

# SITE INFORMATION

**Report Type: Closure 2RP-493**

**General Site Information:**

<b>Site:</b>	Woolley Federal #7				
<b>Company:</b>	COG Operating LLC				
<b>Section, Township and Range</b>	Unit K	Sec 21	T17S	R30E	
<b>Lease Number:</b>	API-30-015-31258				
<b>County:</b>	Eddy County				
<b>GPS:</b>	32.81272° N			103.98012° W	
<b>Surface Owner:</b>	Federal				
<b>Mineral Owner:</b>					
<b>Directions:</b>	In Loco Hills, from the intersection of Haggerman Cutoff and 82, travel south on CR 217 for 0.3m, turn left and travel 0.3m to leak on side of lease road.				

**Release Data:**

<b>Date Released:</b>	11/26/2010
<b>Type Release:</b>	Produced Fluid
<b>Source of Contamination:</b>	2 1/2 nipple at road crossing
<b>Fluid Released:</b>	70 bbls
<b>Fluids Recovered:</b>	50 bbls

**Official Communication:**

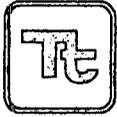
<b>Name:</b>	Pat Ellis		Ike Tavarez
<b>Company:</b>	COG Operating, LLC		Tetra Tech
<b>Address:</b>	550 W. Texas Ave. Ste. 1300		1910 N. Big Spring
<b>P.O. Box</b>			
<b>City:</b>	Midland Texas, 79701		Midland, Texas
<b>Phone number:</b>	(432) 686-3023		(432) 425-3878
<b>Fax:</b>	(432) 684-7137		
<b>Email:</b>	pellis@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	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
<b>Total Ranking Score:</b>		<b>0</b>

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

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 SEP 22 2011  
 NMOCD ARTESIA



TETRA TECH

August 23, 2011

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

**Re: Closure Report for the COG Operating LLC, Woolley Federal #7  
Flow line, Unit K, 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 Woolley Federal #7 Flow line located in Unit K, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.81272°, W 103.98012°. The site location is shown on Figures 1 and 2.

### **Background**

On November 26, 2010, the leak was discovered on a flow line nipple and released approximately seventy (70) barrels of produced fluids. To alleviate the problem, COG personnel repaired the flow line. Fifty (50) barrels of standing fluids were recovered. The spill initiated south of a lease road in the pasture where several active flow lines are present. The spill area affected an area around several flow lines measuring approximately 20' x 90' and migrated east on the lease road for approximately 430', at a width of 15' to 25'. The initial C-141 form is enclosed in Appendix C.

### **Groundwater**

No water wells were listed within Section 21. According to the *Geology and Groundwater Resources of Eddy County, New Mexico* (Report 3), one well is located in Section 34, Township 17 South, Range 31 East, with reported depth to water of 271' below surface. According to the

Tetra Tech

1910 North Big Spring, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 [www.tetrattech.com](http://www.tetrattech.com)



NMOCD groundwater map, the average depth to groundwater in this area is greater than 300' below surface. The average depth to groundwater map is shown in Appendix B.

### **Regulatory**

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

### **Soil Assessment and Analytical Results**

On December 30, 2010, Tetra Tech personnel inspected and sampled the spill area. A total of seven (7) auger holes (AH-1 through AH-7) were installed using a stainless steel hand auger to assess the impacted soils. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B. The sampling results are summarized in Table 1. The spill and auger hole locations are shown on Figure 3.

Referring to Table 1, all of the selected samples were below the RRAL for TPH and BTEX. In the pasture, the areas of AH-1 and AH-2 appear to have a shallow impact (0-1') to the soils, with chloride concentrations of 1,770 mg/kg and 5,780 mg/kg, respectively. The chloride concentrations declined with depth at 1-1.5' to 202 mg/kg (AH-1) and 1,060 mg/kg (AH-2). Deeper samples could not be obtained due to the dense caliche formation.

The remaining auger holes (AH-3, AH-4 and AH-6) on the lease road showed a chloride impact to the soils ranging from 430 mg/kg (AH-3) at 0-1' to 5,600 mg/kg (AH-4). Auger holes (AH-5 and AH-7) did not show a significant impact to the soils.



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## Remediation Activities and Closure Request

Based on the approved work plan, Tetra Tech personnel supervised the excavation of the site. The final excavation depths of the soil remediation were met or exceeded as stated in the approved work plan. The excavation depths are highlighted in Table 1 and shown on Figure 4. The excavations were backfilled with clean soil to grade.

As discussed with the BLM, spills on the lease road would be handled on a case-by-case basis. The depth to groundwater in the area is reported to be greater than 300' below surface. The lease road is a well traveled road used daily by oil field related activities. Concerns were also discussed on possible historical impacts on the lease road. As requested by the BLM, the areas of AH-4 and AH-6 were scraped (approximately 1.0') to remove isolated hot spots on the road.

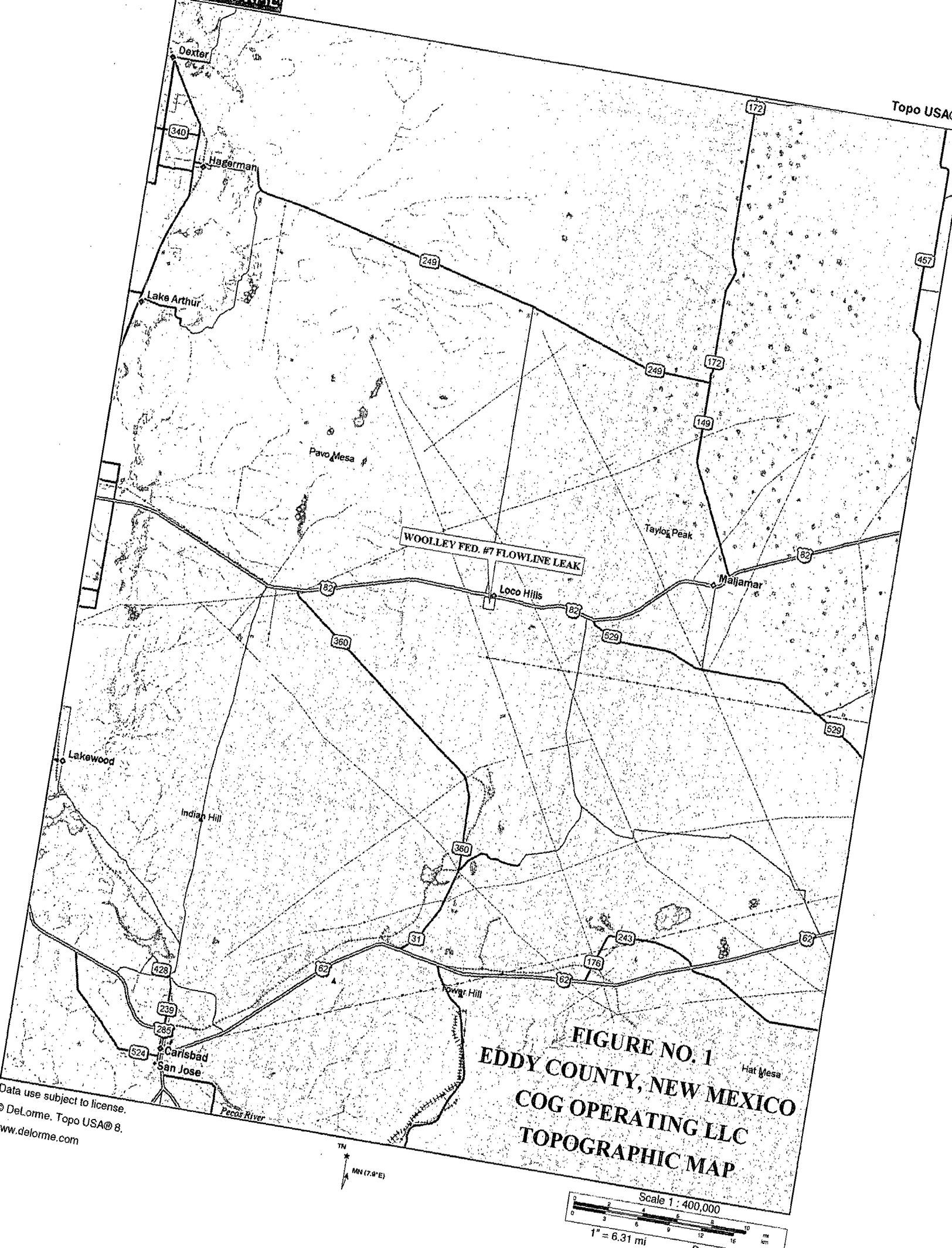
Based on the remedial activities performed, COG request closure of the site. A copy of the C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the remedial activities, please call me at (432) 682-4559.

