SITE INFORMATION Report Type: Work Plan General Site Information: Berry A Federal #1 Site: **COG Operating LLC** Company: Sec 21 Section, Township and Range 17S Unit C 30E Lease Number: 54988 **Eddy County** County: GPS: 32.82643° N 103.980206° W Surface Owner: Federal Mineral Owner: From the intersection of Hwy 82 and CR 219 travel 0.4m north on CR 219 turn left, travel 100' to Directions: Release Data: Date Released: 5/18/2010 Produced Fluid Type Release: MAR 16 2011 Source of Contamination: Casing Fluid Released: 550 bbls NMOCD ARTESIA Fluids Recovered: 520 bbls Official Communication: Name: Pat Ellis Kim Dorev Company: COG Operating, LLC Tetra Tech Address: 550 W. Texas Ave. Ste. 1300 1910 N. Big Spring P.O. Box City: Midland Texas, 79701 Midland, Texas Phone number: (432) 686-3023 (432) 631-0348 (432) 684-7137 Fax: Email: pellis@conchoresources.com kim.dorey@tetratech.com

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	0
WellHead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10 '	
>1,000 ft.	0	0 .
Total Ranking Score:	10, 43	

5,000

10



February 25, 2011

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

Work Plan for the COG Operating LLC., Berry A Federal #1 Well, Re: Unit C, Section 21, Township 17 South, Range 30 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 Berry A Federal #1 Well, Unit C, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.82643°, W 103.98020°. The site location is shown on Figures 1 and 2.

Background

On May 18, 2010, the leak was caused by a casing failure during the process of plugging the well and released approximately five hundred fifty (550) barrels of produced fluid. During the release, COG personnel immediately excavated an area 30' x 30' x 4' deep next to the well to contain the fluids. The fluids were pickup using vacuum trucks and recovered five hundred twenty (520) barrels of standing fluids. The initial C-141 form is enclosed in Appendix A.

According to the BLM inspection, the spill initiated from the well and contained in the 30' x 30' area near the well. However, some fluids did migrate on the well pad, which measured approximately 80' x 140'.

Groundwater

No water wells were listed within Section 21. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 300' below surface. In discussions with the NMOCD and review of available data, groundwater may absent in this area. The water data is shown in Appendix B.



Regulatory

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

Soil Assessment and Analytical Results

On August 11, 2010, Tetra Tech personnel sampled the spill area and installed one (1) auger hole (AH-1) using a stainless steel hand auger. The auger hole was installed in the backfilled containment area (30' x 30') near the well. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

The sample was below the RRAL for BTEX and TPH. Elevated chloride concentrations were detected at AH-1 of 16,800 mg/kg at 4.0'-4.5' below surface. Deeper samples could not be collected due to a dense caliche formation. In order to delineate the chloride impact, deeper samples would need to be collected using an air rotary rig.

On November 15, 2010, Tetra Tech personnel were onsite to reevaluate the area of AH-1. According to the BLM initial inspection, the spill had also migrated on the pad, which was not discussed on the C-141. Based on an impact map provided by the BLM, the impacted areas were shown east, west and south of the well pad. In addition, it appeared the fluids migrated west off the pad onto a closed reserve pit. A total of four (4) boreholes (BH-1 through BH-4) were installed to assess the spill area. Borehole results are summarized in Table 1.

Referring to Table 1, none of the selected samples exceeded the RRAL for TPH and BTEX. Boreholes (BH-2 and BH-3) did not show a significant chloride impact to the soils, with a chloride high of 504 mg/kg at BH-3 (0-1'). The area of borehole (BH-4) showed an elevated chloride



concentration of 19,800 mg/kg (0-1') which decline to <200 (5.0') below surface. In the area of BH-1, elevated chloride concentrations were detected at 5.0' (33,400 mg/kg) and declined with depth at 10.0' (9,540 mg/kg), 15.0' (4,100 mg/kg) and 30.0' (234 mg/kg). The borehole sample at 60.0' showed a chloride concentration spike of 3,030 mg/kg. The lithology of the borehole indicated that a dense dry clay barrier was encountered at 60.0'. It would appear that residual chloride impact from this spill was contained at the top of this seemingly impermeable barrier. The boring log for BH-1 is shown in Appendix D.

Work Plan

COG will remove impacted material as highlighted (green) in Table 1. Once the areas are excavated to the appropriate depths, the excavation will be backfilled with clean soil.

As discussed and approved by Mike Bratcher with the NMOCD, the area of BH-1 will be excavated to a depth of approximately 15.0' below surface to remove the elevated chloride concentrations. The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safely concerns. As such, Tetra Tech will excavate the soils to the maximum extent practicable. If the depths are not reached, a 40 mil liner will be installed at depth of 4' to 5' below surface to cap the impacted area. In addition, the area of BH-4 will be excavated down to approximately 3.0' to 5.0' below surface.

Upon completion, a final report will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,

