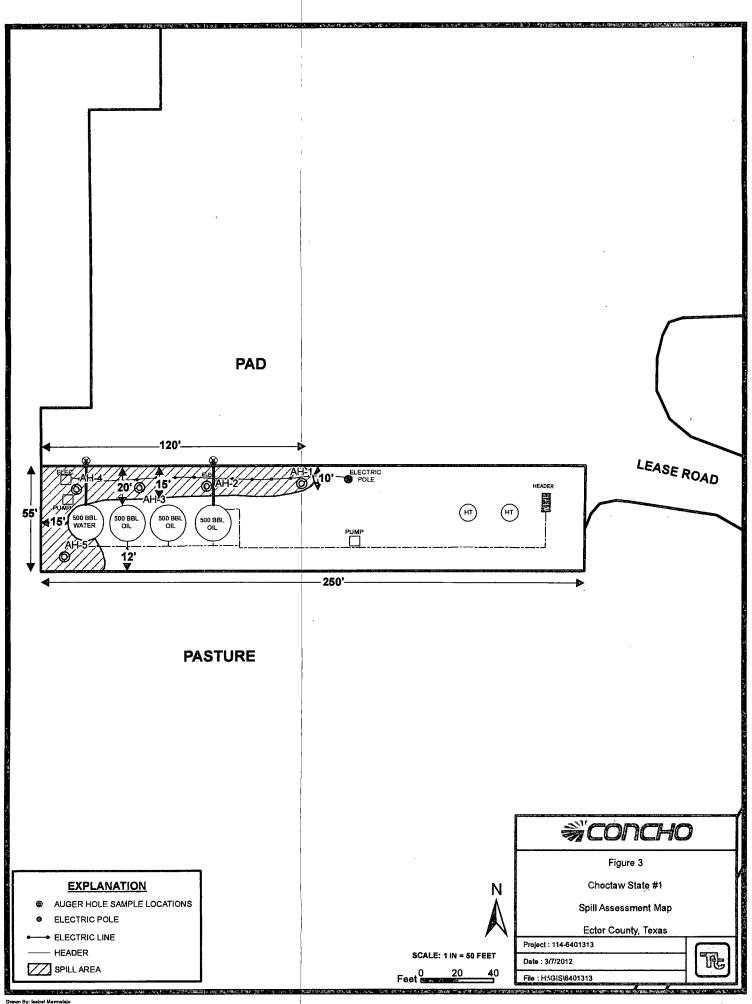
cc: Pat Ellis - COG

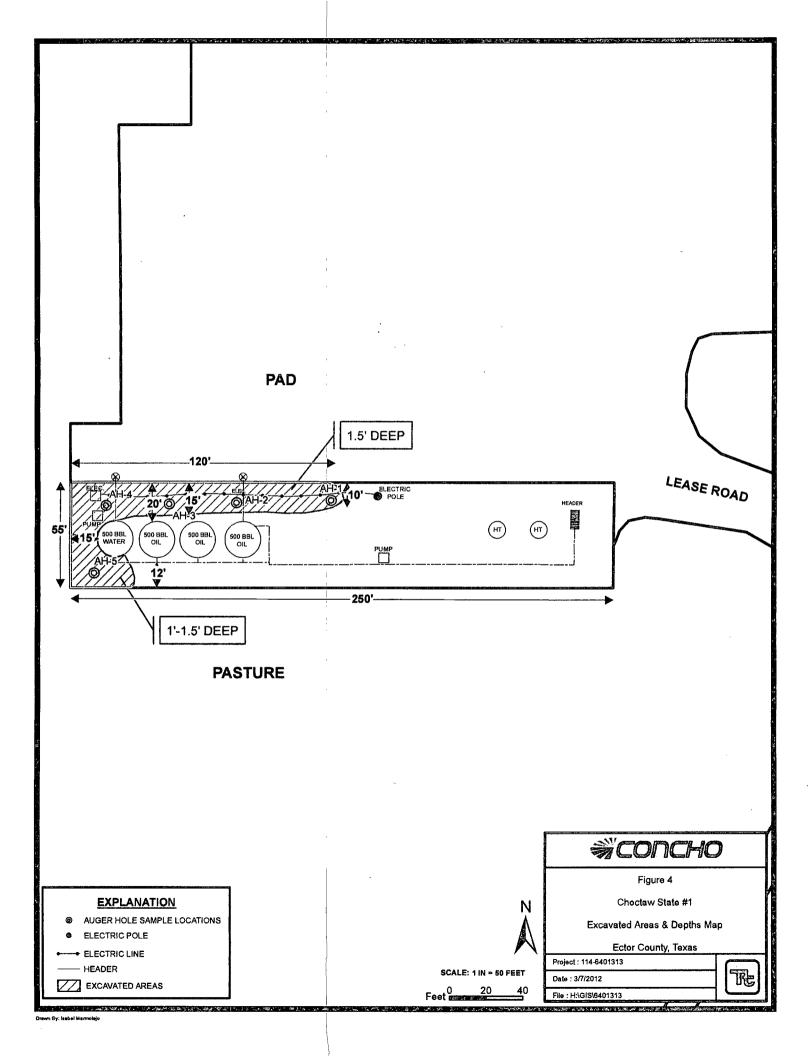
FIGURES











Tables

Table 1 COG Operating LLC. Choctaw State #1 Eddy County, New Mexico

Sample	Sample	Sample	Soil	Status		ГРН (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total BTEX	Chloride
ID	Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	3/7/2012	0-1		X	<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	2,830
	II .	1-1.5		X									<200
	ı,	2-2.5	Х		-	-	-	-	-	-	-	-	<200
	u	3-3.5	Х		-	-	-	-	-	-	-	-	654
AH-2	3/7/2012	0-1		X	31.2	2,260	2,291	<0.0200	<0.0200	<0.0200	<0.0200	-≨0.0200	2,670
		1-1.5	age contains	X	ميد ولماتر ۾ ۽	k is to light king on an	্ৰস কিন্তু ক্ৰিয় েছ	the Hell to receive	n erer Schwerferenner	e camen postanio e timo se della	and the second	CHARGE CONTRACTOR	1,610
	н	2-2.5	Х		-	-	-	-	-	-	_	-	459
	н	3-3.5	Х		-	-	-	-	-	-	-	-	235
AH-3	3/7/2012	0-1		X	14.0	645	659	<0.0200	<0.0200	<0.0200	<0.0200	₹0.0200	2,530
	u	1-1.5		. X			- 1						<200
	u	2-2.5	Х		-	-	-	-	-	-	-	-	285
	п	3-3.5	Х		-	-	-	-	-	-	-	-	230
AH-4	3/7/2012	0-1		Χ	36.4	506	542	<0.0200	<0.0200	<0.0200	<0.0200	₹0.0200	1,360
	п	1-1.5	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	X					الله الله الله الله الله الله الله الله		1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		420
	И	2-2.5	Х		-	-	-	-	-	-	-	-	440
	и	3-3.5	Х		-	-	-	-		-	-	-	330
AH-5	3/7/2012	0-1	er er	X	<2.00	<50.0	<50.0	<0.0200.	<0.0200	<0.0200	<0.0200	₹ 0.0200;	14,400
	a	1-1.5		. X									-5,990
	11 .	2-2.5	Х		-	-	•	-	-	-	-	-	<200
	· II	3-3.5	Х		-	-	-	_	-	-		_	<200

