SITE INFORMATION **Report Type: Closure Report** General Site Information: Jenkins B Federal Water Flood (Northwest Central) Site: **COG Operating LLC** Company: Section, Township and Range Unit C T17S **R30E** Sec 20 Lease Number: (API#) 30-015-21945 **Eddy County** County: GPS: 32.83021° N 103.99532° W Surface Owner: Federal Mineral Owner: From the intersection of Hwy 82 and CR 217, turn right and travel North for approximatly 0.6 Directions: miles. Then turn left and travel West for 0.5 miles. The location will be on the right to the north. 1st Spill 2nd Spill Release Data: Date Released: 3/23/2012 6/26/2012 Type Release: Produced Water and Oil Oil Source of Contamination: Skim Tank Gun Barrel Fluid Released: 3 bbls Oil 17 bbls Produced Water 75 bbls Oil Fluids Recovered: 3 bbls Oil 15 bbls Produced Water 70 bbls Oil Official Communication: Name: Robert McNeil Ike Tavarez Company: COG Operating, LLC Tetra Tech Address: One Concho Center 1910 N. Big Spring 600 W. Illinois Ave. Midland Texas, 79701 City: Midland, Texas Phone number: (432) 686-3023 (432) 682-4559 Fax: (432) 684-7137 rmcneil@conchoresources.com Email: ike.tavarez@tetratech.com Ranking Criteria Depth to Groundwater: Ranking Score Site Data <50 ft 20 50-99 ft 10 10 >100 ft. 0 0 WellHead Protection: Ranking Score Site Data Water Source <1,000 ft., Private <200 ft. Water Source >1,000 ft., Private >200 ft. Surface Body of Water: Ranking Score Site Data <200 ft. 20 200 ft - 1,000 ft. 10 >1,000 ft. 0 0 Total Ranking Score: 0 RECEIVED Acceptable Soil RRAL (mg/kg) Benzene Total BTEX **TPH**

10

50

5,000

MAR **05** 2014

MOCD ARTESIA



November 19, 2013

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

Re: Closure Report for the COG Operating LLC., Jenkins B Federal Water Flood, Unit N, Section 17, Township 17 South, Range 29 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the Jenkins B Federal Water Flood, located in Unit N, Section 17, Township 17 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.83021°, W 103.99532°. The site location is shown on Figures 1 and 2.

Background

1st Spill

According to the State of New Mexico C-141 Initial Report, the leak was discovered on 23 March, 2012 and released approximately three (3) barrels of oil and seventeen (17) barrels of produced water from a Skim Tank. Three (3) barrels of oil and fifteen (15) barrels of produced water were recovered. Due to the rush of fluid from a new well and a plugged strainer the skim tank overflowed. The strainer has been cleaned out. The initial C-141 form is enclosed in Appendix A.

2nd Spill

According to the State of New Mexico C-141 Initial Report, the leak was discovered on 27 June, 2012 and released approximately seventy five (75) barrels of oil from the gun barrel. Seventy (70) barrels of oil were recovered. The motor valves failed to open and the gun barrel overflowed. Electricians were called out to ensure the problem was resolved.



Groundwater

No water wells were listed within Section 17. According to the NMOCD groundwater map, the average depth to groundwater in this area is 250' below surface. The groundwater data is shown in Figure B.

Regulatory

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

Soil Assessment and Analytical Results

On April 20, 2012, Tetra Tech personnel inspected and sampled the spill area. Three (3) auger holes (AH-1 through AH-3) were installed using a stainless steel hand auger to assess the impacted soils. Selected 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 auger hole locations are shown on Figure 3.

Referring to Table 1, AH-2 was above the RRAL for Total BTEX and Total TPH but declined below regulatory levels at 1.5' below surface. Auger holes (AH-1 and AH-3) did not exceed the RRAL for total BTEX or TPH. In addition, all auger holes (AH-1, AH-2, and AH-3) also showed elevated chloride concentrations and AH-1 and AH-3 were not vertically defined. Deeper samples were not collected due to a dense formation.



On June 6, 2012, Tetra Tech supervised the installation of two (2) boreholes (BH-1 and BH-2) using an air rotary drilling rig to assess the soils. The soil bores were installed in the areas of AH-1 and AH-3 to define the vertical extents. Copies of the laboratory analysis chain-of-custody documentation are included in Appendix C. The soil boring results are summarized in Table 1 and shown on Figure 3. Referring to Table 1, both of the boreholes were not vertically defined due to the flowing sands at the depths of 50' to 80'.

On June 12, 2013, Tetra Tech supervised the installation of one (1) soil bore using a hollow stem auger drilling rig to further delineate the impacted soils. Referring to Table 1, SB-1 exceeded the RRAL for Total TPH and Total BTEX but was vertically delineated at a depth of 2.0' below surface. Elevated chloride concentrations were detected at depths down to 90' below surface. However, the chloride concentrations declined with depth and showed 2,000 mg/kg at 90', 1,060 mg/kg at 100' and 92.5 mg/kg at 105', respectively.

Remediation

Between November 6 and November 8, 2013, Tetra Tech personnel were onsite to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. Due to the facility equipment onsite, the areas of AH-1, AH-2, AH-3, BH-1, BH-2, and SB-1 were excavated to an approximate depth of 4.0' below surface. Approximately 76 yards of material was removed. A 40 mil plastic liner was installed in the areas in order to cap the remaining impact and prevent further migration of chlorides. Approximately 200 cubic yards of the impacted material was transported offsite for proper disposal. The excavated areas were backfilled with clean soil to surface grade.



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

Respectfully submitted,

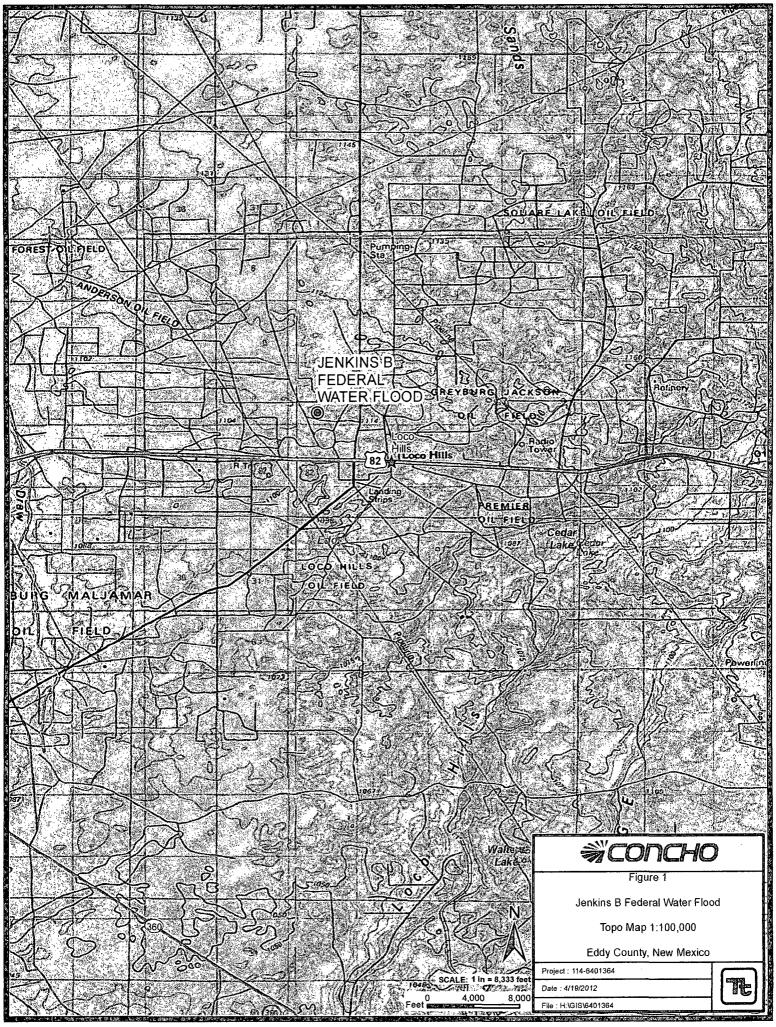
TETRA TEĆH

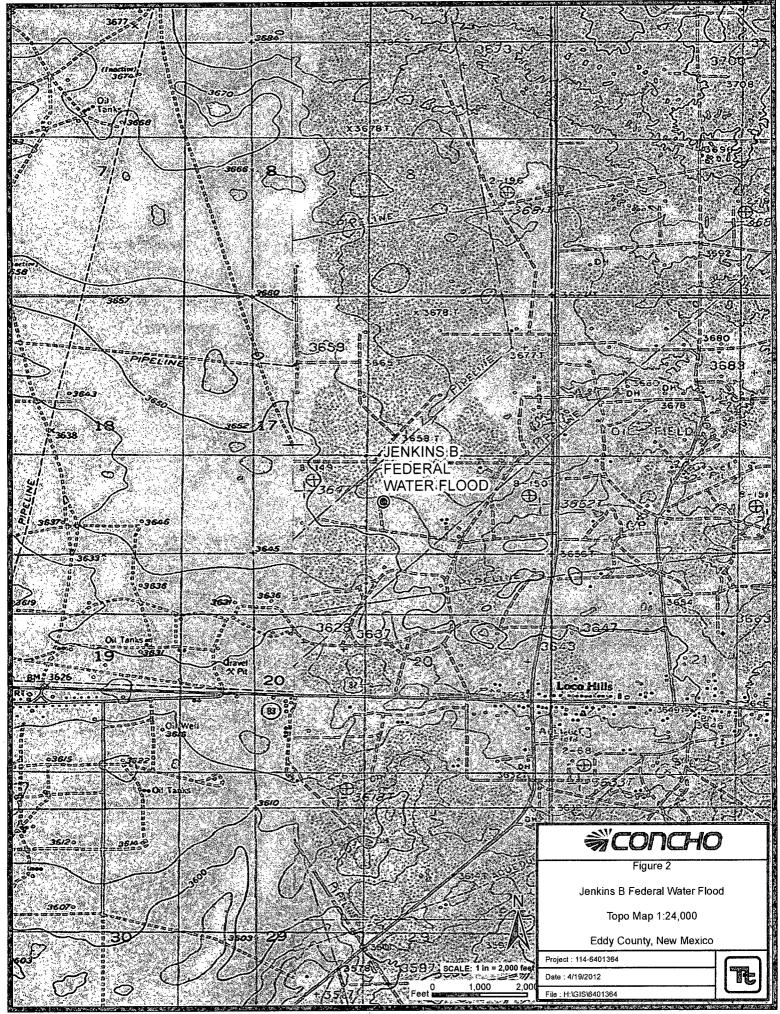
Clair Gonzales, Geologist

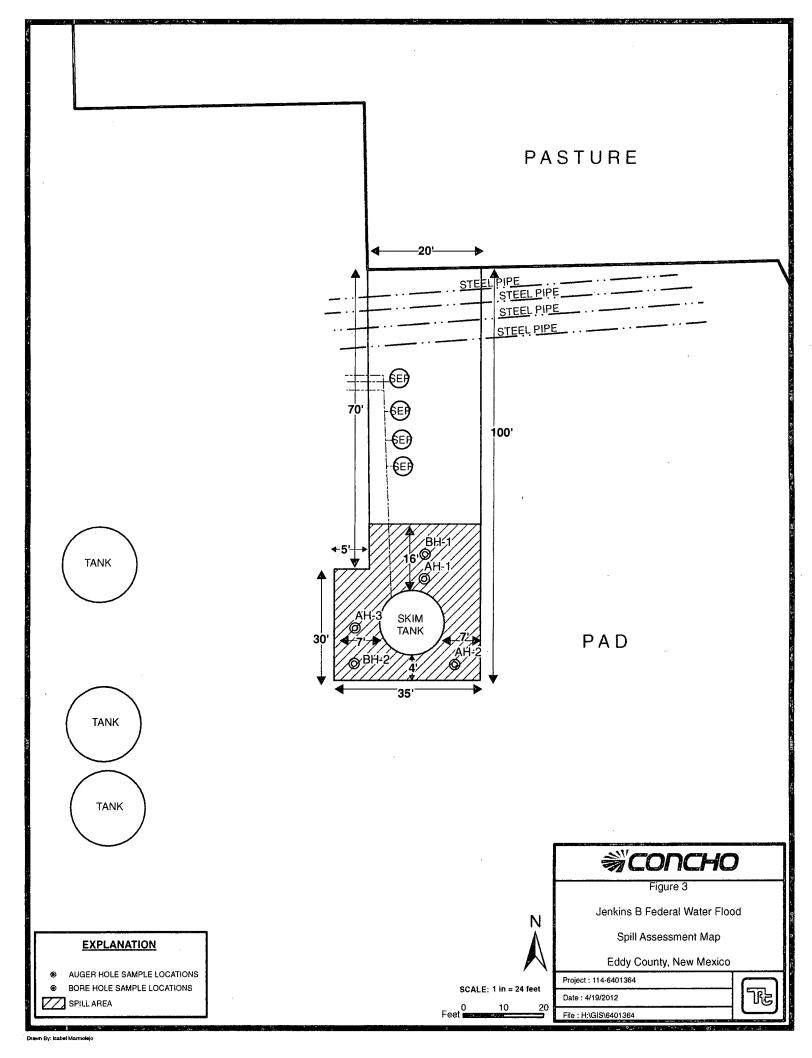
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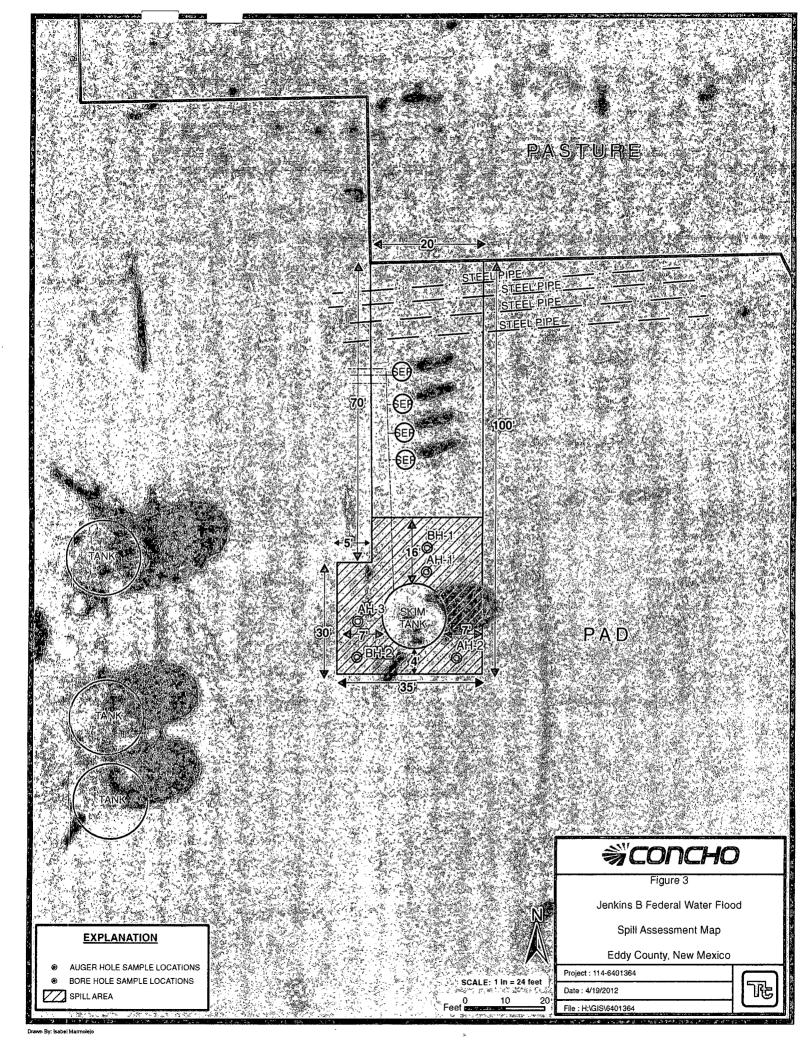
Robert McNeil – COG Mike Burton- BLM

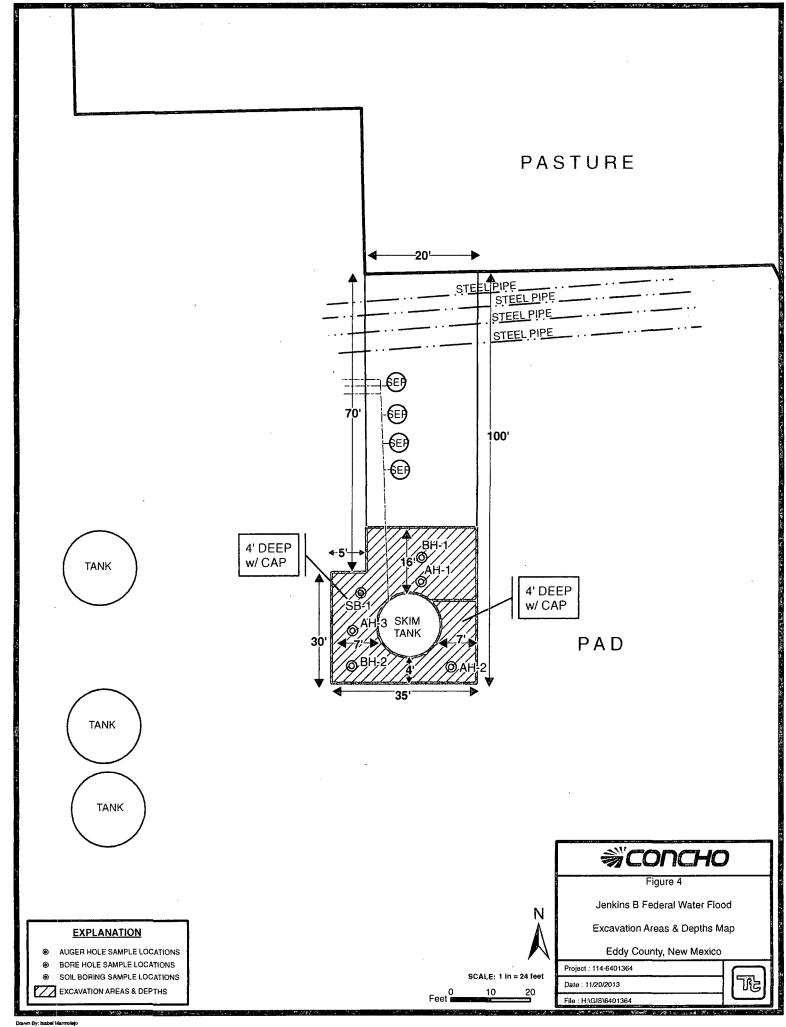
Figures











Tables

Table 1
COG Operating LLC.
Jenkins B Federal Water Flood
Eddy County, New Mexico

Sample	Sample	Sample	BEB	Soi	l Status	TP	H (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total BTEX	Chloride
D	Date	Depth (ft)	Depth (ft)	in-Situ	Removed	GRO	DRO ·	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	4/20/2012	0-1	҈ 0.5 ु	and the second	X	166	378	544	<0.0200	, 0.0941	0.782	1.62	2.50	6;670
		1-1.5	0.5		X	多生活	建		是對於於於			法的证据	地数水道	1,080
		2-2.5	· 0.5		X		7.3		Water Baston					159
		3-3.5	0.5		X							大家公園	型影響	606
		4-4.5	0.5 €		X							NEW SE		987
	"	5-5.5	0.5	Х		-	-	-	-	-	-	-	-	1,790
	11	6-6.5	0.5	Х		-	-	-	-	-	_	-	-	2,910
	11	7-7.5	0.5	Х		-	-	-	-	-	-	-	-	2,980
	"	. 8-8.5	0.5	Х		-	-	-	-	-	-	-	-	4,590
· · · · · · · · · · · · · · · · · · ·	u	9-9.5	0.5	Х		-	-	-	-	-	-	-	-	6,480
BH-1	6/6/2012	0-1	0.5		× X		16 E					44844	1577	1,740
	0.3	2-3	0.5		Χ.					14 19 E	是一些人	支援達		3,190
Air		4-5	0.5		X					10.29	學的意义是			780
Rotary	II	6-7	0.5	Х		-	-	-	-	-	-	•	-	1,440
	II	9-10	0.5	Х		-	-	-	-	-	-	-	-	2,570
	II	14-15	0.5	Х		-	-	-	-	-	-	-	-	5,890
	ıı	19-20	0.5	Х		-	-	-	-	-	-	_	-	8,650
	11	24-25	0.5	Х		-	-	-	-	-	-	-	-	7,640
	-11	29-30	0.5	Х		-	-	-	-	-	-	-	-	7,190
	11	39-40	0.5	Х		-	-	-	-	-	-	-	-	14,700
	11	49-50	0.5	Х		-	-	-	-	-	-	-	-	9,100
	II	59-60	0.5	Х		-	-	-	-	-	-	-	-	12,000
	11	69-70	0.5	Х		-	-	-	-	-	-	-	-	3,800
	11	79-80	0.5	Х		-	-	-	-	-	-	-	-	5,550

Table 1
COG Operating LLC.
Jenkins B Federal Water Flood
Eddy County, New Mexico

Sample	Sample	Sample	BEB	Soi	l Status	TP	H (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride
۵I	Date	Depth (ft)	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	BTEX (mg/kg)	(mg/kg)
SB-1	6/12/2013	0-1	- 7,0		X	4,900	8,530	13,430	<1.00,	59.8	94.8	165	320	2,240
		/s- 2-3	, 0		X - X	.ੂ<4.00∜	<50.0	҈<50.0∂	<0.0200	<0.0200	<0.0200	<0.0200	-<0:0200 i	.÷11,700⊊
Hollow		4-5	. o:		X								器艺术	5,130
Stem	"	6-7	0	Х		-	-	-	-	-	-	•	-	1,220
Auger	II	9-10	0	Х		-	-	-	-	-	-	-	-	7,920
	11	19-20	0	Х		-	-	-	•	-	-	-	-	9,460
	11	39-40	0	Х		-	-	-	-	-	-	-	-	12,000
	n	59-60	0	Х		-	-	-	-	-	-	-	-	2,440
	н	79-80	0	Х		-	-	-	-	-	-	-	-	6,150
	ii	89-90	0	Х		-	-	-	-	-	-	-	-	2,000
	10	99-100	0	Х	, to	-	-	-	-	-	-	-	-	1,060
	u	104-105	0	X		-	-	-	_	-	-	-	-	92.5
AH-2	4/20/2012	0-1 ; ; ;	0.5		X	4,150	5;970	10,120	4.74	61.1	73.4	95.2	234	L 6;540
	27 m 1 2 m	1-1.5	0.5		X	4.90	<50.0	4.90	<0.0200	<0.0200	<0.0200	<0.0200	<0:0200	5,560
	II	2-2.5	0.5	Х	Assimization of the	-	-	-	-	-		<u>-</u>		166
AH-3	4/20/2012		0.5	X	X	33.6	50.3	*83.9	<0.0200	0.106	0.105	j 0.362∌∗	0.573 c	6.130
		1-1.5	0.5	X	X								TERM	4,090
	in the market of the	2-2.5	0.5	× X	X		37425			V 200 1	V-504-05453		M.Z. (50)	900
	700 maria	3-3.5	, 0.5 €	X	X					- 3			32.73	- 885
	海海里的 德		₹0:5	×	X		7.3.43					BVATEZA		i₃1,810=