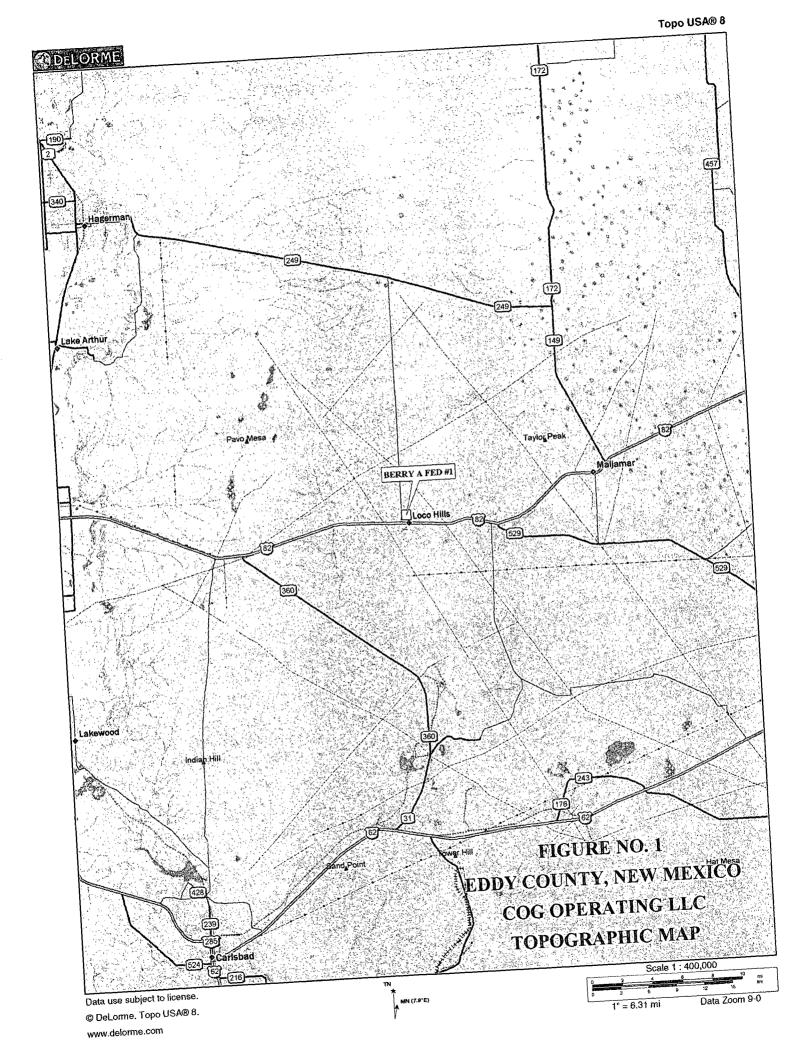
TETRA TECH

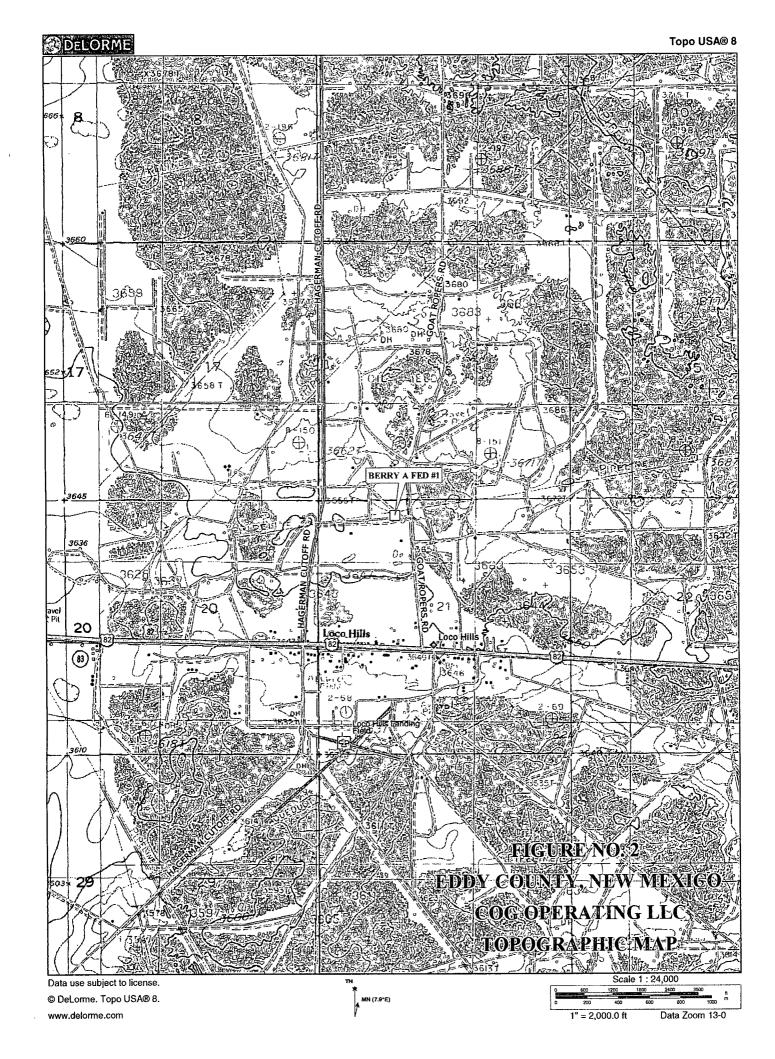
Tim Reed, P.G.

Sr. Consultant

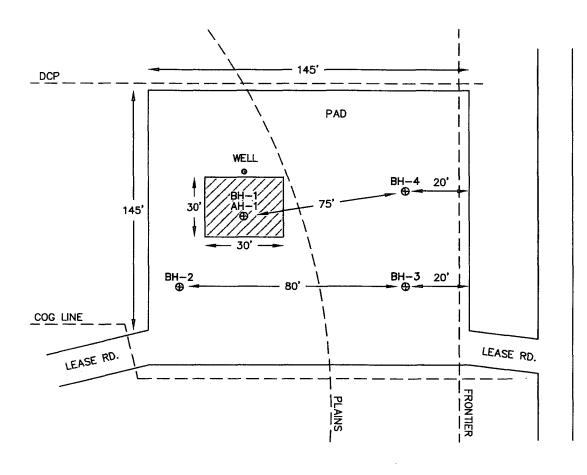
cc: Pat Ellis - COG cc: Terry Gregston - BLM

FIGURES









\mathbb{Z}	SPILL	AREA	
⊕	AUGER	HOLE	LOC

CATIONS

⊕	BORE	HOLE	LOCATIONS	
				_

	EDDY COUNTY, NEW MEXICO
	COG OPERATING LLC
DATE: 10/15/10 DWN. BY:	BERRY A FEDERAL #1
JJ FILE: H:\COO\640062B BEGRY A FED #1	TETRA TECH, INC. MIDLAND, TEXAS

NOT TO SCALE

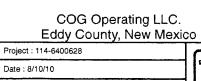
FIGURE NO. 3

BERRY A FED. #1



Aerial Map

File: H:\GIS\6400628



TABLES

Table 1
COG Operating LLC.
BERRY A FEDERAL #1
EDDY COUNTY, NEW MEXICO

Sample	Sample	Sample	Depth	Soil	Status	Ti	PH (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
ID	Date	Depth (ft)	(BEB)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	8/11/2010	4-4.5'	1	Χ		<2.00	67.3	67.3	<0.0200	<0.0200	<0.0200	<0.0200	16,800
BH-1	10/14/2010	0-1'		X			_	- 1		_		_	<200
	н	3'		X		<u>-</u>	_	_	_			-	<200
	u u	5'		Х		-	-	-	_	-	- · · · · · · · · · · · · · · · · · · ·	-	33,400
	11	7.		Х			-	-			_	-	15,000
	II	10'		×		_	-	_		-	_	-	9,540
	11	15'		X			-	-	· · -	.	-	-	4,100
	н	20'		Х		_		-	-	-	-	-	1,370
	п	25'		×		÷	-	-	-	-	-	-	1,230
	91	30'		х		. =	-	-	-	-	_	_	234
	1)	40'		Х		-	-	-	-	-	-	-	513
	п	50'		Х		_	-	-	-	-	-	-	371
	и	60'		Х		_	-	-	-	-	-	<u>-</u>	3,030

Table 1 COG Operating LLC. BERRY A FEDERAL #1 EDDY COUNTY, NEW MEXICO

Sample	Sample	Sample	Depth	Soil	Status	ŢI	PH (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
ID	Date	Depth (ft)	(BEB)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH-2	10/14/2010	0-1'		X		-	_	-	-	-	-	-	<200
	п	3'		X		_	-	-		-	~	<u>-</u>	204
	п	5'		X		-	_	-	_	-	-	-	<200
	II .	7'		Х		-	-	-	_	-	-	_	<200
BH-3	10/14/2010	0-1'		X		-	-	-	<u> </u>	_	_	-	504
	II.	3'		X		_	-	-		-	_	-	387
	11	5'		Х		-	-	-	-	-	-	-	316
	11	7'		Х		_	_	-	-	-	-	<u>.</u>	<200
	II .	10'		Х		*	-	-	-	-	-	-	<200
BH-4	10/14/2010	. 0-1!		х		-	-	. <u>-</u>	- <u>-</u>	-,	<u>-</u>	- .	19,800
	п	3'		×		<u>-</u>	-	-	-	-	-	-	9,280
	11	5'		X		-	-	-	-	-	-	-	<200
	19	7'		×		_	-	-	-) be	-	-	<200
	и	10'		Х		_	-	-	-	-	_	-	229

BEB Below Excavation Bottom

(--) Not Analyzed

Proposed Excavation Material

APPENDIX A

Pistrick I 1625 N. French Dr., Hobbs, NM 88240 Pistrict II 1301 W. Grand Avenue, Artesia, NM 88210 Pistrict III 1000 Rio Brazzis Road, Azice, NM 87410 Pistrict 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. Submit 2 Copies to appropriate District Office in accordance with Rule 1 to on back side of form