(-) Not Analyzed

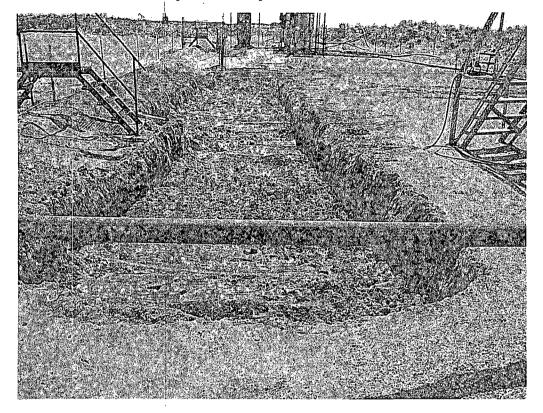
Excavation Depths

Photos

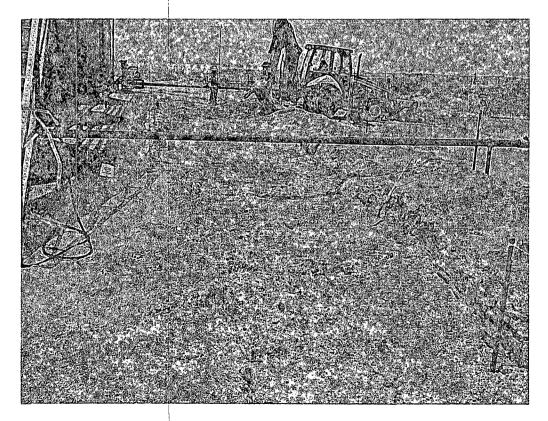
TETRATECH

COG Operating LLC Choctaw State #1 Tank Battery Eddy County, New Mexico





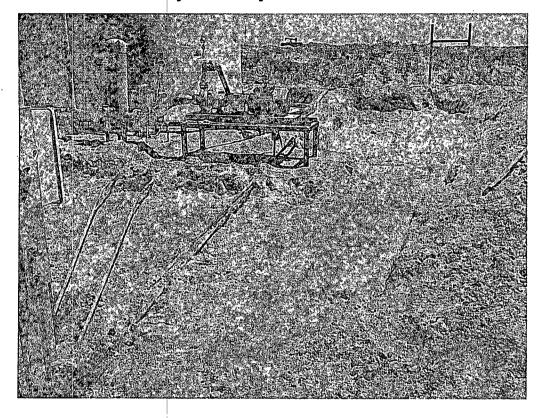
View East - Area of AH-2 and AH-1



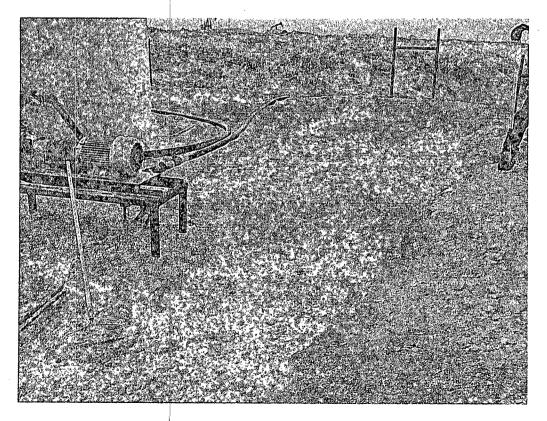
View West - AH-3 and AH-4

COG Operating LLC Choctaw State #1 Tank Battery Eddy County, New Mexico





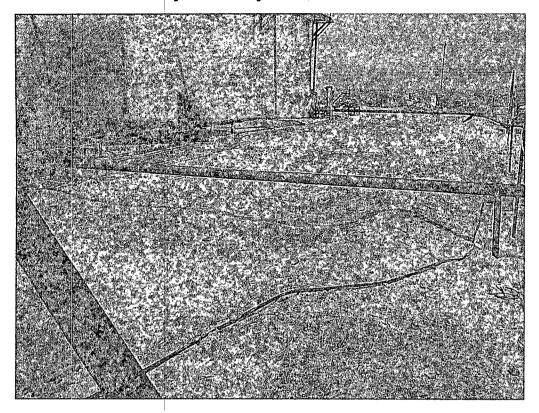
View South – Area of AH-5



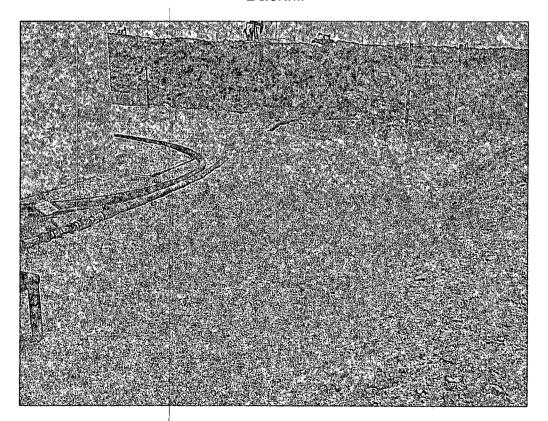
Backfill

COG Operating LLC Choctaw State #1 Tank Battery Eddy County, New Mexico





Backfill



Backfill

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

						(OPERAT	TOR .		☐ Initia	al Report	\boxtimes	Final Report
Name of Co	mpany C	OG Operat	ing LLC			C	Contact Par	Ellis					
Address 55	0 W. Texa	s, Suite 130	0 Midlar	ıd, Texas	79701	T	'elephone N	lo. (432) 230-0	077				
Facility Nar	ne Chocta	w State #1				F	acility Typ	e Tank Batter	ry				
Surface Ow	ner: State			Mine	eral Ow	ner	Lease No. (API#) 30-015-24011						5-24011
				L	OCAT	ION	OF REI	LEASE					
Unit Letter A	Section 16	Township 17S	Range 31E	Feet from	the N	Vorth/S	South Line	Feet from the	East/\	West Line	County	Eddy	7
			I				Longitud	e W 103.86962 E ASE	<u>2</u> °				
Type of Relea	ase: Produce	ed Water			11110			Release 17 bbls		Volume F	Recovered 1	5 bbls	
Source of Release: Vic Clamp ruptured								our of Occurrence	e	Date and	Hour of Dise 2 7:00a.n	covery	
Was Immedia	nte Notice G		Yes 🛛	No 🛛 N	Not Requ	iired	If YES, To	Whom?			· · · · · · · · · · · · · · · · · ·		
By Whom?						-	Date and H	our			 		
Was a Watercourse Reached? ☐ Yes ☒ No								lume Impacting th	he Wate	ercourse.	, 187 18		
If a Watercou	rse was Imp	pacted, Descri	be Fully.*			I			· · · · · · · · · · · · · · · · · · ·				
Describe Cau	se of Proble	m and Remed	lial Actior	Taken.*									
The gasket on	vic clamp	ruptured caus	ing the rel	ease of fluid	d. A nev	v gaske	et has been in	nstalled.					
Describe Area	a Affected a	nd Cleanup A	ction Tak	en.*			· · · · · · · · · · · · · · · · · · ·		***************************************				
Tetra Tech in: The site was t	spected the hen brough	site and collect t up to surface	cted sample grade wi	les to define th clean bac	the spill kfill mat	ls exter terial. T	nt. Soil that of Fetra Tech p	exceeded RRAL v repared a closure	was rem report a	noved and h and submitt	auled away ed it to NM(for pro OCD fo	per disposal. or review.
regulations all public health should their o	l operators a or the envir perations ha ment. In ac	are required to onment. The ave failed to a Idition, NMO	report an acceptanc dequately CD accept	d/or file cer e of a C-14 investigate	tain releated tain report I and rem	ase not by the l ediate o	tifications ar NMOCD ma contamination	knowledge and und perform corrector when as "Final Reson that pose a threetor of resonance the operator of resonance the o	tive acti eport" d eat to gr	ons for rele oes not reli ound water	eases which eve the oper , surface wa	may en ator of ter, hur	danger liability nan health
Signature:		1 1						OIL CONS	SERV	ATION	DIVISIO	N	
Printed Name	: Ike Tavare	z Ac	evit	- An	Cor	C A	pproved by	District Superviso	or:				
Title: Project	Manager					A ₁	pproval Date	e:	<u> </u>	Expiration I	Date:		
E-mail Addres	ss: Ike.Tava	rez@TetraTe	ch.com			C	onditions of	Approval:			Attached		
Date: 7- Attach Addit	- 2C -			(432) 682-4	559			7-701-1					

<u>District I</u> 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

Revised October 10, 2003

Form C-141

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

Release Notification and Corrective Action

		OPERA:	ror_		Initia	l Report	\Box	Final Report
Name of Company COG OPERATING LLC	(Contact	Pa	at Ellis				
Address 550 W. Texas, Suite 100, Midland, T2	C 79701	Felephone N	No. 432-	230-0077	'			
Facility Name Choctaw State #1		acility Typ	e Tani	k Battery				
Surface Owner State Min	neral Owner				Lease N	o. (API#)	30-015	-24011
T T	OCATION		FASE					
Unit Letter Section Township Range Feet from		South Line	Feet from the	East/We	st Line	County		
A 16 17S 31E		Journ Dino					Eddy	
Latitu	de 32 50.335	Longitu	ide 103 52.183					<u> </u>
	NATURE	OF RELI	EASE					
Type of Release Produced water			Release 17bbls	V	olume R	ecovered 1	5bbls	
Source of Release vic clamp ruptured		Date and H 02/21/2012	our of Occurrenc			Hour of Disc 2 7:00 a.m		
Was Immediate Notice Given? ☐ Yes ☒ No ☒	Not Paguired	If YES, To	Whom?					
By Whom?	INDU Kequireu	Date and H						
Was a Watercourse Reached?	<u> </u>		lume Impacting t	he Waterr	ourse			
☐ Yes ⊠ No		, a 125, ve	ionic unpacting t	ne watere	ourse.			
If a Watercourse was Impacted, Describe Fully.*		<u> </u>						
Describe Cause of Problem and Remedial Action Taken.*								
The gasket on vic clamp ruptured causing the release of flu	id. A new gask	et has been i	nstalled.					
Describe Area Affected and Cleanup Action Taken.*			 					
Initially 17bbls of produced water were released from the vinside the facility walls and measured roughly 120' long. release and we will present a remediation work plan to the	Tetra Tech will s	ample the sp	ill site area to del	lineate any	possible			
I hereby certify that the information given above is true and regulations all operators are required to report and/or file of public health or the environment. The acceptance of a C-I should their operations have failed to adequately investigate or the environment. In addition, NMOCD acceptance of a federal, state, or local laws and/or regulations.	ertain release no 41 report by the e and remediate	tifications ar NMOCD ma contamination	nd perform correct arked as "Final Roon that pose a three	tive action eport" doe eat to grou	s for rele s not reli nd water	eases which eve the oper , surface wa	may en ator of ter, hun	danger liability nan health
Signature:	-		OIL CONS	<u>SERVA</u>	TION	DIVISIO	<u>N</u>	
Printed Name: Josh Russo	А	pproved by	District Supervise	or:			1	
Title: HSE Coordinator	А	pproval Date	2 :	Ex	piration I	Date:		
E-mail Address: jrusso@conchoresources.com	c	onditions of	Approval:			Attached		
Date: 03/05/2012 Phone: 432-212- Attach Additional Sheets If Necessary	2399				· 			

Appendix B

Water Well Data Average Depth to Groundwater (ft) COG -Choctaw State #1 Eddy County, New Mexico

