SITE INFORMATION

Report Type: Closure Report

General Site Information:						
Site:	**Willow A State #3**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit J**	**Sec 3**	**T25S**	**R28E**		
Lease Number:	**API-30-015-33371**					
County:	**Eddy County**					
GPS:	**32.15771° N**			**104.07320° W**		
Surface Owner:	State					
Mineral Owner:						
Directions:	On Hwy 285 at the Texas, New Mexico State line, travel north on Hwy 285 for 11.1 miles. Turn right onto lease road and travel 350', spill is in the pasture on the left side of road.					

Release Data:	
Date Released:	1/16/2013
Type Release:	Produced water with skim oil
Source of Contamination:	Flowline failure
Fluid Released:	75 bbls
Fluids Recovered:	0 bbls

Official Communication:			
Name:	Pat Ellis		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		1910 N. Big Spring
	600 W. Illinois Ave.		
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	20
50-99 ft	10	
>100 ft.	0	
WellHead Protection:	***Ranking Score***	***Site Data***
Water Source <1,000 ft., Private <200 ft.	*20*	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	***Ranking Score***	***Site Data***
<200 ft.	*20*	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:	**20**	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	100

TETRA TECH

September 13, 2013

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

Re: Closure Report for the COG Operating LLC., Willow A State #3 Flow Line Leak, Unit J, Section 3, Township 25 South, Range 28 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 Willow A State #3 Flow Line Leak located in Unit J, Section 3, Township 25 South, Range 28 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.15771°, W 104.07320°. 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 January 16, 2013, and released approximately seventy five (75) barrels of produced fluid from a flow line. To alleviate the problem, COG personnel repaired the flow line. Zero (0) barrels of standing fluids were recovered. The spill initiated west of the lease road affecting an area approximately 15' X 40' in the pasture. The initial C-141 form is enclosed in Appendix A.

Groundwater

One water well was listed within Section 3, with an approximate depth to groundwater of 32' below surface. According to the NMOCD groundwater map, the average depth to groundwater in this area is less than 50' below surface. The groundwater data is shown in Figure B.

Tetra Tech
1910 North Big Spring, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.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 100 mg/kg.

Soil Assessment and Analytical Results

On January 8, 2013, Tetra Tech personnel inspected and sampled the spill area. Two (2) auger holes (AH-1 and AH-2) and a background auger hole were installed using a stainless steel hand auger to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, AH-1 exceeded the TPH RRAL of 163 mg/kg, but declined at 1.5' below RRAL. None of the auger holes exceeded the RRAL for benzene or total BTEX. Elevated chloride concentrations were detected in both auger holes (AH-1 and AH-2). Auger holes (AH-1) showed declining chloride concentrations, but was not vertically defined. AH-1 detected a chloride high of 19,400 mg/kg at 0-1' and declined to 1,980 mg/kg at 9-9.5' below surface. The chloride impact in the area of AH-2 showed a shallow impact and vertically defined at approximately 3.0' below surface.

The background samples showed a chloride high of 76.5 mg/kg at 0-1' below surface.

Closure Activities

Prior to excavating the impacted areas, one (1) backhoe trench (T-1) was installed in the area of AH-1 to attempt to vertically define the chloride impact. The sampling results are shown in Table 1. Referring to Table 1, the area of AH-1 showed a significant chloride impact down to 12.0' below grade surface, with a chloride concentration of 4,450 mg/kg. Deeper samples were not collected due to the backhoe depth limitation. The excavation areas and depths are highlighted in Table 1 and shown on Figure 4.

TETRA TECH

Based on the field data, the impacted areas (AH-1 and AH-2) were excavated to depth of 4.0' below surface. For safety concerns, deeper excavation could not be achieved due to the sandy subsurface formation and lines in the area of AH-1. As such, Tetra Tech excavated the soils to the maximum extent practicable. Due to deeper extent, the excavation bottom was lined with a 40 mil liner to cap the remaining impact. Approximately 110 cubic yards were transported offsite for proper disposal. The site was backfilled with clean material and brought to grade.

On July 23, 2013, Tetra Tech installed one (1) soil boring in the area of AH-1 to define chloride extents. The SB-1 results are shown in Table 2. Referring to Table 2, the soil sampling began at 4-5' below surface, where it showed a chloride high of 13,500 mg/kg. The chloride concentrations fluctuated with depth declining at 14-15' (511 mg/kg) and 24-25' (939 mg/kg). Overall, the chlorides declined with depth down to 1,470 mg/kg at 39-40' below surface, which was not vertically defined. However, the area is limited (15' x 20'), chlorides declined with depth and the area was capped with a liner to prevent vertical migration.

The fluctuating chloride concentrations may be possibly cross-contamination from the upper soil or from the natural gypsum formation encountered at 15' and deeper. A trend chart of the chloride concentrations (Figure 6) is included in the Figures section.

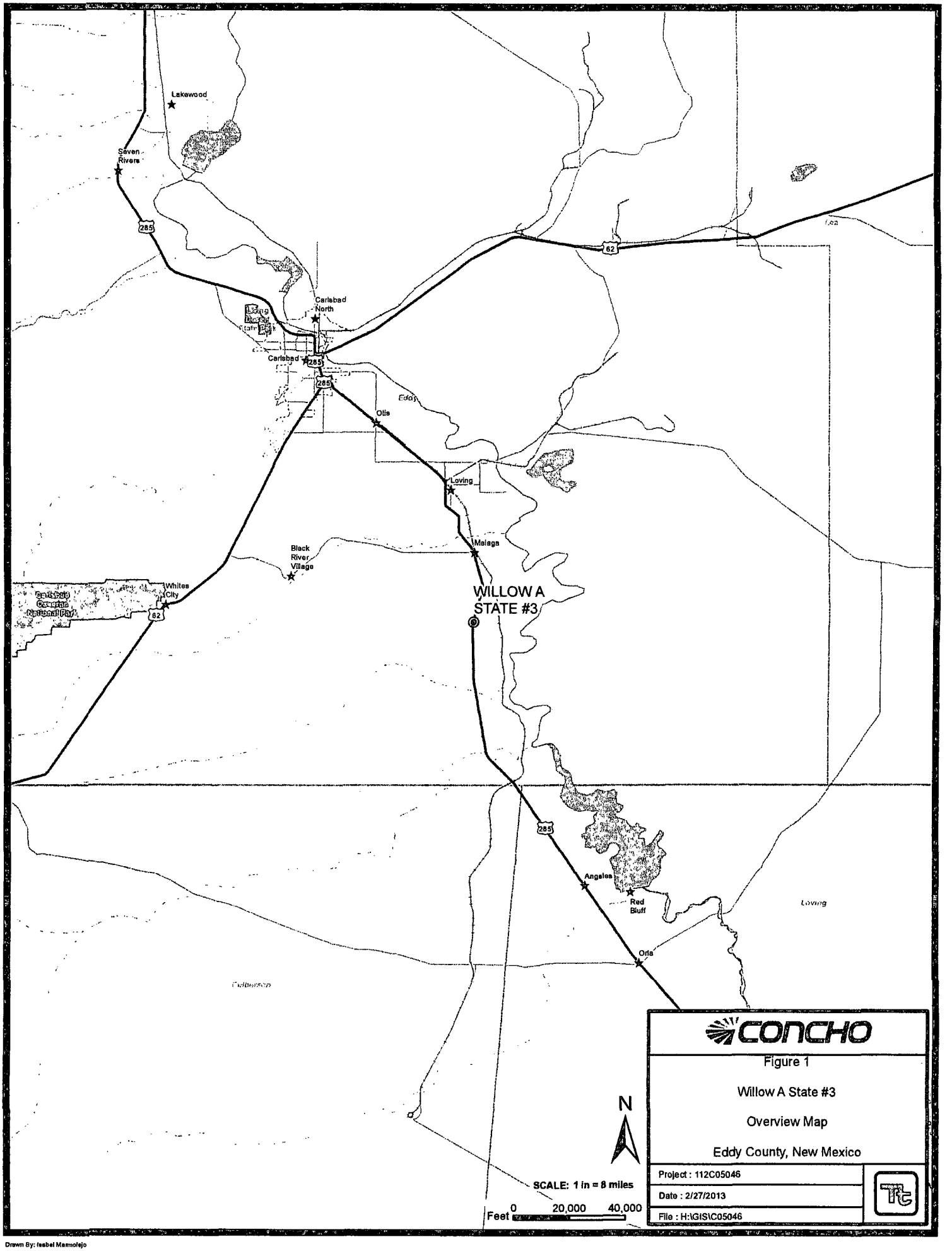
Based on the remedial activities performed, COG requests closure of the site. A copy of the C-141 (Final) is included in Appendix A. If you have any questions or comments concerning the remedial activities, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

