

SITE INFORMATION

Report Type: Closure

General Site Information:

Site:	Ebony State #4				
Company:	COG Operating LLC				
Section, Township and Range	Unit H	Sec. 25	T 17S	R 27E	
Lease Number:	API-30-015-39412				
County:	Eddy County				
GPS:	32.80641° N			104.22475° W	
Surface Owner:	State				
Mineral Owner:					
Directions:	In Loco Hills, from the intersection of Haggerman Cutoff and 82, travel west on 82 (4.7 miles), turn north (800 feet) straight ahead to location				

Release Data:

Date Released:	3/1/2013
Type Release:	Oil
Source of Contamination:	Oil Hauler Tank
Fluid Released:	18 bbls
Fluids Recovered:	0 bbls

Official Communication:

Name:	Robert McNeill		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Suite 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 682-4559
Fax:	(432) 684-7137		
Email:	rmcneill@conchoresources.com		ike.tavarez@tetrattech.com

Ranking Criteria

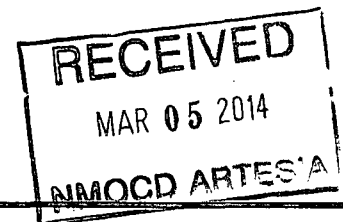
Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	

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:	0
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Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	5,000





TETRA TECH

January 14, 2014

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

Re: Closure Request for the COG Operating LLC., Ebony State #4 Tank Battery, Unit H, Section 25, Township 17 South, Range 27 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 Ebony State #4 Tank Battery located in Unit H, Section 25, Township 17 South, Range 27 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.80641°, W 104.22475°. 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 March 01, 2013, and released approximately eighteen (18) barrels of oil from an oil hauler tank that ran over. To alleviate the problem, the truck driver will keep a better watch when loading the trailer. Zero (0) barrels of standing fluids were recovered. The spill initiated and stayed on the southwest side of the pad affecting an area 55' X 155'. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 27. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 125' below surface. The groundwater data is shown in Figure B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of

Tetra Tech

1910 North Big Spring, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



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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 August 16, 2013, Tetra Tech personnel inspected and sampled the spill area. Five (5) auger holes (AH-1 through AH-5) were installed using a stainless steel hand auger to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, none of the samples exceeded the Benzene, Total BTEX or TPH RRAL's. The areas of auger holes (AH-2 and AH-4) showed detectable TPH concentrations of 3,739 mg/kg and 1,750 mg/kg, respectively. In addition, the chloride concentrations did not show a significant impact to the soils, with a chloride high of 197 mg/kg.

Recommendations

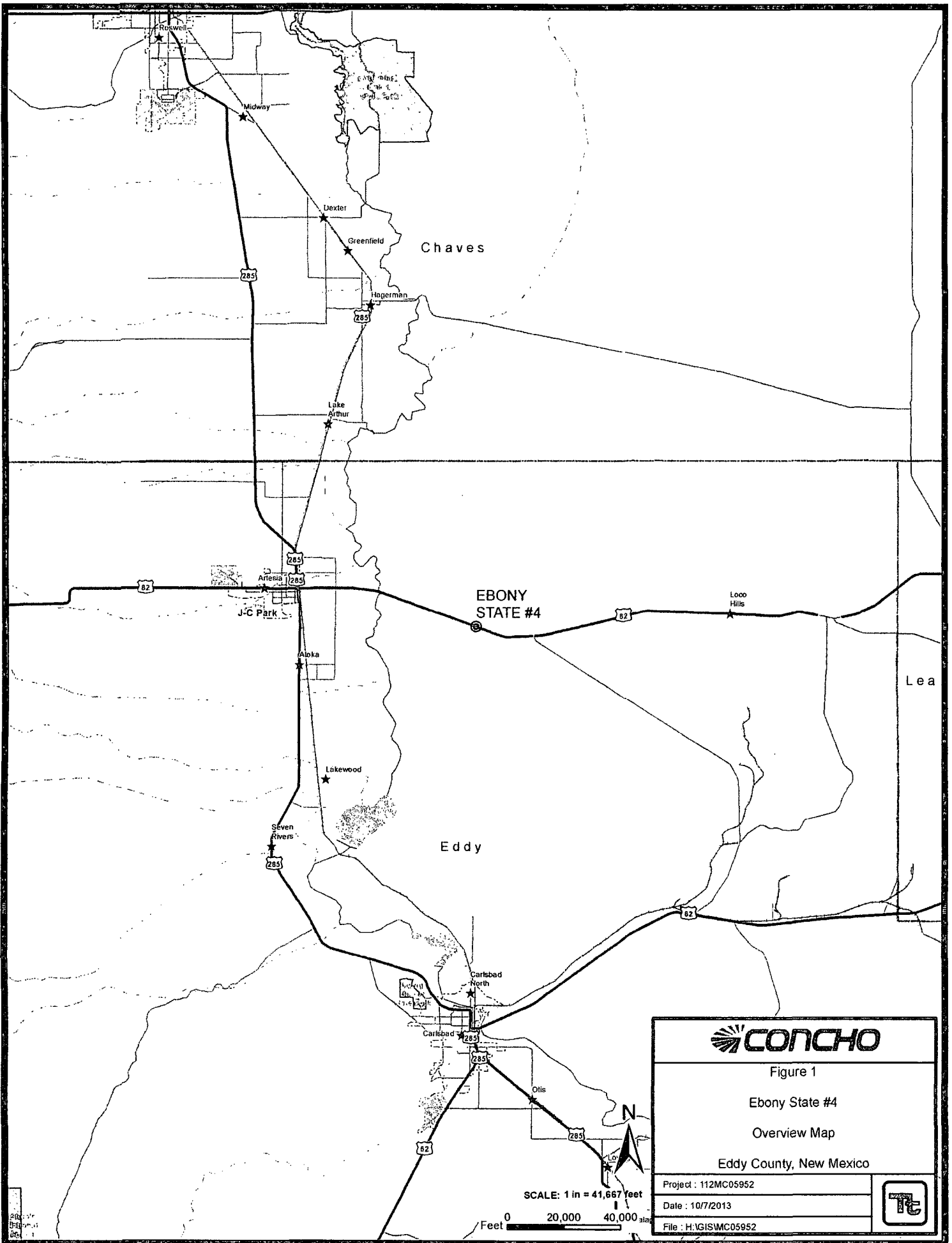
The TPH and BTEX concentrations were all below the RRAL's and the chloride concentrations did not show a significant impact to the soils. Based on the results, COG proposes to close this site. The final C-141 is enclosed in Appendix A.