	16 9	South		30 East		-	16	South		31 East			16	South	3	2 East	
)	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3 €	5 2 26 5	1 2
	8	9	10	11	12	7	8	9	10	11	12 288	7	8	9	10	11	12 215
8	17	16	15	14	13	18	17	16	15	14	13 113	18	17	16 221	15	14	13 215
9 .	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
0	29	28	27	26	25	30	29	28	27	26	25	220 30	29	210 28	27	210	25
i	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	243 35	36 260
	17.9	South	- l	30 East		230	17	South		31 East	·		17 :	South	3	2 East	1200
	5	4	3	2	1	6	5	4	3	2	1	6	5		3 175		1 2:
	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11 70 88	12
В	17	16	15	14	13	18	17	16 SITE	15	14	13	18	17	16	15	14	13
)	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
0	29	28	27	26	25	30	29	28	27	26	25	30 18 dry	29	28	27	26	25
1	32	33	34	35	36	31	32	33	34 271	35	36	31	32	33	34	35	36
	18 9	South	;	30 East			18	South		31 East			18 9	South	3	2 East	
•	5	4	3	2	1	6	5	4	3	2	1	6	5	4 65	3	2	1
	8	9	10	11	12	7	8	9	10	11	12 400	7 460 82	8	9	10	11	12
	17	16	15	14	13	18	17	16	15	14 317	13	18	17	16 84	15	14	13
3	1			23	24	19	20	21	22	23	24	19	20 164	21	22 429	23	24
	20	21	22	- 1	1 1				27	26	25	30	29	28	27	26	25
9	20	21 28	27	26	25	30	29	28	27		1 1	11	1			i	

NMOCD - Groundwater Data

SITE

Appendix C

Report Date: March 23, 2012 Work Order: 12031201 Page Number: 1 of 4

Summary Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX 79705

Project Location: Eddy Co., NM

Project Name: COG/Choctaw State #1

Project Number: 114-6401313

Report Date: March 23, 2012

Work Order: 12031201

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
291027	AH-1 0-1'	soil	2012-03-07	00:00	2012-03-09
291028	AH-1 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291029	AH-1 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291030	AH-1 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291037	AH-2 0-1'	soil	2012-03-07	00:00	2012-03-09
291038	AH-2 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291039	AH-2 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291040	AH-2 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291047	AH-3 0-1'	soil	2012-03-07	00:00	2012-03-09
291048	AH-3 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291049	AH-3 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291050	AH-3 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291057	AH-4 0-1'	soil	2012-03-07	00:00	2012-03-09
291058	AH-4 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291059	AH-4 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291060	AH-4 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291067	AH-5 0-1'	soil	2012-03-07	00:00	2012-03-09
291068	AH-5 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291069	AH-5 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291070	AH-5 3-3.5'	soil	2012-03-07	00:00	2012-03-09

			BTEX		TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
291027 - AH-1 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00
291037 - AH-2 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	2260	31.2
291047 - AH-3 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	645	14.0
291057 - AH-4 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	506	36.4
291067 - AH-5 0-1'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	< 2.00

Report Date: March 23, 2012	Work Order: 12031201	Page	Number: 2 of 4
Sample: 291027 - AH-1 0-1'			
Param Flag	Result	Units	RL
Chloride	2830	mg/Kg	4
Sample: 291028 - AH-1 1-1.5'			
Param Flag	Result	Units	RL
Chloride	<200	mg/Kg	4
Sample: 291029 - AH-1 2-2.5'			
Param Flag	Result	Units	m RL
Chloride	<200	m mg/Kg	4
Sample: 291030 - AH-1 3-3.5'			
Param Flag	Result	Units	RL
Chloride	654	mg/Kg	4
Sample: 291037 - AH-2 0-1' Param Flag	Result	Units	m RL
Chloride	2670	mg/Kg	4
Sample: 291038 - AH-2 1-1.5'			
Param Flag	Result	Units	RL
Chloride	1610	mg/Kg	4
Sample: 291039 - AH-2 2-2.5'			
Param Flag	Result	Units	RL
Chloride	459	mg/Kg	4
Sample: 291040 - AH-2 3-3.5'			
Param Flag	Result	Units	RL
Chloride	235	mg/Kg	4

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296

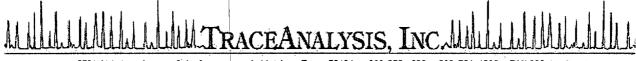
This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: March	h 23, 2012	Work Order: 12031201	Page I	Number: 3 of 4
Sample: 291047 -	· AH-3 0-1'			
Param	Flag	Result	Units	RL
Chloride		2530	mg/Kg	4
Sample: 291048	- AH-3 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4
Sample: 291049 -	· AH-3 2-2.5'			
Param	Flag	Result	Units	RL
Chloride		285	mg/Kg	4
Sample: 291050 -	- AH-3 3-3.5'			
Param	Flag	Result	Units	RL
Chloride		230	mg/Kg	4
Sample: 291057 -	- AH-4 0-1'			
Param	Flag	Result	Units	RL
Chloride		1360	mg/Kg	4
Sample: 291058 -	- AH-4 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		420	mg/Kg	4
	1== 4 2 2 2 2			
Sample: 291059 -	· AH-4 2-2.5			
Param	Flag	Result	Units	RL
Chloride		440	mg/Kg	4
Sample: 291060 -	· AH-4 3-3.5			
Sample: 291060 - Param	• AH-4 3-3.5 ′ Flag	Result	Units	m RL

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296

This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: March 23, 2012		Work Order: 12031201		Page Number: 4 of 4
Sample: 291067	- AH-5 0-1'			
Param .	Flag	Result	Units	RL
Chloride		14400	mg/Kg	4
Sample: 291068	- AH-5 1-1.5'			
Param	Flag	Result	Units	RL
Chloride		5990	mg/Kg	4
Sample: 291069	- AH-5 2-2.5'			
Param	\mathbf{Flag}	Result	Units	RL
Chloride		<200	mg/Kg	4
Sample: 291070	- AH-5 3-3.5'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Ro., Suite 100 Lubbock El Paso, Midland,

Texas 79424 Texas 79922 Texas 79703 800-378-1296 806-794-1296 915-585-3443

432-689-6301

FAX 808 · 794 · 1298 FAX 915 · 585 · 4944 FAX 432 · 689 · 6313

Suite 100 Carrolton, Texas 75006 972-242-7750 E-Maii lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report (Corrected Report)

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: March 23, 2012

Work Order: 12031201

Project Location: Eddy Co., NM

Project Name: COG/Choctaw State #1

Project Number: 114-6401313

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
291027	AH-1 0-1'	soil	2012-03-07	00:00	2012-03-09
291028	AH-1 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291029	AH-1 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291030	AH-1 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291037	AH-2 0-1'	soil	2012-03-07	00:00	2012-03-09
291038	AH-2 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291039	AH-2 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291040	AH-2 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291047	AH-3 0-1'	soil	2012-03-07	00:00	2012-03-09
291048	AH-3 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291049	AH-3 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291050	AH-3 3-3.5'	soil	2012-03-07	00:00	2012-03-09
291057	AH-4 0-1'	soil	2012-03-07	00:00	2012-03-09
291058	AH-4 1-1.5'	soil	2012-03-07	00:00	2012-03-09
291059	AH-4 2-2.5'	soil	2012-03-07	00:00	2012-03-09
291060	AH-4 3-3.5'	soil	2012-03-07	00:00	2012-03-09

			Date	Time	Date	
Sample	Description	Matrix	Taken	Taken	Received	
291067	AH-5 0-1'	soil	2012-03-07	00:00	2012-03-09	
291068	AH-5 1-1.5'	soil	2012-03-07	00:00	2012-03-09	
291069	AH-5 2-2.5'	soil	2012-03-07	00:00	2012-03-09	
291070	AH-5 3-3.5'	soil	2012-03-07	00:00	2012-03-09	

Report Corrections (Work Order 12031201)

• Re-ran sample 291030 for Cl. 3-23-12

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

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

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Sample 291030 (AH-1 3-3.5')			 		8
Sample 291037 (AH-2 0-1')			 		8
Sample 291038 (AH-2 1-1.5')			 		9
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Sample 291040 (AH-2 3-3.5')			 		10
Sample 291047 (AH-3 0-1')			 		10
Sample 291047 (AH-3 0-1') Sample 291048 (AH-3 1-1.5')			 		12
Sample 291049 (AH-3 2-2.5')			 		12
Sample 291050 (AH-3 3-3.5')			 		12
Sample 291057 (AH-4 0-1')			 		13
Sample 291058 (AH-4 1-1.5')					
Sample 291059 (AH-4 2-2.5')			 		14
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Sample 291067 (AH-5 0-1')					
Sample 291068 (AH-5 1-1.5')			 		16
Sample 291069 (AH-5 2-2.5')					
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Laboratory Control Spikes					21 21
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QC Batch 89384 - LCS (1)					
QC Batch 89385 - LCS (1)					
QC Batch 89562 - LCS (1)					
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Case Narrative

Samples for project COG/Choctaw State #1 were received by TraceAnalysis, Inc. on 2012-03-09 and assigned to work order 12031201. Samples for work order 12031201 were received intact at a temperature of 0.8 C.

