

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

HOBBS OCD

State of New Mexico
Energy Minerals and Natural Resources

JAN 14 2013

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

RECEIVED

4629

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	SL Deep Federal #3 Tank Battery	Facility Type	Tank Battery

Surface Owner: Federal	Mineral Owner	Lease No. (API#) 30-025-33441
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LOCATION OF RELEASE

Unit Letter C	Section 20	Township 19S	Range 32E	Feet from the	North/South Line	Feet from the	East/West Line	County Lea
------------------	---------------	-----------------	--------------	---------------	------------------	---------------	----------------	---------------

Latitude 32 38.148 Longitude 103 48.540

NATURE OF RELEASE

Type of Release: Produced Fluid / Skim oil	Volume of Release 19 bbls oil 1 bbls pw	Volume Recovered 15 bbls oil 1 bbls pw
Source of Release: Man way plate gasket at heater	Date and Hour of Occurrence 08/05/2012	Date and Hour of Discovery 08/05/2012 9:45 a.m.
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom? Josh Russo	Date and Hour	
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.*

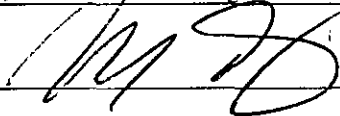
Describe Cause of Problem and Remedial Action Taken.*

The gasket on the man way plate at the heater was releasing fluid and was replaced.

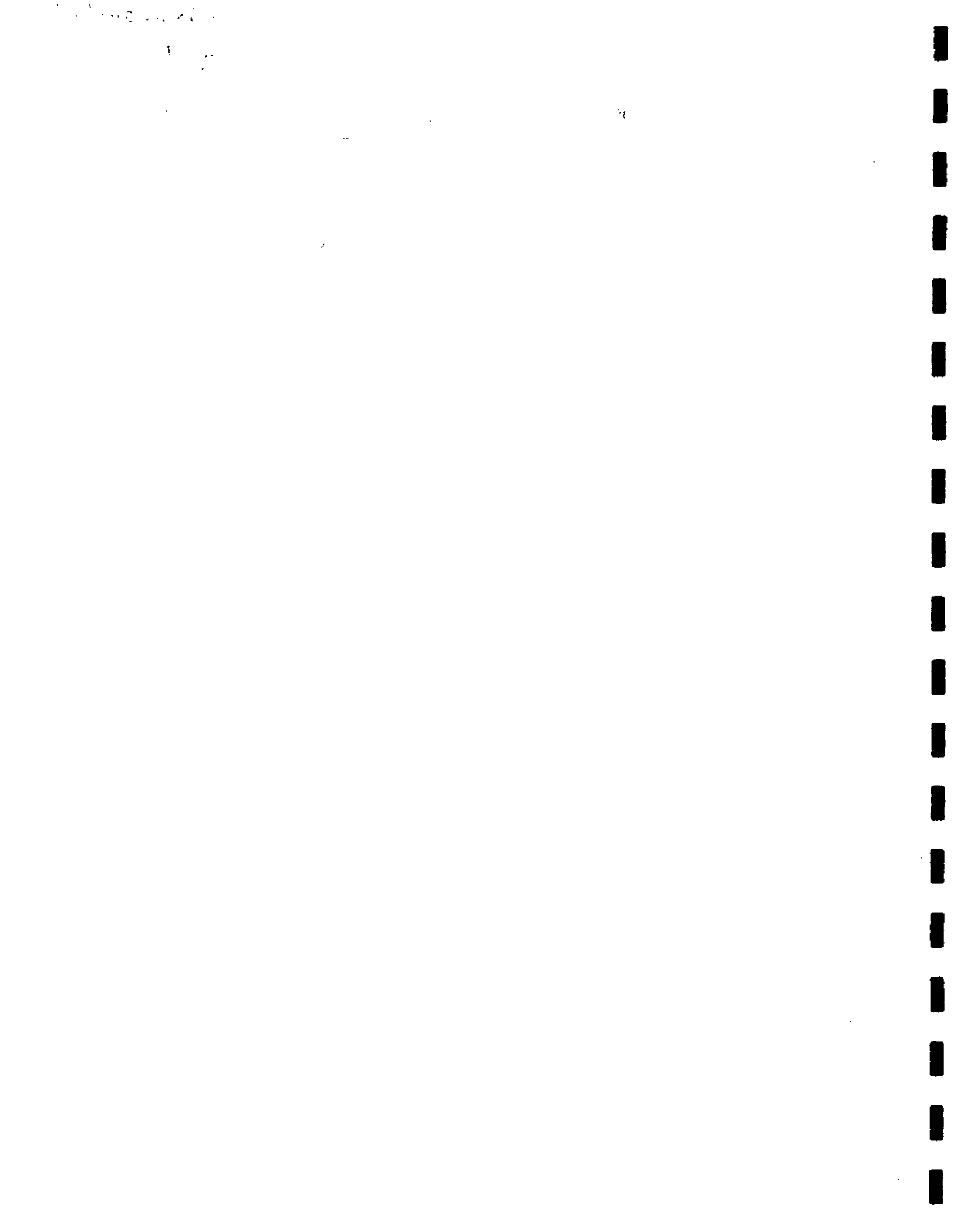
Describe Area Affected and Cleanup Action Taken.*

Tetra Tech personnel inspected the site and collected samples to define the spills extent. Soil that exceeded RRAL was removed and hauled to a proper disposal facility. The site was then brought up to surface grade with clean backfill material. Tetra Tech prepared a closure report and submitted it 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 (agent for COG)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 1-10-13 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary



5th
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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	SL Deep Federal #3 Tank Battery	Facility Type	Tank Battery
Surface Owner	Federal	Mineral Owner	
		Lease No. (API#)	30-025-39441

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	30	19S	32E					Lea

Latitude 32 38.148 Longitude 103 48.540

NATURE OF RELEASE

Type of Release	Produced water / Skim oil	Volume of Release	19bbbls pw 1bbl oil	Volume Recovered	15bbbls pw 1bbl oil
Source of Release	Man way plate gasket at heater	Date and Hour of Occurrence	08/05/2012	Date and Hour of Discovery	08/05/2012 9:45 a.m.
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?			
By Whom?		Date and Hour			
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.*

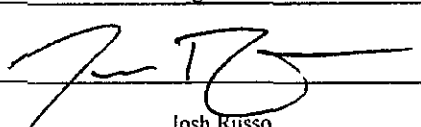
The gasket on the man way plate at the heater was releasing fluid and needed to be replaced. We have made all necessary repairs and the heater has been returned to service.

Describe Area Affected and Cleanup Action Taken.*

Initially 20bbbls were released from the heater and we were able to recover 16bbbls with a vacuum truck. The released fluid was contained inside a 20' x 20' area in the tank battery around the heater. The spill area has been scraped and the contaminated soil has been hauled. 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/BLM 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.

OIL CONSERVATION DIVISION

Signature:		Approved by District Supervisor:	
Printed Name:	Josh Russo	Approval Date:	Expiration Date:
Title:	HSE Coordinator	Conditions of Approval:	
E-mail Address:	jrusso@conchoresources.com	Attached <input type="checkbox"/>	
Date:	08/15/2012	Phone:	432-212-2399

* Attach Additional Sheets If Necessary



SITE INFORMATION

Report Type: Closure Report

General Site Information:

Site:	SL Deep Federal #3 Tank Battery				
Company:	COG Operating LLC				
Section, Township and Range	Unit C	Sec 30	T19S	R32E	
Lease Number:	API-30-025-39441				
County:	Lea County				
GPS:	32.63590° N			103.80924° W	
Surface Owner:	Federal				
Mineral Owner:					
Directions:	From the intersection of Hwy 62/180 and Hwy 243, travel northwest on Hwy 243 for 4.3 miles, turn right (north) on CR126 and travel for 4.5 miles, turn left and travel 0.4 miles, turn right and travel 0.4 miles to location.				

Release Data:

Date Released:	8/5/2012
Type Release:	Produced Water/ Skim Oil
Source of Contamination:	Man way plate gasket at heater treater
Fluid Released:	19 bbls pw 1 bbl oil
Fluids Recovered:	15 bbls pw 1 bbl oil

Official Communication:

Name:	Pat Ellis	Ike Tavaréz
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.tavaréz@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

Total Ranking Score:	0
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Acceptable Soil RRAL (mg/kg)

Benzene	Total BTEX	TPH
10	50	5,000

DEC 22 2015





TETRA TECH

January 7, 2013

HOBBS OCD

JAN 14 2013

Mr. Geoffrey Leking
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

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**Re: Closure Report for the COG Operating LLC., SL Deep Federal #3
Tank Battery, Unit C, Section 30, Township 19 South, Range 32
East, Lea County, New Mexico.**

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the SL Deep Federal #3 Tank Battery, Unit C, Section 30, Township 19 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.63590°, W 103.80924°. 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 August 5, 2012, and released approximately twenty (20) barrels of oil and produced water from a heater treater with sixteen (16) barrels of standing fluids recovered. The spill was completely contained inside the firewalls and measured approximately 30' x 40'. The initial C-141 form is enclosed in Appendix C.

Groundwater

No water wells were listed within Section 30. According to the NMOCD groundwater map, the average depth to groundwater in this area is approximately 600' below surface. The average depth to groundwater map is shown in Appendix A.

Tetra Tech

1910 North Big Spring, Midland, TX 79705

Tel 432.682.4559

Fax 432.682.3946

www.tetrattech.com





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 August 31, 2012, Tetra Tech personnel inspected and sampled the spill area. Two (2) auger holes (AH-1 and AH-2) were installed using a stainless steel hand auger to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, the area of AH-1 exceeded the RRAL at 0-1' for TPH and total BTEX, but declined below the RRAL at 1-1.5' below surface. In addition, a shallow chloride impact was detected in both of the auger holes. Auger holes (AH-1 and AH-2) at 0-1' showed chloride concentrations of 3,040 mg/kg and 3,020 mg/kg, respectively. The deeper samples significantly declined with depth at 1-1.5' below surface. In the area of AH-1, the chlorides spiked at 3.0' (1,160 mg/kg) to 4.0' (1,790 mg/kg) below surface. The deeper sample declined with depth with concentrations of 942 mg/kg at 4.5-5.0' below surface.

