SITE INFORMATION

2RP-609

Report Type: Closure Report

General Site Information:

Site:	Harper State # 10 Flowline					
Company:	COG Operating LLC					
Section, Township and Range	Unit P	Sec 16	T17S	R30E		
Lease Number:	API-30-015-34870					
County:	Eddy County					
GPS:	32.82907° N			103.96906° W		
Surface Owner:	State					
Mineral Owner:						
Directions:	In Loco Hills, from the intersection of Goat Roper Rd and Hwy 82, travel north on Goat Roper Rd for 0.7m, turn right and travel 0.5m, turn right and travel 0.2m to site.					

Release Data:

Date Released:	2/7/2011
Type Release:	Produced Fluid
Source of Contamination:	Flowline failure
Fluid Released:	10 bbls
Fluids Recovered:	0 bbls

RECEIVED
MAR 30 2012
NMOCD ARTESIA

Official Communication:

Name:	Pat Ellis		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	550 W. Texas Ave. Ste. 1300		1910 N. Big Spring
P.O. Box			
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 682-4559
Fax:	(432) 684-7137		
Email:	pellis@conchoresources.com		ike.tavarez@tetratech.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
Total Ranking Score:	**0**	

Acceptable Soil RRAL (mg/kg)

Benzene	***Total BTEX***	***TPH***
10	50	5,000

TETRA TECH

March 2, 2012

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., Harper State # 10, Unit P, Section 16, 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 Harper State # 10 located in Unit P, Section 16, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.82907°, W 103.96906°. 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 February 7, 2011, and released approximately ten (10) barrels of produced fluid from a flowline. To alleviate the problem, COG personnel repaired the flowline. Zero (0) barrels of standing fluids were recovered. The spill initiated on the south end of the tank battery in the pasture and covered an area that measured 30' X 20'. The initial C-141 is enclosed in Appendix A.

Tetra Tech
1910 North Big Spring Midland,TX 79705
Tel 432.682.4559 Fax 432.682 3946 www.tetratech.com

Groundwater

No water wells were listed within Section 16. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 100' below surface. The Geology and Groundwater Resources of Eddy County, New Mexico (Report 3) well report data is shown in Appendix B.

Regulatory

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

Soil Assessment and Analytical Results

On February 21, 2011, Tetra Tech personnel inspected and sampled the spill area. One (1) auger hole (AH-1) was 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 C. The results of the sampling are summarized in Table 1. The auger hole location is shown on Figure 3.

Referring to Table 1, elevated chloride concentrations were detected in AH-1 with samples ranging from 2320mg/kg at 0-1' and then declining to <200 mg/kg at 2-2.5'.

TETRA TECH

Remediation and Conclusion

On January 30, 2012, Tetra Tech personnel supervised the excavation as outlined in the approved work plan. The impacted soil near AH-1 was excavated to a depth of 1.0' below surface. Approximately 80 yards^3 was excavated and transported to CRI of Hobbs, NM for proper disposal. The site was backfilled with clean material and brought up to surface grade.