Respectfully submitted,  
TETRA TECH

Ike Tavaréz  
Project Manager

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

# Figures

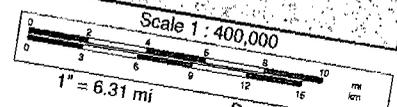


Topo USA

**WOOLLEY FED. #7 FLOWLINE LEAK**

**FIGURE NO. 1  
EDDY COUNTY, NEW MEXICO  
COG OPERATING LLC  
TOPOGRAPHIC MAP**

Data use subject to license.  
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www.delorme.com







LEASE RD.

430'

LEASE RD.

15'

#3

#4

#5

10'

#6

#7

25'

LEAK

#1

#2

STEEL FLOWLINES

20'

90'

SPILL AREA  
SAMPLE LOCATIONS

NOT TO SCALE

DATE:  
12/30/10  
DWN. BY:  
JJ  
FILE:  
H:\COG\040744  
WOOLLEY FED #7

FIGURE NO. 3

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

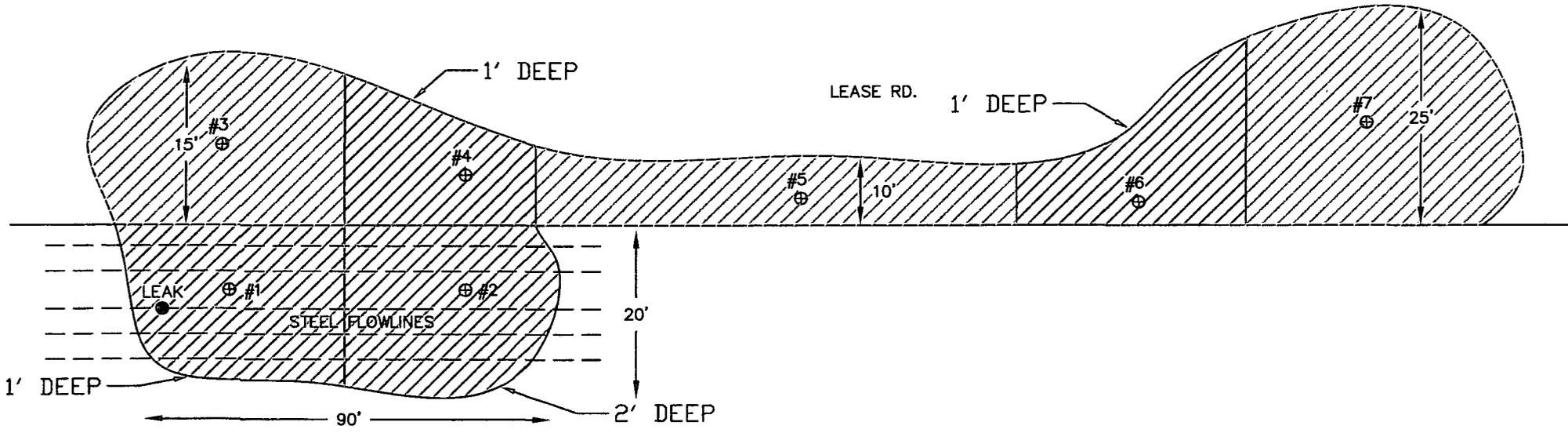
WOOLLEY FED. #7 FLOWLINE LEAK

TETRA TECH, INC.  
MIDLAND, TEXAS



LEASE RD.

430'



▨ EXCAVATED DEPTHS  
⊕ SAMPLE LOCATIONS

FIGURE NO. 4

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

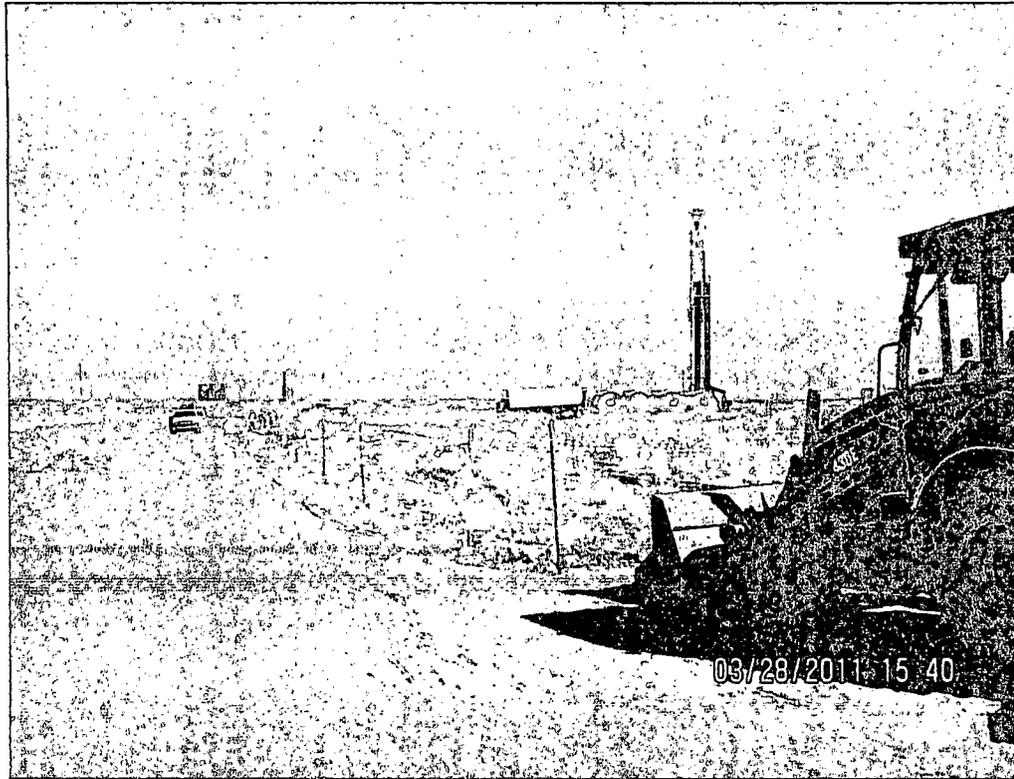
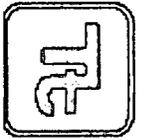
WOOLLEY FED. #7 FLOWLINE LEAK