Remediation and Closure Request

Tetra Tech personnel supervised the site remediation from December 18 to 19, 2012. The excavation areas and depths are highlighted (green) in Table 1 and shown on Figure 4. As stated in the work plan, the areas of AH-1 and AH-2 were excavated to a depth of approximately 1.0' below surface. Due to the vessels and lines in the area, the deeper impact soil will be deferred due to safety concerns and the remaining impacted soils does not appear be an environmental concern.





TETRA TECH

Approximately 12 cubic yards were removed and transported to R360 facility for proper disposal. Based on the remedial activities, the BLM and NMOCD approved the backfilling of the excavation with clean material to grade.

Based on the remediation activities performed at the site, COG requests closure of the site. The final C-141 is enclosed in Appendix A. If you should requires any additional information or have any questions or comments concerning this closure request, please call me at (432) 682-4559.

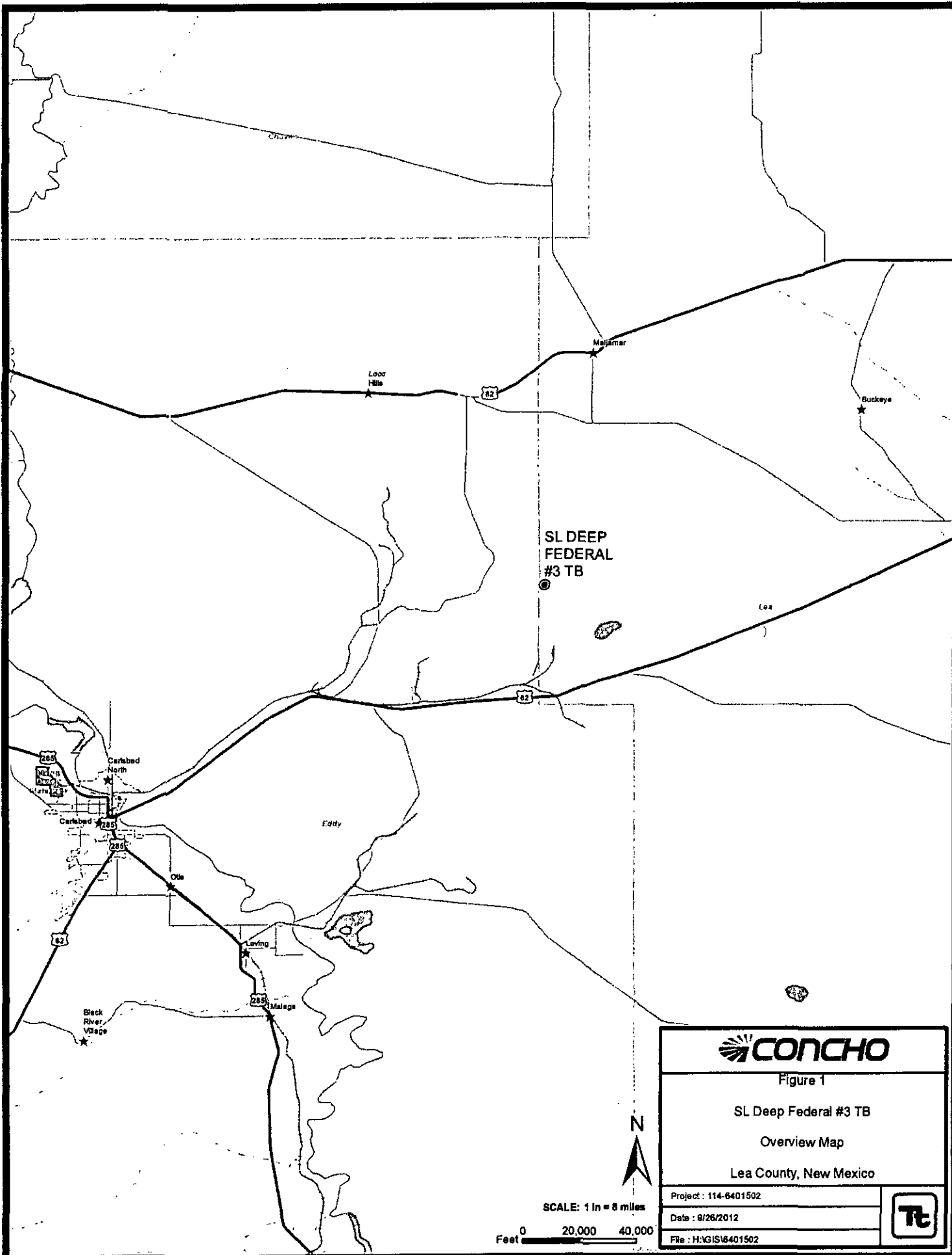
Respectfully submitted,
TETRA TECH

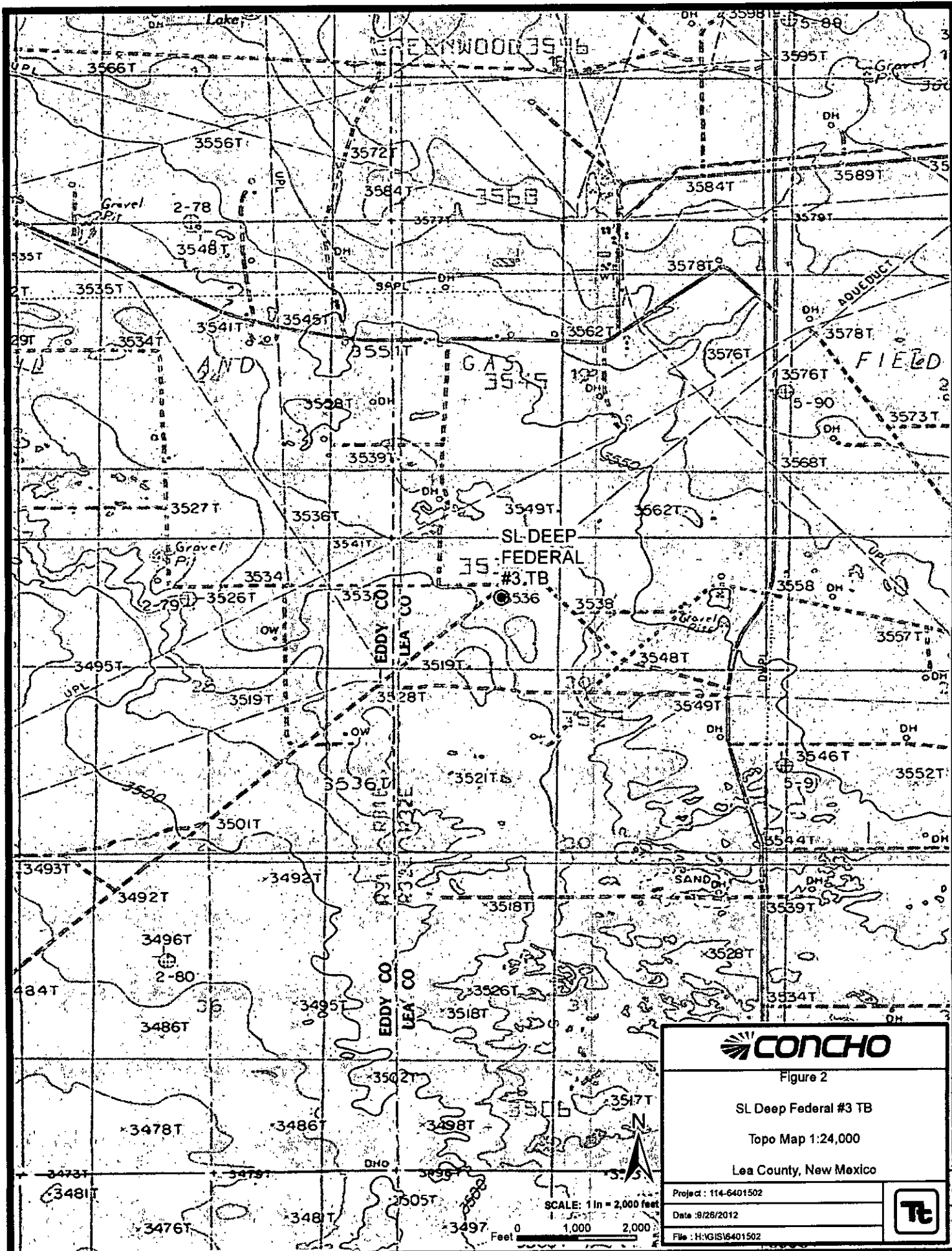


Ike Tavaraz
Senior Project Manager

cc: Pat Ellis – COG
cc: Jim Amos – BLM







CONCHO

Figure 2

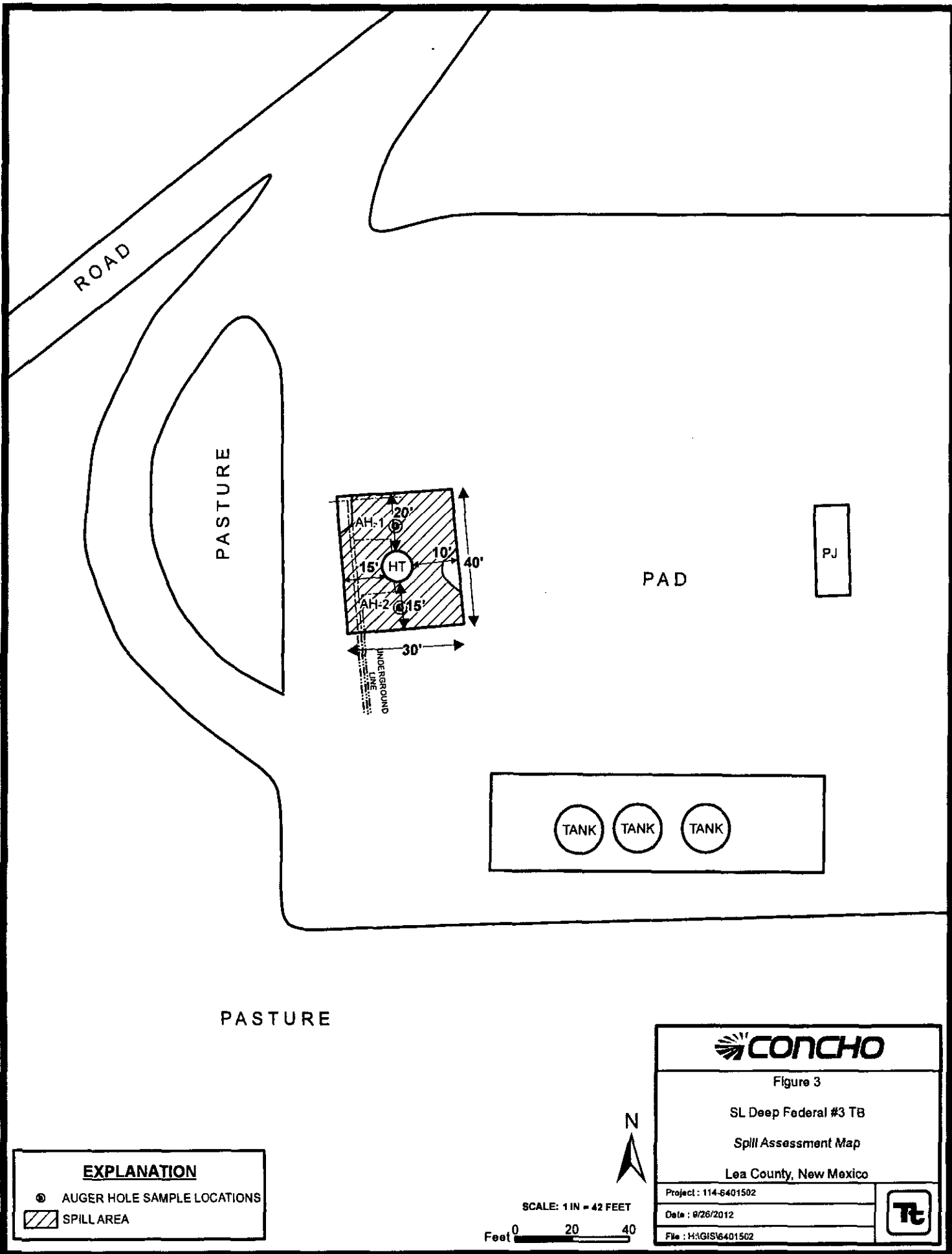
SL Deep Federal #3 TB

Topo Map 1:24,000

Lea County, New Mexico







EXPLANATION