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

Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Project Manager

cc: Pat Ellis – COG

FIGURES

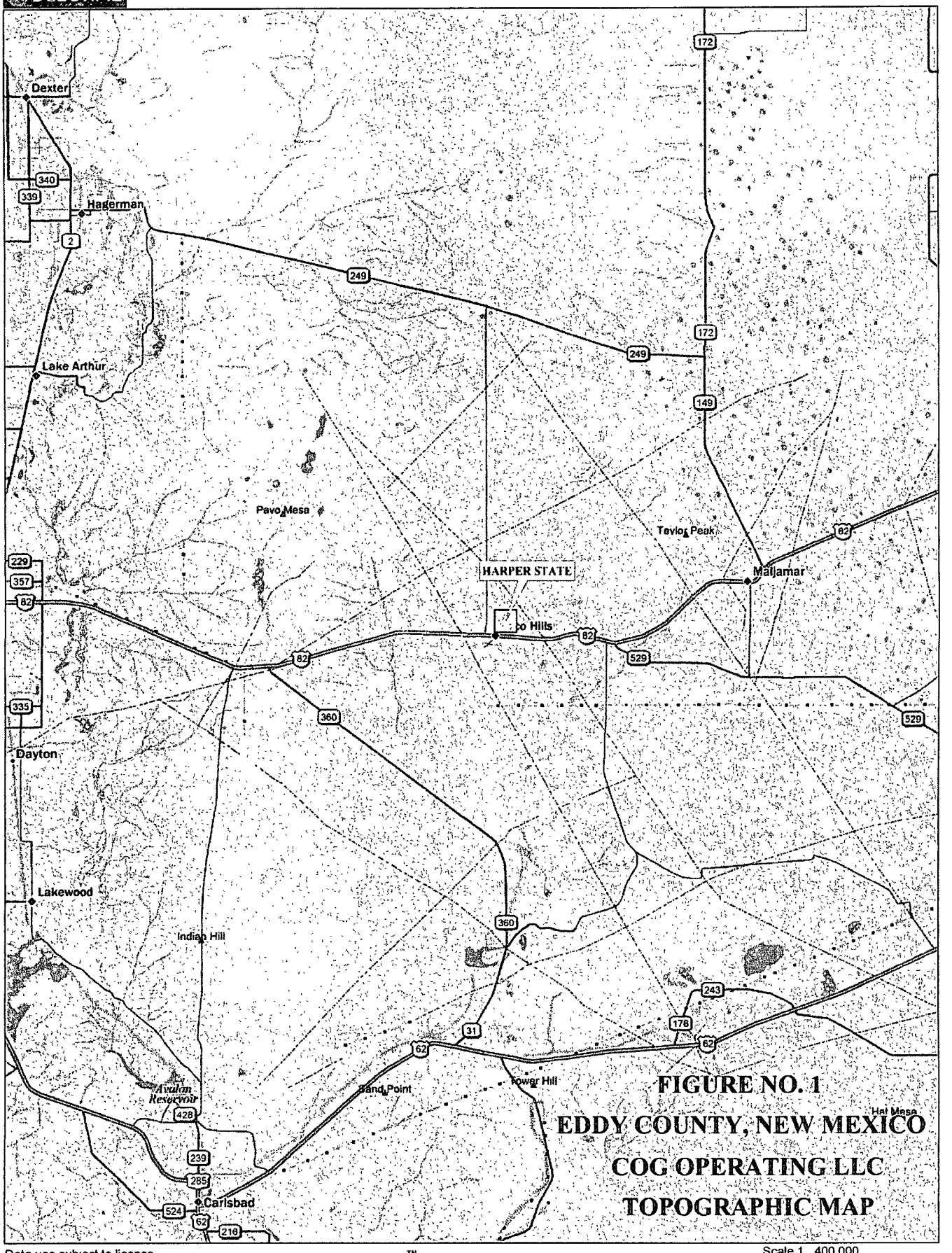


FIGURE NO. 1

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

TOPOGRAPHIC MAP

TN
MN (7.7°E)