TETRA TECH, INC.  
MIDLAND, TEXAS

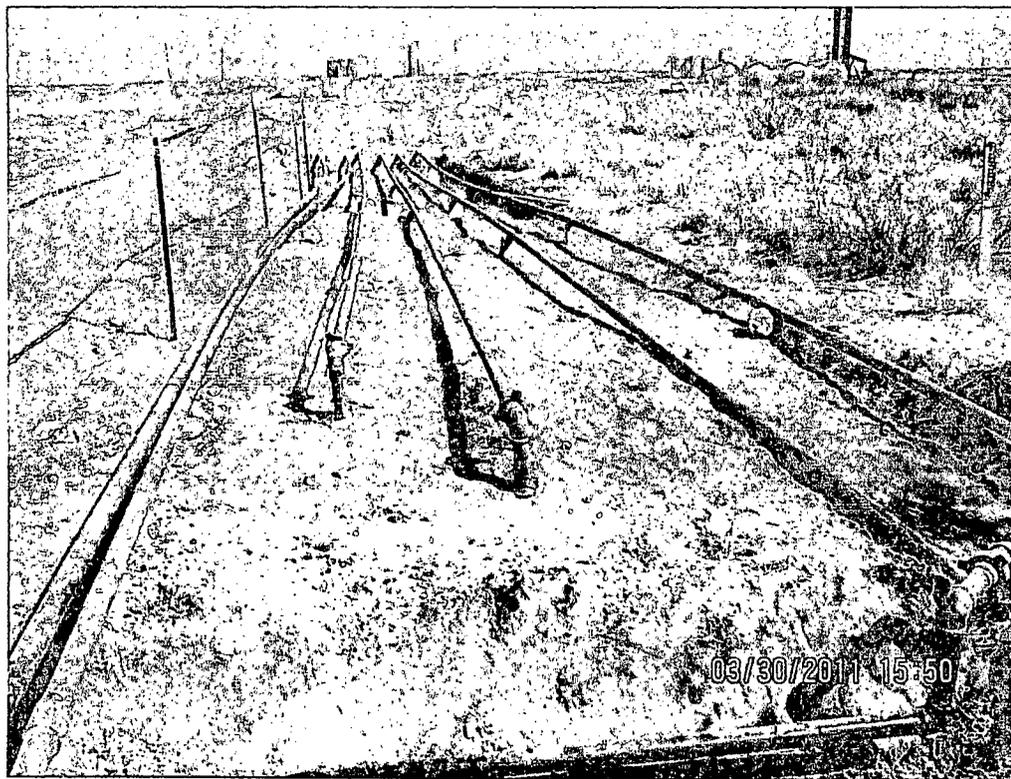
DATE:  
8/23/2011  
DWN. BY:  
IM  
FILE:  
H:\2007\0400744  
WOOLLEY FED #7

NOT TO SCALE

Photos



View East – AH-3, 4, 5



View East – AH-1, 2

COG Operating LLC  
Woolley Federal #7  
Eddy County, New Mexico



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View East - Backfill

Site info and picture details

# Tables

**Table 1**  
**COG Operating LLC.**  
**Woolley Federal #7 (Flow line)**  
**EDDY COUNTY, NEW MEXICO**

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
<b>Area of Flow lines</b>													
AH-1	12/30/2010	0-1'			X	78.3	333.0	411.3	<0.100	<0.100	0.404	0.515	1,770
		1-1.5'		X		-	-	-	-	-	-	-	202
		2-2.5'		X		-	-	-	-	-	-	-	356
		3-3.5'		X		-	-	-	-	-	-	-	489
AH-2	12/30/2010	0-1'			X	16	367	383	<0.0200	0.0834	0.145	0.279	5,780
		1-1.5'			X				-	-	-	-	1,060
<b>Lease Road</b>													
AH-3	12/30/2010	0-1'		X		<2.00	<50.0	<50.0	-	-	-	-	430
		1-1.5'		X		-	-	-	-	-	-	-	1,160
AH-4	12/30/2010	0-1'			X	<10.0	<50.0	<50.0	-	-	-	-	5,690
		1-1.5'		X		-	-	-	-	-	-	-	2,160
AH-5	12/30/2010	0-1'		X		<2.00	59.3	59.3	<0.0200	<0.0200	<0.0200	<0.0200	617
AH-6	12/30/2010	0-1'			X	<2.00	149	149	<0.0200	<0.0200	<0.0200	<0.0200	3,500
AH-7	12/30/2010	0-1'	1.5	X		<10.0	<50.0	<50.0	-	-	-	-	<200
		1-1.5'	1.5	X		-	-	-	-	-	-	-	<200
		2-2.5'	1.5	X		-	-	-	-	-	-	-	<200
		3-3.5'	1.5	X		-	-	-	-	-	-	-	<200

BEB Below Excavation Bottom

(-) Not Analyzed

Excavation Depths

# 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	550 W. Texas, Suite 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Woolley Federal #7	Facility Type	Flowline

Surface Owner	Federal	Mineral Owner		Lease No.	NMLC-028936-A (API#) 30-015-31258
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**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
K	21	17S	30E					Eddy

Latitude 32 48.862 Longitude 103 59.078

**NATURE OF RELEASE**

Type of Release	Produced fluid	Volume of Release	70bbbs	Volume Recovered	50bbbs
Source of Release	2 ½ inch nipple at road crossing	Date and Hour of Occurrence	11/26/2010	Date and Hour of Discovery	11/26/2010 2:00 p.m.