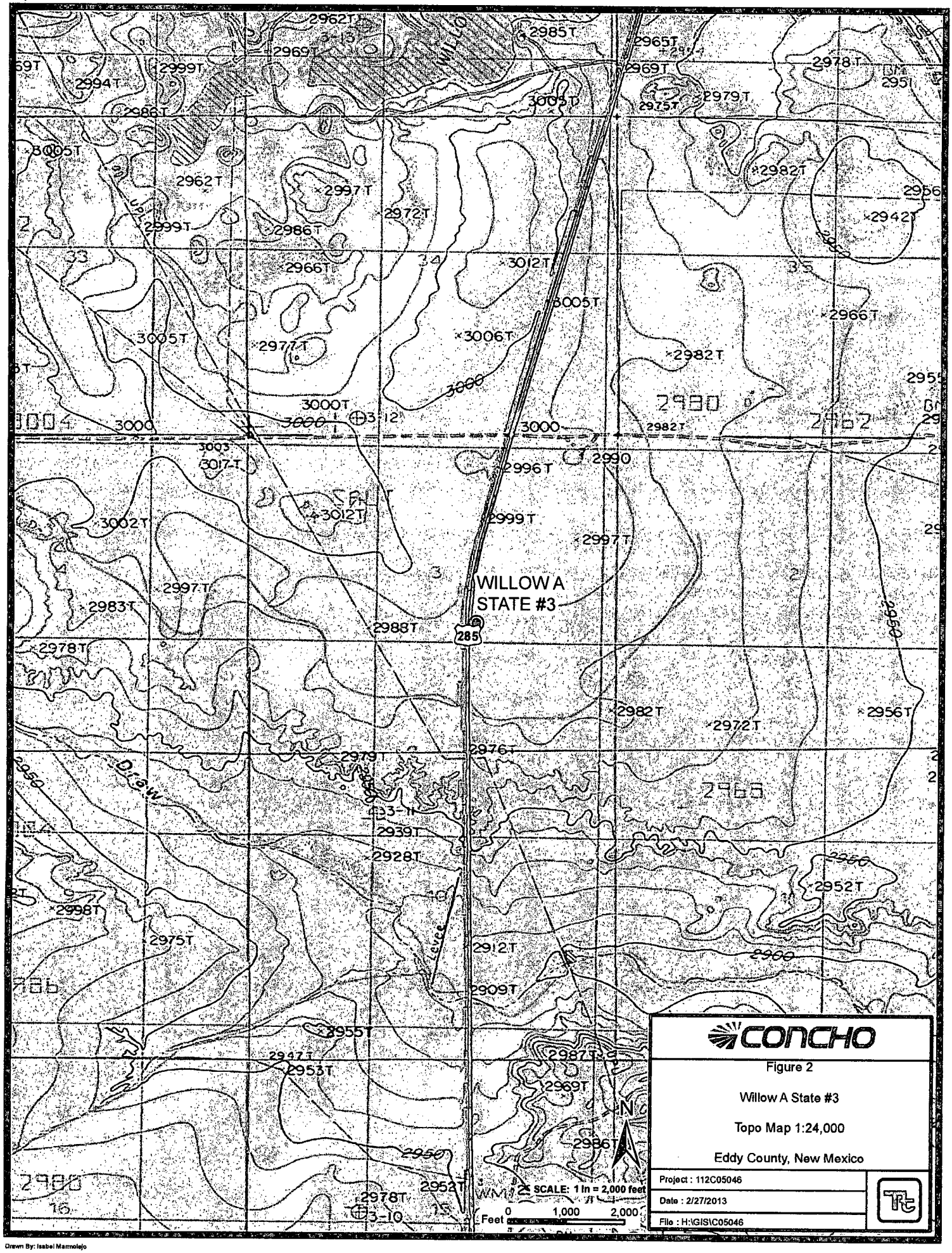
Ike Tavarez, PG
Senior Project Manager

cc: Pat Ellis – COG

Figures



Drawn By: Isabel Marmolejo



CONCHO

Figure 2

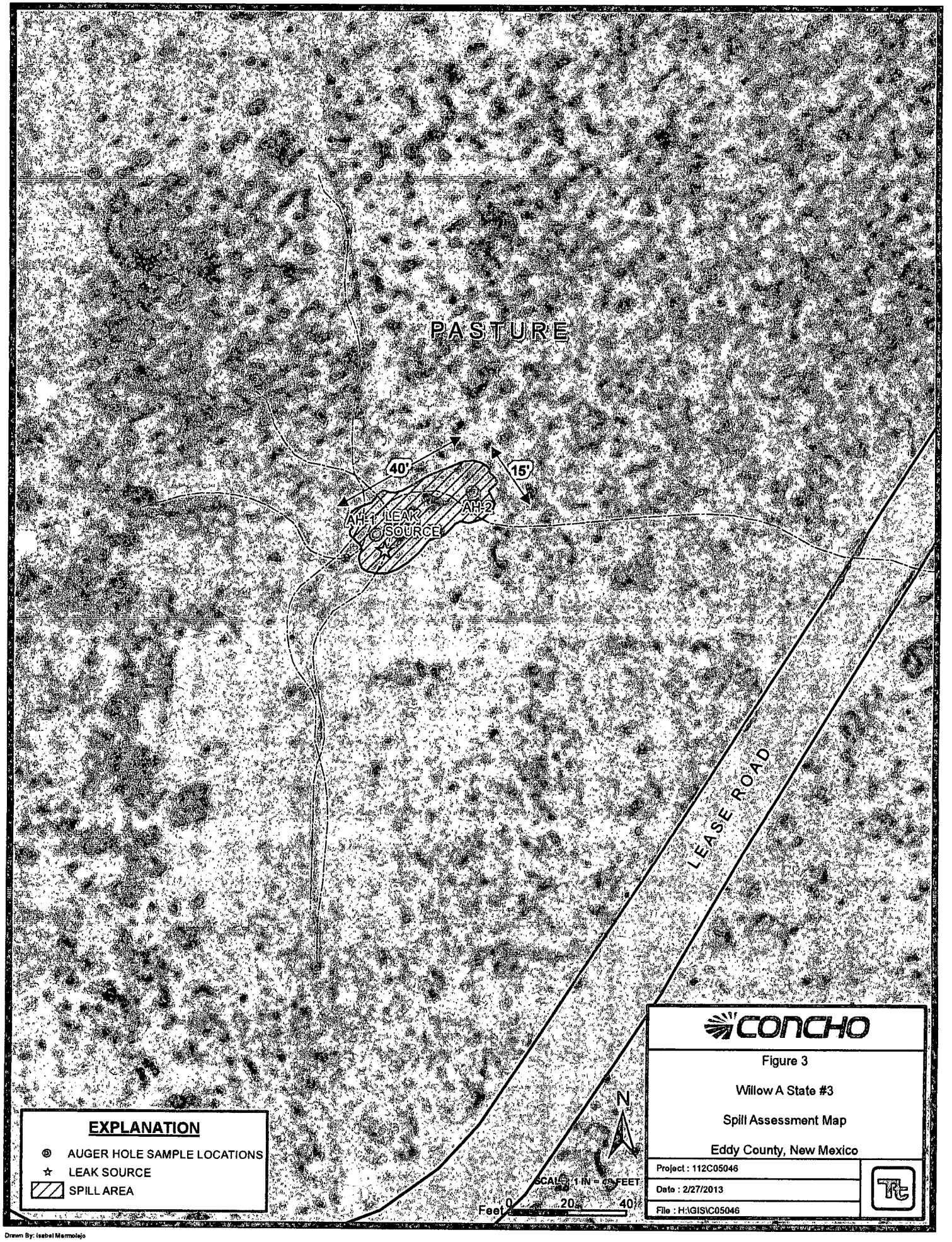
Willow A State #3

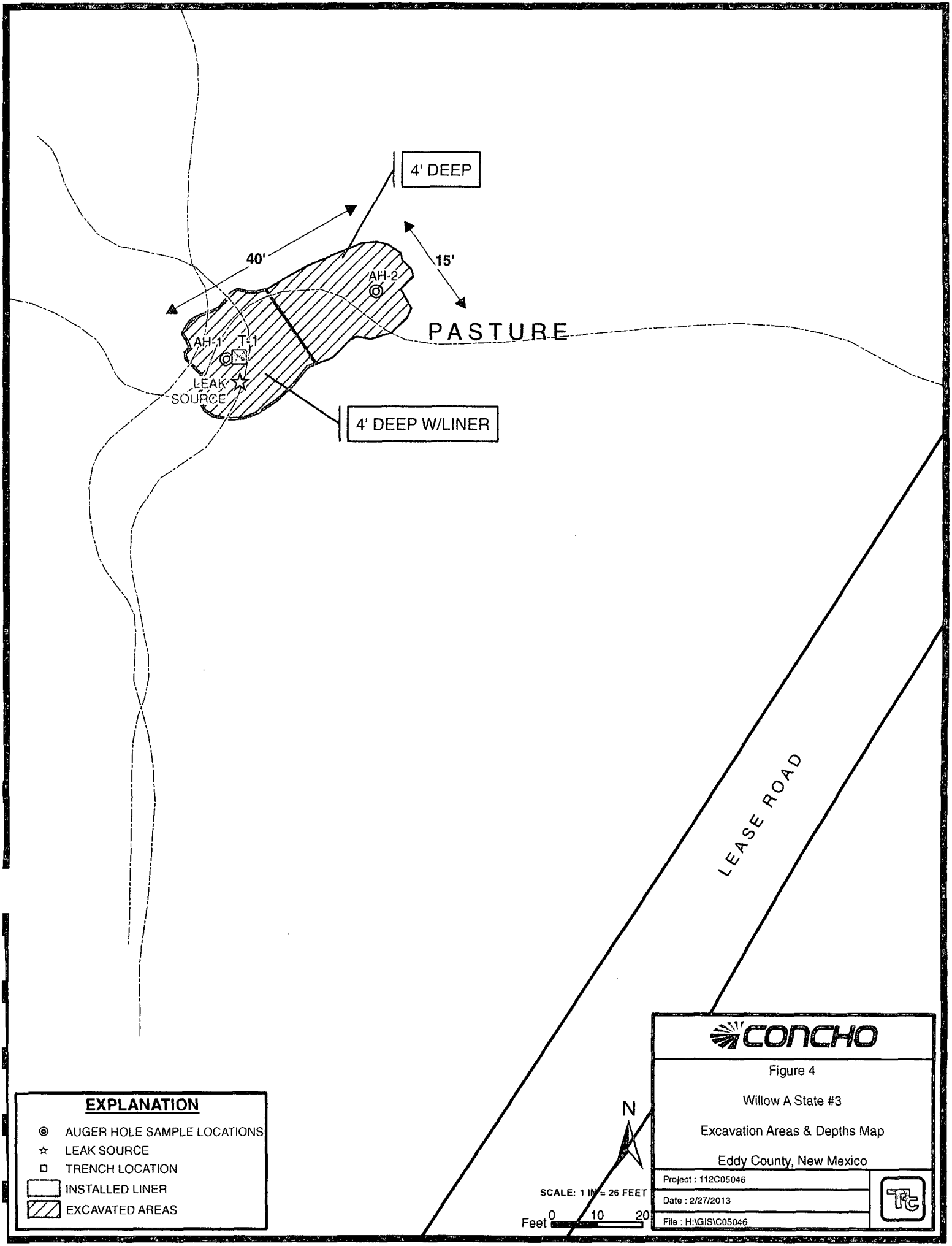
Topo Map 1:24,000

Eddy County, New Mexico

Project : 112C05046	
Date : 2/27/2013	
File : H:\GIS\C05046	

Drawn By: Isabel Marmolejo


PASTURE
40'
15'
AH-1
LEAK SOURCE
AH-2
LEASE ROAD
N
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
LEAK SOURCE
SPILL AREA
SCALE: 1 IN = 40 FEET
Feet 0 20 40
CONCHO
Figure 3
Willow A State #3
Spill Assessment Map
Eddy County, New Mexico
Project : 112C05046
Date : 2/27/2013
File : H:\GIS\C05046
Drawn By: Isabel Marmolejo


4' DEEP
40'
15'
AH-2
PASTURE
AH-1
T-1
LEAK SOURCE
4' DEEP W/LINER
LEASE ROAD
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
LEAK SOURCE
TRENCH LOCATION
INSTALLED LINER
EXCAVATED AREAS
N
SCALE: 1 IN = 26 FEET
Feet 0 10 20
CONCHO
Figure 4
Willow A State #3
Excavation Areas & Depths Map
Eddy County, New Mexico
Project : 112C05046
Date : 2/27/2013
File : H:\GIS\C05046
Drawn By: Isabel Marmolejo