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

Ike Tavaréz, PG
Senior Project Manager

Figures



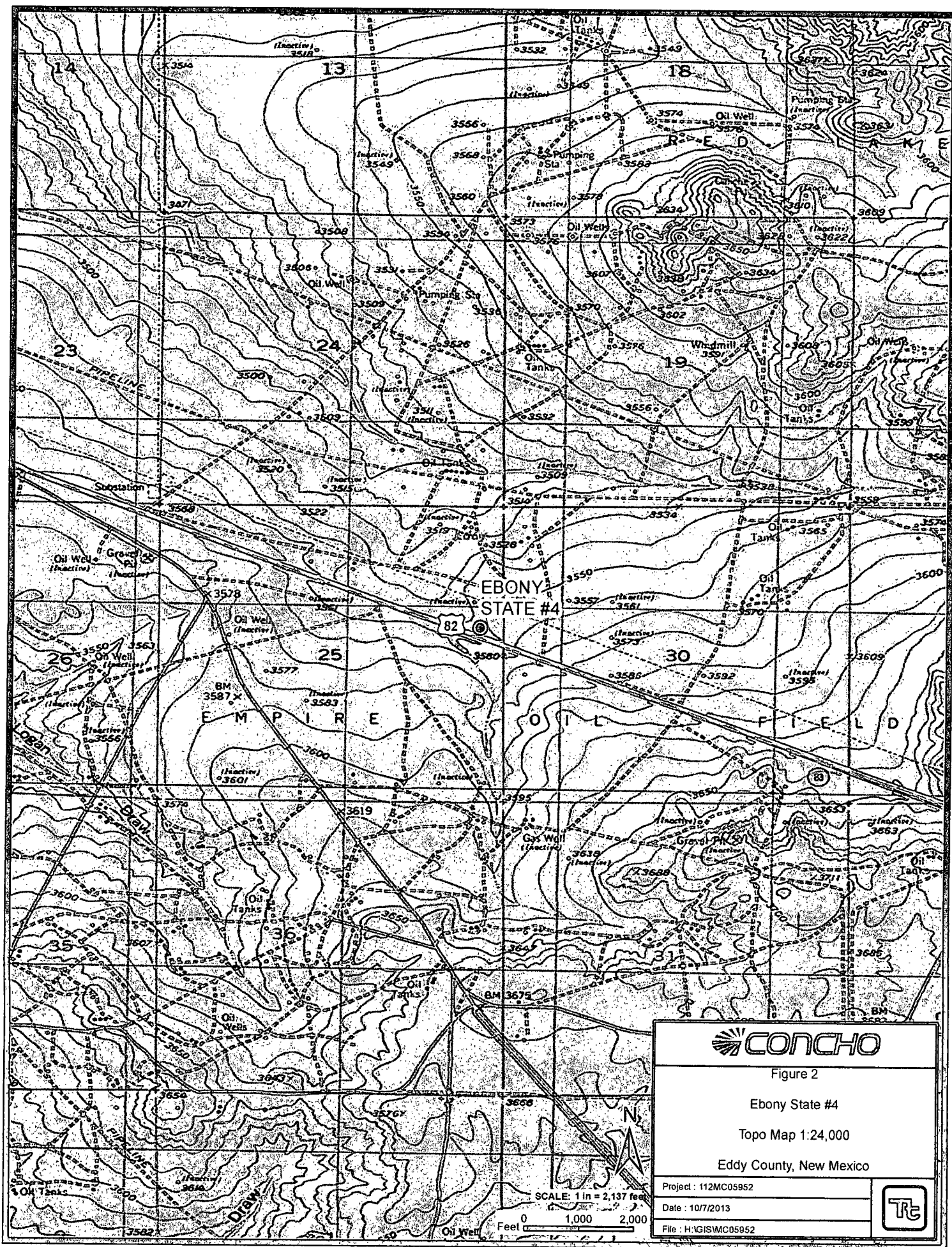


Figure 2

Ebony State #4

Topo Map 1:24,000

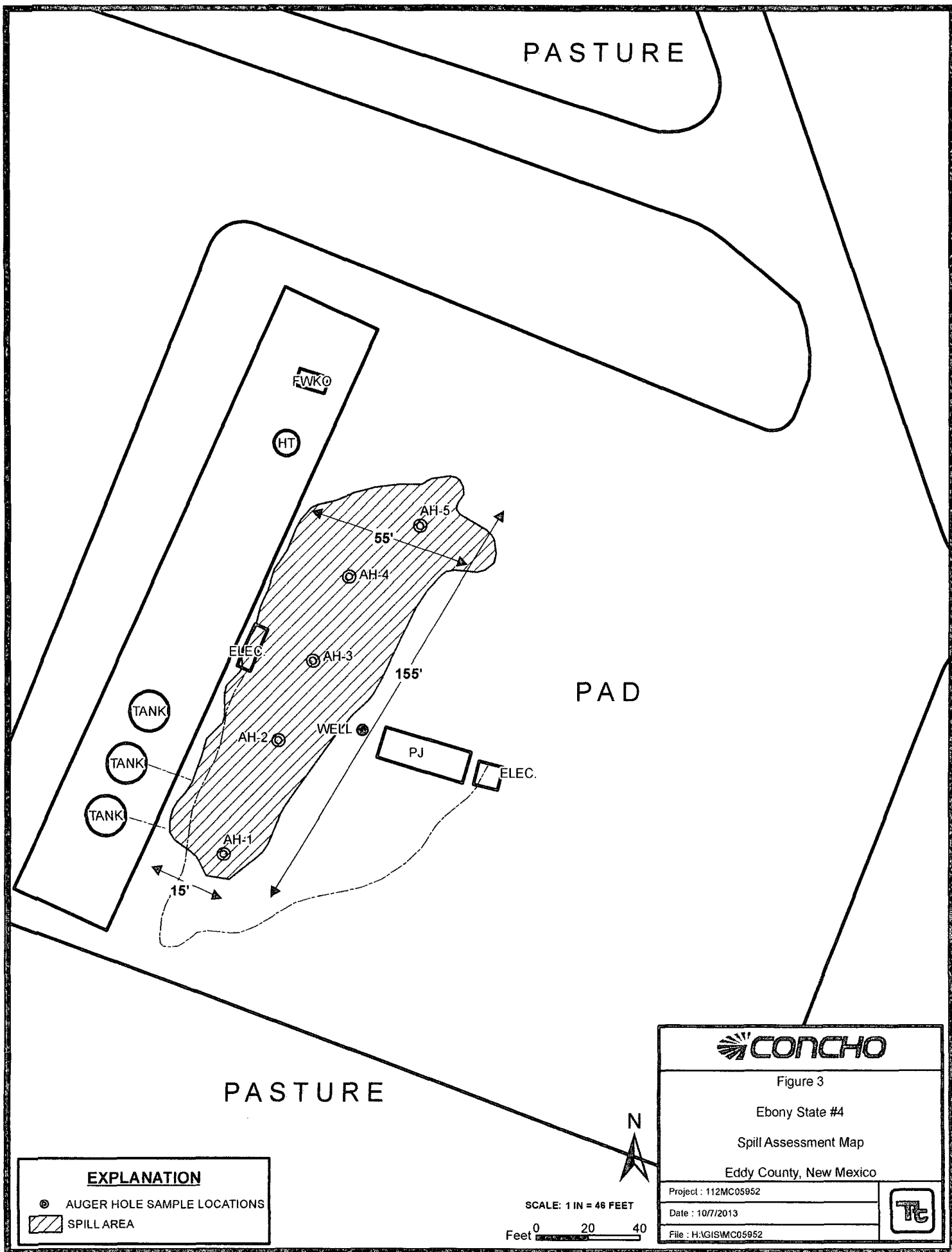
Eddy County, New Mexico

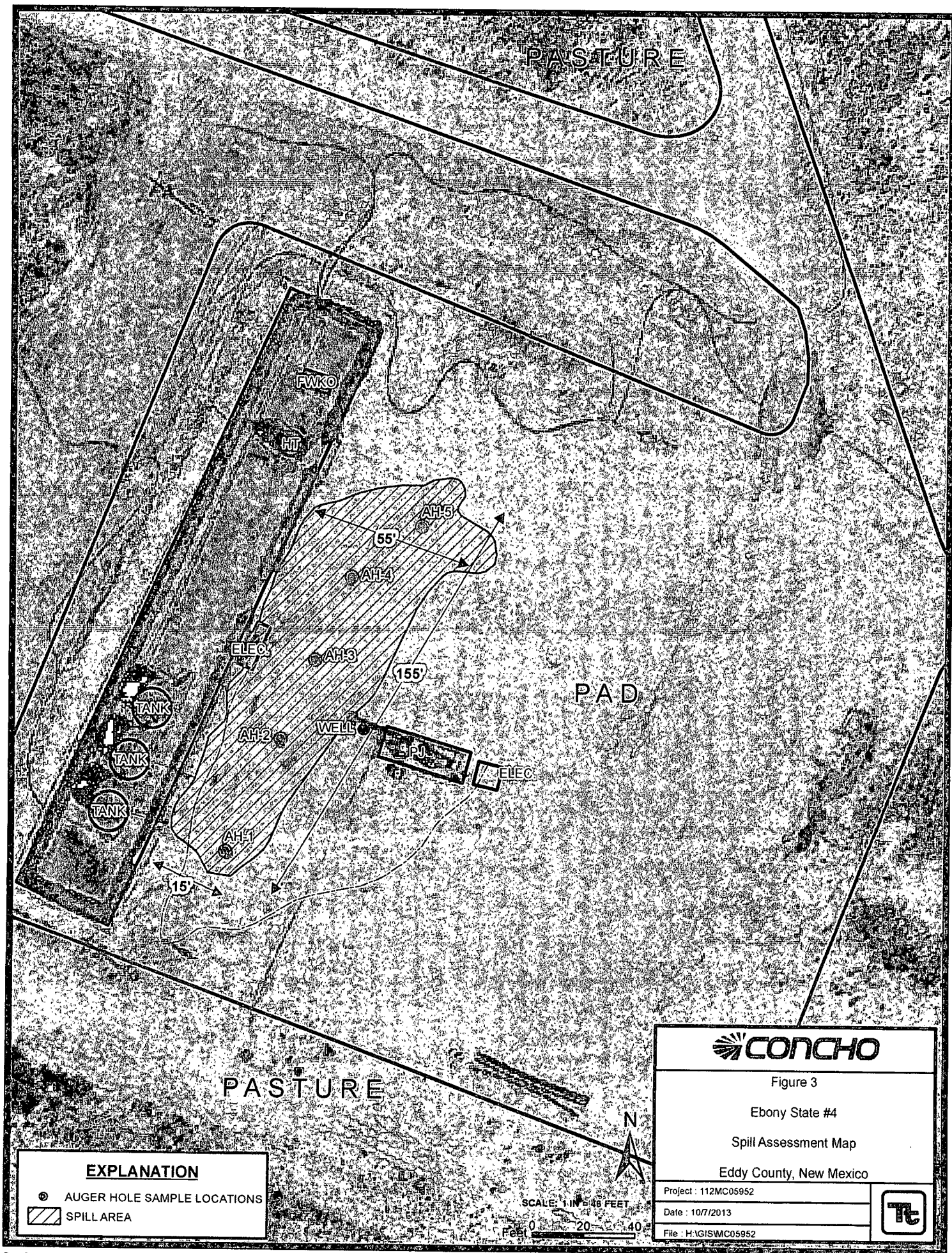
Project : 112MC05952

Date : 10/7/2013

File : H:\GIS\MC05952







Tables

Table 1
COG Operating LLC.
Ebony State #4
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
AH-1	8/16/2013	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	<20.0
AH-2	8/16/2013	0-1	-	X		89.4	3650	3,739	<0.100	<0.100	<0.100	<0.100	<0.100	250
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	<20.0
AH-3	8/16/2013	0-1	-	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	40.0
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	<20.0
AH-4	8/16/2013	0-1	-	X		<20.0	1750	1750	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<20.0
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	30.0
	"	2-2.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	3-3.5	-	X		-	-	-	-	-	-	-	-	59.0
	"	4-4.5	-	X		-	-	-	-	-	-	-	-	<20.0
	"	5-5.5	-	X		-	-	-	-	-	-	-	-	<20.0
AH-5	8/16/2013	0-1	-	X		<4.00	154	154	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	128
	"	1-1.5	-	X		-	-	-	-	-	-	-	-	197

