SITE INFORMATION

Report Type: Work Plan

General Site Information:						
Site:	BKU #146 Flowline					
Company:	COG Operating LLC					
Section, Township and Range	Unit B	Sec. 30	T-17-S	R-30-E		
Lease Number:	API 30-015-04394					
County:	Eddy County					
GPS:	32.81208° N			104.00906° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	Intersection of Hwy 82 and CR-216 (west of Loco Hills), south on CR-216 0.6 mi, left on Lace C 0.6 mi, left 500' to location.					

Release Data:	
Date Released:	2/2/2012
Type Release:	Produced Water
Source of Contamination:	Steel flowline leak
Fluid Released:	75 bbls
Fluids Recovered:	1 bbls

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

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	10	
>100 ft.	***0***	***0***
WellHead Protection:	***Ranking Score***	***Site Data***
Water Source <1,000 ft., Private <200 ft.	*20*	
Water Source >1,000 ft., Private >200 ft.	***0***	***0***
Surface Body of Water:	***Ranking Score***	***Site Data***
<200 ft.	*20*	
200 ft - 1,000 ft.	10	
>1,000 ft.	***0***	***0***
Total Ranking Score:	**0**	

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

TETRA TECH

May 31, 2012

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

Re: Work Plan for the COG Operating LLC., BKU #146 Flow line, Unit B, Section 30, Township 17 South, Range 30 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the BKU #146 Flow line, Unit B, Section 30, Township 17 South, Range 30 East, Eddy County, New Mexico. (Site). The spill site coordinates are N 32.81208°, W 104.00906°. The site location is shown on Figures 1 and 2.

Background

According to the C-141 Initial Report, the leak was discovered on February 2, 2012, and released approximately seventy-five (75) barrels of produced water from a steel flowline that ruptured. COG recovered approximately 1 barrel of fluid from the spill. The spill is located in sand dunes and pasture area along a two track road. The spill initiated at the flow line impacting an area south of the release, which measured approximately 155' along the two track road. The spill migrated into two fingers measuring approximately 30' and approximately 100' long, with a width of approximately 1.0' to 10.0'. The spill ended as it pooled in an area measuring approximately 45' x 55'. The initial C-141 form is enclosed in Appendix A.

Tetra Tech
1910 North Big Spring, Midland,TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Groundwater

No water wells were listed within Section 30. According to the NMOCD groundwater map, the average depth to groundwater in this area is approximately 200' below surface. The groundwater data is shown in Appendix B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the 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, ethyl-benzene 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, ethyl-benzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On March 8, 2011, Tetra Tech personnel inspected and sampled the spill area. Eight (8) auger holes (AH-1 through AH-8) were installed using a stainless steel hand auger to assess the impacted soils. Soil samples were collected at 0-1' below surface and deeper samples could not be collected due to a shallow dense caliche. 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 reports and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, all of the samples were below the RRAL for BTEX and TPH. The chloride impact was not vertically defined, with bottom hole samples ranging from 6,310 mg/kg to 11,000 mg/kg.

On April 20, 2012, Tetra Tech supervised the installation of eight (8) boreholes (BH-1 through BH-8) using an air rotary drilling rig to assess the soils. The boreholes were installed to a maximum depth of 49-50' below surface. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The borehole results are summarized in Table 1.

Referring to Table 1, chloride concentrations greater than 10,000 mg/kg were detected in all of the boreholes, with concentrations declining below 10,000 mg/kg at 4.0' to 24.0' below surface. The chloride impact was vertically defined in all of the boreholes. The areas of BH-4, BH-5, BH-6 and BH-8 showed a chloride spike at 29-30' below surface and significantly declined at 39-40' below surface.

Work Plan

COG proposes removal of impacted material as highlighted (green) in Table 1 and shown on Figure 4. To remove the elevated chloride concentrations, the areas of AH-2 and AH-4 will be excavated to a depth of approximately 5.0' and 10.0' below surface, respectively. The area of AH-7 will be excavated approximately 20.0' below surface. The remaining areas will be excavated to a depth of approximately 15.0' below surface. Once excavated to the appropriate depths, the excavated areas will be capped with a 40 mil liner at 4.0' to 5.0' below surface and backfilled to grade with clean soil.

Due to the location of the spill, the proposed excavation depths and areas may not be achieved due to wall cave ins, oil and gas equipment, electrical, structures or lines which 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 impacted soil is not accessible, the soil will be deferred unit the abandonment of the facility. If deeper excavation cannot be achieved, the impacted soil will be capped with a 40 mil liner 4.0' to 5.0' below surface and backfilled with soil to grade.

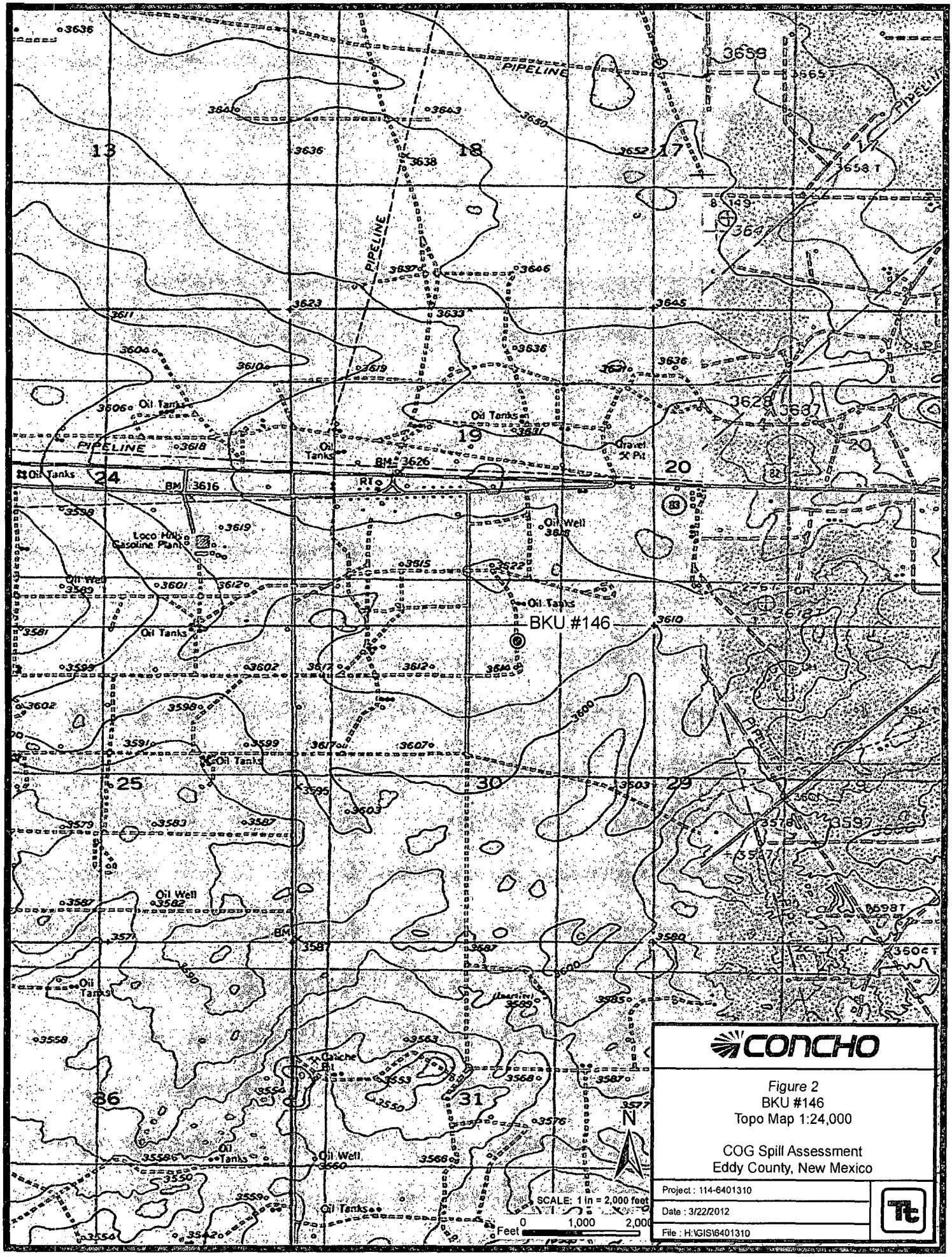
Upon completion a final report will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Project Manager