Scale 1 : 400,000
1" = 6 31 mi
Data Zoom 9-0

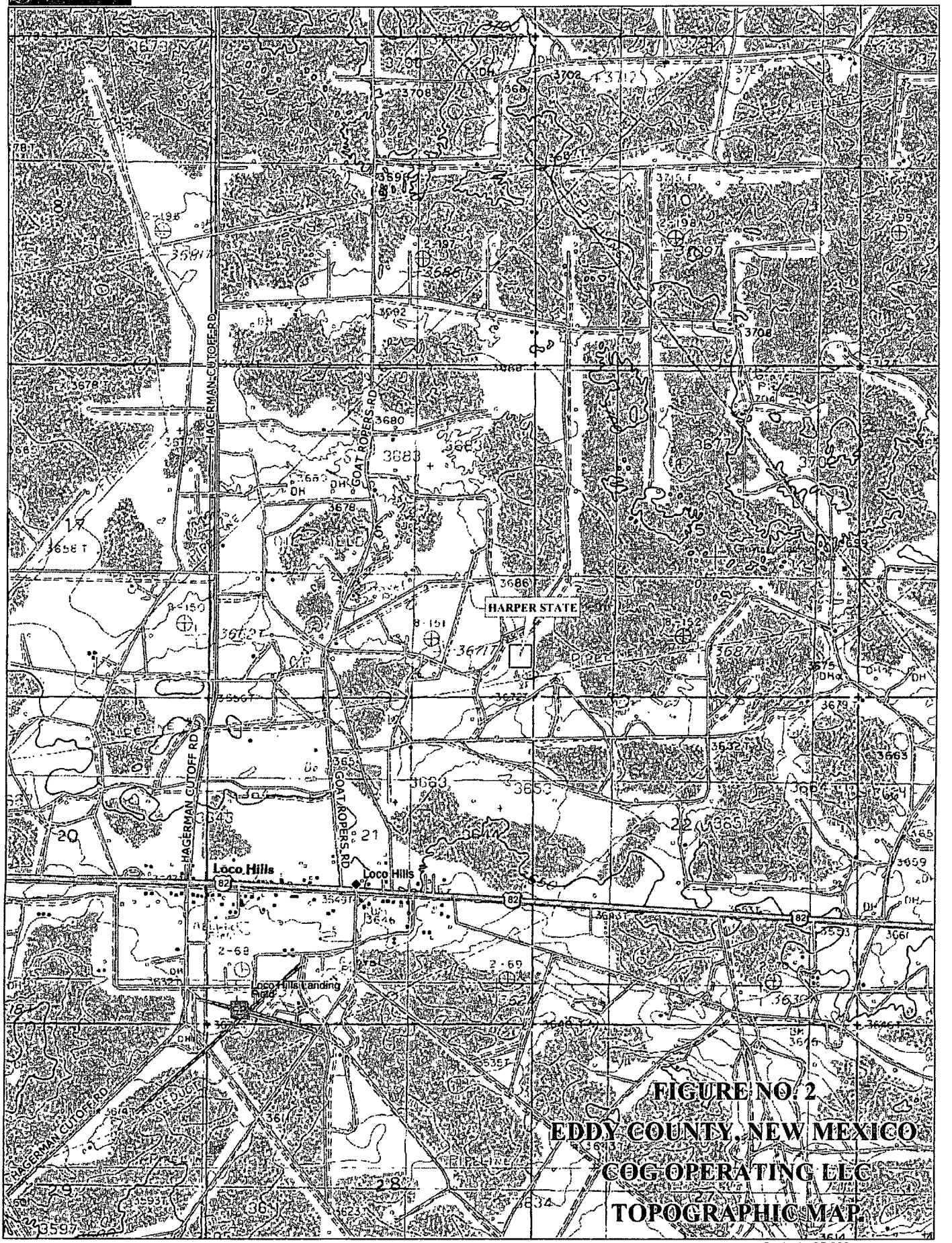


FIGURE NO. 2

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

TOPOGRAPHIC MAP

TN

MN (7.7°E)