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

		Prep	Prep	$_{ m QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	75875	2012-03-14 at 11:37	89384	2012-03-14 at 12:29
Chloride (Titration)	SM 4500-Cl B	75918	2012-03-16 at 08:55	89562	2012-03-21 at 14:47
Chloride (Titration)	SM 4500-Cl B	75918	2012-03-16 at 08:55	89563	2012-03-21 at 14:48
Chloride (Titration)	SM 4500-Cl B	76090	2012-03-22 at 10:11	89635	2012-03-22 at 14:11
TPH DRO - NEW	S 8015 D	75807	2012-03-12 at 12:24	89298	2012-03-12 at 12:29
TPH DRO - NEW	S 8015 D	75832	2012-03-13 at 11:00	89329	2012-03-13 at 11:03
TPH GRO	S 8015 D	75875	2012-03-14 at 11:37	89385	2012-03-14 at 12:56

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 12031201 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: March 23, 2012

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 6 of 32 Eddy Co., NM

Analytical Report

Sample: 291027 - AH-1 0-1'

Laboratory: Midland

Analysis: QC Batch: BTEX 89384

Analytical Method: Date Analyzed:

S 8021B

2012-03-14

Prep Method: S 5035 Analyzed By:

tc

Prep Batch:

75875

Sample Preparation:

2012-03-14

Prepared By:

RLRLParameter Flag Cert Result Units Dilution Benzene < 0.0200 mg/Kg 0.0200 U 0.0200 Toluene < 0.0200 mg/Kg 1 U Ethylbenzene < 0.0200 mg/Kg 1 0.0200 U 0.0200 Xylene < 0.0200 mg/Kg

							Spike	Percent	Recovery
Surrogate		\mathbf{Flag}	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	Qsr	Qsr		3.13	mg/Kg	1	2.00	156	75 - 135.4
4-Bromofluorobenzene (4-BFB)				2.10	mg/Kg	1	2.00	105	63.6 - 158.9

Sample: 291027 - AH-1 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 89562 Prep Batch: 75918

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-03-21

2012-03-16

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

RLCert Units Dilution RLParameter Flag Result Chloride 2830 mg/Kg 100 4.00

Sample: 291027 - AH-1 0-1'

Laboratory:

Prep Batch:

Midland

75807

Analysis: TPH DRO - NEW QC Batch: 89298

Analytical Method: Date Analyzed:

S 8015 D 2012-03-12 2012-03-12

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

RLFlag Cert Dilution RLResult Units Parameter < 50.0 50.0 DRO mg/Kg 1

Sample Preparation:

Report Date: March 23, 2012

114-6401313

Work Order: 12031201

COG/Choctaw State #1

Page Number: 7 of 32

Eddy Co., NM

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			103	mg/Kg	1	100	103	49.3 - 157.5

Sample: 291027 - AH-1 0-1'

Laboratory:

Midland

Analysis:

TPH GRO

Analytical Method:

S 8015 D

Prep Method: S 5035

QC Batch:

89385

Date Analyzed:

2012-03-14

Analyzed By:

Prep Batch: 75875

Sample Preparation: 2012-03-14

Prepared By: tc

RL

ъ.		~ .	7025	TT 1.	5.1	T) T
Parameter	\mathbf{Flag}	Cert	Result	Units	Dilution	KL ·
GRO		1	< 2.00	mg/Kg	1	2.00

						Spike	Percent	Recovery
Surrogate	\mathbf{Flag}	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.96	mg/Kg	1	2.00	148	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)	1		1.98	mg/Kg	1	2.00	99	45.1 - 162.2

Sample: 291028 - AH-1 1-1.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

89562 75918

Date Analyzed: Sample Preparation:

2012-03-21 2012-03-16 Analyzed By: ARPrepared By: AR

RL

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

Sample: 291029 - AH-1 2-2.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By: AR

QC Batch: Prep Batch:

89562

75918

Date Analyzed: Sample Preparation: 2012-03-21 2012-03-16

Prepared By: AR

continued ...

114-6401313	Iarch 23, 2012		Work Order: 12031201 COG/Choctaw State #1				Page Number: 8 of 3 Eddy Co., NN		
sample 291029 c	$continued \dots$								
				$_{ m RL}$					
Parameter	Flag	Ce	rt	Result		Units	Dilution		RL
				RL					
Parameter	Flag	Ce	rt	Result		Units	Dilution		RL
Chloride	U			<200	n	ng/Kg	50		4.00
Sample: 29103	30 - AH-1 3-3.5'								
-	idland								
•	hloride (Titration)	A	nalytical I	Method:	SM 4500-	Cl B	Prep Me	ethod:	N/A
	0635	D	ate Analy:	zed:	2012-03-2	2	Analyze	d By:	\mathbf{AR}
Prep Batch: 76	6090	Sa	mple Pre	paration:	2012-03-23	2	Prepare	d By:	AR
				RL					
Parameter	Flag	Ce	rt	Result		Units	Dilution		RL
Chloride				654	n	ng/Kg	50		4.00
		4							
Analysis: Br QC Batch: 89	3 7 - AH-2 0-1' idland FEX 1384 1875	Date A	ical Metho nalyzed: Preparat	2012	21B -03-14 -03-14		Prep Meth Analyzed Prepared l	By:	S 5035 tc tc
Laboratory: M Analysis: B QC Batch: 89 Prep Batch: 75	idland TEX 1384 1875	Date A	nalyzed: Preparat	2012 on: 2012 RL	-03-14 -03-14		Analyzed 1 Prepared 1	By:	tc tc
Laboratory: M Analysis: B' QC Batch: 89 Prep Batch: 75	idland TEX 9384 875 Fla	Date A	nalyzed: Preparat	2012 on: 2012 RL Result	-03-14 -03-14	Units	Analyzed Prepared I	By: 1 By: 1	tc tc RL
Laboratory: M Analysis: B' QC Batch: 89 Prep Batch: 75 Parameter Benzene	idland TEX 9384 9875 Fla	Date A Sample	nalyzed: Preparat	2012 on: 2012 RL Result <0.0200	-03-14 -03-14	ıg/Kg	Analyzed Prepared 1 Dilution	By: 1	tc tc RL 0.0200
Laboratory: M Analysis: B' QC Batch: 89 Prep Batch: 75 Parameter Benzene Toluene	idland TEX 9384 9875 Fla U	Date A Sample	nalyzed: Preparat	2012 on: 2012 RL Result <0.0200 <0.0200	-03-14 -03-14 -03-14	ıg/Kg ıg/Kg	Analyzed 1 Prepared 1 Dilution	By: 1	RL 0.0200 0.0200
Laboratory: M Analysis: B' QC Batch: 89 Prep Batch: 75 Parameter Benzene Toluene	idland TEX 9384 9875 Fla	Date A Sample	nalyzed: Preparat	2012 on: 2012 RL Result <0.0200	-03-14 -03-14 -03-14	ıg/Kg	Analyzed Prepared 1 Dilution	By: 1	tc tc RL 0.0200
Laboratory: M Analysis: B QC Batch: 89 Prep Batch: 75 Parameter Benzene Toluene Ethylbenzene	idland TEX 9384 9875 Fla U	Date A Sample	nalyzed: Preparat	2012 on: 2012 RL Result <0.0200 <0.0200 <0.0200	-03-14 -03-14 -03-14	ig/Kg ig/Kg ig/Kg	Analyzed Prepared Dilution	By:	RL 0.0200 0.0200 0.0200
Laboratory: M Analysis: B' QC Batch: 89 Prep Batch: 75 Parameter Benzene Toluene Ethylbenzene Xylene Surrogate	idland TEX 9384 9875 Fla U U U	Date A Sample	nalyzed: Preparat: t	2012 on: 2012 RL Result <0.0200 <0.0200 <0.0200 <0.0200 Units	-03-14 -03-14 m m	ag/Kg ag/Kg ag/Kg ag/Kg ag/Kg Spike an Amount	Analyzed Prepared Dilution 1 1 1 Percent Recovery	By: 1 By: 1	RL 0.0200 0.0200 0.0200 0.0200 0.0200 overy
Laboratory: M Analysis: B' QC Batch: 89 Prep Batch: 75 Parameter Benzene Toluene Ethylbenzene	idland TEX 9384 9875 Fla U U U (TFT)	Date A Sample	nalyzed: Preparat	2012 non: 2012 RL Result <0.0200 <0.0200 <0.0200 <0.0200 <0.0200	-03-14 -03-14 m m m Dilution	ng/Kg ng/Kg ng/Kg ng/Kg ng/Kg Spike	Analyzed Prepared Dilution 1 1 1 Percent	By: 1 Recc Lir 75 -	RL 0.0200 0.0200 0.0200 0.0200

COG/Choctaw State #1 Sample: 291037 - AH-2 0-1' Laboratory: Midland Analytical Method: SM 4500-Cl B Prep Method: N/A Analysis: Chloride (Titration) QC Batch: 89562 Date Analyzed: 2012-03-21 Analyzed By: AR Sample Preparation: Prepared By: Prep Batch: 75918 2012-03-16 ARRLDilution RLParameter Flag Cert Result Units 4.00 Chloride 2670 mg/Kg 100 Sample: 291037 - AH-2 0-1' Laboratory: Midland Analytical Method: Prep Method: Analysis: TPH DRO - NEW S 8015 D N/A QC Batch: 89298 Date Analyzed: 2012-03-12 Analyzed By: DA Prepared By: Prep Batch: 75807 Sample Preparation: 2012-03-12 DA RLParameter Flag Cert Result Units Dilution RL50.0 DRO 2260 mg/Kg Recovery Spike Percent Limits Surrogate Flag Cert Result Units Dilution Amount Recovery 49.3 - 157.5 n-Tricosane 514 mg/Kg 5 100 514 Qsz Qar Sample: 291037 - AH-2 0-1' Laboratory: Midland TPH GRO Analytical Method: S 5035 Analysis: S 8015 D Prep Method: QC Batch: 89385 Date Analyzed: 2012-03-14 Analyzed By: tc Sample Preparation: 2012-03-14 Prep Batch: 75875 Prepared By: RLDilution Parameter Flag Cert Result Units RLGRO 31.2 2.00 mg/Kg 1 1 Spike Percent Recovery Surrogate Flag Cert Result Units Dilution Amount Recovery Limits

2.44

1.82

mg/Kg

mg/Kg

1

1

2.00

2.00

122

91

58.5 - 155.1

45.1 - 162.2

Work Order: 12031201

Report Date: March 23, 2012

Trifluorotoluene (TFT)

4-Bromofluorobenzene (4-BFB)