Sample	Sample	Sample	BEB	Soi	l Status	TF	PH (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride
ID	Date	Depth (ft)	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	BTEX (mg/kg)	(mg/kg)
BH-2	6/6/2012	0-1 -50	0.5		X		AN S	第分字 符	色量的					1,730
		2-3	0.5		X			在 字標				BY BE		1,180
Air		4-5	∍0.5 <i>*</i> ∗	生活病	X			\$\$4.J						2,830
Rotary	=	6-7	0.5	Х		-	-	-	-	-	-	-	-	3,290
	'n	9-10	0.5	Х		-	-	-	-	-	<u>-</u>	-	-	6,230
	1	14-15	0.5	X		-	-	-	-	-	-	-	-	6,350
	11	19-20	0.5	Х		-	-	-	-	-	-	-		6,890
	41	24-25	0.5	X		-	-	-	-	-	-	-	-	4,830
	11	29-30	0.5	Х		-	-	-	<u>-</u>	•	-	-	-	6,870
	П	39-40	0.5	Х		-	-	-	-	-	-	-	-	7,860
	"	49-50	0.5	Х		-	-	-	-	_	-	-	-	5,840
	11	59-60	0.5	Х		-	-	-	-	-	-	-	-	8,290
	11	69-70	0.5	Х		-	-	-	-	-	-	-	-	4,680
	u	79-80	0.5	Х		-	-	-	-	-	-	-	-	4,420

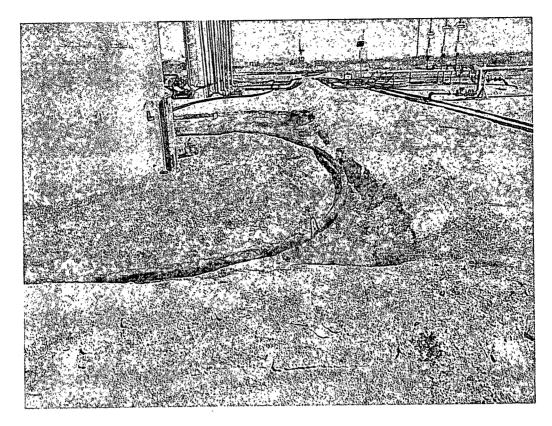
BEB Below Excavation Bottom

(--) Not Analyzed

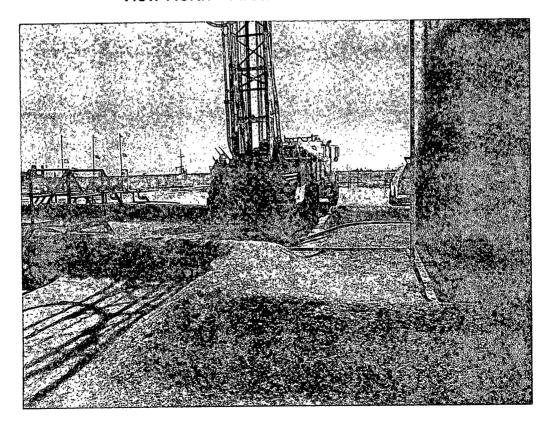
Excavated Depths

Liner



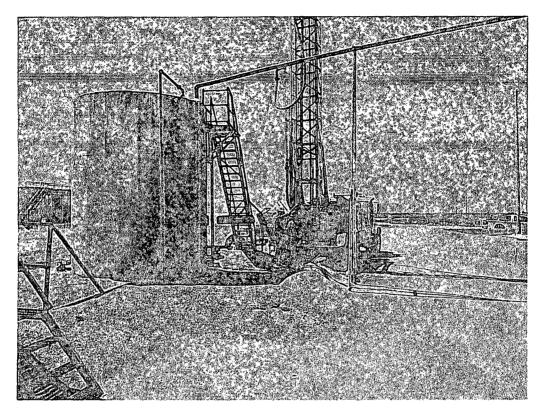


View North - Areas of AH-2 and AH-3

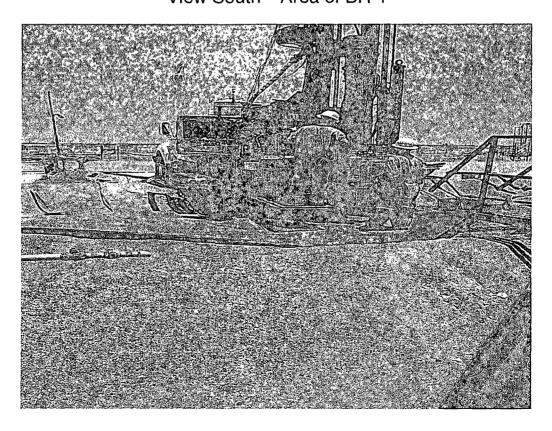


View East - Area of BH-1



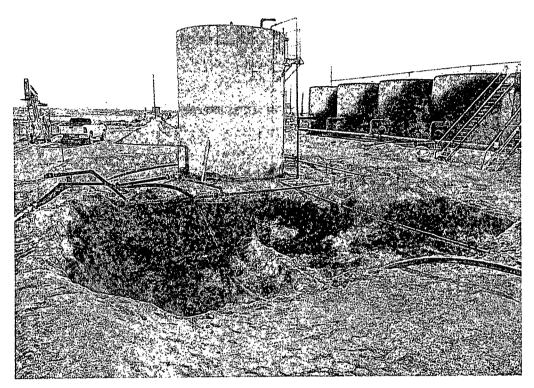


View South - Area of BH-1

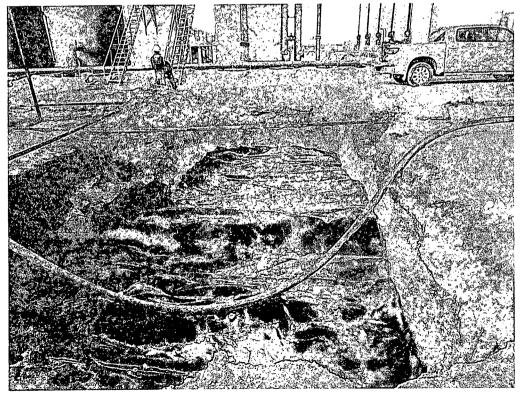


View East - Areas of SB-1



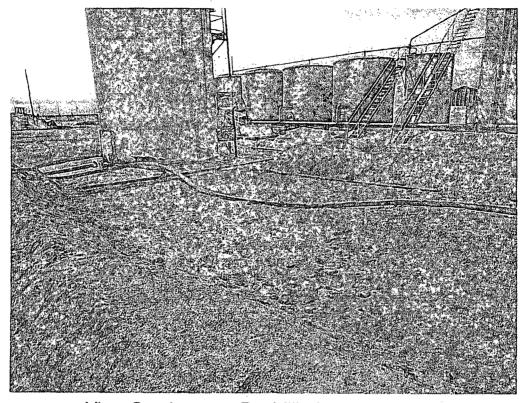


View East - Excavated area



View South - Lined excavated area.





View Southeast - Backfilled excavated area

Appendix A

District 1 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

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources

MAR 05 2014

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Form C-141 Revised October 10, 2003

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

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

Release Notification and Corrective Action

						OPERA	TOR		Initi	al Report	\boxtimes	Final Repor
Name of Co	mpany C	OG Operat	ting LLC			Contact Pa	t Ellis					
Address 55	0 W. Texa	s, Suite 130	0 Midlan	d, Texas 79701	t		No. (432) 230-0					
Facility Nar	ne Jenkins	B Federal Wa	ater Flood (Northwest Centr	al)	Facility Typ	e Tank Batte	ry				
Surface Ow	ner: Federa	al		Mineral O	wner				Lease N	No. (API #) Clo		5-21945 cell location
				LOCA	TIC	N OF RE	LEASE					
Unit Letter	Section	Township	Range	Feet from the		h/South Line	Feet from the	East/	West Line	County		
С	20	178	30E									
		<u> </u>		Latitude 32	- 49.81	3 Longitud	le 103 59.736					
				NAT	URI	E OF REL						
Type of Rele	ise: Produce	ed water/ Oil				Volume of	Release 3 bbls of 17 bbls of 17 bbls of 17		Volume I	Recovered 3	bbls o bbls v	
Source of Re	ease: Skim	Tank				Date and I	lour of Occurrence		Date and	Hour of Dis		
						3/23/2012			3/23/2012			
Was Immedia	ite Notice G		Yes 🛛	No 🛭 Not Re	quirec	If YES, To	Whom?					
By Whom?							Iour					
Was a Water	Vas a Watercourse Reached? ☐ Yes ☒ No						olume Impacting	the Wat	ercourse.			•
If a Watercou N/A	rse was Imp	oacted, Descri	be Fully.*			<u> </u>						
Describe Cau	f Duo l-1-	and Dames	dial Assina	T-1 *								
	of fluid fro	m a new well			ır Texa	aco BE #8 Inje	ctor the skim tanl	k overfl	owed. The	strainer at tl	ne Texa	ico BE #8
Describe Are	a Affected a	and Cleanup A	Action Take	n.*								
	as containe	d on the locat	ion. The co				uum truck. The s proximately 4.0'					
regulations al public health should their o	l operators a or the environs ha ment. In ac	are required to onment. The ave failed to a ddition, NMC	report and acceptance idequately is CD accepta	or file certain re of a C-141 repor nvestigate and re	elease rt by tl emedia	notifications a he NMOCD m nte contaminati	knowledge and und perform correct arked as "Final R on that pose a three the operator of	ctive act teport" of eat to g	tions for relations for relations for the following the fo	eases which ieve the oper r, surface wa	may en rator of iter, hui	ndanger Tiability man health
Signature:	/ //	1, 5	$\overline{}$				OIL CON	SERV	ATION	DIVISIO	<u>N</u>	
Printed Name	: Ike Tavare	ez (Ne	len s	In CoG)	Approved by	District Supervis	or:				
Title: Project	Manager					Approval Date:			Expiration Date:			
E-mail Addre	E-mail Address: Ike.Tavarez@TetraTech.com					Conditions of Approval: Attached						
Date:	(1 , 6 , 13											

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 MAR 05 2014

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Form C-141 Revised October 10, 2003

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

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

Release Notification and Corrective Action

						OPERA	TOR	[Initi	al Report	\boxtimes	Final Repor
Name of Co	ompany C	COG Operat	ting LLC	;		Contact Pa	t Ellis					
				nd, Texas 79701	1	Telephone N	No. (432) 230-0)077				
Facility Nar	ne Jenkins	Water Flood				Facility Typ	e Tank Batte	ry				
Surface Ow	ner: Feder	al		Mineral O	wner				Lease N	No. (API #)		
										Clo	sest w	ell location
		T	, — <u> </u>			N OF REI	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	T		,		
Unit Letter N	Section 17	Township 17S	Range 30E	Feet from the	North/	/South Line	Feet from the	East/W	est Line	County		
						_	le 103 59.765					-
~ (D.1				NAT	URE	OF RELI			17 1 F		20111	
Type of Release		Darrel					Release 75 bbls Iour of Occurrence			Recovered 7 Hour of Dise		
Source of Ne.	lease. Ouir i	Danei				6/26/2012	10th of Occurrence		6//26/201			
Was Immedia	ate Notice C	Given?				If YES, To	Whom?		07.20.20	<i>y y z z z z z z z z z z</i>		
			Yes 🗌	No 🗌 Not Red	quired							
By Whom?							lour 6/27/2012					
Was a Water	course Reac			• • •		1	olume Impacting t	he Water	course.			
			Yes 🛚	No		N/A						
If a Watercou N/A												
Describe Cau	se of Proble	em and Remed	dial Action	Taken.*		_						
		ikins Water Fl valves has bee		nk Battery overflow l.	wed due	to motor val	lves that did not o	pen. Elec	etricians v	vere called o	ut to en	isure that the
Describe Are	a Affected a	and Cleanup A	Action Tak	en.*								
inside the dik the area was l	ted walls of backfilled w	the facility. The state of the	The contamerial.	barrel at the facili	excavate	ed to approxin	nately 4.0' below	surface, a	a 40 mil p	lastic liner w	vas insta	alled, and
regulations al public health should their o	I operators or the environment of the environment of the environment of the environment. In accordance of the environment of th	are required to ronment. The ave failed to a ddition, NMO	o report and acceptance adequately OCD accept	is true and comple d/or file certain re e of a C-141 repor investigate and re tance of a C-141 re	elease no rt by the emediate	otifications and NMOCD made contamination	nd perform correct arked as "Final Re on that pose a thre the operator of r	tive action eport" doe eat to grou esponsibi	ns for rele es not reli- und water lity for co	eases which in eve the opera surface wat compliance wat	may end ator of l ter, hun ith any	danger liability nan health
Signature:		11 6	\angle				OIL CONS	SERVA	TION	DIVISIO	N	
Printed Name	: Ike Tavan	ez Ag	ANT	In Col		Approved by	District Superviso	or:				
Title: Project Manager						Approval Date	e:	Ex	piration I	Date:		
E-mail Addre	ss: Ike.Tav	arez@TetraΤε	ech.com		(Conditions of	Approval:			Attached		}
Date: //	-19-	13	Phone:	(432) 682-4559								j

^{*} Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
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1000 Rio Brazos Road, Aztec, NM 87410
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* Attach Additional Sheets If Necessary

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

ubmit 2 Copies to appropriate

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'	TOR		🛭 Initia	al Report		Final Rep	ort
Name of Co	mpany	COG OP	ERATIN	G LLC		Contact	P	at Ellis					
Address	550 W.	Texas, Suite	100, Mic	lland, TX 7970	1 '	Telephone l	*****	230-007	17				
Facility Nar	ne Jenk	ins B Federal W	ater Flood	(Northwest Central) .]	Facility Typ	e Skin	n Tank					
Surface Ow	ner Feder	al		Mineral C)wner				Lease N		f) 30-01: est well	5-21945 location	
				LOCA		OF RE	LEASE		•				
Unit Letter C	Section 20	Township 17S	Range 30E	Feet from the	North/	South Line	Feet from the	East/W	est Line	County	Eddy	,	
				Latitude 32 4		Longiti OF REL	ude 103 59.736						
Type of Rele	ase Produc	ed water / Oil		1478.1	UKE	Volume of	Release 3bb	ls oil ols pw	Volume F	Recovered	3bbls o		
Source of Re	lease Skim	tank				Date and F 03/23/2012	lour of Occurrenc			Hour of D 2 11:30	iscovery		
Was Immedia	ate Notice C		Yes 🏻	No 🖾 Not Re	equired	If YES, To	Whom?	-					
By Whom?						Date and I							_
Was a Water	course Reac	hed?	Yes 🏻	No		If YES, Vo	olume Impacting t	he Water	rcourse.				
If a Watercou	ırse was lmı	pacted, Descri	be Fully.*								······································		
	of fluid fro				ır Texac	o BE #8 Inje	ctor the skim tank	overflov	wed. The s	strainer at	the Texa	co BE #8	
Describe Are	a Affected a	nd Cleanup A	ction Tak	en.*									
skim tank. T	he release w	as contained	on the loca	tion. Tetra Tech	will san	nple the spill	rith a vacuum truc site area to deline ant remediation v	ate any p					
regulations al 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 acceptance dequately CD accept	d/or file certain re c of a C-141 repo investigate and re	elease no ort by the emediate	otifications as NMOCD me contaminati	knowledge and up of perform correct arked as "Final Roon that pose a three the operator of r	tive action eport" do eat to gro	ons for rele es not reli- ound water	eases which eve the ope s, surface w	n may en erator of ater, hur	danger liability nan health	
G :		76			-		OIL CONS	SERVA	ATION	DIVISI	ON		
Signature: Printed Name		Josh	Russo			Approved by	District Supervise)F:	·				
Title:		HSE Co	ordinator			Approval Dat	e:	E	xpiration [Date:			
E-mail Addre	ss:	jrusso@concl	oresource	s.com	c	Conditions of	Approval:			Attached	d 🔲		
Date	04/02/2012	Di	10ne	432-212-2300			S.			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

Submit 2 Copies to appropriate District Office in accordance

Form C-141

Revised October 10, 2003

with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

·	OPERA'	TOR	🛛 Initi:	al Report 🔲 Final Report
Name of Company COG OPERATING LLC	Contact	Pa	ıt Ellis	
Address 550 W. Texas, Suite 100, Midland, TX 79701	Telephone l		230-0077	
Facility Name Jenkins Water Flood	Facility Typ	e Tanl	c Battery	
Surface Owner Federal Mineral Owner	er		Lease 1	No. (API#) 30-015-20972 Closest well location
LOCATI	ON OF RE	LEASE		
Unit Letter Section 17 Section 17S Range 30E Feet from the No	rth/South Line	Feet from the	East/West Line	County Eddy
Latitude 32 49.81		ude 103 59.765		
	E OF REL		1:37-1	2011
Type of Release Oil Source of Release Gun barrel		Release 75bbls lour of Occurrence		Recovered 70bbls Hour of Discovery
Source of Nelcase Gan barrer	06/26/2012			12 9:30 a.m.
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Require	ed If YES, To	Whom?	Mike Bratcher-O	CD
By Whom? Michelle Mullins	Date and I	lour 06/27/2012	9:27 a.m.	
Was a Watercourse Reached? ☐ Yes ☑ No	If YES, Vo	olume Impacting t	he Watercourse.	
If a Watercourse was Impacted, Describe Fully.*				
Describe Cause of Problem and Remedial Action Taken.*				11 10000
The gun barrel at the Jenkins Water Flood & Tank Battery overflowed that the problem with the motor valves has been resolved.	due to motor va	ves that did not o	pen. Electricians t	nave been called out to ensure
Describe Area Affected and Cleanup Action Taken.*				
Initially 75bbls of oil were released from the gun barrel at the facility a contained inside the diked walls of the facility. Tetra Tech will sample will present a remediation work plan to the NMOCD/BLM for approva	the spill site are I prior to any sig	a to delineate any inificant remediat	possible contamin ion work.	ation from the release and we
I hereby certify that the information given above is true and complete tregulations all operators are required to report and/or file certain release public health or the environment. The acceptance of a C-141 report by should their operations have failed to adequately investigate and remed or the environment. In addition, NMOCD acceptance of a C-141 report federal, state, or local laws and/or regulations.	e notifications ar the NMOCD mate contaminati	nd perform correct arked as "Final Re on that pose a thre	tive actions for rele eport" does not reli eat to ground water	eases which may endanger eve the operator of liability surface water, human health
Signature:		OIL CONS	ERVATION	DIVISION
Printed Name: Josh Russo	Approved by	District Superviso	r:	
Title: HSE Coordinator	Approval Date	e:	Expiration	Date:
E-mail Address: jrusso@conchoresources.com	Conditions of	Approval:		Attached
Date: 06/26/2012 Phone: 432-212-2399 Attach Additional Sheets If Necessary			······································	

Appendix B

Water Well Data Average Depth to Groundwater (ft) COG-Jenkins B Fed Water Flood Eddy County, New Mexico

	16 Sc	uth	2	9 East			16 S	outh		30 Eas	t			16	South	- 3	31 East	
3	5	4	3	2	1	6	5	4	3	2	1]	6	5	4	3	2 290	1
	8	9	10	11	12	7	8	9	10	11	12	1	7	8	9	10	11	12
8	17	16	15	14 220) 13	18	17	16	15	14	13	-	18	17	16	15	14 113	28
				dry							_		{	[314	29
9	20	21	22	23	24	. 19	20	21	22	23	24		19	20	21	22	23	24
10	29	28	27	26	25	30	29	28	27	26	25	1	30	29	28	27	26	25
11	32	33	34	35	36	31	32	33	34	35	36	1	31	32	33	34	35	36
			Ш.			<u> </u>		<u> </u>				٠ ل	290	<u> </u>	<u> </u>			L
	17 Sc	outh	2	29 East			17 Sc	outh	;	30 Eas	t	_		17 9	South	3	31 East	
3	5	4	3	2	1	6	5	4	3	2	1	7	6	5	4	3	2	1
7 /	8	9	10	11	12	7	8	9	10	11	12	1	7	8	9	10	11	12
18	17	16	15	14	13	18	17	16	15	14	13	1	18	17	16	15	14	13
19	20	21	22 7	6 23	24	19	20 80	21	22	23	24		19	20	21	22	23	24
30		28	27	26	25	30	29	28	27	26	25	1	30	29	28	27	26	25
31	208 32	33	34	35	36	31	32	33	34	35	36	1	31	32	33	34	35	36
				153		<u></u>				Ш]		Ш.		271		
	18 Sc	uth	2	29 East			18 Sc	outh	;	30 Eas	t			18 9	outh	3	1 East	
3	5	4	3	2	1	6	5	4	3	2	1	1	6	5	4	3	2	1
	8	9	10 9	5 11	12	7	8	9	10	11	12	1	7	8	9	10	11	12
8	17	16	15	14	13	18	17	16	15	14	13	1	18	17	16	15	14	13
9	20	21	22	23	24	19	20	21	22	23	24	1	19	20	21	22	317 23	24
0	29	28	27	26	158 25	30	29	28	27	26	25	1	30	29	28	27	26	25
11	32	33	34	35	36	31	32	33	34	35	36	1	31	32	33	34	35	36
	ĺ	1	1	1	1 1	ı	í	i	1	1	(ı	i	1	1	1	261	i

	Now Movi	on State	Engineere	MAKAII	Donorto
No. 14.5	IAGM MIGY	co State	Engineers	VVCII	reports

USGS Well Reports

Geology and Groundwater Conditions in Southern Eddy, County, NM

NMOCD - Groundwater Data

Field water level

New Mexico Water and Infrastructure Data System

Appendix C

Report Date: May 1, 2012 Work Order: 12042404 Page Number: 1 of 4

Summary Report

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

Report Date: May 1, 2012

Work Order: 12042404

Project Location:

Eddy Co., NM

Project Name:

COG/Jenkins B Federal Water Flood

Project Number: 114-6401364

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
295008	AH-1 0.5' BEB 0-1'	soil	2012-04-20	00:00	2012-04-23
295009	AH-1 0.5' BEB 1-1.5'	soil	2012-04-20	00:00	2012-04-23
295010	AH-1 0.5' BEB 2-2.5'	soil	2012-04-20	00:00	2012-04-23
295011	AH-1 0.5' BEB 3-3.5'	soil	2012-04-20	00:00	2012-04-23
295012	AH-1 0.5' BEB 4-4.5'	soil	2012-04-20	00:00	2012-04-23
295013	AH-1 0.5' BEB 5-5.5'	soil	2012-04-20	00:00	2012-04-23
295014	AH-1 0.5' BEB 6-6.5'	soil	2012-04-20	00:00	2012-04-23
295015	AH-1 0.5' BEB 7-7.5'	soil	2012-04-20	00:00	2012-04-23
295016	AH-1 0.5' BEB 8-8.5'	soil	2012-04-20	00:00	2012-04-23
295017	AH-1 0.5' BEB 9-9.5'	soil	2012-04-20	00:00	2012-04-23
295018	AH-2 0.5' BEB 0-1'	soil	2012-04-20	00:00	2012-04-23
295019	AH-2 0.5' BEB 1-1.5'	soil	2012-04-20	00:00	2012-04-23
295020	AH-2 0.5' BEB 2-2.5'	soil	2012-04-20	00:00	2012-04-23
295021	AH-3 0.5' BEB 0-1'	soil	2012-04-20	00:00	2012-04-23
295022	AH-3 0.5' BEB 1-1.5'	soil	2012-04-20	00:00	2012-04-23
295023	AH-3 0.5' BEB 2-2.5'	soil	2012-04-20	00:00	2012-04-23
295024	AH-3 0.5' BEB 3-3.5'	soil	2012-04-20	00:00	2012-04-23
295025	AH-3 0.5' BEB 4-4.5'	soil	2012-04-20	00:00	2012-04-23