cc: Pat Ellis – COG
Terry Gregston - BLM

Figures



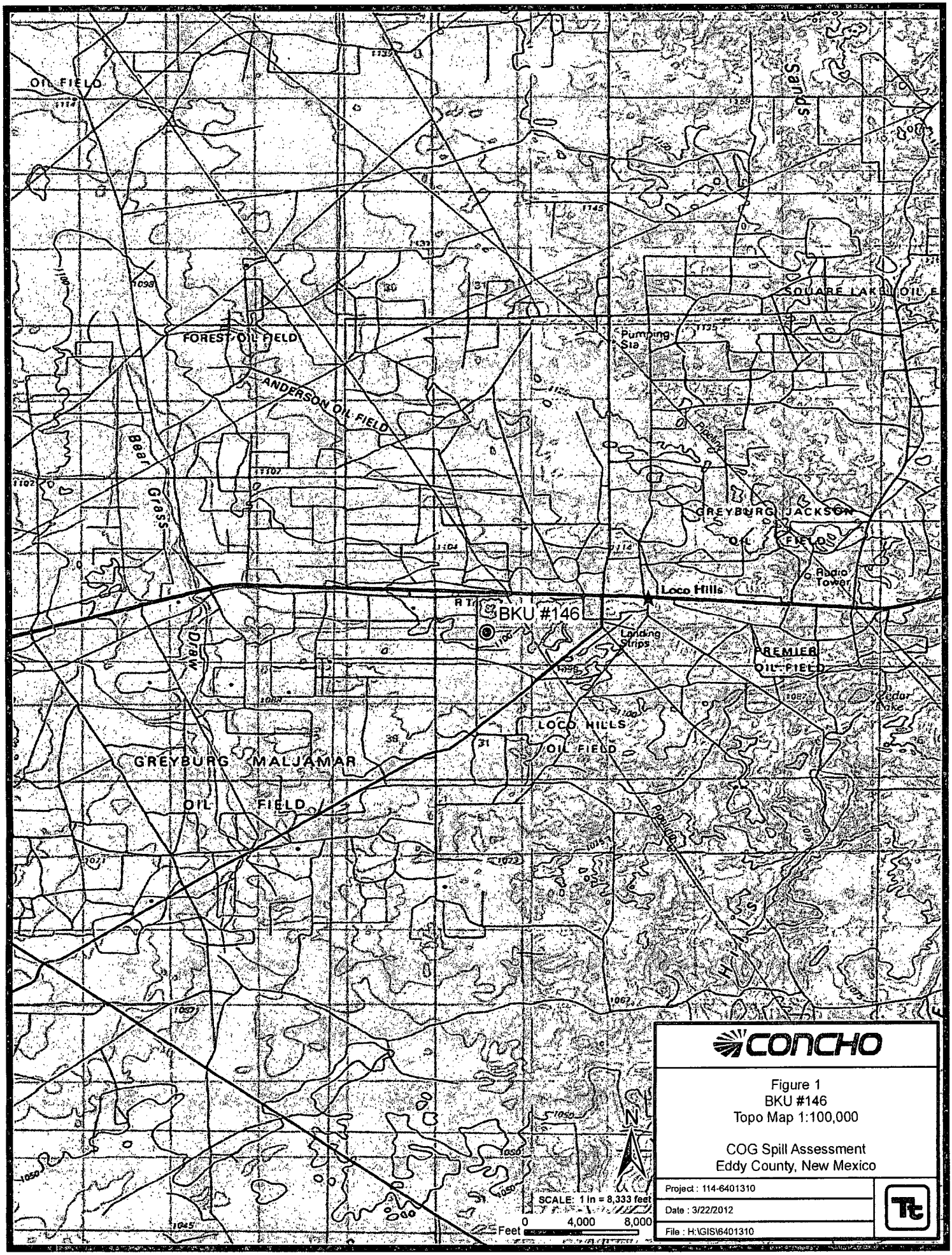
CONCHO

Figure 2
BKU #146
Topo Map 1:24,000

COG Spill Assessment
Eddy County, New Mexico

Project : 114-6401310
Date : 3/22/2012
File : H:\GIS\6401310

Drawn By: Isabel Marmolejo



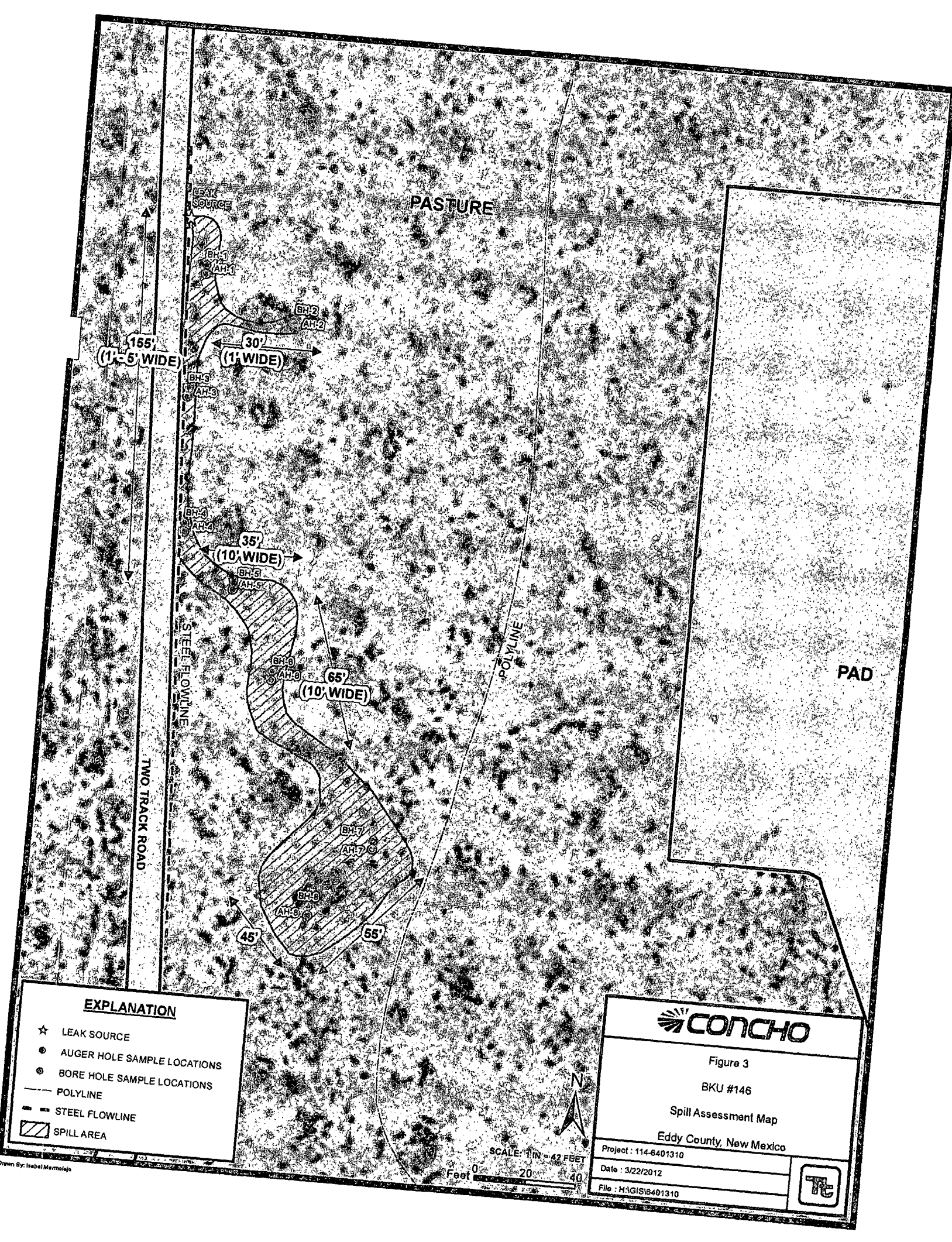
CONCHO

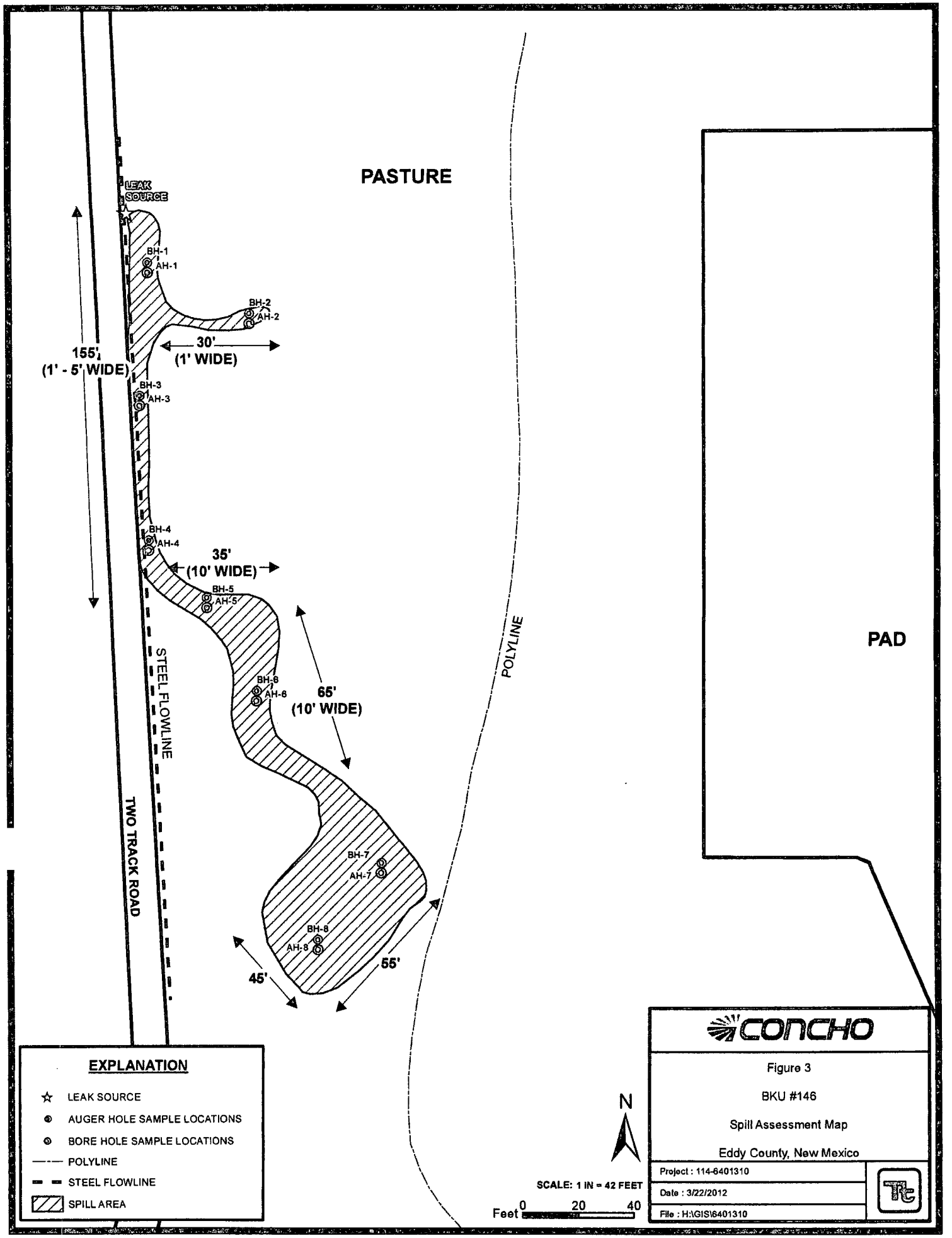
Figure 1
BKU #146
Topo Map 1:100,000

COG Spill Assessment
Eddy County, New Mexico

Project : 114-6401310
Date : 3/22/2012
File : H:\GIS\6401310

