SITE INFORMATION

Report Type: Work Plan

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

March 18, 2013

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

Re: Work Plan 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, 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.

TETRA TECH

Work Plan

COG proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. Due to multiple flow lines in the area, AH-1 will be excavated to approximate depth of 6.0' to 8.0' to remove the elevated chloride concentrations, if accessible. In addition, deeper samples will be collected for the excavation bottom (backhoe) to attempt to define the chloride extents. Once the appropriate depth is achieved, the excavated area will be capped with a 40 mil liner at 4.0' below surface and backfilled to grade. In addition, the area of AH-2 will be excavated to a depth of approximately 2.0' to 3.0' below surface and backfilled with clean soil. All of the excavated soil will be transported to proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safely concerns. As such, Tetra Tech will excavate the soils to the maximum extent practicable. If the appropriate depths are not achieved, the impacted areas will be excavated and capped at 3.0' to 4.0' below surface.

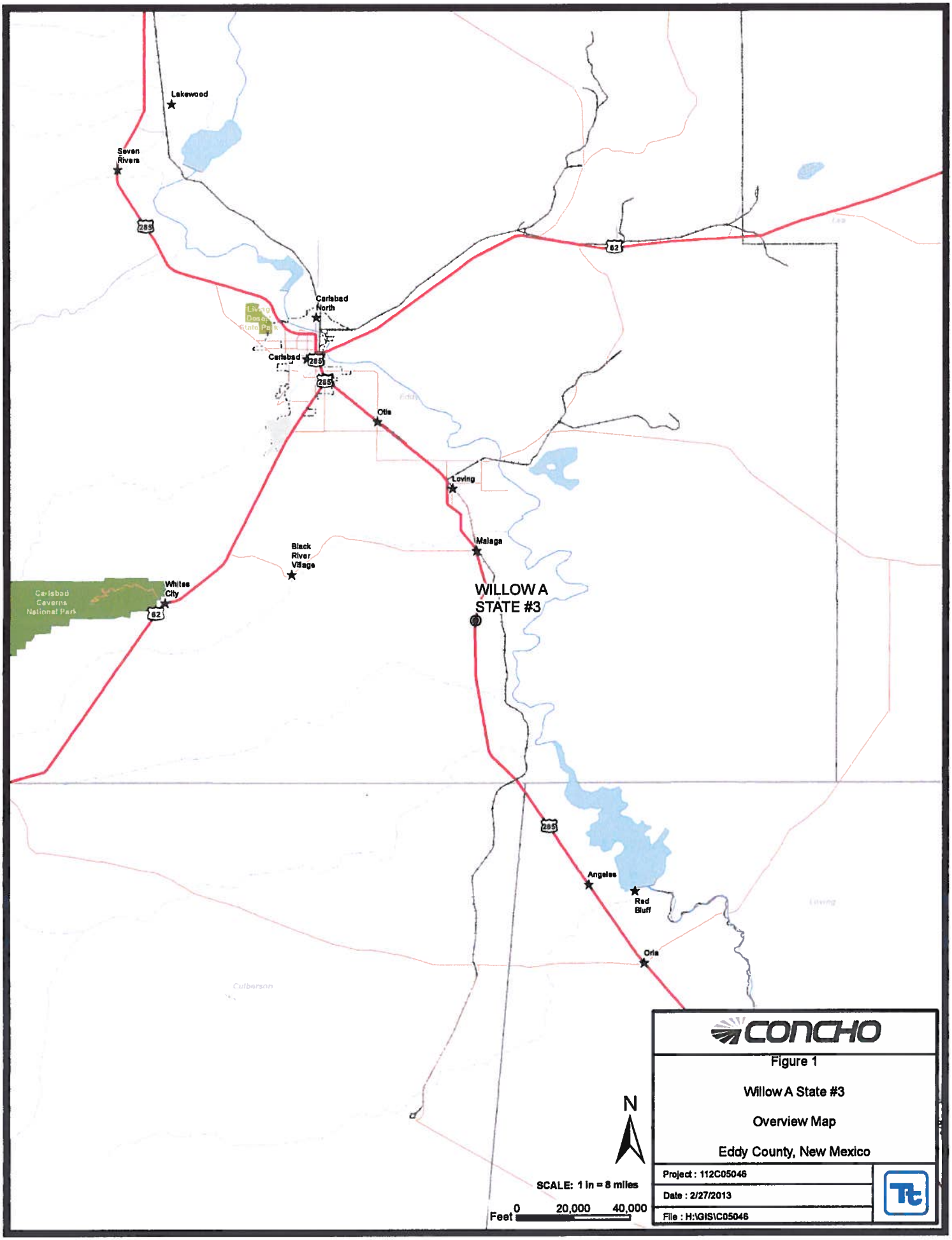
If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