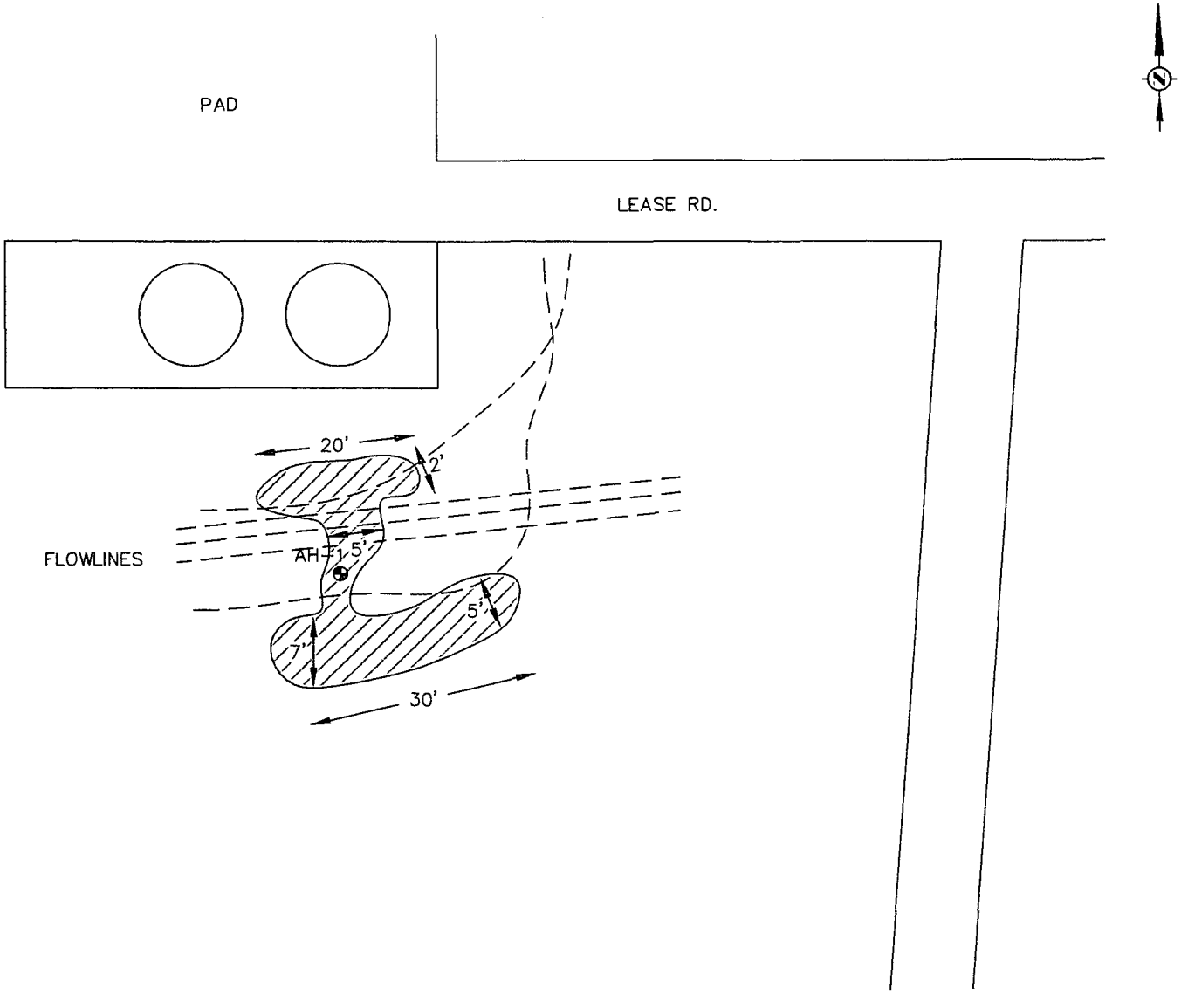
Scale 1 : 25,000

0 600 1200 1800 2400 3000 ft

0 200 400 600 800 1000 m

1" = 2,083 3 ft

Data Zoom 13-0



SPILL AREA
SAMPLE LOCATIONS

NOT TO SCALE

FIGURE NO. 3

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

HARPER STATE

DATE: 2/21/11
DWN BY: JJ
FILE: H:\COG\6400824 HARPER STATE

TETRA TECH, INC.
MIDLAND, TEXAS

TABLES

Table 1
COG Operating LLC.
Harper State #10 Flowline
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					
AH-1	2/21/2011	0-1'	1'		X	<2.00	<50.0	<50.0	<0.0200	0.14	0.126	0.382	2,320
		1-1.5'	1'	X		-	-	-	-	-	-	-	342
		2-2.5'	1'	X		-	-	-	-	-	-	-	<200
		3-3.5'	1'	X		-	-	-	-	-	-	-	<200
		4-4.5'	1'	X		-	-	-	-	-	-	-	<200
		5-5.5'	1'	X		-	-	-	-	-	-	-	<200
		6-6.5'	1'	X		-	-	-	-	-	-	-	<200