]	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)
295008 - AH-1 0.5' BEB 0-1'	< 0.0200	0.0941	0.782	1.62	378 Qs	$166~_{ m Qs}$
295018 - AH-2 0.5' BEB 0-1'	4.74	61.1	73.4	95.2	5970 Qs	4150 Qs
295019 - AH-2 0.5' BEB 1-1.5'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 50.0	$4.90~_{\mathrm{Qr,Qs}}$
295021 - AH-3 0.5' BEB 0-1'	< 0.0200	0.106	0.105	0.362	$50.3~\mathrm{Qs}$	$33.6~_{\mathrm{Qs}}$

Sample: 295008 - AH-1 0.5' BEB 0-1'

Report Date: May 1, 2012	Work Order: 12042404	Page 1	Number: 2 of 4
Param Flag	g Result	Units	RL
Chloride	6670	mg/Kg	4
Sample: 295009 - AH-1 0.5' B	EB 1-1.5'		
Param Flag		Units	RL
Chloride	1080	mg/Kg	4
Sample: 295010 - AH-1 0.5' B	EB 2-2.5'		
Param Flag	g Result	Units	RL
Chloride	159	m mg/Kg	4
Sample: 295011 - AH-1 0.5' B	EB 3-3.5'		
Param Flag	g Result	Units	RL
Chloride	606	nıg/Kg	4
Sample: 295012 - AH-1 0.5' B	EB 4-4.5'		
Param Flag	g Result	Units	RL
Chloride	987	mg/Kg	4
Sample: 295013 - AH-1 0.5' B	EB 5-5.5'		
Param Flag	Result	Units	RL
Chloride	1790	mg/Kg	4
Sample: 295014 - AH-1 0.5' B	EB 6-6.5'		
Param Flag	g Result	Units	RL
Chloride	2910	mg/Kg	4
Sample: 295015 - AH-1 0.5' B	EB 7-7.5'		
Param Flag	Result	Units	R.L
Chloride	2980	nıg/Kg	4

Report Date: May 1, 2012		Work Order: 12042404	Page Number: 3 of 4		
Sample: 295016 - A	.H-1 0.5' BEB 8-8.	5'			
Param	Flag	Result	Units	RL	
Chloride		4590	mg/Kg	4	
Sample: 295017 - A	AH-1 0.5' BEB 9-9.	.5'			
Param	Flag	Result	Units	RL	
Chloride		6480	mg/Kg	4	
Sample: 295018 - A	AH-2 0.5' BEB 0-1'	,			
Param	Flag	Result	Units	RL	
Chloride		6540	mg/Kg	4	
Sample: 295019 - A	.H-2 0.5' BEB 1-1.	5'			
Param	Flag	Result	Units	RL	
Chloride		5560	mg/Kg	4	
Sample: 295020 - A	.H-2 0.5' BEB 2-2.	5'			
Param	Flag	Result	Units	RL	
Chloride		166	mg/Kg	4	
Sample: 295021 - A	.H-3 0.5' BEB 0-1'				
Param	Flag	Result	Units	RL	
Chloride		6130	mg/Kg	4	
Sample: 295022 - A	.H-3 0.5' BEB 1-1.	5'			
Param	Flag	Result	Units	RL	
Chloride		4090	mg/Kg	4	
Sample: 295023 - A	.H-3 0.5' BEB 2-2.	5'			
Param	Flag	Result	Units	RL	
Chloride		900	mg/Kg	4	



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E

5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100 El Paso Texas 79922 Midland Texas 79703 Carroliton, Texas 75006 800-378-1296 806-794-1296 915-585-3443

806-794-1296 FAX 806-794-1298 915-585-3443 FAX 915-585-4944 432-689-6301 FAX 432-689-6313

972-242-7750

E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: May 1, 2012

Work Order: 12042404

Project Location:

Eddy Co., NM

Project Name:

COG/Jenkins B Federal Water Flood

Project Number: 114-6401364

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
295008	AH-1 0.5' BEB 0-1'	soil	2012-04-20	00:00	2012-04-23
295009	AH-1 0.5' BEB 1-1.5'	soil	2012-04-20	00:00	2012-04-23
295010	AH-1 0.5' BEB 2-2.5'	soil	2012-04-20	00:00	2012-04-23
295011	AH-1 0.5' BEB 3-3.5'	soil	2012-04-20	00:00	2012-04-23
295012	AH-1 0.5' BEB 4-4.5'	soil	2012-04-20	00:00	2012-04-23
295013	AH-1 0.5' BEB 5-5.5'	soil	2012-04-20	00:00	2012-04-23
295014	AH-1 0.5' BEB 6-6.5'	soil	2012-04-20	00:00	2012-04-23
295015	AH-1 0.5' BEB 7-7.5'	soil	2012-04-20	00:00	2012-04-23
295016	AH-1 0.5' BEB 8-8.5'	soil	2012-04-20	00:00	2012-04-23
295017	AH-1 0.5' BEB 9-9.5'	soil	2012-04-20	00:00	2012-04-23
295018	AH-2 0.5' BEB 0-1'	soil	2012-04-20	00:00	2012-04-23
295019	AH-2 0.5' BEB 1-1.5'	soil	2012-04-20	00:00	2012-04-23
295020	AH-2 0.5' BEB 2-2.5'	soil	2012-04-20	00:00	2012-04-23
295021	AH-3 0.5' BEB 0-1'	soil	2012-04-20	00:00	2012-04-23
295022	AH-3 0.5' BEB 1-1.5'	soil	2012-04-20	00:00	2012-04-23
295023	AH-3 0.5' BEB 2-2.5'	soil	2012-04-20	00:00	2012-04-23
295024	AH-3 0.5' BEB 3-3.5'	soil	2012-04-20	00:00	2012-04-23
295025	AH-3 0.5' BEB 4-4.5'	soil	2012-04-20	00:00	2012-04-23

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 34 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

Report Contents

Case Narrative	
Analytical Report	
Sample 295008 (AH-1 0.5' BEB 0-1')	
Sample 295009 (AH-1 0.5' BEB 1-1.5')	
Sample 295010 (AH-1 0.5' BEB 2-2.5')	
Sample 295011 (AH-1 0.5' BEB 3-3.5')	
Sample 295012 (AH-1 0.5' BEB 4-4.5')	
Sample 295013 (AH-1 0.5' BEB 5-5.5')	
Sample 295014 (AH-1 0.5' BEB 6-6.5')	
Sample 295015 (AH-1 0.5' BEB 7-7.5')	
Sample 295016 (AH-1 0.5' BEB 8-8.5')	
Sample 295017 (AH-1 0.5' BEB 9-9.5')	
Sample 295018 (AH-2 0.5' BEB 0-1')	. 1
Sample 295019 (AH-2 0.5' BEB 1-1.5')	. 1
Sample 295020 (AH-2 0.5' BEB 2-2.5')	. 1
Sample 295021 (AH-3 0.5' BEB 0-1')	. 1
Sample 295022 (AH-3 0.5' BEB 1-1.5')	. 1
Sample 295023 (AH-3 0.5' BEB 2-2.5')	. 1
Sample 295024 (AH-3 0.5' BEB 3-3.5')	. 1
Sample 295025 (AH-3 0.5' BEB 4-4.5')	. 1
Method Blanks	4
QC Batch 90553 - Method Blank (1)	. 1
QC Batch 90566 - Method Blank (1)	
QC Batch 90567 - Method Blank (1)	
QC Batch 90586 - Method Blank (1)	
QC Batch 90601 - Method Blank (1)	
QC Batch 90612 - Method Blank (1)	
QC Batch 90738 - Method Blank (1)	
QC Batch 90739 - Method Blank (1)	
CO Daten 90/40 - Method Diank (1)	. 1
Laboratory Control Spikes	20
QC Batch 90553 - LCS (1)	. 20
QC Batch 90566 - LCS (1)	. 20
QC Batch 90567 - LCS (1)	. 2
QC Batch 90586 - LCS (1)	. 2
QC Batch 90611 - LCS (1)	. 25
QC Batch 90612 - LCS (1)	. 2
QC Batch 90738 - LCS (1)	. 2
QC Batch 90739 - LCS (1)	
QC Batch 90740 - LCS (1)	_
QC Batch 90553 - MS (1)	
QC Batch 90566 - MS (1)	
OC Batch 90567 - MS (1)	. <u>-</u>

QC Batch 90586 - MS (1)	25
QC Batch 90611 - MS (1)	26
QC Batch 90612 - MS (1)	27
QC Batch 90738 - MS (1)	27
QC Batch 90739 - MS (1)	
QC Batch 90740 - MS (1)	28
Calibration Standards	29
QC Batch 90553 - CCV (2)	29
QC Batch 90553 - CCV (3)	29
QC Batch 90566 - CCV (1)	29
QC Batch 90566 - CCV (2)	29
QC Batch 90567 - CCV (1)	30
QC Batch 90567 - CCV (2)	30
QC Batch 90586 - CCV (2)	30
QC Batch 90586 - CCV (3)	30
QC Batch 90611 - CCV (1)	
QC Batch 90611 - CCV (2)	31
QC Batch 90612 - CCV (1)	
QC Batch 90612 - CCV (2)	31
QC Batch 90738 - CCV (1)	. , 32
QC Batch 90738 - CCV (2)	
QC Batch 90739 - CCV (1)	
QC Batch 90739 - CCV (2)	
QC Batch 90740 - CCV (1)	
QC Batch 90740 - CCV (2)	33
Appendix	34
Report Definitions	
Laboratory Certifications	34
Standard Flags	34
Attachments	34

Case Narrative

Samples for project COG/Jenkins B Federal Water Flood were received by TraceAnalysis, Inc. on 2012-04-23 and assigned to work order 12042404. Samples for work order 12042404 were received intact at a temperature of 3.9 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	76841	2012-04-24 at 10:30	90566	2012-04-24 at 10:23
BTEX	S 8021B	76879	2012-04-25 at 10:55	90611	2012-04-25 at 11:11
Chloride (Titration)	SM 4500-Cl B	76915	2012-04-27 at 09:48	90738	2012-04-30 at 10:14
Chloride (Titration)	SM 4500-Cl B	76915	2012-04-27 at 09:48	90739	2012-05-01 at 10:15
Chloride (Titration)	SM 4500-Cl B	76915	2012-04-27 at 09:48	90740	2012-05-01 at 10:16
TPH DRO - NEW	S 8015 D	76815	2012-04-24 at 13:11	90553	2012-04-24 at 14:58
TPH DRO - NEW	S 8015 D	76854	2012-04-25 at 13:34	90586	2012-04-25 at 13:36
TPH GRO	S 8015 D	76841	2012-04-24 at 10:30	90567	2012-04-24 at 10:51
TPH GRO	S 8015 D	76879	2012-04-25 at 10:55	90612	2012-04-25 at 11:39

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 12042404 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: May 1, 2012

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 6 of 34 Eddy Co., NM

Analytical Report

Sample: 295008 - AH-1 0.5' BEB 0-1'

Laboratory:

Midland

Analysis:

BTEX

90566

Analytical Method:

S 8021B

2012-04-24

Prep Method: S 5035

QC Batch: Prep Batch:

76841

Date Analyzed: Sample Preparation:

2012-04-24

Analyzed By: Prepared By:

tcte

RΤ

			15,1.			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene	U	1	< 0.0200	mg/Kg	1	0.0200
Toluene		1	0.0941	$\mathrm{mg/Kg}$	1	0.0200
Ethylbenzene		1	0.782	mg/Kg	1	0.0200
Xylene		1	$\bf 1.62$	mg/Kg	1	0.0200

						$_{ m Spike}$	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	\mathbf{A} mount	Recovery	Limits
Trifluorotoluene (TFT)			2.06	mg/Kg	1	2.00	103	75 - 135.4
4-Bromofluorobenzene (4-BFB)			2.41	mg/Kg	1	2.00	120	63.6 - 158.9

Sample: 295008 - AH-1 0.5' BEB 0-1'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By: AR

QC Batch: Prep Batch:

90738 76915

Date Analyzed: Sample Preparation:

2012-04-30 2012-04-27

Prepared By: AR.

Flag

RL

10

Dilution

Parameter Chloride

Cert

Result 6670

Units mg/Kg

RL

4.00

DA

Sample: 295008 - AH-1 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: QC Batch: TPH DRO - NEW 90553

Analytical Method: Date Analyzed: Sample Preparation:

S 8015 D 2012-04-24 2012-04-24 Prep Method: N/AAnalyzed By: $\mathrm{D}\mathrm{A}$

Prepared By:

Prep Batch:

76815

RL

Parameter Flag Cert Result Units Dilution RL378 DRO mg/Kg 50.0 Qв ı

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 7 of 34

Eddy Co., NM

							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	${ m Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane	Qsr	Qar		166	mg/Kg	1	100	166	49.3 - 157.5

Sample: 295008 - AH-1 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: QC Batch: TPH GRO 90567

Analytical Method:

S 8015 D 2012-04-24 Prep Method: S 5035 Analyzed By: tc

Prep Batch:

Date Analyzed:

tc

76841

Sample Preparation:

2012-04-24

Prepared By:

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
GRO	Qs	1	166	mg/Kg	1	2.00

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.16	mg/Kg	1	2.00	108	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			2.61	${ m mg/Kg}$	1	2.00	130	45.1 - 162.2

Sample: 295009 - AH-1 0.5' BEB 1-1.5'

Laboratory:

Midland

Analysis: QC Batch: Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-04-30

Prep Method: N/A AR

Prep Batch:

90738 76915

Sample Preparation:

Analyzed By: AR

2012-04-27

Prepared By:

RL Cert Result Dilution RLParameter Flag Units Chloride 1080 mg/Kg 4.00

Sample: 295010 - AH-1 0.5' BEB 2-2.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/AAR.

QC Batch: Prep Batch:

90738 76915 Date Analyzed: Sample Preparation:

2012-04-30 2012-04-27 Analyzed By: Prepared By:

AR

continued ...

Report Date:	May	1,	2012
114-6401364			

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 8 of 34 Eddy Co., NM

sample	295010	continued		

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			159	mg/Kg	5	4.00

Sample: 295011 - AH-1 0.5' BEB 3-3.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

90738

Date Analyzed:

2012-04-30

Analyzed By: AR

Prep Batch: 76915

Sample Preparation: 2012-04-27

Prepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			606	mg/Kg	5	4.00

Sample: 295012 - AH-1 0.5' BEB 4-4.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

90739 76915 Date Analyzed: Sample Preparation:

2012-05-01 2012-04-27

Analyzed By: AR. Prepared By: AR.

RL

Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			987	mg/Kg	5	4.00

Sample: 295013 - AH-1 0.5' BEB 5-5.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By:

QC Batch: Prep Batch:

90739 76915 Date Analyzed: Sample Preparation: 2012-04-27

2012-05-01

ARPrepared By: AR.

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 9 of 34 Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			1790	${ m mg/Kg}$	10	4.()()

Sample: 295014 - AH-1 0.5' BEB 6-6.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 90739 Prep Batch: 76915 Analytical Method:
Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-05-01

2012-04-27

Prep Method: N/A

Analyzed By: AR Prepared By: AR

RL Parameter Flag Cert Result

Parameter	Flag	Cert	Result	Units	Dilution	RL
<u>Chl</u> oride			2910	${ m mg/Kg}$	10	4.00

Sample: 295015 - AH-1 0.5' BEB 7-7.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 90739 Prep Batch: 76915 Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-05-01 2012-04-27 Prep Method: N/A

Analyzed By: AR Prepared By: AR

Sample: 295016 - AH-1 0.5' BEB 8-8.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 90739 Prep Batch: 76915 Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-05-01 2012-04-27 Prep Method: N/A Analyzed By: AR

AR

Prepared By:

RL

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 10 of 34

Eddy Co., NM

Sample: 295017 - AH-1 0.5' BEB 9-9.5'

Laboratory:

Midland

Analysis: QC Batch: Chloride (Titration)

90739 Prep Batch: 76915 Analytical Method:

Date Analyzed: Sample Preparation: SM 4500-Cl B

2012-05-01 2012-04-27 Prep Method: N/A Analyzed By:

AR. AR.

Prepared By:

RL

Flag Parameter Chloride

Result 6480

Units mg/Kg

Dilution RL10 4.00

Sample: 295018 - AH-2 0.5' BEB 0-1'

Laboratory:

Midland

Analysis:

BTEX

Analytical Method:

Cert

S 8021B 2012-04-24 Prep Method: Analyzed By:

S 5035 tc

QC Batch: Prep Batch:

90566 76841

Date Analyzed: Sample Preparation:

2012-04-24

Prepared By: tc

RL

			1011			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene		1	$\overline{4.74}$	mg/Kg	50	0.0200
Toluene		1	61.1	mg/Kg	50	0.0200
Ethylbenzene		1	73.4	mg/Kg	50	0.0200
Xylene		1	95.2	mg/Kg	50	0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			47.4	mg/Kg	50	50.0	95	75 - 135.4
4-Bromofluorobenzene (4-BFB)			57.6	mg/Kg	50	50.0	115	63.6 - 158.9

Sample: 295018 - AH-2 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: QC Batch: 90739

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-05-01

Prep Method: N/A Analyzed By: AR

Prep Batch:

76915

Sample Preparation:

2012-04-27

Prepared By: AR

RL

Parameter Flag Cert Result Units Dilution RL6540 mg/Kg 10 4.00 Chloride

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 11 of 34 Eddy Co., NM

Sample: 295018 - AH-2 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: QC Batch: TPH DRO - NEW

Analytical Method: Date Analyzed:

S 8015 D

2012-04-24

Prep Method: Analyzed By:

N/A DA DA

Prep Batch: 76815

90553

Sample Preparation: 2012-04-24 Prepared By:

RL

Parameter Units Dilution RLFlag Cert Result DRO 5970 mg/Kg 5 50.0 Q_8

							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	${ m Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane	Qяг	Qar		571	mg/Kg	5	100	571	49.3 - 157.5

Sample: 295018 - AH-2 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: TPH GRO QC Batch: 90567 Prep Batch: 76841

Analytical Method: Date Analyzed:

S 8015 D 2012-04-24 Sample Preparation: 2012-04-24

Prep Method: S 5035 Analyzed By:

tcPrepared By: tc

DΤ

			N.L			
Parameter	Flag	Cert	Result	Units	Dilution	RL
GRO	Qs	1	4150	mg/Kg	50	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			49.6	mg/Kg	50	50.0	99	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			61.0	mg/Kg	50	50.0	122	45.1 - 162.2

Sample: 295019 - AH-2 0.5' BEB 1-1.5'

Laboratory: Midland

Analysis:

BTEX QC Batch: 90611 Prep Batch: 76879

Analytical Method: Date Analyzed:

Sample Preparation:

S 8021B 2012-04-25 2012-04-25 Prep Method: S 5035 Analyzed By: tcPrepared By: tc

			R.L			
Parameter	Flag	Cert	Result	\mathbf{Units}	Dilution	RL
Benzene	U	l	< 0.0200	mg/Kg	1	0.0200
Toluene	υ	1	< 0.0200	${ m mg/Kg}$	1	0.0200
Ethylbenzene	U	1	< 0.0200	${ m mg/Kg}$	1	0.0200
Xylene	U	1	< 0.0200	mg/Kg	1	0.0200

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 12 of 34

Eddy Co., NM

AR.

AR.

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	${f Amount}$	Recovery	Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	75 - 135.4
4-Bromofluorobenzene (4-BFB)			1.97	$\mathrm{mg/Kg}$	1	2.00	98	63.6 - 158.9

Sample: 295019 - AH-2 0.5' BEB 1-1.5'

Laboratory:

Midland

Analysis: QC Batch: Chloride (Titration)

90739 Prep Batch: 76915 Analytical Method:

Date Analyzed: Sample Preparation: SM 4500-Cl B 2012-05-01

Prep Method: N/A Analyzed By: 2012-04-27 Prepared By:

RL

Parameter	Flag	Cert	Result	Units	Dilution ·	RL
Chloride			5560	nıg/Kg	10	4.00

Sample: 295019 - AH-2 0.5' BEB 1-1.5'

Laboratory:

Midland

TPH DRO - NEW Analysis: QC Batch: 90586 Prep Batch: 76854

Analytical Method: Date Analyzed:

S 8015 D 2012-04-25 Sample Preparation: 2012-04-25 Prep Method: N/A Analyzed By: DA

Prepared By: DA

			m RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
DRO	U	1	< 50.0	mg/Kg	. 1	50.0
				Cm:l-a	Domoont	D

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			114	mg/Kg	1	100	114	49.3 - 157.5

Sample: 295019 - AH-2 0.5' BEB 1-1.5'

Laboratory:

Midland

Analysis: QC Batch: TPH GRO

Analytical Method: Date Analyzed:

S 8015 D 2012-04-25 Prep Method: S 5035

90612 Sample Preparation: Prep Batch: 76879 2012-04-25 Analyzed By: tcPrepared By: tc

RLCert Units Dilution Parameter Flag Result RLGRO 4.90 mg/Kg $\overline{1}$ 2.00 Qr,Qs 1

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 13 of 34 Eddy Co., NM

Surrogate	Flag	Cert	Result	Units	Dilution	$egin{array}{c} { m Spike} \ { m Amount} \end{array}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.12	mg/Kg	1	2.00	106	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			1.96	mg/Kg	1	2.00	98	45.1 - 162.2

Sample: 295020 - AH-2 0.5' BEB 2-2.5'

Laboratory:

Midland

Chloride (Titration) Analysis: QC Batch: 90739 Prep Batch: 76915

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-05-01 Sample Preparation: 2012-04-27

Prep Method: N/A

Analyzed By: AR. Prepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			166	mg/Kg	5	4.00

Sample: 295021 - AH-3 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: BTEX QC Batch: 90566 Prep Batch: 76841

Analytical Method: Date Analyzed:

S 8021B 2012-04-24 Sample Preparation: 2012-04-24 Prep Method: S 5035 Analyzed By: tc

Prepared By: tc

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Benzene	U	j	< 0.0200	mg/Kg	1	0.0200
Toluene		1	0.106	m mg/Kg	1	0.0200
Ethylbenzene		1	0.105	mg/Kg	1	0.0200
Xylene		1	0.362	mg/Kg	1	0.0200

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			2.20	mg/Kg	1	2.00	110	75 - 135.4
4-Bromofluorobenzene (4-BFB)			2.14	mg/Kg	1	2.00	107	63.6 - 158.9

Sample: 295021 - AH-3 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration) Analytical Method: Prep Method: N/A SM 4500-Cl B QC Batch: Date Analyzed: Analyzed By: AR. 90739 2012-05-01 Prep Batch: 76915 Sample Preparation: 2012-04-27 Prepared By: AR

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 14 of 34

Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			6130	mg/Kg	10	4.00

Sample: 295021 - AH-3 0.5' BEB 0-1'

Laboratory:

Midland

Analysis:

TPH DRO - NEW

QC Batch: 90553 Analytical Method: Date Analyzed:

S 8015 D 2012-04-24 Prep Method: N/A Analyzed By: DA

Prep Batch:

76815

Sample Preparation:

2012-04-24

Prepared By: DA

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
DRO	Qs	1	50.3	mg/Kg	1	50.0

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			145	mg/Kg	1	100	145	49.3 - 157.5

Sample: 295021 - AH-3 0.5' BEB 0-1'

Laboratory:

Midland

Analysis: OC Batch: TPH GRO 90567

Analytical Method:

S 8015 D

Prep Method: S 5035 Analyzed By: tc

RL

2.00

Prep Batch:

76841

Date Analyzed:

2012-04-24 Sample Preparation: 2012-04-24

Prepared By: tc

RLParameter Cert Result Units Dilution Flag 33.6 GRO mg/Kg 1 Qs 1

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.34	mg/Kg	1	2.00	117	58.5 - 155.1
4-Bromofluorobenzene (4-BFB)			2.27	mg/Kg	1	2.00	114	45.1 - 162.2

Sample: 295022 - AH-3 0.5' BEB 1-1.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method: Date Analyzed:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch: 76915

90740

Sample Preparation:

2012-05-01 2012-04-27 Analyzed By: ARPrepared By: AR

114-6401364

Work Order: 12042404

COG/Jenkins B Federal Water Flood

Page Number: 15 of 34

Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			4090	mg/Kg	10	4.00

Sample: 295023 - AH-3 0.5' BEB 2-2.5'

Laboratory:

Midland

Analysis: QC Batch: Chloride (Titration)

90740

Prep Batch: 76915 Analytical Method:

Date Analyzed:

2012-05-01 Sample Preparation: 2012-04-27

Prep Method: N/A SM 4500-Cl B Analyzed By:

AR Prepared By: AR

			m RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			900	mg/Kg	5	4.00

Sample: 295024 - AH-3 0.5' BEB 3-3.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B 2012-05-01

Prep Method: N/A Analyzed By:

AR.