- ⊙ AUGER HOLE SAMPLE LOCATIONS
- ▨ SPILL AREA



SCALE: 1 IN = 42 FEET

Feet 0 20 40



Figure 3

SL Deep Federal #3 TB

Spill Assessment Map

Lea County, New Mexico

Project: 114-6401502

Date: 9/26/2012

File: H3GIS\6401502





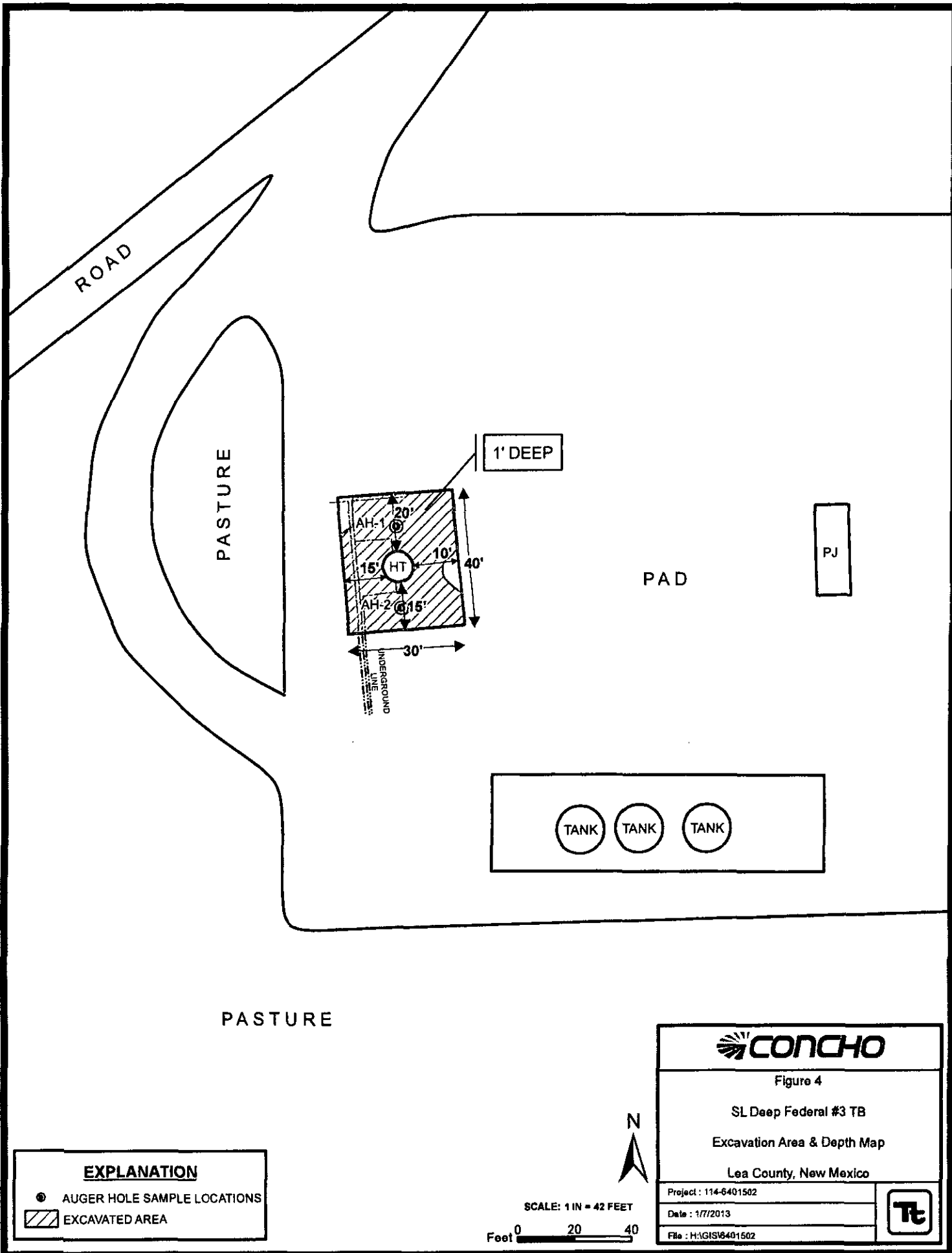




Table 1

**COG Operating LLC.
SL Deep Federal #3 Tank Battery
Lea County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
AH-1	8/31/2012	0-1		X	3,470	19,100	22,570	<1.00	3.66	24.3	74.8	103	3,040
	"	1-1.5	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	0.0239	0.0812	0.105	333
	"	2-2.5	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	763
	"	3-3.5	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	1,160
	"	4-4.5	X		29.2	133	162	<0.0200	<0.0200	0.0637	0.214	0.278	1,790
	"	4.5-5	X		148	1,040	1,188	<0.0400	0.0480	0.437	1.40	1.89	942
AH-2	8/31/2012	0-1		X	4.86	<50.0	4.86	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	3,020
	"	1-1.5	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	275
	"	2-2.5	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	232

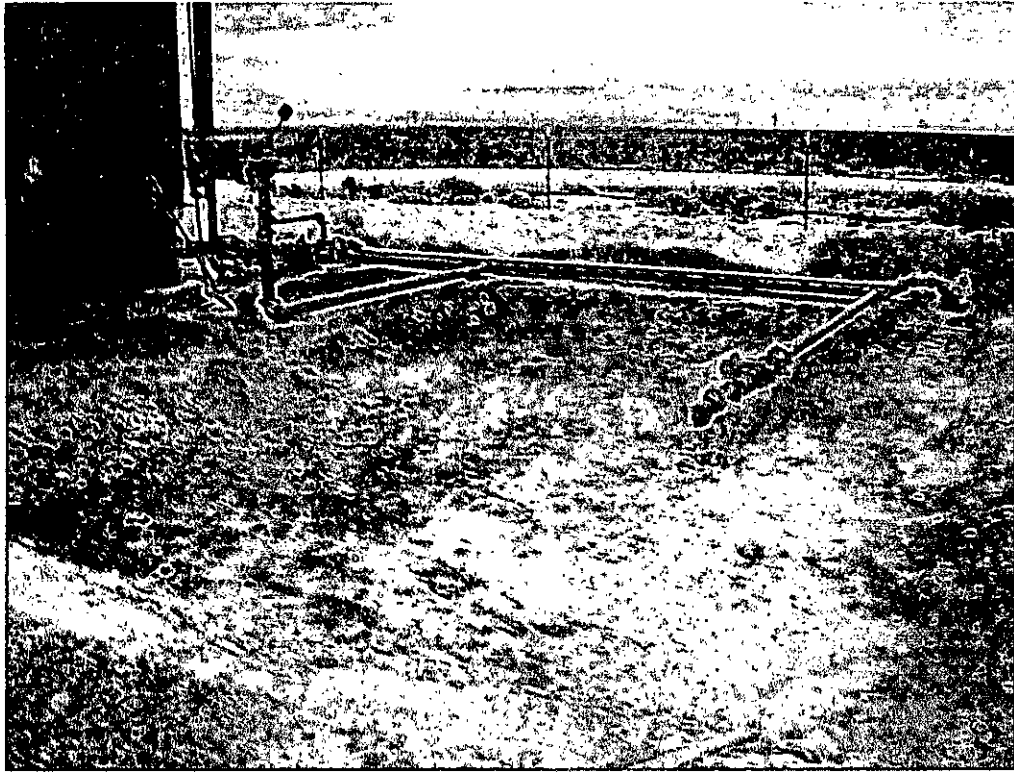
(-) Not Analyzed

 Excavated Depths

COG Operating LLC
SL Deep Federal #3 Tank Battery
Lea County, New Mexico



TETRA TECH



Excavation area of AH-1



Excavation area of AH-2



Water Well Data
Average Depth to Groundwater (ft)
COG - SL Deep Federal #3 Tank Battery
Lea County, New Mexico