Drawn By: Isabel Marmolejo


PASTURE
PAD
LEAK SOURCE
BH-1
AH-1
BH-2
AH-2
30'
(1' WIDE)
155'
(1' - 5' WIDE)
BH-3
AH-3
BH-4
AH-4
35'
(10' WIDE)
BH-5
AH-5
BH-6
AH-6
65'
(10' WIDE)
BH-7
AH-7
BH-8
AH-8
45'
55'
STEEL FLOWLINE
POLYLINE
TWO TRACK ROAD
EXPLANATION
LEAK SOURCE
AUGER HOLE SAMPLE LOCATIONS
BORE HOLE SAMPLE LOCATIONS
POLYLINE
STEEL FLOWLINE
SPILL AREA
N
SCALE: 1 IN = 42 FEET
Feet 0 20 40
CONCHO
Figure 3
BKU #146
Spill Assessment Map
Eddy County, New Mexico
Project : 114-6401310
Date : 3/22/2012
File : H:\GIS\6401310
Drawn By: Isabel Marmolejo


PASTURE
PAD
LEAK SOURCE
BH-1
AH-1
BH-2
AH-2
30'
(1' WIDE)
155'
(1' - 5' WIDE)
BH-3
AH-3
BH-4
AH-4
35'
(10' WIDE)
BH-5
AH-5
BH-6
AH-6
65'
(10' WIDE)
BH-7
AH-7
BH-8
AH-8
45'
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STEEL FLOWLINE
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SPILL AREA
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Feet 0 20 40
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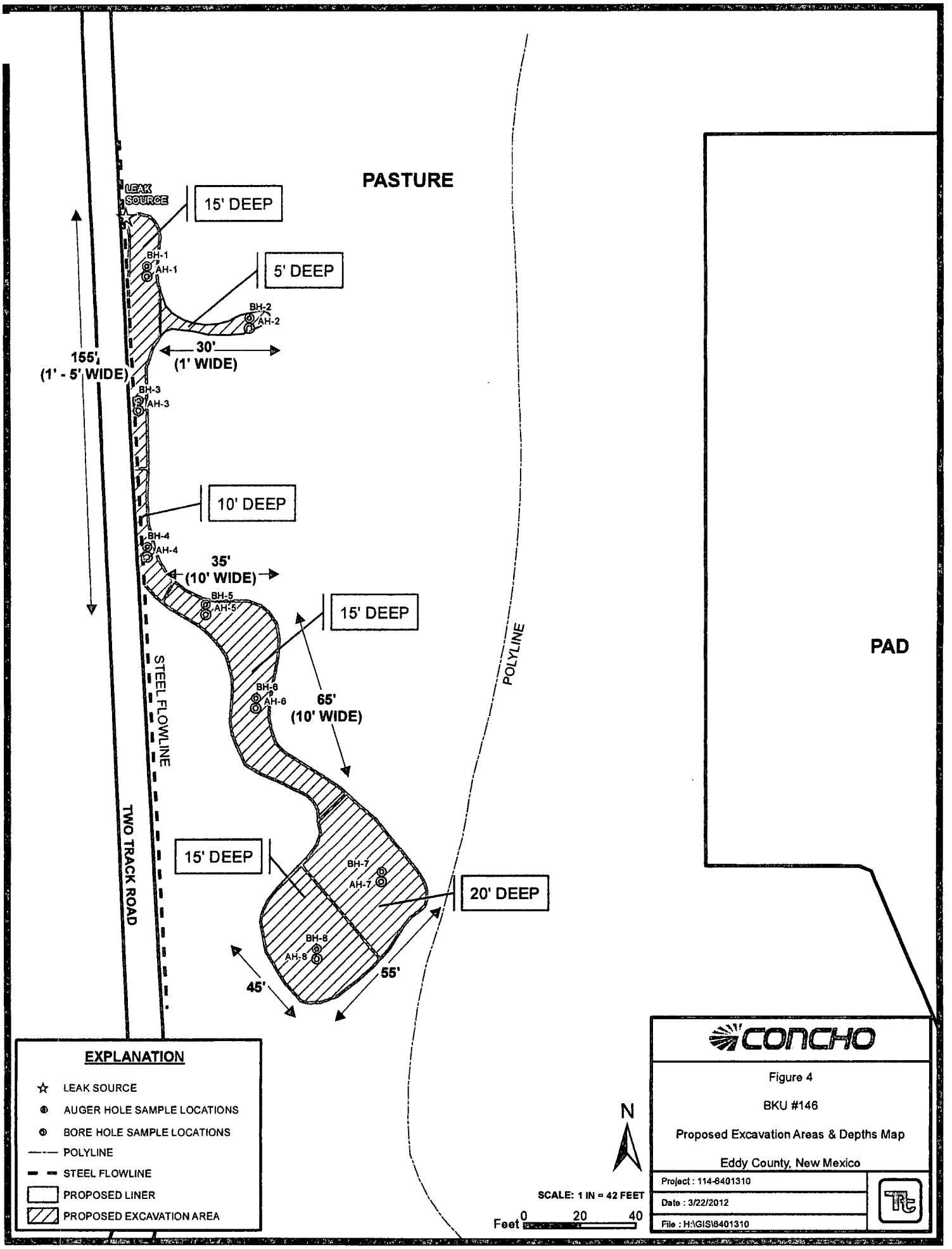