AR.

QC Batch: 90740 Date Analyzed: Prep Batch: 76915 Sample Preparation: Prepared By: 2012-04-27

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			885	mg/Kg	10	4.00

Sample: 295025 - AH-3 0.5' BEB 4-4.5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B 2012-05-01

Prep Method: N/AAnalyzed By: AR.

QC Batch: 90740 Prep Batch: 76915

Date Analyzed: Sample Preparation:

2012-04-27

Prepared By: AR.

RLParameter Flag Cert Result Units Dilution RLChloride mg/Kg 1810 4.00 10

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 16 of 34

Eddy Co., NM

Method Blanks

Method Blank (1)

QC Batch: 90553

QC Batch:

90553

Date Analyzed: 2012-04-24 Analyzed By: DA

Prep Batch:

76815

QC Preparation: 2012-04-24

Prepared By: DA

MDL

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

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane			118	mg/Kg	1	100	118	52 - 140.8

Method Blank (1)

QC Batch: 90566

QC Batch:

90566

Date Analyzed:

2012-04-24

Analyzed By: tc Prepared By:

Prep Batch: 76841 QC Preparation: 2012-04-24

MDL Parameter Units RLFlag Cert Result Benzene < 0.00470 mg/Kg 0.02 1 Toluene < 0.00980 mg/Kg 0.02Ethylbenzene mg/Kg 0.02< 0.00500 < 0.0170 mg/Kg 0.02Xylene

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	${f Amount}$	Recovery	Limits
Trifluorotoluene (TFT)			1.88	mg/Kg	1	2.00	94	78 - 123.6
4-Bromofluorobenzene (4-BFB)			1.76	${ m mg/Kg}$	1	2.00	88	55.9 - 112.4

Method Blank (1)

QC Batch: 90567

QC Batch:

90567

Date Analyzed:

2012-04-24

Analyzed By: tc Prepared By: tc

Prep Batch:

76841

QC Preparation:

2012-04-24

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 17 of 34

Eddy Co., NM

Parameter GRO	Flag		Cert		MDL Result <1.22		Units mg/Kg	RL
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-BFB)			$1.96 \\ 1.72$	mg/Kg mg/Kg	1 1	2.00 2.00	98 86	78.6 - 111 55 - 100

Method Blank (1)

QC Batch: 90586

QC Batch:

90586

Date Analyzed:

110

2012-04-25

Analyzed By: DA

Prep Batch:

76854

QC Preparation: 2012-04-25

Prepared By: DA

MDLParameter Flag Cert Result Units RLDRO <14.5 mg/Kg 50 1 Spike Percent Recovery Surrogate Flag Cert Result Units Dilution Amount Recovery Limits

mg/Kg

Method Blank (1)

QC Batch: 90611

QC Batch: Prep Batch:

n-Tricosane

90611 76879

C 1 1

Date Analyzed: QC Preparation: 2012-04-25 2012-04-25 100

Analyzed By: tc Prepared By: tc

52 - 140.8

110

MDLParameter Flag Cert Result Units RLBenzene < 0.00470 mg/Kg 0.02 Toluene < 0.00980 mg/Kg 0.02Ethylbenzene < 0.00500 mg/Kg 0.02Xylene < 0.0170mg/Kg 0.02

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.61	mg/Kg	1	2.00	80	78 - 123.6
4-Bromofluorobenzene (4-BFB)			1.58	mg/Kg	1	2.00	7 9	55.9 - 112.4

114-6401364

Work Order: 12042404

COG/Jenkins B Federal Water Flood

Page Number: 18 of 34

Eddy Co., NM

RL

 $\overline{2}$

Method Blank (1)

QC Batch: 90612

QC Batch: Prep Batch:

Parameter

GRO

90612 76879 Date Analyzed:

2012-04-25

QC Preparation: 2012-04-25 Analyzed By: tc Prepared By:

MDL Flag CertResult Units <1.22 mg/Kg

Spike Percent Recovery Dilution Limits Surrogate Flag Cert Result Units Amount Recovery Trifluorotoluene (TFT) 1.70 mg/Kg1 2.00 85 78.6 - 111 76 55 - 1004-Bromofluorobenzene (4-BFB) 1.52 mg/Kg 1 2.00

Method Blank (1)

QC Batch: 90738

Flag

QC Batch: Prep Batch:

Parameter

Chloride

90738 76915 Date Analyzed:

2012-04-30

Analyzed By: AR.

Prepared By: AR.

QC Preparation: 2012-04-27

Cert

MDL Result

< 3.85

Units RLmg/Kg $\overline{4}$

Method Blank (1)

QC Batch: 90739

QC Batch:

90739

Date Analyzed:

2012-05-01

Analyzed By: ARAR.

Prep Batch:

76915

QC Preparation:

2012-04-27

Prepared By:

MDL Parameter Flag Cert Result Units RLChloride < 3.85mg/Kg

Method Blank (1)

Prep Batch: 76915

QC Batch: 90740

QC Batch:

90740

Date Analyzed:

2012-05-01

QC Preparation:

2012-04-27

Analyzed By: AR

Prepared By:

AR

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 19 of 34

Eddy Co., NM

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

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 20 of 34

Eddy Co., NM

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch:

90553

Date Analyzed:

2012-04-24

Analyzed By: DA

Prep Batch: 76815

QC Preparation: 2012-04-24

Prepared By: DA

			LCS			$_{ m Spike}$	Matrix		${ m Rec.}$
Param	F	\mathbf{C}	Result	Units	Dil.	${f A}{f mount}$	Result	Rec.	Limit
DRO		1	242	mg/Kg	1	250	<14.5	97	62 - 128.3

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

			LCSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	$_{ m Limit}$
DRO		1	262	mg/Kg	1	250	<14.5	105	62 - 128.3	8	20

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

	LCS	LCSD			Spike	LCS	LCSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	117	125	ıng/Kg	1	100	117	$\overline{125}$	58.6 - 149.6

Laboratory Control Spike (LCS-1)

QC Batch:

90566

Date Analyzed:

2012-04-24

Analyzed By: tc Prepared By: tc

Prep Batch:

76841

QC Preparation: 2012-04-24

LCS Matrix Rec. Spike Param Result Units Dil. Amount Result Rec. Limit Benzene 2.38 mg/Kg 86.5 - 124.9 1 2.00 < 0.00470119 Toluene 2.32mg/Kg 1 2.00 < 0.00980116 84.7 - 122.5Ethylbenzene mg/Kg 2.00 109 2.18 1 < 0.00500 79.4 - 118.9 Xylene 6.51mg/Kg 108 79.5 - 118.96.00< 0.0170

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}	RPD	Limit
Benzene		1	2.33	mg/Kg	1	2.00	< 0.00470	116	86.5 - 124.9	2	20
Toluene		1	2.25	mg/Kg	1	2.00	< 0.00980	112	84.7 - 122.5	3	20
Ethylbenzene		1	2.15	mg/Kg	1	2.00	< 0.00500	108	79.4 - 118.9	1	20
Xylene		1	6.41	mg/Kg	1	6.00	< 0.0170	107	79.5 - 118.9	2	20

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 21 of 34

Eddy Co., NM

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	${ m Rec.} \ { m Limit}$
Trifluorotoluene (TFT)	1.94	2.24	mg/Kg	1	2.00	97	112	73.9 - 127
4-Bromofluorobenzene (4-BFB)	1.44	1.76	mg/Kg	1	2.00	72	88	70.4 - 119.9

Laboratory Control Spike (LCS-1)

QC Batch:

90567

Date Analyzed:

2012-04-24

Analyzed By: tc

Prep Batch: 76841

QC Preparation: 2012-04-24

Prepared By: tc

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	${f Amount}$	Result	Rec.	\mathbf{Limit}
GRO		1	15.6	mg/Kg	1	20.0	<1.22	78	68.3 - 105.7

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	$_{ m Limit}$
GRO		1	16.0	mg/Kg	1	20.0	<1.22	80	68.3 - 105.7	2	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.89	1.95	mg/Kg	1	2.00	94	98	80 - 111.2
4-Bromofluorobenzene (4-BFB)	1.80	1.82	mg/Kg	1	2.00	90	91	66.4 - 106.6

Laboratory Control Spike (LCS-1)

QC Batch:

90586

Date Analyzed:

2012-04-25

Analyzed By: DA

Prep Batch: 76854

QC Preparation: 2012-04-25

Prepared By: DA

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
DRO		1	261	mg/Kg	1	250	<14.5	104	62 - 128.3

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	271	mg/Kg	1	250	<14.5	108	62 - 128.3	4	20

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 22 of 34

Eddy Co., NM

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	${ m Units}$	Dil.	${f Amount}$	Rec.	Rec.	${f Limit}$
n-Tricosane	110	115	mg/Kg	1	100	110	115	58.6 - 149.6

Laboratory Control Spike (LCS-1)

QC Batch:

90611

Date Analyzed:

2012-04-25

Analyzed By: tc

Prep Batch: 76879

QC Preparation: 2012-04-25

Prepared By: to

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	2.06	mg/Kg	1	2.00	< 0.00470	103	86.5 - 124.9
Toluene		1	2.04	mg/Kg	1	2.00	< 0.00980	102	84.7 - 122.5
Ethylbenzene		1	1.99	$_{ m ing/Kg}$	1	2.00	< 0.00500	100	79.4 - 118.9
Xylene		1	5.95	mg/Kg	1	6.00	< 0.0170	99	79.5 - 118.9

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		1	2.14	mg/Kg	1	2.00	< 0.00470	107	86.5 - 124.9	4	20
Toluene		1	2.10	mg/Kg	1	2.00	< 0.00980	105	84.7 - 122.5	3	20
Ethylbenzene		ì	2.03	mg/Kg	1	2.00	< 0.00500	102	79.4 - 118.9	2	20
Xylene		1	6.06	mg/Kg	1	6.00	< 0.0170	101	79.5 - 118.9	2	20

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

	LCS	LCSD			$_{ m Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.61	1.88	mg/Kg	1	2.00	80	94	73.9 - 127
4-Bromofluorobenzene (4-BFB)	1.65	1.89	mg/Kg	1	2.00	82	94	70.4 - 119.9

Laboratory Control Spike (LCS-1)

QC Batch:

90612

Date Analyzed:

2012-04-25

Analyzed By: tc

Prep Batch: 76879

QC Preparation: 2012-04-25

Prepared By: tc

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1	17.1	mg/Kg	1	20.0	<1.22	86	68.3 - 105.7

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 23 of 34

Eddy Co., NM

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}	RPD	Limit
GRO		1	17.3	mg/Kg	1	20.0	<1.22	86	68.3 - 105.7	1	20

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

	LCS	LCSD			Spike	LCS	LCSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Trifluorotoluene (TFT)	1.91	1.97	mg/Kg	1	2.00	96	98	80 - 111.2
4-Bromofluorobenzene (4-BFB)	1.78	1.83	mg/Kg	. 1	2.00	89	92	66.4 - 106.6

Laboratory Control Spike (LCS-1)

QC Batch:

90738

Date Analyzed:

2012-04-30

Analyzed By: AR Prepared By: AR.

Prep Batch: 76915

QC Preparation: 2012-04-27

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	$\mathbf{A}\mathbf{mount}$	Result	Rec.	${f Limit}$
Chloride			2580	ıng/Kg	1	2500	< 3.85	103	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{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2540	mg/Kg	1	2500	< 3.85	102	85 - 115	2	20

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

Laboratory Control Spike (LCS-1)

QC Batch:

Prep Batch: 76915

90739

Date Analyzed:

2012-05-01

QC Preparation: 2012-04-27

Analyzed By: AR

Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}
Chloride			2350	mg/Kg	1	2500	< 3.85	94	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{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2190	mg/Kg	1	2500	< 3.85	88	85 - 115	7	20

114-6401364

Work Order: 12042404

COG/Jenkins B Federal Water Flood

Page Number: 24 of 34

Eddy Co., NM

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 76915

90740

Date Analyzed:

2012-05-01

QC Preparation: 2012-04-27 Analyzed By: AR.

Prepared By: AR.

			LCS			Spike	Matrix		${ m Rec.}$
Param	F	$^{\rm C}$	Result	Units	Dil.	$\mathbf{A}\mathbf{m}\mathbf{o}\mathbf{u}\mathbf{n}\mathbf{t}$	Result	Rec.	Limit
Chloride			2410	mg/Kg	1	2500	< 3.85	96	85 - 115

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2500	mg/Kg	1	2500	< 3.85	100	85 - 115	4	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: 295039

QC Batch:

90553

Date Analyzed:

2012-04-24

Analyzed By: DA

Prep Batch: 76815

QC Preparation: 2012-04-24

Prepared By: DA

			MS			Spike	Matrix		${ m Rec.}$
Param.	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1	2340	mg/Kg	5	250	2210	52	45.5 - 127

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

				MSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	$\mathbf{A}\mathbf{mount}$	Result	Rec.	Limit	RPD	Limit
DRO	Qs	Qs	1	2700	mg/Kg	5	250	2210	196	45.5 - 127	14	20

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

			MS	MSD			Spike	MS	MSD	Rec.
Surrogate			Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	Qar	Qar	378	411	mg/Kg	5	100	378	411	45.4 - 145.8

Matrix Spike (MS-1)

Spiked Sample: 295021

QC Batch:

90566

Date Analyzed:

2012-04-24

Analyzed By: tc

Prep Batch: 76841

QC Preparation: 2012-04-24

Prepared By: tc

114 - 6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 25 of 34 Eddy Co., NM

Param	F	С	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		t	2.39	mg/Kg	1	2.00	< 0.00470	120	69.3 - 159.2
Toluene		1	2.42	mg/Kg	1	2.00	0.1064	116	68.7 - 157
Ethylbenzene		1	2.52	mg/Kg	1	2.00	0.1049	121	71.6 - 158.2
Xvlene			7.76	mø/Kø	1	6.00	0.3622	123	70.8 - 159.8

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

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	\mathbf{A} mount	Result	Rec.	Limit	RPD	Limit
Benzene		1	2.45	mg/Kg	1	2.00	< 0.00470	122	69.3 - 159.2	2	20
Toluene		ì	2.49	mg/Kg	1	2.00	0.1064	119	68.7 - 157	3	20
Ethylbenzene		1	2.60	mg/Kg	1	2.00	0.1049	125	71.6 - 158.2	3	20
Xylene		1	7.90	mg/Kg	1	6.00	0.3622	126	70.8 - 159.8	2	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Trifluorotoluene (TFT)	2.44	2.20	mg/Kg	1	2	122	110	71.4 - 133.9
4-Bromofluorobenzene (4-BFB)	2.44	2.15	mg/Kg	1	2	122	108	72.6 - 144.1

Matrix Spike (MS-1) Spiked Sample: 295018

QC Batch: 90567 Prep Batch: 76841 Date Analyzed: 2012-04-24 QC Preparation: 2012-04-24

Analyzed By: tc Prepared By: tc

				MS			Spike	Matrix		Rec.
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	Qu	Qs	1	7400	mg/Kg	50	500	4149.32	650	28.2 - 157.2

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

				MSD			Spike	Matrix		${ m Rec.}$		RPD
Param		\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	Qs	Qя	1	7620	mg/Kg	50	500	4149.32	694	28.2 - 157.2	3	20

			MS	MSD			Spike	MS	MSD	${ m Rec.}$
Surrogate			Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)			53.8	52.0	mg/Kg	50	50	108	104	75.5 - 122.3
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	70.0	69.2	mg/Kg	50	50	140	138	77.9 - 122.4

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 26 of 34 Eddy Co., NM

Matrix Spike (MS-1)

Spiked Sample: 294998

QC Batch:

90586

Date Analyzed:

2012-04-25

Analyzed By: DA

Prep Batch: 76854

QC Preparation: 2012-04-25

Prepared By: DA

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
DRO		ı	274	mg/Kg	1	250	120	62	45.5 - 127

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

·			MSD			Spike	Matrix		$\mathrm{Rec.}$		RPD
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	288	mg/Kg	1	250	120	67	45.5 - 127	5	20

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

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	\mathbf{Units}	Dil.	Amount	Rec.	Rec.	${f Limit}$
n-Tricosane	126	121	mg/Kg	1	100	126	121	45.4 - 145.8

Matrix Spike (MS-1)

Spiked Sample: 295157

QC Batch:

90611

Date Analyzed:

2012-04-25

Analyzed By: tc

Prep Batch: 76879

QC Preparation: 2012-04-25

Prepared By: tc

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	56.8	mg/Kg	50	50.0	3.918	106	69.3 - 159.2
Toluene		1	108	mg/Kg	50	50.0	45.884	124	68.7 - 157
Ethylbenzene		1	110	mg/Kg	50	50.0	50.3205	119	71.6 - 158.2
Xylene		1	263	mg/Kg	50	150	93.1734	113	70.8 - 159.8

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

,			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
Benzene		1	56.9	mg/Kg	50	50.0	3.918	106	69.3 - 159.2	0	20
Toluene		1	101	mg/Kg	50	50.0	45.884	110	68.7 - 157	7	20
Ethylbenzene		1	102	${ m mg/Kg}$	50	50.0	50.3205	103	71.6 - 158.2	8	20
Xylene		1	247	mg/Kg	50	150	93.1734	102	70.8 - 159.8	6	20

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

	MS	MSD	1		Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Trifluorotoluene (TFT)	40.9	44.3	${ m mg/Kg}$	50	50	82	89	71.4 - 133.9

 $continued \dots$

Work Order: 12042404

Page Number: 27 of 34

114-6401364

COG/Jenkins B Federal Water Flood

Eddy Co., NM

matrix	spikes	continued			
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	MS	MSD			Spike	MS	MSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
4-Bromofluorobenzene (4-BFB)	53.2	55.3	mg/Kg	50	50	106	111	72.6 - 144.1

Matrix Spike (MS-1)

Spiked Sample: 295158

QC Batch:

90612

Date Analyzed:

2012-04-25

Analyzed By: tc

Prep Batch: 76879

Prepared By:

QC Preparation: 2012-04-25

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
GRO		1	6340	mg/Kg	50	500	5925.95	83	28.2 - 157.2

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

				MSD			Spike	Matrix		Rec.		RPD
Param		\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	Qr,Qs	Qr,Qs	1	7790	mg/Kg	50	500	5925.95	373	28.2 - 157.2	20	20

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

			MS	MSD			Spike	MS	MSD	$\mathrm{Rec.}$
Surrogate			Result	Result	Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Triffuorotoluene (TFT)			51.2	51.0	mg/Kg	50	50	102	102	75.5 - 122.3
4-Bromofluorobenzene (4-BFB)	Qar	Qsr	66.2	65.4	mg/Kg	50	50	132	131	77.9 - 122.4

Matrix Spike (MS-1)

Spiked Sample: 295011

QC Batch:

90738

Date Analyzed:

2012-04-30

Analyzed By: AR

Prep Batch:

76915

QC Preparation:

2012-04-27

Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			3100	mg/Kg	5	2500	606	100	79.4 - 120.6

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

			MSD			Spike	Matrix		${ m Rec.}$		RPD
Param	\mathbf{F}	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			3190	mg/Kg	5	2500	606	103	79.4 - 120.6	3	20

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 28 of 34

Eddy Co., NM

Matrix Spike (MS-1)

Spiked Sample: 295021

QC Batch: Prep Batch:

90739 76915 Date Analyzed: QC Preparation: 2012-05-01

2012-04-27

Analyzed By: AR

Prepared By: AR.

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	${f Amount}$	Result	Rec.	\mathbf{Limit}
Chloride			8280	mg/Kg	10	2500	6130	86	79.4 - 120.6

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			8750	mg/Kg	10	2500	6130	105	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: 295025

QC Batch:

90740

Date Analyzed:

2012-05-01

Analyzed By: AR.

Prep Batch:

76915

QC Preparation:

2012-04-27

Prepared By: AR.