18 South 31 East					
6	5	4	3	2	1
7	8	9	10	11	12
					400
18	17	16	15	14	13
				317	
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
				261	

19 South 31 East					
6	5	4	3	2	1
	SITE				
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
		180			
31	32	33	101	34	35
				36	130

20 South 31 East					
6	5	4	3	2	1
7	8	9	10	11	12
			130		
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
					80

18 South 32 East					
6	5	4	65	3	2
			Prong #2		1
7	460	8	9	10	11
82					12
18	17	16	15	14	13
		84			
19	20	21	22	23	24
	164		429		
30	29	28	27	26	25
31	32	33	34	35	36
			117		







19 South 32 East					
6	5	4	3	2	1
7	8	9	10	11	12
	365				
18	17	16	15	14	13
					135
19	20	21	22	23	24
	102	345			dry
30	29	28	27	26	25
	SITE				
31	32	33	34	35	36
			250		

20 South 32 East					
6	5	4	3	2	1
					21.8
7	8	9	10	11	12
18	17	16	15	14	13
89					
19	20	21	22	23	24
30	29	28	27	26	25
9.9			12.3		
31	32	33	34	35	36
					46

18 South 33 East					
6	5	4	3	60	2
					1
7	8	100	9	10	11
				62	48
18	17	16	15	14	12
	85			36	143
19	20	21	22	23	24
	>140				195
30	29	28	27	26	25
35					
31	32	33	34	35	36
		177			

19 South 33 East					
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
340	116				
19	20	21	22	23	24
30	29	28	130	27	26
		dry		92	25
31	32	33	34	35	36
	185				

20 South 33 East					
6	5	278	4	3	2
					1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
					+300
30	29	28	27	26	25
31	32	33	34	35	36

-  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

Summary Report

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

Report Date: September 19, 2012

Work Order: 12091206



Project Location: NM
Project Name: COG/SL Deep Fed. #3 TB
Project Number: 114-6401502

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
308982	AH-1 0-1'	soil	2012-08-31	00:00	2012-09-11
308983	AH-1 1-1.5'	soil	2012-08-31	00:00	2012-09-11
308984	AH-1 2-2.5'	soil	2012-08-31	00:00	2012-09-11
308985	AH-1 3-3.5'	soil	2012-08-31	00:00	2012-09-11
308986	AH-1 4-4.5'	soil	2012-08-31	00:00	2012-09-11
308987	AH-1 4.5-5'	soil	2012-08-31	00:00	2012-09-11
308988	AH-2 0-1'	soil	2012-08-31	00:00	2012-09-11
308989	AH-2 1-1.5'	soil	2012-08-31	00:00	2012-09-11
308990	AH-2 2-2.5'	soil	2012-08-31	00:00	2012-09-11

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)
308982 - AH-1 0-1'	<1.00 ¹	3.66	24.3	74.8	19100 Q _a	3470
308983 - AH-1 1-1.5'	<0.0200	<0.0200	0.0239	0.0812	<50.0 Q _a	<4.00
308984 - AH-1 2-2.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Q _a	<4.00
308985 - AH-1 3-3.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Q _a	<4.00
308986 - AH-1 4-4.5'	<0.0200	<0.0200	0.0637	0.214	133 Q _a	29.2
308987 - AH-1 4.5-5'	<0.0400 ²	0.0480	0.437	1.40	1040 Q _a	148
308988 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Q _a	4.86
308989 - AH-2 1-1.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Q _a	<4.00
308990 - AH-2 2-2.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Q _a	<4.00

Sample: 308982 - AH-1 0-1'

continued ...

¹Sample dilution due to hydrocarbons.²Sample dilution due to hydrocarbons.



sample 308982 continued ...

Param	Flag	Result	Units	RL
Param	Flag	Result	Units	RL
Chloride	Qs	3040	mg/Kg	5

Sample: 308983 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride	Qs	333	mg/Kg	5

Sample: 308984 - AH-1 2-2.5'

Param	Flag	Result	Units	RL
Chloride	Qs	763	mg/Kg	5

Sample: 308985 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride	Qs	1160	mg/Kg	5

Sample: 308986 - AH-1 4-4.5'

Param	Flag	Result	Units	RL
Chloride	Qs	1790	mg/Kg	5

Sample: 308987 - AH-1 4.5-5'

Param	Flag	Result	Units	RL
Chloride	Qs	942	mg/Kg	5

Sample: 308988 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride	Qs	3020	mg/Kg	5

Sample: 308989 - AH-2 1-1.5'



Report Date: September 19, 2012

Work Order: 12091206

Page Number: 3 of 3

Param	Flag	Result	Units	RL
Chloride	Q*	275	mg/Kg	5

Sample: 308990 - AH-2 2-2.5'

Param	Flag	Result	Units	RL
Chloride	Q*	232	mg/Kg	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
(BioAquatec) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: fab@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 19, 2012

Work Order: 12091206



Project Location: NM
Project Name: COG/SL Deep Fed. #3 TB
Project Number: 114-6401502

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
308982	AH-1 0-1'	soil	2012-08-31	00:00	2012-09-11
308983	AH-1 1-1.5'	soil	2012-08-31	00:00	2012-09-11
308984	AH-1 2-2.5'	soil	2012-08-31	00:00	2012-09-11
308985	AH-1 3-3.5'	soil	2012-08-31	00:00	2012-09-11
308986	AH-1 4-4.5'	soil	2012-08-31	00:00	2012-09-11
308987	AH-1 4.5-5'	soil	2012-08-31	00:00	2012-09-11
308988	AH-2 0-1'	soil	2012-08-31	00:00	2012-09-11
308989	AH-2 1-1.5'	soil	2012-08-31	00:00	2012-09-11
308990	AH-2 2-2.5'	soil	2012-08-31	00:00	2012-09-11

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 30 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



Case Narrative

Samples for project COG/SL Deep Fed. #3 TB were received by TraceAnalysis, Inc. on 2012-09-11 and assigned to work order 12091206. Samples for work order 12091206 were received intact at a temperature of 2.1 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	80319	2012-09-13 at 07:34	94773	2012-09-13 at 07:34
Chloride (Titration)	SM 4500-Cl B	80440	2012-09-18 at 09:00	94929	2012-09-18 at 11:00
TPH DRO - NEW	S 8015 D	80328	2012-09-13 at 11:00	94787	2012-09-14 at 10:06
TPH GRO	S 8015 D	80319	2012-09-13 at 07:34	94774	2012-09-13 at 07:34

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 12091206 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: 308982 - AH-1 0-1'

Laboratory: Lubbock

Analysis: BTEX

QC Batch: 94773

Prep Batch: 80319

Analytical Method: S 8021B

Date Analyzed: 2012-09-13

Sample Preparation: 2012-09-13

Prep Method: S 5035

Analyzed By: JS

Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<1.00	mg/Kg	50	0.0200
Toluene		1	3.66	mg/Kg	50	0.0200
Ethylbenzene		1	24.3	mg/Kg	50	0.0200
Xylene		1	74.8	mg/Kg	50	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	Qsr	Qsr	0.929	mg/Kg	50	10.0	9	70 - 130
4-Bromofluorobenzene (4-BFB)			9.33	mg/Kg	50	10.0	93	70 - 130

Sample: 308982 - AH-1 0-1'

Laboratory: Lubbock

Analysis: Chloride (Titration)

QC Batch: 94929

Prep Batch: 80440

Analytical Method: SM 4500-Cl B

Date Analyzed: 2012-09-18

Sample Preparation: 2012-09-18

Prep Method: N/A

Analyzed By: LM

Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qs		3040	mg/Kg	50	5.00

Sample: 308982 - AH-1 0-1'

Laboratory: Lubbock

Analysis: TPH DRO - NEW

QC Batch: 94787

Prep Batch: 80328

Analytical Method: S 8015 D

Date Analyzed: 2012-09-14

Sample Preparation: 2012-09-13

Prep Method: N/A

Analyzed By: CM

Prepared By: CM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Qs	1	19100	mg/Kg	10	50.0

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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr	580	mg/Kg	10	100	580	70 - 130

Sample: 308982 - AH-1 0-1'

Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	3470	mg/Kg	50	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.45	mg/Kg	50	2.00	72	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	53.7	mg/Kg	50	2.00	2685	70 - 130

Sample: 308983 - AH-1 1-1.5'

Laboratory: Lubbock
Analysis: BTEX
QC Batch: 94773
Prep Batch: 80319

Analytical Method: S 8021B
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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		1	0.0239	mg/Kg	1	0.0200
Xylene		1	0.0812	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.84	mg/Kg	1	2.00	92	70 - 130
4-Bromofluorobenzene (4-BFB)			2.28	mg/Kg	1	2.00	114	70 - 130

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Sample: 308983 - AH-1 1-1.5'

Laboratory:	Lubbock	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2012-09-18	Analyzed By:	LM
QC Batch:	94929	Sample Preparation:	2012-09-18	Prepared By:	LM
Prep Batch:	80440				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Q*		333	mg/Kg	10	5.00

Sample: 308983 - AH-1 1-1.5'

Laboratory:	Lubbock	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2012-09-14	Analyzed By:	CM
QC Batch:	94787	Sample Preparation:	2012-09-13	Prepared By:	CM
Prep Batch:	80328				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Q*,U	1	<50.0	mg/Kg	1	50.0