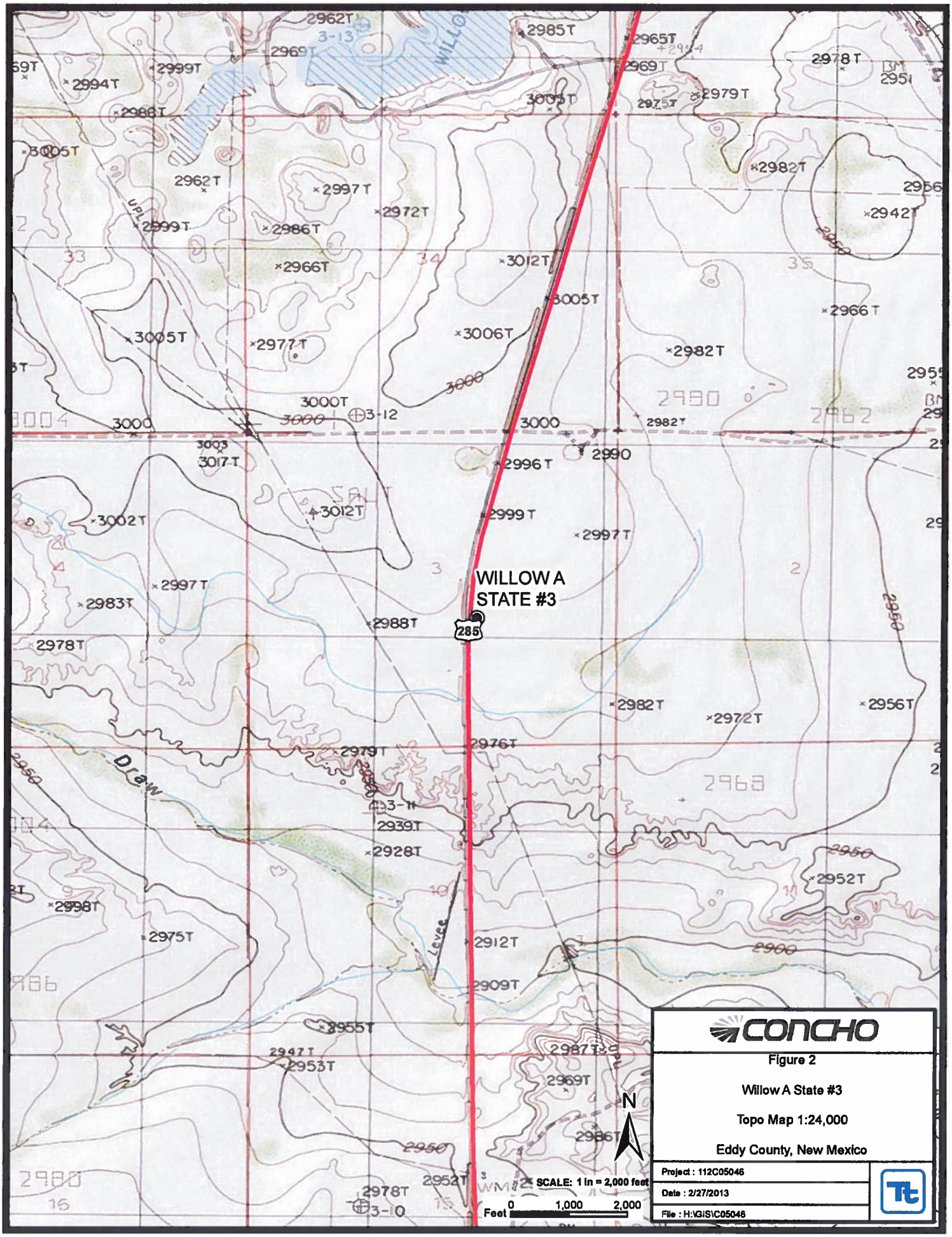
Ike Tavarez, PG
Senior Project Manager

cc: Pat Ellis – COG

Figures



