		S	TE INFORM	ATION			
		Repor	t Type: Clos	sure Re	port		
General Site Inf	ormation:	No. Wysel &					a the set of
Site:		Burch Kelly	Unit # 632 Iniec	tion Line			
Company:	<u></u>	COG Opera	ting LLC		· · · · · · · · · · · · · · · · · · ·		
Section, Towns	hip and Range	Unit M	Sec 24	T17S	R29E		
Lease Number:		(API#) 30-01	15-40327				
County:		Eddy Count	ty				
GPS:		1	32.81479° N		1	104	1.03448° W
Surface Owner:	,	Federal			- <b>-</b>		
Mineral Owner:	· · · · · · · · · · · · · · · · · · ·					<u> </u>	
Directions: From the in miles. Turr miles on th		From the inte miles. Turn rig miles on the c	rsection of Hwy 260 ght crossing the cat caliche road and arr	and Hwy 82 tle guard and ive at the loc	, turn right ar I make an lef ation on the	nd travel v ft on the c right.	west for approximatly 7.8 aliche road. Travel 0.29
	and the second of the second second		an a	jir y . W.		AND ANTER TO	and an and a start of the start
Helease Data:	And the second second second second	Ta la la carta				ie see	and the second
Date Released:		1/8/2013			<u>CEI¥</u> E		
I ype Release:		Produced W	ater				
Source of Contai	mination:	Injection Lin	9		IG 23 201	3	<u></u>
Fluid Released:		40 bbls					
Huids Recovere	d:	35 bbls		<u>I NIMO</u>	CD ARTE	SIAL	
Official Commu	nication:	and the second second	S. S	1. 5. 1 B. 6. 5. 1. 1.	1. v 201 - 2 - 4 - 4	A Los A	
Name:	Pat Ellis				Ike Tavarez	Z	
Company:	COG Operating 11	С			Tetra Tech		
Addross;	One Conche Conte				1010 N. Bic	a Sorina	
1001055.	One Concho Cente					y spring	
	600 W. Illinois Ave.	·				· · ·	
City:	Midland Texas, 797	01			Midland, Te	exas	
Phone number:	(432) 686-3023			(432) 682-4559			
Fax:	(432) 684-7137						
Email:	pellis@conchoreso	urces.com			ike.tavarez	z@tetrate	ech.com
Ranking Criteria Depth to Groundu <50 ft 50-99 ft >100 ft.	a water:		Ranking Score       20       10       0			Site Da	ita
NollHand Destant	lion		Denking Coort	1		Cite D	
Water Source -1	1011. NNN ft Privata -200 f	+			·	Sile Da	
Water Source >1	000 ft., Private <200 ft	t.	0			n	
				J	<u> </u>		
Surface Body of V	Water:		Ranking Score			Site Da	ita
<200 ft.			20				
200 ft - 1,000 ft.			10				
	· · · · · · · · · · · · · · · · · · ·		0			0	
1,000 ft.							
>1,000 ft. <b></b>	tal Ranking Score:				7		
>1,000 ft.	tal Ranking Score:	Accept	able Soil RRAL (	」 mg/kg) :::::			
>1,000 ft.	tal Ranking Score:	Accept Benzene	able Soil RRAL ( Total BTEX	」 mg/kg) : ☐ <u>TPH</u>			



July 8, 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., Burch Kelly Unit # 632 Injection Line, Unit M, Section 24, 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 Burch Kelly Unit # 632 Injection Line, located in Unit M, Section 24, Township 17 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.81479°, W 104.03448°. The site location is shown on Figures 1 and 2.

#### Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on January 8, 2013, and released approximately forty (40) barrels of produced water from an injection line. Thirty five (35) barrels of produced water were recovered. The leak was caused by an auger truck installing an electrical pole near the fiberglass line. COG has repaired the line. The spill affected an area of approximately 20' x 60' on the pad. The final C-141 form is enclosed in Appendix A.

#### Groundwater

No water wells were listed within Section 24. According to the NMOCD groundwater map, the average depth to groundwater in this area is approximately 150' below surface. The groundwater data is shown in Appendix A.

#### 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 February 12, 2013, Tetra Tech personnel inspected and sampled the spill area. Two (2) auger holes (AH-1and AH-2) 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 results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, AH-1 and AH-2 did not show concentrations above the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the auger holes. Auger hole (AH-1) showed declining chloride concentrations with depth with bottom auger hole sample of 1,970 mg/kg at 1.5-2.0' below surface. The area of AH-1 was not vertically defined. The chloride impact in the area of AH-2 showed a shallow impact of 4,950 mg/kg at 0-1' below surface and declining to 742 mg/kg at 1-1.5' below surface. Deeper samples were not collected due to the dense caliche formation.

#### Site Remediation and Conclusion

On May 10, 2013, Tetra Tech personnel supervised the excavation of the impacted soils. A trench (T-1) was installed in the area of AH-1 to further delineate the vertical extent of the chloride impact. Referring to Table 1, the confirmation trench samples not show any elevated chloride impacts at 4.0' below surface.

In order to remove the chloride impact, the excavation depths ranged from 2.0' to 3.0' below surface. Bottom hole and sidewall confirmation samples were collected in the excavation and confirmed that the chloride impact was removed. The excavated areas and depths are highlighted in Table 1 and shown on Figure 4. Approximately 240 cubic yards<sup>3</sup> of soil were removed and transported to R360 facility for proper disposal. Once approved by the BLM, the site was then backfilled with clean material to surface grade, ripped and seeded.



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 performed at the site, please call me at (432) 682-4559.

Respectfully submitted, TETRATECH Ike Tavarez, PG Senior Project Menager

cc: Pat Ellis – COG Jim Amos - BLM

## FIGURES

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Drawn By; Isabel Marmolejo







## PHOTOGRAPHS

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## COG Operating LLC Burch Keely Unit #632 Eddy County, New Mexico



View Northwest- Excavated areas of AH-1 and AH-2.



View Northwest – Backfill

## TABLES

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# Table 1COG Operating LLC.Birch Keely Unit #632Eddy County, New Mexico

Sample ID	Somala Data	Sample	Soil S	Status	]	「PH (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride
Sample ID	Sample Date	Depth (ft)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	2/12/2013	- 0-1		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	2,290
		1-1.5		X							- 新聞 - 新聞		2,030
		*1.5-2		X									1,970
CS-1 South Wall	5/13/2013	-	X		-	-	-	-	-	_	-	-	192
CS-1 East Wall	11	-	X		-	-	-	-	-	-	-	-	622
CS-1 West Wall	11	-	Х		-	-	-	-	-	-	-	-	1,410
CS-1 Bottom Hole	11	~	Х		-	-	-	-	-	-	-	-	243
T-1	5/9/2013	0		X	-			ر. بر رو <del>ب</del> ر میدرد.	a ser a s			<b>-</b>	1,670
	ti -	2		X	-		-	-		-	-	-	1,040
	U	4	Х		-	-	-	-	-	-	-	-	759
	11	6	X		-	-	-	-	-	~	-	-	646
	"	8	Х		-	-	-	-		-	-	-	220
	11	10	X		-	-	-	-	-	-	-	-	<20.0
	в	12	X		-	-	-	-	-	-	-	-	25.3
AH-2	2/12/2013	0-1		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,950
· · · · · · · · · · · · · · · · · · ·	.H 	1-1.5	e of	X		12		18. T.					742
CS-2 North Wall	5/9/2013	-	X		-	-	-	-	-	-	-	-	111
CS-2 East Wall	13	-	Х		-	-	-	-	-	-	-	-	607
CS-2 West Wall	11	-	Х		-	-	-	-	-	-	-	-	223
CS-2 Bottom Hole	·u	-	Х		-	-	-	-	-	-	-	-	132



APPENDIX A

.

District I 1625 N. French Dr., Hobbs, NM 88240 State of New Monte Energy Minerals and Natural Resources AUG 23 2013 Form C-141 Revised October 10, 2003 District II 1301 W. Grand Avenue, Artesia, NM 88210 Oil Conservation Division 1220 South St. Francis DrOCD ARTESIA Submit 2 Copies to appropriate District Office in accordance District III 1000 Rio Brazos Road, Aztec, NM 87410 with Rule 116 on back District IV side of form 1220 S. St. Francis Dr., Santa Fe, NM 87505 Santa Fe, NM 87505 **Release Notification and Corrective Action** . . .

			OPERATOR	L	_ Initial Report	I Final Repor
Name of Company	y COG Operating	g LLC	Contact	Pat Ellis		
Address	600 W. Illinois Ave. Midland,	Texas 79701	Telephone No.	(432) 230-0077	7	
Facility Name	Burch Keely Unit #	632	Facility Type	Well Pad		
	· · · · · · · · · · · · · · · · · · ·					
Surface Owner: Fe	ederal	Mineral Owner	r		Lease No. (API#)	30-015-40327

#### LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County	
М	24	175	29E					1	Eddy
								}	

Latitude N 32 48.855° Longitude W 104 02.066°

#### NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 40 bbls	Volume Re	ecovered 35 bbls
Source of Release: BKU #112 Injection Line	Date and Hour of Occurrence 01/08/2013	Date and H 01/08/2012	lour of Discovery 2 10:00 AM
Was Immediate Notice Given?	If YES, To Whom?		
🗌 Yes 🛛 No 🗌 Not Required			
By Whom?	Date and Hour 12/31/2012 9:30 p	.m.	
Was a Watercourse Reached?	If YES, Volume Impacting the Wa	tercourse.	
, 🗌 Yes 🛛 No	N/A		
If a Watercourse was Impacted, Describe Fully.*			
Describe Cause of Problem and Remedial Action Taken.*			
Dean's Electric was drilling a hole to set an electrical pole and hit a fiberg	glass injection line. The line has been	replaced.	
Describe Area Affected and Cleanup Action Taken.*			
Tetra Tech personnel inspected the site and collected samples to define the	e spills extent. Soil that exceeded the	RRAL was re	moved and hauled away for
to NMOCD for review	with clean backing material. Tetra Tech	n prepared a c	iosure report and submitted it
I hereby certify that the information given above is true and complete to t	he best of my knowledge and understa	and that pursu	ant to NMOCD rules and
regulations all operators are required to report and/or file certain release n	otifications and perform corrective ac	tions for relea	ises which may endanger
public health or the environment. The acceptance of a C-141 report by th	e NMOCD marked as "Final Report"	does not relie	ve the operator of liability
should their operations have failed to adequately investigate and remediat	e contamination that pose a threat to g	ground water,	surface water, human health
or the environment. In addition, NMOCD acceptance of a C-141 report d	oes not relieve the operator of respon	sibility for co	mpliance with any other
federal, state, or local laws and/or regulations.	OU CONGERN		
	<u>OIL CONSERV</u>	VATIONI	DIVISION
Signature:			
	Approved by District Supervisor:		
Printed Name: Ike Tavarez			
Title: Project Manager	Approval Date:	Expiration D	ate:
	- TL		
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:		Attached
$0 \leq 12$			
Date: Phone: (432) 682-4559			