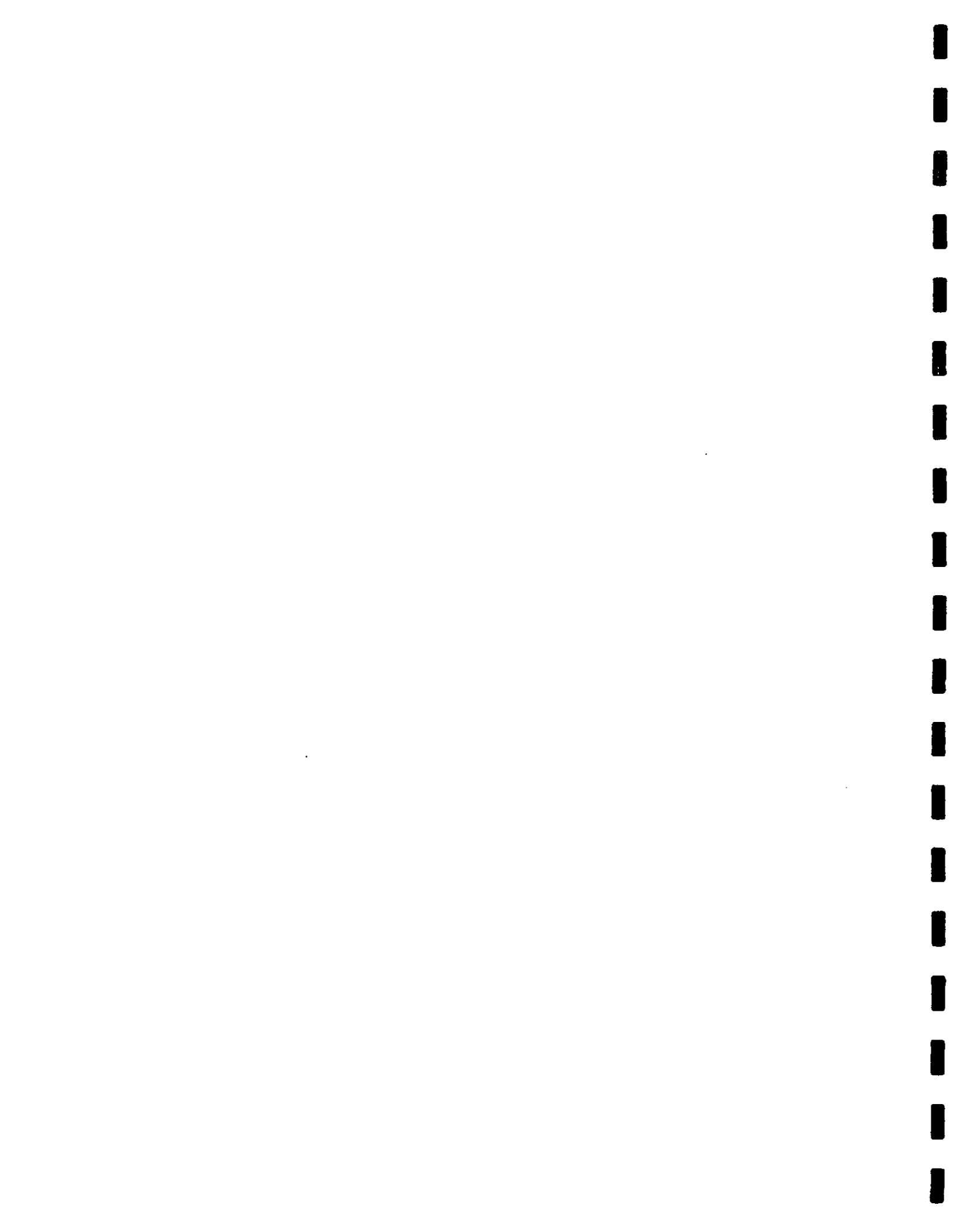
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			98.2	mg/Kg	1	100	98	70 - 130

Sample: 308983 - AH-1 1-1.5'

Laboratory:	Lubbock	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2012-09-13	Analyzed By:	JS
QC Batch:	94774	Sample Preparation:	2012-09-13	Prepared By:	JS
Prep Batch:	80319				

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

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)			2.32	mg/Kg	1	2.00	116	70 - 130



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Sample: 308984 - AH-1 2-2.5'

Laboratory: Lubbock
Analysis: BTEX
QC Batch: 94773
Prep Batch: 80319

Analytical Method: S 8021B
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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)			1.74	mg/Kg	1	2.00	87	70 - 130
4-Bromofluorobenzene (4-BFB)			2.24	mg/Kg	1	2.00	112	70 - 130

Sample: 308984 - AH-1 2-2.5'

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 94929
Prep Batch: 80440

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-09-18
Sample Preparation: 2012-09-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	q*		763	mg/Kg	10	5.00

Sample: 308984 - AH-1 2-2.5'

Laboratory: Lubbock
Analysis: TPH DRO - NEW
QC Batch: 94787
Prep Batch: 80328

Analytical Method: S 8015 D
Date Analyzed: 2012-09-14
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	q*,u	1	<50.0	mg/Kg	1	50.0

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

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Sample: 308984 - AH-1 2-2.5'

Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.78	mg/Kg	1	2.00	89	70 - 130
4-Bromofluorobenzene (4-BFB)			2.17	mg/Kg	1	2.00	108	70 - 130

Sample: 308985 - AH-1 3-3.5'

Laboratory: Lubbock
Analysis: BTEX
QC Batch: 94773
Prep Batch: 80319

Analytical Method: S 8021B
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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		1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.27	mg/Kg	1	2.00	113	70 - 130
4-Bromofluorobenzene (4-BFB)			2.42	mg/Kg	1	2.00	121	70 - 130

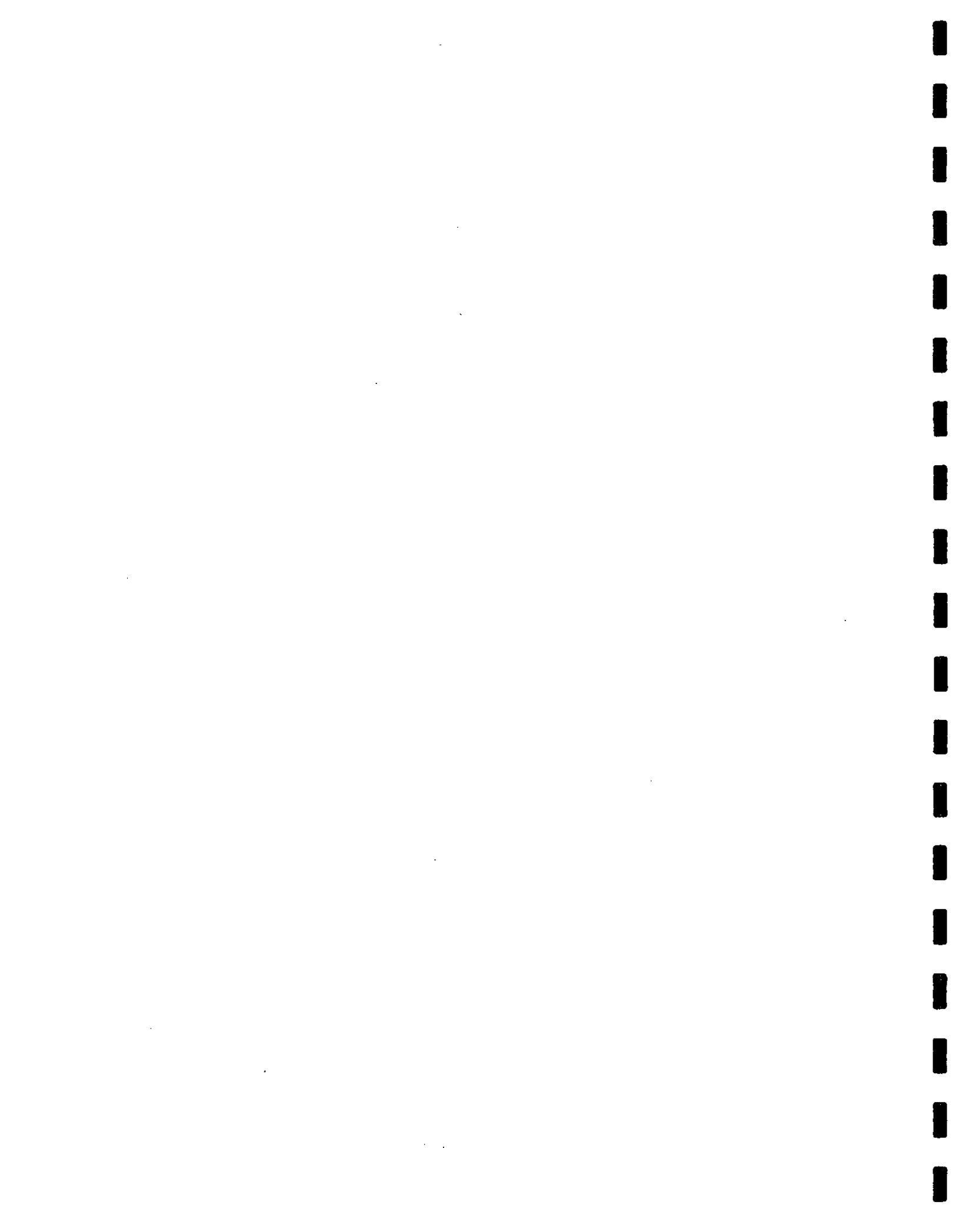
Sample: 308985 - AH-1 3-3.5'

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 94929
Prep Batch: 80440

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-09-18
Sample Preparation: 2012-09-18

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

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Q		1160	mg/Kg	20	5.00

Sample: 308985 - AH-1 3-3.5'

Laboratory: Lubbock
Analysis: TPH DRO - NEW
QC Batch: 94787
Prep Batch: 80328

Analytical Method: S 8015 D
Date Analyzed: 2012-09-14
Sample Preparation: 2012-09-13

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			97.6	mg/Kg	1	100	98	70 - 130

Sample: 308985 - AH-1 3-3.5'