Form C-141 Revised October 10, 2003

Santa Fe, NM 87505

Release Notification and Corrective Action

	OPERATOR	☑ Initial Report ☐ Final Report									
Name of Company COG OPERATING LLC	Contact Pat Ellis										
Address 550 W. Texas, Suite 100, Midland, TX 79701	Telephone No. 432-230-0077										
Facility Name Berry A Federal #1	Facility Type Well										
Surface Owner Pederal Mineral Owner	· · · · · · · · · · · · · · · · · · ·	Lease No. 054988									
LOCATION	ON OF RELEASE										
		West Line County									
C 21 178 30E 330	NORTH 1650	WEST Eddy									
Latitude 32.82643 Longitude 103.980206											
NATURE OF RELEASE											
Pype of Release Produced fluid Source of Release Casing	Volume of Release 550 BBLS	Volume Recovered 520 BBLS									
Source of Release Casing	Date and Hour of Occurrence 5-18-10	Date and Hour of Discovery 5-18-10									
Was Immediate Notice Given?	If YES, To Whom?										
🛛 Yes 🗌 No 🔲 Not Require		Braicher-OCD Gregston-BLM									
By Whom? Pat Ellis	Date and Hour 05/18/2010 4:15	p.m.									
Was a Watercourse Reached?	If YBS, Volume Impacting the Watercourse,										
☐ Yes ⊠ No											
If a Watercourse was Impacted, Describe Pully.*											
		•									
Describe Cause of Problem and Remedial Action Taken.*		7,000,000,000,000,000,000									
The Berry A Federal #1 well had a casing leak while in the process of j immediately constructed to commit the water flow. The leak was stopp	logging and abandoning the well. A tered and the well has successfully plugged	reportry pit around the well head area was d and abandoned.									
Describe Area Affected and Cleanup Action Taken.* Due to water flow during the plugging process an additional 3600 BBL candition. The saturated soil was removed and the release site will be swork plan.	ampled by Teirn Tech Environmental to	o determine appropriate elean-up actions and									
I hereby certify that the information given above is true and complete to regulations 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 reportederal, state, or local laws and/or regulations.	notifications and perform corrective as the NMOCD marked as "Pinal Report" ata contamination that pass a threat to a	tions for releases which may endanger does not relieve the operator of lightlity ground water, surface water, burnen legal by									
\bigcirc .	OIL CONSERV	VATION DIVISION									
Signature: Latin Z. Ello											
Printed Name Patrick Eilis	Approved by District Supervisor:										
Title: HSE Manager	Approval Date:	Expiration Date:									
E-mail Address: pellis@conchoresources.com	Conditions of Approval:	Attached 🔲									
Date: 07/16/2010 Phone: 432-230-0077 Attach Additional Sheets If Necessary		No.									

APPENDIX B

Water Well Data Average Depth to Groundwater (ft) COG - Berry A Federal #1 Eddy County, New Mexico

	16 S			29 East				South		30 East		6		South		1 E
3	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2
,	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11
8	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14
9	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23
10 30	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26
31	32	33	34	35	36	31	32	33	34	35	36	31 290	32	33	34	35
	 17 Sc	outh	2	29 East		•	17:	South		30 East	<u> </u>		17	South	3	1 Ea
3	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2
7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11
8	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14
19	20	21	22 80	23	24	19	20	21	22	23	24	19	20	21	22 SITE	23
30	29 210	28	27	26	25	30	29	28	27	26	25	30	29	2,8	27	26
31	32	33	34	35 153	36	31	32	33	34	35	36	31	32	33	34 271	35
	18 S	outh		29 East		I	18	South		30 East			18	South		1 Ea
3	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2
,	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11
8	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14
9	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	31 7
10	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26
31	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35 26

	New Mexico State Engineers Well Reports
	USGS Well Reports
,	Geology and Groundwater Conditions in Southern Eddy, County, NN
2.78°	NMOCD - Groundwater Data

APPENDIX C

Summary Report

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

Report Date: August 23, 2010

Work Order: 10081640

Project Name:

Project Location: Eddy County, NM COG/Berry A Fed. #1

Project Number: 114-6400628

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
241219	AH-1 4-4.5'	soil	2010-08-11	00:00	2010-08-13

			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)
241219 - AH-1 4-4.5'	< 0.0200	< 0.0200	< 0.0200	< 0.0200	67.3	< 2.00

Sample: 241219 - AH-1 4-4.5'

Param	Flag	Result	Units	RL
Chloride		16800	mg/Kg	4.00

Summary Report

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

Report Date: October 25, 2010

Work Order: 10102019

 $\begin{array}{ll} \mbox{Project Location:} & \mbox{Eddy County, NM} \\ \mbox{Project Name:} & \mbox{COG/Berry A Fed. } \#1 \end{array}$

Project Number: 114-6400628

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
248002	BH-1 0-1'	soil	2010-10-14	00:00	2010-10-20
248003	BH-1 3'	soil	2010-10-14	00:00	2010-10-20
248004	BH-1 5'	soil	2010-10-14	00:00	2010-10-20
248005	BH-1 7'	soil	2010-10-14	00:00	2010-10-20
248006	BH-1 10'	soil	2010-10-14	00:00	2010-10-20
248007	BH-1 15'	soil	2010-10-14	00:00	2010-10-20
248008	BH-1 20'	soil	2010-10-14	00:00	2010-10-20
248009	BH-1 25'	soil	2010-10-14	00:00	2010-10-20
248010	BH-1 30'	soil	2010-10-14	00:00	2010-10-20
248011	BH-1 40'	soil	2010-10-14	00:00	2010-10-20
248012	BH-1 50'	soil	2010-10-14	00:00	2010-10-20
248013	BH-1 60'	soil	2010-10-14	00:00	2010-10-20
248014	BH-2 0-1'	soil	2010-10-14	00:00	2010-10-20
248015	BH-2 3'	soil	2010-10-14	00:00	2010-10-20
248016	BH-2 5'	soil	2010-10-14	00:00	2010-10-20
248017	BH-2 7'	soil	2010-10-14	00:00	2010-10-20
248018	BH-3 0-1'	soil	2010-10-14	00:00	2010-10-20
248019	BH-3 3'	soil	2010-10-14	00:00	2010-10-20
248020	BH-3 5'	soil	2010-10-14	00:00	2010-10-20
248021	BH-3 7'	soil	2010-10-14	00:00	2010-10-20
248022	BH-3 10'	soil	2010-10-14	00:00	2010-10-20
248023	BH-4 0-1'	soil	2010-10-14	00:00	2010-10-20
248024	BH-4 3'	soil	2010-10-14	00:00	2010-10-20
248025	$\mathrm{BH} ext{-}4\ 5'$	soil	2010-10-14	00:00	2010-10-20
248026	BH-4 7'	soil	2010-10-14	00:00	2010-10-20
248027	BH-4 10'	soil	2010-10-14	00:00	2010-10-20

Report Date: October 2	25, 2010	Work Order: 10102019	P	Page Number: 2 of 5	
Sample: 248002 - BF	H-1 0-1'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 248003 - BI	H-1 3'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 248004 - BI	H-1 5'				
Param	Flag	Result	Units	RL	
Chloride		33400	mg/Kg	4.00	
Sample: 248005 - BI	H-1 7'				
Param	Flag	Result	Units	RL	
Chloride		15000	ıng/Kg	4.00	
Sample: 248006 - BI	H-1 10'				
Param	Flag	Result	Units	RL	
Chloride		9540	mg/Kg	4.00	
Sample: 248007 - BI	H-1 15'				
Param	Flag	Result	Units	RL	
Chloride		4100	mg/Kg	4.00	
Sample: 248008 - BI	H-1 20'				
Param	Flag	Result	Units	RL	
Chloride		1370	mg/Kg	4.00	
Sample: 248009 - BF	H-1 25'				
Param	Flag	Result	Units	m RL	
Chloride		1230	mg/Kg	4.00	
				······································	

Report Date: Octo	ber 25, 2010	Work Order: 10102019	Page	Page Number: 3 of 5	
Sample: 248010 -	- BH-1 30'				
Param	Flag	Result	Units	RL	
Chloride		234	mg/Kg	4.00	
Sample: 248011 -	- BH-1 40'				
Param	Flag	Result	Units	RL	
Chloride		513	mg/Kg	4.00	
Sample: 248012 -	- BH-1 50'				
Param	Flag	Result	Units	RL	
Chloride		371	mg/Kg	4.00	
Sample: 248013 -	- BH-1 60'				
Param	Flag	Result	Units	RL	
Chloride		3030	mg/Kg	4.00	
Sample: 248014 -	- BH-2 0-1'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 248015	- BH-2 3'				
Param	Flag	Result	Units	RL	
Chloride		204	mg/Kg	4.00	
Sample: 248016 -	- BH-2 5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 248017 -	- BH-2 7'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	