(-) Not Analyzed

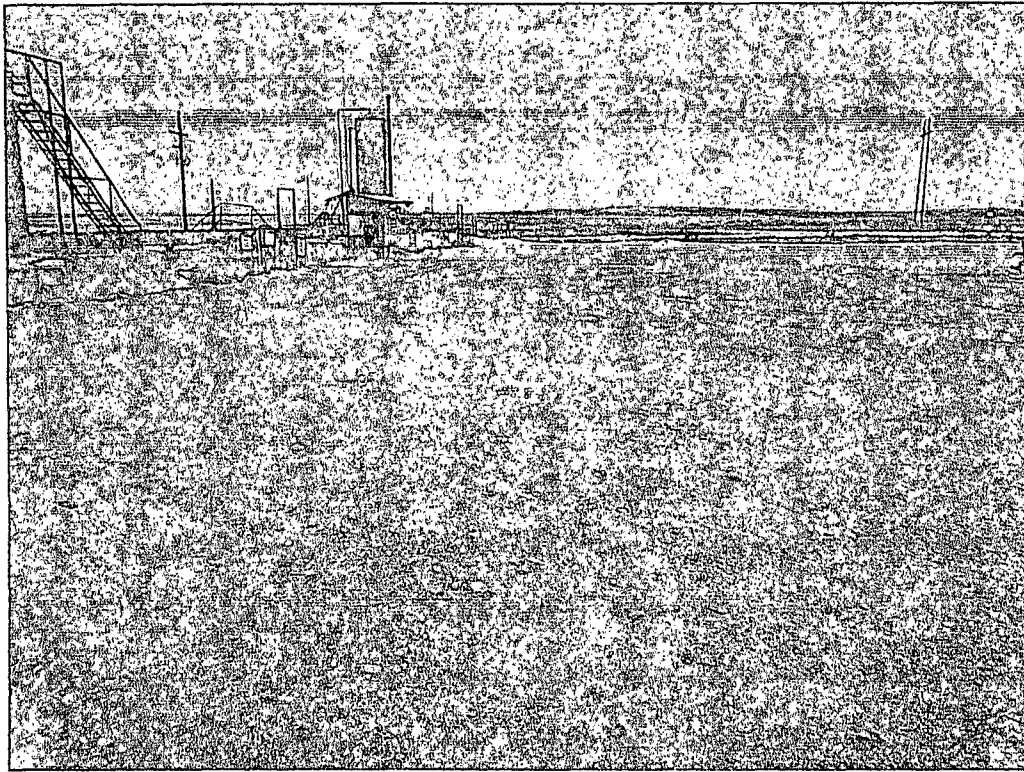
(BEB) Below Excavation Bottom

Photos

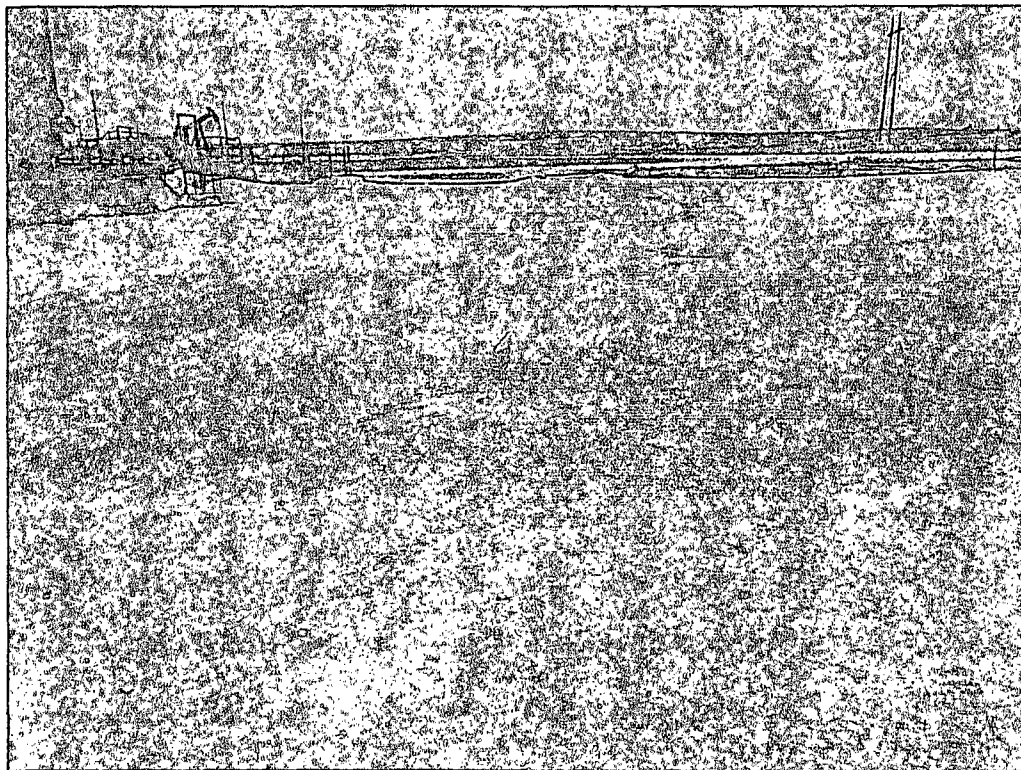
COG Operating LLC
Ebony St. #4 Tank Battery
Eddy County, New Mexico



TETRA TECH



View North – AH-1, AH-2, AH-2, and AH-4



View North – AH-3, AH-4, and AH-5

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company COG Operating LLC	Contact Pat Ellis
Address 600 W. Illinois Ave., Midland, Texas 79701	Telephone No. (432) 230-0077
Facility Name Ebony State #4	Facility Type Tank Battery

Surface Owner: State	Mineral Owner	Lease No. (API) 30-015-39412
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LOCATION OF RELEASE

Unit Letter H	Section 25	Township 17S	Range 27E	Feet from the	North/South Line	Feet from the	East/West Line	County Eddy
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Latitude N 32.80641° Longitude W 104.22475°

NATURE OF RELEASE

Type of Release: Oil	Volume of Release 18 bbls	Volume Recovered 0 bbls
Source of Release: Oil hauler tank ran over	Date and Hour of Occurrence 3/1/13	Date and Hour of Discovery 3/1/2013 10:00am
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom? Josh Russo	Date and Hour 3/15/10 4:59 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

Oil hauler driver was not paying attention while he was loading the trailer. Keep watch when loading trailer.

RECEIVED

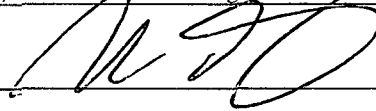
MAR 05 2014

NMOCD ARTESIA

Describe Area Affected and Cleanup Action Taken.*

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

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

Signature: 	OIL CONSERVATION DIVISION		
Printed Name: Ike Tavarez	Approved by District Supervisor:		
Title: Project Manager	Approval Date:	Expiration Date:	
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:		Attached ☐
Date: 1-14-14	Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Ebony State #4
Eddy County, New Mexico

16 South			26 East			
6	5	88	4	3	2	1
7	8	66	9	10	11	71
18	116	17	78	16	15	14
19	20	21	22	23	24	
30	130	29	28	27	26	25
31	32	119	33	34	35	36

16 South			27 East			
6	5	4	3	2	1	
7	8	9	10	11	12	
18	17	16	15	14	13	
19	20	21	22	23	24	
30	29	28	27	26	25	
31	32	33	70	35	36	

16 South			28 East			
6	5	4	3	2	1	
7	8	9	10	11	12	
18	17	16	15	14	13	
19	20	21	22	23	24	
30	29	61	27	26	25	
31	32	33	34	35	36	

17 South			26 East			
6	5	4	80	3	2	1
7	8	9	10	71	11	12
18	17	16	15	80	14	13
19	20	21	120	22	23	24
30	29	28	27	26	25	
31	98	32	33	40	35	36
		80	160	25		

17 South			27 East			
6	5	4	3	2	1	
7	30	8	9	10	11	54
14	18	17	16	15	14	50
111	19	20	21	22	23	24
				40		
30	29	28	27	26	25	Site
31	32	33	34	35	36	
		140				

17 South			28 East			
6	5	4	3	2	28	1
7	8	9	10	11	12	
18	17	16	15	14	13	
19	20	21	22	45	23	24
224	30	29	28	79	26	25
31	32	33	34	35	36	
				258		

18 South			26 East			
6	200	5	96	4	24	3
7	8	9	70	10	8	11
18	56	17	16	61	15	14
19	20	21	22	98	23	24
30	29	28	27	26	25	
31	32	33	34	35	36	

18 South			27 East			
6	5	4	3	2	1	
7	8	9	10	11	12	
18	17	16	15	14	13	
19	20	21	22	23	24	
30	29	28	27	26	25	
31	66	32	33	146	34	35

18 South			28 East			
6	5	4	3	2	66	1
7	49	8	81	9	10	11
18	17	16	15	80	14	13
19	20	21	22	23	24	
30	137	29	28	27	26	25
31	32	33	34	35	36	
				66		

-  New Mexico State Engineers Well Reports
-  USGS Well Reports
-  Geology and Groundwater Conditions in Southern Eddy, County, NM
-  NMOCD - Groundwater Data
-  Field water level
-  New Mexico Water and Infrastructure Data System