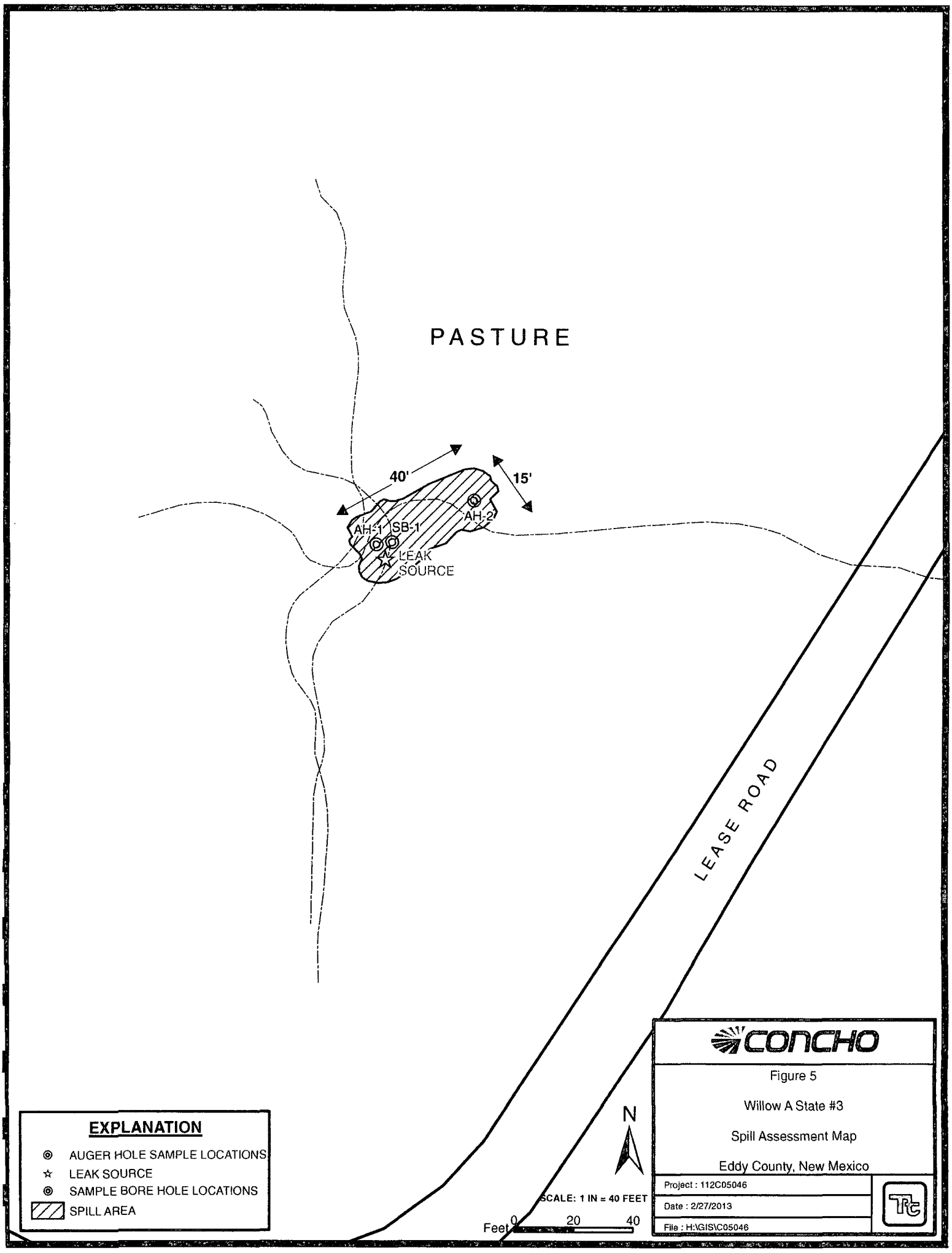
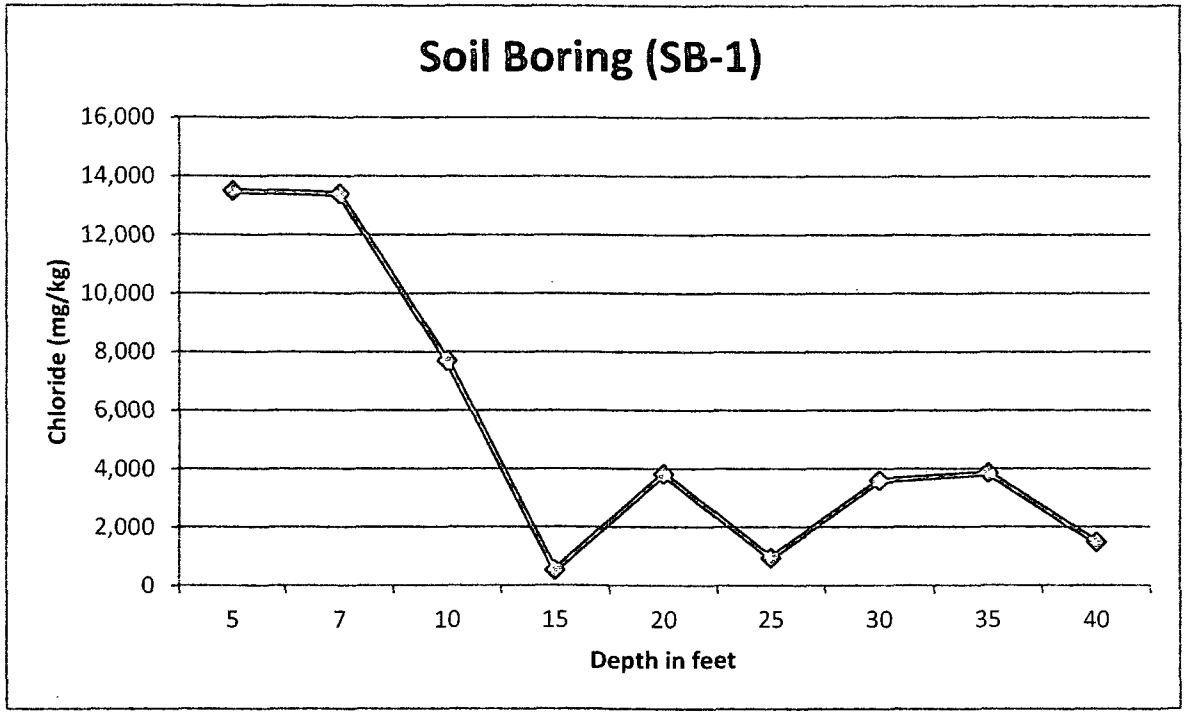

PASTURE
40'
15'
AH-1
SB-1
AH-2
LEAK SOURCE
LEASE ROAD
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
LEAK SOURCE
SAMPLE BORE HOLE LOCATIONS
SPILL AREA
N
SCALE: 1 IN = 40 FEET
Feet 0 20 40
CONCHO
Figure 5
Willow A State #3
Spill Assessment Map
Eddy County, New Mexico
Project : 112C05046
Date : 2/27/2013
File : H:\GIS\C05046
Drawn By: Isabel Marmolejo

Figure 6
COG Operating LLC.
Willow State #3 Tank Battery
Eddy County, New Mexico



Tables

Table 1
COG Operating LLC.
Willow A State #3
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
AH-1	2/8/2013	0-1		X	51.7	111	163	<0.100	<0.100	<0.100	1.67	1.67	19,400
	"	1-1.5		X	4.89	<50.0	4.89	-	-	-	-	-	13,200
	"	2-2.5		X	-	-	-	-	-	-	-	-	16,300
	"	3-3.5		X	-	-	-	-	-	-	-	-	17,800
	"	4-4.5		X	-	-	-	-	-	-	-	-	18,300
	"	5-5.5	X		-	-	-	-	-	-	-	-	14,700
	"	6-6.5	X		-	-	-	-	-	-	-	-	14,000
	"	7-7.5	X		-	-	-	-	-	-	-	-	8,030
	"	8-8.5	X		-	-	-	-	-	-	-	-	3,820
	"	9-9.5	X		-	-	-	-	-	-	-	-	1,980
T-1	4/1/2013	0		X	-	-	-	-	-	-	-	-	10,400
	"	2		X	-	-	-	-	-	-	-	-	12,000
	"	4		X	-	-	-	-	-	-	-	-	18,100
	"	6	X		-	-	-	-	-	-	-	-	16,800
	"	8	X		-	-	-	-	-	-	-	-	15,800
	"	10	X		-	-	-	-	-	-	-	-	3,330
	"	12	X		-	-	-	-	-	-	-	-	4,450

Table 1
COG Operating LLC.
Willow A State #3
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
AH-2	2/8/2013	0-1		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	1,030
	"	1-1.5		X	-	-	-	-	-	-	-	-	408
	"	2-2.5		X	-	-	-	-	-	-	-	-	946
	"	3-3.5		X	-	-	-	-	-	-	-	-	282
	"	4-4.5		X	-	-	-	-	-	-	-	-	220
	"	5-5.5	X		-	-	-	-	-	-	-	-	205
	"	6-6.5	X		-	-	-	-	-	-	-	-	440
	"	7-7.5	X		-	-	-	-	-	-	-	-	186
	"	8-8.5	X		-	-	-	-	-	-	-	-	119
	"	9-9.5	X		-	-	-	-	-	-	-	-	444
Background	2/8/2013	0-1	X		-	-	-	-	-	-	-	-	76.5
	"	1.5-2	X		-	-	-	-	-	-	-	-	<20.0
	"	3.5-4	X		-	-	-	-	-	-	-	-	<20.0
	"	5.5-6	X		-	-	-	-	-	-	-	-	<20.0

(-) Not Analyzed

Excavated Depths

Liner Installed

Table 2
COG Operating LLC.
Willow State #3 Tank Battery
Eddy County, New Mexico

Sample ID	Sample Date	BEB Sample Depth (ft)	Excavation Bottom Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
BH-1	7/23/2013	4-5	0	X		-	-	-	-	-	-	-	-	**13,500**
	"	6-7	"	X		-	-	-	-	-	-	-	-	**13,400**
	"	9-10	"	X		-	-	-	-	-	-	-	-	**7,690**
	"	14-15	"	X		-	-	-	-	-	-	-	-	511
	"	19-20	"	X		-	-	-	-	-	-	-	-	**3,820**
	"	24-25	"	X		-	-	-	-	-	-	-	-	939
	"	29-30	"	X		-	-	-	-	-	-	-	-	**3,590**
	"	34-35	"	X		-	-	-	-	-	-	-	-	**3,850**
	"	39-40	"	X		-	-	-	-	-	-	-	-	**1,470**