BEB Below Excavation Bottom

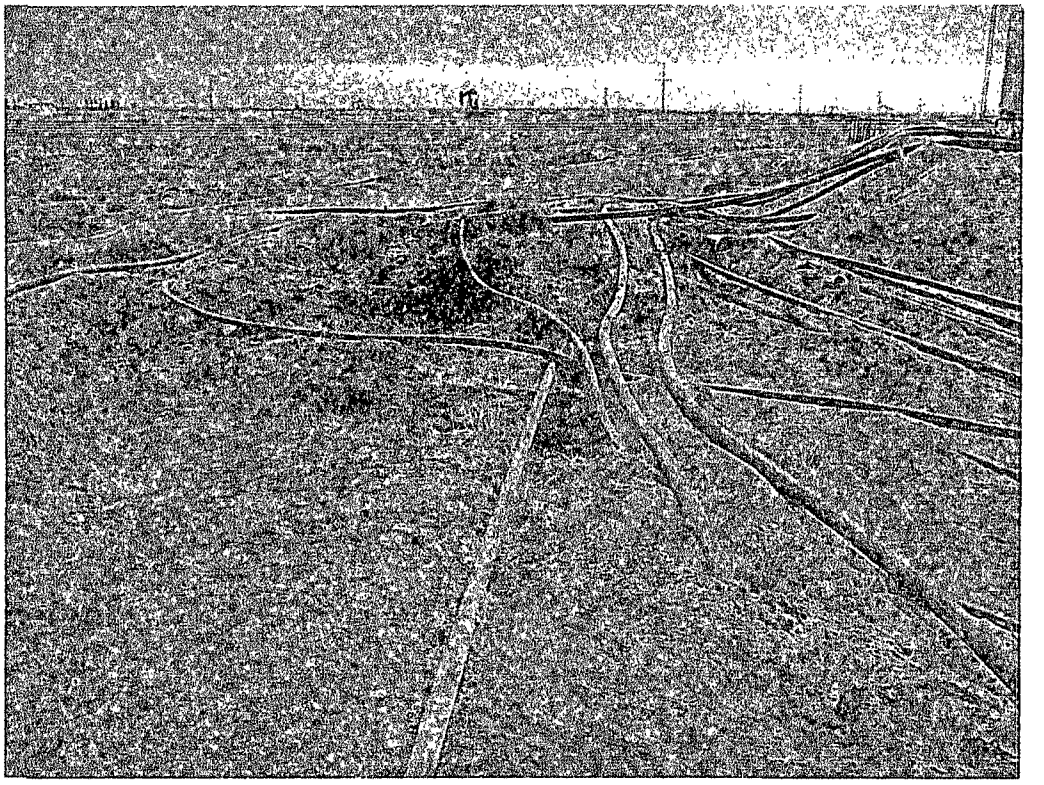
(--) Not Analyzed

Excavation Depth

PHOTOGRAPHS

COG Operating LLC
Harper State # 10 Flowline
Eddy County, New Mexico

TETRA TECH



View West – AH-1

View East – AH-1

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 1300 Midland, Texas 79701**	Telephone No. **(432) 230-0077**
Facility Name Harper State #10	Facility Type **Flowline**

Surface Owner State	Mineral Owner	Lease No. API 30-015-34870

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	16	17-S	30-E					Eddy

Latitude N 32 49.741° **Longitude** W 103 58.142°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release **10 bbls**	Volume Recovered **0 bbls**
Source of Release **Flowline**	Date and Hour of Occurrence 2/7/11	Date and Hour of Discovery **2/7/11 1:30 pm**
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
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.*

Steel flowline split due to freezing temperatures. The split joint has been replaced with a new one and returned to service.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected site and collected samples to define spills extent. Soil with elevated chloride concentrations was removed and hauled away to Controlled Recovery, Inc., Hobbs, NM. 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: 3-1-12 Phone: (432) 682-4559		

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
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	Harper State #10	Facility Type	Flowline

Surface Owner State	Mineral Owner	Lease No. (API#) 30-015-34870

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	16	17S	30E					Eddy

Latitude 32 49.741 **Longitude** 103 58.142

NATURE OF RELEASE

Type of Release Produced fluid	Volume of Release 10bbls	Volume Recovered 0bbls
Source of Release Flowline	Date and Hour of Occurrence 02/07/2011	Date and Hour of Discovery 02/07/2011 1:30 p.m.
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Steel flowline spilt due to freezing temperatures. The split joint of flowline has been replaced with a new one and returned to service.

Describe Area Affected and Cleanup Action Taken.*

Initially 10bbls of produced fluid was released from the split Harper State #10 flowline located behind the Harper State Tank Battery. The fluid traveled 10' x 50' outside of the facility dike walls. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD 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:	OIL CONSERVATION DIVISION	
Printed Name: Josh Russo	Approved by District Supervisor:	
Title: HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: jrusso@conchoresources.com	Conditions of Approval:	Attached ☐
Date: 02/16/2011 Phone: 432-212-2399		

* Attach Additional Sheets If Necessary

APPENDIX B

Water Well Data
Average Depth to Groundwater (ft)
COG - Harper State #10
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 **110**	20	21	22	23	24
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 **290**	32	33	34	35

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 **80**	23	24
30	29 **210** **208'**	28	27	26	25
31	32	33	34	35 153	36

17 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16 Site	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 **271**	35

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 **317**
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35 **261**

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

Kim Dorey
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: March 17, 2011

Work Order: 11030103

Project Name: COG/Harper State #10
Project Number: 114-6400824

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
259081	AH-1 0-1' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259082	AH-1 1'-1.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259083	AH-1 2'-2.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259084	AH-1 3'-3.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259085	AH-1 4'-4.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259086	AH-1 5'-5.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259087	AH-1 6'-6.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28

	BTEX				TPH DRO - NEW	TPH GRO
Sample - Field Code	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
259081 - AH-1 0-1' 1' BEB	<0.0200	**0.140**	**0.126**	**0.382**	<50.0	<2.00

Sample: 259081 - AH-1 0-1' 1' BEB

Param	Flag	Result	Units	RL
Chloride		**2320**	mg/Kg	4.00

Sample: 259082 - AH-1 1'-1.5' 1' BEB

Param	Flag	Result	Units	RL
Chloride		**342**	mg/Kg	4.00

Sample: 259083 - AH-1 2'-2.5' 1' BEB

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

Sample: 259084 - AH-1 3'-3.5' 1' BEB

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

Sample: 259085 - AH-1 4'-4.5' 1' BEB

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

Sample: 259086 - AH-1 5'-5.5' 1' BEB

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

Sample: 259087 - AH-1 6'-6.5' 1' BEB

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

TRACEANALYSIS, INC.