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

			Rele	ease Notific	cation	and Co	orrective A	ction		
						<b>OPERA</b>	FOR	🛛 Initi	al Report 🔲 Final Repor	
Name of Co	mpany	COG OP	ERATIN	G LLC		Contact	. Pa	t Ellis		
Address	600 We	st Illinois A	venue, M	idland, TX 797	01	Telephone 1	No. 432-	230-0077		
Facility Nat	ne	Burch Keely	y Unit #6	32		Facility Typ	e We	ll pad		
Surface Ow	ner Feder	al		Mineral C	Owner			Lease 1	No. (API#) 30-015-40327	
, 			•	LOCA	TION	N OF REI	LEASE			
Unit Letter M	Section 24	Township 17S	Range 29E	Feet from the	North/	th/South Line Feet from the East/West Line Cou			County Eddy	
	Latitude 32 48.855 Longitude 104 02.066									
Transform	D1			NAT	URE	OF REL	EASE		D 1 26111	
Type of Kele	ase produc	ed water				volume of	Kelease 4000is	volume	Recovered 3300is	
Source of Re	lease BKU	#112 injectio	n line			Date and H 01/08/2012	lour of Occurrenc	e Date and 01/08/20	Hour of Discovery 13 10:00 a.m.	
Was Immedi	ate Notice C	Given?	Yes 🛛	No 🗌 Not R	equired	If YES, To	Whom?			
By Whom?	_					Date and I	lour			
Was a Watercourse Reached?							olume Impacting t	he Watercourse.		
If a Watercon	irse was Im	pacted, Descr	ibe Fully.'	k						
Describe Cau	ise of Probl	em and Reme	dial Actio	n Taken.*						
Dean's Elect	ric was drill	ling hole to se	t an electri	ical pole and hit a	fibergla	ss injection l	ine. The line has	been replaced.		
Describe Are	a Affected	and Cleanup /	Action Tal	cen.*				······································		
Initially 40bb recovered. The area to deline remediation	ols of produche spill was eate any pos work.	ced water wer contained on ssible contami	e released the well p nation from	from the injectio ad adjacent to wh m the release and	n line an here the i we will	d we were at njection line present a wo	ole to recover 35bl was hit in an area rk plan to the NM	ols with a vacuum of 20' x 60'. Tetra OCD/BLM for app	truck. All free fluid has been a Tech will sample the spill site proval prior to any significant	
I hereby certi regulations a public health should their o or the envirou federal, state	fy that the i ll operators or the envir operations h nment. In a or local lav	information gi are required to ronment. The ave failed to a ddition, NMC ws and/or regu	ven above o report ar acceptanc adequately OCD accep ilations.	is true and comp id/or file certain r ce of a C-141 repo investigate and r tance of a C-141	elete to the release no ort by the remediate report de	te best of my otifications a NMOCD m contaminationes not reliev	knowledge and u nd perform correc arked as "Final Re on that pose a thre the operator of r	nderstand that pur tive actions for rel eport" does not rel eat to ground wate esponsibility for c	suant to NMOCD rules and eases which may endanger ieve the operator of liability r, surface water, human health ompliance with any other	
Signature:		$Z_1$	2.	5			OIL CONS	SERVATION	DIVISION	
Printed Name	e:	Josh	Russo			Approved by	District Supervise	or:		
Title:		Senior Enviro	nmental C	oordinator		Approval Da	te:	Expiration	Date:	
E-mail Addre	255:	jrusso@c	concho.co	<u>n</u>		Conditions o	f Approval:		Attached	
Date: 01/2 Attach Addi	2/2013 tional Shee	Phone: ets If Necess	432-2 arv	12-2399			******			

.

## APPENDIX B

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#### Water Well Data Average Depth to Groundwater (ft) COG - Burch Keely Unit # 632 Eddy County, New Mexico

	16	South		28 East			16 S	South	2	9 East	
6	5	4	3	2	1	6	5	4	3	2	1
7	8	9	10	11	12	7	8	9	10	11	12
18	17	16	15	14	13	18	17	16	15	14 220 dp(	13
19	20	21	22	23	24	19 110	20	21	22	23	24
30	29	28	27	26	25	30	29	28	27	26	25
31	32	33	34	35	36	31	32	33	34	35	36
	17	South		28 East	<b>4</b>		17 S	outh	2	9 East	
6	5	4	3	2	1	6	5	4	3	2	1
7	8	9	10	11	12	7	8	9	10	11	12
18	17	16	15	14	13	18	17	16	15	14	13
19	20	21	22 79	23	24	19	20	21	22 80	23	24
30	29	28	27	26	25	30	29 210 208'	28	27	26	25
31	32	33	34	35 <b>258</b>	36	31	32	33	34	35 153	36
	18	South		28 East			18 S	outh	29	) East	
6	5	4 108	3	2	1	6	5	4	3	2	1
7 49	8 69	9	10	11	12	7	8	9	10 95	11	12

	16 S	outh	30		
6	5	4	3	2	1
7	8	9	10	11	12
78	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32 سم	33	34	35	36

	17 S	outh	3(	) East	
سم ،	5-0	4	3	2	1
	8	9	10	11	12
لر 18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

6	5	4	3	2	1
7 49	8 69	9	10	11	12
18	17	16	15	14	13
19	20	21 <b>226</b>	22	23	24
49	29	28	27	26	25
31	32	33	34	35 65	36

		• • • • •			
6	5	4	3	2	م 1
7	8	9	10 <b>95</b>	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

18	South	30 1	East
10	ooun		

6	5 [7	4	3	2	1
7	ر م	9	10	11	12
18	<b>1</b> 7	16	15	14	13
19	20	21	22	23	24
30 U	29	28	27	26	25
31	32	33	34	35	36

New Mexico State Engineers Well Reports

USGS Well Reports

Example 3 Geology and Groundwater Conditions in Southern Eddy, County, NM

NMOCD - Groundwater Data

Field water level

New Mexico Water and Infrastructure Data System

## APPENDIX C

.

## **Summary Report**

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

Report Date: February 25, 2013

Work Order: 13021532

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
321287	AH-1 (0-1')	soil	2013-02-12	00:00	2013-02-15
321288	AH-1 (1-1.5')	soil	2013-02-12	00:00	2013-02-15
321289	AH-1 (1.5-2')	soil	2013-02-12	00:00	2013-02-15
321290	AH-2 (0-1')	soil	2013-02-12	00:00	2013-02-15
321291	AH-2 (1-1.5')	soil	2013-02-12	00:00	2013-02-15

			BTEX	TPH DRO - NEW	TPH GRO	
	Benzene Tolucne Ethylbenzene Xylene					GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
321287 - AH-1 (0-1')	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<4.00 Qs
321290 - AH-2 (0-1')	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<4.00 Qs

#### Sample: 321287 - AH-1 (0-1')

Param	Flag	Result	Units	$\operatorname{RL}$
Chloride		2290	mg/Kg	4

#### Sample: 321288 - AH-1 (1-1.5')

Param	Flag	Result	$\mathbf{Units}$	$\operatorname{RL}$
Chloride		2030	mg/Kg	4

#### Sample: 321289 - AH-1 (1.5-2')

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

Report Date: February 25, 2013		Work Order: 13021532		Page Number: 2 of 2		
Param	Flag	Result	Units	RL		
Chloride		1970	mg/Kg	4		
Sample: 321290	- AH-2 (0-1')					
Param	Flag	Result	Units	RL		
Chloride		4950	mg/Kg	4		
Sample: 321291	- AH-2 (1-1.5')					
Param	Flag	Result	Units	RL		
Chloride		742	mg/Kg	4		



200 East Surise! Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

El Paso, Texas 79922 Midland, Texas 79923 Carrolizon, Texas 7506 Ostraicanalusis com WEB: www

Svite 100 Carroliton. Texas 75006 972-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: February 25, 2013

FAX 915 - 585 - 4944

FAX 432 . 689 . 6313

Work Order: 13021532

915-585-3443

432-689-6301

972-242-7750

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

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
321287	AH-1 (0-1')	soil	2013-02-12	00:00	2013-02-15
321288	AH-1 (1-1.5')	soil	2013-02-12	00:00	2013-02-15
321289	AH-1 (1.5-2')	soil	2013-02-12	00:00	2013-02-15
321290	AH-2 (0-1')	soil	2013-02-12	00:00	2013-02-15
321291	AH-2 (1-1.5')	soil	2013-02-12	00:00	2013-02-15

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

This report consists of a total of 21 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Slan,

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

## **Report Contents**

Case Narrative
Analytical Report     Sample 321287 (AH-1 (0-1'))     Sample 321288 (AH-1 (1-1.5'))     Sample 321289 (AH-1 (1.5-2'))     Sample 321290 (AH-2 (0-1'))     Sample 321291 (AH-2 (1-1.5'))
Method Blanks QC Batch 99035 - Method Blank (1)
QC Batch 99229 - Method Blank (1)   1     QC Batch 99230 - Method Blank (1)   1
Laboratory Control Spikes   1     QC Batch 99035 - LCS (1)   1     QC Batch 99045 - LCS (1)   1     QC Batch 99047 - LCS (1)   1     QC Batch 99029 - LCS (1)   1     QC Batch 99229 - LCS (1)   1     QC Batch 99230 - LCS (1)   1     QC Batch 99230 - LCS (1)   1     QC Batch 99035 - MS (1)   1
QC Batch 99045 - MS (1)   11     QC Batch 99047 - MS (1)   14     QC Batch 99229 - MS (1)   14     QC Batch 99230 - MS (1)
Calibration Standards   16     QC Batch 99035 - CCV (1)   16     QC Batch 99035 - CCV (2)   16     QC Batch 99035 - CCV (3)   16     QC Batch 99035 - CCV (4)   16     QC Batch 99035 - CCV (1)   16     QC Batch 99045 - CCV (1)   16     QC Batch 99045 - CCV (2)   17     QC Batch 99045 - CCV (2)   17     QC Batch 99047 - CCV (2)   17     QC Batch 99047 - CCV (2)   17     QC Batch 99047 - CCV (2)   18     QC Batch 99047 - CCV (2)   18     QC Batch 99047 - CCV (2)   18     QC Batch 99047 - CCV (2)   14     QC Batch 99047 - CCV (2)   14     QC Batch 99047 - CCV (2)   14     QC Batch 9929 - CCV (1)   14     QC Batch 9920 - CCV (2)   14     QC Batch 99230 - CCV (2)   14
Appendix   20     Report Definitions   20

Laboratory Certifications	20
Standard Flags	20
Attachments	20

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## Case Narrative

Samples for project COG/Birch Kelly Unit #632 were received by TraceAnalysis, Inc. on 2013-02-15 and assigned to work order 13021532. Samples for work order 13021532 were received intact at a temperature of 2.2 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	83915	2013-02-18 at 10:00	99045	2013-02-18 at 10:00
Chloride (Titration)	SM 4500-Cl B	84061	2013-02-21 at 12:58	99229	2013-02-25 at 15:59
Chloride (Titration)	SM 4500-Cl B	84061	2013-02-21 at 12:58	99230	2013-02-25 at 16:00
TPH DRO - NEW	S 8015 D	83905	2013-02-18 at 08:00	99035	2013-02-19 at 08:53
TPH GRO	S 8015 D	83915	2013-02-18 at 10:00	99047	2013-02-18 at 10:00

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 13021532 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: February 25, 2013 112C05053