Drawn By: Isabel Marmolejo



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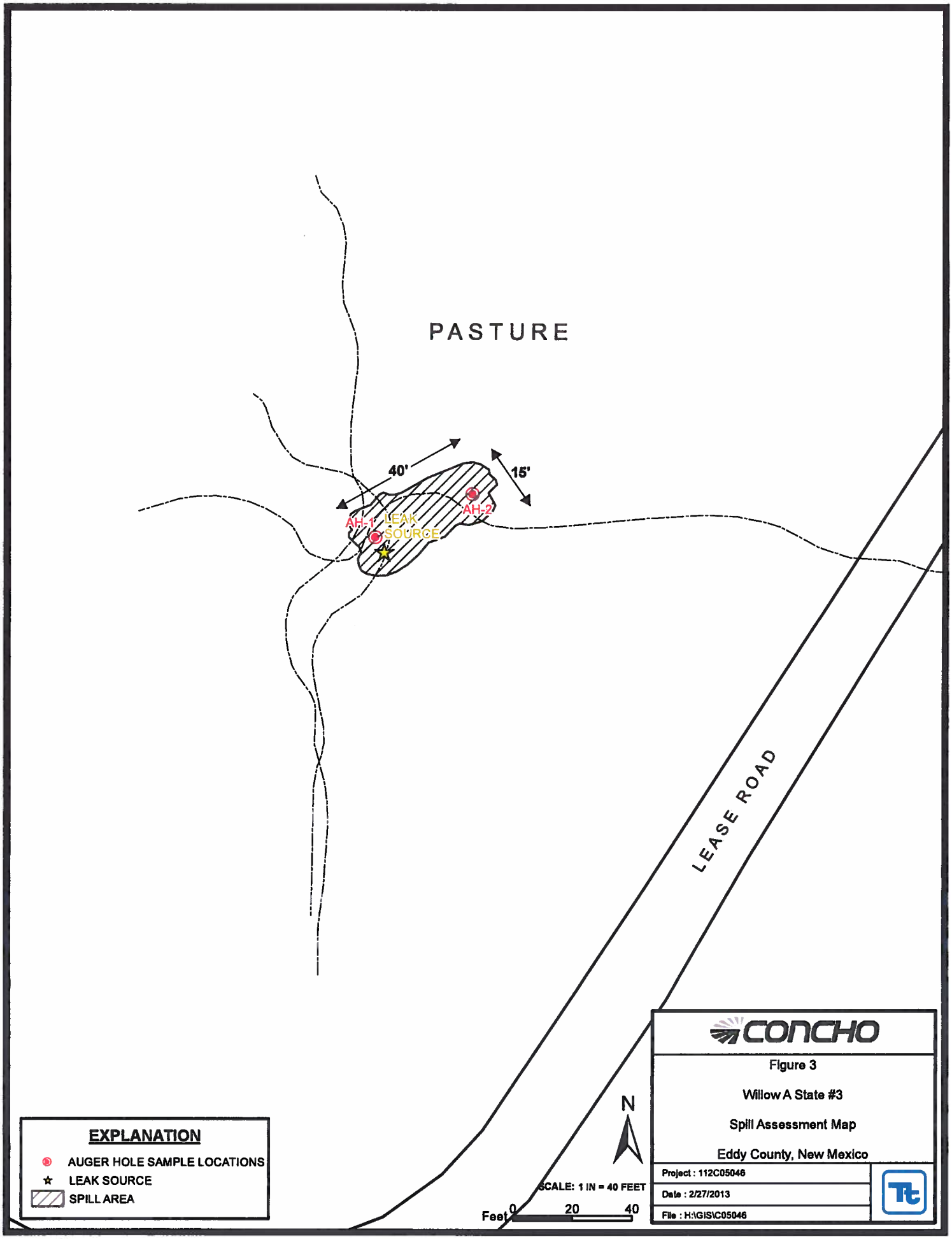