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 888•588•3443 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260
E-Mail: lab@traceanalysis.com

Certifications

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

NELAP Certifications

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

Analytical and Quality Control Report

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

Report Date: March 16, 2011

Work Order: 11030103

Project Name: COG/Harper State #10
Project Number: 114-6400824

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
259081	AH-1 0-1' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259082	AH-1 1'-1.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259083	AH-1 2'-2.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259084	AH-1 3'-3.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259085	AH-1 4'-4.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259086	AH-1 5'-5.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28
259087	AH-1 6'-6.5' 1' BEB	Soil	2011-02-21	00:00	2011-02-28

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

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

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/Harper State #10 were received by TraceAnalysis, Inc. on 2011-02-28 and assigned to work order 11030103. Samples for work order 11030103 were received intact at a temperature of 9.6 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	67042	2011-03-02 at 09:01	79024	2011-03-02 at 16:01
Chloride (Titration)	SM 4500-Cl B	67258	2011-03-04 at 14:22	79393	2011-03-07 at 09:26
TPH DRO - NEW	S 8015 D	67158	2011-03-03 at 13:18	79169	2011-03-03 at 13:18
TPH GRO	S 8015 D	67042	2011-03-02 at 09:01	79025	2011-03-02 at 16:01

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 11030103 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: 259081 - AH-1 0-1' 1' BEB

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	79024	Date Analyzed:	2011-03-02	Analyzed By:	ME
Prep Batch:	67042	Sample Preparation:	2011-03-02	Prepared By:	ME

Parameter	Flag	Result	RL	Units	Dilution	RL
Benzene		<0.0200		mg/Kg	1	0.0200
Toluene		**0.140**		mg/Kg	1	0.0200
Ethylbenzene		**0.126**		mg/Kg	1	0.0200
Xylene		**0.382**		mg/Kg	1	0.0200

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.51	mg/Kg	1	2.00	126	52.8 - 137
4-Bromofluorobenzene (4-BFB)		2.74	mg/Kg	1	2.00	137	38.4 - 157

Sample: 259081 - AH-1 0-1' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

Parameter	Flag	Result	RL	Units	Dilution	RL
Chloride		**2320**		mg/Kg	100	4.00

Sample: 259081 - AH-1 0-1' 1' BEB

Laboratory:	Midland				
Analysis.	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	79169	Date Analyzed:	2011-03-03	Analyzed By:	kg
Prep Batch:	67158	Sample Preparation:	2011-03-03	Prepared By:	kg

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		94.0	mg/Kg	1	100	94	70 - 130

Sample: 259081 - AH-1 0-1' 1' BEB

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	79025	Date Analyzed:	2011-03-02	Analyzed By:	ME
Prep Batch:	67042	Sample Preparation:	2011-03-02	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)		2.56	mg/Kg	1	2.00	128	48.5 - 152
4-Bromofluorobenzene (4-BFB)		2.55	mg/Kg	1	2.00	128	42 - 159

Sample: 259082 - AH-1 1'-1.5' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		**342**	mg/Kg	50	4.00

Sample: 259083 - AH-1 2'-2.5' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

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

Sample: 259084 - AH-1 3'-3.5' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

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

Sample: 259085 - AH-1 4'-4.5' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

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

Sample: 259086 - AH-1 5'-5.5' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

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

Sample: 259087 - AH-1 6'-6.5' 1' BEB

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	79393	Date Analyzed:	2011-03-07	Analyzed By:	AR
Prep Batch:	67258	Sample Preparation:	2011-03-04	Prepared By:	AR

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

Method Blank (1) QC Batch: 79024

QC Batch: 79024 | Date Analyzed: 2011-03-02 | Analyzed By: ME
Prep Batch: 67042 | QC Preparation: 2011-03-02 | Prepared By: ME

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.0118	mg/Kg	0.02
Toluene		<0.00600	mg/Kg	0.02
Ethylbenzene		<0.00850	mg/Kg	0.02
Xylene		<0.00613	mg/Kg	0.02

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.62	mg/Kg	1	2.00	81	66.6 - 122
4-Bromofluorobenzene (4-BFB)		1.81	mg/Kg	1	2.00	90	55.4 - 124

Method Blank (1) QC Batch: 79025

QC Batch: 79025 | Date Analyzed: 2011-03-02 | Analyzed By: ME
Prep Batch: 67042 | QC Preparation: 2011-03-02 | Prepared By: ME

Parameter	Flag	MDL Result	Units	RL
GRO		<0.753	mg/Kg	2

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.71	mg/Kg	1	2.00	86	67.6 - 150
4-Bromofluorobenzene (4-BFB)		1.72	mg/Kg	1	2.00	86	52.4 - 130