## **Analytical Report**

#### Sample: 321287 - AH-1 (0-1')

Laboratory:	Midland											
Analysis:	BTEX		Aı	nalytical	Method:	S 80	21B			Prep Method	l: S 50	)35
QC Batch:	99045		D٤	ate Anal	yzed:	2013	-02-18			Analyzed By	: YG	
Prep Batch:	83915		Sa	mple Pr	eparation	2013	-02-18			Prepared By	: YG	
						DI						
<b>D</b>		101		<u> </u>				<b>TT T</b>			-	<b></b>
Parameter		Flag		Cert		Result		Units	3	Dilution	1	
Benzene		U		1	<	0.0200		ing/Ka	r D	1	0.02	200
Toluene		U.		1	<	0.0200		mg/Kg	, ,	1	0.02	200
Ethylbenzene	<u>}</u>	U		I	<	0.0200		mg/Kg	>	1	0.02	200
Xylene		U		.1	<	0.0200		mg/Kg	5	<u> </u>	0.02	200
									Spike	Percent	Recover	rv
Surrogate			Flag	Cert	Result	Unit	s I	Dilution	Amount	Recovery	Limits	s
Triffuorotolue	ene (TFT)	Qsr	Qsr		2.20	mg/k	ζg	1	2.00	110	79.5 - 1	08
4-Bromofluor	obenzene (4-BFB)				2.02	mg/k	ζg	1	2.00	101	71.4 - 1	.08
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titration 99229 84061	n) Flag		Analy Date Samp Cert	vtical Met Analyzed: le Prepara F	hod: ation: RL Result 2290	SM 45 2013-0 2013-0	500-Cl B 02-25 02-21 Units mg/Kg	s	Prep Meth Analyzed I Prepared E Dilution 10	od: N/ By: AF By: AF R 4.0	/A 3 3 RL 00
Sample: 32 Laboratory: Analysis: QC Batch: Prep Batch:	<b>1287 - AH-1 (0-1</b> Midland TPH DRO - NEW 99035 83905	<b>'</b> )		Anal Dat€ Sam	lytical Me e Analyzec ple Prepa	thod: l: ration:	S 803 2013- 2013-	15 D -02-19 -02-18		Prep Methe Analyzed E Prepared E	od: N/ By: CV By: CV	'A N N
						RL						
Parameter		Flag	_	Cert	F	Result		Units	3	Dilution	R	ł۲
DRO		U		1		< 50.0		mg/Kg	5	1	50	0.0

Report Date: February 25, 2013 112C05053				C	Work Ore OG/Birch	Page Number: 6 of 21 Eddy Co., NM				
Surrogate	Flag	Cer	t.	Result	Units	Dilu	tion	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane				70.8	mg/Kg	1		100	71	70 - 130
Sample: 32	1287 - AH-1 (0-1	L')								
Laboratory: Analysis: QC Batch:	Midland TPH GRO 99047			Analytic Date An	al Method: alyzed:	S 8013 2013-0	5 D )2-18		Prep Meth Analyzed F	od: S 5035 3y: YG
Prep Batch:	83915			Sample 1	Preparation	a: 2013-0	)2-18	•	Prepared E	By: YG
						$\mathbf{RL}$				
Parameter		Flag		Cert	R	esult		Units	Dilution	$\operatorname{RL}$
GRO		Qs,U		<u>ا</u>	<	<4.00	1	ng/Kg	1	4.00
								Spike	Percent	Recovery
Surrogate			Flag	Cert	Result	Units	Dilut	ion Amount	Recovery	Limits
Trifluorotolu	ene (TFT)				1.82	mg/Kg	1	2.00	91	70 - 130
4-Bromofluor	cobenzene (4-BFB)				1.99	$\mathrm{mg/Kg}$	1	2.00	100	70 - 130

### Sample: 321288 - AH-1 (1-1.5')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 99230 84061		Analytic Date An Sample I	al Method: alyzed: Preparation:	SM 4500-Cl B 2013-02-25 2013-02-21	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Parameter	pr Flag		RL Cert Besult		Units	Dilution	BL
Chloride		0		2030	mg/Kg	10	4.00

#### Sample: 321289 - AH-1 (1.5-2')

Laboratory: Analysis	Midland Chloride (Titration)	Aualytical Method	SM 4500-C1 B	Pren Method:	N / A
QC Batch:	99230	Date Analyzed:	2013-02-25	Analyzed By:	AR
Prep Batch:	84061	Sample Preparation:	2013-02-21	Prepared By:	$\mathbf{AR}$
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continued ...

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Report Date: February 25, 112C05053	2013		Work Order: 13021532 COG/Birch Kelly Unit #632					Page Number: 7 of 21 Eddy Co., NM		
sample 321289 continued										
					$\operatorname{RL}$					
Parameter	Flag		Cert	R	esult	Unit	s	Dilution	RL	
					RL					
Parameter Fla			Cert	R	esult	Unit	s	Dilution	$\mathbf{RL}$	
Chloride					1970	mg/K	g	10	4.00	
Sample: 321290 - AH-2 Laboratory: Midland Analysis: BTEX QC Batch: 99045 Brop Batch: 82015	(0-1')	An Da Sai	alytical te Anal mple Pr	Method: yzed: eparation:	S 8021E 2013-02- 2013-02-	3 -18		Prep Meth Analyzed I Prenared F	od: S 5035 3y: YG	
Fred Datch: 65910								- repeterer -		
rrep batch: 85915				1	DI				. IQ	
Parameter	Flag		Cert	F	RL Result	Unit:	3	Dilution	RL	
ParameterBenzene	Flag		Cert	F 	RL Result	Unit: mg/Kg	<u> </u>	Dilution .	$\frac{\text{RL}}{0.0200}$	
Parameter Benzene Toluene	Flag v v		Cert 1	F <0 <0	RL Result .0200 .0200	Unit: mg/Kg mg/Kg	5	Dilution 1 1	RL 0.0200 0.0200	
Parameter Benzene Toluene Ethylbenzene	Flag v v		Cert 1 1	F <0 <0 <0	RL Result .0200 .0200 .0200	Unit: mg/Kg mg/Kg mg/Kg	5	Dilution . 1 1 1	RL 0.0200 0.0200 0.0200	
Parameter Benzene Toluene Ethylbenzene Xylene	Flag v v v		Cert 1 1 1	F <0 <0 <0 <0	RL Result .0200 .0200 .0200 .0200	Unit: mg/Kg mg/Kg mg/Kg mg/Kg	5	Dilution . 1 1 1 1	RL 0.0200 0.0200 0.0200 0.0200 0.0200	
Parameter Benzene Toluene Ethylbenzene Xylene	Flag v v v v		Cert 1 1 1	F <0 <0 <0 <0 <0	RL Result .0200 .0200 .0200 .0200	Unit: mg/Kg mg/Kg mg/Kg	S S S S S S S S S S Pike	Dilution	RL 0.0200 0.0200 0.0200 0.0200 0.0200 Recovery	
Parameter Benzene Toluene Ethylbenzene Xylene Surrogate	Flag v v v	Flag	Cert 1 1 1 Cert	F <00 <00 <00 <00 Result	RL Acsult .0200 .0200 .0200 .0200 .0200 Units	Unit: mg/Kg mg/Kg mg/Kg Dilution	s 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Dilution 1 1 1 1 1 1 Percent Recovery	RL 0.0200 0.0200 0.0200 0.0200 0.0200 Recovery Limits	
Parameter Benzene Toluene Ethylbenzene Xylene Surrogate Trifluorotoluene (TFT)	Flag U U U U	Flag	Cert 1 1 1 Cert	Image: Filler       <0	RL Result .0200 .0200 .0200 .0200 .0200 .0200 .0200	Unit: mg/Kg mg/Kg mg/Kg Dilution	s 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Dilution 1 1 1 1 1 Percent Recovery 109	RL 0.0200 0.0200 0.0200 0.0200 0.0200 Recovery Limits 79.5 - 108	

#### Sample: 321290 - AH-2 (0-1')

Laboratory: Midland Analysis: Chloride (Titration) QC Batch: 99230 Prep Batch: 84061		Analytic Date An Sample 1	al Method: alyzed: Preparation:	SM 4500-Cl B 2013-02-25 2013-02-21	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			$\operatorname{RL}$			
Parameter	Flag	Cert	Result	Units	Dilution	$\mathbf{RL}$
Chloride			4950	mg/Kg	10	4.00

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Report Date 112C05053	: February 25, 20		C	Work Or OG/Birch		Page Number: 8 of 21 Eddy Co., NM				
Sample: 32	1290 - AH-2 (0-	1')								
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH DRO - NE 99035 83905		Analytical Method:S 8015 DDate Analyzed:2013-02-19Sample Preparation:2013-02-18					Prep Method: N Analyzed By: C Prepared By: C		
		RL								
Parameter		Flag		Cert Result Units		ts	Dilution	RL		
DRO		46		1		<50.0	mg/F	(g	1	50.0
Surrogate	Flag	Cert	R	esult	Units	Dilut	tion A	Spike mount	Percent Recovery	Recovery Limits
n-Tricosane				103	mg/Kg	1		100	103	70 - 130
Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 99047 83915		A D S	Analytica Date Ana Cample F	al Method alyzed: Preparation	: S 8015 2013-0 n: 2013-0	D 2-18 2-18		Prep Meth Analyzed E Prepared E	od: S 5035 8y: YG 8y: YG
Danamatan		Flag		Cont	т	RL	T 7:	<b>L</b>	Dilution	זסי
GRO				, Cert	1	$\frac{1}{\sqrt{4.00}}$		เร ัส		4.00
Gumerata			Elog.	Cont	Double	Unita	Dilution	Spike	Percent	Recovery
Triffuorotolu	and (TET)	~	r lag	Cert	2 01			2 00		
4-Bromofluor	obenzene (4-BFB)	Qsr )	Clar		1.99	mg/Kg mg/Kg	1	2.00 2.00	100	70 - 130
Sample: 32	1291 - AH-2 (1- Midland	1.5')								

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Analysis: QC Batch: Prep Batch:	nalysis: Chloride (Titration) 2C Batch: 99230 rep Batch: 84061		vtical Method: Analyzed: le Preparation:	SM 4500-Cl B 2013-02-25 2013-02-21	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Danamatan	Diam	Cont	RL	Tin:te	Dilution	זמ
Farameter	rag	Cert	Result	Units	Dilution	<u>RL</u>
Chloride	······································		742	mg/Kg	5	4.00

Report Date: February 25, 2013 112C05053

#### Work Order: 13021532 COG/Birch Kelly Unit #632

## Method Blanks

QC Batch: 99035

Method Blank (1)

QC Batch: Prep Batch:	C Batch: 99035 rep Batch: 83905		Date Ar QC Pre	nalyzed: paration:	2013-02-19 2013-02-18			Analyze Preparec	d By: CW d By: CW	
Parameter			Flag	Ş	Cert		MDL Result		Units	RL
DRO				I		8.53		mg/Kg	50	
Surrogate		Flag	Cert	Result	Units	Dilutic	)11 .	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane				114	nıg/Kg	ς 1		100	114	70 - 130
Method Bla	ank (1)	QC B	Batch: 9904;	5						