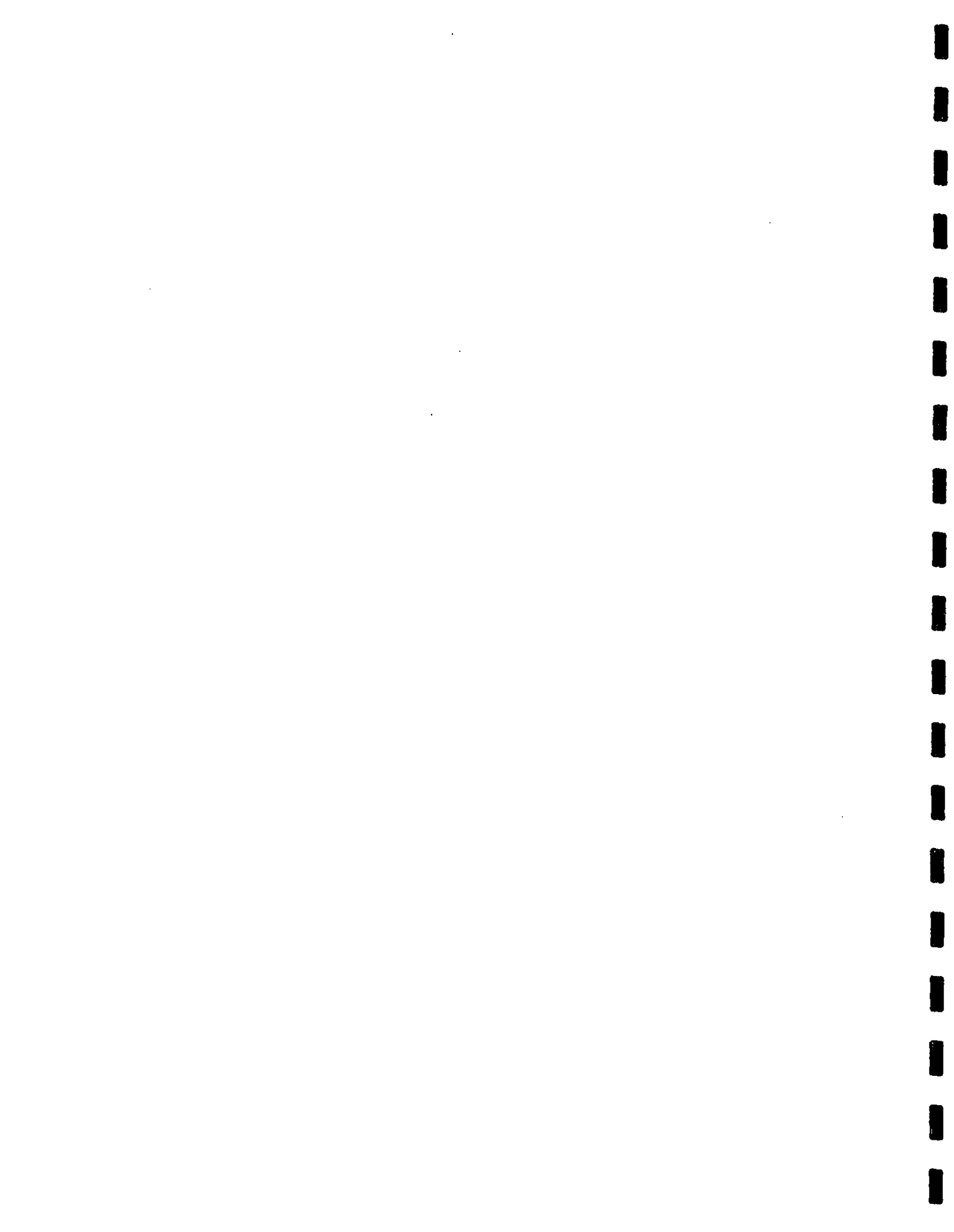
Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.42	mg/Kg	1	2.00	121	70 - 130
4-Bromofluorobenzene (4-BFB)			2.42	mg/Kg	1	2.00	121	70 - 130



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Sample: 308986 - AH-1 4-4.5'

Laboratory: Lubbock

Analysis: BTEX

QC Batch: 94773

Prep Batch: 80319

Analytical Method: S 8021B

Date Analyzed: 2012-09-13

Sample Preparation: 2012-09-13

Prep Method: S 5035

Analyzed By: JS

Prepared By: JS

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		1	0.0637	mg/Kg	1	0.0200
Xylene		1	0.214	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			2.53	mg/Kg	1	2.00	126	70 - 130

Sample: 308986 - AH-1 4-4.5'

Laboratory: Lubbock

Analysis: Chloride (Titration)

QC Batch: 94929

Prep Batch: 80440

Analytical Method: SM 4500-Cl B

Date Analyzed: 2012-09-18

Sample Preparation: 2012-09-18

Prep Method: N/A

Analyzed By: LM

Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Q*		1790	mg/Kg	50	5.00

Sample: 308986 - AH-1 4-4.5'

Laboratory: Lubbock

Analysis: TPH DRO - NEW

QC Batch: 94787

Prep Batch: 80328

Analytical Method: S 8015 D

Date Analyzed: 2012-09-14

Sample Preparation: 2012-09-13

Prep Method: N/A

Analyzed By: CM

Prepared By: CM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Q*	1	133	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		108		mg/Kg	1	100	108	70 - 130

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Sample: 308986 - AH-1 4-4.5'

Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	29.2	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.15	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			2.32	mg/Kg	1	2.00	116	70 - 130

Sample: 308987 - AH-1 4.5-5'

Laboratory: Lubbock
Analysis: BTEX
QC Batch: 94773
Prep Batch: 80319

Analytical Method: S 8021B
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL	Units	Dilution	RL	
			Result				
Benzene	2	u	1	<0.0400	mg/Kg	2	0.0200
Toluene			1	0.0480	mg/Kg	2	0.0200
Ethylbenzene			1	0.437	mg/Kg	2	0.0200
Xylene			1	1.40	mg/Kg	2	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.71	mg/Kg	2	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	2.66	mg/Kg	2	2.00	133	70 - 130

Sample: 308987 - AH-1 4.5-5'

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 94929
Prep Batch: 80440

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-09-18
Sample Preparation: 2012-09-18

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

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qs		942	mg/Kg	10	5.00

Sample: 308987 - AH-1 4.5-5'

Laboratory: Lubbock
Analysis: TPH DRO - NEW
QC Batch: 94787
Prep Batch: 80328

Analytical Method: S 8015 D
Date Analyzed: 2012-09-14
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Qs	1	1040	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr	133	mg/Kg	1	100	133	70 - 130

Sample: 308987 - AH-1 4.5-5'

Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	148	mg/Kg	2	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.66	mg/Kg	2	2.00	83	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	3.20	mg/Kg	2	2.00	160	70 - 130

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Sample: 308988 - AH-2 0-1'

Laboratory: Lubbock
Analysis: BTEX
QC Batch: 94773
Prep Batch: 80319

Analytical Method: S 8021B
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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)			2.18	mg/Kg	1	2.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			2.40	mg/Kg	1	2.00	120	70 - 130

Sample: 308988 - AH-2 0-1'

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 94929
Prep Batch: 80440

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-09-18
Sample Preparation: 2012-09-18

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qs		3020	mg/Kg	50	5.00

Sample: 308988 - AH-2 0-1'

Laboratory: Lubbock
Analysis: TPH DRO - NEW
QC Batch: 94787
Prep Batch: 80328

Analytical Method: S 8015 D
Date Analyzed: 2012-09-14
Sample Preparation: 2012-09-13

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			97.4	mg/Kg	1	100	97	70 - 130

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Sample: 308988 - AH-2 0-1'

Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	4.86	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.40	mg/Kg	1	2.00	120	70 - 130
4-Bromofluorobenzene (4-BFB)			2.50	mg/Kg	1	2.00	125	70 - 130

Sample: 308989 - AH-2 1-1.5'

Laboratory: Lubbock
Analysis: BTEX
QC Batch: 94773
Prep Batch: 80319

Analytical Method: S 8021B
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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)			2.15	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			2.33	mg/Kg	1	2.00	116	70 - 130

Sample: 308989 - AH-2 1-1.5'

Laboratory: Lubbock
Analysis: Chloride (Titration)
QC Batch: 94929
Prep Batch: 80440

Analytical Method: SM 4500-Cl B
Date Analyzed: 2012-09-18
Sample Preparation: 2012-09-18

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

continued ...

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sample 308989 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qs		275	mg/Kg	10	5.00

Sample: 308989 - AH-2 1-1.5'

Laboratory: Lubbock
Analysis: TPH DRO - NEW
QC Batch: 94787
Prep Batch: 80328

Analytical Method: S 8015 D
Date Analyzed: 2012-09-14
Sample Preparation: 2012-09-13

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			96.9	mg/Kg	1	100	97	70 - 130

Sample: 308989 - AH-2 1-1.5'

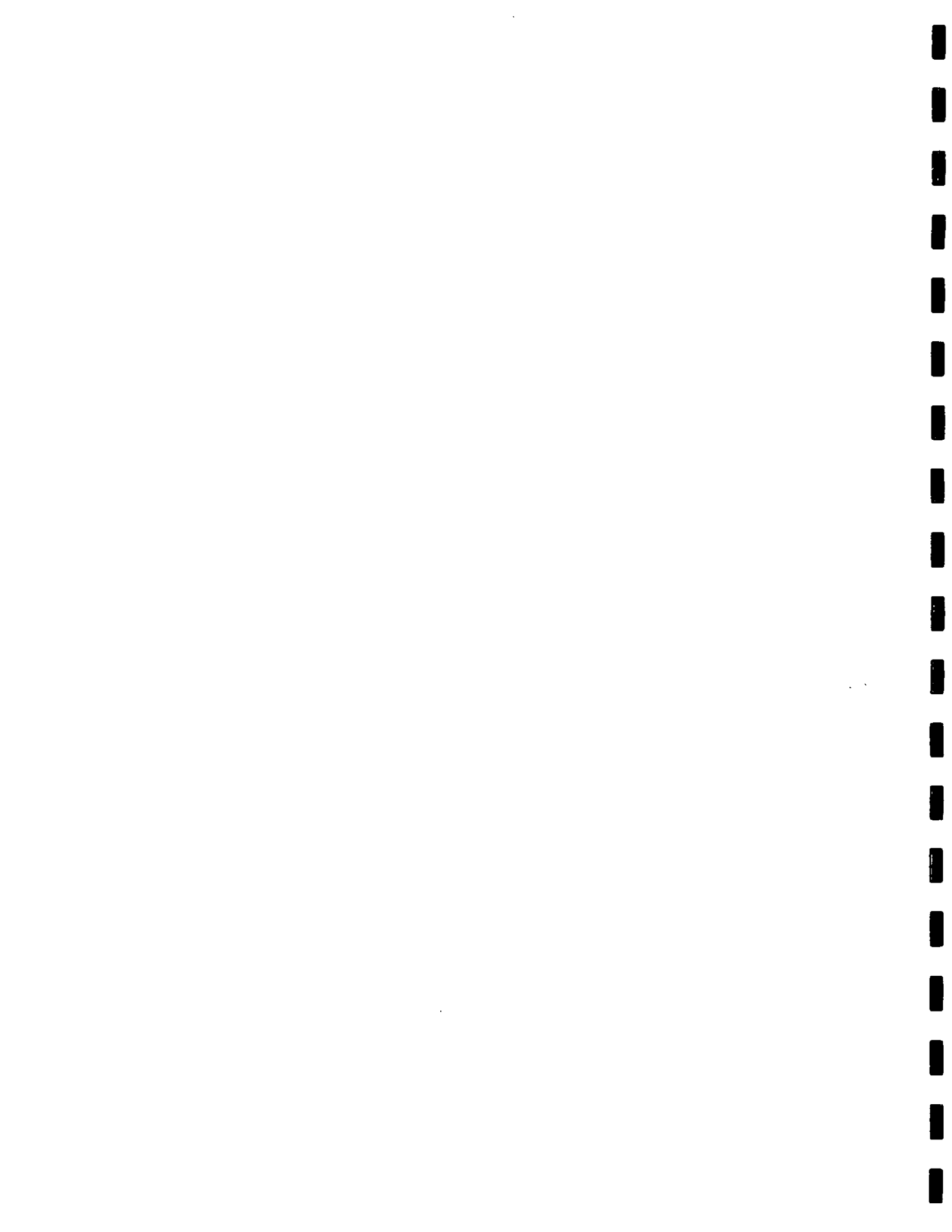
Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.28	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)			2.33	mg/Kg	1	2.00	116	70 - 130