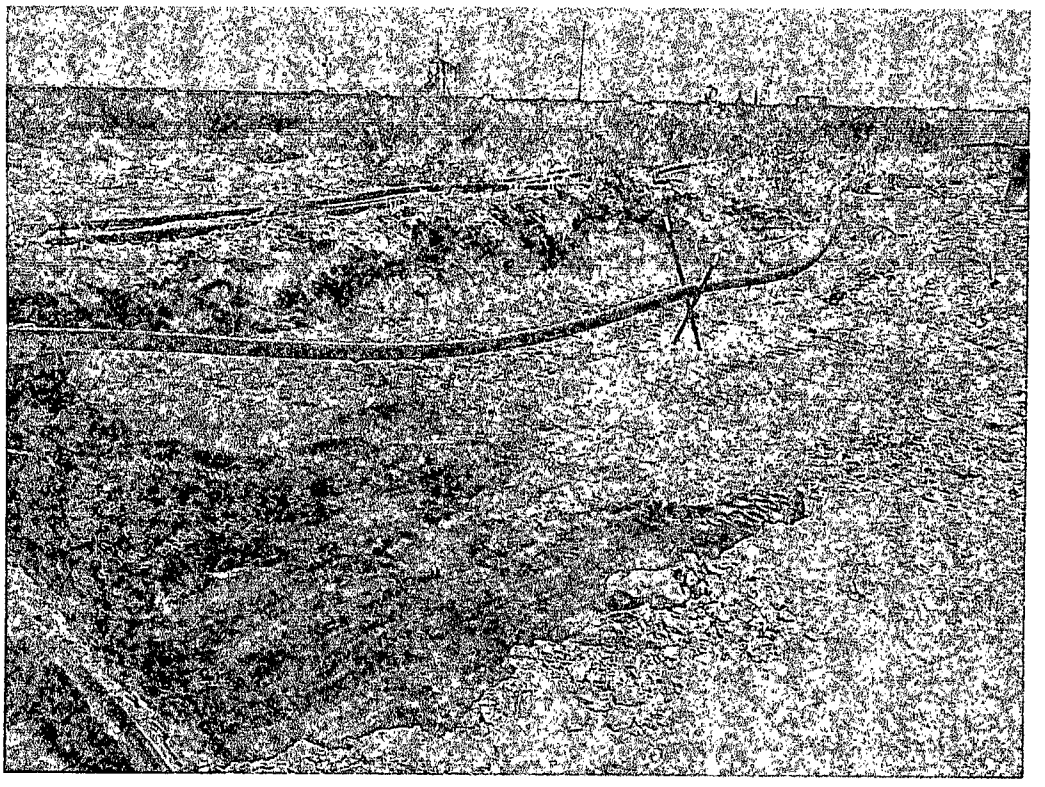
(-) Not Analyzed

(BEB) Below Excavation Bottom

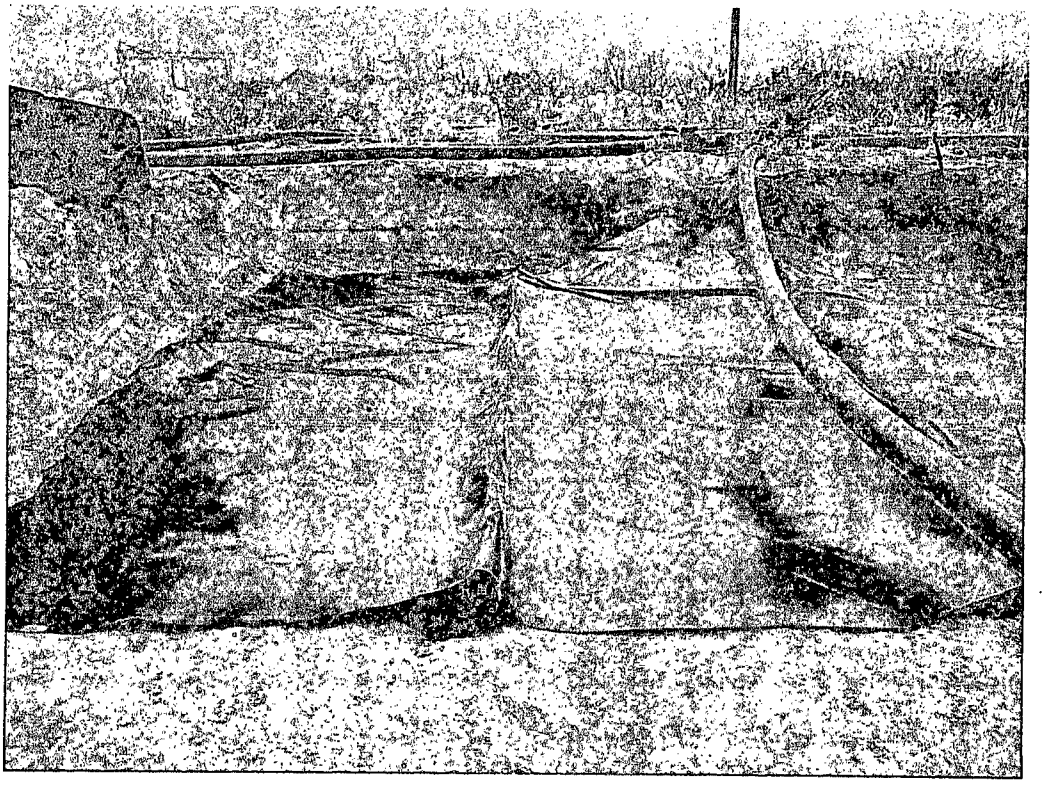
Photos

COG Operating LLC
Willow A State #3
Eddy County, New Mexico

TETRA TECH



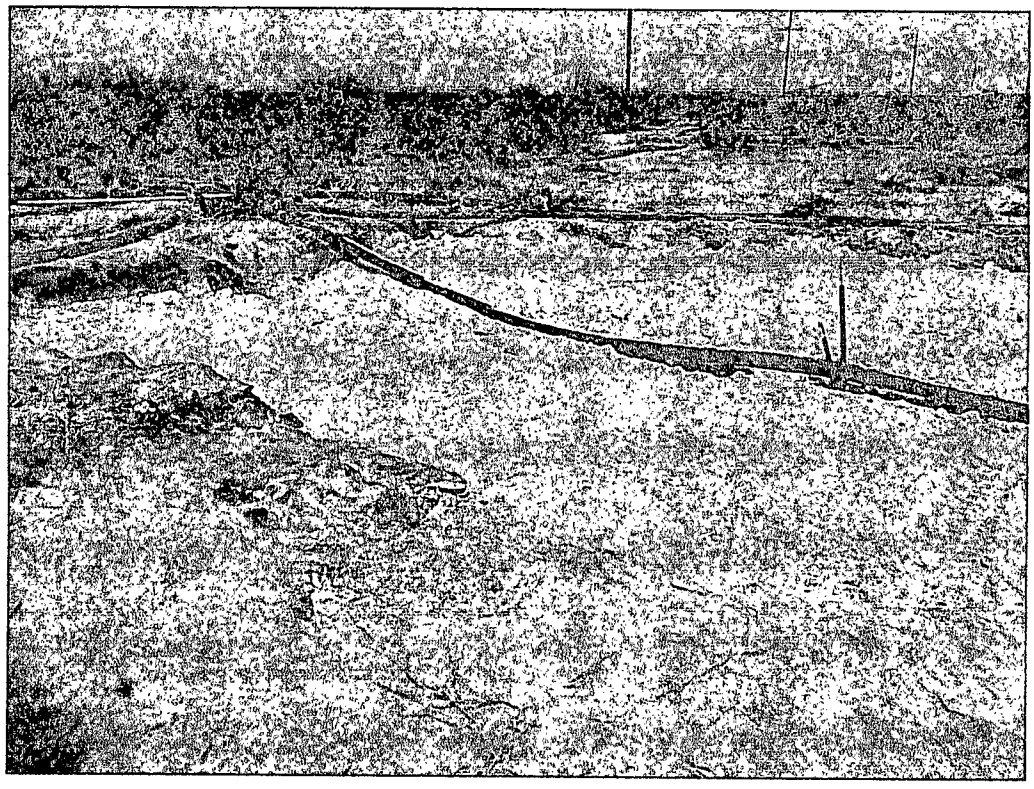
View North – Areas of AH-1 and AH-2



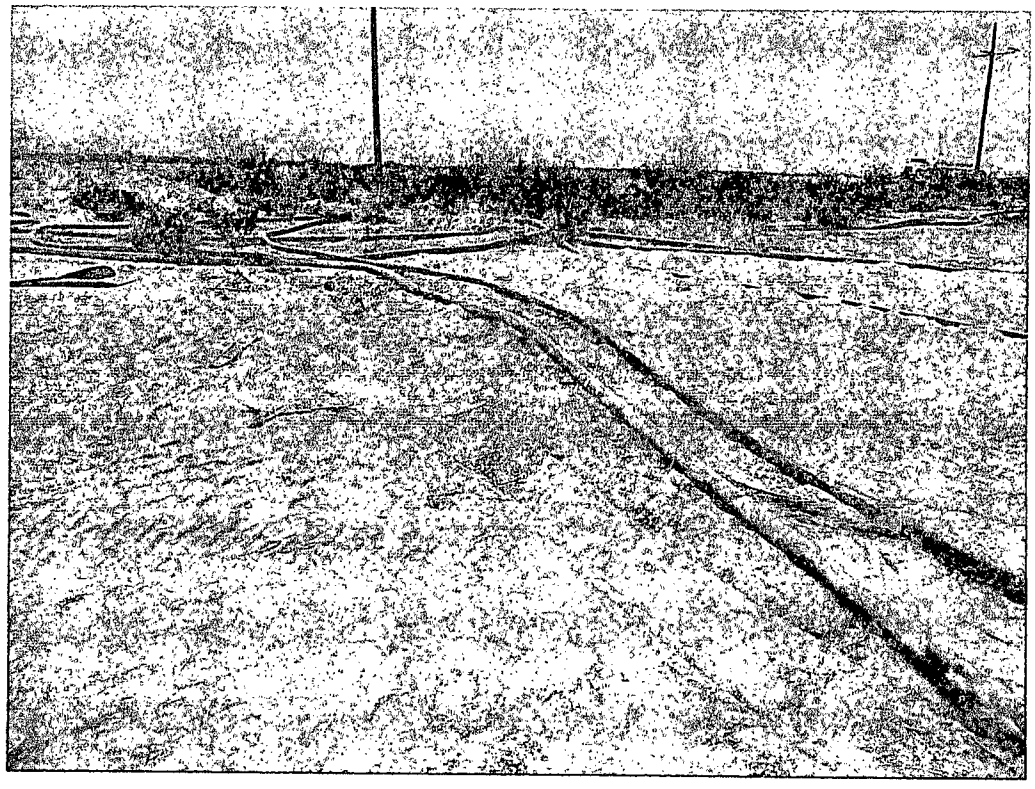
View West – Liner installed at AH-1

COG Operating LLC
Willow A State #3
Eddy County, New Mexico

TETRA TECH



View North - Backfill



View West - Backfill

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

RECEIVED
JAN 24 2014
NMOCD ARTESIA

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company	**COG Operating LLC**	Contact	**Pat Ellis**
Address	**600 W. Illinois Ave. Midland, Texas 79701**	Telephone No.	**(432) 230-0077**
Facility Name	**Willow A State #3**	Facility Type	**3" Poly water line**