QC Batch: 99045		Date Analyzed:			2013-02-1	.8	Analyze	d By: YG		
Prep Batch: 83915		QC Preparation			2013-02-1	2013-02-18			l By: YG	
						MDL				
Parameter		Flag		Cert		$\operatorname{Result}$		Units		
Benzene				1		< 0.00810		mg/Kg		
Toluene				1		< 0.00750		mg/Kg		
Ethylbenzene				1		< 0.00730		mg/Kg		
Xylene				1		< 0.00700		mg/Kg	0.02	
							Spike	Percent	Recovery	
Surrogate		Flag	$\operatorname{Cert}$	Result	Units	Dilution	Amount	Recovery	Limits	
Trifluorotoluene (TFT)	Qsr	Qar		2.21	mg/Kg	1	2.00	110	79.5 - 108	
4-Bromofluorobenzene (4-BFB)		2.08	mg/Kg	1	2.00	104	71.4 - 108			

Method Bla	ank (1)	QC Batch: 99047					
QC Batch:	99047		Date Analyzed:	2013-02-18	Ar	nalyzed By:	YG
Prep Batch:	83915		QC Preparation:	2013-02-18	Pr	epared By:	YG

Report Date: Febru 112C05053	ary 25, 2013	Work Or COG/Birch	der: 1302153 Kelly Unit =		Page Number: 10 of 21 Eddy Co., NM			
Parameter GRO	Flag	Cert		MDL Result		Units	RL 4	
Surrogate Trifluorotoluene (TF 4-Bromoffuorobenze	Flag T) ne (4-BFB)	Cert     Result       1.66     2.05	Units mg/Kg mg/Kg	Dilution 1 1	Spike Amount 2.00 2.00	Percent Recovery 83 102	Recovery Limits 70 - 130 70 - 130	
Method Blank (1) QC Batch: 99229 Prep Batch: 84061	) QC Batch: 99229	Date Analyzed: QC Preparation:	2013-02-25 2013-02-21			Analyzed I Prepared I	3y: AR 3y: AR	
Parameter Chloride	Flag	Cert		MDL Result <3.85		Units mg/Kg	RL 4	
, Method Blank (1)	QC Batch: 99230							
QC Batch: 99230 Prep Batch: 84061	· · · · · · · · · · · · · · · · · · ·	Date Analyzed: QC Preparation:	2013-02-25 2013-02-21			Analyzed I Prepared I	By: AR By: AR	
Parameter Chloride	Flag	Cert		MDL Result <3.85		Units mg/Kg	RL 4	

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Report Date: February 25, 2013 112C05053

## Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

QC Batch:	99035			Date	Analyzed	l: 2013	3-02-19			Au	alyzed B	y: CW
Prep Batch:	83905			QC P	reparatio	on: 2013	8-02-18			$\Pr$	epared B	y: CW
					LCS			Spike	M	atrix		Rec.
Param			$\mathbf{F}$	C I	Result	Units	Dil.	Amount	$\mathbf{R}$	esult	Rec.	$\operatorname{Limit}$
DRO				1	298	mg/Kg	1	250	8	3.53	116	70 - 130
Percent recov	very is based on the s	spike	resu	lt. RPD	is based	on the sp	oike and s	pike duplica	ate res	nlt.		
				LCSD			Spike	Matrix		Rec.		RPD
Param		$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPE	) Limit
DRO	······································		1	268	mg/Kg	; 1	250	8.53	104	70 - 13	$0 \cdot 11$	20
Percent recov	very is based on the s	pike	resu	lt. RPD	is based	on the sp	oike and s	pike duplica	ate res	ult.		
		L	CS	LCS	D			Spike	LC	S L	CSD	Rec.
Surrogate		$\operatorname{Re}$	$\operatorname{sult}$	Resu	lt U	Inits	Dil.	Amount	Rec	:. F	lec.	Limit
n-Tricosane		1	27	120	m	g/Kg	1	100	12	7	20	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch:	99045		I	Date Analy	zed: 20	013-02-18			Analyzed By:	YG
Prep Batch:	83915		C	QC Prepara	ation: 20	013-02-18			Prepared By:	$\mathbf{Y}\mathbf{G}$
					-					
				LCS			Spike	Matrix	I	Rec.
Param		$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	$\operatorname{Amount}$	Result	Rec. L	imit

	τ.	U	Treame	Omts	$D_{\Pi}$ .	Amount	ruesun	nec.	Dunn
Benzene		ı	1.87	mg/Kg	1	2.00	< 0.00810	94	72.4 - 120
Toluene		1	1.96	mg/Kg	1	2.00	< 0.00750	98	77 - 120
Ethylbenzene		1	2.12	mg/Kg	1	2.00	< 0.00730	106	71.8 - 120
Xylene		1	6.60	mg/Kg	1	6.00	< 0.00700	110	78.3 - 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	$\mathbf{F}$	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		1	1.87	mg/Kg	1	2.00	< 0.00810	94	72.4 - 120	0	20
Toluene		1	1.95	mg/Kg	1	2.00	< 0.00750	98	77 - 120	0	20
Ethylbenzene		Т	2.11	mg/Kg	1	2.00	< 0.00730	106	71.8 - 120	0	20
Xylene		1	6.60	mg/Kg	1	6.00	<0.00700	110	78.3 - 120	0	20

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

Report Date: February 25, 2013 112C05053			Work Order: 13021532 COG/Birch Kelly Unit #632									Page Number: 12 of 21 Eddy Co., NM			
Surrogate			R	LCS lesult	LCSE Resul	) .t	Units	Dil	Spil Amou	æ int	LCS Rec.	LCS Rec	D	Rec. Limit	
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-BFB)	Qør	Qsr		2.20 2.10	2.22 2.07	11	ng/Kg ng/Kg	1 1	2.0 2.0	0	$\frac{110}{105}$	111 104	. 7§ . 7]	).5 - 108 L.4 - 108	
Laboratory Control Spike (LC	CS-1	.)													
QC Batch: 99047 Prep Batch: 83915			Date QC	e Analy Prepara	vzed: ation:	$\begin{array}{c} 201 \\ 201 \end{array}$	3-02-18 3-02-18					Analy Prepa	zed By red By	y: YG 7: YG	
Param		F	С	LCS Bosult	T	Inite	ائط		Spike Amount	N T	Aatrix	Be		Rec. Limit	
GRO				23.8	<u> </u>	r/Ka	1	•	20.0	1	9.01	11	<u>q</u>	$\frac{1000}{70-130}$	
Depart approximit is bound on the s	:1.0	-	י זמס ו	20.0		5/ <u>115</u>			20.0				.0		
rercent recovery is based on the s	ріке	resu	16. N.I. I.	o is das	eq on a	sne sj	nke and	. зрік	e aupica	ue re	sun.				
			LCSD	i -			Spike	: ]	Matrix		R	ec.		RPD	
Param	F	С	Result	; Un	its I	Dil.	Amou	ıt	Result	Rec.	Li	mit	RPD	Limit	
GRO		1	24.4	mg/	′Kg	1	20.0		9.01	122	- 70 -	130	2	20	
Percent recovery is based on the s	pike	resul	lt. RPD	) is base	ed on t	he sp	oike and	spik	e duplica	te re	sult.				
			т	<b>~</b>	ו מפח				Q;1		T CR	IC	מה	Dog	
Surrogato			Бе Ве	oo sult	Result	T	Inite	Dil	ուրը Amo	se unt	Bec		SU M	Limit	
Triffuorotoluene (TFT)			2.	02	2.01	`	10°/Kg	1	2.0	0	101	10	0	1000000000000000000000000000000000000	
4-Bromofluorobenzene (4-BFB)			2.	08	2.11	n	g/Kg	1	2.0	0	104	10	6	70 - 130	
Laboratory Control Spike (LC	CS-1	)													
			-												
QC Batch: 99229 Prep Batch: 84061			Date QC	e Analy Prepara	zed: ation:	2013 2013	3-02-25 3-02-21					Analy Prepa	zed By red By	y: AR y: AR	
<b>D</b>		P	a	LCS	TT	.,	D.1		Spike	N	Iatrix	D		Rec.	
raram Chlorido		г	<u> </u>	nesult 9750		nits			Amount	-1	tesult	Ke	<u>c.</u>	Limit	
	• 1			2100		- 	<u> </u>		2000		L0.00	11	<u> </u>	50 - 110	
Percent recovery is based on the s	pike	resul	t. RPD	is base	ed on t	ne sp	nke and	spik	e duplica	te re	sult.				
			LCSD				Spike	I	Matrix		Re	ec.		RPD	
Param	F	$\mathbf{C}$	Result	Uni	its I	Dil.	Amour	nt i	Result	Rec.	Liı	mit	RPD	Limit	
Chloride			2630	mg/	Kg	1	2500		<3.85	105	85 -	115	4	20	
Percent recovery is based on the s	pike	resul	t. RPD	is base	ed on t	he sp	ike and	spik	e duplica	te re	sult.				

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Laboratory Control Spike (I QC Batch: 99230 Prep Batch: 84061 Param Chloride	CS-1	1)	Date QC	e Analyzed Preparatic	l: 2013 on: 2013	3-02-25 3-02-21			Ana	lyzed B	y: AR
QC Batch: 99230 Prep Batch: 84061 Param Chloride			Date QC	e Analyzed Preparatio	l: 2013 on: 2013	3-02-25 3-02-21			Ana	lyzed B	y: AR
Prep Batch: 84061 Param Chloride			QC	Preparatio	on: 201;	3-02-21			Drot	וח	
Param Chloride									riej	bared B	y: AR
Param Chloride				LCS			Spike	Mε	atrix		Rec.
Chloride		F	С	Result	Units	Dil.	Amount	Re	sult F	lec.	Limit
				2520	mg/Kg	1	2500		3.85	101	85 - 115
Percent recovery is based on the	spike	resu	lt. RPE	) is based o	on the sp	ike and sp	ike duplica	te resu	ılt.	•	
			LCSD			Snike	Matrix		Rec		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2710	mg/Kg	1	2500	<3.85	108	85 - 115	7	20
QC Batch: 99035 Prep Batch: 83905			Date QC 1	: Analyzed Preparatio	: 2013 n: 2013	-02-19 -02-18			Anal Prep	yzed By ared By	: CW : CW
D		-	a	MS	<b>**</b> •.	D.1	Spike	Ma	trix		Rec.
Param		<u>F.</u>	C	Result	Units	1	Amount	Ke	$\frac{\text{sult}}{50}$	.ec.	$\frac{\text{Limit}}{70 + 120}$
			1 .	055	ng/Kg		200	4		10	10 - 150
Percent recovery is based on the	spike	resu	it. RPD	is based of	on the sp	ike and sp	ike duplica	te resu	.lt.		
			MSD			Spike	Matrix		Rec.		RPD
	Б	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Param	г			1	- 1	250	459	124	70 - 130	16	20
Param DRO	<u>г</u>	1	768	mg/Kg	<u> </u>	200					
Param DRO Percent recovery is based on the	г spike	ı resu	768 lt. RPD	mg/Kg is based o	on the sp	ike and sp	ike duplica	te resu	lt.		
Param DRO Percent recovery is based on the	spike	resul	768 lt. RPD	mg/Kg ) is based o	on the sp	ike and sp	ike duplica Snike	te resu	lt. S MS		Rec
Param DRO Percent recovery is based on the Surrogate	r spike N Be	resul 1S sult	768 lt. RPD MS Res	mg/Kg ) is based of 3D ult. I	n the sp	Dil.	ike duplica Spike Amount	te resu MS Rec	lt. S MS 2. Be	Dc.	Rec. Limit