MS Spike Matrix Rec. \mathbf{F} C Param Result Units Dil. Amount Result Rec. Limit Chloride 4540 mg/Kg $\overline{10}$ 2500 1810 109 79.4 - 120.6

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$	RPD	Limit
Chloride			4330	mg/Kg	10	2500	1810	101	79.4 - 120.6	5	20

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 29 of 34 Eddy Co., NM

Calibration Standards

Standard (CCV-2)

QC Batch: 90553

Date Analyzed: 2012-04-24

Analyzed By: DA

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	$\operatorname{Conc.}$	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	236	94	80 - 120	2012-04-24

Standard (CCV-3)

QC Batch: 90553

Date Analyzed: 2012-04-24

Analyzed By: DA

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	${ m Units}$	Conc.	$\operatorname{Conc.}$	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	253	101	80 - 120	2012-04-24

Standard (CCV-1)

QC Batch: 90566

Date Analyzed: 2012-04-24

Analyzed By: tc

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		ı	mg/kg	0.100	0.109	109	80 - 120	2012-04-24
Toluene		1	mg/kg	0.100	0.107	107	80 - 120	2012-04-24
Ethylbenzene		1	mg/kg	0.100	0.108	108	80 - 120	2012-04-24
Xylene		1	mg/kg	0.300	0.323	108	80 - 120	2012-04-24

Standard (CCV-2)

QC Batch: 90566

Date Analyzed: 2012-04-24

Analyzed By: tc

Report Date: May 1, 2012 114-6401364

Work Order: 12042404

Page Number: 30 of 34 COG/Jenkins B Federal Water Flood Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.111	111	80 - 120	2012-04-24
Toluene		1	nig/kg	0.100	0.109	109	80 - 120	2012-04-24
Ethylbenzene		í	mg/kg	0.100	0.105	105	80 - 120	2012-04-24
Xylene		ſ	m mg/kg	0.300	0.317	106	80 - 120	2012-04-24

Standard (CCV-1)

QC Batch: 90567

Date Analyzed: 2012-04-24

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	1.10	110	80 - 120	2012-04-24

Standard (CCV-2)

QC Batch: 90567

Date Analyzed: 2012-04-24

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	1.14	114	80 - 120	2012-04-24

Standard (CCV-2)

QC Batch: 90586

Date Analyzed: 2012-04-25

Analyzed By: DA

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO	 	1	mg/Kg	250	272	109	80 - 120	2012-04-25

Standard (CCV-3)

QC Batch: 90586

Date Analyzed: 2012-04-25

Analyzed By: DA

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 31 of 34 Eddy Co., NM

				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		1	mg/Kg	250	250	100	80 - 120	2012-04-25

Standard (CCV-1)

QC Batch: 90611

Date Analyzed: 2012-04-25

Analyzed By: tc

				CCVs True	${ m CCVs} \ { m Found}$	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.0925	92	80 - 120	2012-04-25
Toluene		1	mg/kg	0.100	0.0912	91	80 - 120	2012-04-25
Ethylbenzene		1	mg/kg	0.100	0.0883	88	80 - 120	2012-04-25
Xylene		1	mg/kg	0.300	0.266	89	80 - 120	2012-04-25

Standard (CCV-2)

QC Batch: 90611

Date Analyzed: 2012-04-25

Analyzed By: tc

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	${ m Units}$	Conc.	Conc.	Recovery	Limits	\mathbf{A} nalyzed
Benzene		1	mg/kg	0.100	0.104	104	80 - 120	2012-04-25
Toluene		1	mg/kg	0.100	0.105	105	80 - 120	2012-04-25
Ethylbenzene		i	mg/kg	0.100	0.0991	99	80 - 120	2012-04-25
Xylene		1	m mg/kg	0.300	0.295	98	80 - 120	2012-04-25

Standard (CCV-1)

QC Batch: 90612

Date Analyzed: 2012-04-25

Analyzed By: tc

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	$\mathbf{U}\mathbf{nits}$	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	1.07	107	80 - 120	2012-04-25

114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 32 of 34

Eddy Co., NM

Standard (CCV-2)

QC Batch: 90612

Date Analyzed: 2012-04-25

Analyzed By: tc

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		ı	mg/Kg	1.00	1.18	118	80 - 120	2012-04-25

Standard (CCV-1)

QC Batch: 90738

Date Analyzed: 2012-04-30

Analyzed By: AR

			•	$rac{ ext{CCVs}}{ ext{True}}$	${ m CCVs} \ { m Found}$	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-04-30

Standard (CCV-2)

QC Batch: 90738

Date Analyzed: 2012-04-30

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	2012-04-30

Standard (CCV-1)

QC Batch: 90739

Date Analyzed: 2012-05-01

Analyzed By: AR

				CCVs	CCVs	CCVs	Percent	Data
Param	Flag	Cert	Units	True Conc.	Found Conc.	Percent Recovery	Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2012-05-01

Standard (CCV-2)

QC Batch: 90739

Date Analyzed: 2012-05-01

Analyzed By: AR

Report Date: May 1, 2012 114-6401364

Work Order: 12042404 COG/Jenkins B Federal Water Flood Page Number: 33 of 34 Eddy Co., NM

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.9	100	85 - 115	2012-05-01

Standard (CCV-1)

QC Batch: 90740

Date Analyzed: 2012-05-01

Analyzed By: AR

				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.8	100	85 - 115	2012-05-01

Standard (CCV-2)

QC Batch: 90740

Date Analyzed: 2012-05-01

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
	1 10%							· · · · · · · · · · · · · · · · · · ·
Chloride			mg/Kg	100	100	100	85 - 115	2012-05-01

Work Order: 12042404 COG/Jenkins B Federal Water Flood

Page Number: 34 of 34

Eddy Co., NM

114-6401364

Report Date: May 1, 2012

Appendix

Report Definitions

Name	Definition
$\overline{ ext{MDL}}$	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 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.

1. めし ノカケンフ **Analysis Request of Chain of Custody Record** PAGE: **ANALYSIS REQUEST** (Circle or Specify Method No.) TETRA TECH (Ext. to C35) g g 1910 N. Big Spring St. 외윤 Midland, Texas 79705 2 B (432) 682-4559 • Fax (432) 682-3946 CLIENT NAME: SITE MANAGER: PRESERVATIVE NUMBER OF CONTAINERS (OG **METHOD** Ile Tarriez **TCLP Semi Volatiles** PROJECT NO .: PROJECT NAME: GC.MS Semi. Vol. Jankins B Federal Water Flood 114-6401364 LAB I.D. MATRIX SAMPLE IDENTIFICATION COMP DATE TIME IOE NONE GRAB HNO3 NUMBER 2012 295008 5 0.5' BEB AH-1 009 4-4.5' 016 8-8.5 Date: 4-2n-12 SAMPLED BY: (Print & Initial) 6 RELINQUISHED BY: (Signature Date: RECÉIVED BY: (Signature) SAMPLE SHIPPED BY: (Circle) Date: AIRBILL #: Time: OTHER: HAND DELIVERED Date: RELINQUISHED BY: (Signature) RECEIVED BY: (Signature) TETRA TECH CONTACT PERSON: Results by: RECEIVING LABORATORY: RECEIVED BY: (Signature) RUSH Charges The Towarez Authorized: ZIP:

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

PHONE:

SAMPLE CONDITION WHEN RECEIVED:

Undelpu Double of benjeve bound 10 mailly or titel BTEX exceeds Strally

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							Midland, Tex	Spring St.								15 (Ext. to C35)	PAH 8270 BCBA Metals & As Ba Cri Cr Dh Hr So	Cd Vr Pd Hg Se									TDS			
CLIENT NAM	1E:						SITE MANAGE			8				ATIVE		TX1005	100	aa C			/624	0/625			ŀ		됨		Ì	
COG PROJECT N	<u> </u>		_	- DE	201	ECT	NAME:	Varez	**************************************	- BI	-		ETH	עט	4	ام	A	As		es	8260	827					tions			
114-640		4				_		on Water	Flood	S	€	1				S S	8	ls Ag	es	Volati	8240	i. Vol	809	١	ပ္ထ	(Air)	itos)			
LAB I.D. NUMBER	DAT 2012	E	TIME	V				E IDENTIFICATION		NUMBER OF CONTAINERS	FILTERED (Y/N)	HNO3	ICE	NONE	BTEX 8021E	TAN 8015 MOD.	PAH 8270 BCBA Metal	TCLP Metals Ag As Ba	TCLP Volatiles	TCLP Semi Volatiles	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080,	Pest. Bus/608	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos) Major Anions/Cations, pH, TDS			
018	4/2	\Box		5		X	AH-2 0.5	BEB (5-1'	1			X		Х	Τ.								1	f_			П		
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39 /M	A	TEN F					REMARKS:																							

Report Date: June 15, 2012 Work Order: 12060828 Page Number: 1 of 5

Summary Report

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

Report Date: June 15, 2012

Work Order: 12060828

Project Location: - Eddy Co., NM

Project Name: COG/Jenkins B Federal Water Flood

Project Number: 114-6401364

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
300502	BH-1 @ AH-1 (6 in. BEB) 0-1'	soil	2012-06-06	00:00	2012-06-08
300503	BH-1 @ AH-1 (6 in. BEB) 2-3'	soil	2012-06-06	00:00	2012-06-08
300504	BH-1 @ AH-1 (6 in. BEB) 4-5'	soil	2012-06-06	00:00	2012-06-08
300505	BH-1 @ AH-1 (6 in. BEB) 6-7'	soil	2012-06-06	00:00	2012-06-08
300506	BH-1 @ AH-1 (6 in. BEB) 9-10'	soil	2012-06-06	00:00	2012-06-08
300507	BH-1 @ AH-1 (6 in. BEB) 14-15'	soil	2012-06-06	00:00	2012-06-08
300508	BH-1 @ AH-1 (6 in. BEB) 19-20'	soil	2012-06-06	00:00	2012-06-08
300509	BH-1 @ AH-1 (6 in. BEB) 24-25'	soil.	2012-06-06	00:00	2012-06-08
300510	BH-1 @ AH-1 (6 in. BEB) 29-30'	soil	2012-06-06	00:00	2012-06-08
300511	BH-1 @ AH-1 (6 in. BEB) 39-40'	soil	2012-06-06	00:00	2012-06-08
300512	BH-1 @ AH-1 (6 in. BEB) 49-50'	soil	2012-06-06	00:00	2012-06-08
300513	BH-1 @ AH-1 (6 in. BEB) 59-60'	soil	2012-06-06	00:00	2012-06-08
300514	BH-1 @ AH-1 (6 in. BEB) 69-70'	soil	2012-06-06	00:00	2012-06-08
300515	BH-1 @ AH-1 (6 in. BEB) 79-80'	soil	2012-06-06	00:00	2012-06-08
300516	BH-2 @ AH-3 (6 in. BEB) 0-1'	soil	2012-06-06	00:00	2012-06-08
300517	BH-2 @ AH-3 (6 in. BEB) 2-3'	soil	2012-06-06	00:00	2012-06-08
300518	BH-2 @ AH-3 (6 in. BEB) 4-5'	soil	2012-06-06	00:00	2012-06-08
300519	BH-2 @ AH-3 (6 in. BEB) 6-7'	soil	2012-06-06	00:00	2012-06-08
300520	BH-2 @ AH-3 (6 in. BEB) 9-10'	soil	2012-06-06	00:00	2012-06-08
300521	BH-2 @ AH-3 (6 in. BEB) 14-15'	soil	2012-06-06	00:00	2012-06-08
300522	BH-2 @ AH-3 (6 in. BEB) 19-20'	soil	2012-06-06	00:00	2012-06-08
300523	BH-2 @ AH-3 (6 in. BEB) 24-25'	soil	2012-06-06	00:00	2012-06-08
300524	BH-2 @ AH-3 (6 in. BEB) 29-30'	soil	2012-06-06	00:00	2012-06-08
300525	BH-2 @ AH-3 (6 in. BEB) 39-40'	soil	2012-06-06	00:00	2012-06-08
300526	BH-2 @ AH-3 (6 in. BEB) 49-50'	soil	2012-06-06	00:00	2012-06-08
300527	BH-2 @ AH-3 (6 in. BEB) 59-60'	soil	2012-06-06	00:00	2012-06-08
300528	BH-2 @ AH-3 (6 in. BEB) 69-70'	soil	2012-06-06	00:00	2012-06-08
300529	BH-2 @ AH-3 (6 in. BEB) 79-80'	soil	2012-06-06	00:00	2012-06-08

Report D	Pate: June 15, 2012		Work Order: 12060828		Page Number: 2 of 5
Comple	300502 - BH-1 @	AU 1 (e :-	DED) 0.12		
_	300302 - DII-I @	•	· ·		
Param		Flag	Result	Units	RL
Chloride			1740	mg/Kg	4
Sample:	300503 - BH-1 @	AH-1 (6 in	n. BEB) 2-3'		
Param		Flag	Result	Units	RL
Chloride			3190	mg/Kg	4
Sample:	300504 - BH-1 @	AH-1 (6 in	n. BEB) 4-5'		
Param		Flag	Result	Units	RL
Chloride			780	mg/Kg	4
Param Chloride	300505 - BH-1 @	Flag	Result 1440	Units mg/Kg Units mg/Kg	RL 4
Sample:	300507 - BH-1 @	AH-1 (6 in	n. BEB) 14-15'		
Param		Flag	Result	Units	m RL
Chloride			5890	mg/Kg	4
Sample: Param Chloride	300508 - BH-1 @	AH-1 (6 in Flag	n. BEB) 19-20' Result 8650	Units mg/Kg	RL 4
Omoride			0000	mg/vg	4
Param	300509 - BH-1 @	AH-1 (6 ir Flag	Result	Units	RL
Chloride			7640	mg/Kg	4

Report Date: June 15, 2012	Work Order: 12060828	Page	Number: 3 of 5
Sample: 300510 - BH-1 @ AH-1 (6	5 in. BEB) 29-30'		
Param Flag	Result	Units	RL
Chloride	7190	mg/Kg	4
Sample: 300511 - BH-1 @ AH-1 (6	5 in. BEB) 39-40'		
Param Flag	Result	Units	RL
Chloride	14700	mg/Kg	4
Sample: 300512 - BH-1 @ AH-1 (6	6 in. BEB) 49-50'		
Param Flag	Result	Units	RL
Chloride	9100	mg/Kg	4
Sample: 300513 - BH-1 @ AH-1 (6 Param Flag Chloride	Result 12000	Units mg/Kg	RL 4
Sample: 300514 - BH-1 @ AH-1 (6) Param Flag Chloride	8 in. BEB) 69-70' Result 3800	Units mg/Kg	RL 4
. Sample: 300515 - BH-1 @ AH-1 (6 Param Flag Chloride	8 in. BEB) 79-80' Result 5550	Units mg/Kg	RL 4
Sample: 300516 - BH-2 @ AH-3 (6 Param Flag Chloride	Result 1730	Units mg/Kg	RL 4
Sample: 300517 - BH-2 @ AH-3 (6	3 in. BEB) 2-3'		
Param Flag	Result	Units	RL
Chloride	1180	mg/Kg	4

Report Date: June 15, 2012	Work Order: 12060828	Pag	e Number: 4 of 5
Sample: 300518 - BH-2 @ AH-3	(6 in. BEB) 4-5'		
Param Flag	Result	Units	RL
Chloride	2830	mg/Kg	4
Sample: 300519 - BH-2 @ AH-3	(6 in. BEB) 6-7'		
Param Flag	Result	Units	RL
Chloride	3290	mg/Kg	4
Sample: 300520 - BH-2 @ AH-3	(6 in. BEB) 9-10'		
Param Flag	Result	Units	RL
Chloride	6230	mg/Kg	4
Sample: 300521 - BH-2 @ AH-3	(6 in. BEB) 14-15'		
Param Flag	Result	Units	RL
Chloride	6350	mg/Kg	4
Sample: 300522 - BH-2 @ AH-3	(6 in. BEB) 19-20'		
Param Flag	Result	Units	$_{ m RL}$
Chloride	6890	ıng/Kg	4
Sample: 300523 - BH-2 @ AH-3	(6 in. BEB) 24-25'		
Param Flag	Result	Units	RL
Chloride	4830	mg/Kg	4
Sample: 300524 - BH-2 @ AH-3		T T 1.	TO I
Param Flag Chloride	Result 6870	Units mg/Kg	$\frac{\text{RL}}{4}$
Cinoride	0870	nig/ Ng	4
Sample: 300525 - BH-2 @ AH-3	(6 in. BEB) 39-40'		
Param Flag	Result	Units	RL
Chloride	7860	mg/Kg	4

Work Order: 12060828 Report Date: June 15, 2012 Page Number: 5 of 5 Sample: 300526 - BH-2 @ AH-3 (6 in. BEB) 49-50' Param Result Units RLChloride 5840 mg/Kg 4 Sample: 300527 - BH-2 @ AH-3 (6 in. BEB) 59-60' Param Flag Result Units RLChloride 8290 mg/Kg 4 Sample: 300528 - BH-2 @ AH-3 (6 in. BEB) 69-70' Flag Units RLParam Result Chloride 4680 mg/Kg 4 Sample: 300529 - BH-2 @ AH-3 (6 in. BEB) 79-80' Flag Result Param Units RLChloride 4420 mg/Kg



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., 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 806 - 794 - 1298 FAX 915 - 585 - 4944. FAX 432 - 689 - 6313

Carroliton, Texas 75006 972-242-7750 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

NCTRCA DBE **NELAP** DoDLELAP Oklahoma ISO 17025 WBE HUB Kansas

Analytical and Quality Control Report

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

Report Date: June 15, 2012

Work Order: 12060828

Project Location: Eddy Co., NM

Project Name:

COG/Jenkins B Federal Water Flood

Project Number: 114-6401364

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

			Date	${f Time}$	Date
Sample	Description	Matrix	Taken	Taken	Received
300502	BH-1 @ AH-1 (6 in. BEB) 0-1'	soil	2012-06-06	00:00	2012-06-08
300503	BH-1 @ AH-1 (6 in. BEB) 2-3'	soil	2012-06-06	00:00	2012-06-08
300504	BH-1 @ AH-1 (6 in. BEB) 4-5'	soil	2012-06-06	00:00	2012-06-08
300505	BH-1 @ AH-1 (6 in. BEB) 6-7'	soil	2012-06-06	00:00	2012-06-08
300506	BH-1 @ AH-1 (6 in. BEB) 9-10'	soil	2012-06-06	00:00	2012-06-08
300507	BH-1 @ AH-1 (6 in. BEB) 14-15'	soil	2012-06-06	00:00	2012-06-08
300508	BH-1 @ AH-1 (6 in. BEB) 19-20'	soil	2012-06-06	00:00	2012-06-08
300509	BH-1 @ AH-1 (6 in. BEB) 24-25'	soil	2012-06-06	00:00	2012-06-08
300510	BH-1 @ AH-1 (6 in. BEB) 29-30'	soil	2012-06-06	00:00	2012-06-08
300511	BH-1 @ AH-1 (6 in. BEB) 39-40'	soil	2012-06-06	00:00	2012-06-08
300512	BH-1 @ AH-1 (6 in. BEB) 49-50'	soil	2012-06-06	00:00	2012-06-08
300513	BH-1 @ AH-1 (6 in. BEB) 59-60'	soil	2012-06-06	00:00	2012-06-08
300514	BH-1 @ AH-1 (6 in. BEB) 69-70'	soil	2012-06-06	00:00	2012-06-08
300515	BH-1 @ AH-1 (6 in. BEB) 79-80'	soil	2012-06-06	00:00	2012-06-08
300516	BH-2 @ AH-3 (6 in. BEB) 0-1'	soil	2012-06-06	00:00	2012-06-08
300517	BH-2 @ AH-3 (6 in. BEB) 2-3'	soil	2012-06-06	00:00	2012-06-08
300518	BH-2 @ AH-3 (6 in. BEB) 4-5'	soil	2012-06-06	00:00	2012-06-08
300519	BH-2 @ AH-3 (6 in. BEB) 6-7'	soil	2012-06-06	00:00	2012-06-08

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
300520	BH-2 @ AH-3 (6 in. BEB) 9-10'	soil	2012-06-06	00:00	2012-06-08
300521	BH-2 @ AH-3 (6 in. BEB) 14-15'	soil	2012-06-06	00:00	2012-06-08
300522	BH-2 @ AH-3 (6 in. BEB) 19-20'	soil	2012-06-06	00:00	2012-06-08
300523	BH-2 @ AH-3 (6 in. BEB) 24-25'	soil	2012-06-06	00:00	2012-06-08
300524	BH-2 @ AH-3 (6 in. BEB) 29-30'	soil	2012-06-06	00:00	2012-06-08
300525	BH-2 @ AH-3 (6 in. BEB) 39-40'	soil	2012-06-06	00:00	2012-06-08
300526	BH-2 @ AH-3 (6 in. BEB) 49-50'	soil	2012-06-06	00:00	2012-06-08
300527	BH-2 @ AH-3 (6 in. BEB) 59-60'	soil	2012-06-06	00:00	2012-06-08
300528	BH-2 @ AH-3 (6 in. BEB) 69-70'	soil	2012-06-06	00:00	2012-06-08
300529	BH-2 @ AH-3 (6 in. BEB) 79-80'	soil	2012-06-06	00:00	2012-06-08

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

This report consists of a total of 23 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

Page 2 of 23

Report Contents

Case Narrative	5
Analytical Report	(
Sample 300502 (BH-1 @AH-1 (6 in. BEB) 0-1')	. (
Sample 300503 (BH-1 @AH-1 (6 in. BEB) 2-3')	. (
Sample 300504 (BH-1 @AH-1 (6 in. BEB) 4-5')	. (
Sample 300505 (BH-1 @AH-1 (6 in. BEB) 6-7')	. (
Sample 300506 (BH-1 @AH-1 (6 in. BEB) 9-10')	
Sample 300507 (BH-1 @AH-1 (6 in. BEB) 14-15')	
Sample 300508 (BH-1 @AH-1 (6 in. BEB) 19-20')	
Sample 300509 (BH-1 @AH-1 (6 in. BEB) 24-25')	. 8
Sample 300510 (BH-1 @AH-1 (6 in. BEB) 29-30')	. 8
Sample 300511 (BH-1 @AH-1 (6 in. BEB) 39-40')	
Sample 300512 (BH-1 @AH-1 (6 in. BEB) 49-50')	
Sample 300513 (BH-1 @AH-1 (6 in. BEB) 59-60')	
Sample 300514 (BH-1 @AH-1 (6 in. BEB) 69-70')	
Sample 300515 (BH-1 @AH-1 (6 in. BEB) 79-80')	
Sample 300516 (BH-2 @AH-3 (6 in. BEB) 0-1')	
Sample 300517 (BH-2 @AH-3 (6 in. BEB) 2-3')	
Sample 300518 (BH-2 @AH-3 (6 in. BEB) 4-5')	
Sample 300519 (BH-2 @AH-3 (6 in BEB) 6-7')	
Sample 300520 (BH-2 @AH-3 (6 in. BEB) 9-10')	
Sample 300521 (BH-2 @AH-3 (6 in. BEB) 14-15')	
Sample 300522 (BH-2 @AH-3 (6 in. BEB) 19-20')	
Sample 300523 (BH-2 @AH-3 (6 in. BEB) 24-25')	
Sample 300524 (BH-2 @AH-3 (6 in. BEB) 29-30')	
Sample 300525 (BH-2 @AH-3 (6 in. BEB) 39-40')	
Sample 300526 (BH-2 @AH-3 (6 in. BEB) 49-50')	
Sample 300527 (BH-2 @AH-3 (6 in. BEB) 59-60')	
Sample 300528 (BH-2 @AH-3 (6 in. BEB) 69-70')	
Sample 300529 (BH-2 @AH-3 (6 in. BEB) 79-80')	
Sumple 600020 (Bit 2 Sittle (6 Int. BBB) 1.5 60)	
Method Blanks	15
QC Batch 92103 - Method Blank (1)	. 15
QC Batch 92156 - Method Blank (1)	. 15
QC Batch 92157 - Method Blank (1)	
QC Batch 92158 - Method Blank (1)	. 15
Laboratory Control Spikes	17
QC Batch 92103 - LCS (1)	. 17
QC Batch 92156 - LCS (1)	. 17
QC Batch 92157 - LCS (1)	
QC Batch 92158 - LCS (1)	
QC Batch 92103 - MS (1)	
QC Batch 92156 - MS (1)	. 18
QC Batch 92157 - MS (1)	10

QC Batch 92158 - MS (1)	18
Calibration Standards	21
QC Batch 92103 - CCV (1)	21
QC Batch 92103 - CCV (2)	
QC Batch 92156 - CCV (1)	
QC Batch 92156 - CCV (2)	
QC Batch 92157 - CCV (1)	
QC Batch 92157 - CCV (2)	
QC Batch 92158 - CCV (1)	
QC Batch 92158 - CCV (2)	
Appendix	23
Report Definitions	23
Laboratory Certifications	23
Standard Flags	
Attachments	

Case Narrative

Samples for project COG/Jenkins B Federal Water Flood were received by TraceAnalysis, Inc. on 2012-06-08 and assigned to work order 12060828. Samples for work order 12060828 were received intact at a temperature of 3.5 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	78114	2012-06-12 at 09:13	92103	2012-06-13 at 16:02
Chloride (Titration)	SM 4500-Cl B	78114	2012-06-12 at 09:13	92156	2012-06-14 at 12:12
Chloride (Titration)	SM 4500-Cl B	78114	2012-06-12 at 09:13	92157	2012-06-14 at 12:13
Chloride (Titration)	SM 4500-Cl B	78114	2012-06-12 at 09:13	92158	2012-06-14 at 12:14

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 12060828 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 6 of 23 Eddy Co., NM

Analytical Report

Sample: 300502 - BH-1 @ AH-1 (6 in. BEB) 0-1'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92103

Date Analyzed:

Cert

2012-06-13

Analyzed By: AR. AR.