Method Blank (1) QC Batch: 79169

QC Batch: 79169 | Date Analyzed: 2011-03-03 | Analyzed By: kg
Prep Batch: 67158 | QC Preparation: 2011-03-03 | Prepared By: kg

Parameter	Flag	MDL Result	Units	RL
DRO		<15.7	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		90.1	mg/Kg	1	100	90	70 - 130

Method Blank (1) QC Batch: 79393

QC Batch: 79393 | Date Analyzed: 2011-03-07 | Analyzed By: AR
Prep Batch: 67258 | QC Preparation: 2011-03-04 | Prepared By: AR

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

Laboratory Control Spike (LCS-1)

QC Batch: 79024 | Date Analyzed: 2011-03-02 | Analyzed By: ME
Prep Batch: 67042 | QC Preparation: 2011-03-02 | Prepared By: ME

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	1.81	mg/Kg	1	2.00	<0.0118	90	81.9 - 108
Toluene	1.82	mg/Kg	1	2.00	<0.00600	91	81.9 - 107
Ethylbenzene	1.79	mg/Kg	1	2.00	<0.00850	90	78.4 - 107
Xylene	5.42	mg/Kg	1	6.00	<0.00613	90	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	1.89	mg/Kg	1	2.00	<0.0118	94	81.9 - 108	4	20
Toluene	1.94	mg/Kg	1	2.00	<0.00600	97	81.9 - 107	6	20
Ethylbenzene	1.90	mg/Kg	1	2.00	<0.00850	95	78.4 - 107	6	20
Xylene	5.77	mg/Kg	1	6.00	<0.00613	96	79.1 - 107	6	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)	1.77	1.61	mg/Kg	1	2.00	88	80	70.2 - 114
4-Bromofluorobenzene (4-BFB)	2.10	1.89	mg/Kg	1	2.00	105	94	69.8 - 121

Laboratory Control Spike (LCS-1)

QC Batch: 79025 | Date Analyzed: 2011-03-02 | Analyzed By: ME
Prep Batch: 67042 | QC Preparation: 2011-03-02 | Prepared By: ME

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	14.2	mg/Kg	1	20.0	<0.753	71	60.9 - 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	14.4	mg/Kg	1	20.0	<0.753	72	60.9 - 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)	1.86	1.82	mg/Kg	1	2.00	93	91	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.96	1.94	mg/Kg	1	2.00	98	97	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 79169 | Date Analyzed: 2011-03-03 | Analyzed By: kg
Prep Batch: 67158 | QC Preparation: 2011-03-03 | Prepared By: kg

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	241	mg/Kg	1	250	<15.7	96	47.5 - 144.1

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
DRO	230	mg/Kg	1	250	<15.7	92	47.5 - 144.1	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
n-Tricosane	110	108	mg/Kg	1	100	110	108	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 79393 | Date Analyzed: 2011-03-07 | Analyzed By: AR
Prep Batch: 67258 | QC Preparation: 2011-03-04 | Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	96.5	mg/Kg	1	100	<3.85	96	85 - 115

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
Chloride	104	mg/Kg	1	100	<3.85	104	85 - 115	8	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:

QC Batch: 79024 | Date Analyzed: 2011-03-02 | Analyzed By: ME
Prep Batch: 67042 | QC Preparation: 2011-03-02 | Prepared By: ME

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	1.84	mg/Kg	1	2.00	<0.0118	92	80.5 - 112
Toluene	2.01	mg/Kg	1	2.00	0.206	90	82.4 - 113
Ethylbenzene	2.32	mg/Kg	1	2.00	0.3343	99	83.9 - 114
Xylene	6.72	mg/Kg	1	6.00	0.8966	97	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	1.80	mg/Kg	1	2.00	<0.0118	90	80.5 - 112	2	20
Toluene	1.99	mg/Kg	1	2.00	0.206	89	82.4 - 113	1	20
Ethylbenzene	2.27	mg/Kg	1	2.00	0.3343	97	83.9 - 114	2	20
Xylene	6.64	mg/Kg	1	6.00	0.8966	96	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)	[1]	2.32	2.37	mg/Kg	1	2	116	118	41.3 - 117
4-Bromofluorobenzene (4-BFB)	[2,3]	3.24	3.16	mg/Kg	1	2	162	158	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 259081

QC Batch: 79025 | Date Analyzed: 2011-03-02 | Analyzed By: ME
Prep Batch: 67042 | QC Preparation: 2011-03-02 | Prepared By: ME

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	14.5	mg/Kg	1	20.0	<0.753	72	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	15.5	mg/Kg	1	20.0	<0.753	78	61.8 - 114	7	20