Matrix Spil	ke (MS-1)	Spiked Sample: 321062			
QC Batch:	99045	Date Analyzed:	2013-02-18	Analyzed By:	YG
Prep Batch:	83915	QC Preparation:	2013-02-18	Prepared By:	YG

Report Date: February 25, 2013 112C05053			We COG,	Pa	Page Number: 14 of 21 Eddy Co., NM				
Param	F	С	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.29	mg/Kg	1	2.00	<0.00810	114	66.3 - 138
Toluene		1	2.41	mg/Kg	1	2.00	< 0.00750	120	64.8 - 142
Ethylbenzene		1	2.63	mg/Kg	1	2.00	< 0.00730	132	72 - 132
Xylene		1	8.17	$\mathrm{mg/Kg}$	1	6.00	< 0.00700	136	60.8 - 148

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
Benzene		1	2.24	mg/Kg	1	2.00	< 0.00810	112	66.3 - 138	2	20
Toluene		1	2.35	mg/Kg	1	2.00	< 0.00750	118	64.8 - 142	$^{2}$	20
Ethylbenzene		ı	2.54	mg/Kg	1	2.00	< 0.00730	127	72 - 132	4	20
Xylene		ı	7.88	mg/Kg	1	6.00	< 0.00700	131	60.8 - 148	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	Rec.
Surrogate			$\operatorname{Result}$	$\operatorname{Result}$	Units	Dil.	$\operatorname{Amount}$	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	Qsr	Qsr	2.19	2.20	mg/Kg	1	2	110	110	79.5 - 108
4-Bromofluorobenzene (4-BFB)			2.09	2.06	mg/Kg	1	2	104	103	71.4 - 108

#### Matrix Spike (MS-1) Spiked Sample: 321062

QC Batch:	2013-02-18 Date Analyzed: 2013-02-18							Analyzed By: YG				
Prep Batch:	83915		Q	C Preparat	Ι	Prepared By: YG						
		Spike	Matrix		Rec.							
Param		$\mathbf{F}$	С	Result	Units	Dil.	Amount	Result	Rec.	$\mathbf{Limit}$		
GRO			1	22.3	mg/Kg	1	20.0	<2.32	112	70 - 130		
Percent recov	very is based on th	e spike resu	ılt. RI	PD is based	l on the spil	ce and s	oike duplicat	e result.				

				MSD			Spike	Ma	trix		Rec		RPD
Param		F	$\mathbf{C}$	Result	Units	Dil.	Amount	t Re	sult R	ec.	Lini	it RP	D Limit
GRO	Qs	Qs	1	27.0	mg/Kg	1	20.0	<2	2.32  1	35	70 - 1	30 19	20
Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.													
				MS	MSI	)			Spike		MS	MSD	Rec.
Surrogate				Resul	t Resu	lt	Units	Dil.	Amour	ıt	Rec.	Rec.	Limit
Trifluorotoluene (TFT)				1.61	1.64	L 1	ng/Kg	1	2		80	82	70 - 130
4-Bromofluorobenzene (4-BFB)	)			2.14	2.14	ŧ ı	ng/Kg	1	2		107	107	70 - 130
Report Date: February 25, 112C05053	2013		Work Order: 13021532 COG/Birch Kelly Unit #632						Page Number: 15 of 21 Eddy Co., NM				
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Matrix Spike (MS-1)	Spiked Sa	umple	: 32128	7									
QC Batch: 99229			Da	te Analyze	ed: 203	13-02-25			A	Analyz	ed By	AR.	
Prep Batch: 84061			QC	Preparati	ion: 201	13-02-21			F	Prepar	ed By:	AR.	
				${ m MS}$			Spike	Ma	ıtrix			Rec.	
Param		F	С	Result	Units	Dil.	Amount	Re	sult	Rec.	I	Limit	
Chloride				4910	mg/Kg	10	2500	22	290	105	78.	9 - 121	
Percent recovery is based or	ı the spik	e resi	ılt. RP	D is based	on the s	pike and a	spike dupli	cate re	sult.				
			MSD			Spiko	Motrix		Roc			RPD	
Param	F	С	Result	t Units	Dil	Amount	Result	Rec.	Limi	t	RPD	Limit	
Chloride			4630	mg/Kg	10	2500	2290	94	78.9 -	121	6	20	
Matrix Spike (MS-1)	Spiked Sa	umple	e: 32150	5		•							
OC Batch: 09230			Da	te Analyza	ad ⊃01	13-02-25			۵	nalvz	od By	ΔR	
Prep Batch: 84061			QC	Preparati	ion: 201	3-02-21			F	repar	ed By:	AR	
				MS			Spike	Ма	trix		]	Rec.	
Param		$\mathbf{F}$	С	Result	Units	Dil.	Amount	Re	sult	Rec.	I	imit	
Chloride .				14600	mg/Kg	10	2500	12	600	80	78.	9 - 121	
Percent recovery is based or	1 the spike	e resu	ult. RP	D is based	on the s	pike and s	spike dupli	cate res	sult.			. <u></u>	
			MSD			Spike	Matrix		Rec.			RPD	
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	t I	RPD	Limit	

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			-	~	2000,0000	C 222010		1 millio dato	2000000000	10000	
Chlor	ide				15000	mg/Kg	10	2500	12600	96	78.9 - 121
		 <u>,</u>	 								1.

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

.

Report Date: February 25, 2013 112C05053

# **Calibration Standards**

Standard (CCV-1)

QC Batch:	99035			Date .	Analyzed:	2013-02-19		Analyzed By: CW		
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
Param	Fla	g C	$\operatorname{ert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO			1	mg/Kg	250	260	104	80 - 120	2013-02-19	

#### Standard (CCV-2)

QC Batch:	99035			Date A	Analyzed:	2013-02-19		Analyzed By: CW		
					CCVs	CCVs	CCVs	Percent	_	
					True	Found	Percent	Recovery	Date	
Param	]	Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO			1	mg/Kg	250	259	104	80 - 120	2013-02-19	

### Standard (CCV-3)

QC Batch:	99035		Dat	e Analyzed:	2013-02-19		Analy	Analyzed By: CW		
				CCVs	CCVs	CCVs	Percent	D /		
				True	Found	Percent	Recovery	Date		
Param	Fla	g Cei	rt Units	Conc.	Conc.	Recovery	Limits	Analyzed		
DRO		1	mg/Kg	250	288	115	80 - 120	2013-02-19		

#### Standard (CCV-4)

QC Batch:	99035			Date A	Analyzed:	2013-02-19		Analyzed By: CW		
					CCVs	CCVs	CCVs	Percent		
					True	Found	Percent	Recovery	Date	
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO			1	mg/Kg	250	285	114	80 - 120	2013-02-19	

Report Date: February 112C05053		CO	Work Order G/Birch Ke	Page Number: 17 of 21 Eddy Co., NM				
Standard (CCV-1)								
QC Batch: 99045		Date Ana	alyzed: 201	Analyzed By: YG				
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.0934	93	80 - 120	2013-02-18
Toluene		1	mg/kg	0.100	0.0948	95	80 - 120	2013-02-18
Ethylbenzene		1	mg/kg	0.100	0.0988	99	80 - 120	2013-02-18
Xylene		ł	$\mathrm{mg/kg}$	0.300	0.306	102	80 - 120	2013-02-18

### Standard (CCV-2)

QC Batch: 99045			Analyzed By: YG					
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	$\mathbf{Flag}$	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	0.100	0.102	102	80 - 120	2013-02-18
Toluene		1	mg/kg	0.100	0.104	104	80 - 120	2013-02-18
Ethylbenzene		1	mg/kg	0.100	0.108	108	80 - 120	2013-02-18
Xylene		I	mg/kg	0.300	0.334	111	80 - 120	2013-02-18

### Standard (CCV-3)

QC Batch: 99045				Date Ana	alyzed: 201	Analyzed By: YG			
					CCVs True	CCVs Found	CCVs Percent	Percent	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene	**		J	mg/kg	0.100	0.101	101	80 - 120	2013-02-18
Toluene			1	mg/kg	0.100	0.102	102	80 - 120	2013-02-18
Ethylbenzen	e		1	mg/kg	0.100	0.106	106	80 - 120	2013-02-18
Xylene			1	mg/kg	0.300	0.330	110	80 - 120	2013-02-18

Standard (CCV-1)

QC Batch: 99047

Date Analyzed: 2013-02-18

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Analyzed By: YG

Report Date: 112C05053	February 25,	2013		Work O COG/Bircl	2 632 ·	Page Number: 18 of 21 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	0.879	88	80 - 120	2013-02-18
Standard (C	CV-2)							
QC Batch: 99	9047		Date	Analyzed:	2013-02-18		Analy	zed By: YG
5		<b>a</b> .		CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param GBO	Flag	Cert	Units mg/Kg	<u>Cone.</u>	<u>Conc.</u>	Recovery	Limits 80 - 120	Analyzed
Standard (C) QC Batch: 99	C <b>V-3)</b> 0047		Date	Analyzed:	2013-02-18		Analy	zed By: YG
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	1.00	1.01	- 101	80 - 120	2013-02-18
Standard (C	CV-1)							
QC Batch: 99	0229		Date .	Analyzed:	2013-02-25		Analy	zed By: AR
				CCVs	CCVs Found	CCVs Porcout	Percent	Data
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	98.7	99	85 - 115	2013-02-25

#### Standard (CCV-2)

QC Batch: 99229

Date Analyzed: 2013-02-25

Analyzed By: AR

Report Date: 1 112C05053	February 25, 2	013	С	Work Orde OG/Birch K	Page Number: 19 of 21 Eddy Co., NM			
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date . Analyzed
Chloride	6		mg/Kg	100	101	101	85 - 115	2013-02-25

## Standard (CCV-1)

QC Batch:	99230			Date A	nalyzed: 2	2013-02-25		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	99.3	99	85 - 115	2013-02-25	

## Standard (CCV-2)

.

QC Batch:	99230			Date A	Analyzed: 2	2013-02-25		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	101	101	85 - 115	2013-02-25

.

Report Date: February 25, 2013 112C05053 Work Order: 13021532 COG/Birch Kelly Unit #632 Page Number: 20 of 21 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
1	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

## Attachments

Report Date: February 25, 2013 112C05053 Work Order: 13021532 COG/Birch Kelly Unit #632 Page Number: 21 of 21 Eddy Co., NM

The scanned attachments will follow this page.