Was Immediate Notice Given?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	Mike Bratcher—OCD Terry Gregston—BLM
-----------------------------	-----------------------------------------------------------------------------------------------------------	------------------	-----------------------------------------

By Whom?	Josh Russo	Date and Hour	11/27/2010 2:54 p.m.
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Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse	
----------------------------	---------------------------------------------------------------------	------------------------------------------	--

If a Watercourse was Impacted, Describe Fully.\*

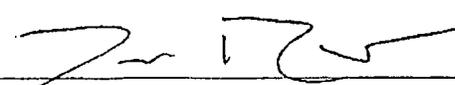
Describe Cause of Problem and Remedial Action Taken.\*

2 ½ inch nipple failed at the road crossing; the nipple has been replaced and the line has been returned back into service.

Describe Area Affected and Cleanup Action Taken.\*

Initially 70bbbs of produced fluid was released and we were able to recover 50bbbs with a vacuum truck. The spill area measured 10' x 420' east of the GPS coordinates on the lease road and 10' x 20' southeast of the origin in the pasture. The lease road has had been scraped, back-dragged, and returned to its previous condition. (The closest location to the release is the Woolley Federal Tank Battery, Unit C, Sec.28-T17S-R30E, Eddy County NM). Tetra Tech will sample the spill site area in the pasture to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD/BLM for approval prior to any significant remediation work.

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: 		<u>OIL CONSERVATION DIVISION</u>	
Printed Name: Josh Russo		Approved by District Supervisor:	
Title: HSE Coordinator		Approval Date:	Expiration Date:
E-mail Address: jrusso@conchoresources.com		Conditions of Approval:	
Date: 12/06/2010 Phone: 432-212-2399		Attached <input type="checkbox"/>	

\* Attach Additional Sheets If Necessary

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

State of New Mexico  
Energy Minerals and Natural Resources

Form C-141  
Revised October 10, 2003

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

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

**Release Notification and Corrective Action**

**OPERATOR**

Initial Report  Final Report

Name of Company <b>COG Operating LLC</b>	Contact <b>Pat Ellis</b>
Address <b>550 W. Texas, Suite 1300 Midland, Texas 79701</b>	Telephone No. <b>(432) 270-0077</b>
Facility Name <b>Woolley Federal #7</b>	Facility Type <b>Flowline</b>
Surface Owner: Federal	Mineral Owner
Lease No. NMLC-028936-A (API#) 30-015-31258	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
K	21	17S	30E					Eddy

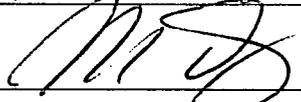
Latitude N 32.81272° Longitude W 103.98012°

**NATURE OF RELEASE**

Type of Release: Produced Fluid	Volume of Release 70 bbls	Volume Recovered 50 bbls
Source of Release: 2 1/2 inch nipple at road crossing	Date and Hour of Occurrence 11/26/2010	Date and Hour of Discovery 11/26/2010 2:00p.m.
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mike Bratcher—OCD Terry Gregston—BLM	
By Whom? Josh Russo	Date and Hour 11/27/2010 2:54 p.m.	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.* 2 1/2 inch nipple failed at the road crossing; the nipple has been replaced and the line has been returned back into service.		
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.		

**RECEIVED**  
SEP 22 2011  
NMOCD ARTESIA

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: 	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Ike Tavarez (Agent for COG)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	
Date: 8/23/11 Phone: (432) 682-4559	Attached <input type="checkbox"/>	

\* Attach Additional Sheets If Necessary

## Appendix B

**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG - Woolley Federal #7**  
**Eddy County, New Mexico**

**16 South      29 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
<b>110</b>	29	28	27	26	25
30	29	28	27	26	25
31	32	33	34	35	36

**16 South      30 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	34	35	36

**16 South      31 East**

6	5	4	3	2
7	8	9	10	11
18	17	16	15	14
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35
<b>290</b>				

**17 South      29 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	<b>210</b>	28	27	26
	<b>208'</b>				
31	32	33	34	35	36
				153	

**17 South      30 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	34	35	36

**17 South      31 East**

6	5	4	3	2
7	8	9	10	11
18	17	16	15	14
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35
			<b>271</b>	

**18 South      29 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	34	35	36

**18 South      30 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	34	35	36

**18 South      31 East**

6	5	4	3	2
7	8	9	10	11
18	17	16	15	14
				<b>317</b>
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35
				<b>261</b>

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

# Appendix C

## Summary Report

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

Report Date: January 13, 2011

Work Order: 11010508



Project Location: Eddy County, NM  
Project Name: COG/Wooley Fed. #7  
Project Number: 114-6400744

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
254686	AH-1 0-1'	soil	2010-12-30	00:00	2011-01-05
254687	AH-1 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254688	AH-1 2-2.5'	soil	2010-12-30	00:00	2011-01-05
254689	AH-1 3-3.5'	soil	2010-12-30	00:00	2011-01-05
254693	AH-2 0-1'	soil	2010-12-30	00:00	2011-01-05
254694	AH-2 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254695	AH-3 0-1'	soil	2010-12-30	00:00	2011-01-05
254696	AH-3 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254697	AH-4 0-1'	soil	2010-12-30	00:00	2011-01-05
254698	AH-4 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254699	AH-5 0-1'	soil	2010-12-30	00:00	2011-01-05
254700	AH-6 0-1'	soil	2010-12-30	00:00	2011-01-05
254701	AH-7 0-1' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05
254702	AH-7 1-1.5' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05
254703	AH-7 2-2.5' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05
254704	AH-7 3-3.5' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05

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)
254686 - AH-1 0-1'	<0.100	<0.100	0.404	0.515	333	78.3
254693 - AH-2 0-1'	<0.0200	0.0834	0.145	0.279	367	16.0
254695 - AH-3 0-1'					<50.0	<2.00
254697 - AH-4 0-1'					<50.0	<10.0
254699 - AH-5 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	59.3	<2.00
254700 - AH-6 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	149	<2.00
254701 - AH-7 0-1' 1.5 BEB					<50.0	<10.0

Sample: 254686 - AH-1 0-1'

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

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Param	Flag	Result	Units	RL
Chloride		<b>1770</b>	mg/Kg	4.00