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

[1]High surrogate recovery due to peak interference.
[2]High surrogate recovery due to peak interference.
[3]High surrogate recovery due to peak interference.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.48	2.48	mg/Kg	1	2	124	124	50 - 162
4-Bromofluorobenzene (4-BFB)	2.64	2.63	mg/Kg	1	2	132	132	50 - 162

Matrix Spike (MS-1) Spiked Sample: 259355

QC Batch: 79169 | Date Analyzed: 2011-03-03 | Analyzed By: kg
Prep Batch: 67158 | QC Preparation: 2011-03-03 | Prepared By: kg

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	239	mg/Kg	1	250	37.1	81	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	263	mg/Kg	1	250	37.1	90	11.7 - 152.3	10	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	109	107	mg/Kg	1	100	109	107	70 - 130

Matrix Spike (MS-1) Spiked Sample: 259094

QC Batch: 79393 | Date Analyzed: 2011-03-07 | Analyzed By: AR
Prep Batch: 67258 | QC Preparation: 2011-03-04 | Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	14300	mg/Kg	100	10000	4710	96	80 - 120

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	14600	mg/Kg	100	10000	4710	99	80 - 120	2	20

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

Standard (CCV-1)

QC Batch: 79024 | Date Analyzed: 2011-03-02 | 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	0.0872	87	80 - 120	2011-03-02
Toluene		mg/Kg	0.100	0.0884	88	80 - 120	2011-03-02
Ethylbenzene		mg/Kg	0.100	0.0871	87	80 - 120	2011-03-02
Xylene		mg/Kg	0.300	0.263	88	80 - 120	2011-03-02

Standard (CCV-2)

QC Batch: 79024 Date Analyzed: 2011-03-02 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	0.0918	92	80 - 120	2011-03-02
Toluene		mg/Kg	0.100	0.0935	94	80 - 120	2011-03-02
Ethylbenzene		mg/Kg	0.100	0.0912	91	80 - 120	2011-03-02
Xylene		mg/Kg	0.300	0.276	92	80 - 120	2011-03-02

Standard (CCV-1)

QC Batch: 79025 Date Analyzed: 2011-03-02 Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	0.841	84	80 - 120	2011-03-02

Standard (CCV-2)

QC Batch: 79025 Date Analyzed: 2011-03-02 Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/Kg	1.00	1.07	107	80 - 120	2011-03-02

Standard (CCV-1)

QC Batch: 79169 Date Analyzed: 2011-03-03 Analyzed By: kg

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	241	96	80 - 120	2011-03-03

Standard (CCV-2)

QC Batch: 79169 Date Analyzed: 2011-03-03 Analyzed By: kg

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	234	94	80 - 120	2011-03-03

Standard (ICV-1)

QC Batch: 79393 Date Analyzed: 2011-03-07 Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	97.3	97	85 - 115	2011-03-07

Standard (CCV-1)

QC Batch: 79393 Date Analyzed: 2011-03-07 Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	103	103	85 - 115	2011-03-07

dewo #: 11030103

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

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

CLIENT NAME: COG

SITE MANAGER: Harper State #10

PROJECT NO.: 114-C4D0824

PROJECT NAME: COG / Harper State #10 Eddy Co, NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE
259081	7/21		S		X	AH-1 0-1' 1'BEB	1				X	
082						AH-1 1'-1.5' 1'BFB						
083						AH-1 2'-2.5' 1'BEB						
084						AH-1 3'-3.5' 1'BEB						
085						AH-1 4'-4.5' 1'BEB						
086						AH-1 5'-5.5' 1'BEB						
087						AH-1 6'-6.5' 1'BEB						

ANALYSIS REQUEST (Circle or Specify Method No.)

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. 8081/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
	X											X				

RELINQUISHED BY: (Signature) — Date: 7/22/11 Time: 1650 — RECEIVED BY: (Signature) — Date: 7/26/11 Time: 10:50

SAMPLED BY: (Print & Initial) JT — Date: 8/21/11 Time:

RELINQUISHED BY: (Signature) — Date: Time: — RECEIVED BY: (Signature) — Date: Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: Time: — RECEIVED BY: (Signature) — Date: Time:

RECEIVING LABORATORY: Trace — RECEIVED BY: (Signature)

ADDRESS: — CITY: Midland STATE: TX ZIP: — CONTACT: — PHONE: — DATE: — TIME:

TETRA TECH CONTACT PERSON: Ike Tavarez — Results by: — RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 9.6°C in Ice

REMARKS: If total TPH exceeds 5,000 mg/kg run deeper samples / If total BTEX exceeds 50 mg/kg or Benzene exceeds 10 mg/kg run deeper samples

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

all tests - Midland