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

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## **Summary Report**

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

Report Date: May 22, 2013

Work Order: 13051707

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
329470	CS-1 (AH-1) South Wall	soil	2013-05-13	00:00	2013-05-17
329471	CS-1 (AH-1) East Wall	soil	2013 - 05 - 13	00:00	2013-05-17
329472	CS-1 (AH-1) West Wall	soil	2013-05-13	00:00	2013 - 05 - 17
329473	CS-1 (AH-1) Bottom Hole	soil	2013-05-13	00:00	2013-05-17

#### Sample: 329470 - CS-1 (AH-1) South Wall

Param	Flag	Result	Units	RL
Chloride		192	mg/Kg	4

#### Sample: 329471 - CS-1 (AH-1) East Wall

Param	Flag	Result	Units	RL
Chloride		622	mg/Kg	4

#### Sample: 329472 - CS-1 (AH-1) West Wall

Param	Flag	Result	Units	RL
Chloride		1410	mg/Kg	4

#### Sample: 329473 - CS-1 (AH-1) Bottom Hole

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

Report Date: May	22, 2013	Work Order: 13051707	Page	Page Number: 2 of 2		
Param	Flag	Result	Units	RL		
Chloride		243	mg/Kg	4		

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## Analytical and Quality Control Report

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

Report Date: May 22, 2013

Work Order: 13051708

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

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
329474	CS-2 (AH-2) North Wall	soil	2013-05-09	00:00	2013-05-17
329475	CS-2 (AH-2) East Wall	soil	2013-05-09	00:00	2013-05-17
329476	CS-2 (AH-2) West Wall	soil	2013-05-09	00:00	2013-05-17
329477	CS-2 (AH-2) Bottom Hole	soil	2013-05-09	00:00	2013-05-17

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

This report consists of a total of 10 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Richard 1

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

# **Report Contents**

Case Narrative	3
Analytical ReportSample 329474 (CS-2 (AH-2) North Wall)Sample 329475 (CS-2 (AH-2) East Wall)Sample 329476 (CS-2 (AH-2) West Wall)Sample 329477 (CS-2 (AH-2) Bottom Hole)	4 4 4 4
Method Blanks QC Batch 101563 - Method Blank (1)	<b>6</b> 6
Laboratory Control Spikes           QC Batch 101563 - LCS (1)           QC Batch 101563 - MS (1)	<b>7</b> 7 7
Calibration Standards           QC Batch 101563 - CCV (1)           QC Batch 101563 - CCV (2)	<b>8</b> 8 8
Appendix         Report Definitions         Laboratory Certifications         Standard Flags         Attachments	9 9 9 9 9

## Case Narrative

Samples for project COG/Birch Kelly Unit #632 were received by TraceAnalysis, Inc. on 2013-05-17 and assigned to work order 13051708. Samples for work order 13051708 were received intact at a temperature of 3.7 C.

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

		Prep	$\operatorname{Prep}$	QC	Analysis
Test	Method	$\operatorname{Batch}$	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	86059	2013-05-20 at 09:47	101563	2013-05-20 at 15:20

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 13051708 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

# **Analytical Report**

#### Sample: 329474 - CS-2 (AH-2) North Wall

Laboratory: Analysis: QC Batch: Prep Batch:	Laboratory: Midland Analysis: Chloride (Titration) QC Batch: 101563 Prep Batch: 86059		ytical Method: Analyzed: ble Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			$\operatorname{RL}$			
Parameter	Flag	Cert	Result	Units	Dilution	$\mathbf{RL}$
Chloride			111	mg/Kg	5	4.00

#### Sample: 329475 - CS-2 (AH-2) East Wall

Laboratory: Midland Analysis: Chloride (Titration) QC Batch: 101563 Prep Batch: 86059		Analytic Date An Sample B	al Method: alyzed: Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			RL	<b></b>		<b>D</b> 1
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride		_	607	mg/Kg	5	4.00

#### Sample: 329476 - CS-2 (AH-2) West Wall

Chloride			223	mg/Kg	5	4.00
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	86059	Sample 1	Preparation:	2013-05-20	Prepared By:	AR
QC Batch:	101563	Date An	alyzed:	2013-05-20	Analyzed By:	ÁR
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
Laboratory:	Midland					

Report Date: May 22, 2013	Work Order: 13051708	Page Number: 5 of 10
112C05053	COG/Birch Kelly Unit #632	Eddy Co., NM
·····		

### Sample: 329477 - CS-2 (AH-2) Bottom Hole

Chloride			132	mg/Kg	5	4.00
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	86059	Sample I	Preparation:	2013-05-20	Prepared By:	$\mathbf{AR}$
QC Batch:	101563	Date An	alyzed:	2013-05-20	Analyzed By:	$\mathbf{AR}$
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
Laboratory:	Midland					

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Work Order: 13051708 COG/Birch Kelly Unit #632 Page Number: 6 of 10 Eddy Co., NM

# Method Blanks

Chloride		<u></u>		<3.85	mg/Kg	4
Parameter		Flag	Cert	MDL Result	Units	RL
QC Batch: Prep Batch:	101563 86059		Date Analyzed: QC Preparation:	2013-05-20 2013-05-20	Analyzed By: Prepared By:	AR AR
Method Bl	ank (1)	QC Batch: 101563				

# Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

QC Batch: 101563 Prep Batch: 86059			Dat QC	e Analyze Preparat	ed: 201 ion: 201	13-05-20 13-05-20			Ana Pre	alyzed By pared By	r: AR r: AR
Param		F	С	LCS Result	Units	Dil.	Spike Amount	M z R	latrix .esult I	Rec.	Rec. Limit
Chloride				2720	mg/Kg	1	2500	<	(3.85	109	35 - 115
Percent recovery is based on	the spike	resu	lt. RPI	) is based	on the s	oike and s	pike duplic	ate res	ult.		
Param	F	С	LCSE Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2660	mg/Kŧ	g 1	2500	<3.85	106	85 - 115	2	20
Matrix Spike (MS-1) S	piked Sa	nple:	329477		1 001	9.05.00					
Prep Batch: 86059			QC	Preparati	ion: 201	3-05-20 3-05-20	Spilco	Mot	Ana Prej	pared By	: AR : AR
Param		F	C I	Result	Units	Dil.	Amount	Res	sult Re	c. ]	Limit
Chloride				2750	mg/Kg	5	2500	13	32 10	5 78	9 - 121
Percent recovery is based on	he spike	resu	lt. RPL	) is based	on the sp	oike and sp	pike duplica	ate res	ult.		
Param	F	C	MSD Rosult	Unite	Dil	Spike Amount	Matrix Besult	Rec	Rec. Limit	RPD	RPD Limit
Chloride	Γ.	0	2630	mg/Kg	5	2500	132	100	78.9 - 121	4	20

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

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# **Calibration Standards**

### Standard (CCV-1)

QC Batch:	101563			Date A	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2013-05-20

### Standard (CCV-2)

QC Batch:	101563			Date 1	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	_
					True	Found	Percent	Recovery	Date
Param		Flag	$\operatorname{Cert}$	Units	Conc.	Conc.	Recovery	$\operatorname{Limits}$	Analyzed
Chloride				mg/Kg	100	99.8	100	85 - 115	2013-05-20

Page Number: 9 of 10 Eddy Co., NM

## Appendix

## **Report Definitions**

NameDefinitionMDLMethod Detection LimitMQLMinimum Quantitation LimitSDLSample 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	T104704392-12-4	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

## Attachments

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Work Order: 13051708 COG/Birch Kelly Unit #632 Page Number: 10 of 10 Eddy Co., NM

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The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

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

## **Summary Report**

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

Report Date: May 22, 2013

Work Order: 13051706

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

Sample	Description	Matrix	Date Taken	Time Takeu	Date Received
$\frac{229463}{329463}$	T-1 (AH-1) 0'	soil	2013-05-09	00:00	2013-05-17
329464	T-1 (AH-1) 2'	soil	2013-05-09	00:00	2013-05-17
329465	T-1 (AH-1) 4'	soil	2013-05-09	00:00	2013-05-17
329466	T-1 (AH-1) 6'	soil	2013-05-09	00:00	2013-05-17
329467	T-1 (AH-1) 8'	soil	2013-05-09	00:00	2013-05-17
329468	T-1 (AH-1) 10'	soil	2013-05-09	00:00	2013-05-17
329469	T-1 (AH-1) 12'	soil	2013-05-09	00:00	2013-05-17

Sample: 329463 - T-1 (AH-1) 0'

Param	Flag	Result	Units	$\operatorname{RL}$
Chloride		1670	mg/Kg	4

#### Sample: 329464 - T-1 (AH-1) 2'

Param	Flag	Result	Units	$\operatorname{RL}$
Chloride		1040	mg/Kg	4

#### Sample: 329465 - T-1 (AH-1) 4'

Param	Flag	Flag Result		$\operatorname{RL}$
Chloride		759	mg/Kg	4

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

Report Date: May	22, 2013	Work Order: 13051706	Page	Number: 2 of 2
Sample: 329466	- T-1 (AH-1) 6'			
Param	Flag	Result	Units	RL
Chloride		646	mg/Kg	4
Sample: 329467	- T-1 (AH-1) 8'			
Param	Flag	$\mathbf{Result}$	Units	RL
Chloride		220	mg/Kg	4
Sample: 329468	- T-1 (AH-1) 10'			
Param	Flag	Result	Units	$\operatorname{RL}$
Chloride		<20.0	mg/Kg	4
Sample: 329469	- T-1 (AH-1) 12'			
Param	Flag	Result	Units	RL

25.3

Chloride

mg/Kg

4

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

TraceAnalysis, Inc.  $\bullet~~6701$  Aberdeen Ave., Suite 9  $\bullet~~$  Lubbock, TX 79424-1515  $\bullet~~(806)$  794-1296



(BioAquatic) 2501 Mayes Rd., Suite 100 Carrolizon, E-Mail: lab@traceanaly

Svite 100 Carrolzon, Texas 75006 972-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 22, 2013

# Work Order: 13051706

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

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
329463	T-1 (AH-1) 0'	soil	2013-05-09	00:00	2013-05-17
329464	T-1 (AH-1) 2'	soil	2013-05-09	00:00	2013-05-17
329465	T-1 (AH-1) 4'	soil	2013-05-09	00:00	2013-05-17
329466	T-1 (AH-1) 6'	soil	2013-05-09	00:00	2013-05-17
329467	T-1 (AH-1) 8'	soil	2013-05-09	00:00	2013-05-17
329468	T-1 (AH-1) 10'	soil	2013-05-09	00:00	2013-05-17
329469	T-1 (AH-1) 12'	soil	2013-05-09	00:00	2013-05-17

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

This report consists of a total of 13 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael abel

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

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# **Report Contents**

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Case Narrative	4
Analytical Report	5
Sample 329463 (T-1 (AH-1) 0')	5
Sample 329464 (T-1 (AH-1) 2')	5
Sample 329465 (T-1 (AH-1) 4')	5
Sample 329466 (T-1 (AH-1) 6')	5
Sample 329467 (T-1 (AH-1) 8)	6
Sample 329468 (T-1 (AH-1) 10')	6
Sample 329469 (T-1 (AH-1) 12')	6
Method Blanks	8
QC Batch 101562 - Method Blank (1)	8
$\operatorname{QC}$ Batch 101563 - Method Blank (1)	8
Laboratory Control Spikes	9
QC Batch 101562 - LCS (1)	9
QC Batch 101563 - LCS (1)	9
QC Batch 101562 - MS (1)	9
QC Batch 101563 - MS (1)	10
Calibration Standards	11
QC Batch 101562 - CCV (1)	11
QC Batch 101562 - CCV (2)	11
QC Batch 101563 - CCV (1)	11
QC Batch 101563 - CCV (2)	11
Appendix 1	12
Report Definitions	12
Laboratory Certifications	12
Standard Flags	12
Attachments	12