Surface Owner: Federal	Mineral Owner	Lease No. (API#) 300-015-33371

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	3	25S	28E					Eddy

Latitude N 32.15771° **Longitude** W 104.07320°

NATURE OF RELEASE

Type of Release: Produced water with skim oil	Volume of Release 75 bbls	Volume Recovered 0 bbls
Source of Release: 3" poly water line	Date and Hour of Occurrence 01/16/2013	Date and Hour of Discovery 01/16/2013
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-OCD	
By Whom? Michelle Mullins	Date and Hour 01/17/2013 3:49 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

3" poly water line was cracked during cold weather conditions and constantly being driven over by power line crews in large truck. The line has been repaired and returned to service.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech personnel inspected the site and collected samples to define the spills extent. Soil that exceeded the RRAL was removed and hauled away for proper disposal. The site was then lined and 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	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: 8-13-13 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	600 West Illinois Avenue, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Willow A State #3	Facility Type	3" Poly water line

Surface Owner State	Mineral Owner	Lease No. (API#) 30-015-33371

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	3	25S	28E					Eddy

Latitude 32 09.840 **Longitude** 104 04.319

NATURE OF RELEASE

Type of Release Produced water w/ skim oil	Volume of Release 75bbls	Volume Recovered 0bbls
Source of Release 3" poly water line	Date and Hour of Occurrence 01/16/2013	Date and Hour of Discovery 01/16/2013 3:00 p.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-OCD	
By Whom? Michelle Mullins	Date and Hour 01/17/2013 3:49 p.m.	
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.*

3" poly water line was cracked during cold weather conditions and constantly being driven over by power line crews in large trucks. The line has been repaired and returned to service.

Describe Area Affected and Cleanup Action Taken.*

Initially an estimated 75bbls were released from the cracked flowline and we were unable to recover released fluid due to location of the release. The spill area is located on ROW adjacent to where the line was located and along nearby fence line roughly 30' x 10'. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a 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: Senior Environmental Coordinator	Approval Date:	Expiration Date:
E-mail Address: jrusso@concho.com	Conditions of Approval:	Attached ☐
Date: 01/29/2013 Phone: 432-212-2399		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Willow A State #3 Flowline
Eddy County, New Mexico

24 South 27 East

6	5	4	3	2	1
7	8 **26**	9 **43**	10	11	12 **27**
18 **34**	17	16	15	14	13 **31**
19	20	21	22 **70**	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South 28 East

6 **70**	5 **30**	4 **30**	3	2 **55**	1 **60**
7	8 **50**	9	10 **17**	11 **20**	12 **73**
18	17 **42**	16 **29**	15 **18**	14 **52**	13 **34**
19	20 **48**	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South 29 East

6	5	4	3	2	1
7 **160**	8	9	10	11	12
18	17	16 **18**	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South 27 East

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

25 South 28 East

6	5 **59**	4 **35**	3 **32** SITE	2	1
7	8	9	10	11	12
18 **67**	17	16	15 **48** **49**	14	13
19	20 **96**	21	22	23	24
30	29 **15**	28 **90**	27	26 **30**	25
31	32	33	34	35	36 **40**

25 South 29 East

6 **40**	5	4	3	2	1
7	8	9	10 **40**	11	12
18	17	16	15 **60**	14	13
19	20	21	22	23	24
30 **30**	29	28	27	26	25
31	32	33	34	35	36

26 South 27 East

6	5 **12**	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13 **35**
19	20	21	22 **60**	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South 28 East

6	5	4	3	2 **120**	1
7	8	9	10	11	12 **100**
18	17	16	15	14 **120**	13 **56**
19	20	21	22 **120**	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 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 **57** **69**	23	24
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 Tavarez
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: April 17, 2013

Work Order: 13041026

Project Location: Eddy Co., NM
Project Name: COG/Willow A State #3
Project Number: 112C05046

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
325792	T-1 (AH-1) 0'	soil	2013-04-01	00:00	2013-04-10
325793	T-1 (AH-1) 2'	soil	2013-04-01	00:00	2013-04-10
325794	T-1 (AH-1) 4'	soil	2013-04-01	00:00	2013-04-10
325795	T-1 (AH-1) 6'	soil	2013-04-01	00:00	2013-04-10
325796	T-1 (AH-1) 8'	soil	2013-04-01	00:00	2013-04-10
325797	T-1 (AH-1) 10'	soil	2013-04-01	00:00	2013-04-10
325798	T-1 (AH-1) 12'	soil	2013-04-01	00:00	2013-04-10

Sample: 325792 - T-1 (AH-1) 0'

Param	Flag	Result	Units	RL
Chloride		**10400**	mg/Kg	4

Sample: 325793 - T-1 (AH-1) 2'

Param	Flag	Result	Units	RL
Chloride		**12000**	mg/Kg	4

Sample: 325794 - T-1 (AH-1) 4'

Param	Flag	Result	Units	RL
Chloride		**18100**	mg/Kg	4

Sample: 325795 - T-1 (AH-1) 6'

Param	Flag	Result	Units	RL
Chloride		**16800**	mg/Kg	4

Sample: 325796 - T-1 (AH-1) 8'

Param	Flag	Result	Units	RL
Chloride		**15800**	mg/Kg	4

Sample: 325797 - T-1 (AH-1) 10'

Param	Flag	Result	Units	RL
Chloride		**3330**	mg/Kg	4

Sample: 325798 - T-1 (AH-1) 12'

Param	Flag	Result	Units	RL
Chloride		**4450**	mg/Kg	4

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 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: April 17, 2013

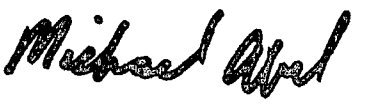
Work Order: 13041026

Project Location: Eddy Co., NM
Project Name: COG/Willow A State #3
Project Number: 112C05046

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
325792	T-1 (AH-1) 0'	soil	2013-04-01	00:00	2013-04-10
325793	T-1 (AH-1) 2'	soil	2013-04-01	00:00	2013-04-10
325794	T-1 (AH-1) 4'	soil	2013-04-01	00:00	2013-04-10
325795	T-1 (AH-1) 6'	soil	2013-04-01	00:00	2013-04-10
325796	T-1 (AH-1) 8'	soil	2013-04-01	00:00	2013-04-10
325797	T-1 (AH-1) 10'	soil	2013-04-01	00:00	2013-04-10
325798	T-1 (AH-1) 12'	soil	2013-04-01	00:00	2013-04-10

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.



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

Report Contents

Case Narrative

Samples for project COG/Willow A State #3 were received by TraceAnalysis, Inc. on 2013-04-10 and assigned to work order 13041026. Samples for work order 13041026 were received intact at a temperature of 4.0 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	85158	2013-04-15 at 11:25	100556	2013-04-17 at 13:52

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 13041026 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: 325792 - T-1 (AH-1) 0'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**10400**	mg/Kg	10	4.00

Sample: 325793 - T-1 (AH-1) 2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**12000**	mg/Kg	10	4.00

Sample: 325794 - T-1 (AH-1) 4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**18100**	mg/Kg	10	4.00

Sample: 325795 - T-1 (AH-1) 6'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**16800**		mg/Kg	10	4.00

Sample: 325796 - T-1 (AH-1) 8'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**15800**		mg/Kg	10	4.00

Sample: 325797 - T-1 (AH-1) 10'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	Result	RL	Units	Dilution	RL
Chloride			**3330**		mg/Kg	10	4.00

Sample: 325798 - T-1 (AH-1) 12'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	Sample Preparation:	2013-04-15	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**4450**	mg/Kg	10	4.00

Method Blanks

Method Blank (1) QC Batch: 100556

QC Batch:	100556	Date Analyzed:	2013-04-17	Analyzed By:	AR
Prep Batch:	85158	QC Preparation:	2013-04-15	Prepared By:	AR

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

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 100556 | Date Analyzed: 2013-04-17 | Analyzed By: AR
Prep Batch: 85158 | QC Preparation: 2013-04-15 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2630	mg/Kg	1	2500	<3.85	105	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2770	mg/Kg	1	2500	<3.85	111	85 - 115	5	20

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

Matrix Spike (MS-1) Spiked Sample: 325801

QC Batch: 100556 | Date Analyzed: 2013-04-17 | Analyzed By: AR
Prep Batch: 85158 | QC Preparation: 2013-04-15 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2440	mg/Kg	5	2500	119	93	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2570	mg/Kg	5	2500	119	98	78.9 - 121	5	20

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

Calibration Standards

Standard (CCV-1)

QC Batch: 100556 | Date Analyzed: 2013-04-17 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-04-17

Standard (CCV-2)

QC Batch: 100556 | Date Analyzed: 2013-04-17 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2013-04-17

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

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 then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Attachments

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

1304102G

Analysis Request of Chain of Custody Record

PAGE: | OF:

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG
SITE MANAGER: The Tavarez
PROJECT NO.: 112C05046
PROJECT NAME: COG - Willow A State #3
Eddy Co, NM

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
325792	4/1		S		X	T-1 (AH-1) 0'	1					X													X				
793						T-1 (AH-1) 2'	1					X													X				
794						T-1 (AH-1) 4'	1					X													X				
795						T-1 (AH-1) 6'	1					X													X				
796						T-1 (AH-1) 8'	1					X													X				
797						T-1 (AH-1) 10'	1					X													X				
798						T-1 (AH-1) 12'	1					X													X				

RELINQUISHED BY: (Signature) Mavis Kujawski — Date: — Time:
RECEIVED BY: (Signature) — Date: 4/11/13 — Time: 1135
SAMPLED BY: (Print & Initial) Marcus Kujawski / MK — Date: — Time:

RELINQUISHED BY: (Signature) — Date: 4/11/13 — Time: 1135
RECEIVED BY: (Signature) — Date: 4-12-13 — Time: 1135
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: — Time:
RECEIVED BY: (Signature) — Date: — Time:
TETRA TECH CONTACT PERSON: The Tavarez — Results by:

RECEIVING LABORATORY: TRACE
ADDRESS:
CITY: MIDLAND STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED:
REMARKS: Midland all

4°C

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

Summary Report

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

Report Date: February 15, 2013

Work Order: 13021102

Project Location: Eddy Co., NM
Project Name: COG/Willow A State #3
Project Number: 112C05046