Drawn By: Isabel Marmolejo

Tables

Table 1
COG Operating LLC.
BKU #146 Flowline
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	3/8/2012	0-1	X		46.3	301	347	<0.0200	<0.0200	0.198	0.600	0.798	8,580
BH-1	4/20/2012	0-1	X		-	-	-	-	-	-	-	-	8,090
	"	2-3	X		-	-	-	-	-	-	-	-	12,500
	"	4-5	X		-	-	-	-	-	-	-	-	15,200
	"	6-7	X		-	-	-	-	-	-	-	-	12,000
	"	9-10	X		-	-	-	-	-	-	-	-	12,600
	"	14-15	X		-	-	-	-	-	-	-	-	10,200
	"	19-20	X		-	-	-	-	-	-	-	-	1,110
	"	24-25	X		-	-	-	-	-	-	-	-	2,530
	"	29-30	X		-	-	-	-		-	-	-	<20.0
	"	49-50	X		-	-	-	-	-	-	-	-	<20.0
AH-2	3/8/2012	0-1	X		4.88	136	141	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	8,390
BH-2	4/20/2012	0-1	X		-	-	-	-	-	-	-	-	5,570
	"	2-3	X		-	-	-	-	-	-	-	-	13,800
	"	4-5	X		-	-	-	-	-	-	-	-	9,120
	"	6-7	X		-	-	-	-	-	-	-	-	1,890
	"	9-10	X		-	-	-	-	-	-	-	-	517
	"	14-15	X		-	-	-	-	-	-	-	-	117
	"	19-20	X		-	-	-	-	-	-	-	-	43.9

Table 1
COG Operating LLC.
BKU #146 Flowline
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-3	3/8/2012	0-1	X		391	1,260	1,651	<0.100	<0.100	1.22	2.75	3.97	8,730
BH-3	4/19/2012	0-1	X		-	-	-	-	-	-	-	-	6,380
	"	2-3	X		-	-	-	-	-	-	-	-	5,280
	"	4-5	X		-	-	-	-	-	-	-	-	14,900
	"	6-7	X		-	-	-	-	-	-	-	-	11,600
	"	9-10	X		-	-	-	-	-	-	-	-	10,200
	"	14-15	X		-	-	-	-	-	-	-	-	10,800
	"	19-20	X		-	-	-	-	-	-	-	-	3,560
	"	24-25	X		-	-	-	-	-	-	-	-	6,790
	"	29-30	X		-	-	-	-	-	-	-	-	6,900
	"	39-40	X		-	-	-	-	-	-	-	-	321
	"	49-50	X		-	-	-	-	-	-	-	-	97.3

Table 1
COG Operating LLC.
BKU #146 Flowline
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-4	3/8/2012	0-1	X		6.18	569	575	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	8,260
BH-4	4/19/2012	0-1	X		-	-	-	-	-	-	-	-	6,960
	"	2-3	X		-	-	-	-	-	-	-	-	11,900
	"	4-5	X		-	-	-	-	-	-	-	-	14,900
	"	6-7	X		-	-	-	-	-	-	-	-	13,000
	"	9-10	X		-	-	-	-	-	-	-	-	13,400
	"	14-15	X		-	-	-	-	-	-	-	-	6,520
	"	19-20	X		-	-	-	-	-	-	-	-	3,080
	"	24-25	X		-	-	-	-	-	-	-	-	734
	"	29-30	X		-	-	-	-	-	-	-	-	2,170
	"	39-40	X		-	-	-	-	-	-	-	-	151

Table 1
COG Operating LLC.
BKU #146 Flowline
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-5	3/8/2012	0-1	X		6.21	92.1	98.3	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	7,630
BH-5	4/23/2012	0-1	X		-	-	-	-	-	-	-	-	4,050
	"	2-3	X		-	-	-	-	-	-	-	-	6,620
	"	4-5	X		-	-	-	-	-	-	-	-	13,500
	"	6-7	X		-	-	-	-	-	-	-	-	11,700
	"	9-10	X		-	-	-	-	-	-	-	-	11,500
	"	14-15	X		-	-	-	-	-	-	-	-	11,000
	"	19-20	X		-	-	-	-	-	-	-	-	7,040
	"	24-25	X		-	-	-	-	-	-	-	-	5,460
	"	29-30	X		-	-	-	-	-	-	-	-	11,800
	"	39-40	X		-	-	-	-	-	-	-	-	376
	"	49-50	X		-	-	-	-	-	-	-	-	225

Table 1
COG Operating LLC.
BKU #146 Flowline
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-6	3/8/2012	0-1	X		<2.00	109	109	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	11,000
BH-6	4/23/2012	0-1	X		-	-	-	-	-	-	-	-	7,730
	"	2-3	X		-	-	-	-	-	-	-	-	12,200
	"	4-5	X		-	-	-	-	-	-	-	-	15,600
	"	6-7	X		-	-	-	-	-	-	-	-	11,800
	"	9-10	X		-	-	-	-	-	-	-	-	7,400
	"	14-15	X		-	-	-	-	-	-	-	-	10,600
	"	19-20	X		-	-	-	-	-	-	-	-	3,400
	"	24-25	X		-	-	-	-	-	-	-	-	1,250
	"	29-30	X		-	-	-	-	-	-	-	-	6,800
	"	39-40	X		-	-	-	-	-	-	-	-	1,120
	"	49-50	X		-	-	-	-	-	-	-	-	169

Table 1
COG Operating LLC.
BKU #146 Flowline
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-7	3/8/2012	0-1	X		146	3,040	3,186	<0.100	0.634	1.52	3.28	5.43	6,530
BH-7	4/23/2012	0-1	X		-	-	-	-	-	-	-	-	5,490
	"	2-3	X		-	-	-	-	-	-	-	-	7,870
	"	4-5	X		-	-	-	-	-	-	-	-	13,400
	"	6-7	X		-	-	-	-	-	-	-	-	12,400
	"	9-10	X		-	-	-	-	-	-	-	-	13,600
	"	14-15	X		-	-	-	-	-	-	-	-	14,000
	"	19-20	X		-	-	-	-	-	-	-	-	10,800
	"	24-25	X		-	-	-	-	-	-	-	-	2,530
	"	29-30	X		-	-	-	-	-	-	-	-	539
	"	39-40	X		-	-	-	-	-	-	-	-	89.8

Table 1
COG Operating LLC.
BKU #146 Flowline
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-8	3/8/2012	0-1	X		2.91	65.4	68.3	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	6,310
BH-8	4/23/2012	0-1	X		-	-	-	-	-	-	-	-	549
	"	2-3	X		-	-	-	-	-	-	-	-	484
	"	4-5	X		-	-	-	-	-	-	-	-	8,250
	"	6-7	X		-	-	-	-	-	-	-	-	14,200
	"	9-10	X		-	-	-	-	-	-	-	-	9,890
	"	14-15	X		-	-	-	-	-	-	-	-	8,960
	"	19-20	X		-	-	-	-	-	-	-	-	1,740
	"	24-25	X		-	-	-	-	-	-	-	-	935
	"	29-30	X		-	-	-	-	-	-	-	-	5,390
	"	39-40	X		-	-	-	-	-	-	-	-	453