114-6401313

Page Number: 9 of 32

Eddy Co., NM

Report Date 114-6401313	: March 23, 2012		Choctaw Sta	Page Number: 10 of 3: Eddy Co., NM		
Sample: 29	1038 - AH-2 1-1.5'					
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 89562 75918	Date An	al Method: alyzed: Preparation:	SM 4500-Cl B 2012-03-21 2012-03-16	Prep Method: Analyzed By: Prepared By:	N/A AR AR
•			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			1610	mg/Kg	50	4.00
Sample: 29	1039 - AH-2 2-2.5'					
Laboratory:	Midland					
Analysis:	Chloride (Titration)		al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	89562	Date An		2012-03-21	Analyzed By:	AR
Prep Batch:	75918	Sample I	Preparation:	2012-03-16	Prepared By:	AR
		,	RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			459	mg/Kg	50	4.00
Laboratory:	1040 - AH-2 3-3.5' Midland		13641.4	CNA AFOO CIL D	Duan Mathada	NT / A
Analysis:	Chloride (Titration)		al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch: Prep Batch:	89562 75918	Date An	aryzea: Preparation:	2012-03-21 2012-03-16	Analyzed By: Prepared By:	AR AR
Trop Bayen.	10070	Sample	_	2012 00 10	r ropatou by.	1110
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			235	mg/Kg	50	4.00
Chloride	Flag	Cert		Units mg/Kg		
	1047 - AH-3 0-1' Midland BTEX	Analytical Me	ethod: S.80	021B	Prep Method	S 5035
Laboratory: Analysis: QC Batch:		Analytical Me Date Analyze Sample Prepa	d: 2012	021B 2-03-14		S 5035

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 11 of 32

Eddy	Co.,	NM
------	------	----

		RL			
Flag	Cert	Result	Units	Dilution	RL
Ü	1	< 0.0200	mg/Kg	1	0.0200
U	1	< 0.0200	mg/Kg	1	0.0200
υ	1	< 0.0200		1	0.0200
υ	1	< 0.0200		1	0.0200
	บ บ บ	U 1 U 1	Flag Cert Result U 1 <0.0200 U 1 <0.0200 U 1 <0.0200 C 0.0200	Flag Cert Result Units U 1 <0.0200	Flag Cert Result Units Dilution v 1 <0.0200

							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	Qsr	Qar		3.04	mg/Kg	1	2.00	152	75 - 135.4
4-Bromofluorobenzene (4-BFB)				2.21	mg/Kg	1	2.00	110	63.6 - 158.9

Sample: 291047 - AH-3 0-1'

Laboratory:

Midland

Analysis:

Chloride (Titration)

QC Batch:

89562

Prep Batch: 75918

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

Date Analyzed: Sample Preparation:

2012-03-21 2012-03-16

Analyzed By: ARPrepared By: AR

RL

			1613			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			2530	mg/Kg	100	4.00

Sample: 291047 - AH-3 0-1'

Laboratory:

Midland

Analysis:

TPH DRO - NEW

QC Batch:

Analytical Method: Date Analyzed:

S 8015 D

Prep Method: N/A Analyzed By: DA

89298 Prep Batch:

75807

2012-03-12 Sample Preparation: 2012-03-12

Prepared By: DA

RLFlag Cert Result Units Dilution RLParameter 645 DRO mg/Kg 50.0

							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qar		184	mg/Kg	1	100	184	49.3 - 157.5

Sample: 291047 - AH-3 0-1'

Laboratory:

Midland

Analysis:

TPH GRO

QC Batch:

89385

Prep Batch: 75875

Analytical Method:

S 8015 D

Date Analyzed: Sample Preparation:

2012-03-14

2012-03-14

Prep Method: S 5035

Analyzed By:

Prepared By:

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 12 of 32 Eddy Co., NM

Parameter	Flag	Cert		RL Result	U	nits	Dilution	m RL
GRO		1		14.0	mg/	/Kg	1	2.00
						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	İ		2.91	mg/Kg	1	2.00	146	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			2.10	mg/Kg	1	2.00	105	45.1 - 162.2

Sample: 291048 - AH-3 1-1.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

QC Batch: Prep Batch:

89562 75918

Analytical Method:

Date Analyzed:

SM 4500-Cl B 2012-03-21

Prep Method: N/A Analyzed By: AR

Sample Preparation: 2012-03-16 Prepared By: AR RL

Parameter Flag Cert Units Dilution RLResult mg/Kg Chloride <200 50 4.00 υ

Sample: 291049 - AH-3 2-2.5'

Laboratory:

Midland

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

89563 75918 Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-03-21 2012-03-16

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

RLParameter Flag Cert Result Units Dilution RLChloride 285 50 4.00 mg/Kg

Sample Preparation:

Sample: 291050 - AH-3 3-3.5'

Laboratory:

Midland

Analysis:

QC Batch: 89563 Prep Batch: 75918

Chloride (Titration)

Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B 2012-03-21

2012-03-16

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

114-6401313

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Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			230	mg/Kg	50	4.00

Sample: 291057 - AH-4 0-1'

Laboratory:

Analysis:

QC Batch:

Midland BTEX 89384 Prep Batch: 75875

Analytical Method: S 8021B Date Analyzed:

2012-03-14

Prep Method: S 5035

Analyzed By: tc Sample Preparation: 2012-03-14 Prepared By:

			m RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene	U	1	< 0.0200	mg/Kg	1	0.0200
Toluene	υ	1	< 0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	< 0.0200	mg/Kg	1	0.0200
Xylene	ប	1	< 0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.57	mg/Kg	1	2.00	128	75 - 135.4
4-Bromofluorobenzene (4-BFB)			2.02	mg/Kg	1	2.00	101	63.6 - 158.9

Sample: 291057 - AH-4 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 89563 Prep Batch: 75918

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-03-21

2012-03-16

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

RLParameter Flag Cert Result Units Dilution RL1360 Chloride mg/Kg 100 4.00

Sample: 291057 - AH-4 0-1'

Laboratory:

Midland

Analysis: TPH DRO - NEW

QC Batch: 89329 Prep Batch: 75832 Analytical Method: S 8015 D 2012-03-13 Date Analyzed: Sample Preparation: 2012-03-13

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

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Work Order: 12031201 COG/Choctaw State #1 Page Number: 14 of 32 Eddy Co., NM

				RL			
	Flag	Cert	F	Result	Units	Dilution	RL
		1		506	mg/Kg	5	50.0
					Spike	Percent	Recovery
Flag	Cert	${f Result}$	Units	Dilution	Amount	Recovery	Limits
		139	mg/Kg	5	100	139	49.3 - 157.5
	Flag		Flag Cert Result	Flag Cert Result Units	Flag Cert Result 1 506 Flag Cert Result Units Dilution	Flag Cert Result Units 1 506 mg/Kg Spike Flag Cert Result Units Dilution Amount	Flag Cert Result Units Dilution 1 506 mg/Kg 5 Spike Percent Flag Cert Result Units Dilution Amount Recovery

Sample: 291057 - AH-4 0-1'

Laboratory:

Midland TPH GRO

Analysis: TPH G QC Batch: 89385 Prep Batch: 75875 Analytical Method:

S 8015 D 2012-03-14 Prep Method: S 5035 Analyzed By: tc

Date Analyzed: Sample Preparation:

2012-03-14

Prepared By: tc

		E		m RL			
Parameter	\mathbf{Flag}	!	Cert	Result	Units	Dilution	RL
GRO			1	36.4	mg/Kg	1	2.00

						Spike	Percent	$\operatorname{Recovery}$
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.47	mg/Kg	1	2.00	124	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			1.90	mg/Kg	1	2.00	95	45.1 - 162.2

Sample: 291058 - AH-4 1-1.5'

 ${\bf Laboratory:}$

Midland

Analysis: Chloride (Titration) QC Batch: 89563 Prep Batch: 75918 Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-03-21

2012-03-16

Prep Method: N/A Analyzed By: AR

AR

Prepared By:

RL
prameter Flag Cert Result

ParameterFlagCertResultUnitsDilutionRLChloride420mg/Kg504.00

Sample: 291059 - AH-4 2-2.5'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 89563 Prep Batch: 75918 Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-03-21

2012-03-16

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

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 15 of 32

Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			440	mg/Kg	50	4.00

Sample: 291060 - AH-4 3-3.5'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch:

89563

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

Prep Batch: 75918

Date Analyzed: Sample Preparation: 2012-03-16

2012-03-21

AR Analyzed By: Prepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride	•		330	mg/Kg	50	4.00

Sample: 291067 - AH-5 0-1'

Laboratory: Midland

Analysis: BTEX QC Batch:

89384 Prep Batch: 75875 Analytical Method: Date Analyzed:

Sample Preparation:

S 8021B 2012-03-14 2012-03-14 Prep Method: S 5035 Analyzed By: tc

Prepared By:

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

						Бріке	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.62	mg/Kg	1	2.00	131	75 - 135.4
4-Bromofluorobenzene (4-BFB)	_		1.74	mg/Kg	1	2.00	87	63.6 - 158.9

Sample: 291067 - AH-5 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 89563 Prep Batch: 75918

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-03-21

2012-03-16

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

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			\mathbf{RL} .			
Parameter	Flag	Cert	Result	Units	Dilution	. RL
Chloride			14400	mg/Kg	100	4.00

Sample: 291067 - AH-5 0-1'

Laboratory: Midland

TPH DRO - NEW Analysis:

QC Batch: 89329 Prep Batch: 75832 Analytical Method: Date Analyzed:

Sample Preparation: 2012-03-13

S 8015 D 2012-03-13 Prep Method: N/A

Analyzed By: DAPrepared By: DA

tc

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	m RL
DRO	U	1	< 50.0	mg/Kg	1	50.0
				a .:	.	2

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			94.2	mg/Kg	1	100	94	49.3 - 157.5

Sample: 291067 - AH-5 0-1'

Laboratory:

Parameter

GRO

Midland

Analysis: TPH GRO QC Batch: 89385 75875 Prep Batch:

Analytical Method: Date Analyzed:

Sample Preparation:

S 8015 D 2012-03-14

2012-03-14

Prep Method: S 5035 Analyzed By: Prepared By:

. RL Flag Result Units Cert Dilution RL< 2.00 mg/Kg 2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.54	mg/Kg	1	2.00	127	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			1.67	mg/Kg	1	2.00	84	45.1 - 162.2

Sample: 291068 - AH-5 1-1.5'

Laboratory:

Midland

Chloride (Titration) Analysis:

QC Batch: 89563 Prep Batch: 75918

Analytical Method: Date Analyzed:

SM 4500-Cl B

2012-03-21 Sample Preparation: 2012-03-16

Prep Method: N/A Analyzed By: AR

Prepared By: AR

114-6401313 COG/Choctaw State #1 Eddy Co., NM RLFlag Parameter Cert Result Units Dilution RLChloride 5990 mg/Kg 100 4.00 Sample: 291069 - AH-5 2-2.5' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 89563 Analyzed By: Date Analyzed: 2012-03-21 ARPrep Batch: 75918 Sample Preparation: 2012-03-16 Prepared By: ARRL \mathbf{Flag} Parameter Cert Result Dilution Units RL<200 4.00 Chloride mg/Kg 50 Sample: 291070 - AH-5 3-3.5' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 89563 Date Analyzed: 2012-03-21 Analyzed By: AR Prep Batch: 75918 Sample Preparation: 2012-03-16 Prepared By: AR RLParameter Flag Cert Result Units Dilution RL

<200

mg/Kg

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Chloride

υ

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4.00

50

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Work Order: 12031201 COG/Choctaw State #1 Page Number: 18 of 32 Eddy Co., NM

Method Blanks

Method Blank (1)

QC Batch: 89298

QC Batch: 89298 Prep Batch: 75807

2012-03-12 Date Analyzed: QC Preparation: 2012-03-12 Analyzed By: DA Prepared By: DA

MDL

Cert Result Units RLParameter Flag DRO <14.5 mg/Kg 50 1

Spike Percent Recovery Flag Units Dilution Amount Recovery Limits Surrogate Cert Result 100 93 52 - 140.8 n-Tricosane 93.1 mg/Kg 1

Method Blank (1)

QC Batch: 89329

QC Batch: 89329 Prep Batch: 75832 Date Analyzed: QC Preparation: 2012-03-13 2012-03-13

Analyzed By: DA

Prepared By: DA

MDLFlag Parameter Cert Result

Units RLDRO 33.1 mg/Kg 50 1

Spike Percent Recovery Surrogate Flag Cert Result Units Dilution Amount Recovery Limits n-Tricosane 108 mg/Kg 1 100 108 52 - 140.8

Method Blank (1)

QC Batch: 89384

QC Batch: 89384 Prep Batch:

75875

Date Analyzed:

2012-03-14

Analyzed By: tc

2012-03-14 QC Preparation: Prepared By:

MDL Flag Parameter Cert Result Units RLBenzene < 0.00470 mg/Kg 0.02 1. Toluene < 0.00980 mg/Kg 0.02 Ethylbenzene < 0.00500 mg/Kg 0.02

continued ...

Report Date: March 23, 2012 114-6401313		Work Ord	er: 120312 ctaw State	-		Page Number: 19 of 32 Eddy Co., NM		
method blank continued Parameter Fla	or !	Cert		MDL Result		Units		RL
Xylene Tak	<u>5 </u>	1		< 0.0170		mg/Kg		0.02
Try to the	+			(0.0110		1116/116		0.02
Surrogate Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Reco Lin	nits
Trifluorotoluene (TFT)		1.73	mg/Kg	1	2.00	86	78 - 3	
4-Bromofluorobenzene (4-BFB)		1.39	mg/Kg	1	2.00	70	55.9 -	112.4
Method Blank (1) QC Batch: 89385								
QC Batch: 89385		Analyzed:	2012-03				yzed By	
Prep Batch: 75875	QC F	reparation	2012-03	-14		Prepa	ared By	tc
				MDL				
Parameter Flag	İ	Cert		Result		Units		RL
GRO		1		<1.22		mg/Kg		2
Surrogate Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Lit	overy nits
Trifluorotoluene (TFT)		1.65	mg/Kg	1	2.00	82		- 111
4-Bromofluorobenzene (4-BFB)	<u> </u>	1.32	mg/Kg	1	2.00	66	55 -	100
Method Blank (1) QC Batch: 89562								
QC Batch: 89562		Analyzed:	2012-03-			Analyz		AR
Prep Batch: 75918	QC Pi	reparation:	2012-03-	16		Prepar	ed By:	AR
				MDL				
Parameter Flag	j	Cert		Result		Units		RL
Chloride				< 3.85		mg/Kg		4
Method Blank (1) QC Batch: 89563								
QC Batch: 89563	Date A	Analyzed:	2012-03-	21		Analyz	ed By:	AR
Prep Batch: 75918	QC Pı	reparation:	2012-03-	16		Prepar		AR

Report Date: March 23, 2012 Page Number: 20 of 32 Eddy Co., NM 114-6401313 COG/Choctaw State #1 MDLFlag Parameter Result Units RL Cert Chloride < 3.85 mg/Kg 4 Method Blank (1) QC Batch: 89635 QC Batch: 89635 Date Analyzed: 2012-03-22 Analyzed By: AR Prep Batch: 76090 QC Preparation: 2012-03-22 Prepared By: AR MDL Parameter Units

Cert

Result

< 3.85

RL

4

mg/Kg

Flag

Chloride

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Eddy Co., NM

Laboratory Control Spikes

Laboratory	Control Spike (LCS-1))
QC Batch:	89298	
Prep Batch:	75807	

Date Analyzed: 2012-03-12 QC Preparation: 2012-03-12 Analyzed By: DA Prepared By: DA

Param		F		LCS Result	Units	Dil.	Spike Amount		atrix esult Rec		Rec. Limit
DRO			1	240	mg/Kg	1	250	<	14.5 96	62	- 128.3
Percent recovery is based on t	he spike	resu	ılt. RPD	is based	on the s	pike and s	pike dupli	cate re	sult.		
			raan			~	3		-		
			LCSD			Spike	Matrix		${ m Rec.}$		RPD
Param	\mathbf{F}	C	Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param DRO	F	C	1	Units mg/Kg	Dil.	. *		Rec. 98		RPD 2	

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	95.5	97.4	mg/Kg	1	100	96	97	58.6 - 149.6

Laboratory Control Spike (LCS-1)

QC Batch: 89329 Prep Batch: 75832 Date Analyzed: 2012-03-13 QC Preparation: 2012-03-13 Analyzed By: DA Prepared By: DA

D 27		LCS	TT '.	D.11	Spike	Matrix	n	Rec.
Param F	Ų	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	1	250	mg/Kg	1	250	<14.5	100	62 - 128.3

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

			LCSD			Spike	Matrix		${ m Rec.}$		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	252	mg/Kg	1	250	<14.5	101	62 - 128.3	1	20
			i								

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	93.3	93.0	mg/Kg	1	100	93	93	58.6 - 149.6

Report Date: March 23, 2012 114-6401313				Work Order: 12031201 Page Nu COG/Choctaw State #1							22 of 32 20., NM		
Laboratory Control Spike (I	CS-	1)											
QC Batch: 89384				Date Ar	alvzed:	2012-03	-14				Ana	lyzed B	v: tc
Prep Batch: 75875					paration:							pared B	
*				•	•						•		•
				LCS			S	pike	Ma	trix		F	lec.
Param		F	C	Result	Unit	s Dil.		nount		sult	Rec.		imit
Benzene			1	2.02	mg/I	ζg 1		2.00		0470	101	86.5	- 124.9
Foluene			1	2.04	mg/I		2	2.00	< 0.0	0890	102	84.7	- 122.5
Ethylbenzene			1	2.00	mg/I	ζg 1	2	2.00	< 0.0	0500	100	79.4	- 118.9
Xylene			1	6.07	mg/I		(6.00	<0.	0170	101	79.5	- 118.9
Percent recovery is based on the	spik	e res	ult.	RPD is b	ased on	the spike a	ınd sp	ike dupl	icate 1	result.		_	
			LCS	SD		Spike	M	latrix		F	Rec.		RPD
Param	F	C	Res			. Amoun	t_R	tesult	Rec.		imit	RPD	Limit
Benzene		1	2.0			2.00	<0	.00470	102	86.5	- 124.9	2	20
Toluene		1	2.0		Kg 1	2.00	<0	.00980	104	84.7	- 122.5	1	20
Ethylbenzene		1	2.0)5 mg/	Kg 1	2.00	<0	.00500	102	79.4	- 118.9	2	20
Xylene		1	6.1	6 mg/	Kg 1	6.00	<(0.0170	103	79.5	- 118.9	2	20
Percent recovery is based on the	spik	e res	uit.	LCS	LCSD	_	_	Spil	кe	LCS	LCSD		lec.
Surrogate				Result	Result	Units	Dil.	Amo		Rec.	Rec.		imit
Trifluorotoluene (TFT)			.	2.28	2.08	mg/Kg	1	2.0		114	104		- 127
4-Bromofluorobenzene (4-BFB)				2.38	2.15	mg/Kg	1_	2.0	0	119	108	70.4	- 119.9
Laboratory Control Spike (L QC Batch: 89385 Prep Batch: 75875	CCS-	1)		Date Ar QC Prej	nalyzed: paration:	2012-03- 2012-03-						lyzed B	•
Param		F	C	LCS Result	t Un	its Dil		Spike Amount		atrix esult	Rec.		lec. imit
		F	C		t Un			_	Re		Rec.	L	
GRO	spike		1	Result 17.6	mg/	Kg 1	. A	Amount 20.0	Re	sult 1.22		L	imit
Param GRO Percent recovery is based on the	spike		ult.	Result 17.6	mg/	Kg 1	nd spi	Amount 20.0	Re	esult 1.22 result.		L	imit
GRO Percent recovery is based on the Param	spike F		ult.	Result 17.6 RPD is b SD sult Ur	mg/ ased on t	Kg 1 the spike a Spike l. Amou	nd spi	Amount 20.0 ike dupl 1atrix Result	Re	esult 1.22 result. R	88	L	imit - 105.7
GRO Percent recovery is based on the	-	e rest	ult.	Result 17.6 RPD is b SD sult Ur	mg/ ased on t	Kg 1 the spike a Spike l. Amou	nd spi	Amount 20.0 ike dupl 1atrix	Re < icate r	esult 1.22 result. R Li	.ec.	68.3	imit - 105.7 RPD
GRO Percent recovery is based on the Param	F	e rest	ult. LC Res	Result 17.6 RPD is b SD sult Ut 0.7 mg	mg/ ased on t aits Di /Kg 1	Kg 1 she spike a Spike l. Amou 20.0	and spi	Amount 20.0 ike dupl fatrix Result <1.22	Rec.	esult 1.22 result. R Li 68.3	.ec. mit	68.3 RPD	imit - 105.7 RPD Limit