Appendix C

Summary Report

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

Report Date: September 12, 2013

Work Order: 13081915



Project Name: COG/Ebony State #4
Project Number: TBD

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
338984	AH-1 0-1'	soil	2013-08-16	00:00	2013-08-19
338985	AH-1 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338986	AH-1 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338987	AH-1 3-3.5'	soil	2013-08-16	00:00	2013-08-19
338988	AH-2 0-1'	soil	2013-08-16	00:00	2013-08-19
338989	AH-2 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338990	AH-2 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338991	AH-3 0-1'	soil	2013-08-16	00:00	2013-08-19
338992	AH-3 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338993	AH-3 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338994	AH-3 3-3.5'	soil	2013-08-16	00:00	2013-08-19
338995	AH-4 0-1'	soil	2013-08-16	00:00	2013-08-19
338996	AH-4 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338997	AH-4 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338998	AH-4 3-3.5'	soil	2013-08-16	00:00	2013-08-19
338999	AH-4 4-4.5'	soil	2013-08-16	00:00	2013-08-19
339000	AH-4 5-5.5'	soil	2013-08-16	00:00	2013-08-19
339001	AH-5 0-1'	soil	2013-08-16	00:00	2013-08-19
339002	AH-5 1-1.5'	soil	2013-08-16	00:00	2013-08-19

Sample - Field Code	BTEx				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
338984 - AH-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00 _{Qs}
338988 - AH-2 0-1'	<0.100 ¹	<0.100	<0.100	<0.100	3650	89.4 ² _{Qs}
338991 - AH-3 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00 _{Qs}

continued ...

¹Dilution due to hydrocarbons.²Dilution due to hydrocarbons.

... continued

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
338995 - AH-4 0-1'	<0.100 ³	<0.100	<0.100	<0.100	1750	<20.0 ⁴ Q _s
339001 - AH-5 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	154	<4.00 Q _s

Sample: 338984 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338985 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338986 - AH-1 2-2.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338987 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338988 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		250	mg/Kg	4

Sample: 338989 - AH-2 1-1.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338990 - AH-2 2-2.5'³Dilution due to hydrocarbons.⁴Dilution due to hydrocarbons.

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338991 - AH-3 0-1'

Param	Flag	Result	Units	RL
Chloride		40.0	mg/Kg	4

Sample: 338992 - AH-3 1-1.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338993 - AH-3 2-2.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338994 - AH-3 3-3.5'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338995 - AH-4 0-1'

Param	Flag	Result	Units	RL
Chloride		<20.0	mg/Kg	4

Sample: 338996 - AH-4 1-1.5'

Param	Flag	Result	Units	RL
Chloride		30.0	mg/Kg	4

Sample: 338997 - AH-4 2-2.5'

Param	Flag	Result	Units	RL
Chloride	Qr, Qs	<20.0	mg/Kg	4

Sample: 338998 - AH-4 3-3.5'

Qbsbn	Grbh	Sftvm	Vojut	SM
Di rpsjef	RS-R I	59.0	n hOL h	5

Sample: 338999 - AH-4 4-4.5'

Qbsbn	Grbh	Sftvm	Vojut	SM
Di rpsjef	RS-R I	<31/1	n hOL h	5

Sample: 339000 - AH-4 5-5.5'

Qbsbn	Grbh	Sftvm	Vojut	SM
Di rpsjef	RS-R I	<31/1	n hOL h	5

Sample: 339001 - AH-5 0-1'

Qbsbn	Grbh	Sftvm	Vojut	SM
Di rpsjef	RS-R I	128	n hOL h	5

Sample: 339002 - AH-5 1-1.5'

Qbsbn	Grbh	Sftvm	Vojut	SM
Di rpsjef	RS-R I	197	n hOL h	5



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: September 12, 2013

Work Order: 13081915



Project Name: COG/Ebony State #4
Project Number: TBD

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
338984	AH-1 0-1'	soil	2013-08-16	00:00	2013-08-19
338985	AH-1 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338986	AH-1 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338987	AH-1 3-3.5'	soil	2013-08-16	00:00	2013-08-19
338988	AH-2 0-1'	soil	2013-08-16	00:00	2013-08-19
338989	AH-2 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338990	AH-2 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338991	AH-3 0-1'	soil	2013-08-16	00:00	2013-08-19
338992	AH-3 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338993	AH-3 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338994	AH-3 3-3.5'	soil	2013-08-16	00:00	2013-08-19
338995	AH-4 0-1'	soil	2013-08-16	00:00	2013-08-19
338996	AH-4 1-1.5'	soil	2013-08-16	00:00	2013-08-19
338997	AH-4 2-2.5'	soil	2013-08-16	00:00	2013-08-19
338998	AH-4 3-3.5'	soil	2013-08-16	00:00	2013-08-19
338999	AH-4 4-4.5'	soil	2013-08-16	00:00	2013-08-19
339000	AH-4 5-5.5'	soil	2013-08-16	00:00	2013-08-19
339001	AH-5 0-1'	soil	2013-08-16	00:00	2013-08-19
339002	AH-5 1-1.5'	soil	2013-08-16	00:00	2013-08-19

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

A handwritten signature in black ink, reading "Michael Abel". The signature is written in a cursive, flowing style.

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

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Case Narrative

Samples for project COG/Ebony State #4 were received by TraceAnalysis, Inc. on 2013-08-19 and assigned to work order 13081915. Samples for work order 13081915 were received intact at a temperature of 5.9 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	88440	2013-08-23 at 12:00	104361	2013-08-24 at 01:30
Chloride (Titration)	SM 4500-Cl B	88425	2013-08-22 at 16:08	104345	2013-08-23 at 16:12
Chloride (Titration)	SM 4500-Cl B	88426	2013-08-23 at 16:09	104346	2013-08-23 at 16:14
Chloride (Titration)	SM 4500-Cl B	88427	2013-08-23 at 16:11	104347	2013-08-23 at 16:15
TPH DRO - NEW	S 8015 D	88317	2013-08-20 at 14:00	104227	2013-08-21 at 09:40
TPH GRO	S 8015 D	88440	2013-08-23 at 12:00	104381	2013-08-24 at 01:45

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 13081915 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.

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Analytical Report

Sample: 338984 - AH-1 0-1'

Laboratory: Midland

Analysis: BTEX

QC Batch: 104361

Prep Batch: 88440

Analytical Method: S 8021B

Date Analyzed: 2013-08-24

Sample Preparation: 2013-08-23

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.79	mg/Kg	1	2.00	90	70 - 130
4-Bromofluorobenzene (4-BFB)			1.65	mg/Kg	1	2.00	82	70 - 130

Sample: 338984 - AH-1 0-1'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 104345

Prep Batch: 88425

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-23

Sample Preparation: 2013-08-22

Prep Method: N/A

Analyzed By: AH

Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338984 - AH-1 0-1'

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 104227

Prep Batch: 88317

Analytical Method: S 8015 D

Date Analyzed: 2013-08-21

Sample Preparation: 2013-08-20

Prep Method: N/A

Analyzed By: CW

Prepared By: CW

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

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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			90.8	mg/Kg	1	100	91	76.3 - 192.6

Sample: 338984 - AH-1 0-1'

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 104381
Prep Batch: 88440

Analytical Method: S 8015 D
Date Analyzed: 2013-08-24
Sample Preparation: 2013-08-23