---

**Sample: 254687 - AH-1 1-1.5'**

Param	Flag	Result	Units	RL
Chloride		<b>202</b>	mg/Kg	4.00

---

**Sample: 254688 - AH-1 2-2.5'**

Param	Flag	Result	Units	RL
Chloride		<b>356</b>	mg/Kg	4.00

---

**Sample: 254689 - AH-1 3-3.5'**

Param	Flag	Result	Units	RL
Chloride		<b>489</b>	mg/Kg	4.00

---

**Sample: 254693 - AH-2 0-1'**

Param	Flag	Result	Units	RL
Chloride		<b>5780</b>	mg/Kg	4.00

---

**Sample: 254694 - AH-2 1-1.5'**

Param	Flag	Result	Units	RL
Chloride		<b>1060</b>	mg/Kg	4.00

---

**Sample: 254695 - AH-3 0-1'**

Param	Flag	Result	Units	RL
Chloride		<b>430</b>	mg/Kg	4.00

---

**Sample: 254696 - AH-3 1-1.5'**

Param	Flag	Result	Units	RL
Chloride		<b>1160</b>	mg/Kg	4.00

---

**Sample: 254697 - AH-4 0-1'**

Param	Flag	Result	Units	RL
Chloride		5690	mg/Kg	4.00

**Sample: 254698 - AH-4 1-1.5'**

Param	Flag	Result	Units	RL
Chloride		2160	mg/Kg	4.00

**Sample: 254699 - AH-5 0-1'**

Param	Flag	Result	Units	RL
Chloride		617	mg/Kg	4.00

**Sample: 254700 - AH-6 0-1'**

Param	Flag	Result	Units	RL
Chloride		3500	mg/Kg	4.00

**Sample: 254701 - AH-7 0-1' 1.5 BEB**

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

**Sample: 254702 - AH-7 1-1.5' 1.5 BEB**

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

**Sample: 254703 - AH-7 2-2.5' 1.5 BEB**

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00

**Sample: 254704 - AH-7 3-3.5' 1.5 BEB**

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4.00



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6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260  
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## Certifications

**WBENC:** 237019      **HUB:** 1752439743100-86536      **DBE:** VN 20657  
**NCTRCA** WFWB38444Y0909

## NELAP Certifications

**Lubbock:** T104704219-08-TX      **El Paso:** T104704221-08-TX      **Midland:** T104704392-08-TX  
LELAP-02003      LELAP-02002  
Kansas E-10317

# Analytical and Quality Control Report

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

Report Date: January 13, 2011

Work Order: 11010508



Project Location: Eddy County, NM  
Project Name: COG/Wooley Fed. #7  
Project Number: 114-6400744

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
254686	AH-1 0-1'	soil	2010-12-30	00:00	2011-01-05
254687	AH-1 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254688	AH-1 2-2.5'	soil	2010-12-30	00:00	2011-01-05
254689	AH-1 3-3.5'	soil	2010-12-30	00:00	2011-01-05
254693	AH-2 0-1'	soil	2010-12-30	00:00	2011-01-05
254694	AH-2 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254695	AH-3 0-1'	soil	2010-12-30	00:00	2011-01-05
254696	AH-3 1-1.5'	soil	2010-12-30	00:00	2011-01-05
254697	AH-4 0-1'	soil	2010-12-30	00:00	2011-01-05
254698	AH-4 1-1.5'	soil	2010-12-30	00:00	2011-01-05

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
254699	AH-5 0-1'	soil	2010-12-30	00:00	2011-01-05
254700	AH-6 0-1'	soil	2010-12-30	00:00	2011-01-05
254701	AH-7 0-1' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05
254702	AH-7 1-1.5' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05
254703	AH-7 2-2.5' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05
254704	AH-7 3-3.5' 1.5 BEB	soil	2010-12-30	00:00	2011-01-05

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

This report consists of a total of 23 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.




---

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

**Standard Flags**

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

## Case Narrative

Samples for project COG/Wooley Fed. #7 were received by TraceAnalysis, Inc. on 2011-01-05 and assigned to work order 11010508. Samples for work order 11010508 were received intact at a temperature of 3.0 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	65908	2011-01-12 at 10:10	76857	2011-01-12 at 10:10
Chloride (Titration)	SM 4500-Cl B	65759	2011-01-05 at 10:41	76737	2011-01-07 at 10:25
Chloride (Titration)	SM 4500-Cl B	65759	2011-01-05 at 10:41	76738	2011-01-07 at 10:25
TPH DRO - NEW	S 8015 D	65801	2011-01-06 at 15:19	76742	2011-01-06 at 15:19
TPH GRO	S 8015 D	65793	2011-01-06 at 11:27	76727	2011-01-06 at 11:27

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 11010508 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

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

## Analytical Report

### Sample: 254686 - AH-1 0-1'

Laboratory: Midland  
Analysis: BTEX  
QC Batch: 76857  
Prep Batch: 65908

Analytical Method: S 8021B  
Date Analyzed: 2011-01-12  
Sample Preparation: 2011-01-12

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

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.100	mg/Kg	5	0.0200
Toluene		<0.100	mg/Kg	5	0.0200
Ethylbenzene		0.404	mg/Kg	5	0.0200
Xylene		0.515	mg/Kg	5	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5.87	mg/Kg	5	5.00	117	52.8 - 137
4-Bromofluorobenzene (4-BFB)		5.92	mg/Kg	5	5.00	118	38.4 - 157

### Sample: 254686 - AH-1 0-1'

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 76737  
Prep Batch: 65759

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2011-01-07  
Sample Preparation: 2011-01-05

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

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1770	mg/Kg	100	4.00

### Sample: 254686 - AH-1 0-1'

Laboratory: Midland  
Analysis: TPH DRO - NEW  
QC Batch: 76742  
Prep Batch: 65801

Analytical Method: S 8015 D  
Date Analyzed: 2011-01-06  
Sample Preparation: 2011-01-06

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

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		333	mg/Kg	5	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	<sup>1</sup>	152	mg/Kg	5	100	152	70 - 130

**Sample: 254686 - AH-1 0-1'**

Laboratory: Midland  
 Analysis: TPH GRO                      Analytical Method: S 8015 D                      Prep Method: S 5035  
 QC Batch: 76727                      Date Analyzed: 2011-01-06                      Analyzed By: ME  
 Prep Batch: 65793                      Sample Preparation: 2011-01-06                      Prepared By: ME

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<b>78.3</b>	mg/Kg	20	2.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		22.2	mg/Kg	20	20.0	111	48.5 - 152
4-Bromofluorobenzene (4-BFB)		22.5	mg/Kg	20	20.0	112	42 - 159

**Sample: 254687 - AH-1 1-1.5'**

Laboratory: Midland  
 Analysis: Chloride (Titration)                      Analytical Method: SM 4500-C1 B                      Prep Method: N/A  
 QC Batch: 76737                      Date Analyzed: 2011-01-07                      Analyzed By: AR  
 Prep Batch: 65759                      Sample Preparation: 2011-01-05                      Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>202</b>	mg/Kg	50	4.00

**Sample: 254688 - AH-1 2-2.5'**

Laboratory: Midland  
 Analysis: Chloride (Titration)                      Analytical Method: SM 4500-C1 B                      Prep Method: N/A  
 QC Batch: 76737                      Date Analyzed: 2011-01-07                      Analyzed By: AR  
 Prep Batch: 65759                      Sample Preparation: 2011-01-05                      Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>356</b>	mg/Kg	50	4.00

<sup>1</sup>High surrogate recovery due to peak interference.