			1								
											٠
Report Date: March 23, 2012 114-6401313				Work O COG/Ch	rder: 12 10ctaw S				Page		: 23 of 32 Co., NM
control spikes continued			LCS	LCSI	5		Spike	T	CS LCS	zn	Rec.
Surrogate			Resul			its Dil	•		ec. Re		Limit
Surrogate			LCS Resul			its Dil	Spike . Amour		CS LCS		Rec. Limit
Trifluorotoluene (TFT)			1.92			Kg 1	2.00		6 10) - 111.2
4-Bromofluorobenzene (4-BFB)			1.70				2.00		35 10		.4 - 106.6
Laboratory Control Spike (LCS-1) OC Patch - 2012 02 21											
QC Batch: 89562 Prep Batch: 75918				Analyzed reparatio		2-03-21 2-03-16				alyzed E epared E	
Param	17		1	LCS	Tīn:40	Dil.	Spike Amount		latrix	D.,,	Rec.
Chloride	F			lesult 95.5	Units mg/Kg	1	100		esult 3.85	Rec. 96	Limit 85 - 115
Percent recovery is based on the s	nika ra	enlt							*****		
to order to covery is based on the s	pine re			is subout t	n one or		_	auc 105			
D	15 (LCSD	TT:4	D:1	Spike	Matrix	n	Rec.	DDC	RPD
Param Chloride	F (C I	Result 104	Units mg/Kg	Dil.	Amount 100	Result <3.85	Rec. 104	Limit 85 - 11	RPD 5 8	$\frac{\text{Limit}}{20}$
Percent recovery is based on the s	•1	1.	 				*			0	
Laboratory Control Spike (LCQC Batch: 89563		,surv.		Analyzed		2-03-21	orac dupile	200 103		alyzed B	By: AR
Prep Batch: 75918				reparatio		2-03-16				aryzed E epared B	
n.		ļ		LCS	**	***	Spike		atrix	T.	Rec.
Param	F	(lesult	Units	Dil.	Amount			Rec.	Limit
Chloride				96.8	mg/Kg	. 1	100		3.85	97	85 - 115
Percent recovery is based on the sp	pike re	sult.	RPD i	s based o	n the sp	ike and sp	pike duplic	ate res	ult.		
		I	CSD			Spike	Matrix		Rec.		RPD
Param	F (Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			105	mg/Kg	1	100	<3.85	105	85 - 11	5 8	20
Percent recovery is based on the sp			DDD 1		_						

Report Date: March 23, 2012 Work Order: 12031201 Page Number: 24 of 32 114-6401313 COG/Choctaw State #1 Eddy Co., NM Laboratory Control Spike (LCS-1) 2012-03-22 Analyzed By: AR QC Batch: 89635 Date Analyzed: Prep Batch: 76090 QC Preparation: 2012-03-22 Prepared By: AR LCS Spike Matrix Rec. Units Param \mathbf{F} C Result Dil. Amount Result Rec. Limit Chloride 97.1 mg/Kg 100 < 3.8597 85 - 115 Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. LCSD Spike Matrix Rec. RPD Param \mathbf{C} Result Units Dil. Amount Result Limit **RPD** Limit Rec. < 3.85 Chloride 105 mg/Kg 100 105 85 - 115 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: 290978 QC Batch: 89298 Date Analyzed: 2012-03-12 Analyzed By: DA Prep Batch: 2012-03-12 75807 QC Preparation: Prepared By: DA MS Spike Matrix Rec. Ć Units Dil. Param Result Amount Result Rec. Limit 250 256 mg/Kg 45.5 - 127 DRO < 14.5102 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{C} Result Units Dil. Amount Result Rec. Limit RPD Limit DRO 259 mg/Kg 250 <14.5 104 45.5 - 127 $\overline{20}$ Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. MS MSD MS MSD Spike Rec. Units Surrogate Result Dil. Result Amount Rec. Rec. Limit 91 n-Tricosane 91.0 94.2 mg/Kg 100 94 45.4 - 145.8 Matrix Spike (MS-1) Spiked Sample: 291067

Date Analyzed:

QC Preparation:

2012-03-13

2012-03-13

Analyzed By: DA

Prepared By: DA

QC Batch:

Prep Batch:

89329

75832

114-6401313

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				MS			Spike	Ma	trix		Rec.
Param	F	C	R	esult	Units	Dil .	Amount	Re	sult Re	c.	Limit
DRO		1		254	mg/Kg	1	250	<1	14.5 10	2 45	.5 - 127
Percent recovery is ba	sed on the spike r	esult.	RPD	is based	on the s	pike and	spike dupli	icate res	sult.		
		M.	ISD			Spike	Matrix		Rec.		RPD
Param	F ($C = \mathbf{R}$	sult	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1 2	46	mg/Kg	1	250	<14.5	98	45.5 - 127	3	20
Percent recovery is ba	sed on the spike r	esult.	RPD	is based	on the s	pike and	spike dupli	icate res	sult.		
	MS		MSD				Spike	MS	MSD]	Rec.
Surrogate	Result	t j	Result	Ur	nits	Dil.	Amount	Rec.	Rec.	I	imit
n-Tricosane	95.7		94.8	mg	/Kg	1	100	96	95	45.4	- 145.8

Matrix Spike (MS-1) Spiked Sample: 290978

QC Batch: Prep Batch: 75875

89384

Date Analyzed:

2012-03-14 QC Preparation: 2012-03-14

Analyzed By: tc Prepared By: tc

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	2.77	mg/Kg	1	2.00	< 0.00470	138	69.3 - 159.2
Toluene		1	2.86	mg/Kg	1	2.00	< 0.00980	143	68.7 - 157
Ethylbenzene		1	2.95	mg/Kg	1	2.00	< 0.00500	148	71.6 - 158.2
Xylene		1	8.71	mg/Kg	1	6.00	< 0.0170	145	70.8 - 159.8

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

Param	F	С	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.40	mg/Kg	1	2.00	< 0.00470	120	69.3 - 159.2	14	20
Toluene		1	2.50	mg/Kg	1	2.00	< 0.00980	125	68.7 - 157	13	20
Ethylbenzene		1	2.56	mg/Kg	1	2.00	< 0.00500	128	71.6 - 158.2	14	20
Xylene		1	7.52	mg/Kg	1	6.00	< 0.0170	125	70.8 - 159.8	15	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	${ m Rec.}$	Rec .	Limit
Trifluorotoluene (TFT)	2.61	3.07	mg/Kg	1	2	130	154	71.4 - 133.9
4-Bromofluorobenzene (4-BFB)	2.15	2.52	mg/Kg	1	2	108	126	72.6 - 144.1

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 26 of 32

Eddy Co., NM

Matrix Spike (MS-1)

Spiked Sample: 290982

QC Batch:

89385

Date Analyzed:

2012-03-14

Analyzed By: tc

Prep Batch: 75875

QC Preparation: 2012-03-14

mg/Kg

Dil.

Prepared By:

Param	
GRO	_

aram	\mathbf{F}	C	
RO		1	

MS Spike Matrix Dil. Result Result Units Amount

1

Rec.

96

1.8991

Rec. Limit

28.2 - 157.2

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

21.1

Param	
GRO	

	Med	
\mathbf{C}	Result	Units
1	22.0	mg/Kg

F

Spike	Matrix
Amount	Result
20.0	1.8991

	nec.
Rec.	Limit
100	28.2 - 157.2

RPD RPD Limit

 $\overline{20}$

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

Surrogate
Trifluorotoluene (TFT)
4-Bromoflyorohenzene (4-BFB)

MS Result	${f MSD}$ Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
2.44	2.48	mg/Kg	1	2	122	124	75.5 - 122.3
1.93	1.97	mg/Kg	1	2	96	98	77.9 - 122.4

20.0

Matrix Spike (MS-1)

Spiked Sample: 291048

QC Batch:

89562

Date Analyzed:

2012-03-21

Dil.