# Case Narrative

Samples for project COG/Birch Kelly Unit #632 were received by TraceAnalysis, Inc. on 2013-05-17 and assigned to work order 13051706. Samples for work order 13051706 were received intact at a temperature of 3.7 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	86059	2013-05-20 at 09:47	101562	2013-05-20 at 15:19
Chloride (Titration)	SM 4500-Cl B	86059	2013-05-20 at 09:47	101563	2013-05-20 at 15:20

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 13051706 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

# **Analytical Report**

#### Sample: 329463 - T-1 (AH-1) 0'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 101562 86059	Analy Date Samp	vtical Method: Analyzed: le Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Paramotor	Flag	Cort	RL Bosult	Unite	Dilution	RI.
Chloride	1 ag		1670	mg/Kg	10	4.00

#### Sample: 329464 - T-1 (AH-1) 2'

Laboratory: Analysis: QC Batch: Prep Batch:	boratory: Midland alysis: Chloride (Titration) Analytical C Batch: 101562 Date Anal ep Batch: 86059 Sample Pr		al Method: alyzed: Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
		<b>a</b> .	RL			
Parameter	Flag	Cert	Result	Units	Dilution	$\operatorname{RL}$
Chloride			1040	mg/Kg	10	4.00

#### Sample: 329465 - T-1 (AH-1) 4'

Chloride			759	mg/Kg	5	4.00
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	86059	Sample 1	Preparation:	2013-05-20	Prepared By:	AR
QC Batch:	101562	Date An	al Metnod: alyzed:	SM 4500-CI B 2013-05-20	Analyzed By:	N/A AR
Laboratory:	Midland	A	. 136.411.	(M. 4500 CU D	Deve Matheal	NT / A

Report Date: May 22, 2013 112C05053		Work Order: 13051706 COG/Birch Kelly Unit #632			Page Number: 6 of 13 Eddy Co., NM	
466 - T-1 (AH-1) 6'						
Midland Chloride (Titration) 101562 86059	Analytic Date An Sample I	al Method: alyzed: Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR	
	~	RL				
Flag	Cert	Result 646	Units mg/Kg	Dilution 5	4.00	
-	May 22, 2013 <b>466 - 'T-1 (AH-1) 6'</b> Midland Chloride (Titration) 101562 86059 Flag	May 22, 2013 Work COG/B 466 - T-1 (AH-1) 6' Midland Chloride (Titration) 101562 Bate An 86059 Flag Cert	May 22, 2013 Work Order: 1305 COG/Birch Kelly Un 466 - T-1 (AH-1) 6' Midland Chloride (Titration) 101562 86059 Sample Preparation: RL Flag Cert Result 646	May 22, 2013 Work Order: 13051706 COG/Birch Kelly Unit #632 466 - T-1 (AH-1) 6' Midland Chloride (Titration) 101562 86059 RL Flag Cert Result Units 646 mg/Kg	May 22, 2013       Work Order: 13051706 COG/Birch Kelly Unit #632       Page Number: 6 Eddy Co         466 - T-1 (AH-1) 6'       Midland         Midland       Analytical Method: SM 4500-Cl B       Prep Method:         101562       Date Analyzed: 2013-05-20       Analyzed By:         86059       Sample Preparation: 2013-05-20       Prepared By:         RL         Flag       Cert       Result       Units       Dilution         646       ng/Kg       5	

#### Sample: 329467 - T-1 (AH-1) 8'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 101562 86059	Analytic Date An Sample	cal Method: nalyzed: Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			$\mathbf{RL}$			
Parameter	Flag	Cert	$\operatorname{Result}$	Units	Dilution	RL
Chloride			220	mg/Kg	5	4.00

### Sample: 329468 - T-1 (AH-1) 10'

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 101563 86059	Analy Date Samp	tical Method: Analyzed: le Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			$\operatorname{RL}$			·
Parameter	Flag	Cert	Result	Units	Dilution	$\mathbf{RL}$
Chloride	U	<u> </u>	<20.0	mg/Kg	5	4.00

#### Sample: 329469 - T-1 (AH-1) 12'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	101563	Date Analyzed:	2013-05-20	Analyzed By:	AR.
Prep Batch:	86059	Sample Preparation:	2013-05-20	Prepared By:	AR.

Report Date: May 22, 2013 112C05053		Worl COG/B	c Order: 13051700 irch Kelly Unit #	i 632	Page Numb Eddy	er: 7 of 13 y Co., NM
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			25.3	mg/Kg	5	4.00

.

Report Date: May 22, 2013 112C05053 Page Number: 8 of 13 Eddy Co., NM Work Order: 13051706 COG/Birch Kelly Unit #632

# Method Blanks

Method Bla	nk (1)	QC Batch: 101562				
QC Batch: Prep Batch:	101562 86059		Date Analyzed: QC Preparation:	2013-05-20 2013-05-20	Analyzed By: Prepared By:	AR AR
Parameter		Flag	Cert	MDL Result	Units	$\mathbf{RL}$
Chloride				<3.85	mg/Kg	4
			<u></u>	<3.60	шу/кд	

Method Bl	ank (1)	QC Batch: 101563				
QC Batch: 101563 Prep Batch: 86059			Date Analyzed: QC Preparation:	2013-05-20 2013-05-20	Analyzed By: Prepared By:	AR AR
D				MDL		57
Parameter		Flag	Cert	Result	Units	RL
Chloride				< 3.85	mg/Kg	4

# Laboratory Control Spikes

#### Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	101562 86059		. Dat QC	e Analyzec Preparatic	l: 201 on: 201	3-05-20 3-05-20			An Pr	alyzed B epared B	y: AR y: AR
Param		F	С	LCS Result	Units	Dil.	Spike Amount	M R	atrix esult	Rec.	Rec. Limit
Chloride	· · · · · · · · · · · · · · · · · · ·			2530	mg/Kg	1	2500	<	(3.85	101	85 - 115
Percent recov	ery is based on the spik	e resu	ılt. RPD	is based o	on the sp	oike and sp	ike duplica	ate res	ult.		
Param	म	, C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2690	mg/Kg	1	2500	<3.85	108	85 - 11	5 - 6	20
Laboratory	Control Spike (LCS-	·1)									
QC Batch: Prep Batch:	101563 86059		Dat QC	e Analyzed Preparatic	l: 201 on: 201	3-05-20 3-05-20	Snike	М	An Pro	alyzed B pared B	y: AR y: AR.
Param		$\mathbf{F}$	$\mathbf{C}$ ·	Result	Units	Dil.	Amount	Re	esult	Rec.	Limit
Chloride	·			2720	mg/Kg	1	2500	<	3.85	109	85 - 115
Percent recov	ery is based on the spik	e resu	lt. RPD	is based o	n the sp	ike and sp	ike duplica	te res	ult.		
			LCSD			Spike	Matrix		Rec.		RPD
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Unloride			2660	mg/Kg	1	2500	< 3.85	106	85 - 118	) 2	20

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

Matrix Spil	ke (MS-1)	Spiked Sample: 329467			
QC Batch:	101562	Date Analyzed:	2013-05-20	Analyzed By:	AR
Prep Batch:	86059	QC Preparation:	2013-05-20	Prepared By:	AR.

Report Date: May 22, 2013 112C05053		(	Work Order: 13051706 COG/Birch Kelly Unit #632						Page Number: 10 of 13 Eddy Co., NM			
Param		F	С	MS Result	Units	Dil.	Spike Amount	M R	atrix esult	Rec.	) L	Rec. .imit
Chloride				2740	mg/Kg	5	2500		220	101	78.	9 - 121
Percent recovery is based on the	spike	e resi	ılt. RPI	) is based	on the s	pike and s	spike dupli	cate re	esult.			
Demons	Ţ	C	MSD Docult	Thite	ГЦ	Spike	Matrix	Dag	Rec		רומם	RPD Limit
Chloride	<u> </u>	<u> </u>	2860	mg/Kg	5	2500	220	<u>106</u>	78.9 -	1 <u>21</u>	<u>A 1</u>	$\frac{1.1111}{20}$
Matrix Spike (MS-1) Spike QC Batch: 101563 Prep Batch: 86059	ed Sa	mple	:: 329477 Dat QC	te Analyze Preparat	ed: 20 ion: 20	13-05-20 13-05-20			ļ	Analyz Prepar	ed By: ed By:	AR. AR
Param		F	C	MS Result	Units	Dil.	Spike Aniount	M Re	atrix esult	Rec.	I I	Rec.
Chloride			.1	2700	mg/Kg		2000	-	1.52	100	10.3	9 - 121
recent recovery is based on the	spike	e resu	ut. KPL	is based	on the s	pike and s	ріке апри	tate re	suit.			
			MSD			Spike	Matrix		Rec.			RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limi	t	RPD	Limit
Chloride			2630	mg/Kg	5	2500	132	100	78.9 - 1	121	4	20
Percent recovery is based on the	spike	e resu	lt. RPE	) is based	on the s	pike and s	pike duplie	cate re	sult.			

# **Calibration Standards**

Standard (CCV-1)

QC Batch:	101562			Date A	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	101	101	85 - 115	2013-05-20

#### Standard (CCV-2)

QC Batch:	101562			Date 1	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs True	<sup>.</sup> CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	99.5	100	85 - 115	2013-05-20

### Standard (CCV-1)

QC Batch:	101563			Date 1	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2013-05-20

### Standard (CCV-2)

QC Batch:	101563			Date A	Anałyzed:	2013-05-20		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	_
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	99.8	100	85 - 115	2013-05-20

Work Order: 13051706 COG/Birch Kelly Unit #632 Page Number: 12 of 13 Eddy Co., NM

## Appendix

## **Report Definitions**

NameDefinitionMDLMethod Detection LimitMQLMinimum Quantitation LimitSDLSample Detection Limit

## Laboratory Certifications

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

## Standard Flags

F Description

B Analyte detected in the corresponding method blank above the method detection limit

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

## Attachments

Work Order: 13051706 COG/Birch Kelly Unit #632 Page Number: 13 of 13 Eddy Co., NM