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qs,U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.53	mg/Kg	1	2.00	76	70 - 130
4-Bromofluorobenzene (4-BFB)			1.39	mg/Kg	1	2.00	70	70 - 130

Sample: 338985 - AH-1 1-1.5'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 104345
Prep Batch: 88425

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-08-23
Sample Preparation: 2013-08-22

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	"		<20.0	mg/Kg	5	4.00

Sample: 338986 - AH-1 2-2.5'

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 104345
Prep Batch: 88425

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-08-23
Sample Preparation: 2013-08-22

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

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sample 338986 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 338987 - AH-1 3-3.5'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 104346 Date Analyzed: 2013-08-23 Analyzed By: AH
Prep Batch: 88426 Sample Preparation: 2013-08-23 Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 338988 - AH-2 0-1'

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 104361 Date Analyzed: 2013-08-24 Analyzed By: AK
Prep Batch: 88440 Sample Preparation: 2013-08-23 Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.100	mg/Kg	5	0.0200
Toluene	U	1	<0.100	mg/Kg	5	0.0200
Ethylbenzene	U	1	<0.100	mg/Kg	5	0.0200
Xylene	U	1	<0.100	mg/Kg	5	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.00	mg/Kg	5	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)	QSR	QSR	3.75	mg/Kg	5	2.00	188	70 - 130

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Sample: 338988 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			250	mg/Kg	5	4.00

Sample: 338988 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2013-08-21	Analyzed By:	CW
QC Batch:	104227	Sample Preparation:	2013-08-20	Prepared By:	CW
Prep Batch:	88317				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO			3650	mg/Kg	5	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Q _{NT}	Q _{NT}	316	mg/Kg	5	100	316	76.3 - 192.6

Sample: 338988 - AH-2 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2013-08-24	Analyzed By:	AK
QC Batch:	104381	Sample Preparation:	2013-08-23	Prepared By:	AK
Prep Batch:	88440				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	2	Q _{NT}	89.4	mg/Kg	5	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.73	mg/Kg	5	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)	Q _{NT}	Q _{NT}	4.13	mg/Kg	5	2.00	206	70 - 130

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Sample: 338989 - AH-2 1-1.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL	Units	Dilution	RL
			Result			
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338990 - AH-2 2-2.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL	Units	Dilution	RL
			Result			
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338991 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2013-08-24	Analyzed By:	AK
QC Batch:	104361	Sample Preparation:	2013-08-23	Prepared By:	AK
Prep Batch:	88440				

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.79	mg/Kg	1	2.00	90	70 - 130
4-Bromofluorobenzene (4-BFB)			1.69	mg/Kg	1	2.00	84	70 - 130

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Sample: 338991 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			40.0	mg/Kg	5	4.00

Sample: 338991 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2013-08-21	Analyzed By:	CW
QC Batch:	104227	Sample Preparation:	2013-08-20	Prepared By:	CW
Prep Batch:	88317				

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			103	mg/Kg	1	100	103	76.3 - 192.6

Sample: 338991 - AH-3 0-1'

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2013-08-24	Analyzed By:	AK
QC Batch:	104381	Sample Preparation:	2013-08-23	Prepared By:	AK
Prep Batch:	88440				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Q8,11		<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.58	mg/Kg	1	2.00	79	70 - 130
4-Bromofluorobenzene (4-BFB)			1.45	mg/Kg	1	2.00	72	70 - 130

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Sample: 338992 - AH-3 1-1.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338993 - AH-3 2-2.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338994 - AH-3 3-3.5'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-08-23	Analyzed By:	AH
QC Batch:	104346	Sample Preparation:	2013-08-23	Prepared By:	AH
Prep Batch:	88426				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338995 - AH-4 0-1'

Laboratory:	Midland	Analytical Method:	S 8021B	Prep Method:	S 5035
Analysis:	BTEX	Date Analyzed:	2013-08-24	Analyzed By:	AK
QC Batch:	104361	Sample Preparation:	2013-08-23	Prepared By:	AK
Prep Batch:	88440				

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.100	mg/Kg	5	0.0200
Toluene	u	1	<0.100	mg/Kg	5	0.0200
Ethylbenzene	u	1	<0.100	mg/Kg	5	0.0200
Xylene	u	1	<0.100	mg/Kg	5	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.93	mg/Kg	5	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.11	mg/Kg	5	2.00	106	70 - 130

Sample: 338995 - AH-4 0-1'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 104346 Date Analyzed: 2013-08-23 Analyzed By: AH
Prep Batch: 88426 Sample Preparation: 2013-08-23 Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 338995 - AH-4 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 104227 Date Analyzed: 2013-08-21 Analyzed By: CW
Prep Batch: 88317 Sample Preparation: 2013-08-20 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1	1750	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr	205	mg/Kg	1	100	205	76.3 - 192.6

Sample: 338995 - AH-4 0-1'

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 104381 Date Analyzed: 2013-08-24 Analyzed By: AK
Prep Batch: 88440 Sample Preparation: 2013-08-23 Prepared By: AK

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Parameter	Flag	Cert.	RL Result	Units	Dilution	RL	
GRO	4	Qs, U	1	<20.0	mg/Kg	5	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.72	mg/Kg	5	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	5	2.00	99	70 - 130

Sample: 338996 - AH-4 1-1.5'

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	104346	Date Analyzed:	2013-08-23	Analyzed By: AH
Prep Batch:	88426	Sample Preparation:	2013-08-23	Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			30.0	mg/Kg	5	4.00

Sample: 338997 - AH-4 2-2.5'

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	104347	Date Analyzed:	2013-08-23	Analyzed By: AH
Prep Batch:	88427	Sample Preparation:	2013-08-23	Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qr, Qs, U		<20.0	mg/Kg	5	4.00

Sample: 338998 - AH-4 3-3.5'

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	104347	Date Analyzed:	2013-08-23	Analyzed By: AH
Prep Batch:	88427	Sample Preparation:	2013-08-23	Prepared By: AH

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qr, Qs		59.0	mg/Kg	5	4.00

Sample: 338999 - AH-4 4-4.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 104347

Prep Batch: 88427

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-23

Sample Preparation: 2013-08-23

Prep Method: N/A

Analyzed By: AH

Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qr, Qs, U		<20.0	mg/Kg	5	4.00

Sample: 339000 - AH-4 5-5.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 104347

Prep Batch: 88427

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-23

Sample Preparation: 2013-08-23

Prep Method: N/A

Analyzed By: AH

Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qr, Qs, U		<20.0	mg/Kg	5	4.00

Sample: 339001 - AH-5 0-1'

Laboratory: Midland

Analysis: BTEX

QC Batch: 104361

Prep Batch: 88440

Analytical Method: S 8021B

Date Analyzed: 2013-08-24

Sample Preparation: 2013-08-23

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

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

continued ...