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Sample: 308990 - AH-2 2-2.5'

Laboratory: Lubbock

Analysis: BTEX

QC Batch: 94773

Prep Batch: 80319

Analytical Method: S 8021B

Date Analyzed: 2012-09-13

Sample Preparation: 2012-09-13

Prep Method: S 5035

Analyzed By: JS

Prepared By: JS

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)			2.19	mg/Kg	1	2.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			2.36	mg/Kg	1	2.00	118	70 - 130

Sample: 308990 - AH-2 2-2.5'

Laboratory: Lubbock

Analysis: Chloride (Titration)

QC Batch: 94929

Prep Batch: 80440

Analytical Method: SM 4500-Cl B

Date Analyzed: 2012-09-18

Sample Preparation: 2012-09-18

Prep Method: N/A

Analyzed By: LM

Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Q*		232	mg/Kg	20	5.00

Sample: 308990 - AH-2 2-2.5'

Laboratory: Lubbock

Analysis: TPH DRO - NEW

QC Batch: 94787

Prep Batch: 80328

Analytical Method: S 8015 D

Date Analyzed: 2012-09-14

Sample Preparation: 2012-09-13

Prep Method: N/A

Analyzed By: CM

Prepared By: CM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Q*,U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			96.1	mg/Kg	1	100	96	70 - 130



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Sample: 308990 - AH-2 2-2.5'

Laboratory: Lubbock
Analysis: TPH GRO
QC Batch: 94774
Prep Batch: 80319

Analytical Method: S 8015 D
Date Analyzed: 2012-09-13
Sample Preparation: 2012-09-13

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	i	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.32	mg/Kg	1	2.00	116	70 - 130
4-Bromofluorobenzene (4-BFB)			2.28	mg/Kg	1	2.00	114	70 - 130



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Method Blanks

Method Blank (1) QC Batch: 94773

QC Batch: 94773
Prep Batch: 80319

Date Analyzed: 2012-09-13
QC Preparation: 2012-09-13

Analyzed By: JS
Prepared By: JS

Parameter	Flag	Cert	MDL		Units	RL
			Result			
Benzene		1	<0.00365		mg/Kg	0.02
Toluene		1	<0.00816		mg/Kg	0.02
Ethylbenzene		1	<0.00560		mg/Kg	0.02
Xylene		1	<0.00460		mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.02	mg/Kg	1	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)			1.99	mg/Kg	1	2.00	100	70 - 130

Method Blank (1) QC Batch: 94774

QC Batch: 94774
Prep Batch: 80319

Date Analyzed: 2012-09-13
QC Preparation: 2012-09-13

Analyzed By: JS
Prepared By: JS

Parameter	Flag	Cert	MDL		Units	RL
			Result			
GRO		1	<0.359		mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.18	mg/Kg	1	2.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)			1.99	mg/Kg	1	2.00	100	70 - 130

Method Blank (1) QC Batch: 94787

QC Batch: 94787
Prep Batch: 80328

Date Analyzed: 2012-09-14
QC Preparation: 2012-09-13

Analyzed By: CM
Prepared By: CM



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Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<15.3	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			108	mg/Kg	1	100	108	70 - 130

Method Blank (1) QC Batch: 94929

QC Batch: 94929
Prep Batch: 80440

Date Analyzed: 2012-09-18
QC Preparation: 2012-09-18

Analyzed By: LM
Prepared By: LM

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.05	mg/Kg	5

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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 94773
Prep Batch: 80319

Date Analyzed: 2012-09-13
QC Preparation: 2012-09-13

Analyzed By: JS
Prepared By: JS

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.91	mg/Kg	1	2.00	<0.00365	96	75.4 - 120
Toluene		1	1.94	mg/Kg	1	2.00	<0.00816	97	74.9 - 120
Ethylbenzene		1	2.09	mg/Kg	1	2.00	<0.00560	104	78.1 - 120
Xylene		1	6.26	mg/Kg	1	6.00	<0.00460	104	77.3 - 120

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.94	mg/Kg	1	2.00	<0.00365	97	75.4 - 120	2	20
Toluene		1	1.96	mg/Kg	1	2.00	<0.00816	98	74.9 - 120	1	20
Ethylbenzene		1	2.11	mg/Kg	1	2.00	<0.00560	106	78.1 - 120	1	20
Xylene		1	6.31	mg/Kg	1	6.00	<0.00460	105	77.3 - 120	1	20

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

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.85	1.95	mg/Kg	1	2.00	92	98	70 - 130
4-Bromofluorobenzene (4-BFB)	1.94	1.98	mg/Kg	1	2.00	97	99	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 94774
Prep Batch: 80319

Date Analyzed: 2012-09-13
QC Preparation: 2012-09-13

Analyzed By: JS
Prepared By: JS

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	20.5	mg/Kg	1	20.0	<0.359	102	68.9 - 120

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

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control spikes continued ...

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	20.6	mg/Kg	1	20.0	<0.359	103	68.9 - 120	0	20

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

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.02	2.02	mg/Kg	1	2.00	101	101	70 - 130
4-Bromofluorobenzene (4-BFB)	2.07	2.02	mg/Kg	1	2.00	104	101	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 94787
Prep Batch: 80328

Date Analyzed: 2012-09-14
QC Preparation: 2012-09-13

Analyzed By: CM
Prepared By: CM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	243	mg/Kg	1	250	<15.3	97	70 - 130

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	237	mg/Kg	1	250	<15.3	95	70 - 130	2	20

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

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
n-Tricosane	106	104	mg/Kg	1	100	106	104	70 - 130

Matrix Spike (xMS-1) Spiked Sample:

QC Batch: 94773
Prep Batch: 80319

Date Analyzed: 2012-09-13
QC Preparation: 2012-09-13

Analyzed By: JS
Prepared By: JS

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.97	mg/Kg	1	2.00	<0.00365	98	37.6 - 142

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matrix spikes continued ...

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Toluene		1	2.16	mg/Kg	1	2.00	<0.00816	108	38.6 - 153
Ethylbenzene		1	2.38	mg/Kg	1	2.00	<0.00560	119	36.7 - 172
Xylene		1	7.08	mg/Kg	1	6.00	<0.00460	118	36.7 - 173

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
Benzene		1	2.09	mg/Kg	1	2.00	<0.00365	104	37.6 - 142	6	20
Toluene		1	2.32	mg/Kg	1	2.00	<0.00816	116	38.6 - 153	7	20
Ethylbenzene		1	2.54	mg/Kg	1	2.00	<0.00560	127	36.7 - 172	6	20
Xylene		1	7.61	mg/Kg	1	6.00	<0.00460	127	36.7 - 173	7	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)	2.12	2.18	mg/Kg	1	2	106	109	70 - 130
4-Bromofluorobenzene (4-BFB)	2.18	2.29	mg/Kg	1	2	109	114	70 - 130

Matrix Spike (MS-1) Spiked Sample: 309005

QC Batch: 94774
Prep Batch: 80319

Date Analyzed: 2012-09-13
QC Preparation: 2012-09-13

Analyzed By: JS
Prepared By: JS

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	21.3	mg/Kg	1	20.0	<0.359	106	68.9 - 120

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		1	20.0	mg/Kg	1	20.0	<0.359	100	68.9 - 120	6	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)	2.08	1.90	mg/Kg	1	2	104	95	70 - 130
4-Bromofluorobenzene (4-BFB)	2.40	2.29	mg/Kg	1	2	120	114	70 - 130



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Matrix Spike (MS-1) Spiked Sample: 308982

QC Batch: 94787
Prep Batch: 80328

Date Analyzed: 2012-09-14
QC Preparation: 2012-09-13

Analyzed By: CM
Prepared By: CM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	Q _s	Q _s	1	21800	mg/Kg	10	250	19100	1080 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
DRO	Q _s	Q _s	1	20100	mg/Kg	10	250	19100	400 70 - 130	8	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	Q _{sc}	Q _{sc}	621	590	mg/Kg	10	100	621 590 70 - 130

Matrix Spike (MS-1) Spiked Sample: 308999

QC Batch: 94929
Prep Batch: 80440

Date Analyzed: 2012-09-18
QC Preparation: 2012-09-18

Analyzed By: LM
Prepared By: LM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	Q _s	Q _s		11100	mg/Kg	500	500	8985.51	423 80 - 120

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				11600	mg/Kg	500	500	8985.51	523 80 - 120	4	20

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



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Calibration Standards

Standard (CCV-1)