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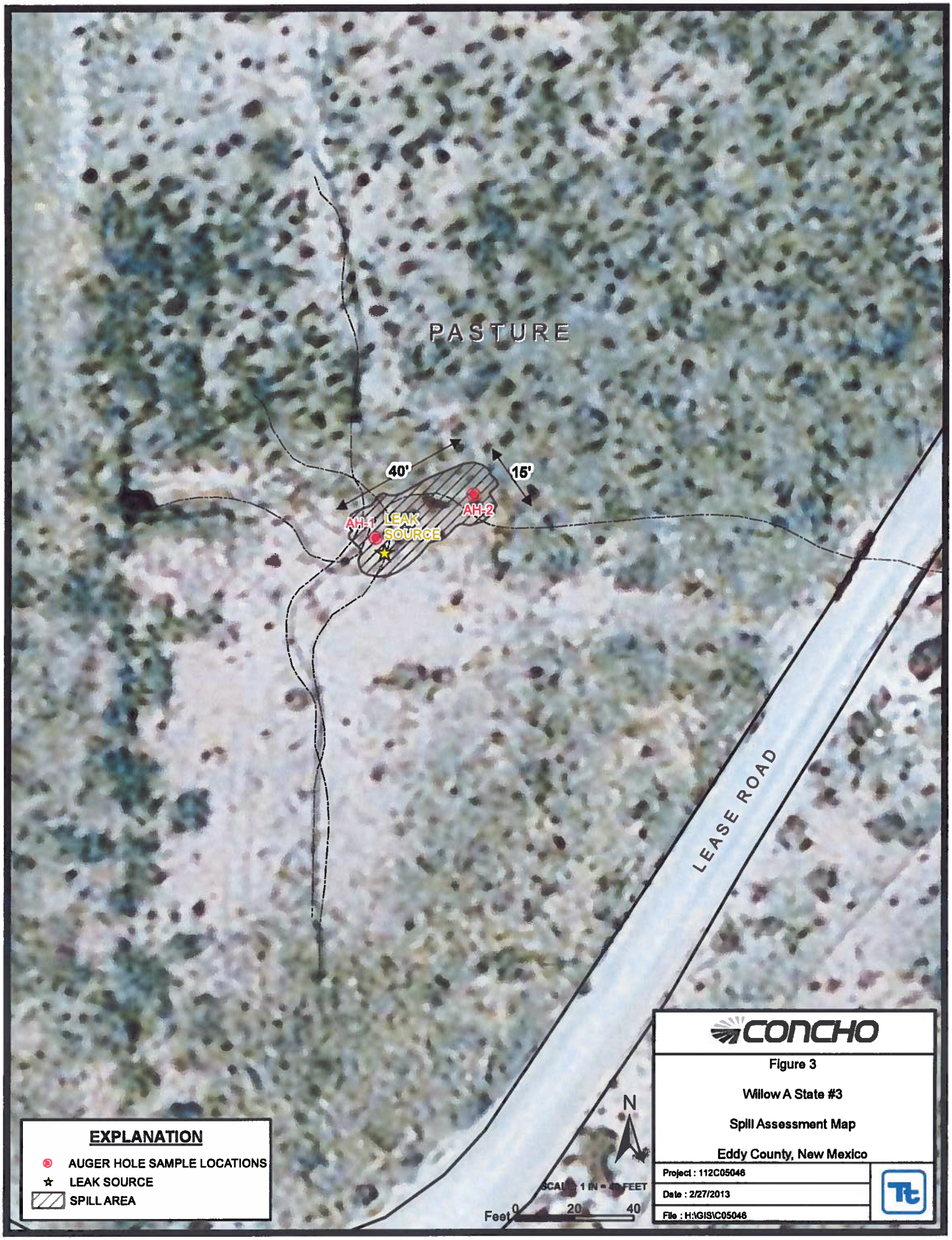
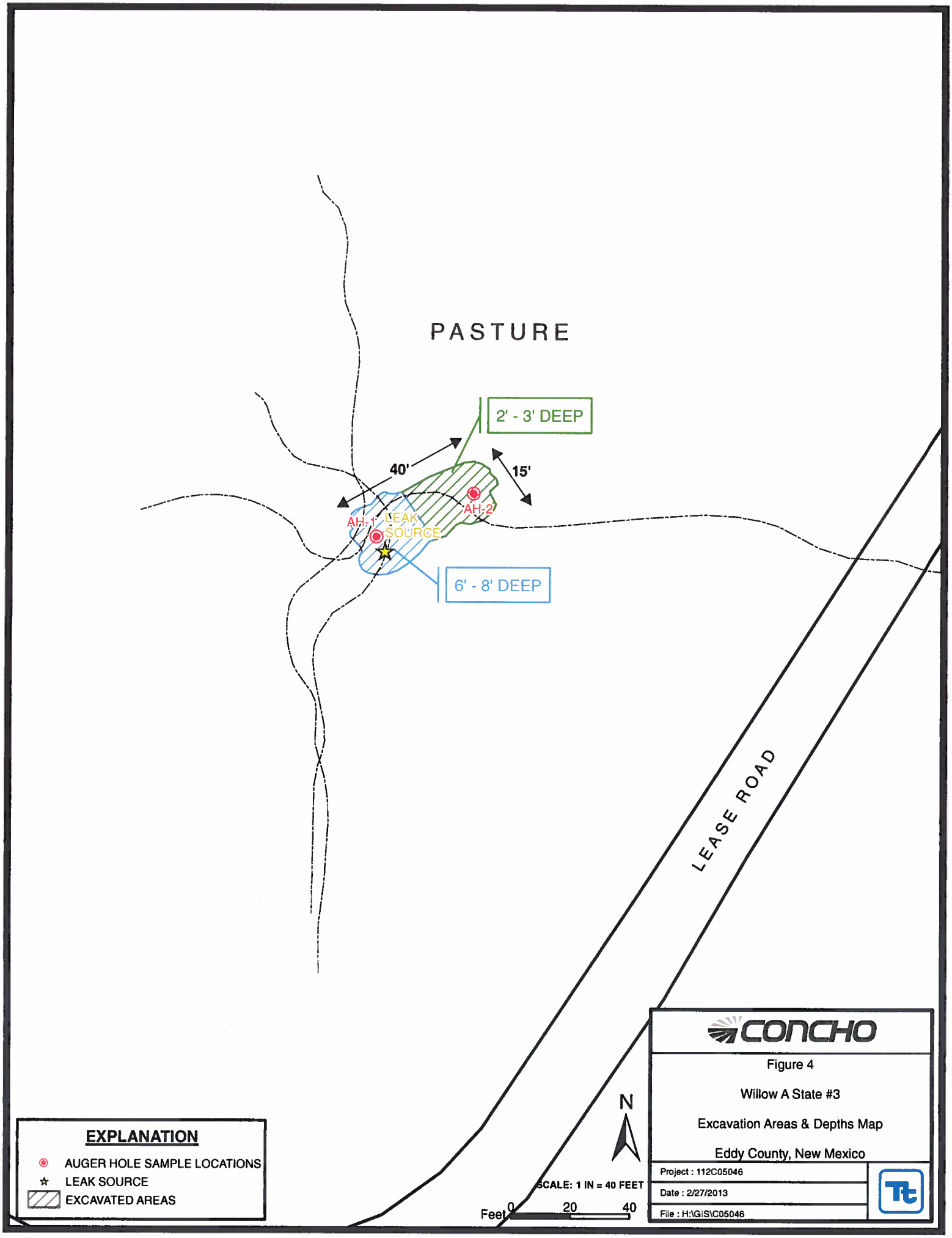


Drawn By: Isabel Marmolejo


PASTURE
2' - 3' DEEP
40'
15'
AH-1
LEAK SOURCE
AH-2
6' - 8' DEEP
LEASE ROAD
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
LEAK SOURCE
EXCAVATED AREAS
N
SCALE: 1 IN = 40 FEET
Feet 0 20 40
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

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

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

Proposed Excavated Depths

Proposed Liner Installed

Photos

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

TETRA TECH

View West – Area of AH-1

View West – Area of AH-2

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	COG OPERATING LLC	Contact	Pat Ellis
Address	600 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 50	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

Appendix C

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