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sample 339001 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	v	i	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.88	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.75	mg/Kg	1	2.00	88	70 - 130

Sample: 339001 - AH-5 0-1'

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 104347 Date Analyzed: 2013-08-23 Analyzed By: AH
Prep Batch: 88427 Sample Preparation: 2013-08-23 Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qr, Qs		128	mg/Kg	5	4.00

Sample: 339001 - AH-5 0-1'

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 104227 Date Analyzed: 2013-08-21 Analyzed By: CW
Prep Batch: 88317 Sample Preparation: 2013-08-20 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		i	154	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			114	mg/Kg	1	100	114	76.3 - 192.6

Sample: 339001 - AH-5 0-1'

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 104381 Date Analyzed: 2013-08-24 Analyzed By: AK
Prep Batch: 88440 Sample Preparation: 2013-08-23 Prepared By: AK

Report Date: September 12, 2013
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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qs, U	I	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.59	mg/Kg	1	2.00	80	70 - 130
4-Bromofluorobenzene (4-BFB)			1.48	mg/Kg	1	2.00	74	70 - 130

Sample: 339002 - AH-5 1-1.5'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 104347

Prep Batch: 88427

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-23

Sample Preparation: 2013-08-23

Prep Method: N/A

Analyzed By: AH

Prepared By: AH

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qr, Qs		197	mg/Kg	5	4.00

Report Date: September 12, 2013
TBD

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Method Blanks

Method Blank (1) QC Batch: 104227

QC Batch: 104227
Prep Batch: 88317

Date Analyzed: 2013-08-21
QC Preparation: 2013-08-20

Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO			<10.2	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			91.7	mg/Kg	1	100	92	64.1 - 164.4

Method Blank (1) QC Batch: 104345

QC Batch: 104345
Prep Batch: 88425

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-22

Analyzed By: AH
Prepared By: AH

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

Method Blank (1) QC Batch: 104346

QC Batch: 104346
Prep Batch: 88426

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-23

Analyzed By: AH
Prepared By: AH

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

Report Date: September 12, 2013
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Method Blank (1) QC Batch: 104347

QC Batch: 104347
Prep Batch: 88427

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-23

Analyzed By: AH
Prepared By: AH

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

Method Blank (1) QC Batch: 104361

QC Batch: 104361
Prep Batch: 88440

Date Analyzed: 2013-08-24
QC Preparation: 2013-08-23

Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.00810	mg/Kg	0.02
Toluene		1	<0.00750	mg/Kg	0.02
Ethylbenzene		1	<0.00730	mg/Kg	0.02
Xylene		1	<0.00700	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.91	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.72	mg/Kg	1	2.00	86	70 - 130

Method Blank (1) QC Batch: 104381

QC Batch: 104381
Prep Batch: 88440

Date Analyzed: 2013-08-24
QC Preparation: 2013-08-23

Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<2.32	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.62	mg/Kg	1	2.00	81	70 - 130
4-Bromofluorobenzene (4-BFB)			1.44	mg/Kg	1	2.00	72	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 104227
Prep Batch: 88317

Date Analyzed: 2013-08-21
QC Preparation: 2013-08-20

Analyzed By: CW
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO			284	mg/Kg	1	250	<10.2	114	53.8 - 129

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO			244	mg/Kg	1	250	<10.2	98	53.8 - 129	15	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	99.1	102	mg/Kg	1	100	99	102	61.3 - 170.4

Laboratory Control Spike (LCS-1)

QC Batch: 104345
Prep Batch: 88425

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-22

Analyzed By: AH
Prepared By: AH

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2470	mg/Kg	1	2500	<3.85	99	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2380	mg/Kg	1	2500	<3.85	95	89.7 - 115.9	4	20

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

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Laboratory Control Spike (LCS-1)

QC Batch: 104346
Prep Batch: 88426

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-23

Analyzed By: AH
Prepared By: AH

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2620	mg/Kg	1	2500	<3.85	105	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2580	mg/Kg	1	2500	<3.85	103	89.7 - 115.9	2	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 104347
Prep Batch: 88427

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-23

Analyzed By: AH
Prepared By: AH

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2440	mg/Kg	1	2500	<3.85	98	89.7 - 115.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2480	mg/Kg	1	2500	<3.85	99	89.7 - 115.9	2	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 104361
Prep Batch: 88440

Date Analyzed: 2013-08-24
QC Preparation: 2013-08-23

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.78	mg/Kg	1	2.00	<0.00810	89	70 - 130
Toluene		1	1.86	mg/Kg	1	2.00	<0.00750	93	70 - 130
Ethylbenzene		1	1.90	mg/Kg	1	2.00	<0.00730	95	70 - 130

continued ...

control spikes continued ...

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Xylene		1	5.62	mg/Kg	1	6.00	<0.00700	94	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.80	mg/Kg	1	2.00	<0.00810	90	70 - 130	1	20
Toluene		1	1.90	mg/Kg	1	2.00	<0.00750	95	70 - 130	2	20
Ethylbenzene		1	1.98	mg/Kg	1	2.00	<0.00730	99	70 - 130	4	20
Xylene		1	5.82	mg/Kg	1	6.00	<0.00700	97	70 - 130	4	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.67	1.74	mg/Kg	1	2.00	84	87	70 - 130
4-Bromofluorobenzene (4-BFB)	1.64	1.64	mg/Kg	1	2.00	82	82	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 104381
Prep Batch: 88440

Date Analyzed: 2013-08-24
QC Preparation: 2013-08-23

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	14.1	mg/Kg	1	20.0	<2.32	70	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	14.7	mg/Kg	1	20.0	<2.32	74	70 - 130	4	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.43	1.45	mg/Kg	1	2.00	72	72	70 - 130
4-Bromofluorobenzene (4-BFB)	1.45	1.44	mg/Kg	1	2.00	72	72	70 - 130

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Matrix Spike (MS-1) Spiked Sample: 338606

QC Batch: 104227
Prep Batch: 88317

Date Analyzed: 2013-08-21
QC Preparation: 2013-08-20

Analyzed By: CW
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO			333	mg/Kg	1	250	77.7	102	29 - 168.5

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO			386	mg/Kg	1	250	77.7	123	29 - 168.5	15	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	110	113	mg/Kg	1	100	110	113	59.5 - 168.9

Matrix Spike (MS-1) Spiked Sample: 338986

QC Batch: 104345
Prep Batch: 88425

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-22

Analyzed By: AH
Prepared By: AH

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2460	mg/Kg	5	2500	<19.2	98	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2380	mg/Kg	5	2500	<19.2	95	78.9 - 121	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: 338996

QC Batch: 104346
Prep Batch: 88426

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-23

Analyzed By: AH
Prepared By: AH

Report Date: September 12, 2013
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Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2730	mg/Kg	5	2500	30	108	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2830	mg/Kg	5	2500	30	112	78.9 - 121	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: 339006

QC Batch: 104347
Prep Batch: 88427

Date Analyzed: 2013-08-23
QC Preparation: 2013-08-23

Analyzed By: AH
Prepared By: AH

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	Qs	Qs	18600	mg/Kg	10	2500	10000	344	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	5	Qr, Qs	14200	mg/Kg	10	2500	10000	168	78.9 - 121	27	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: 338984

QC Batch: 104361
Prep Batch: 88440

Date Analyzed: 2013-08-24
QC Preparation: 2013-08-23

Analyzed By: AK
Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.76	mg/Kg	1	2.00	<0.00810	88	70 - 130
Toluene		1	1.87	mg/Kg	1	2.00	<0.00750	94	70 - 130
Ethylbenzene		1	1.94	mg/Kg	1	2.00	<0.00730	97	70 - 130
Xylene		1	5.63	mg/Kg	1	6.00	<0.00700	94	70 - 130

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

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matrix spikes continued ...