QC Batch: 94773

Date Analyzed: 2012-09-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0998	100	80 - 120	2012-09-13
Toluene		1	mg/kg	0.100	0.102	102	80 - 120	2012-09-13
Ethylbenzene		1	mg/kg	0.100	0.108	108	80 - 120	2012-09-13
Xylene		1	mg/kg	0.300	0.322	107	80 - 120	2012-09-13

Standard (CCV-2)

QC Batch: 94773

Date Analyzed: 2012-09-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0987	99	80 - 120	2012-09-13
Toluene		1	mg/kg	0.100	0.101	101	80 - 120	2012-09-13
Ethylbenzene		1	mg/kg	0.100	0.107	107	80 - 120	2012-09-13
Xylene		1	mg/kg	0.300	0.320	106	80 - 120	2012-09-13

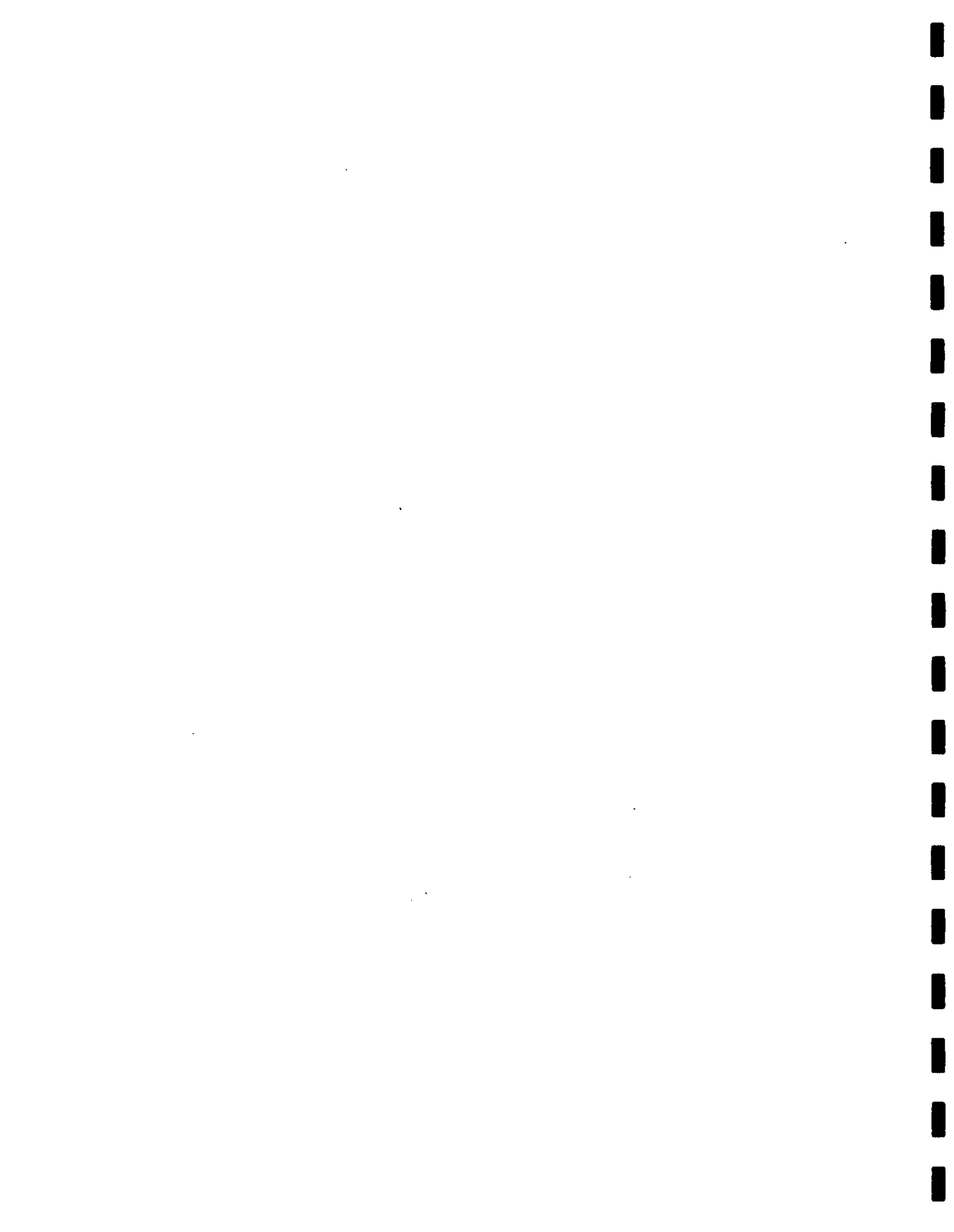
Standard (CCV-3)

QC Batch: 94773

Date Analyzed: 2012-09-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.101	101	80 - 120	2012-09-13
Toluene		1	mg/kg	0.100	0.0994	99	80 - 120	2012-09-13
Ethylbenzene		1	mg/kg	0.100	0.105	105	80 - 120	2012-09-13
Xylene		1	mg/kg	0.300	0.310	103	80 - 120	2012-09-13



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Standard (CCV-1)

QC Batch: 94774

Date Analyzed: 2012-09-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.05	105	80 - 120	2012-09-13

Standard (CCV-2)

QC Batch: 94774

Date Analyzed: 2012-09-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.974	97	80 - 120	2012-09-13

Standard (CCV-3)

QC Batch: 94774

Date Analyzed: 2012-09-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.948	95	80 - 120	2012-09-13

Standard (CCV-1)

QC Batch: 94787

Date Analyzed: 2012-09-14

Analyzed By: CM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	258	103	80 - 120	2012-09-14

Standard (CCV-2)

QC Batch: 94787

Date Analyzed: 2012-09-14

Analyzed By: CM



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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	240	96	80 - 120	2012-09-14

Standard (CCV-3)

QC Batch: 94787

Date Analyzed: 2012-09-14

Analyzed By: CM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	220	88	80 - 120	2012-09-14

Standard (ICV-1)

QC Batch: 94929

Date Analyzed: 2012-09-18

Analyzed By: LM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2012-09-18

Standard (CCV-1)

QC Batch: 94929

Date Analyzed: 2012-09-18

Analyzed By: LM

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	2012-09-18



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	T104704219-12-8	Lubbock

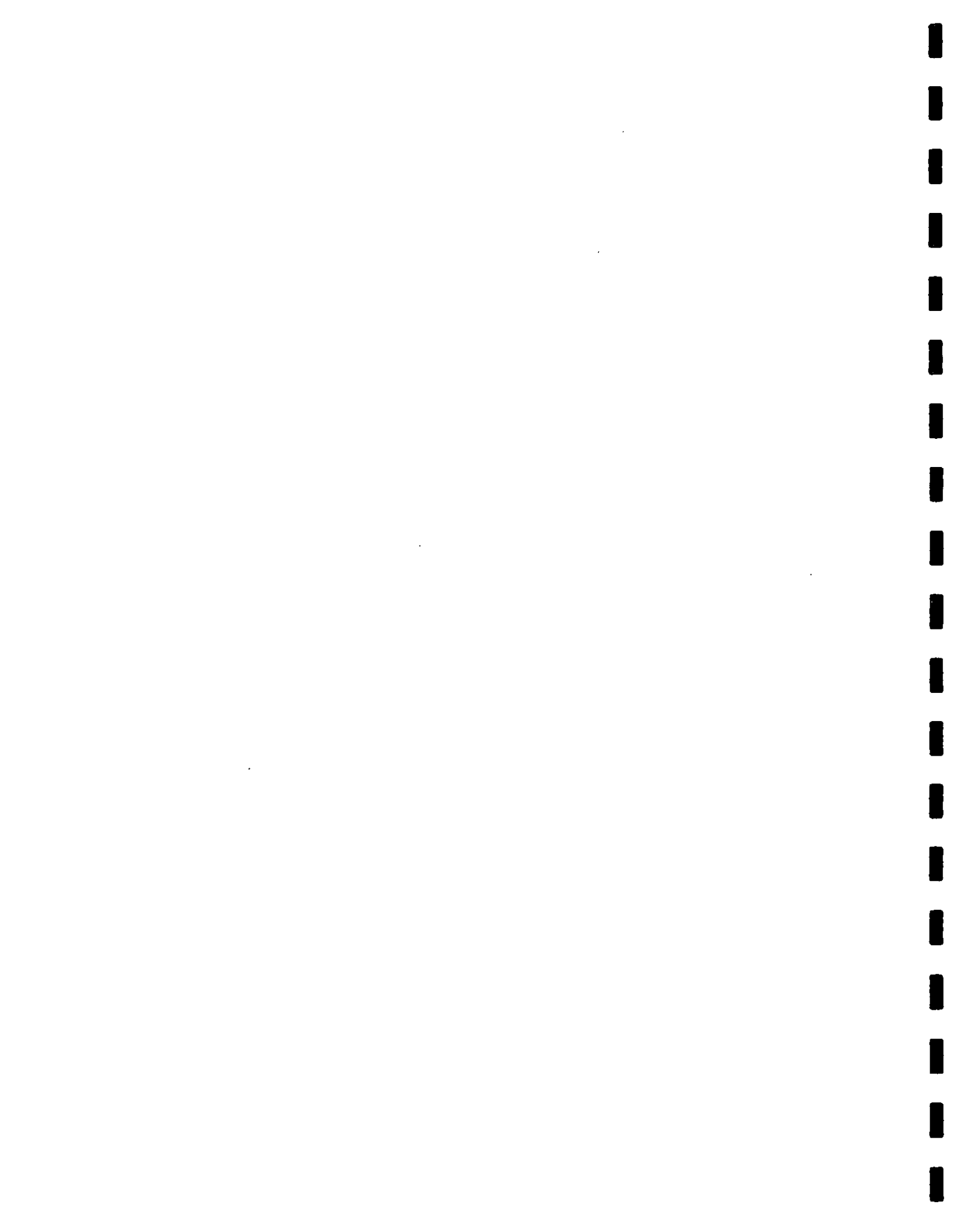
Standard Flags

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.
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 Sample dilution due to hydrocarbons.
- 2 Sample dilution due to hydrocarbons.

Attachments



Report Date: September 19, 2012
114-6401502

Work Order: 12091206
COG/SL Deep Fed. #3 TB

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