100

Analyzed By: AR

Prep Batch: 75918

Prepared By: AR

Param
~

			MS
Param	${f F}$	\mathbf{C}	Result
Chloride			10500

QU Pre	eparation:	2012-03-10

Units

mg/Kg

Matrix		Rec.
Result	Rec.	Limit
<385	105	79.4 - 120.6

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

Param	\mathbf{F}	(
Chloride		

	MSD		
\mathbf{F}	\mathbf{C}	Result	
		11/000	

		Spike
Units	Dil.	Amount
mg/Kg	100	10000

	Matrix	
,	Result	Rec.
	<385	110

Spike

Amount

10000

Re	Rec.								
Lir	nit								
79.4 -	120.6								

RPD RPD Limit 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: 291070

QC Batch:

89563

Date Analyzed:

2012-03-21

Analyzed By: AR

Prep Batch:

75918

QC Preparation:

2012-03-16

Prepared By: AR

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 27 of 32

Eddy Co., NM

Param		\mathbf{F}	C F	MS Result	Units	Dil.	Spike Amount		atrix esult I	Rec.		Rec.
Chloride]]	L0400	mg/Kg	100	10000	<	385	104	79.4	- 120.6
Percent recovery is based or	n the spike	res	ult. RPI) is based	on the	spike and	spike dup	licate	result.			
			MSD			Spike	Matrix		Rec.			RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limi	t	RPD	Limit
Chloride			11/100	mg/Kg	100	10000	<385	111	79.4 - 12	20.6	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: 291030

QC Batch: 89635 Prep Batch: 76090

Date Analyzed:

QC Preparation:

2012-03-22 2012-03-22 Analyzed By: AR

Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	${f F}$	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			10700	mg/Kg	100	10000	654	100	79.4 - 120.6

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

			MSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			11000	mg/Kg	100	10000	654	103	79.4 - 120.6	3	20

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

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 28 of 32 Eddy Co., NM

Calibration Standards

Standard	(CCV-3)	۱
Dianagara		,

QC Batch: 89298

Date Analyzed: 2012-03-12

Analyzed By: DA

				CCVs	CCVs	CCVs	Percent	
			i	True	Found	Percent	Recovery	Date
Param	Flag	Cert	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	264	106	80 - 120	2012-03-12

Standard (CCV-4)

QC Batch: 89298

Date Analyzed: 2012-03-12

Analyzed By: DA

			 	CCVs True	CCVs Found	$\begin{array}{c} { m CCVs} \\ { m Percent} \end{array}$	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	258	103	80 - 120	2012-03-12

Standard (CCV-3)

QC Batch: 89329

Date Analyzed: 2012-03-13

Analyzed By: DA

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	273	109	80 - 120	2012-03-13

Standard (CCV-4)

QC Batch: 89329

Date Analyzed: 2012-03-13

Analyzed By: DA

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	299	120	80 - 120	2012-03-13

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 29 of 32

Eddy Co., NM

Standard (CCV-2)

QC Batch: 89384

Date Analyzed: 2012-03-14

Analyzed By: tc

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0959	96	80 - 120	2012-03-14
Toluene		1	mg/kg	0.100	0.0966	97	80 - 120	2012-03-14
Ethylbenzene		1	mg/kg	0.100	0.0943	94	80 - 120	2012-03-14
Xylene		1	mg/kg	0.300	0.273	91	80 - 120	2012-03-14

Standard (CCV-3)

QC Batch: 89384

Date Analyzed: 2012-03-14

Analyzed By: tc

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0946	95	80 - 120	2012-03-14
Toluene		1	mg/kg	0.100	0.0932	93	80 - 120	2012-03-14
Ethylbenzene		1	mg/kg	0.100	0.0874	87	80 - 120	2012-03-14
Xylene		1	mg/kg	0.300	0.254	85	80 - 120	2012-03-14

Standard (CCV-2)

QC Batch: 89385

Date Analyzed: 2012-03-14

Analyzed By: tc

				CCVs	\mathbf{CCVs}	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.966	97	80 - 120	2012-03-14

Standard (CCV-3)

QC Batch: 89385

Date Analyzed: 2012-03-14

Analyzed By: tc

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.992	99	80 - 120	2012-03-14

114-6401313	arch 23, 2012				er: 12031201 saw State #1			mber: 30 of 32 Eddy Co., NM
Standard (ICV-	-1)							
QC Batch: 8956	2		Date A	Analyzed: 2	2012-03-21		Analy	zed By: AR
Param Chloride	Flag	Cert	Units mg/Kg	ICVs True Conc.	ICVs Found Conc. 99.2	ICVs Percent Recovery	Percent Recovery Limits 85 - 115	Date Analyzed 2012-03-21
Standard (CCV QC Batch: 8956	·		Date A	Analyzed: 2	2012-03-21		Analy	zed By: AR
a Button.	~		20001	•	`	~~~		bod by. III
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
D	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Param	1 105	OCLU			101		85 - 115	2012-03-21
Param Chloride Standard (ICV			mg/Kg	100	101	101	60 - 110	2012 00 21
	-1)	Cert			IOT 2012-03-21 ICVs Found Conc. 101	ICVs Percent Recovery		zed By: AR Date Analyzed 2012-03-21
Chloride Standard (ICV-QC Batch: 8956) Param	-1) 3 Flag	Cert	Date A Units mg/Kg	Analyzed: 2 ICVs True Conc. 100	2012-03-21 ICVs Found Conc. 101	ICVs Percent Recovery 101	Analy Percent Recovery Limits 85 - 115	zed By: AR Date Analyzed
Chloride Standard (ICV-QC Batch: 8956) Param Chloride Standard (CCV	-1) 3 Flag	Cert	Date A Units mg/Kg	Analyzed: 2 ICVs True Conc. 100 Analyzed: 2 CCVs	2012-03-21 ICVs Found Conc. 101 2012-03-21 CCVs	ICVs Percent Recovery 101	Analy Percent Recovery Limits 85 - 115 Analy Percent	zed By: AR Date Analyzed 2012-03-21 zed By: AR
Chloride Standard (ICV-QC Batch: 8956) Param Chloride Standard (CCV	-1) 3 Flag	Cert	Date A Units mg/Kg	Analyzed: 2 ICVs True Conc. 100	2012-03-21 ICVs Found Conc. 101	ICVs Percent Recovery 101	Analy Percent Recovery Limits 85 - 115	zed By: AR Date Analyzed 2012-03-21

Date Analyzed: 2012-03-22

Analyzed By: AR

QC Batch: 89635

114-6401313

Work Order: 12031201

COG/Choctaw State #1

Page Number: 31 of 32

Eddy Co., NM

				ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-03-22

Standard (CCV-1)

QC Batch: 89635

Date Analyzed: 2012-03-22

Analyzed By: AR

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.0	99	85 - 115	2012-03-22

114-6401313

Work Order: 12031201 COG/Choctaw State #1 Page Number: 32 of 32 Eddy Co., NM

Appendix

Report Definitions

Name	Definition
$\overline{\mathrm{MDL}}$	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-11-3	Midland

Standard Flags

-	*		
F	Desc	crin	tion

- 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.

An	Analysis Request of Chain of Custody Record														PA	GE:	1			OF:	5									
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Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

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Analysis Request of Chain of Custody Record	ANALYSIS REQUEST	•
(C)	ircle or Specify Method	
TETRATECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559・Fax (432) 682-3946		TDS
CLIENT NAME: SITE MANAGER: METHOD	270/626	ns, pH,
PROJECT NO.: PROJECT NAME: 114-6401313 Charton State #1	M. Vol. 8 1/608 08 9ec.	(Air) stos) ns/Catio
CLIENT NAME: COG PROJECT NO.: IN-6401313 Chorton State PRESERVATIVE METHOD PRESERVATIVE METHOD PRESERVATIVE METHOD NUMBER NON PRESERVATIVE METHOD PRESERVATIVE METHOD PRESERVATIVE METHOD NUMBER NON PRESERVATIVE METHOD PRESERVATIVE METHOD PRESERVATIVE METHOD PRESERVATIVE METHOD NUMBER NON PRESERVATIVE METHOD PRESERVATIVE METHOD PRESERVATIVE METHOD NON PRESERVATIVE METHOD PRESERVATI	PCI 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
057 317 S X AH-4 0-1 1 X MM		
058	У	
059 2-2.5'	1	
060 3-35	1	
061 4-4.5'		
062 5-5-5'		
063 6-6.5		
OG4 7-7.5'		
065 8-8.5'		
945	- 0 de Man	Date: 3-7-13
REGINQUISHED BY: (Signature) Date: 5 1 1 RECEIVED BY: (Signature) Time: 5 0 7 P Time: 7 Time	nt & inflat)	Time:
RELINQUISHED BY: (Signature) Date: HECEIVED BY: (Signature) Date: SAMPLE SHIPPED	- •	AIRBILL #:
Time: Time: FEDEX RELINQUISHED BY: (Signature) Date: RECEIVED BY: (Signature) Date: MAND DELIVERED	BUS UPS	OTHER:
Time: Time: Terra Tech Cont	TACT PERSON:	Results by:
RECEIVING LABORATORY: True RECEIVED BY: (Signature) ADDRESS: ZIP: ZIP:	Tower	RUSH Charges Authorized:
CONTACT: PHONE: DATE: TIME:		Yes No
SAMPLE CONDITION WHEN RECEIVED: REMARKS: Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - A		old copy

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Analysis Request of Chain of Custody Record									L	PAGE: 5 OF: 5																				
7 that you had a control of castody hoodid												ANALYSIS REQUEST (Circle or Specify Method No.)																		
TETRA TECH 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946															35 (Ext. to C35)	1	<u>ت</u>	Pd Hg									tne	SOL.		
CLIENT NAME: SITE MANAGI							R: Tavarez	INERS		P		THO	ATIVE DD		TX1005		g .	As Ba C	l s		260/624	270/625					7	TS, PT.		
PROJECT N	13		PRO		NAME:	# /	CONTA	Y/N)					6	S RED		A BY SI	9	Volatile		8240/8	ni. Vol. 8	809/	3	90.	(Air)	stos)	NS/Cath			
LAB I.D. NUMBER	DAT 201	1	TIME	MATRIX	GRAB	Edd. SAMPL	Le IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	고	HNO3	<u>.</u>	NONE	STEX 8021B	TRH 8015	PAH 8270	RCRA Meta	TCLP Metals Ag	TCLP Semi Volatiles	₽Ģ.	GC.MS Vol. 8240/8260/624	GC.MS Ser	PCB's 8080/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos) Major Anjons/Cations nH TDS	Wajor cons		
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RECEIVING LABO ADDRESS; CITY: M	iv: _	Mary STATE:_	TX	PHONI	ZIP:	ARECEIVED BY: (Signature)	VEO BY: (Signature)						Ike Tower RUSH Charges Authorized:																	
CONTACT: PHONE: DATE: TIME: SAMPLE CONDITION WHEN RECEIVED: REMARKS:																						Ye	<u>s</u>	^	Vo					
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