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
320672	AH-1 0-1'	soil	2013-02-08	00:00	2013-02-08
320673	AH-1 1-1.5'	soil	2013-02-08	00:00	2013-02-08
320674	AH-1 2-2.5'	soil	2013-02-08	00:00	2013-02-08
320675	AH-1 3-3.5'	soil	2013-02-08	00:00	2013-02-08
320676	AH-1 4-4.5'	soil	2013-02-08	00:00	2013-02-08
320677	AH-1 5-5.5'	soil	2013-02-08	00:00	2013-02-08
320678	AH-1 6-6.5'	soil	2013-02-08	00:00	2013-02-08
320679	AH-1 7-7.5'	soil	2013-02-08	00:00	2013-02-08
320680	AH-1 8-8.5'	soil	2013-02-08	00:00	2013-02-08
320681	AH-1 9-9.5'	soil	2013-02-08	00:00	2013-02-08
320682	AH-2 0-1'	soil	2013-02-08	00:00	2013-02-08
320683	AH-2 1-1.5'	soil	2013-02-08	00:00	2013-02-08
320684	AH-2 2-2.5'	soil	2013-02-08	00:00	2013-02-08
320685	AH-2 3-3.5'	soil	2013-02-08	00:00	2013-02-08
320686	AH-2 4-4.5'	soil	2013-02-08	00:00	2013-02-08
320687	AH-2 5-5.5'	soil	2013-02-08	00:00	2013-02-08
320688	AH-2 6-6.5'	soil	2013-02-08	00:00	2013-02-08
320689	AH-2 7-7.5'	soil	2013-02-08	00:00	2013-02-08
320690	AH-2 8-8.5'	soil	2013-02-08	00:00	2013-02-08
320691	AH-2 9-9.5'	soil	2013-02-08	00:00	2013-02-08
320692	Background 0-1'	soil	2013-02-08	00:00	2013-02-08
320693	Background 1.5-2'	soil	2013-02-08	00:00	2013-02-08
320694	Background 3.5-4'	soil	2013-02-08	00:00	2013-02-08
320695	Background 5.5-6'	soil	2013-02-08	00:00	2013-02-08

Sample - Field Code	BTEX Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	TPH DRO - NEW DRO (mg/Kg)	TPH GRO GRO (mg/Kg)
320672 - AH-1 0-1'	<0.100 [1]	<0.100	<0.100	**1.67**	**111**	**51.7**
320673 - AH-1 1-1.5'					<50.0	**4.89**
320682 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00 [2]

Sample: 320672 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		**19400**	mg/Kg	4

Sample: 320673 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		**13200**	mg/Kg	4

Sample: 320674 - AH-1 2-2.5'

Param	Flag	Result	Units	RL
Chloride		**16300**	mg/Kg	4

Sample: 320675 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride		**17800**	mg/Kg	4

Sample: 320676 - AH-1 4-4.5'

Param	Flag	Result	Units	RL
Chloride		**18300**	mg/Kg	4

Sample: 320677 - AH-1 5-5.5'

Param	Flag	Result	Units	RL
Chloride		**14700**	mg/Kg	4

Sample: 320678 - AH-1 6-6.5'

[1]Dilution due to surfactant.
[2]Dilution due to surfactant.

Param	Flag	Result	Units	RL
Chloride		**14000**	mg/Kg	4

Sample: 320679 - AH-1 7-7.5'

Param	Flag	Result	Units	RL
Chloride		**8030**	mg/Kg	4

Sample: 320680 - AH-1 8-8.5'

Param	Flag	Result	Units	RL
Chloride		**3820**	mg/Kg	4

Sample: 320681 - AH-1 9-9.5'

Param	Flag	Result	Units	RL
Chloride		**1980**	mg/Kg	4

Sample: 320682 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		**1030**	mg/Kg	4

Sample: 320683 - AH-2 1-1.5'

Param	Flag	Result	Units	RL
Chloride		**408**	mg/Kg	4

Sample: 320684 - AH-2 2-2.5'

Param	Flag	Result	Units	RL
Chloride		**946**	mg/Kg	4

Sample: 320685 - AH-2 3-3.5'

Param	Flag	Result	Units	RL
Chloride		**282**	mg/Kg	4

Sample: 320686 - AH-2 4-4.5'

Param	Flag	Result	Units	RL
Chloride		**220**	mg/Kg	4

Sample: 320687 - AH-2 5-5.5'

Param	Flag	Result	Units	RL
Chloride		**205**	mg/Kg	4

Sample: 320688 - AH-2 6-6.5'

Param	Flag	Result	Units	RL
Chloride		**440**	mg/Kg	4

Sample: 320689 - AH-2 7-7.5'

Param	Flag	Result	Units	RL
Chloride		**186**	mg/Kg	4

Sample: 320690 - AH-2 8-8.5'

Param	Flag	Result	Units	RL
Chloride		**119**	mg/Kg	4

Sample: 320691 - AH-2 9-9.5'

Param	Flag	Result	Units	RL
Chloride		**444**	mg/Kg	4

Sample: 320692 - Background 0-1'

Param	Flag	Result	Units	RL
Chloride		**76.5**	mg/Kg	4

Sample: 320693 - Background 1.5-2'

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

Sample: 320694 - Background 3.5-4'

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

Sample: 320695 - Background 5.5-6'

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

TRACEANALYSIS, INC.

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5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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

Report Date: February 15, 2013

Work Order: 13021102

Project Location: Eddy Co., NM
Project Name: COG/Willow A State #3
Project Number: 112C05046

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
320672	AH-1 0-1'	soil	2013-02-08	00:00	2013-02-08
320673	AH-1 1-1.5'	soil	2013-02-08	00:00	2013-02-08
320674	AH-1 2-2.5'	soil	2013-02-08	00:00	2013-02-08
320675	AH-1 3-3.5'	soil	2013-02-08	00:00	2013-02-08
320676	AH-1 4-4.5'	soil	2013-02-08	00:00	2013-02-08
320677	AH-1 5-5.5'	soil	2013-02-08	00:00	2013-02-08
320678	AH-1 6-6.5'	soil	2013-02-08	00:00	2013-02-08
320679	AH-1 7-7.5'	soil	2013-02-08	00:00	2013-02-08
320680	AH-1 8-8.5'	soil	2013-02-08	00:00	2013-02-08
320681	AH-1 9-9.5'	soil	2013-02-08	00:00	2013-02-08
320682	AH-2 0-1'	soil	2013-02-08	00:00	2013-02-08
320683	AH-2 1-1.5'	soil	2013-02-08	00:00	2013-02-08
320684	AH-2 2-2.5'	soil	2013-02-08	00:00	2013-02-08
320685	AH-2 3-3.5'	soil	2013-02-08	00:00	2013-02-08
320686	AH-2 4-4.5'	soil	2013-02-08	00:00	2013-02-08
320687	AH-2 5-5.5'	soil	2013-02-08	00:00	2013-02-08
320688	AH-2 6-6.5'	soil	2013-02-08	00:00	2013-02-08
320689	AH-2 7-7.5'	soil	2013-02-08	00:00	2013-02-08

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
320690	AH-2 8-8.5'	soil	2013-02-08	00:00	2013-02-08
320691	AH-2 9-9.5'	soil	2013-02-08	00:00	2013-02-08
320692	Background 0-1'	soil	2013-02-08	00:00	2013-02-08
320693	Background 1.5-2'	soil	2013-02-08	00:00	2013-02-08
320694	Background 3.5-4'	soil	2013-02-08	00:00	2013-02-08
320695	Background 5.5-6'	soil	2013-02-08	00:00	2013-02-08

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.

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

Case Narrative

Samples for project COG/Willow A State #3 were received by TraceAnalysis, Inc. on 2013-02-08 and assigned to work order 13021102. Samples for work order 13021102 were received intact at a temperature of 2.2 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	83781	2013-02-12 at 15:00	98888	2013-02-12 at 15:00
Chloride (Titration)	SM 4500-Cl B	83717	2013-02-11 at 08:44	98827	2013-02-11 at 15:36
Chloride (Titration)	SM 4500-Cl B	83717	2013-02-11 at 08:44	98917	2013-02-13 at 14:44
Chloride (Titration)	SM 4500-Cl B	83717	2013-02-11 at 08:44	98918	2013-02-13 at 14:45
Chloride (Titration)	SM 4500-Cl B	83717	2013-02-11 at 08:44	98919	2013-02-13 at 14:46
TPH DRO - NEW	S 8015 D	83748	2013-02-11 at 10:00	98841	2013-02-12 at 09:47
TPH DRO - NEW	S 8015 D	83844	2013-02-15 at 11:00	98965	2013-02-15 at 13:34
TPH GRO	S 8015 D	83781	2013-02-12 at 15:00	98887	2013-02-12 at 15:00
TPH GRO	S 8015 D	83839	2013-02-15 at 08:00	98958	2013-02-15 at 08:00

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 13021102 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: 320672 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	98888	Date Analyzed:	2013-02-12	Analyzed By:	YG
Prep Batch:	83781	Sample Preparation:	2013-02-12	Prepared By:	YG

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene	U	1	<0.100	mg/Kg	5	0.0200
Toluene	U	1	<0.100	mg/Kg	5	0.0200
Ethylbenzene	U	1	<0.100	mg/Kg	5	0.0200
Xylene		1	**1.67**	mg/Kg	5	0.0200

Surrogate		Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	Qsr	Qsr		11.8	mg/Kg	5	10.0	118	79.5 - 108
4-Bromofluorobenzene (4-BFB)				10.8	mg/Kg	5	10.0	108	71.4 - 108

Sample: 320672 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98827	Date Analyzed:	2013-02-11	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**19400**	mg/Kg	10	4.00

Sample: 320672 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	98841	Date Analyzed:	2013-02-12	Analyzed By:	CW
Prep Batch:	83748	Sample Preparation:	2013-02-11	Prepared By:	CW

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO		1	**111**	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			111	mg/Kg	1	100	111	70 - 130

Sample: 320672 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	98887	Date Analyzed:	2013-02-12	Analyzed By:	YG
Prep Batch:	83781	Sample Preparation:	2013-02-12	Prepared By:	YG

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
GRO		1	**51.7**	mg/Kg	5	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			9.00	mg/Kg	5	10.0	90	70 - 130
4-Bromofluorobenzene (4-BFB)			11.4	mg/Kg	5	10.0	114	70 - 130

Sample: 320673 - AH-1 1-1.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98827	Date Analyzed:	2013-02-11	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**13200**	mg/Kg	10	4.00

Sample: 320673 - AH-1 1-1.5'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	98965	Date Analyzed:	2013-02-15	Analyzed By:	CW
Prep Batch:	83844	Sample Preparation:	2013-02-15	Prepared By:	CW