Report Date: Octob	per 25, 2010	Work Order: 10102019	Page	Page Number: 4 of 5	
Sample: 248018 -	· BH-3 0-1'				
Param	Flag	Result	Units	RL	
Chloride		504	mg/Kg	4.00	
Sample: 248019 -	- BH-3 3'				
Param	Flag	Result	Units	RL	
Chloride		387	mg/Kg	4.00	
Sample: 248020 -	· BH-3 5'				
Param	Flag	Result	Units	RL	
Chloride		316	mg/Kg	4.00	
Sample: 248021 -	- BH-3 7'				
Param	Flag	\mathbf{Result}	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 248022 -	- BH-3 10'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	
Sample: 248023 -	BH-4 0-1'				
Param	Flag	Result	Units	RL	
Chloride		19800	mg/Kg	4.00	
Sample: 248024 -	- BH-4 3'				
Param	Flag	Result	Units	RL	
Chloride		9280	mg/Kg	4.00	
Sample: 248025 -	· BH-4 5'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4.00	

Report Date: October 25, 2010		Work Order: 1010201	9 Page	Page Number: 5 of 5				
Sample: 248026 - BH-4 7'								
Param	Flag	Result	Units	RL				
Chloride		<200	mg/Kg	4.00				
Sample: 248027	- BH-4 10'							
Param	Flag	Result	Units	RL				
Chloride		229	mg/Kg	4.00				



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1

Lubbock, Texas 79424 El Paso, Texas 79922 Midland, Texas, 79703

800 • 378 • 1296 888 • 588 • 3443 806 • 794 • 1296 915 • 585 • 3443 432 • 689 • 6301

FAX 806 • 794 • 1298 FAX 915 • 585 • 4944

6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132

817 • 201 • 5260

FAX 432 • 689 • 6313

E-Mail: lab@traceanalysis.com

Certifications

WBENC: 237019 HUB:

1752439743100-86536

DBE: VN 20657

NCTRCA WFWB38444Y0909

NELAP Certifications

T104704219-08-TX Lubbock:

LELAP-02003

Kansas E-10317

El Paso: T104704221-08-TX

LELAP-02002

Midland: T104704392-08-TX

Analytical and Quality Control Report

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

Report Date: August 20, 2010

Work Order:

10081640

Project Location: Eddy County, NM COG/Berry A Fed. #1

Project Name: Project Number:

114-6400628

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
241219	AH-1 4-4.5'	soil	2010-08-11	00:00	2010-08-13

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

This report consists of a total of 12 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Latourch

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

Standard Flags

 ${f B}$ - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project COG/Berry A Fed. #1 were received by TraceAnalysis, Inc. on 2010-08-13 and assigned to work order 10081640. Samples for work order 10081640 were received intact at a temperature of 18.0 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	62330	2010-08-18 at 09:15	72769	2010-08-18 at 11:58
Chloride (Titration)	SM 4500-Cl B	62312	2010-08-17 at 11:03	72698	2010-08-17 at 16:18
TPH DRO - NEW	S 8015 D	62397	2010-08-19 at 10:46	72774	2010-08-19 at 10:46
TPH GRO	S 8015 D	62330	2010-08-18 at 09:15	72770	2010-08-18 at 12:25

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 10081640 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

Samples received on ice.

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

114-6400628

Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 4 of 12 Eddy County, NM

Analytical Report

Sample: 241219 - AH-1 4-4.5'

Laboratory: Midland

Prep Batch: 62330

Analysis: QC Batch: BTEX 72769

Analytical Method:

S 8021B

Date Analyzed: Sample Preparation: 2010-08-18

2010-08-18

Prep Method: S 5035 Analyzed By:

AGPrepared By: AG

RT.

		1617			
Parameter	Flag	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

					\mathbf{Spike}	Percent	Recovery
Surrogate	Flag	Result	\mathbf{Units}	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)	1	0.863	mg/Kg	1	2.00	43	52.8 - 137
4-Bromofluorobenzene (4-BFB)		0.845	mg/Kg	1	2.00	42	38.4 - 157

Sample: 241219 - AH-1 4-4.5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 72698 Prep Batch: 62312

Analytical Method: Date Analyzed:

SM 4500-Cl B 2010-08-17 Sample Preparation: 2010-08-17

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

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		16800	mg/Kg	100	4.00

Sample: 241219 - AH-1 4-4.5'

Laboratory: Midland

Analysis: QC Batch:

Prep Batch: 62397

TPH DRO - NEW 72774

Analytical Method: Date Analyzed: Sample Preparation: 2010-08-19

S 8015 D 2010-08-19 Prep Method: N/A Analyzed By: kg Prepared By: kg

RL

Parameter	Flag	Result	Units	Dilution	RL
DRO		67.3	mg/Kg	1	50.0

¹SPECIAL-TFT is out of control limits due to an unknown anomaly. However, 4-BFB is within control limits and shows the method to be in control. •

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Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 5 of 12 Eddy County, NM

Surrogate	Flag	Result	Units	Dilution	$egin{array}{c} ext{Spike} \ ext{Amount} \end{array}$	Percent Recovery	Recovery Limits
n-Tricosane		114	mg/Kg	1	100	114	70 - 130

Sample: 241219 - AH-1 4-4.5'

Laboratory: Midland

Analysis:

TPH GRO

QC Batch: 72770 Prep Batch: 62330

Analytical Method: Date Analyzed:

S 8015 D

2010-08-18

Prep Method: S 5035 Analyzed By:

AG

Sample Preparation: 2010-08-18

Prepared By:

AG

Parameter	Flag	Result	Units	Dilution	RL
GRO		< 2.00	mg/Kg	1	2.00

					$_{ m Spike}$	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.13	mg/Kg	1	2.00	56	48.5 - 152
4-Bromofluorobenzene (4-BFB)		0.983	${ m mg/Kg}$	1	2.00	49	42 - 159

Method Blank (1)

QC Batch: 72698

QC Batch: 72698 Prep Batch: 62312 Date Analyzed:

2010-08-17 QC Preparation: 2010-08-17 Analyzed By: AR

Prepared By: AR

MDL

Parameter	Flag	Result	Units	RL
Chloride		<2.18	mg/Kg	4

Method Blank (1)

QC Batch: 72769

QC Batch: Prep Batch: 62330

72769

Date Analyzed:

2010-08-18 QC Preparation: 2010-08-18 Analyzed By: AG

Prepared By: AG

MDL

Parameter	Flag	Result	Units	RL
Benzene		< 0.0150	mg/Kg	0.02
Toluene		< 0.00950	mg/Kg	0.02
Ethylbenzene		< 0.0106	mg/Kg	0.02
Xylene		< 0.00930	mg/Kg	0.02

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Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 6 of 12 Eddy County, NM

Surrogate	Flag	Result	Units	Dilution	${ m Spike} \ { m Amount}$	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.78	mg/Kg	1	2.00	89	66.6 - 122
4-Bromofluorobenzene (4-BFB)		1.48	mg/Kg	1	2.00	74	55.4 - 132

Method Blank (1)

QC Batch: 72770

QC Batch:

72770

Date Analyzed:

2010-08-18

Analyzed By: AG

Prep Batch: 62330

QC Preparation: 2010-08-18 Prepared By: AG

		1.122		
Parameter	Flag	Result	Units	RL
GRO		< 1.65	mg/Kg	2

					Spike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		1.99	mg/Kg	1	2.00	100	67.6 - 150
4-Bromofluorobenzene (4-BFB)		1.60	mg/Kg	1	2.00	80	52.4 - 130