**Sample: 254689 - AH-1 3-3.5'**

Laboratory: Midland  
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A  
QC Batch: 76737 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 Sample Preparation: 2011-01-05 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>489</b>	mg/Kg	50	4.00

**Sample: 254693 - AH-2 0-1'**

Laboratory: Midland  
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035  
QC Batch: 76857 Date Analyzed: 2011-01-12 Analyzed By: ME  
Prep Batch: 65908 Sample Preparation: 2011-01-12 Prepared By: ME

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0200	mg/Kg	1	0.0200
Toluene		<b>0.0834</b>	mg/Kg	1	0.0200
Ethylbenzene		<b>0.145</b>	mg/Kg	1	0.0200
Xylene		<b>0.279</b>	mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.49	mg/Kg	1	2.00	124	52.8 - 137
4-Bromofluorobenzene (4-BFB)		2.38	mg/Kg	1	2.00	119	38.4 - 157

**Sample: 254693 - AH-2 0-1'**

Laboratory: Midland  
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A  
QC Batch: 76737 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 Sample Preparation: 2011-01-05 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>5780</b>	mg/Kg	100	4.00

**Sample: 254693 - AH-2 0-1'**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: N/A
Analysis: TPH DRO - NEW	Date Analyzed: 2011-01-06	Analyzed By: kg
QC Batch: 76742	Sample Preparation: 2011-01-06	Prepared By: kg
Prep Batch: 65801		

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<b>367</b>	mg/Kg	5	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	<sup>2</sup>	159	mg/Kg	5	100	159	70 - 130

**Sample: 254693 - AH-2 0-1'**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: S 5035
Analysis: TPH GRO	Date Analyzed: 2011-01-06	Analyzed By: ME
QC Batch: 76727	Sample Preparation: 2011-01-06	Prepared By: ME
Prep Batch: 65793		

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<b>16.0</b>	mg/Kg	1	2.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.43	mg/Kg	1	2.00	122	48.5 - 152
4-Bromofluorobenzene (4-BFB)		2.35	mg/Kg	1	2.00	118	42 - 159

**Sample: 254694 - AH-2 1-1.5'**

Laboratory: Midland	Analytical Method: SM 4500-Cl B	Prep Method: N/A
Analysis: Chloride (Titration)	Date Analyzed: 2011-01-07	Analyzed By: AR
QC Batch: 76737	Sample Preparation: 2011-01-05	Prepared By: AR
Prep Batch: 65759		

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>1060</b>	mg/Kg	100	4.00

<sup>2</sup>High surrogate recovery due to peak interference.

**Sample: 254695 - AH-3 0-1'**

Laboratory: Midland  
 Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A  
 QC Batch: 76737 Date Analyzed: 2011-01-07 Analyzed By: AR  
 Prep Batch: 65759 Sample Preparation: 2011-01-05 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		430	mg/Kg	50	4.00

**Sample: 254695 - AH-3 0-1'**

Laboratory: Midland  
 Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A  
 QC Batch: 76742 Date Analyzed: 2011-01-06 Analyzed By: kg  
 Prep Batch: 65801 Sample Preparation: 2011-01-06 Prepared By: kg

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		102	mg/Kg	1	100	102	70 - 130

**Sample: 254695 - AH-3 0-1'**

Laboratory: Midland  
 Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035  
 QC Batch: 76727 Date Analyzed: 2011-01-06 Analyzed By: ME  
 Prep Batch: 65793 Sample Preparation: 2011-01-06 Prepared By: ME

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.40	mg/Kg	1	2.00	120	48.5 - 152
4-Bromofluorobenzene (4-BFB)		2.21	mg/Kg	1	2.00	110	42 - 159

Report Date: January 13, 2011  
114-6400744

Work Order: 11010508  
COG/Wooley Fed. #7

Page Number: 9 of 23  
Eddy County, NM

**Sample: 254696 - AH-3 1-1.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 76737      Date Analyzed: 2011-01-07      Analyzed By: AR  
Prep Batch: 65759      Sample Preparation: 2011-01-05      Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1160	mg/Kg	100	4.00

**Sample: 254697 - AH-4 0-1'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 76738      Date Analyzed: 2011-01-07      Analyzed By: AR  
Prep Batch: 65759      Sample Preparation: 2011-01-05      Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		5690	mg/Kg	100	4.00

**Sample: 254697 - AH-4 0-1'**

Laboratory: Midland  
Analysis: TPH DRO - NEW      Analytical Method: S 8015 D      Prep Method: N/A  
QC Batch: 76742      Date Analyzed: 2011-01-06      Analyzed By: kg  
Prep Batch: 65801      Sample Preparation: 2011-01-06      Prepared By: kg

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		106	mg/Kg	1	100	106	70 - 130

**Sample: 254697 - AH-4 0-1'**

Laboratory: Midland  
Analysis: TPH GRO      Analytical Method: S 8015 D      Prep Method: S 5035  
QC Batch: 76727      Date Analyzed: 2011-01-06      Analyzed By: ME  
Prep Batch: 65793      Sample Preparation: 2011-01-06      Prepared By: ME

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<10.0	mg/Kg	5	2.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5.90	mg/Kg	5	5.00	118	48.5 - 152
4-Bromofluorobenzene (4-BFB)		5.57	mg/Kg	5	5.00	111	42 - 159

**Sample: 254698 - AH-4 1-1.5'**

Laboratory: Midland  
 Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
 QC Batch: 76738      Date Analyzed: 2011-01-07      Analyzed By: AR  
 Prep Batch: 65759      Sample Preparation: 2011-01-05      Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>2160</b>	mg/Kg	100	4.00

**Sample: 254699 - AH-5 0-1'**

Laboratory: Midland  
 Analysis: BTEX      Analytical Method: S 8021B      Prep Method: S 5035  
 QC Batch: 76857      Date Analyzed: 2011-01-12      Analyzed By: ME  
 Prep Batch: 65908      Sample Preparation: 2011-01-12      Prepared By: ME

Parameter	Flag	RL 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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.49	mg/Kg	1	2.00	124	52.8 - 137
4-Bromofluorobenzene (4-BFB)		2.33	mg/Kg	1	2.00	116	38.4 - 157

**Sample: 254699 - AH-5 0-1'**

Laboratory: Midland	Analytical Method: SM 4500-Cl B	Prep Method: N/A
Analysis: Chloride (Titration)	Date Analyzed: 2011-01-07	Analyzed By: AR
QC Batch: 76738	Sample Preparation: 2011-01-05	Prepared By: AR
Prep Batch: 65759		

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		617	mg/Kg	100	4.00

**Sample: 254699 - AH-5 0-1'**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: N/A
Analysis: TPH DRO - NEW	Date Analyzed: 2011-01-06	Analyzed By: kg
QC Batch: 76742	Sample Preparation: 2011-01-06	Prepared By: kg
Prep Batch: 65801		