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			127	mg/Kg	1	100	127	55.1 - 135.7

Sample: 320673 - AH-1 1-1.5'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	98958	Date Analyzed:	2013-02-15	Analyzed By:	YG
Prep Batch:	83839	Sample Preparation:	2013-02-15	Prepared By:	YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	**4.89**	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.70	mg/Kg	1	2.00	85	70 - 130
4-Bromofluorobenzene (4-BFB)			2.22	mg/Kg	1	2.00	111	70 - 130

Sample: 320674 - AH-1 2-2.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**16300**	mg/Kg	10	4.00

Sample: 320675 - AH-1 3-3.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

continued...

sample 320675 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**17800**	mg/Kg	10	4.00

Sample: 320676 - AH-1 4-4.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**18300**	mg/Kg	10	4.00

Sample: 320677 - AH-1 5-5.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**14700**	mg/Kg	10	4.00

Sample: 320678 - AH-1 6-6.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**14000**	mg/Kg	10	4.00

Sample: 320679 - AH-1 7-7.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**8030**	mg/Kg	10	4.00

Sample: 320680 - AH-1 8-8.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**3820**	mg/Kg	10	4.00

Sample: 320681 - AH-1 9-9.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**1980**	mg/Kg	10	4.00

Sample: 320682 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	98888	Date Analyzed:	2013-02-12	Analyzed By:	YG
Prep Batch:	83781	Sample Preparation:	2013-02-12	Prepared By:	YG

Parameter	Flag	Cert	Result	RL 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)	Qsr	Qsr		2.35	mg/Kg	1	2.00	118	79.5 - 108
4-Bromofluorobenzene (4-BFB)				2.15	mg/Kg	1	2.00	108	71.4 - 108

Sample: 320682 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**1030**	mg/Kg	10	4.00

Sample: 320682 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	98841	Date Analyzed:	2013-02-12	Analyzed By:	CW
Prep Batch:	83748	Sample Preparation:	2013-02-11	Prepared By:	CW

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			86.0	mg/Kg	1	100	86	70 - 130

Sample: 320682 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	98887	Date Analyzed:	2013-02-12	Analyzed By:	YG
Prep Batch:	83781	Sample Preparation:	2013-02-12	Prepared By:	YG

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO [2]	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.03	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			2.16	mg/Kg	1	2.00	108	70 - 130

Sample: 320683 - AH-2 1-1.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98917	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**408**	mg/Kg	5	4.00

Sample: 320684 - AH-2 2-2.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**946**	mg/Kg	5	4.00

Sample: 320685 - AH-2 3-3.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**282**	mg/Kg	5	4.00

Sample: 320686 - AH-2 4-4.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**220**	mg/Kg	5	4.00

Sample: 320687 - AH-2 5-5.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**205**	mg/Kg	5	4.00

Sample: 320688 - AH-2 6-6.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**440**	mg/Kg	5	4.00

Sample: 320689 - AH-2 7-7.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**186**	mg/Kg	5	4.00

Sample: 320690 - AH-2 8-8.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**119**	mg/Kg	5	4.00

Sample: 320691 - AH-2 9-9.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**444**	mg/Kg	5	4.00

Sample: 320692 - Background 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**76.5**	mg/Kg	5	4.00

Sample: 320693 - Background 1.5-2'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98918	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

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

Sample: 320694 - Background 3.5-4'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98919	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

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

Sample: 320695 - Background 5.5-6'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	98919	Date Analyzed:	2013-02-13	Analyzed By:	AR
Prep Batch:	83717	Sample Preparation:	2013-02-11	Prepared By:	AR

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

Method Blanks

Method Blank (1) QC Batch: 98827

QC Batch:	98827	Date Analyzed:	2013-02-11	Analyzed By:	AR
Prep Batch:	83717	QC Preparation:	2013-02-11	Prepared By:	AR

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

Method Blank (1) QC Batch: 98841

QC Batch:	98841	Date Analyzed:	2013-02-12	Analyzed By:	CW
Prep Batch:	83748	QC Preparation:	2013-02-11	Prepared By:	CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	8.97	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: 98887

QC Batch:	98887	Date Analyzed:	2013-02-12	Analyzed By:	YG
Prep Batch:	83781	QC Preparation:	2013-02-12	Prepared By:	YG

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.94	mg/Kg	1	2.00	97	70 - 130
4-Bromofluorobenzene (4-BFB)			1.75	mg/Kg	1	2.00	88	70 - 130

Method Blank (1) QC Batch: 98888

QC Batch: 98888 | Date Analyzed: 2013-02-12 | Analyzed By: YG
Prep Batch: 83781 | QC Preparation: 2013-02-12 | Prepared By: YG

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	Qsr	Qsr	2.31	mg/Kg	1	2.00	116	79.5 - 108
4-Bromofluorobenzene (4-BFB)			2.01	mg/Kg	1	2.00	100	71.4 - 108

Method Blank (1) QC Batch: 98917

QC Batch: 98917 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

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

Method Blank (1) QC Batch: 98918

QC Batch: 98918 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

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

Method Blank (1) QC Batch: 98919

QC Batch: 98919 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

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

Method Blank (1) QC Batch: 98958

QC Batch:	98958	Date Analyzed:	2013-02-15	Analyzed By:	YG
Prep Batch:	83839	QC Preparation:	2013-02-15	Prepared By:	YG

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.73	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1	2.00	94	70 - 130

Method Blank (1) QC Batch: 98965

QC Batch:	98965	Date Analyzed:	2013-02-15	Analyzed By:	CW
Prep Batch:	83844	QC Preparation:	2013-02-15	Prepared By:	CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	23.2	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr	144	mg/Kg	1	100	144	55.1 - 135.7

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 98827 | Date Analyzed: 2013-02-11 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2770	mg/Kg	1	2500	<3.85	111	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2570	mg/Kg	1	2500	<3.85	103	85 - 115	8	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 98841 | Date Analyzed: 2013-02-12 | Analyzed By: CW
Prep Batch: 83748 | QC Preparation: 2013-02-11 | Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	292	mg/Kg	1	250	8.97	113	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	272	mg/Kg	1	250	8.97	105	70 - 130	7	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	Qsr	Qsr	144	112	mg/Kg	1	100	144	112	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 98887 | Date Analyzed: 2013-02-12 | Analyzed By: YG
Prep Batch: 83781 | QC Preparation: 2013-02-12 | Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	20.1	mg/Kg	1	20.0	<2.32	100	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	19.6	mg/Kg	1	20.0	<2.32	98	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	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.37	2.36	mg/Kg	1	2.00	118	118	70 - 130
4-Bromofluorobenzene (4-BFB)	2.10	2.12	mg/Kg	1	2.00	105	106	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 98888 | Date Analyzed: 2013-02-12 | Analyzed By: YG
Prep Batch: 83781 | QC Preparation: 2013-02-12 | Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.81	mg/Kg	1	2.00	<0.00810	90	72.4 - 120
Toluene		1	1.89	mg/Kg	1	2.00	<0.00750	94	77 - 120
Ethylbenzene		1	2.06	mg/Kg	1	2.00	<0.00730	103	71.8 - 120
Xylene		1	6.42	mg/Kg	1	6.00	<0.00700	107	78.3 - 120

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.91	mg/Kg	1	2.00	<0.00810	96	72.4 - 120	5	20
Toluene		1	1.97	mg/Kg	1	2.00	<0.00750	98	77 - 120	4	20
Ethylbenzene		1	2.16	mg/Kg	1	2.00	<0.00730	108	71.8 - 120	5	20
Xylene		1	6.70	mg/Kg	1	6.00	<0.00700	112	78.3 - 120	4	20

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

continued ...

control spikes continued ...

Surrogate			LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Surrogate			LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	Qar	Qar	2.36	2.38	mg/Kg	1	2.00	118	119	79.5 - 108
4-Bromofluorobenzene (4-BFB)	Qar	Qar	2.19	2.15	mg/Kg	1	2.00	110	108	71.4 - 108

Laboratory Control Spike (LCS-1)

QC Batch: 98917 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2700	mg/Kg	1	2500	<3.85	108	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2510	mg/Kg	1	2500	<3.85	100	85 - 115	7	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 98918 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2780	mg/Kg	1	2500	<3.85	111	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2580	mg/Kg	1	2500	<3.85	103	85 - 115	8	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 98919 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2510	mg/Kg	1	2500	<3.85	100	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2690	mg/Kg	1	2500	<3.85	108	85 - 115	7	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 98958 | Date Analyzed: 2013-02-15 | Analyzed By: YG
Prep Batch: 83839 | QC Preparation: 2013-02-15 | Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	21.6	mg/Kg	1	20.0	<2.32	108	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	21.1	mg/Kg	1	20.0	<2.32	106	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	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.03	2.03	mg/Kg	1	2.00	102	102	70 - 130
4-Bromofluorobenzene (4-BFB)	2.02	2.01	mg/Kg	1	2.00	101	100	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 98965 | Date Analyzed: 2013-02-15 | Analyzed By: CW
Prep Batch: 83844 | QC Preparation: 2013-02-15 | Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	213	mg/Kg	1	250	23.2	76	66.9 - 119.9

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	216	mg/Kg	1	250	23.2	77	66.9 - 119.9	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
n-Tricosane	121	134	mg/Kg	1	100	121	134	76.8 - 140.2

Matrix Spike (MS-1) Spiked Sample: 320673

QC Batch: 98827 | Date Analyzed: 2013-02-11 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			15500	mg/Kg	10	2500	13200	92	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			15800	mg/Kg	10	2500	13200	104	78.9 - 121	2	20

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

Matrix Spike (MS-1) Spiked Sample: 320672

QC Batch: 98841 | Date Analyzed: 2013-02-12 | Analyzed By: CW
Prep Batch: 83748 | QC Preparation: 2013-02-11 | Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	338	mg/Kg	1	250	111	91	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		1	331	mg/Kg	1	250	111	88	70 - 130	2	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	117	118	mg/Kg	1	100	117	118	70 - 130

Matrix Spike (MS-1) Spiked Sample: 320696

QC Batch: 98887 | Date Analyzed: 2013-02-12 | Analyzed By: YG
Prep Batch: 83781 | QC Preparation: 2013-02-12 | Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	23.2	mg/Kg	1	20.0	<2.32	116	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	24.3	mg/Kg	1	20.0	<2.32	122	70 - 130	5	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)	2.40	2.40	mg/Kg	1	2	120	120	70 - 130
4-Bromofluorobenzene (4-BFB)	2.13	2.09	mg/Kg	1	2	106	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 320696