Method Blank (1)

QC Batch: 72774

QC Batch:

72774

Date Analyzed:

2010-08-19

Analyzed By: kg Prepared By: kg

Prep Batch: 62397

QC Preparation: 2010-08-19

MDL

Parameter	Flag	Result	Units	RL
DRO		<14.5	mg/Kg	50

					\mathbf{S} pike	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane	Off per la management of the second	91.6	mg/Kg	1	100	92	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch:

72698

Date Analyzed:

2010-08-17

Analyzed By: AR

Prep Batch: 62312

QC Preparation: 2010-08-17

Prepared By: AR

	LCS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.6	mg/Kg	1	100	< 2.18	98	85 - 115

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

114-6400628

Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 7 of 12 Eddy County, NM

n.	LCSD	TT 1.	D.I	Spike	Matrix	T D	Rec.	DDD	RPD
Param	Result	${ m Units}$	$\mathrm{Dil}.$	Amount	Result	$\mathrm{Rec}.$	Limit	RPD	Limit
Chloride	103	mg/Kg	1	100	< 2.18	103	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: 72769 Prep Batch: 62330 Date Analyzed: 2010-08-18 QC Preparation: 2010-08-18 Analyzed By: AG Prepared By: AG

Param	$egin{array}{c} ext{LCS} \ ext{Result} \end{array}$	Units	Dil.	$\begin{array}{c} {\rm Spike} \\ {\rm Amount} \end{array}$	Matrix Result	Rec.	$egin{array}{c} { m Rec.} \\ { m Limit} \end{array}$
Benzene	1.96	mg/Kg	1	2.00	< 0.0150	98	81.9 - 108
Toluene	1.89	mg/Kg	1	2.00	< 0.00950	94	81.9 - 107
Ethylbenzene	1.76	mg/Kg	1	2.00	< 0.0106	88	78.4 - 107
Xylene	5.34	mg/Kg	1	6.00	< 0.00930	89	79.1 - 107

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}	RPD	Limit
Benzene	1.97	mg/Kg	1	2.00	< 0.0150	98	81.9 - 108	0	20
Toluene	1.91	mg/Kg	1	2.00	< 0.00950	96	81.9 - 107	1	20
Ethylbenzene	1.77	mg/Kg	1	2.00	< 0.0106	88	78.4 - 107	1	20
Xylene	5.38	mg/Kg	1	6.00	< 0.00930	90	. 79.1 - 107	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	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.76	1.73	mg/Kg	1	2.00	88	86	70.2 - 114
4-Bromofluorobenzene (4-BFB)	1.65	1.64	mg/Kg	1	2.00	82	82	69.8 - 121

Laboratory Control Spike (LCS-1)

QC Batch: 72770 Prep Batch: 62330 Date Analyzed: 2010-08-18 QC Preparation: 2010-08-18 Analyzed By: AG Prepared By: AG

	LCS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	15.2	mg/Kg	1	20.0	< 1.65	76	69.9 - 95.4

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

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	14.4	mg/Kg	1	20.0	< 1.65	72	69.9 - 95.4	5	20

114-6400628

Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 8 of 12 Eddy County, NM

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

	LCS	LCSD			\mathbf{S} pike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	${ m Rec.}$	\mathbf{Limit}
Trifluorotoluene (TFT)	2.00	1.64	mg/Kg	1	2.00	100	82	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.78	1.59	mg/Kg	1	2.00	89	80	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 72774 Date Analyzed:

2010-08-19

Analyzed By: kg

Prep Batch: 62397

QC Preparation: 2010-08-19

Prepared By: kg

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	204	mg/Kg	1	250	<14.5	82	57.4 - 133.4

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	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	215	mg/Kg	1	250	<14.5	86	57.4 - 133.4	5	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.	$\mathrm{Rec}.$	Limit
n-Tricosane	116	103	mg/Kg	1	100	116	103	70 - 130

Matrix Spike (MS-1) Spiked Sample: 241239

QC Batch: 72698 Prep Batch: 62312 Date Analyzed:

QC Preparation:

2010-08-17 2010-08-17

Analyzed By: AR Prepared By: AR

MS Spike Matrix Rec. Param Result Units Dil. Amount Result Limit Rec. Chloride 10300 100 10000 392 99 85 - 115

mg/Kg

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

	MSD			$_{ m Spike}$	Matrix		$\mathrm{Rec}.$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	10500	mg/Kg	100	10000	392	101	85 - 115	2	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: 241219

QC Batch: 72769 Prep Batch: 62330 Date Analyzed: 2010-08-18 QC Preparation: 2010-08-18

Analyzed By: AG Prepared By: AG

114-6400628

Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 9 of 12 Eddy County, NM

	MS			Spike	Matrix	_	Rec.
Param	Result	$\mathbf{U}\mathbf{nits}$	Dil.	\mathbf{Amount}	Result	Rec .	\mathbf{Limit}
Benzene	2.15	mg/Kg	1	2.00	< 0.0150	108	80.5 - 112
Toluene	2.13	mg/Kg	1	2.00	< 0.00950	106	82.4 - 113
Ethylbenzene	2.15	mg/Kg	1	2.00	< 0.0106	108	83.9 - 114
Xylene	6.47	mg/Kg	1	6.00	< 0.00930	108	84 - 114

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

		MSD			Spike	Matrix		Rec .		RPD
Param		Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene	2	1.52	mg/Kg	1	2.00	< 0.0150	76	80.5 - 112	34	20
Toluene	3	1.50	mg/Kg	1	2.00	< 0.00950	75	82.4 - 113	35	20
Ethylbenzene	4	1.51	mg/Kg	1	2.00	< 0.0106	76	83.9 - 114	35	20
Xylene	5	4.57	mg/Kg	1	6.00	< 0.00930	76	84 - 114	34	20

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

Surrogate	$rac{ ext{MS}}{ ext{Result}}$	$rac{ ext{MSD}}{ ext{Result}}$	Units	Dil.	Spike Amount	$\frac{MS}{Rec.}$	$\frac{\mathrm{MSD}}{\mathrm{Rec.}}$	Rec. Limit
Trifluorotoluene (TFT)	1.74	1.18	mg/Kg	1	2	87	59	41.3 - 117
4-Bromofluorobenzene (4-BFB)	1.67	1.14	${ m mg/Kg}$	1	2	84	57	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 241299

QC Batch: Prep Batch: 62330

72770

Date Analyzed:

2010-08-18 QC Preparation: 2010-08-18

Analyzed By: AG Prepared By: AG

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	${ m Rec.}$	\mathbf{Limit}
GRO	14.6	mg/Kg	1	20.0	<1.65	73	61.8 - 114

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	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	15.7	mg/Kg	1	20.0	<1.65	78	61.8 - 114	7	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.	$\mathrm{Rec}.$	\mathbf{Limit}
Trifluorotoluene (TFT)	1.12	1.23	mg/Kg	1	2	56	62	50 - 162
4-Bromofluorobenzene (4-BFB)	1.16	1.27	mg/Kg	1	2	58	64	50 - 162

²Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

³Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

⁴Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control. ⁵Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

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Work Order: 10081640

COG/Berry A Fed. #1

Page Number: 10 of 12 Eddy County, NM

Matrix Spike (MS-1)

Spiked Sample: 241291

QC Batch: Prep Batch: 62397

72774

Date Analyzed:

2010-08-19

QC Preparation: 2010-08-19

Analyzed By: kg

Prepared By: kg

	MS			Spike	Matrix		${ m Rec.}$
Param	Result	Units	Dil.	Amount	Result	Rec.	\mathbf{Limit}
DRO	220	mg/Kg	1	250	<14.5	88	35.2 - 167.1

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

	MSD			$_{ m Spike}$	Matrix		$\mathrm{Rec.}$		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	228	mg/Kg	1	250	<14.5	91	35.2 - 167.1	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	\mathbf{Units}	Dil.	Amount	${ m Rec.}$	Rec.	Limit
n-Tricosane	107	106	mg/Kg	1	100	107	106	70 - 130

Standard (ICV-1)

QC Batch: 72698

Date Analyzed: 2010-08-17

Analyzed By: AR

			ICVs True	ICVs Found	ICVs Paraent	Percent	Data
D	T31	TT * 6	~		Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-08-17

Standard (CCV-1)

QC Batch: 72698

Date Analyzed: 2010-08-17

Analyzed By: AR

			CCVs True	CCVs Found	$egin{array}{c} ext{CCVs} \ ext{Percent} \end{array}$	Percent Recovery	Date
Param .	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.2	99	85 - 115	2010-08-17

Standard (CCV-1)

QC Batch: 72769

Date Analyzed: 2010-08-18

Analyzed By: AG

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		mg/Kg	0.100	0.0958	96	80 - 120	2010-08-18

continued ...