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The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.
Analysis Pa	quest of Chain of Custody	Record	PAGE: OF:
Allalysis ne	quest of chain of custody	Necolu	ANALYSIS REQUEST
	<b>TETRATECH</b> 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946		(Circle or Specify Method No.)
CLIENT NAME:	SITE MANAGER: IKE TAVAREZ	PRESERVATIVE	All Control Co
PROJECT NO.: PF 112 C05055 C	ROJECT NAME: 0ム- 13ドル #6Sで	- CONTA	B B B B B B B B B B B B B B B B B B B
LAB I.D. NUMBER DATE TIME	Eday Co, やへ SAMPLE IDENTIFICATION	NUMBER OF FHLTERED ( HCL HCL HN03 ICE NONE	BTEX 80211 TPH 8014 PAH 8270 FICLP Neta TCLP Volati TCLP Volati TCLP Semi FICLP Semi FIC
5294635/q S	X T-1 (AH-1) 0'		
464 1	1 T-1 (AH-1) 2'	ıγ	
465	T-1 (AH-1) 4'	, X	X
466	T-1 (A17-1) 6'	V V	
467	T-1 (AH-1) 8'	(X	
468	T-1 (AH-1) 10'	ЛУ	
469	UTI (AH-1) 12'		
RELINCUUSHED BY: 4Signature)	Date: 5-17-13 RECEIVED BY: (Signature)		SAMPLED BY: (Print & Initial) Date:
Mu Vill RELINQUISHED BY: (Signature)	Time: Dif IS Date: RECEIVED BY: (Signature)	Time: 8.1	SAMPLE SHIPPED BY: (Circle) AIRBILL #:
RELINQUISHED BY: (Signature)	Date:	Date: Time:	HAND DELIVERED UPS OTHER: TETRA TECH CONTACT PERSON: Results by:
RECEIVING LABORATORY: 774464 ADDRESS: CITY: 77501375 STATE: 7	RECEIVED BY: (Signature)	Тімб-	TKE TAVAREZ RUSH Charges

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## **Summary Report**

,

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

Report Date: May 22, 2013

Work Order: 13051708

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
329474	CS-2 (AH-2) North Wall	soil	2013-05-09	00:00	2013-05-17
329475	CS-2 (AH-2) East Wall	soil	2013-05-09	00:00	2013-05-17
329476	CS-2 (AH-2) West Wall	soil	2013-05-09	00:00	2013-05-17
329477	CS-2 (AH-2) Bottom Hole	soil	2013-05-09	00:00	2013-05-17

#### Sample: 329474 - CS-2 (AH-2) North Wall

Param	$\operatorname{Flag}$	Result	Units	RL
Chloride		111	mg/Kg	4

#### Sample: 329475 - CS-2 (AH-2) East Wall

Param	Flag	Result	Units	RL
Chloride		607	mg/Kg	4

#### Sample: 329476 - CS-2 (AH-2) West Wall

Param	Flag	Result	Units	$\mathbf{RL}$
Chloride		223	mg/Kg	4

#### Sample: 329477 - CS-2 (AH-2) Bottom Hole

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

Report Date: May 22, 2013		Work Order: 13051708	P	Page Number: 2 of 2		
Param	Flag	Result	Units	RL		
Chloride		132	mg/Kg	4		

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

•



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

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 Texas 79922
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915,585-3443 FAX 915-585-4944 432-689-6301 FAX 432-689-6313 972-242-7750

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 22, 2013

Work Order: 13051707

Project Location:Eddy Co., NMProject Name:COG/Birch Kelly Unit #632Project Number:112C05053

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
329470	CS-1 (AH-1) South Wall	soil	2013-05-13	00:00	2013-05-17
329471	CS-1 (AH-1) East Wall	soil	2013-05-13	00:00	2013 - 05 - 17
329472	CS-1 (AH-1) West Wall	soil	2013-05-13	00:00	2013-05-17
329473	CS-1 (AH-1) Bottom Hole	soil	2013-05-13	00:00	2013-05-17

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

This report consists of a total of 10 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael Al

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

# **Report Contents**

Case Narrative	3
Analytical Report         Sample 329470 (CS-1 (AH-1) South Wall)         Sample 329471 (CS-1 (AH-1) East Wall)         Sample 329472 (CS-1 (AH-1) West Wall)         Sample 329473 (CS-1 (AH-1) Bottom Hole)	4 4 4 4
Method Blanks QC Batch 101563 - Method Blank (1)	<b>6</b> 6
Laboratory Control Spikes           QC Batch 101563 - LCS (1)           QC Batch 101563 - MS (1)	<b>7</b> 7 7
Calibration Standards           QC Batch 101563 - CCV (1)           QC Batch 101563 - CCV (2)	<b>8</b> 8 8
Appendix         Report Definitions         Laboratory Certifications         Standard Flags         Attachments	9 9 9 9 9

# Case Narrative

Samples for project COG/Birch Kelly Unit #632 were received by TraceAnalysis, Inc. on 2013-05-17 and assigned to work order 13051707. Samples for work order 13051707 were received intact at a temperature of 3.7 C.

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

		Prep	$\operatorname{Prep}$	$\mathbf{QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	86059	2013-05-20 at 09:47	101563	2013-05-20 at 15:20

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 13051707 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 22, 2013 112C05053

# **Analytical Report**

#### Sample: 329470 - CS-1 (AH-1) South Wall

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 101563 86059	Analytic Date An Sample I	al Method: alyzed: Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			RL			
Parameter	$\mathbf{Flag}$	Cert	Result	Units	Dilution	$\mathbf{RL}$
Chloride			192	mg/Kg	5	4.00

#### Sample: 329471 - CS-1 (AH-1) East Wall

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 101563 86059	Analytic Date An Sample 1	al Method: alyzed: Preparation:	SM 4500-Cl B 2013-05-20 2013-05-20	Prep Method: Analyzed By: Prepared By:	N/A AR AR
Parameter	Flag	Cert	RL Result	Units	Dilution	$\operatorname{RL}$
Chloride			622	mg/Kg	5	4.00

### Sample: 329472 - CS-1 (AH-1) West Wall

.

Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	101563	Date An	alyzed:	2013-05-20	Analyzed By:	AR
Prep Batch:	86059	Sample 1	Preparation:	2013-05-20	Prepared By:	$\mathbf{AR}$
			$\mathbf{RL}$			
Parameter	Flag	Cert	$\operatorname{Result}$	Units	Dilution	RL
Chloride			1410	mg/Kg	10	4.00

Report Date 112C05053	e: May 22, 2013	COG/B	irch Kelly Un	Page Number: 5 of 10 Eddy Co., NM							
Sample: 32	9473 - CS-1 (AH-1) Botto	om Hole									
Laboratory:	Midland										
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method:	N/A					
QC Batch:	101563	Date An	alyzed:	2013-05-20	Analyzed By:	AR					
Prep Batch:	86059	Sample .	Preparation:	2013-05-20	Prepared By:	AR.					
			RL								
Parameter	$\operatorname{Flag}$	$\operatorname{Cert}$	Result	Units	Dilution	RL					
Chloride	<u></u>		243	mg/Kg	5	4.00					

10081808

mg/Kg

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4.00

5

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Chloride

Report Date: May 22, 2 112C05053	2013	Work Orde COG/Birch K	r: 13051707 elly Unit #632	Page Number: 6 Eddy Co	i of 10 ., NM
Method B	lanks				
Method Blank (1)	QC Batch: 101563				
QC Batch: 101563		Date Analyzed:	2013-05-20	Analyzed By:	AR.
Prep Batch: 86059		QC Preparation:	2013-05-20	Prepared By:	AR.
			MDL		
Parameter	Flag	$\operatorname{Cert}$	Result	Units	$\mathbf{RL}$
Chloride			<3.85	mg/Kg	4

)

Report Date: May 22, 2013 112C05053

Chloride

# Laboratory Control Spikes

### Laboratory Control Spike (LCS-1)

QC Batch: 101563 Prep Batch: 86059			Dat QC	e Analyz Preparat	ed: 201 tion: 201	13-05-20 13-05-20			Anal Prep	yzed By ared By	r: AR :: AR
				LCS			Spike	Ma	trix		Rec.
Param		F	С	Result	Units	Dil.	Amount	Re	sult R	ec.	Limit
Chloride				2720	ng/Kg	1	2500	<3	8.85 1	09 8	35 - 115
Percent recovery is based on the s	pike	resu	lt. RPI	) is based	on the s	pike and s	pike duplic	ate resu	lt.		
			LCSD	,		Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	С	Result	: Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2660	mg/K	g 1	2500	<3.85	106	85 - 115	2	20
Matrix Spike (MS-1) Spiked	l Sa	mple	: 329477								
QC Batch: 101563			Dat	e Analyz	ed: 201	.3-05-20			Anal	yzed By	: AR
Prep Batch: 86059			QC	Preparat	ion: 201	.3-05-20			Prepa	ared By	: AR
				MS			Spike	Matr	·ix		Rec.
Param		F	C I	Result	Units	Dil.	Amount	Resu	ılt Rec	. 1	Limit
Chloride				2750	mg/Kg	5	2500	132	2 105	78	9 - 121
Percent recovery is based on the s	pike	resu	lt. RPI	) is based	on the s	pike and s	pike duplica	ate resu	lt.		
			MSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit

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

mg/Kg

5

2500

132

100

78.9 - 121

20

4

2630

Report Date: May 22, 2013 112C05053

# **Calibration Standards**

### Standard (CCV-1)

QC Batch:	101563			Date 1	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	100	100	85 - 115	2013-05-20

### Standard (CCV-2)

QC Batch:	101563			Date A	Analyzed:	2013-05-20		Analy	zed By: AR
					CCVs	CCVs Found	CCVs Porcout	Percent	Data
					True	round	rercent	necovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	99.8	100	85 - 115	2013-05-20

,

Page Number: 9 of 10 Eddy Co., NM

# Appendix

### **Report Definitions**

NameDefinitionMDLMethod Detection LimitMQLMinimum Quantitation LimitSDLSample Detection Limit

### Laboratory Certifications

	Certifying	Certification	Laboratory
С	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

### Standard Flags

F Description

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

### Attachments

Report Date: May 22, 2013 112C05053

Work Order: 13051707 COG/Birch Kelly Unit #632 Page Number: 10 of 10 Eddy Co., NM

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					1910 N. Big Midland, Te (432) 682-4559	<b>TECH</b> Spring St. xas 79705 • Fax (432) 682-3946								15 (Ext. to C35)	d Cr Bh Ha So	d Vr Pd Hg Se									TDS		
CLIENT NAM	<sup>/E:</sup> င၂၁၇				SITE MANAG	ER:	ERS	Γ	Ρ	RES	ERVA			1X100	c a	Bac			30/624	70/625					s, pH,		
PROJECT N	0.:		PRO.	JECT	NAME:	AVARE Z	TAIN TAIN			Т		Т	-1	ġ		N S		tiles	0/826	82					ation		
1120050	53		Co	<u>G-</u>	BKU 632		Ś	λN)						ž	le A	A sl	les	Vola	824	ĭ≓ Z	809/08		20	stos) (Air	N <sup>2</sup>		
LAB I.D. NUMBER	DATE	TIME	MATRIX COMP:	GRAB	SAMP	PLE IDENTIFICATION	NUMBER OF	FILTERED (	НСГ	HN03	СE ГС	NONE	BTEX 8021	TPH 801	PAH 8270	TCLP Meta	TCLP Volat	TCLP Semi RCI	GC.MS Vol.	GC.MS Ser	PCB's 8080 Pest. 808/6	Chloride	Gamma Sp	Alpha Beta PLM (Asbe	Major Anio		
329,470	5/13		5	×	CS-1 (AH-1) 50	WTH WALL	,					X										X					
471	5/13		5	1	CS-1 (AH-1) EAS	WALL		/				X										X					
472	N3		5	X	<u>(5+1 (AH-1) WES</u>	T WALL	1					X										X					
473	5/13		5	X	CS-1 (AH.1) BOT	for Hole	1					<u>x</u>			_						-	X				_	
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