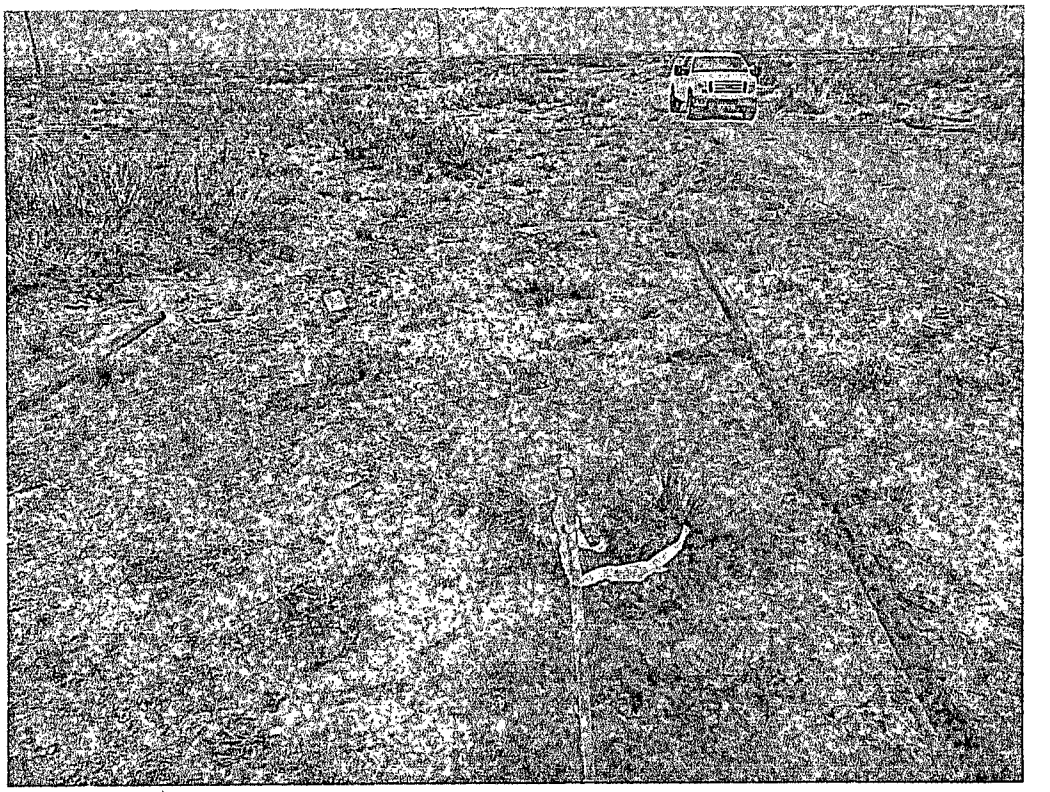
(-) Not Analyzed

Proposed Excavation Depth

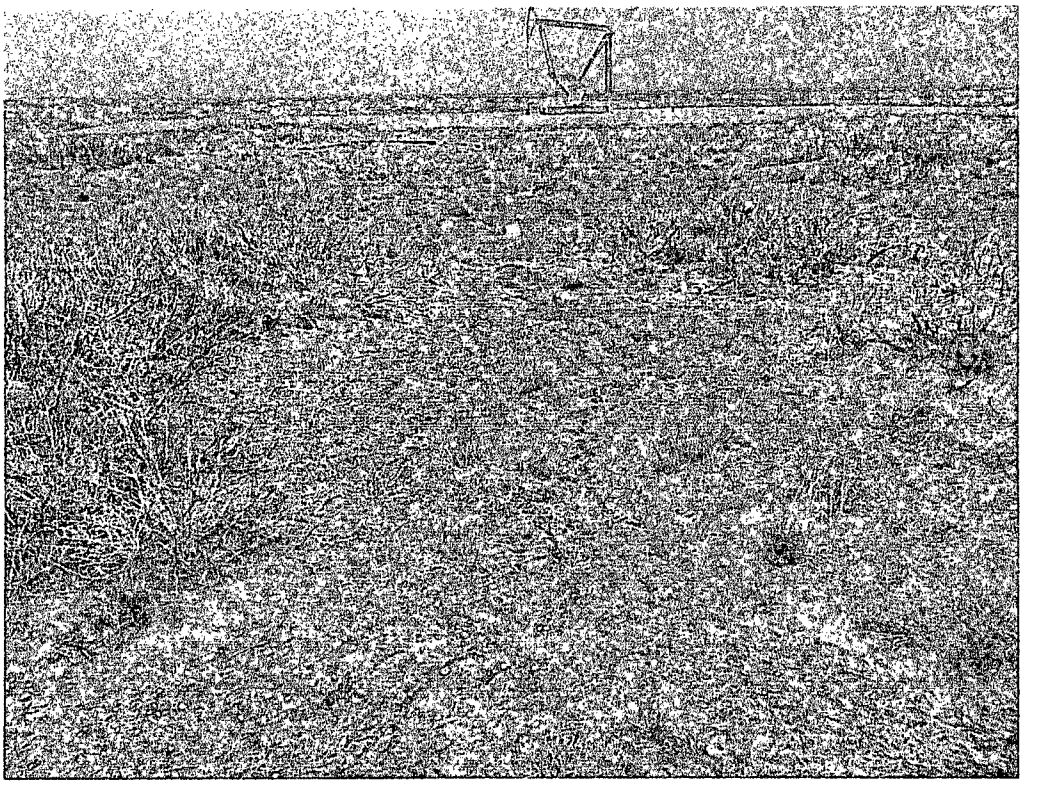
Liner Installation and Depth

Photos

COG Operating LLC
BKU #146
Eddy County, New Mexico