114-6400628

Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 11 of 12 Eddy County, NM

standard	continued		

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Toluene		mg/Kg	0.100	0.0921	92	80 - 120	2010-08-18
Ethylbenzene		mg/Kg	0.100	0.0853	85	80 - 120	2010-08-18
Xylene		${ m mg/Kg}$	0.300	0.260	87	80 - 120	2010-08-18

Standard (CCV-2)

QC Batch: 72769

Date Analyzed: 2010-08-18

Analyzed By: AG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.0980	98	80 - 120	2010-08-18
Toluene		mg/Kg	0.100	0.0947	95	80 - 120	2010-08-18
Ethylbenzene		mg/Kg	0.100	0.0888	89	80 - 120	2010-08-18
Xylene		mg/Kg	0.300	0.266	89	80 - 120	2010-08-18

Standard (CCV-1)

QC Batch: 72770

Date Analyzed: 2010-08-18

Analyzed By: AG

			CCVs True	${ m CCVs} \ { m Found}$	$rac{ ext{CCVs}}{ ext{Percent}}$	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	0.972	97	80 - 120	2010-08-18

Standard (CCV-2)

QC Batch: 72770

Date Analyzed: 2010-08-18

Analyzed By: AG

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.07	107	80 - 120	2010-08-18

Standard (CCV-2)

QC Batch: 72774

Date Analyzed: 2010-08-19

Analyzed By: kg

114-6400628

Work Order: 10081640 COG/Berry A Fed. #1 Page Number: 12 of 12 Eddy County, NM

			CCVs True	CCVs Found	${ m CCVs} \ { m Percent}$	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	233	93	80 - 120	2010-08-19

Standard (CCV-3)

QC Batch: 72774

Date Analyzed: 2010-08-19

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
$\overline{\mathrm{DRO}}$		mg/Kg	250	233	93	80 - 120	2010-08-19

Wo# 10081640 **Analysis Request of Chain of Custody Record** PAGE: **ANALYSIS REQUEST** (Circle or Specify Method No.) TETRA TECH Cr Pb Hg Se Vr Pd Hg Se 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946 GC.MS Voi. 8240/8280/624
GC.MS Semi. Vol. 8270/625
PCB's 8080/608
Pest. 808/608
Chloride
Gamma Spec. 8 8 CLIENT NAME: SITE MANAGER: PRESERVATIVE Ike Turbyr & COG METHOD PROJECT NO.: PROJECT NAME: COG Berry "A" Fed #1 114-6400628 LAB I.D. MATRIX COMP. GRAB TIME HN03 ICE NONE DATE SAMPLE IDENTIFICATION NUMBER 2610 ار- 0 مل 8/,, 124125 (Back All) AH-I 216 (Back All) 217 (Back All) 3'-3.5' (Backfill 218 219 4-45 5-55 220 6-65' 7-25 SAMPLED BY: (Print & Initial) RELINQUISHED BY: (Signature) SAMPLE SHIPPED BY: (Circle) RELINQUISHED BY: (Signature) AIRBILL #: HAND DELIVERED UPS
TETRA TECH CONTACT PERSON: OTHER: **RELINQUISHED BY: (Signature)** RECEIVED BY: (Signature) Results by: RECEIVING LABORATORY: RECEIVED BY: (Signature) Ike Tovarez ADDRESS: RUSH Charges Authorized: If the 1 TPH storeds 5,000 mg/kg run deeper samples II BIEX storeds 50 mg/kg or Box 3 more exceeds 10 mg/kg run deeper samples SAMPLE CONDITION WHEN RECEIVED: Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

Hold additional Suphs



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E-Mail: lab@traceanalysis.com

Certifications

WBENC: 237019

HUB:

1752439743100-86536

DBE: VN 20657

NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

LELAP-02003 Kansas E-10317 El Paso: T104704221-08-TX Midland:

T104704392-08-TX

LELAP-02002

Analytical and Quality Control Report

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

Report Date: October 25, 2010

Work Order: 10102019

Project Location: Eddy County, NM Project Name:

COG/Berry A Fed. #1

Project Number:

114-6400628

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

			Date	rime	Date
Sample	Description	Matrix	Taken	Taken	Received
248002	BH-1 0-1'	soil	2010-10-14	00:00	2010-10-20
248003	BH-1 3'	soil	2010-10-14	00:00	2010-10-20
248004	BH-1 5'	soil	2010-10-14	00:00	2010-10-20
248005	BH-1 7 [;]	soil	2010-10-14	. 00:00	2010-10-20
248006	BH-1 10'	soil	2010-10-14	00:00	2010-10-20
248007	BH-1 15'	soil	2010-10-14	00:00	2010-10-20
248008	BH-1 20'	soil	2010-10-14	00:00	2010-10-20
248009	BH-1 25'	soil	2010-10-14	00:00	2010-10-20
248010	BH-1 30'	soil	2010-10-14	00:00	2010-10-20
248011	BH-1 40'	soil	2010-10-14	00:00	2010-10-20

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
248012	BH-1 50'	soil	2010-10-14	00:00	2010-10-20
248013	BH-1 60'	soil	2010-10-14	00:00	2010-10-20
248014	BH-2 0-1'	soil	2010-10-14	00:00	2010-10-20
248015	BH-2 3'	soil	2010-10-14	00:00	2010-10-20
248016	BH-2 5'	soil	2010-10-14	00:00	2010-10-20
248017	BH-2 7'	soil	2010-10-14	00:00	2010-10-20
248018	BH-3 0-1'	soil	2010-10-14	00:00	2010-10-20
248019	BH-3 3'	soil	2010-10-14	00:00	2010-10-20
248020	BH-3 5'	soil	2010-10-14	00:00	2010-10-20
248021	BH-3 7'	soil	2010-10-14	00:00	2010-10-20
248022	BH-3 10'	soil	2010-10-14	00:00	2010-10-20
248023	BH-4 0-1'	soil	2010-10-14	00:00	2010-10-20
248024	BH-4 3'	soil	2010-10-14	00:00	2010-10-20
248025	BH-4 5'	soil	2010-10-14	00:00	2010-10-20
248026	BH-4 7'	soil	2010-10-14	00:00	2010-10-20
248027	BH-4 10'	soil	2010-10-14	00:00	2010-10-20

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 16 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

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project COG/Berry A Fed. #1 were received by TraceAnalysis, Inc. on 2010-10-20 and assigned to work order 10102019. Samples for work order 10102019 were received intact at a temperature of 4.0 C.

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

		Prep	Prep	$_{ m QC}$	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	64001	2010-10-21 at 09:44	74655	2010-10-22 at 14:33
Chloride (Titration)	SM 4500-Cl B	64001	2010-10-21 at 09:44	74656	2010-10-22 at 14:34
Chloride (Titration)	SM 4500-Cl B	64001	2010-10-21 at 09:44	74657	2010-10-22 at $14:35$
Chloride (Titration)	SM 4500-Cl B	64001	2010-10-21 at 09:44	74658	2010-10-22 at 14:36

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 10102019 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.