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.81	mg/Kg	1	2.00	<0.00810	90	70 - 130	3	20
Toluene		1	1.91	mg/Kg	1	2.00	<0.00750	96	70 - 130	2	20
Ethylbenzene		1	1.97	mg/Kg	1	2.00	<0.00730	98	70 - 130	2	20
Xylene		1	5.80	mg/Kg	1	6.00	<0.00700	97	70 - 130	3	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.82	1.84	mg/Kg	1	2	91	92	70 - 130
4-Bromofluorobenzene (4-BFB)	1.68	1.67	mg/Kg	1	2	84	84	70 - 130

Matrix Spike (MS-1) Spiked Sample: 338984

QC Batch: 104381
Prep Batch: 88440

Date Analyzed: 2013-08-24
QC Preparation: 2013-08-23

Analyzed By: AK
Prepared By: AK

Param		F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	Qs	Qs	1	11.3	mg/Kg	1	20.0	<2.32	56	70 - 130

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

Param			F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	Qs	Qs		1	13.4	mg/Kg	1	20.0	<2.32	67	70 - 130	17	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.48	2.28	mg/Kg	1	2	74	114	70 - 130
4-Bromofluorobenzene (4-BFB)	1.50	2.31	mg/Kg	1	2	75	116	70 - 130

Calibration Standards

Standard (CCV-1)

QC Batch: 104227

Date Analyzed: 2013-08-21

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	271	108	80 - 120	2013-08-21

Standard (CCV-2)

QC Batch: 104227

Date Analyzed: 2013-08-21

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	247	99	80 - 120	2013-08-21

Standard (CCV-3)

QC Batch: 104227

Date Analyzed: 2013-08-21

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	257	103	80 - 120	2013-08-21

Standard (CCV-4)

QC Batch: 104227

Date Analyzed: 2013-08-21

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	264	106	80 - 120	2013-08-21

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Standard (CCV-1)

QC Batch: 104345

Date Analyzed: 2013-08-23

Analyzed By: AH

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-08-23

Standard (CCV-2)

QC Batch: 104345

Date Analyzed: 2013-08-23

Analyzed By: AH

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.0	99	85 - 115	2013-08-23

Standard (CCV-1)

QC Batch: 104346

Date Analyzed: 2013-08-23

Analyzed By: AH

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-08-23

Standard (CCV-2)

QC Batch: 104346

Date Analyzed: 2013-08-23

Analyzed By: AH

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-08-23

Standard (CCV-1)

QC Batch: 104347

Date Analyzed: 2013-08-23

Analyzed By: AH

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-08-23

Standard (CCV-2)

QC Batch: 104347

Date Analyzed: 2013-08-23

Analyzed By: AH

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-08-23

Standard (CCV-1)

QC Batch: 104361

Date Analyzed: 2013-08-24

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.104	104	80 - 120	2013-08-24
Toluene		1	mg/kg	0.100	0.106	106	80 - 120	2013-08-24
Ethylbenzene		1	mg/kg	0.100	0.106	106	80 - 120	2013-08-24
Xylene		1	mg/kg	0.300	0.310	103	80 - 120	2013-08-24

Standard (CCV-2)

QC Batch: 104361

Date Analyzed: 2013-08-24

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.102	102	80 - 120	2013-08-24
Toluene		1	mg/kg	0.100	0.105	105	80 - 120	2013-08-24
Ethylbenzene		1	mg/kg	0.100	0.103	103	80 - 120	2013-08-24
Xylene		1	mg/kg	0.300	0.303	101	80 - 120	2013-08-24

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Standard (CCV-3)

QC Batch: 104361

Date Analyzed: 2013-08-24

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.104	104	80 - 120	2013-08-24
Toluene		1	mg/kg	0.100	0.104	104	80 - 120	2013-08-24
Ethylbenzene		1	mg/kg	0.100	0.102	102	80 - 120	2013-08-24
Xylene		1	mg/kg	0.300	0.297	99	80 - 120	2013-08-24

Standard (CCV-1)

QC Batch: 104381

Date Analyzed: 2013-08-24

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.878	88	80 - 120	2013-08-24

Standard (CCV-2)

QC Batch: 104381

Date Analyzed: 2013-08-24

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.809	81	80 - 120	2013-08-24

Standard (CCV-3)

QC Batch: 104381

Date Analyzed: 2013-08-24

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.00		80 - 120	2013-08-24

Appendix

Report Definitions

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

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory 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 than 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

Result Comments

- 1 Dilution due to hydrocarbons.
- 2 Dilution due to hydrocarbons.
- 3 Dilution due to hydrocarbons.
- 4 Dilution due to hydrocarbons.
- 5 MS/MSD RPD outside of laboratory limits due to spike error. LCS/LCSD RPD are within limits and show the batch to be under control.

Attachments

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

130819/S

Analysis Request of Chain of Custody Record

PAGE: 2 OF: 2

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

 ANALYSIS REQUEST
 (Circle or Specify Method No.)

CLIENT NAME:

COG

SITE MANAGER:

Ike Tavaraz

PROJECT NO.:

TBD

PROJECT NAME:

Ebony State #4

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION		NUMBER OF	FILTERED (Y)	HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015	PAH 8270	RCRA Metals	TCLP Metals	TCLP Volatiles	TCLP Semi V	RCI	GC/MS Vol. 8	GC/MS Semi	PCB's 8080/0	Pest. 808/60	Chloride	Gamma Spec	Alpha Beta (	PLM (Asbest	Major Anion
994	8-16-13		S		X	AH-3	3-3.5					X		X	X										X					
995	"		S		X	AH-4	0-1					X		X	X										X					
996	"		S		X	"	1-1.5					X													X					
997	"		S		X	"	2-2.5					X													X					
998	"		S		X	"	3-3.5					X													X					
999	"		S		X	"	4-4.5					X													X					
339000	"		S		X	"	5-5.5					X													X					
001	"		S		X	AH-5	0-1					X		X	X										X					
002	"		S		X	"	1-1.5					X													X					
												X																		

RELINQUISHED BY: (Signature)

Date:

8-19-13

RECEIVED BY: (Signature)

Date:

8-19-13

SAMPLED BY: (Print & Initial)

Date:

8-16-13

RELINQUISHED BY: (Signature)

Date:

10-4-13

RECEIVED BY: (Signature)

Date:

10-4-13

SAMPLE SHIPPED BY: (Circle)

AIRBILL #:

FEDEX

BUS

HAND DELIVERED

UPS

OTHER:

TETRA TECH CONTACT PERSON:

Results by:

RECEIVING LABORATORY:

RECEIVED BY: (Signature)

ADDRESS:

CITY:

STATE:

ZIP:

CONTACT:

PHONE:

DATE:

TIME:

SAMPLE CONDITION WHEN RECEIVED:

REMARKS:

S. 90

"

"

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