Prep Batch: 78114

Sample Preparation:

2012-06-12

Prepared By:

RL

Parameter Chloride

Flag

Result 1740

Units mg/Kg Dilution 10

RL4.00

Sample: 300503 - BH-1 @ AH-1 (6 in. BEB) 2-3'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92103

Date Analyzed:

2012-06-13

AR. Analyzed By:

Prep Batch: 78114

Sample Preparation:

2012-06-12

Prepared By: AR.

рT

			1 (.1.)	
Parameter	Flag	Cert	Result	Ţ
Chloride			3190	me

Units mg/Kg Dilution RL10 4.00

Sample: 300504 - BH-1 @ AH-1 (6 in. BEB) 4-5'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92103

Date Analyzed: Sample Preparation:

2012-06-13

Analyzed By: AR. AR.

Prep Batch:

78114

2012-06-12

Prepared By:

RL

Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			780	mg/Kg	5	4.00

114-6401364

Work Order: 12060828

COG/Jenkins B Federal Water Flood

Page Number: 7 of 23

Eddy Co., NM

Sample: 300505 - BH-1 @ AH-1 (6 in. BEB) 6-7'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

92103 78114

Date Analyzed:

2012-06-13

Analyzed By: AR.

Sample Preparation: 2012-06-12 Prepared By: AR

RL

Parameter Flag Result

Cert Units Dilution RLChloride 1440 mg/Kg 4.00 10

Sample: 300506 - BH-1 @ AH-1 (6 in. BEB) 9-10'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92103 78114 Date Analyzed:

2012-06-13

Analyzed By:

AR.

Prep Batch:

Sample Preparation:

2012-06-12

Prepared By:

AR.

RL

Parameter Cert Flag Result Units Dilution RLChloride 2570mg/Kg 10 4.00

Sample: 300507 - BH-1 @ AH-1 (6 in. BEB) 14-15'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

Parameter

Chloride

92103

Date Analyzed:

2012-06-13

Analyzed By:

AR

Prep Batch: 78114

Sample Preparation:

2012-06-12

Prepared By:

AR

Cert Flag

RLResult 5890 Units

mg/Kg

10

Dilution

RL

4.00

Sample: 300508 - BH-1 @ AH-1 (6 in. BEB) 19-20'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method:

92156

Date Analyzed:

2012-06-14

Analyzed By:

N/AAR.

QC Batch: Prep Batch: 78114

Sample Preparation:

2012-06-12

Prepared By:

AR.

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 8 of 23 Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	${ m Units}$	Dilution	RL
Chloride			8650	${ m mg/Kg}$	10	4.00

Sample: 300509 - BH-1 @ AH-1 (6 in. BEB) 24-25'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 92156

Analytical Method:

Date Analyzed:

SM 4500-Cl B

Prep Method: N/AAnalyzed By: AR

Prep Batch: 78114

2012-06-14 Sample Preparation: 2012-06-12

Prepared By: AR

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			7640	mg/Kg	10	4.00

Sample: 300510 - BH-1 @ AH-1 (6 in. BEB) 29-30'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 92156 Prep Batch: 78114

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-06-14 Sample Preparation: 2012-06-12

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

AR.

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			7190	mg/Kg	10	4.00

Sample: 300511 - BH-1 @ AH-1 (6 in. BEB) 39-40'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 92156Prep Batch: 78114

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-06-14 2012-06-12

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

RLParameter Flag Cert Result Units Dilution RLChloride 14700 mg/Kg 10 4.00

114-6401364

Work Order: 12060828

COG/Jenkins B Federal Water Flood

Page Number: 9 of 23

Eddy Co., NM

Sample: 300512 - BH-1 @ AH-1 (6 in. BEB) 49-50'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92156

Date Analyzed:

2012-06-14

Analyzed By:

AR

Prep Batch: 78114 Sample Preparation:

2012-06-12

Prepared By:

AR.

RL

Parameter Chloride

Cert

Result 9100

Units mg/Kg Dilution 10

RL4.00

Sample: 300513 - BH-1 @ AH-1 (6 in. BEB) 59-60'

Flag

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92156

Date Analyzed: Sample Preparation:

2012-06-14 2012-06-12

Analyzed By: Prepared By:

AR.

Prep Batch: 78114

RL

AR.

Parameter

Chloride

Flag

Cert

Result 12000

Units mg/Kg Dilution

10

RL

4.00

Sample: 300514 - BH-1 @ AH-1 (6 in. BEB) 69-70'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92156

Date Analyzed:

Cert

2012-06-14

AR

Prep Batch:

78114

Sample Preparation:

2012-06-12

Analyzed By: Prepared By:

AR.

RL

Parameter Flag Chloride

Result 3800

Units mg/Kg

10

Dilution

RL4.00

Sample: 300515 - BH-1 @ AH-1 (6 in. BEB) 79-80'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: Analyzed By:

AR.

N/A

QC Batch: 92156 Prep Batch: 78114 Date Analyzed:

2012-06-14 Sample Preparation: 2012-06-12

Prepared By:

AR

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 10 of 23

Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			5550	mg/Kg	10	4.00

Sample: 300516 - BH-2 @ AH-3 (6 in. BEB) 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration) Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

92156 78114

Date Analyzed: Sample Preparation: 2012-06-14 2012-06-12 Analyzed By: ARPrepared By: AR

RLParameter Flag Cert Result Units Dilution RLChloride 1730 4.00 mg/Kg 10

Sample: 300517 - BH-2 @ AH-3 (6 in. BEB) 2-3'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92156

Date Analyzed:

2012-06-14 2012-06-12 Analyzed By: AR.

Prep Batch: 78114 Sample Preparation:

Prepared By: AR

RLParameter Flag Cert Result Units Dilution RLChloride 1180 mg/Kg 10 4.00

Sample: 300518 - BH-2 @ AH-3 (6 in. BEB) 4-5'

Laboratory:

Midland

Analysis: QC Batch:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By: AR

92157 Prep Batch: 78114 Date Analyzed: Sample Preparation:

2012-06-14 2012-06-12

Prepared By: AR

RLParameter Flag Cert Result Dilution Units RLChloride 2830 mg/Kg 10 4.00

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 11 of 23

Eddy Co., NM

Sample: 300519 - BH-2 @ AH-3 (6 in. BEB) 6-7'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92157

Date Analyzed:

2012-06-14

Analyzed By:

ARAR.

Prep Batch:

78114

Sample Preparation:

2012-06-12

Prepared By:

RL

Parameter Chloride

Flag Cert Result 3290

Units mg/Kg Dilution 10

RL4.00

Sample: 300520 - BH-2 @ AH-3 (6 in. BEB) 9-10'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method:

N/A

QC Batch:

Parameter

Chloride

92157

Date Analyzed: Sample Preparation:

Cert

2012-06-14 2012-06-12 Analyzed By:

AR.

Prep Batch: 78114

Units

mg/Kg

Prepared By:

AR.

Flag

RLResult

6230

Dilution

10

RL

4.00

Sample: 300521 - BH-2 @ AH-3 (6 in. BEB) 14-15'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method:

N/A

QC Batch: Prep Batch:

Chloride

92157 78114

Date Analyzed:

2012-06-14 2012-06-12 Analyzed By:

ARAR.

Sample Preparation:

Cert

Prepared By:

Parameter Flag RL

Result 6350 Units

mg/Kg

10

Dilution

RL

4.00

Sample: 300522 - BH-2 @ AH-3 (6 in. BEB) 19-20'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

92157

Date Analyzed:

2012-06-14

Analyzed By:

Prep Batch:

78114

Sample Preparation:

2012-06-12

ARPrepared By: AR

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 12 of 23

Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			6890	mg/Kg	10	4.00

Sample: 300523 - BH-2 @ AH-3 (6 in. BEB) 24-25'

Laboratory:

Midland

Analysis: QC Batch: Prep Batch:

Chloride (Titration)

92157 78114 Analytical Method:

Date Analyzed: Sample Preparation:

SM 4500-Cl B 2012-06-14 2012-06-12

Prep Method: Analyzed By:

Dilution

10

N/A ARPrepared By: AR

RL

4.00

RLParameter Cert Result Units Flag Chloride 4830 mg/Kg

Sample: 300524 - BH-2 @ AH-3 (6 in. BEB) 29-30'

Laboratory:

Midland

Analysis: QC Batch: Prep Batch:

Chloride (Titration)

92157 78114 Analytical Method:

SM 4500-Cl B Date Analyzed: 2012-06-14 Sample Preparation: 2012-06-12

Prep Method: N/A Analyzed By: AR.

Prepared By: AR

RLParameter Flag Cert Result Units Dilution RL6870 Chloride mg/Kg 10 4.00

Sample: 300525 - BH-2 @ AH-3 (6 in. BEB) 39-40'

Laboratory:

Midland

Analysis: QC Batch: Prep Batch:

Chloride (Titration) 92157 78114

Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2012-06-14 2012-06-12

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

RLParameter Cert Result Units Dilution Flag RLChloride 7860 mg/Kg 10 4.00

114-6401364 COG/Jenkins B Federal Water Flood Page Number: 13 of 23

Eddy Co., NM

Sample: 300526 - BH-2 @ AH-3 (6 in. BEB) 49-50'

Laboratory: Midland

Chloride (Titration) Analysis:

QC Batch: 92157 Prep Batch: 78114 Analytical Method:

SM 4500-Cl B Date Analyzed: 2012-06-14 Sample Preparation: 2012-06-12

Work Order: 12060828

Prep Method: N/A Analyzed By:

AR. Prepared By: AR

RL

Parameter Flag Cert Result Units Dilution RLChloride 5840 mg/Kg 10 4.00

Sample: 300527 - BH-2 @ AH-3 (6 in. BEB) 59-60'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 92157 Prep Batch: 78114 Analytical Method:

SM 4500-Cl B Date Analyzed: 2012-06-14 Sample Preparation: 2012-06-12

Prep Method: N/A

Dilution

10

Analyzed By: AR.

RL

4.00

AR

Prepared By: AR.

RLCert Parameter Flag Result Chloride 8290

Sample: 300528 - BH-2 @ AH-3 (6 in. BEB) 69-70'

Laboratory: Midland

Analysis: Chloride (Titration) QC Batch: 92158 Prep Batch: 78114

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-06-14

Units

mg/Kg

Prep Method: N/A Analyzed By: AR

Prepared By:

Sample Preparation: 2012-06-12

RL

Parameter Cert Flag Result Units Dilution RLChloride 4680 mg/Kg 10 4.00

Sample: 300529 - BH-2 @ AH-3 (6 in. BEB) 79-80'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 92158Prep Batch: 78114

Analytical Method: Date Analyzed:

SM 4500-Cl B 2012-06-14

Prep Method: N/A Analyzed By: AR.

Sample Preparation: 2012-06-12 Prepared By: AR Report Date: June 15, 2012 114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 14 of 23 Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			4420	mg/Kg	10	4.00

Report Date: June 15, 2012 114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood

Page Number: 15 of 23 Eddy Co., NM

Method Blanks

Method Blank (1)

QC Batch: 92103

QC Batch: 92103 Prep Batch: 78114 Date Analyzed:

2012-06-13

Analyzed By: AR.

QC Preparation:

2012-06-12

Prepared By: AR

MDL

RLFlag Cert Units Parameter Result Chloride < 3.85 mg/Kg

Method Blank (1)

QC Batch: 92156

QC Batch: 92156 Date Analyzed:

2012-06-14

Analyzed By: AR

Prep Batch: 78114

QC Preparation: 2012-06-12 Prepared By: AR.

MDL

Parameter Flag Cert Result Units RLChloride <3.85 mg/Kg

Method Blank (1)

QC Batch: 92157

QC Batch:

92157

Date Analyzed:

2012-06-14

Analyzed By: AR

Prep Batch: 78114

QC Preparation:

2012-06-12

Prepared By: AR.

MDL

Parameter RLFlag Cert Result Units Chloride < 3.85mg/Kg

Method Blank (1)

QC Batch: 92158

QC Batch: 92158 Prep Batch: 78114 Date Analyzed: 2012-06-14 QC Preparation: 2012-06-12

Analyzed By: AR

Prepared By: AR. Report Date: June 15, 2012 114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 16 of 23 Eddy Co., NM

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

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 17 of 23 Eddy Co., NM

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch:

92103

Date Analyzed:

2012-06-13

Analyzed By: AR.

Prep Batch: 78114

QC Preparation: 2012-06-12

Prepared By: AR.

			LCS			Spike	Matrix		Rec.
Param	F	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			2540	mg/Kg	1	2500	< 3.85	102	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{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2680	mg/Kg	1	2500	< 3.85	107	85 - 115	5	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:

92156

Date Analyzed:

2012-06-14

Analyzed By: AR

Prep Batch: 78114

QC Preparation: 2012-06-12

Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
Chloride			2460	mg/Kg	1	2500	< 3.85	98	85 - 115

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.	\mathbf{Limit}	RPD	Limit
Chloride			2570	mg/Kg	1	2500	< 3.85	103	85 - 115	4	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:

92157

Date Analyzed:

2012-06-14

QC Preparation: 2012-06-12

Analyzed By: AR Prepared By: AR

Prep Batch: 78114

Report Date: June 15, 2012 114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 18 of 23 Eddy Co., NM

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
Chloride			2460	mg/Kg	1	2500	< 3.85	98	85 - 115

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

			LCSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2570	mg/Kg	1	2500	< 3.85	103	85 - 115	4	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: 92158 Date Analyzed: 2012-06-14 Analyzed By: ARPrepared By: AR

Prep Batch: 78114

Param

Chloride

QC Preparation: 2012-06-12

Dil.

Units

Spike

Amount

2500

<3.85

Matrix Rec. Result Rec. Limit

85 - 115

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

 \mathbf{C}

 \mathbf{F}

LCS

Result

2440

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2550	mg/Kg	1	2500	< 3.85	102	85 - 115	4	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: 300507

QC Batch: 92103Prep Batch: 78114

Date Analyzed: 2012-06-13 QC Preparation: 2012-06-12

Analyzed By: AR. Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	_		8570	mg/Kg	10	2500	5890	107	79.4 - 120.6

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

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}	RPD	Limit
Chloride			8330	mg/Kg	10	2500	5890	98	79.4 - 120.6	3	20

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

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 19 of 23

Eddy Co., NM

Matrix Spike (MS-1)

Spiked Sample: 300517

QC Batch:

92156

Date Analyzed:

2012-06-14

Analyzed By: AR.

Prep Batch: 78114

QC Preparation: 2012-06-12

Prepared By: AR.

Param
Chloride

MS F \mathbf{C} Result 3680

Units Dil. mg/Kg 10

Matrix Result 1180

Rec. Limit 79.4 - 120.6

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

Param	
<u> </u>	

MSD Result

Spike Dil.

Spike

Amount

2500

Rec. Limit

Rec.

100

RPD

Matrix \mathbf{F} С Units Amount Result Rec. **RPD** Limit 79.4 - 120.6 Chloride 3880 mg/Kg 10 2500 1180108 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: 300527

QC Batch:

92157

Date Analyzed:

2012-06-14

Analyzed By: AR

Prep Batch: 78114

Prepared By:

QC Preparation:

2012-06-12

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$
Chloride			11000	mg/Kg	10	2500	8290	108	79.4 - 120.6

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	\mathbf{Limit}
Chloride			11100	mg/Kg	10	2500	8290	112	79.4 - 120.6	1	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: 300538

QC Batch:

92158

Date Analyzed:

2012-06-14

Analyzed By: AR.

Prep Batch: 78114

QC Preparation:

2012-06-12

Prepared By:

			MS			Spike	Matrix		Rec.
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}
Chloride			3640	mg/Kg	10	2500	1230	96	79.4 - 120.6

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

114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 20 of 23

Eddy Co., NM

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
Chloride			3900	mg/Kg	10	2500	1230	107	79.4 - 120.6	7	20

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

Report Date: June 15, 2012 114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 21 of 23 Eddy Co., NM

Calibration Standards

Standard (CO	-٧ز	L)
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QC Batch: 92103

Date Analyzed: 2012-06-13

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	99.8	100	85 - 115	2012-06-13

Standard (CCV-2)

QC Batch: 92103

Date Analyzed: 2012-06-13

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	100	100	85 - 115	2012-06-13

Standard (CCV-1)

QC Batch: 92156

Date Analyzed: 2012-06-14

Analyzed By: AR.

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	${ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2012-06-14

Standard (CCV-2)

QC Batch: 92156

Date Analyzed: 2012-06-14

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	98.9	99	85 - 115	2012-06-14

Page Number: 22 of 23 114-6401364 COG/Jenkins B Federal Water Flood Eddy Co., NM Standard (CCV-1) QC Batch: 92157 Date Analyzed: 2012-06-14 Analyzed By: AR. **CCVs CCVs CCVs** Percent True Found Percent Recovery Date Param Flag Cert Units Conc. Conc. Limits Analyzed Recovery Chloride mg/Kg 100 101 101 85 - 115 2012-06-14 Standard (CCV-2) QC Batch: 92157 Date Analyzed: 2012-06-14 Analyzed By: AR. **CCVs** CCVs**CCVs** Percent True Found Percent Recovery Date Param Flag Cert Units Conc. Conc. Recovery Limits Analyzed Chloride 100 mg/Kg 98.9 99 85 - 115 2012-06-14 Standard (CCV-1) QC Batch: 92158 Date Analyzed: 2012-06-14 Analyzed By: AR CCVs**CCVs** CCVsPercent True Found Percent Recovery Date Param Flag Cert Units Conc. Analyzed Conc. Recovery Limits Chloride mg/Kg 100 100 85 - 115 2012-06-14 100 Standard (CCV-2)

Date Analyzed:

Units

mg/Kg

CCVs

True

Conc.

100

2012-06-14

CCVs

Found

Conc.

100

CCVs

Percent

Recovery

100

Analyzed By: AR.

Date

Analyzed

2012-06-14

Percent

Recovery

Limits

85 - 115

Work Order: 12060828

Report Date: June 15, 2012

QC Batch: 92158

Flag

Cert

Param

Chloride

Report Date: June 15, 2012 114-6401364

Work Order: 12060828 COG/Jenkins B Federal Water Flood Page Number: 23 of 23 Eddy Co., NM

Appendix

Report Definitions

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

Laboratory Certifications

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

Standard Flags

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

Attachments

The scanned attachments will follow this page.

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

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Page Number: 1 of 3 Report Date: June 28, 2013 Work Order: 13061821

Summary Report

Ike Tavarez Tetra Tech

1910 N. Big Spring Street Midland, TX 79705

Report Date: June 28, 2013

Work Order: 13061821

Project Location: Eddy Co., NM

Project Name:

COG/Jenkins B Federal Water Flood

Project Number: 114-6401364

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
332532	SB-1 @ AH-1 0-1'	soil	2013-06-12	00:00	2013-06-18
332533	SB-1 @ AH-1 2-3'	soil	2013-06-12	00:00	2013-06-18
332534	SB-1 @ AH-1 4-5'	soil	2013-06-12	00:00	2013-06-18
332535	SB-1 @ AH-1 6-7'	soil	2013-06-12	00:00	2013-06-18
332536	SB-1 @ AH-1 9-10'	soil	2013-06-12	00:00	2013-06-18
332537	SB-1 @ AH-1 19-20'	soil	2013-06-12	00:00	2013-06-18
332538	SB-1 @ AH-1 39-40'	soil	2013-06-12	00:00	2013-06-18
332539	SB-1 @ AH-1 59-60'	soil	2013-06-13	00:00	2013-06-18
332540	SB-1 @ AH-1 79-80'	soil	2013-06-13	00:00	2013-06-18
332541	SB-1 @ AH-1 89-90'	soil	2013-06-13	00:00	2013-06-18
332542	SB-1 @ AH-1 99-100'	soil	2013-06-14	00:00	2013-06-18
332543	SB-1 @ AH-1 104-105'	soil	2013-06-14	00:00	2013-06-18

			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)
332532 - SB-1 @ AH-1 0-1'	<1.00 Qs	59.8 Qs	94.8	165	8530 Qs	4900
332533 - SB-1 @ AH-1 2-3'	< 0.0200	< 0.0200	< 0.0200	<0.0200 Qc	$< 50.0 \mathrm{Qs}$	< 4.00

Sample: 332532 - SB-1 @ AH-1 0-1'

Param	Flag	Result	${ m Units}$	RL
Chloride		2240	${ m mg/Kg}$	4

Sample: 332533 - SB-1 @ AH-1 2-3'

Report Date: June 28, 2013	Work Order: 13061821	Page	Number: 2 of 3
Param Flag	Result	Units	RL
Chloride	11700	mg/Kg	4
Sample: 332534 - SB-1 @ AH-1	4-5'		
Param Flag	Result	Units	RL
Chloride	5130	mg/Kg	4
Sample: 332535 - SB-1 @ AH-1	6-7'		
Param Flag	Result	Units	RL
Chloride	1220	mg/Kg	4
Sample: 332536 - SB-1 @ AH-1	9-10'		
Param Flag	Result	Units	m RL
Chloride	7920	mg/Kg	4
Sample: 332537 - SB-1 @ AH-1	19-20'		
Param Flag	Result	Units	RL
Chloride	9460	mg/Kg	4
Sample: 332538 - SB-1 @ AH-1	39-40'		
Param Flag	Result	Units	RL
Chloride	12000	mg/Kg	4
Sample: 332539 - SB-1 @ AH-1	59-60'		
Param Flag	Result	Units	RL
Chloride	2440	mg/Kg	4
Sample: 332540 - SB-1 @ AH-1	79-80'		
Param Flag	Result	Units	RL
Chloride	6150	mg/Kg	4

Report Date: June 28, 2013 Work Order: 13061821 Page Number: 3 of 3 Sample: 332541 - SB-1 @ AH-1 89-90' RLParam Flag Result Units Chloride 2000 mg/Kg Sample: 332542 - SB-1 @ AH-1 99-100' Param Result Units RLFlag 1060 Chloride mg/Kg Sample: 332543 - SB-1 @ AH-1 104-105' RLUnits Param Flag Result Chloride 92.54 mg/Kg



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E

5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Texas:79424 Lubbock. El Paso, Texas 79922 Texas 79703 Midland. Carroldon, Texas 75006 800-378-1296

806 - 794 - 1296 915-585-3443 432 - 689 - 6301

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Certifications

NELAP DoD LELAP Oklahoma ISO 17025 DBE Kansas WBE HUB NCTRCA

Analytical and Quality Control Report

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

Report Date:

June 28, 2013

Work Order:

13061821

Project Location: Eddy Co., NM

Project Name:

COG/Jenkins B Federal Water Flood

Project Number: 114-6401364

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

			Date	${f Time}$	Date
\mathbf{Sample}	Description	Matrix	Taken	Taken	Received
332532	SB-1 @ AH-1 0-1'	soil	2013-06-12	00:00	2013-06-18
332533	SB-1 @ AH-1 2-3'	soil	2013-06-12	00:00	2013-06-18
332534	SB-1 @ AH-1 4-5'	soil	2013-06-12	00:00	2013-06-18
332535	SB-1 @ AH-1 6-7'	soil	2013-06-12	00:00	2013-06-18
332536	SB-1 @ AH-1 9-10'	soil	2013-06-12	00:00	2013-06-18
332537	SB-1 @ AH-1 19-20'	soil	2013-06-12	00:00	2013-06-18
332538	SB-1 @ AH-1 39-40'	soil	2013-06-12	00:00	2013-06-18
332539	SB-1 @ AH-1 59-60'	soil	2013-06-13	00:00	2013-06-18
332540	SB-1 @ AH-1 79-80'	soil	2013-06-13	00:00	2013-06-18
332541	SB-1 @ AH-1 89-90'	soil	2013-06-13	00:00	2013-06-18
332542	SB-1 @ AH-1 99-100'	soil	2013-06-14	00:00	2013-06-18
332543	SB-1 @ AH-1 104-105'	soil	2013-06-14	00:00	2013-06-18

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

This report consists of a total of 28 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Muhar April

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

Report Contents

Sample 332533 (SB-1 @AH-1 2-3') 18	Uase Narrative	Ę
Sample 332533 (SB-1 @AH-1 2-3') 7	Analytical Report	6
Sample 332533 (SB-1 @AH-1 2-3') 5	Sample 332532 (SB-1 @AH-1 0-1')	(
Sample 332534 (SB-1 @AH-1 4-5') 5 Sample 332535 (SB-1 @AH-1 19-20') 5 Sample 332537 (SB-1 @AH-1 19-20') 5 Sample 332537 (SB-1 @AH-1 19-20') 5 Sample 332538 (SB-1 @AH-1 19-20') 10 Sample 332539 (SB-1 @AH-1 39-40') 10 Sample 332539 (SB-1 @AH-1 79-80') 10 Sample 332540 (SB-1 @AH-1 79-80') 10 Sample 332542 (SB-1 @AH-1 79-80') 10 Sample 332542 (SB-1 @AH-1 99-100') 11 Sample 332543 (SB-1 @AH-1 104-105') 11 Sample 332543 (SB-1 @AH-1 104-105') 11 Sample 332544 (SB-1 @AH-1 104-105') 12 QC Batch 102539 - Method Blank (1) 12 QC Batch 102540 - Method Blank (1) 12 QC Batch 102559 - Method Blank (1) 12 QC Batch 102559 - Method Blank (1) 13 QC Batch 102555 - Method Blank (1) 13 QC Batch 102555 - Method Blank (1) 13 QC Batch 102559 - Method Blank (1) 13 QC Batch 102540 - Method Blank (1) 13 QC Batch 102555 - LCS (1) 15 QC Batch 102555 - LCS (1) 15 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102556 - LCS (1) 17 QC Batch 102556 - LCS (1) 17 QC Batch 102556 - LCS (1) 19 QC Batch 102556 - LCS (1) 20 QC Batch 102559 - CCV (1) 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (1) 23 QC Batch 102540 - CCV (1) 23		
Sample 332535 (SB-1 @AH-1 6-7') 9 Sample 332537 (SB-1 @AH-1 9-10') 9 Sample 332538 (SB-1 @AH-1 39-40') 10 Sample 332538 (SB-1 @AH-1 39-40') 10 Sample 332538 (SB-1 @AH-1 39-40') 10 Sample 332540 (SB-1 @AH-1 89-90') 10 Sample 332541 (SB-1 @AH-1 89-90') 11 Sample 332542 (SB-1 @AH-1 89-90') 11 Sample 332542 (SB-1 @AH-1 99-100') 11 Sample 332543 (SB-1 @AH-1 199-100') 11 Sample 332543 (SB-1 @AH-1 199-100') 11 Sample 332544 (SB-1 @AH-1 199-100') 11 Sample 332542 (SB-1 @AH-1 199-100') 11 Sample 332542 (SB-1 @AH-1 199-100') 11 Sample 332543 (SB-1 @AH-1 109-100') 11 QC Batch 102549 - Method Blank (1) 12 QC Batch 102540 - Method Blank (1) 12 QC Batch 102555 - Method Blank (1) 12 QC Batch 102555 - Method Blank (1) 12 QC Batch 102642 - Method Blank (1) 13 QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102555 - LCS (1) 15 QC Batch 102549 - LCS (1) 15 QC Batch 102555 - LCS (1) 16 QC Batch 102555 - LCS (1) 17 QC Batch 102564 - LCS (1) 17 QC Batch 102565 - LCS (1) 19 QC Batch 102565 - LCS (1) 20 QC Batch 10256		
Sample 332536 (SB-1 @AH-1 9-10') 95		
Sample 332537 (SB-1 @AH-1 19-20')		
Sample 332538 (SB-1 @AH-1 39-40') 16 Sample 332549 (SB-1 @AH-1 59-60') 16 Sample 332540 (SB-1 @AH-1 99-80') 16 Sample 332541 (SB-1 @AH-1 99-100') 17 Sample 332542 (SB-1 @AH-1 104-105') 17 Sample 332543 (SB-1 @AH-1 104-105') 17 Method Blanks		
Sample 332549 (SB-1 @AH-1 59-60') 16 Sample 332540 (SB-1 @AH-1 79-80') 16 Sample 332541 (SB-1 @AH-1 89-90') 16 Sample 332542 (SB-1 @AH-1 89-90') 17 Sample 332543 (SB-1 @AH-1 104-105') 17 Sample 332543 (SB-1 @AH-1 104-105') 18 Sample 332543 (SB-1 @AH-1 104-105') 18 Sample 332543 (SB-1 @AH-1 104-105') 19 Sample 332543 (SB-1 @AH-1 102-105') 19 Sample 332543 (SB-1 @AH-1 102-105') 19 Sample 332543 (SB-1 @AH-1 102-105') 19 Sample 332543 (SB-1 102-105') 19 Sample 32555 (SB-1 102-105') 19 Sa		
Sample 332540 (SB-1 @AH-1 79-80') 16 Sample 332541 (SB-1 @AH-1 89-90') 17 Sample 332542 (SB-1 @AH-1 99-100') 18 Sample 332542 (SB-1 @AH-1 104-105') 19 Sample 332543 (SB-1 @AH-1 102-105') 19 Sample 332543 (SB-1 102-105') 19 Sample 332		
Sample 332544 (SB-1 @AH-1 89-90') 16 Sample 332543 (SB-1 @AH-1 99-100') 17 Sample 332543 (SB-1 @AH-1 104-105') 18 Method Blanks 12 QC Batch 102539 - Method Blank (1) 12 QC Batch 102540 - Method Blank (1) 17 QC Batch 102555 - Method Blank (1) 17 QC Batch 102555 - Method Blank (1) 18 QC Batch 102556 - Method Blank (1) 18 QC Batch 102642 - Method Blank (1) 18 QC Batch 102643 - Method Blank (1) 18 QC Batch 102643 - Method Blank (1) 18 QC Batch 102559 - LCS (1) 16 QC Batch 102540 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 102540 - LCS (1) 16 QC Batch 102540 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102549 - MS (1) 18 QC Batch 102549 - MS (1) 19 QC Batch 102549 - MS (1) 20 QC Batch 102550 - MS (1) 20 QC Batch 102550 - MS (1) 20 QC Batch 102550 - MS (1) 20 QC Batch 102539 - MS (1) 20		
Sample 332542 (SB-1 @AH-1 99-100") 11 Sample 332543 (SB-1 @AH-1 104-105") 11 Method Blanks 12 QC Batch 102539 - Method Blank (1) 12 QC Batch 102549 - Method Blank (1) 15 QC Batch 102555 - Method Blank (1) 15 QC Batch 102555 - Method Blank (1) 15 QC Batch 102642 - Method Blank (1) 15 QC Batch 102643 - Method Blank (1) 16 QC Batch 102643 - Method Blank (1) 16 QC Batch 102549 - LCS (1) 17 QC Batch 102543 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102540 - MS (1) 18 QC Batch 102549 - MS (1) 18 QC Batch 102549 - MS (1) 20 QC		
Sample 332543 (SB-1 @AH-1 104-105') 11 Method Blanks 12 QC Batch 102539 - Method Blank (1) 12 QC Batch 102540 - Method Blank (1) 15 QC Batch 102555 - Method Blank (1) 15 QC Batch 102556 - Method Blank (1) 15 QC Batch 102642 - Method Blank (1) 15 QC Batch 102643 - Method Blank (1) 16 QC Batch 102643 - Method Blank (1) 17 QC Batch 102539 - LCS (1) 16 QC Batch 102540 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 102540 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102540 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102540 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 20 QC Batch 102543 - MS (1) 20 QC Batch 10		
Method Blanks 12 QC Batch 102539 - Method Blank (1) 15 QC Batch 102540 - Method Blank (1) 16 QC Batch 102555 - Method Blank (1) 15 QC Batch 102555 - Method Blank (1) 16 QC Batch 102556 - Method Blank (1) 17 QC Batch 102642 - Method Blank (1) 18 QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 16 QC Batch 102540 - LCS (1) 16 QC Batch 102540 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102556 - LCS (1) 17 QC Batch 102540 - MS (1) 18 QC Batch 102540 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 20 QC Batch 102540 - MS (1)		
QC Batch 102539 - Method Blank (1) 12 QC Batch 102540 - Method Blank (1) 12 QC Batch 102549 - Method Blank (1) 15 QC Batch 102555 - Method Blank (1) 15 QC Batch 102556 - Method Blank (1) 13 QC Batch 102642 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 16 QC Batch 102642 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102540 - MS (1) 18 QC Batch 102540 - MS (1) 18 QC Batch 102540 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102639 - CCV (1) 23 QC Batch 102539 - COV	· · · · · · · · · · · · · · · · · · ·	
QC Batch 102540 - Method Blank (1) 12 QC Batch 102555 - Method Blank (1) 15 QC Batch 102555 - Method Blank (1) 15 QC Batch 102642 - Method Blank (1) 15 QC Batch 102643 - Method Blank (1) 15 QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102539 - MS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102557 - MS (1) 20 QC Batch 102558 - MS (1) 20 QC Batch 102559 - MS (1) 20 QC Batch 102559 - MS (1) 20 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102530 - CC	Method Blanks	12
QC Batch 102549 - Method Blank (1) 12 QC Batch 102555 - Method Blank (1) 15 QC Batch 102556 - Method Blank (1) 15 QC Batch 102642 - Method Blank (1) 15 QC Batch 102643 - Method Blank (1) 16 QC Batch 102643 - Method Blank (1) 15 QC Batch 102539 - LCS (1) 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102540 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102659 - CV (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (2) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (QC Batch 102539 - Method Blank (1)	. 12
QC Batch 102555 - Method Blank (1) 15 QC Batch 102642 - Method Blank (1) 15 QC Batch 102643 - Method Blank (1) 16 QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102656 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102656 - MS (1) 20 QC Batch 102640 - MS (1) 21 Calibration Standards 23 <td>QC Batch 102540 - Method Blank (1)</td> <td>. 12</td>	QC Batch 102540 - Method Blank (1)	. 12
QC Batch 102556 - Method Blank (1) 13 QC Batch 102642 - Method Blank (1) 13 QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102539 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102556 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23 QC Batch 102540 - CCV (1) 23	QC Batch 102549 - Method Blank (1)	. 12
QC Batch 102642 - Method Blank (1) 13 QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102556 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102539 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23	QC Batch 102555 - Method Blank (1)	. 13
QC Batch 102643 - Method Blank (1) 14 Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 16 QC Batch 1025549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23	QC Batch 102556 - Method Blank (1)	. 13
Laboratory Control Spikes 15 QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102633 - MS (1) 18 QC Batch 102530 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102555 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23 QC Batch 102540 - CCV (1) 23	QC Batch 102642 - Method Blank (1)	. 13
QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102555 - LCS (1) 17 QC Batch 102555 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 19 QC Batch 102555 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102644 - MS (1) 20 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23	QC Batch 102643 - Method Blank (1)	. 14
QC Batch 102539 - LCS (1) 15 QC Batch 102540 - LCS (1) 15 QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102555 - LCS (1) 17 QC Batch 102555 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 19 QC Batch 102555 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102644 - MS (1) 20 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102540 - LCS (1) 15 QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102640 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102549 - LCS (1) 16 QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102555 - LCS (1) 16 QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 20 QC Batch 102555 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 20 QC Batch 102639 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102556 - LCS (1) 17 QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102642 - LCS (1) 17 QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102643 - LCS (1) 18 QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102539 - MS (1) 18 QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 20 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102540 - MS (1) 19 QC Batch 102549 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102549 - MS (1) 19 QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102555 - MS (1) 20 QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102556 - MS (1) 20 QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102642 - MS (1) 20 QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102643 - MS (1) 21 Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
Calibration Standards 23 QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23		
QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23	QC Batch 102643 - MS (1)	. 21
QC Batch 102539 - CCV (1) 23 QC Batch 102539 - CCV (2) 23 QC Batch 102540 - CCV (1) 23	Calibration Standards	20
QC Batch 102539 - CCV (2)		
QC Batch 102540 - CCV (1)		
OC Batch 102540 - CCV (2)	QC Batch 102540 - CCV (2)	. 23

	QC Batch 102549 -	CCV (L) .	 		 	 	 		 									24
	QC Batch 102549 -	CCV (2)	 		 	 			 									24
	QC Batch 102555 -	CCV (1) .	 		 	 			 									24
	QC Batch 102555 -	CCV (2)	 		 	 			 		,							24
	QC Batch 102556 -	CCV (L)	 		 	 			 					 				25
	QC Batch 102556 -	CCV (2)	 	 	 	 			 									25
	QC Batch 102642 -	CCV (1)	 		 	 			 									25
	QC Batch 102642 -	CCV (2	2) .	 		 	 	 		 									25
	QC Batch 102643 -	CCV (1) .	 		 	 			 									26
	QC Batch 102643 -	CCV (2) .	 		 	 	 		 								 •	26
$\mathbf{A}_{]}$	ppendix																		27
	Report Definitions			 		 	 			 									27
	Laboratory Certific	ations		 		 	 	 		 									27
	Standard Flags			 		 	 	 		 						 ų,			27
	Attachments																		27

Case Narrative

Samples for project COG/Jenkins B Federal Water Flood were received by TraceAnalysis, Inc. on 2013-06-18 and assigned to work order 13061821. Samples for work order 13061821 were received intact at a temperature of 4.3 C.

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

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	86863	2013-06-21 at 16:26	102539	2013-06-21 at 16:26
BTEX	S 8021B	86950	2013-06-26 at 16:28	102642	2013-06-26 at 16:28
Chloride (Titration)	SM 4500-Cl B	86840	2013-06-21 at 13:49	102555	2013-06-24 at 12:40
Chloride (Titration)	SM 4500-Cl B	86840	2013-06-21 at 13:49	102556	2013-06-24 at 12:41
TPH DRO - NEW	$\mathrm{S}~8015~\mathrm{D}$	86869	2013-06-23 at 22:00	102549	2013-06-24 at 11:02
TPH GRO	S 8015 D	86863	2013-06-21 at 16:26	102540	2013-06-21 at 16:26
TPH GRO	S 8015 D	86950	2013-06-26 at 16:28	102643	2013-06-26 at 16:28

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 13061821 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: June 28, 2013 114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 6 of 28 Eddy Co., NM

Analytical Report

Sample: 332532 - SB-1 @ AH-1 0-1'

Laboratory: Lubbock

S 5035 Analytical Method: S 8021B Prep Method: Analysis: BTEX Date Analyzed: 2013-06-21 Analyzed By: JSQC Batch: 102539 Sample Preparation: 2013-06-21 Prepared By: JSPrep Batch: 86863

RLResult Dilution Parameter Flag Cert Units RL< 1.00 mg/Kg 50 0.0200 Benzene Qs mg/KgToluene 59.8 50 0.0200 Q_{S} 50 Ethylbenzene 94.8mg/Kg 0.0200Xylene mg/Kg 50 0.0200 165

							\mathbf{Spike}	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Triffuorotoluene (TFT)	Qsr	Qsr		4.49	mg/Kg	50	2.00	224	69.6 - 120
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr		4.43	mg/Kg	50	2.00	222	69.2 - 120

Sample: 332532 - SB-1 @ AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 102555 Date Analyzed: 2013-06-24 Analyzed By: ARPrep Batch: 86840 Sample Preparation: 2013-06-21 Prepared By: AR.

Sample: 332532 - SB-1 @ AH-1 0-1'

Laboratory: Midland

TPH DRO - NEW Analytical Method: S 8015 D Prep Method: Analysis: N/AQC Batch: 102549 Date Analyzed: 2013-06-24 Analyzed By: CW Prep Batch: Sample Preparation: 2013-06-23 86869 Prepared By: CW

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 7 of 28 Eddy Co., NM

							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	${f Amount}$	Recovery	Limits
n-Tricosane	Qsr	Qsr		453	mg/Kg	5	100	453	55.1 - 135.7

Sample: 332532 - SB-1 @ AH-1 0-1'

Laboratory:

Lubbock

Analysis: QC Batch: TPH GRO

102540

Analytical Method: Date Analyzed:

S 8015 D 2013-06-21 Prep Method: S 5035 Analyzed By:

Prep Batch:

86863

Sample Preparation: 2013-06-21

JSPrepared By: JS

RL

Result

Parameter Flag Cert Units Dilution RLGRO 4900 mg/Kg 50 4.00 ı

							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	Qar	Qar	1	132	mg/Kg	50	2.00	6600	69.6 - 124
4-Bromofluorobenzene (4-BFB)	Qar	Qяг		106	mg/Kg	50	2.00	5300	77.7 - 120

Sample: 332533 - SB-1 @ AH-1 2-3'

Laboratory:

Lubbock

Analysis: QC Batch: Prep Batch: **BTEX**

102642

86950

Analytical Method: Date Analyzed: Sample Preparation: S 8021B

2013-06-26 2013 - 06 - 26

Prep Method: S 5035 Analyzed By: MTPrepared By: MT

RL

Parameter Result Units Dilution RLFlag Cert Benzene < 0.0200 mg/Kg 1 0.0200 U Toluene mg/Kg 1 < 0.0200 0.0200Ethylbenzene < 0.0200 mg/Kg 1 0.0200U Xylene mg/Kg 1 < 0.0200 0.0200Jb,Qc

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	$\mathbf{A}\mathbf{mount}$	Recovery	Limits
Trifluorotoluene (TFT)			1.43	mg/Kg	1	2.00	72	69.6 - 120
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1	2.00	94	69.2 - 120

Report Date: June 28, 2013 114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 8 of 28 Eddy Co., NM

Sample: 332533 - SB-1 @ AH-1 2-3'

Laboratory:

Prep Batch:

Midland

Analysis: Chloride QC Batch: 102555

Chloride (Titration) Analytic 102555 Date An 86840 Sample I

Analytical Method: SM 4500-Cl B Date Analyzed: 2013-06-24 Sample Preparation: 2013-06-21 Prep Method: N/A Analyzed By: AR Prepared By: AR

Sample: 332533 - SB-1 @ AH-1 2-3'

Laboratory:

Midland

Analysis: TPH DRO - NEW QC Batch: 102549
Prep Batch: 86869

Analytical Method: S 8015 D
Date Analyzed: 2013-06-24
Sample Preparation: 2013-06-23

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

Parameter	Flag	Cert	Result	Units	Dilution	RL
DRO	Qs	2	< 50.0	mg/Kg	1	50.0

		•				Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	$_{ m Units}$	Dilution	Amount	Recovery	Limits
n-Tricosane			86.4	nıg/Kg	1	.100	86	55.1 - 135.7

Sample: 332533 - SB-1 @ AH-1 2-3'

Laboratory:

Lubbock

Analysis: TPH GRO QC Batch: 102643 Prep Batch: 86950 Analytical Method: S 8015 D
Date Analyzed: 2013-06-26
Sample Preparation: 2013-06-26

Prep Method: S 5035 Analyzed By: MT Prepared By: MT

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
GRO	υ	1	<4.00	mg/Kg	1	4.00

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	${f Amount}$	Recovery	Limits
Trifluorotoluene (TFT)			1.74	mg/Kg	1	2.00	87	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.13	mg/Kg	1	2.00	106	77.7 - 120

Report Date: June 28, 2013 Work Order: 13061821 Page Number: 9 of 28 114-6401364 COG/Jenkins B Federal Water Flood Eddy Co., NM

Sample: 332534 - SB-1 @ AH-1 4-5'

Laboratory: Midland

Chloride (Titration) Analytical Method: Prep Method: N/A Analysis: SM 4500-Cl B ARQC Batch: 102555 Date Analyzed: 2013-06-24 Analyzed By: Prep Batch: 86840 Sample Preparation: 2013-06-21 Prepared By: AR

Sample: 332535 - SB-1 @ AH-1 6-7'

Laboratory: Midland

Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A Date Analyzed: Analyzed By: AR. QC Batch: 102555 2013-06-24 Prep Batch: 86840 Sample Preparation: 2013-06-21 Prepared By: AR

Sample: 332536 - SB-1 @ AH-1 9-10'

Laboratory: Midland

Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/AQC Batch: 102556 Date Analyzed: 2013-06-24 Analyzed By: ARSample Preparation: Prep Batch: 86840 2013-06-21 Prepared By: AR

Sample: 332537 - SB-1 @ AH-1 19-20'

Laboratory: Midland

Chloride (Titration) Analysis: Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 102556 Date Analyzed: 2013-06-24 Analyzed By: ARPrep Batch: 86840 Sample Preparation: 2013-06-21 Prepared By: AR.

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 10 of 28

Eddy Co., NM

			RL			
Parameter	Flag	Cert	Result	${ m Units}$	Dilution	RL
Chloride			9460	mg/Kg	10	4.00

Sample: 332538 - SB-1 @ AH-1 39-40'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

102556

Date Analyzed:

2013-06-24

Analyzed By: AR

Prep Batch:

86840

Sample Preparation:

2013-06-21

Prepared By: AR

			14.12			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			12000	mg/Kg	10	4.00

ЪŢ

Sample: 332539 - SB-1 @ AH-1 59-60'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

102556

Date Analyzed:

2013-06-24

Analyzed By: AR.