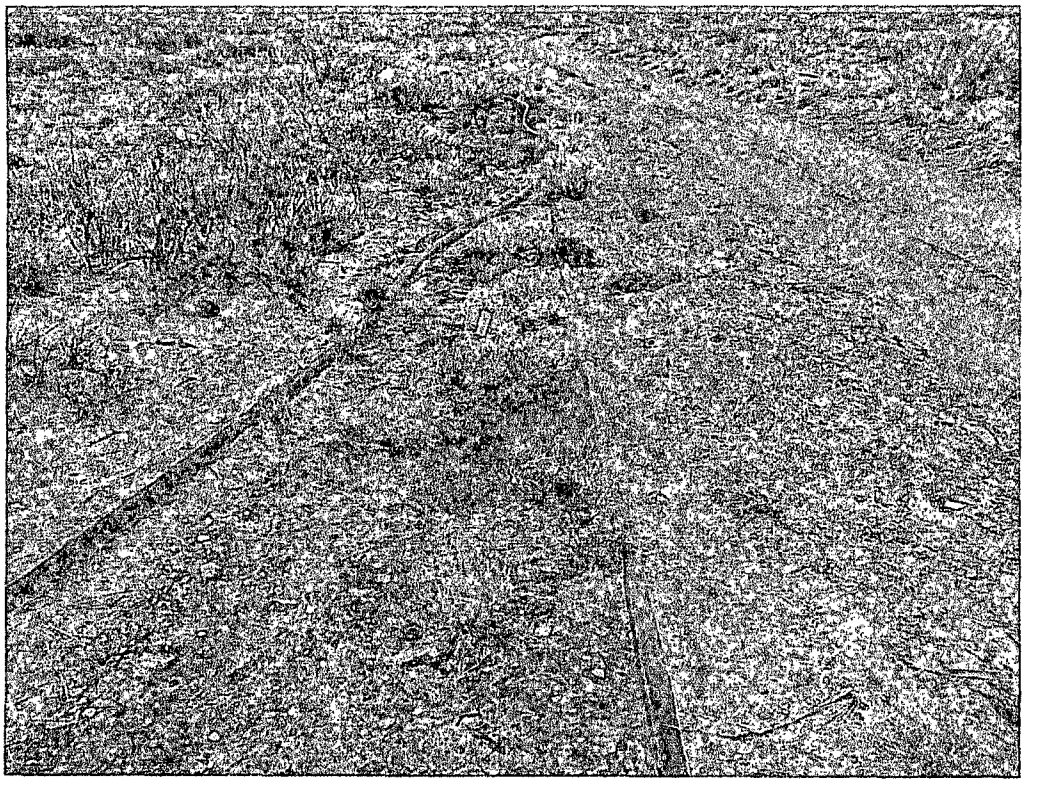
View south – near source and AH-1



View east- Near AH-2

COG Operating LLC
BKU #146
Eddy County, New Mexico

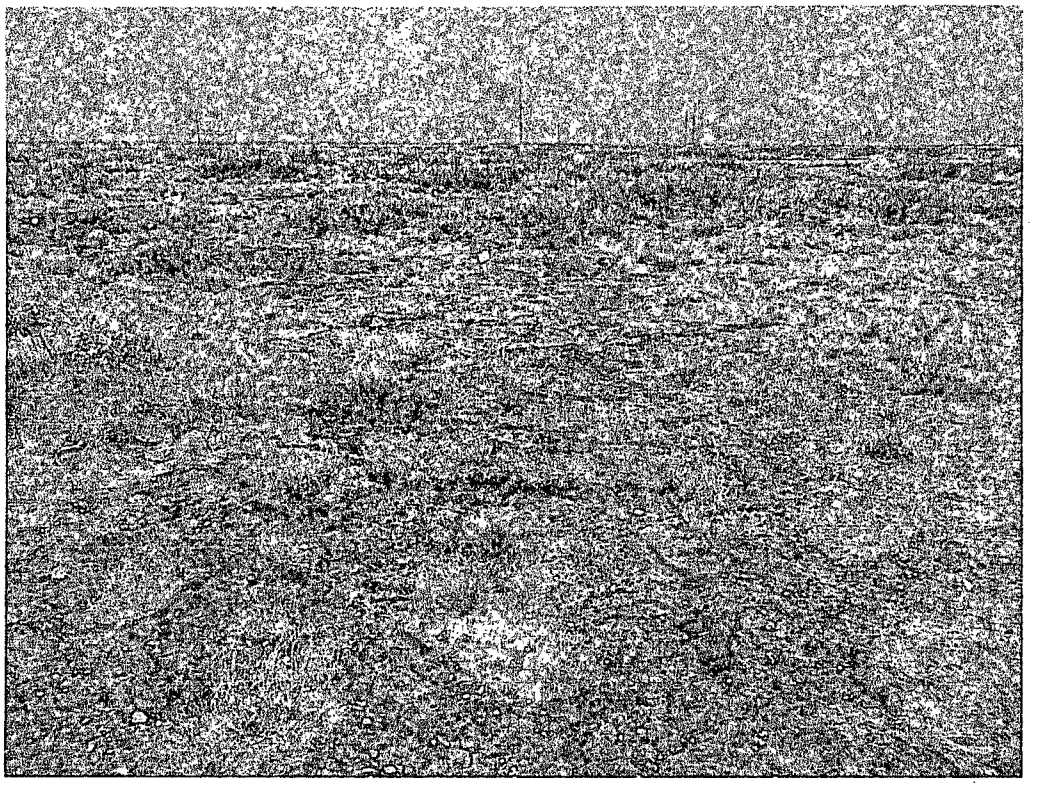
View south – Spill along two track, near AH-3