114-6400628

Work Order: 10102019 COG/Berry A Fed. #1 Page Number: 4 of 16 Eddy County, NM

Analytical Report

Sample: 248002 - BH-1 0-1'

Laboratory:

Midland

Analysis: Chloride (Titration)

QC Batch: 74655 Prep Batch: 64001 Analytical Method:

SM 4500-Cl B

Date Analyzed: 2010-10-22 Sample Preparation: 2010-10-21 Prep Method: N/A Analyzed By: AR Prepared By: AR

RL

Sample: 248003 - BH-1 3'

 ${\bf Laboratory:}$

Midland

Analysis: Chloride (Titration)

QC Batch: 74655 Prep Batch: 64001 Analytical Method: SM 4500-Cl B

Date Analyzed: 2010-10-22 Sample Preparation: 2010-10-21

4500-Cl B Prep Method: N/A 0-10-22 Analyzed By: AR 0-10-21 Prepared By: AR

Dilution

100

RL

33400

Sample: 248004 - BH-1 5'

Laboratory:

Midland

Analysis: Chloride (Titration) QC Batch: 74655 Prep Batch: 64001 Analytical Method:
Date Analyzed:

SM 4500-Cl B 2010-10-22 2010-10-21

Units

mg/Kg

Prep Method: N/A Analyzed By: AR

RL

4.00

RL Parameter Flag Result

Sample Preparation:

Prepared By: AR

Sample: 248005 - BH-1 7'

Laboratory:

Chloride

Midland

Analysis: Chloride (Titration) QC Batch: 74656 Prep Batch: 64001 Analytical Method: Date Analyzed:

Sample Preparation:

SM 4500-Cl B 2010-10-22 2010-10-21 Prep Method: N/A Analyzed By: AR Prepared By: AR

continued . . .

Report Date 114-6400628			Page Number: Eddy Coun		
sample 2480	05 continued				
		RL			
Parameter	Flag	Result	Units	Dilution	RL
		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		15000	mg/Kg	100	4.00
Sample: 24	18006 - BH-1 10'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500 -Cl B	Prep Method:	N/A
QC Batch:	74656	Date Analyzed:	2010-10-22	Analyzed By:	AR
Prep Batch:	64001	Sample Preparation	: 2010-10-21	Prepared By:	AR
		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		9540	mg/Kg	100	4.00
Sample: 24	18007 - BH-1 15'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	74656	Date Analyzed:	2010-10-22	Analyzed By:	AR
Prep Batch:	64001	Sample Preparation	: 2010-10-21	Prepared By:	AR
		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		4100	mg/Kg	100	4.00
Sample: 24	18008 - BH-1 20'				
Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	74656	Date Analyzed:	2010-10-22	Analyzed By:	AR
Prep Batch:	64001	Sample Preparation	: 2010-10-21	Prepared By:	AR
		RL			
Parameter	Flag	Result	Units	Dilution	RL
Chloride		1370	mg/Kg	100	4.00

114-6400628 COG/Berry A Fed. #1 Eddy County, NM Sample: 248009 - BH-1 25' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74656 2010-10-22 Analyzed By: ARDate Analyzed: Prep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLResult Units Dilution RLParameter Flag 1230 100 4.00Chloride mg/Kg Sample: 248010 - BH-1 30' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74656 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLParameter Result Units Dilution RLFlag 234 50 4.00 Chloride mg/Kg Sample: 248011 - BH-1 40' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 2010-10-22 Analyzed By: 74656 Date Analyzed: AR Prep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLParameter Result Units Dilution RLFlag Chloride 513 mg/Kg 50 4.00Sample: 248012 - BH-1 50' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74656 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLParameter Flag Result Units Dilution RL

371

mg/Kg

50

4.00

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Report Date: October 25, 2010

Chloride

114-6400628 COG/Berry A Fed. #1 Eddy County, NM Sample: 248013 - BH-1 60' Laboratory: Midland Chloride (Titration) Analytical Method: Analysis: SM 4500-Cl B Prep Method: N/A QC Batch: 74656 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLParameter Flag Result Units Dilution RL3030 Chloride mg/Kg 100 4.00Sample: 248014 - BH-2 0-1' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-CLB Prep Method: N/A QC Batch: 74656 Date Analyzed: 2010-10-22 Analyzed By: AR 64001 Sample Preparation: Prep Batch: 2010-10-21 Prepared By: AR RLParameter Flag Result Units Dilution RL<200 Chloride mg/Kg 50 4.00 Sample: 248015 - BH-2 3' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: AR RLResult Units Parameter Flag Dilution RL204 Chloride mg/Kg 50 4.00 Sample: 248016 - BH-2 5' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLParameter · Flag Result Units Dilution RL

<200

mg/Kg

50

4.00

Work Order: 10102019

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Report Date: October 25, 2010

Chloride

Report Date: October 25, 2010 114-6400628 Eddy County, NM COG/Berry A Fed. #1 Sample: 248017 - BH-2 7' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/AQC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: ARPrepared By: Prep Batch: 64001 Sample Preparation: 2010-10-21 AR RLRLParameter Result Units Dilution Flag 4.00Chloride <200 mg/Kg 50 Sample: 248018 - BH-3 0-1' Laboratory: Midland Prep Method: Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B N/AAnalyzed By: ARQC Batch: 74657 Date Analyzed: 2010-10-22 Prepared By: Prep Batch: 64001 Sample Preparation: 2010-10-21 AR RLParameter Flag Result Units Dilution RLChloride 504 50 4.00 mg/Kg Sample: 248019 - BH-3 3' Laboratory: Midland Chloride (Titration) SM 4500-Cl B Prep Method: N/AAnalysis: Analytical Method: QC Batch: Analyzed By: AR74657 Date Analyzed: 2010-10-22 Prep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLResult Dilution RLParameter Flag Units Chloride 387 mg/Kg 50 4.00Sample: 248020 - BH-3 5' Laboratory: Midland Chloride (Titration) N/A Analysis: Analytical Method: SM 4500-Cl B Prep Method: QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: Prepared By: AR 2010-10-21 RLParameter RLFlag Result Units Dilution Chloride 316 4.00 mg/Kg 50

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Report Date: October 25, 2010 Work Order: 10102019 Page Number: 9 of 16 114-6400628 COG/Berry A Fed. #1 Eddy County, NM Sample: 248021 - BH-3 7' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLParameter Flag Result Units Dilution RLChloride < 200 mg/Kg 50 4.00 Sample: 248022 - BH-3 10' Laboratory: Midland Analysis: Chloride (Titration) SM 4500-Cl B Analytical Method: Prep Method: N/A QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: AR Prep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLUnits Parameter Dilution Flag Result RL< 200 Chloride mg/Kg 50 4.00 Sample: 248023 - BH-4 0-1' Laboratory: Midland N/A Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: AR Prep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: ARRLFlag Parameter Result Units Dilution RLChloride 19800 mg/Kg 100 4.00Sample: 248024 - BH-4 3' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74657 Date Analyzed: 2010-10-22 Analyzed By: AR Prep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: AR RLParameter Flag Result Units Dilution RLChloride 9280 100 4.00 mg/Kg