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		59.3	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		106	mg/Kg	1	100	106	70 - 130

**Sample: 254699 - AH-5 0-1'**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: S 5035
Analysis: TPH GRO	Date Analyzed: 2011-01-06	Analyzed By: ME
QC Batch: 76727	Sample Preparation: 2011-01-06	Prepared By: ME
Prep Batch: 65793		

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.19	mg/Kg	1	2.00	110	48.5 - 152
4-Bromofluorobenzene (4-BFB)		2.03	mg/Kg	1	2.00	102	42 - 159

**Sample: 254700 - AH-6 0-1'**

Laboratory: Midland	Analytical Method: S 8021B	Prep Method: S 5035
Analysis: BTEX	Date Analyzed: 2011-01-12	Analyzed By: ME
QC Batch: 76857	Sample Preparation: 2011-01-12	Prepared By: ME
Prep Batch: 65908		

Parameter	Flag	RL 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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.65	mg/Kg	1	2.00	132	52.8 - 137
4-Bromofluorobenzene (4-BFB)		2.51	mg/Kg	1	2.00	126	38.4 - 157

**Sample: 254700 - AH-6 0-1'**

Laboratory: Midland	Analytical Method: SM 4500-Cl B	Prep Method: N/A
Analysis: Chloride (Titration)	Date Analyzed: 2011-01-07	Analyzed By: AR
QC Batch: 76738	Sample Preparation: 2011-01-05	Prepared By: AR
Prep Batch: 65759		

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<b>3500</b>	mg/Kg	100	4.00

**Sample: 254700 - AH-6 0-1'**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: N/A
Analysis: TPH DRO - NEW	Date Analyzed: 2011-01-06	Analyzed By: kg
QC Batch: 76742	Sample Preparation: 2011-01-06	Prepared By: kg
Prep Batch: 65801		

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<b>149</b>	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		128	mg/Kg	1	100	128	70 - 130

**Sample: 254700 - AH-6 0-1'**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: S 5035
Analysis: TPH GRO	Date Analyzed: 2011-01-06	Analyzed By: ME
QC Batch: 76727	Sample Preparation: 2011-01-06	Prepared By: ME
Prep Batch: 65793		

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.30	mg/Kg	1	2.00	115	48.5 - 152
4-Bromofluorobenzene (4-BFB)		2.12	mg/Kg	1	2.00	106	42 - 159

**Sample: 254701 - AH-7 0-1' 1.5 BEB**

Laboratory: Midland	Analytical Method: SM 4500-Cl B	Prep Method: N/A
Analysis: Chloride (Titration)	Date Analyzed: 2011-01-07	Analyzed By: AR
QC Batch: 76738	Sample Preparation: 2011-01-05	Prepared By: AR
Prep Batch: 65759		

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

**Sample: 254701 - AH-7 0-1' 1.5 BEB**

Laboratory: Midland	Analytical Method: S 8015 D	Prep Method: N/A
Analysis: TPH DRO - NEW	Date Analyzed: 2011-01-06	Analyzed By: kg
QC Batch: 76742	Sample Preparation: 2011-01-06	Prepared By: kg
Prep Batch: 65801		

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		98.0	mg/Kg	1	100	98	70 - 130

**Sample: 254701 - AH-7 0-1' 1.5 BEB**

Laboratory: Midland  
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035  
QC Batch: 76727 Date Analyzed: 2011-01-06 Analyzed By: ME  
Prep Batch: 65793 Sample Preparation: 2011-01-06 Prepared By: ME

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<10.0	mg/Kg	5	2.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5.79	mg/Kg	5	5.00	116	48.5 - 152
4-Bromofluorobenzene (4-BFB)		5.39	mg/Kg	5	5.00	108	42 - 159

**Sample: 254702 - AH-7 1-1.5' 1.5 BEB**

Laboratory: Midland  
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A  
QC Batch: 76738 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 Sample Preparation: 2011-01-05 Prepared By: AR

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

**Sample: 254703 - AH-7 2-2.5' 1.5 BEB**

Laboratory: Midland  
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A  
QC Batch: 76738 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 Sample Preparation: 2011-01-05 Prepared By: AR

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

**Sample: 254704 - AH-7 3-3.5' 1.5 BEB**

Laboratory: Midland  
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A  
QC Batch: 76738 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 Sample Preparation: 2011-01-05 Prepared By: AR



Parameter	Flag	MDL Result	Units	RL
DRO		<14.6	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		85.1	mg/Kg	1	100	85	70 - 130

**Method Blank (1)**      QC Batch: 76857

QC Batch: 76857      Date Analyzed: 2011-01-12      Analyzed By: ME  
Prep Batch: 65908      QC Preparation: 2011-01-12      Prepared By: ME

Parameter	Flag	MDL 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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.75	mg/Kg	1	2.00	88	66.6 - 122
4-Bromofluorobenzene (4-BFB)		1.77	mg/Kg	1	2.00	88	55.4 - 132

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

QC Batch: 76727      Date Analyzed: 2011-01-06      Analyzed By: ME  
Prep Batch: 65793      QC Preparation: 2011-01-06      Prepared By: ME

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	15.8	mg/Kg	1	20.0	<1.65	79	69.9 - 95.4

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	15.6	mg/Kg	1	20.0	<1.65	78	69.9 - 95.4	1	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)	1.64	1.80	mg/Kg	1	2.00	82	90	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.59	1.78	mg/Kg	1	2.00	80	89	65.2 - 132



Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	117	120	mg/Kg	1	100	117	120	70 - 130

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

QC Batch: 76857  
Prep Batch: 65908

Date Analyzed: 2011-01-12  
QC Preparation: 2011-01-12

Analyzed By: ME  
Prepared By: ME

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	2.19	mg/Kg	1	2.00	<0.0150	110	81.9 - 115
Toluene	2.02	mg/Kg	1	2.00	<0.00950	101	81.9 - 113
Ethylbenzene	1.97	mg/Kg	1	2.00	<0.0106	98	78.4 - 107
Xylene	5.89	mg/Kg	1	6.00	<0.00930	98	79.1 - 107

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	2.30	mg/Kg	1	2.00	<0.0150	115	81.9 - 115	5	20
Toluene	2.10	mg/Kg	1	2.00	<0.00950	105	81.9 - 113	4	20
Ethylbenzene	2.08	mg/Kg	1	2.00	<0.0106	104	78.4 - 107	5	20
Xylene	6.18	mg/Kg	1	6.00	<0.00930	103	79.1 - 107	5	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)	1.73	1.65	mg/Kg	1	2.00	86	82	70.2 - 114
4-Bromofluorobenzene (4-BFB)	1.82	1.74	mg/Kg	1	2.00	91	87	69.8 - 121