QC Batch: 98888 | Date Analyzed: 2013-02-12 | Analyzed By: YG
Prep Batch: 83781 | QC Preparation: 2013-02-12 | Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.02	mg/Kg	1	2.00	<0.00810	101	66.3 - 138
Toluene		1	2.12	mg/Kg	1	2.00	<0.00750	106	64.8 - 142
Ethylbenzene		1	2.33	mg/Kg	1	2.00	<0.00730	116	72 - 132
Xylene		1	7.27	mg/Kg	1	6.00	<0.00700	121	60.8 - 148

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	2.08	mg/Kg	1	2.00	<0.00810	104	66.3 - 138	3	20
Toluene		1	2.19	mg/Kg	1	2.00	<0.00750	110	64.8 - 142	3	20
Ethylbenzene		1	2.40	mg/Kg	1	2.00	<0.00730	120	72 - 132	3	20
Xylene		1	7.47	mg/Kg	1	6.00	<0.00700	124	60.8 - 148	3	20

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

Surrogate			MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	Qsr	Qsr	2.34	2.34	mg/Kg	1	2	117	117	79.5 - 108
4-Bromofluorobenzene (4-BFB)			2.13	2.12	mg/Kg	1	2	106	106	71.4 - 108

Matrix Spike (MS-1) Spiked Sample: 320683

QC Batch: 98917 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2580	mg/Kg	5	2500	408	87	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2780	mg/Kg	5	2500	408	95	78.9 - 121	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: 320693

QC Batch: 98918 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2650	mg/Kg	5	2500	<19.2	106	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2840	mg/Kg	5	2500	<19.2	114	78.9 - 121	7	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: 320695

QC Batch: 98919 | Date Analyzed: 2013-02-13 | Analyzed By: AR
Prep Batch: 83717 | QC Preparation: 2013-02-11 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2560	mg/Kg	5	2500	<19.2	102	78.9 - 121

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2440	mg/Kg	5	2500	<19.2	98	78.9 - 121	5	20

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

Matrix Spike (MS-1) Spiked Sample: 321013

QC Batch: 98958 | Date Analyzed: 2013-02-15 | Analyzed By: YG
Prep Batch: 83839 | QC Preparation: 2013-02-15 | Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	19.8	mg/Kg	1	20.0	<2.32	99	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	20.9	mg/Kg	1	20.0	<2.32	104	70 - 130	5	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)	2.21	2.01	mg/Kg	1	2	110	100	70 - 130
4-Bromofluorobenzene (4-BFB)	2.00	1.99	mg/Kg	1	2	100	100	70 - 130

Matrix Spike (MS-1) Spiked Sample: 320673

QC Batch:	98965	Date Analyzed:	2013-02-15	Analyzed By:	CW
Prep Batch:	83844	QC Preparation:	2013-02-15	Prepared By:	CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	233	mg/Kg	1	250	25.4	83	36.1 - 147.2

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		1	231	mg/Kg	1	250	25.4	82	36.1 - 147.2	1	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	130	130	mg/Kg	1	100	130	130	78.3 - 131.6

Calibration Standards

Standard (CCV-1)

QC Batch: 98827 | Date Analyzed: 2013-02-11 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	103	103	85 - 115	2013-02-11

Standard (CCV-2)

QC Batch: 98827 | Date Analyzed: 2013-02-11 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	97.2	97	85 - 115	2013-02-11

Standard (CCV-1)

QC Batch: 98841 | Date Analyzed: 2013-02-12 | Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	263	105	80 - 120	2013-02-12

Standard (CCV-2)

QC Batch: 98841 | Date Analyzed: 2013-02-12 | Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	275	110	80 - 120	2013-02-12

Standard (CCV-1)

QC Batch: 98887 | Date Analyzed: 2013-02-12 | Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.965	96	80 - 120	2013-02-12

Standard (CCV-2)

QC Batch: 98887 | Date Analyzed: 2013-02-12 | Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.01	101	80 - 120	2013-02-12

Standard (CCV-3)

QC Batch: 98887 | Date Analyzed: 2013-02-12 | Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.993	99	80 - 120	2013-02-12

Standard (CCV-1)

QC Batch: 98888 | Date Analyzed: 2013-02-12 | Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.104	104	80 - 120	2013-02-12
Toluene		1	mg/kg	0.100	0.106	106	80 - 120	2013-02-12
Ethylbenzene		1	mg/kg	0.100	0.111	111	80 - 120	2013-02-12
Xylene		1	mg/kg	0.300	0.345	115	80 - 120	2013-02-12

Standard (CCV-2)

QC Batch: 98888 | Date Analyzed: 2013-02-12 | Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0993	99	80 - 120	2013-02-12
Toluene		1	mg/kg	0.100	0.105	105	80 - 120	2013-02-12
Ethylbenzene		1	mg/kg	0.100	0.112	112	80 - 120	2013-02-12
Xylene		1	mg/kg	0.300	0.349	116	80 - 120	2013-02-12

Standard (CCV-3)

QC Batch: 98888 | Date Analyzed: 2013-02-12 | Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.103	103	80 - 120	2013-02-12
Toluene		1	mg/kg	0.100	0.107	107	80 - 120	2013-02-12
Ethylbenzene		1	mg/kg	0.100	0.113	113	80 - 120	2013-02-12
Xylene		1	mg/kg	0.300	0.351	117	80 - 120	2013-02-12

Standard (CCV-1)

QC Batch: 98917 | Date Analyzed: 2013-02-13 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	103	103	85 - 115	2013-02-13

Standard (CCV-2)

QC Batch: 98917 | Date Analyzed: 2013-02-13 | Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	97.4	97	85 - 115	2013-02-13

Standard (CCV-1)

QC Batch: 98918 Date Analyzed: 2013-02-13 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-02-13

Standard (CCV-2)

QC Batch: 98918 Date Analyzed: 2013-02-13 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.6	100	85 - 115	2013-02-13

Standard (CCV-1)

QC Batch: 98919 Date Analyzed: 2013-02-13 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	98.7	99	85 - 115	2013-02-13

Standard (CCV-2)

QC Batch: 98919 Date Analyzed: 2013-02-13 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-02-13

Standard (CCV-1)

QC Batch: 98958 Date Analyzed: 2013-02-15 Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.935	94	80 - 120	2013-02-15

Standard (CCV-2)

QC Batch: 98958 Date Analyzed: 2013-02-15 Analyzed By: YG

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	2013-02-15

Standard (CCV-3)

QC Batch: 98958 Date Analyzed: 2013-02-15 Analyzed By: YG

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	2013-02-15

Standard (CCV-1)

QC Batch: 98965 Date Analyzed: 2013-02-15 Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	248	99	80 - 120	2013-02-15

Standard (CCV-2)

QC Batch: 98965 Date Analyzed: 2013-02-15 Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	229	92	80 - 120	2013-02-15

Appendix

Report Definitions

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

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-12-4	Midland

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Result Comments

1 Dilution due to surfactant.
2 Dilution due to surfactant.

Attachments

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

1302 1102

Analysis Request of Chain of Custody Record

PAGE: 1 OF: 3

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

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112C0 5046

PROJECT NAME: COG-Willow A State #3 Eddy Co. NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTEX 8021B (circled)	TPH 8015 MOD. TX1005 (Ext. to C35) (TPH circled)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride (circled)	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
320672	2/8 (~~1-8~~)		S		X	AH-1 0-1	1				X		X	X											✓				
673	↓		↓		↓	AH-1 1-1.5	↓				↓														✓				
674						AH-1 2-2.5																			✓				
675						AH-1 3-3.5																			✓				
676						AH-1 4-4.5																			✓				
677						AH-1 5-5.5																			✓				
678						AH-1 6-6.5																			✓				
679						AH-1 7-7.5																			✓				
680						AH-1 8-8.5																			✓				
681	↓		↓		↓	AH-1 9-9.5	↓				↓														✓				

RELINQUISHED BY: (Signature) Marcus Vujasinovic Date: 2-8-13 Time: 1620
RECEIVED BY: (Signature) A Hernandez Date: 2/8/13 Time: 16:20

SAMPLED BY: (Print & Initial) Marcus Vujasinovic / Ryan Roark Date: 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
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

TETRA TECH CONTACT PERSON: Ike Tavarez AH

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 2.2°C

REMARKS: Run deeper sample if TPH exceed 100 mg/kg Standard - all

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

Run deeper samples if benzene exceed 10 mg/kg or total BTEX exceed 50 mg/kg.

13021102

Analysis Request of Chain of Custody Record

PAGE: 2 OF: 3

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

CLIENT NAME: COG
SITE MANAGER: Ike Tavarez
PROJECT NO.: 112C05046
PROJECT NAME: COG-Willow A State #3

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
682	2/8		S		X	AH-2 0-1	1				X		X	X											X				
683	↓		↓		↓	AH-2 1-1.5	↓				↓														X				
684						AH-2 2-2.5																			X				
685						AH-2 3-3.5																			X				
686						AH-2 4-4.5																			X				
687						AH-2 5-5.5																			X				
688						AH-2 6-6.5																			X				
689						AH-2 7-7.5																			X				
690						AH-2 8-8.5																			X				
691	↓		↓		↓	AH-2 9-9.5	↓				↓														X				

RELINQUISHED BY: (Signature) [signature] Date: 2-8-13 Time: 1620
RECEIVED BY: (Signature) A Hernandez Date: 2/8/13 Time: 16:20
SAMPLED BY: (Print & Initial) Moses Kujawski/Ryan Reich Date: Time:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS AIRBILL #: HAND DELIVERED UPS OTHER:

RELINQUISHED BY: (Signature) Date: Time:
RECEIVED BY: (Signature) Date: Time:
TETRA TECH CONTACT PERSON: Ike Tavarez AH
Results by:
RUSH Charges Authorized: Yes No

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

SAMPLE CONDITION WHEN RECEIVED: 2.2°C
REMARKS:

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

1302102

Analysis Request of Chain of Custody Record

PAGE: 3 OF: 3

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

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112C05046

PROJECT NAME: COG - Willow A Stch #3

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC:MS Vol. 8240/8260/624	GC:MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
692	2/8 1-8		S		X	Background 0-1	1				X														X				
693	↓		↓		↓	Background 1.5-2	↓				↓														X				
694						Background 3.5-4																			X				
695	↓		↓		↓	Background 5.5-6	↓				↓														X				

RELINQUISHED BY: (Signature) Marcus Kinjardi	Date: 2-8-13 Time: 1620	RECEIVED BY: (Signature)	Date: 2/8/13 Time: 16:20
SAMPLED BY: (Print & Initial) Marcus Kinjardi / Kyle Reed	Date: 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:
TETRA TECH CONTACT PERSON: Ike Tavarez AH	Results by:		
RECEIVING LABORATORY: Xenco ADDRESS: CITY: Midland STATE: TX ZIP: CONTACT: PHONE:	RECEIVED BY: (Signature) DATE: TIME:		RUSH Charges Authorized: Yes No
SAMPLE CONDITION WHEN RECEIVED: 2.2°C	REMARKS:		

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