Prep Batch:

86840

Sample Preparation: 2013-06-21 Prepared By: AR

Parameter

Cert

RLResult Units Dilution RLFlag Chloride 2440 mg/Kg 10 4.00

Sample: 332540 - SB-1 @ AH-1 79-80'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch:

102556

Date Analyzed:

2013-06-24

Analyzed By: AR

Prepared By:

Prep Batch:

86840

Sample Preparation:

2013-06-21

AR

RL

Parameter Flag Cert Result Units Dilution RL6150 Chloride mg/Kg 10 4.00

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 11 of 28 Eddy Co., NM

Sample: 332541 - SB-1 @ AH-1 89-90'

Laboratory:

Midland

Chloride (Titration) Analysis:

QC Batch: 102556 Prep Batch: 86840

Analytical Method: Date Analyzed:

SM 4500-Cl B 2013-06-24 Sample Preparation: 2013-06-21

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

RL

Cert Result Units Dilution RLParameter Flag Chloride 2000 mg/Kg 4.00 10

Sample: 332542 - SB-1 @ AH-1 99-100'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 102556 Prep Batch: 86840

Analytical Method: Date Analyzed:

SM 4500-Cl B 2013-06-24 Sample Preparation: 2013-06-21

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

RL

Parameter Flag Cert Result Units Dilution RLChloride 1060 mg/Kg 5 4.00

Sample: 332543 - SB-1 @ AH-1 104-105'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 102556 Prep Batch: 86840

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2013-06-24 2013-06-21

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

RL

Parameter Cert Result Units Dilution Flag RLChloride 92.5mg/Kg 5 4.00

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 12 of 28

Eddy Co., NM

Method Blanks

Method Blank (1)

QC Batch: 102539

QC Batch:

102539

Date Analyzed:

2013-06-21

Analyzed By: JS

Prep Batch: 86863

QC Preparation: 2013-06-21

Prepared By: JS

			MDL		
Parameter	Flag	Cert	Result	Units	RL
Benzene		1	< 0.00473	mg/Kg	0.02
Toluene		1	< 0.00416	mg/Kg	0.02
Ethylbenzene		1	< 0.00511	mg/Kg	0.02
Xylene		ı	0.00770	mg/Kg	0.02

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	${f Limits}$
Trifluorotoluene (TFT)			1.72	mg/Kg	1	2.00	86	69.6 - 120
4-Bromofluorobenzene (4-BFB)			1.81	mg/Kg	1	2.00	90	69.2 - 120

Method Blank (1)

QC Batch: 102540

QC Batch:

102540

Date Analyzed:

2013-06-21

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Analyzed By: JS Prepared By: JS

Prep Batch: 86863

QC Preparation: 2013-06-21

			MDL		
Parameter	Flag	Cert	Result	Units	RL
GRO	,	1	< 0.230	mg/Kg	4
		······································			

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	${f Amount}$	Recovery	Limits
Trifluorotoluene (TFT)			2.00	mg/Kg	1	2.00	100	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.02	mg/Kg	1	2.00	101	77.7 - 120

Method Blank (1)

QC Batch: 102549

QC Batch: 102549 Prep Batch: 86869

Date Analyzed: QC Preparation: 2013-06-23

2013-06-24

Analyzed By: CW Prepared By: CW

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 13 of 28 Eddy Co., NM

Parameter		F	lag	Cert		MDL esult	Units	RL
DRO				2		13.9	mg/Kg	50
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			87.1	mg/Kg	1	100	87	55.1 - 135.7

Method Blank (1) QC Batch: 102555

QC Batch: 102555 Prep Batch: 86840 Date Analyzed: 2013-06-24 QC Preparation: 2013-06-21 Analyzed By: AR Prepared By: AR

Method Blank (1)

QC Batch: 102556

QC Batch: 102556 Prep Batch: 86840 Date Analyzed: 2013-06-24 QC Preparation: 2013-06-21 Analyzed By: AR Prepared By: AR

Method Blank (1)

QC Batch: 102642

QC Batch: 102642 Prep Batch: 86950 Date Analyzed: 2013-06-26 QC Preparation: 2013-06-26 Analyzed By: MT Prepared By: MT

			MDL		
Parameter	Flag	Cert	Result	Units	RL
Benzene		1	< 0.00473	ıng/Kg	0.02
Toluene		1	< 0.00416	$\mathrm{mg/Kg}$	0.02
Ethylbenzene		1	< 0.00511	mg/Kg	0.02
Xylene		1	0.00940	mg/Kg	0.02

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 14 of 28 Eddy Co., NM

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Triffuorotoluene (TFT)			1.65	mg/Kg	1	2.00	82	69.6 - 120
4-Bromofluorobenzene (4-BFB)			1.81	mg/Kg	1	2.00	90	69.2 - 120

Method Blank (1)

QC Batch: 102643

QC Batch:

102643

Date Analyzed:

2013-06-26

Analyzed By: MT

Prep Batch: 86950

QC Preparation: 2013-06-26

Prepared By: MT

			MDL		
Parameter	Flag	Cert	Result	Units	RL
GRO		1	< 0.230	mg/Kg	4

						Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.98	mg/Kg	1	2.00	99	69.6 - 124
4-Bromofluorobenzene (4-BFB)			2.05	mg/Kg	1	2.00	102	77.7 - 120

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood

Page Number: 15 of 28 Eddy Co., NM

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 102539 Date Analyzed:

2013-06-21

Analyzed By: JS

Prep Batch: 86863

QC Preparation: 2013-06-21

Prepared By: JS

				LCS			$_{ m Spike}$	Matrix		Rec.
Param		\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit
Benzene	Qs	Qs ·	1	1.48	mg/Kg	1	2.00	< 0.00473	74	74.6 - 120
Toluene	Qs	Qн	1	1.52	mg/Kg	1	2.00	< 0.00416	76	77.1 - 120
Ethylbenzene			1	1.60	mg/Kg	1	2.00	< 0.00511	80	75 - 120
Xylene			1	4.72	mg/Kg	1	6.00	0.0077	79	77 - 120

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		ı	1.54	mg/Kg	1	2.00	< 0.00473	77	74.6 - 120	4	20
Toluene		1	1.59	mg/Kg	1	2.00	< 0.00416	80	77.1 - 120	4	20
Ethylbenzene		1	1.68	mg/Kg	1	2.00	< 0.00511	84	75 - 120	5	20
Xylene		1	4.99	mg/Kg	1	6.00	0.0077	83	77 - 120	6	20

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

	LCS	LCSD			$_{ m Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	\mathbf{Limit}
Trifluorotoluene (TFT)	1.55	1.63	mg/Kg	1	2.00	78	82	69.6 - 120
4-Bromofluorobenzene (4-BFB)	1.66	1.73	mg/Kg	1	2.00	83	86	69.2 - 120

Laboratory Control Spike (LCS-1)

QC Batch: 102540 Prep Batch: 86863

Date Analyzed: 2013-06-21 QC Preparation: 2013-06-21 Analyzed By: JS Prepared By: JS

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO		1	14.8	mg/Kg	1	20.0	< 0.230	74	66.9 - 120

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

 $continued \dots$

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 16 of 28

Eddy Co., NM

control spikes continued.	continued	com	spikes	control
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Param	F	С	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	म	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	15.4	mg/Kg	1	20.0	< 0.230	77	66.9 - 120	4	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	${f Amount}$	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.80	1.85	mg/Kg	1	2.00	90	92	69.6 - 124
4-Bromofluorobenzene (4-BFB)	1.93	2.04	mg/Kg	1	2.00	96	102	77.7 - 120

Laboratory Control Spike (LCS-1)

QC Batch:

102549

Date Analyzed:

2013-06-24

Analyzed By: CW

Prep Batch: 86869

QC Preparation: 2013-06-23

Prepared By: CW

			LCS	•		Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		2	216	mg/Kg	1	250	13.9	81	66.9 - 119.9

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}	RPD	Limit
DRO		2	210	mg/Kg	1	250	13.9	78	66.9 - 119.9	3	20

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

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	Rec.	${f Limit}$
n-Tricosane	90.9	88.1	mg/Kg	1	100	91	88	76.8 - 140.2

Laboratory Control Spike (LCS-1)

QC Batch:

102555

Date Analyzed:

2013-06-24

Analyzed By: AR

Prep Batch: 86840

QC Preparation: 2013-06-21

Prepared By: AR.

				LCS			Spike	Matrix		Rec.
Param	,	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride				2690	mg/Kg	1	2500	< 3.85	108	85 - 115

Work Order: 13061821 COG/Jenkins B Federal Water Flood

Page Number: 17 of 28 Eddy Co., NM

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride		•	2610	mg/Kg	1	2500	< 3.85	104	85 - 115	3	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:

102556

Date Analyzed:

2013-06-24

Analyzed By: AR.

Prepared By: AR.

Prep Batch: 86840

QC Preparation: 2013-06-21

			LCS			\mathbf{Spike}	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil .	Amount	Result	Rec.	${f Limit}$
Chloride			2720	mg/Kg	1	2500	< 3.85	109	85 - 115

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

			LCSD			$_{ m Spike}$	Matrix		Rec.		RPD
Param	\mathbf{F}	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2630	mg/Kg	1	2500	< 3.85	105	85 - 115	3	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: 102642 Prep Batch: 86950

Date Analyzed:

2013-06-26

Analyzed By: MT

QC Preparation: 2013-06-26

Prepared By: MT

			LCS			$_{ m Spike}$	Matrix		Rec.
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$
Benzene		ı	1.65	mg/Kg	1	2.00	< 0.00473	82	74.6 - 120
Toluene		1	1.72	mg/Kg	1	2.00	< 0.00416	86	77.1 - 120
Ethylbenzene		ì	1.81	mg/Kg	1	2.00	< 0.00511	90	75 - 120
Xylene		1	5.37	${ m mg/Kg}$	1	6.00	0.0094	89	77 - 120

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

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		ì	1.56	mg/Kg	1	2.00	< 0.00473	78	74.6 - 120	6	20
Toluene		1	1.62	mg/Kg	1	2.00	< 0.00416	81	77.1 - 120	6	20
Ethylbenzene		1	1.71	mg/Kg	1	2.00	< 0.00511	86	75 - 120	6	20
Xylene		ì	5.07	mg/Kg	1	6.00	0.0094	84	77 - 120	6	20

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 18 of 28 Eddy Co., NM

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

	LCS	LCSD			$_{ m Spike}$	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	\mathbf{A} mount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.73	1.64	mg/Kg	1	2.00	86	82	69.6 - 120
4-Bromofluorobenzene (4-BFB)	1.90	1.78	mg/Kg	1	2.00	95	89	69.2 - 120

Laboratory Control Spike (LCS-1)

QC Batch:

102643

Date Analyzed:

2013-06-26

Analyzed By: MT

Prep Batch: 86950

QC Preparation: 2013-06-26

Prepared By: MT

			LCS			Spike	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$
GRO		1	13.6	mg/Kg	1	20.0	< 0.230	68	66.9 - 120

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}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
GRO		1	13.5	mg/Kg	1	20.0	< 0.230	68	66.9 - 120	1	20

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

Surrogate	$rac{ ext{LCS}}{ ext{Result}}$	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.80	1.59	mg/Kg	1	2.00	90	80	69.6 - 124
4-Bromofluorobenzene (4-BFB)	1.96	1.98	mg/Kg	1	2.00	98	99	77.7 - 120

Matrix Spike (MS-1) Spiked Sample: 332407

QC Batch: Prep Batch: 86863

102539

Date Analyzed: QC Preparation:

2013-06-21 2013-06-21

Analyzed By: JS Prepared By:

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	${f A}{f mount}$	Result	Rec.	Limit
Benzene		1	1.74	mg/Kg	1	2.00	< 0.00473	87	68.8 - 120
Toluene		1	1.80	mg/Kg	1	2.00	< 0.00416	90	71.8 - 122
Ethylbenzene		1	1.91	mg/Kg	1	2.00	< 0.00511	96	75 - 130
Xylene		1	5.66	mg/Kg	1	6.00	0.0128	94	75.4 - 129

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

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 19 of 28 Eddy Co., NM

Param	\mathbf{F}	$^{\mathrm{C}}$	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.80	mg/Kg	1	2.00	< 0.00473	90	68.8 - 120	3	20
Toluene		1	1.86	mg/Kg	1	2.00	< 0.00416	93	71.8 - 122	3	20
Ethylbenzene		i	1.98	mg/Kg	1	2.00	< 0.00511	99	75 - 130	4	20
Xylene		t	5.86	mg/Kg	1	6.00	0.0128	97	75.4 - 129	4	20

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

	MS	MSD			Spike	MS	MSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.82	1.92	mg/Kg	1	2	91	96	69.6 - 120
4-Bromofluorobenzene (4-BFB)	2.01	2.05	mg/Kg	1	2	100	102	69.2 - 120

Matrix Spike (MS-1) Spiked Sample: 332407

QC Batch: 102540 Prep Batch: 86863 Date Analyzed: 2013-06-21 QC Preparation: 2013-06-21 Analyzed By: JS Prepared By: JS

			MS			$_{ m Spike}$	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	$\mathbf{U}_{\mathbf{nits}}$	Dil.	Amount	Result	Rec.	Limit
GRO		1	14.0	mg/Kg	1	20.0	0.266	69	38.8 - 120

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

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO)	14.4	mg/Kg	1	20.0	0.266	71	38.8 - 120	3	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	$\mathbf{U}_{\mathbf{nits}}$	Dil.	Amount	Rec.	Rec.	${f Limit}$
Trifluorotoluene (TFT)	2.26	1.91	mg/Kg	1	2	113	96	69.6 - 124
4-Bromofluorobenzene (4-BFB)	2.40	2.40	mg/Kg	1	2	120	120	77.7 - 120

Matrix Spike (MS-1) Spiked Sample: 332532

QC Batch: 102549 Prep Batch: 86869 Date Analyzed: 2013-06-24 QC Preparation: 2013-06-23

Analyzed By: CW Prepared By: CW

				MS			Spike	Matrix		Rec.
Param		\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	$\mathrm{Rec}.$	Limit
DRO	Qs	Qs	2	7630	mg/Kg	5	250	8530	-360	36.1 - 147.2

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 20 of 28 Eddy Co., NM

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		F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	Qя	Qs	2	7340	mg/Kg	5	250	8530	-476	36.1 - 147.2	4	20

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

			MS	MSD			Spike	MS	MSD	${ m Rec.}$
Surrogate			Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	Qar	Qsr	464	484	${ m mg/Kg}$	5	100	464	484	78.3 - 131.6

Matrix Spike (MS-1) Spiked Sample: 332535

QC Batch: 102555 Prep Batch: 86840 Date Analyzed: 2013-06-24 QC Preparation: 2013-06-21

Analyzed By: AR
Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	\mathbf{F}	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	${f Limit}$
Chloride			3540	mg/Kg	10	2500	1220	93	78.9 - 121

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

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	$_{ m Limit}$
Chloride			3900	mg/Kg	10	2500	1220	107	78.9 - 121	10	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: 332624

QC Batch: 102556 Prep Batch: 86840

Date Analyzed: 2013-06-24 QC Preparation: 2013-06-21 Analyzed By: AR. Prepared By: AR.

			MS			Spike	Matrix		Rec.
Param	F	$^{\rm C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			3920	mg/Kg	5	2500	1380.	102	78.9 - 121

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			3790	mg/Kg	5	2500	1380	96	78.9 - 121	3	20

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

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 21 of 28 Eddy Co., NM

Matrix Spike (MS-1)

Spiked Sample: 332533

QC Batch: Prep Batch: 86950

102642

Date Analyzed: 2013-06-26 QC Preparation: 2013-06-26 Analyzed By: MT Prepared By: MT

			MS			$_{ m Spike}$	Matrix		Rec.
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	$\mathbf{A}\mathbf{m}\mathbf{o}\mathbf{u}\mathbf{n}\mathbf{t}$	Result	Rec.	${f Limit}$
Benzene		1	1.74	mg/Kg	1	2.00	< 0.00473	87	68.8 - 120
Toluene		ŀ	1.82	mg/Kg	1	2.00	0.0069	91	71.8 - 122
Ethylbenzene		1	1.91	mg/Kg	1	2.00	< 0.00511	96	75 - 130
Xylene		1	5.63	m mg/Kg	1	6.00	0.0148	94	75.4 - 129

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

			MSD			Spike	Matrix		Rec.		RPD
Param	\mathbf{F}	\mathbf{C}	Result	Units	Dil.	${f Amount}$	Result	Rec.	\mathbf{Limit}	RPD	Limit
Benzene		1	1.69	mg/Kg	1	2.00	< 0.00473	84	68.8 - 120	3	20
Toluene		1	1.76	mg/Kg	1	2.00	0.0069	88	71.8 - 122	3	20
Ethylbenzene		1	1.86	mg/Kg	1	2.00	< 0.00511	93	75 - 130	3	20
Xylene		1	5.48	mg/Kg	1	6.00	0.0148	91	75.4 - 129	3	20

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

	MS	MSD			$_{ m Spike}$	MS	MSD	${ m Rec.}$
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.75	1.79	mg/Kg	1	2	88	90	69.6 - 120
4-Bromofluorobenzene (4-BFB)	1.95	1.92	mg/Kg	1	2	98	96	69.2 - 120

Matrix Spike (MS-1) Spiked Sample: 332533

QC Batch: Prep Batch: 86950

102643

Date Analyzed: QC Preparation:

2013-06-26 2013-06-26

Analyzed By: MTPrepared By: MT

MS Spike Matrix Rec. Param F Result Units Dil. Amount Result Rec. Limit 79 38.8 - 120 GRO 15.8 mg/Kg 20.0 < 0.230

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

			MSD			Spike	Matrix		Rec.		RPD
Param	F	$^{\mathrm{C}}$	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}	RPD	Limit
GRO		1	15.8	mg/Kg	1	20.0	< 0.230	79	38.8 - 120	0	20

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

 $continued \dots$

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 22 of 28 Eddy Co., NM

matrix spikes continued								
Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Triffuorotoluene (TFT)	1.78	1.68	mg/Kg	1	2	89	84	69.6 - 124
4-Bromofluorobenzene (4-BFB)	2.21	2.20	mg/Kg	1	2	110	110	77.7 - 120

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 23 of 28

Eddy Co., NM

Calibration Standards

Standard (CCV-1)

QC Batch: 102539

Date Analyzed: 2013-06-21

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0858	86	80 - 120	2013-06-21
Toluene		1	mg/kg	0.100	0.0803	80	80 - 120	2013-06-21
Ethylbenzene		1	mg/kg	0.100	0.0811	81	80 - 120	2013-06-21
Xylene		1	mg/kg	0.300	0.239	80	80 - 120	2013-06-21

Standard (CCV-2)

QC Batch: 102539

Date Analyzed: 2013-06-21

Analyzed By: JS

				CCVs True	${ m CCVs}$ Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	\mathbf{U} nits	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.0877	88	80 - 120	2013-06-21
Toluene		1	mg/kg	0.100	0.0835	84	80 - 120	2013-06-21
Ethylbenzene		1	mg/kg	0.100	0.0838	84	80 - 120	2013-06-21
Xylene		1	mg/kg	0.300	0.247	82	80 - 120	2013-06-21

Standard (CCV-1)

QC Batch: 102540

Date Analyzed: 2013-06-21

Analyzed By: JS

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.922	92	80 - 120	2013-06-21

Standard (CCV-2)

QC Batch: 102540

Date Analyzed: 2013-06-21

Analyzed By: JS

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 24 of 28 Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.940	94	80 - 120	2013-06-21

Standard (CCV-1)

 $QC\ Batch:\ 102549$

Date Analyzed: 2013-06-24

Analyzed By: CW

				CCVs True	${ m CCVs} \ { m Found}$	${ m CCVs} \ { m Percent}$	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		2	mg/Kg	250	204	82	80 - 120	2013-06-24

Standard (CCV-2)

QC Batch: 102549

Date Analyzed: 2013-06-24

Analyzed By: CW

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		2	mg/Kg	250	209	84	80 - 120	2013-06-24

Standard (CCV-1)

QC Batch: 102555

Date Analyzed: 2013-06-24

Analyzed By: AR

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-06-24

Standard (CCV-2)

QC Batch: 102555

Date Analyzed: 2013-06-24

Analyzed By: AR

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 25 of 28

Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride	<u> </u>		mg/Kg	100	99,9	100	85 - 115	2013-06-24

Standard (CCV-1)

QC Batch: 102556

Date Analyzed: 2013-06-24

Analyzed By: AR

				CCVs True	${ m CCVs} \ { m Found}$	${ m CCVs} \ { m Percent}$	Percent Recovery	Date
Param	Flag	Cert	$_{ m Units}$	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2013-06-24

Standard (CCV-2)

QC Batch: 102556

Date Analyzed: 2013-06-24

Analyzed By: AR.

				CCVs True	${ m CCVs} \ { m Found}$	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-06-24

Standard (CCV-1)

QC Batch: 102642

Date Analyzed: 2013-06-26

Analyzed By: MT

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0904	90	80 - 120	2013-06-26
Toluene		1	mg/kg	0.100	0.0842	84	80 ~ 120	2013-06-26
Ethylbenzene		i	mg/kg	0.100	0.0843	84	80 - 120	2013-06-26
Xylene		1	mg/kg	0.300	0.249	83	80 - 120	2013-06-26

Standard (CCV-2)

QC Batch: 102642

Date Analyzed: 2013-06-26

Analyzed By: MT

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 26 of 28 Eddy Co., NM

Param -		Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene	-		1	mg/kg	0.100	0.0865	86	80 - 120	2013-06-26
Toluene			1	mg/kg	0.100	0.0814	81	80 - 120	2013-06-26
Ethylbenzene			J	mg/kg	0.100	0.0813	81	80 - 120	2013-06-26
Xylene	Qe	Qu	1	mg/kg	0.300	0.238	79	80 - 120	2013-06-26

Standard (CCV-1)

QC Batch: 102643

Date Analyzed: 2013-06-26

Analyzed By: MT

				CCVs	CCVs	CCVs	Percent	•
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		l	mg/Kg	1.00	0.887	89	80 - 120	2013-06-26

Standard (CCV-2)

QC Batch: 102643

Date Analyzed: 2013-06-26

Analyzed By: MT

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	0.871	87	80 - 120	2013-06-26

Page Number: 27 of 28

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	T104704219-13-9	Lubbock
2	NELAP	T104704392-12-4	Midland

Standard Flags

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

114-6401364

Work Order: 13061821 COG/Jenkins B Federal Water Flood Page Number: 28 of 28 Eddy Co., NM

Attachments

The scanned attachments will follow this page.

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

Analysis Request of Chain of Custody Record								PAGE: 1 OF: 2																								
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CLIENT NAME:	SITE MANAGER: The Toworez	PRESERVATIVE METHOD	As Ba Cd As Ba Cd	0/624	, bH							
PROJECT NO.: PROJECT I	AME: B Forderal Water Flored	CONTAIN	MOD.	Volatiles Volatiles 8240/826 ii. Vol. 827 608	(Air) stos) ss/Cations							
LAB I.D. DATE TIME WATHER COMP.	Eddy Co NM SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS FILTERED (Y/N) HCL HNO3 ICE OONE	BTEX 8021B TPH 8015 MOD. T PAH 8270 RCHA Metals Ag As E TCLP Metals Ag As E	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	Alpha Beta (Air) PLM (Asbestos) Major Anions/Cations, pH, TDS							
542 614 5 K	5B-1@ AH-1 99-100'	1 X		X								
543 % 5 X	104-10-5			X								
	,											
RELINQUISHED BY Bignatur	ate: 6-19-13 PECEIVED BY: (Signature)	Date: < 18		Y Dan S la Man	Date: 6-14-13							
	ate: RECGIVED BY: (Signature)	Time: 11.12	TE	Y: (Print & Initial) IPPED BY: (Circle)	Time:							
	me: RECEIVED BY: (Signature)	Time:	FEDER	BUS UPS	OTHER:							
RECEIVING LABORATORY: /A.m. /	me: RECEIVED BY: (Signature)	Time:	TETRA TECH									
ADDRESS: Mate STATE: TX CONTACT: PHONE:	ZIP: DATE:	TIME:			RUSH Charges Authorized: Yes No							
SAMPLE CONDITION WHEN RECEIVED: Please fill out all copies - Lal	REMARKS: Oratory retains Yellow copy - Return Orginal copy to Te	etra Tech - Project Manager	retains Pink con	y - Accounting receives G	old copy.							