**Matrix Spike (MS-1) Spiked Sample: 254664**

QC Batch: 76727  
Prep Batch: 65793

Date Analyzed: 2011-01-06  
QC Preparation: 2011-01-06

Analyzed By: ME  
Prepared By: ME

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	15.4	mg/Kg	1	20.0	<1.65	77	61.8 - 114

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	15.6	mg/Kg	1	20.0	<1.65	78	61.8 - 114	1	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)	2.49	2.47	mg/Kg	1	2	124	124	50 - 162
4-Bromofluorobenzene (4-BFB)	2.45	2.44	mg/Kg	1	2	122	122	50 - 162

**Matrix Spike (MS-1)** Spiked Sample: 254696

QC Batch: 76737 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 QC Preparation: 2011-01-05 Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	11100	mg/Kg	100	10000	1160	99	85 - 115

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	11700	mg/Kg	100	10000	1160	105	85 - 115	5	20

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

**Matrix Spike (MS-1)** Spiked Sample: 254704

QC Batch: 76738 Date Analyzed: 2011-01-07 Analyzed By: AR  
Prep Batch: 65759 QC Preparation: 2011-01-05 Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	9430	mg/Kg	100	10000	<218	94	85 - 115

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	10000	mg/Kg	100	10000	<218	100	85 - 115	6	20

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

**Matrix Spike (MS-1)** Spiked Sample: 254664

QC Batch: 76742 Date Analyzed: 2011-01-06 Analyzed By: kg  
Prep Batch: 65801 QC Preparation: 2011-01-06 Prepared By: kg

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	161	mg/Kg	1	250	<14.6	64	11.7 - 152.3

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	162	mg/Kg	1	250	<14.6	65	11.7 - 152.3	1	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	106	106	mg/Kg	1	100	106	106	70 - 130

**Matrix Spike (MS-1) Spiked Sample: 255031**

QC Batch: 76857  
Prep Batch: 65908

Date Analyzed: 2011-01-12  
QC Preparation: 2011-01-12

Analyzed By: ME  
Prepared By: ME

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	<sup>3</sup> 2.48	mg/Kg	1	2.00	<0.0150	124	80.5 - 112
Toluene	2.25	mg/Kg	1	2.00	<0.00950	112	82.4 - 113
Ethylbenzene	2.25	mg/Kg	1	2.00	<0.0106	112	83.9 - 114
Xylene	6.77	mg/Kg	1	6.00	0.1443	110	84 - 114

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	<sup>4</sup> 2.40	mg/Kg	1	2.00	<0.0150	120	80.5 - 112	3	20
Toluene	2.21	mg/Kg	1	2.00	<0.00950	110	82.4 - 113	2	20
Ethylbenzene	2.22	mg/Kg	1	2.00	<0.0106	111	83.9 - 114	1	20
Xylene	6.69	mg/Kg	1	6.00	0.1443	109	84 - 114	1	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)	<sup>5</sup> 2.35	2.42	mg/Kg	1	2	118	121	41.3 - 117
4-Bromofluorobenzene (4-BFB)	<sup>6</sup> 2.29	2.38	mg/Kg	1	2	114	119	35.5 - 129

**Standard (CCV-1)**

QC Batch: 76727

Date Analyzed: 2011-01-06

Analyzed By: ME

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

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

<sup>5</sup>Surrogate out due to peak interference.

<sup>6</sup>Surrogate out due to peak interference.





Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.114	114	80 - 120	2011-01-12
Toluene		mg/Kg	0.100	0.102	102	80 - 120	2011-01-12
Ethylbenzene		mg/Kg	0.100	0.0987	99	80 - 120	2011-01-12
Xylene		mg/Kg	0.300	0.295	98	80 - 120	2011-01-12

**Standard (CCV-2)**

QC Batch: 76857

Date Analyzed: 2011-01-12

Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.111	111	80 - 120	2011-01-12
Toluene		mg/Kg	0.100	0.103	103	80 - 120	2011-01-12
Ethylbenzene		mg/Kg	0.100	0.101	101	80 - 120	2011-01-12
Xylene		mg/Kg	0.300	0.302	101	80 - 120	2011-01-12

**Standard (CCV-3)**

QC Batch: 76857

Date Analyzed: 2011-01-12

Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.112	112	80 - 120	2011-01-12
Toluene		mg/Kg	0.100	0.104	104	80 - 120	2011-01-12
Ethylbenzene		mg/Kg	0.100	0.101	101	80 - 120	2011-01-12
Xylene		mg/Kg	0.300	0.297	99	80 - 120	2011-01-12

WO# 11010508

# Analysis Request of Chain of Custody Record

PAGE: 1 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:			SITE MANAGER:			NUMBER OF CONTAINERS	PRESERVATIVE METHOD				BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC-MS Vol. 8240/8260/624	GC-MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS			
PROJECT NO.: 114-6400744			PROJECT NAME: COG / Bradley Fed #7 Zachry Co, NM				Filtered (Y/N)	HCL	HNO3	ICE																		NONE		
LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION																								
254686	12/30		S	X		AH-1	0-1'																							
687						AH-1	1-1.5'																							
688						AH-1	2-2.5'																							
689						AH-1	3-3.5'																							
690						AH-1	4-4.5'																							
691						AH-1	5-5.5'																							
692						AH-1	6'																							
693						AH-2	0-1'																							
694						AH-2	1-1.5'																							
695						AH-3	0-1'																							

RELINQUISHED BY: (Signature) <i>[Signature]</i>	Date: 1/3/10 Time: 0530	RECEIVED BY: (Signature) <i>[Signature]</i>	Date: _____ Time: _____	SAMPLED BY: (Print & Initial) <i>[Signature]</i>	Date: 12/30/10 Time: 1300
RELINQUISHED BY: (Signature)	Date: _____ Time: _____	RECEIVED BY: (Signature)	Date: _____ Time: _____	SAMPLE SHIPPED BY: (Circle) FEDEX <input type="checkbox"/> BUS <input type="checkbox"/>	AIRBILL #: _____
RELINQUISHED BY: (Signature)	Date: _____ Time: _____	RECEIVED BY: (Signature)	Date: _____ Time: _____	<input checked="" type="checkbox"/> HAND DELIVERED <input type="checkbox"/> UPS	OTHER: _____
RECEIVING LABORATORY: <i>Tetra</i>	RECEIVED BY: (Signature) <i>[Signature]</i>	TETRA TECH CONTACT PERSON: <i>Ibc Tavares</i>	RESULTS BY: _____	RUSH CHARGES AUTHORIZED: Yes <input type="checkbox"/> No <input type="checkbox"/>	
ADDRESS: _____	CITY: <i>Midland</i> STATE: <i>TX</i> ZIP: _____	DATE: 11-5-10	TIME: 9:30		

SAMPLE CONDITION WHEN RECEIVED: 3.0°C intact

REMARKS: *10m deep sample of TPT exceeds 1,000 mg/kg*

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

*10m (4) BOP or highest TPT*