114-6400628 COG/Berry A Fed. #1 Eddy County, NM Sample: 248025 - BH-4 5' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74658 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: Sample Preparation: 64001 2010-10-21 Prepared By: ARRLParameter Flag Result Units Dilution RL<200 mg/Kg Chloride 50 4.00 Sample: 248026 - BH-4 7' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 74658 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 Sample Preparation: 2010-10-21 Prepared By: AR RLParameter Flag Result Units Dilution RLChloride <200 mg/Kg 4.00 50 Sample: 248027 - BH-4 10' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A 74658 QC Batch: Date Analyzed: 2010-10-22 Analyzed By: AR. Sample Preparation: Prep Batch: 64001 2010-10-21 Prepared By: ARRLParameter Flag Result Units Dilution RLChloride 229 mg/Kg 50 4.00 Method Blank (1) QC Batch: 74655 QC Batch: 74655 Date Analyzed: 2010-10-22 Analyzed By: ARPrep Batch: 64001 QC Preparation: 2010-10-21 Prepared By: MDL

Result

< 2.18

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RL

Units

mg/Kg

Report Date: October 25, 2010

Parameter

Chloride

Flag

Report Date: October 25, 2010 Work Order: 10102019 Page Number: 11 of 16 114-6400628 COG/Berry A Fed. #1 Eddy County, NM Method Blank (1) QC Batch: 74656 QC Batch: 74656 Date Analyzed: 2010-10-22 Analyzed By: AR Prep Batch: 64001 QC Preparation: 2010-10-21 Prepared By: AR. MDL RLParameter Flag Result Units Chloride <2.18 mg/Kg 4 Method Blank (1) QC Batch: 74657 Analyzed By: AR QC Batch: 74657 Date Analyzed: 2010-10-22 Prep Batch: 64001 QC Preparation: 2010-10-21 Prepared By: ARMDL RLParameter Flag Result Units Chloride <2.18 mg/Kg 4 Method Blank (1) QC Batch: 74658 QC Batch: Date Analyzed: 2010-10-22 Analyzed By: AR. 74658 Prepared By: AR QC Preparation: 2010-10-21 Prep Batch: 64001 MDL Parameter Result Units RLFlag <2.18 mg/Kg Chloride 4 Laboratory Control Spike (LCS-1) QC Batch: 74655 Date Analyzed: 2010-10-22 Analyzed By: AR

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.7	mg/Kg	1	100	< 2.18	98	85 - 115

QC Preparation: 2010-10-21

Prepared By:

AR

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

Prep Batch: 64001

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	<2.18	102	85 - 115	4	20

114-6400628

Work Order: 10102019 COG/Berry A Fed. #1 Page Number: 12 of 16 Eddy County, NM

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: 64001

74656

Date Analyzed:

2010-10-22

Analyzed By: AR

QC Preparation: 2010-10-21

Prepared By: AR

	LCS			Spike	Matrix	•	Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	96.7	mg/Kg	1	100	< 2.18	97	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	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	< 2.18	102	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: Prep Batch:

74657 64001

Date Analyzed:

2010-10-22 QC Preparation: 2010-10-21 Analyzed By: AR

Prepared By: AR

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	97.4	mg/Kg	1	100	< 2.18	97	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	Result	\mathbf{Units}	Dil .	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	< 2.18	102	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:

74658 Prep Batch: 64001 Date Analyzed:

2010-10-22 QC Preparation: 2010-10-21

Analyzed By: AR. Prepared By: AR

	LCS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	98.4	mg/Kg	1	100	< 2.18	98	85 - 115

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

114-6400628

Work Order: 10102019 COG/Berry A Fed. #1 Page Number: 13 of 16 Eddy County, NM

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	102	mg/Kg	1	100	< 2.18	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: 248004

QC Batch:

74655

Date Analyzed:

2010-10-22

Analyzed By: AR

Prep Batch: 64001

QC Preparation: 2010-10-21

Prepared By: AR

	MS			\mathbf{Spike}	Matrix		Rec.
Param	Result	\mathbf{Units}	Dil.	Amount	Result	Rec.	Limit
Chloride	43700	mg/Kg	100	10000	33400	103	85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	44000	mg/Kg	100	10000	33400	106	85 - 115	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: 248014

QC Batch:

74656

Date Analyzed:

2010-10-22

Analyzed By: AR

Prep Batch: 64001

Prepared By: AR

QC Preparation: 2010-10-21

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride	10200	mg/Kg	100	10000	<218	101	85 - 115

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

	MSD			$\mathbf{S}_{\mathbf{P}ike}$	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	10400	mg/Kg	100	10000	<218	103	85 - 115	2	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: 248024

QC Batch: Prep Batch:

74657 64001 Date Analyzed:

2010-10-22

QC Preparation: 2010-10-21

Analyzed By: AR

Prepared By: AR

continued ...

114-6400628

Work Order: 10102019 COG/Berry A Fed. #1 Page Number: 14 of 16 Eddy County, NM

matrix spikes continued ...

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
_	MS			Spike	Matrix		Rec.
Param	Result	${f Units}$	Dil.	Amount	Result	${ m Rec.}$	Limit
Chloride	18800	mg/Kg	100	10000	9280	95	85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	19400	mg/Kg	100	10000	9280	101	85 - 115	3	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: 248027

QC Batch:

Date Analyzed:

2010-10-22

Analyzed By: AR

Prep Batch: 64001

QC Preparation: 2010-10-21

Prepared By: AR

MS Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit Chloride 10100 mg/Kg 100 10000 22999 85 - 115

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

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	10400	mg/Kg	100	10000	229	102	85 - 115	3	20

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

Standard (ICV-1)

QC Batch: 74655

Date Analyzed: 2010-10-22

Analyzed By: AR

			ICVs	ICVs	ICVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.5	100	85 - 115	2010-10-22

Standard (CCV-1)

QC Batch: 74655

Date Analyzed: 2010-10-22

Analyzed By: AR

114-6400628

Work Order: 10102019

COG/Berry A Fed. #1

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Eddy County, NM

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-10-22

Standard (ICV-1)

QC Batch: 74656

Date Analyzed: 2010-10-22

Analyzed By: AR

			ICVs True	ICVs Found	${ m ICVs} \ { m Percent}$	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	101	101	85 - 115	2010-10-22

Standard (CCV-1)

QC Batch: 74656

Date Analyzed: 2010-10-22

Analyzed By: AR

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
D	Talo m	Units		~		J	
Param	Flag		Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	•	${ m mg/Kg}$	100	99.5	100	85 - 115	2010-10-22

Standard (ICV-1)

QC Batch: 74657

Date Analyzed: 2010-10-22

Analyzed By: AR

			ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.7	100	85 - 115	2010-10-22

Standard (CCV-1)

QC Batch: 74657

Date Analyzed: 2010-10-22

Analyzed By: AR

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	100	100	85 - 115	2010-10-22

Standard (ICV-1)

QC Batch: 74658

Date Analyzed: 2010-10-22

Analyzed By: AR

114-6400628

Work Order: 10102019

COG/Berry A Fed. #1

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			ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	100	100	85 - 115	2010-10-22

Standard (CCV-1)

QC Batch: 74658

Date Analyzed: 2010-10-22

Analyzed By: AR

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	99.8	100	85 - 115	2010-10-22

Wo#: 10102019

Analysis Request of Chain of Custody Record PAGE: OF ANALYSIS REQUEST											=		3																													
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APPENDIX D

Soil Boring Log

Boring/Well:

BH-1

Client:

COG

Site Location:

Berry A Federal #1

Location:

Eddy County, New Mexico

Total Depth

60'

Date Installed:

10/14/10

DEPTH (Ft)	Ft.	OVM	SAMPLE DESCRIPTION
0-1'			Brown sand
3'			Brown sand
5'			Tan sandy caliche (stained)
7'			Tan sandy caliche
10'			Red clay sandy caliche mix
15'			Loose red sandy clay 50/50
20'			Loose red sandy clay 60/40
25'			Loose red sandy clay 60/40
30'			Loose red sandy clay 80/20
40'			Sandy clay with gravel mix
50'			Sandy clay <10% sand
60'			Dense rich red clay

Total Depth is 60 feet

Groundwater was not encountered

BEB Below Excavation Bottom

(--) Not Analyzed