View south – Near AH-4

COG Operating LLC
BKU #146
Eddy County, New Mexico

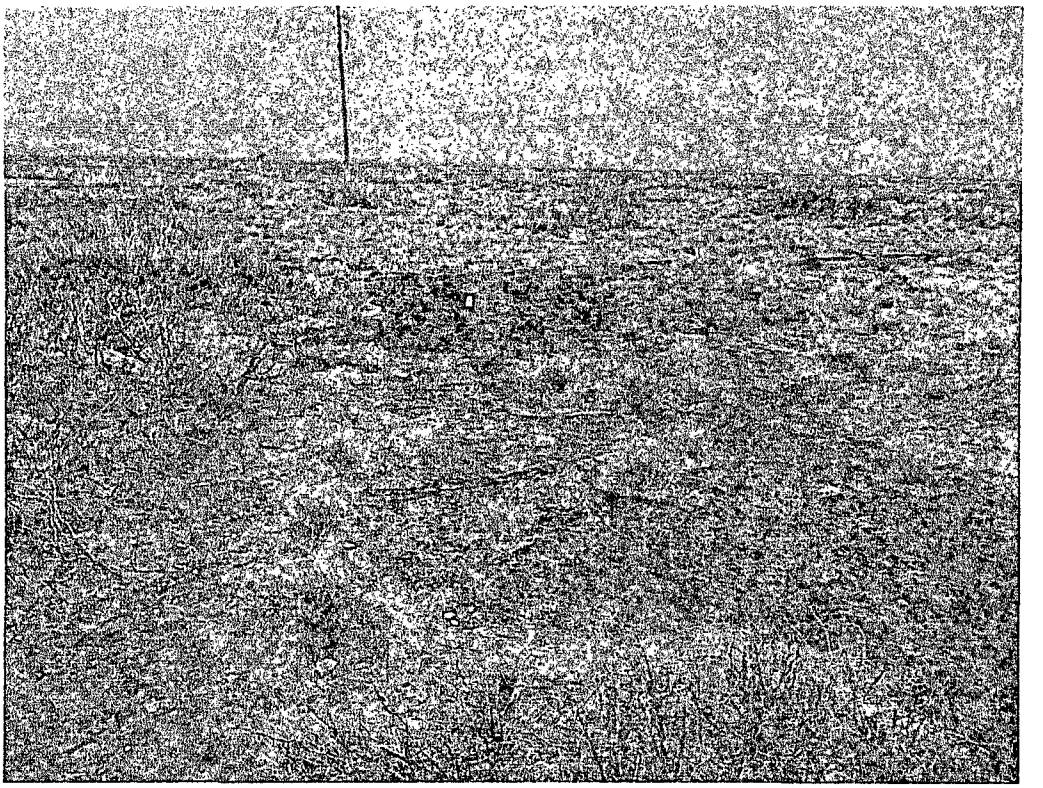
View east – Near AH-5



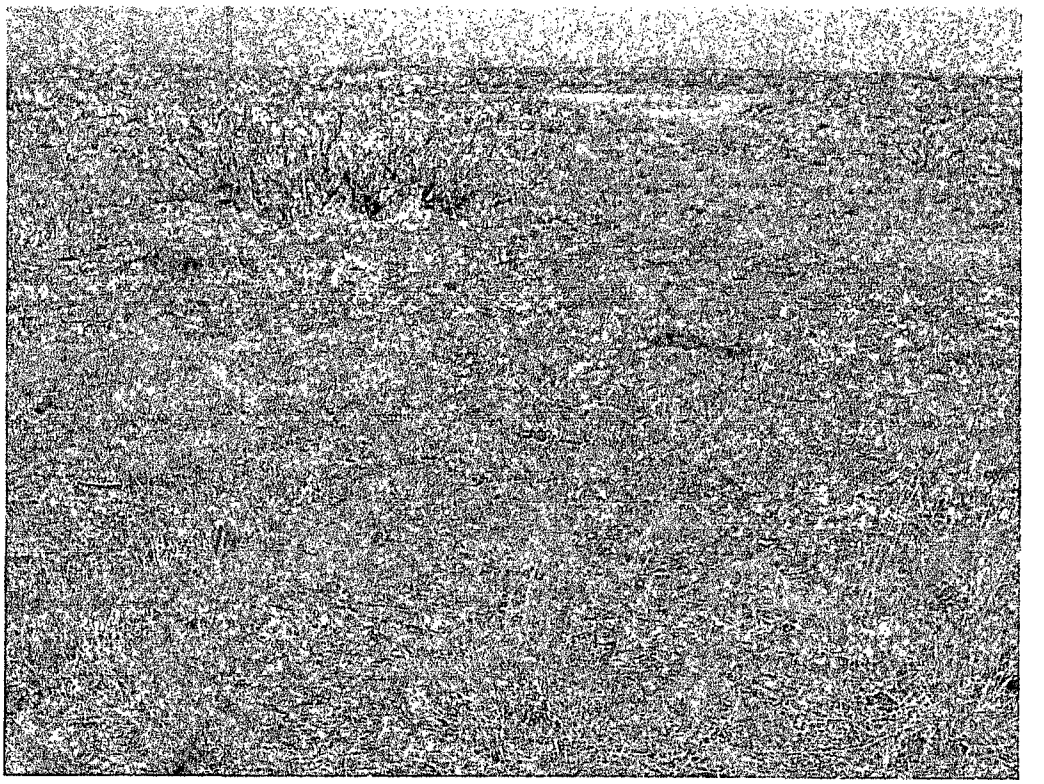
View south – Near AH-6

COG Operating LLC
BKU #146
Eddy County, New Mexico

TETRA TECH

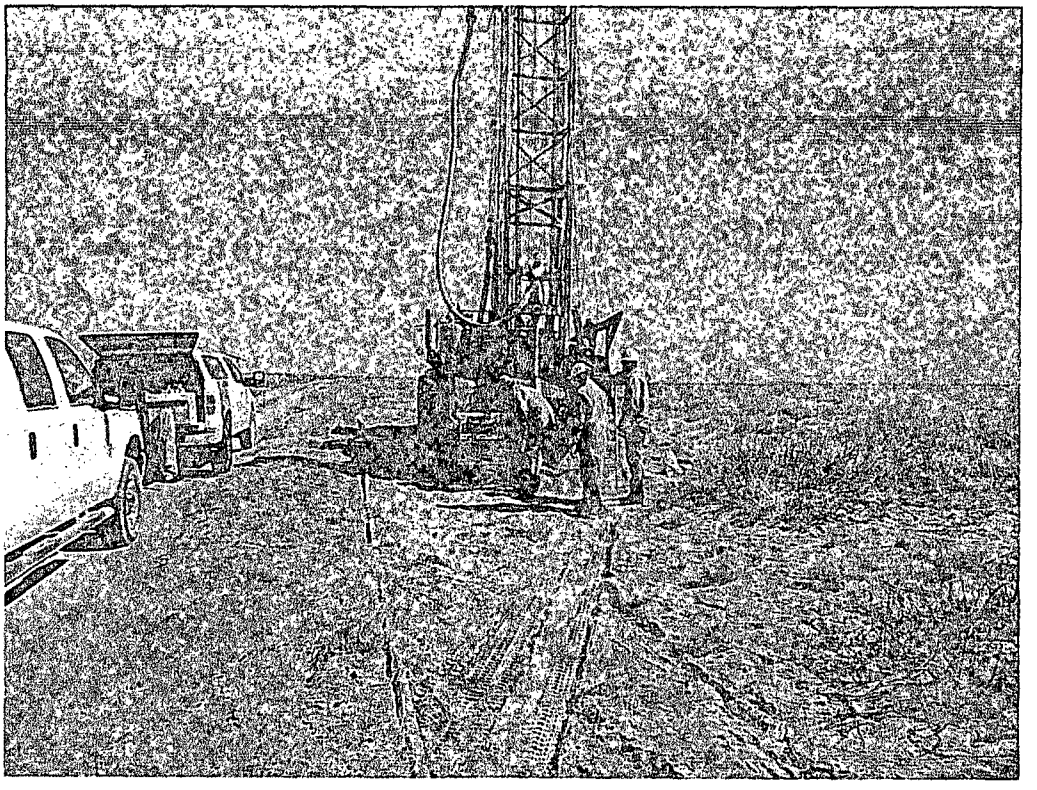


View east – Near AH-7

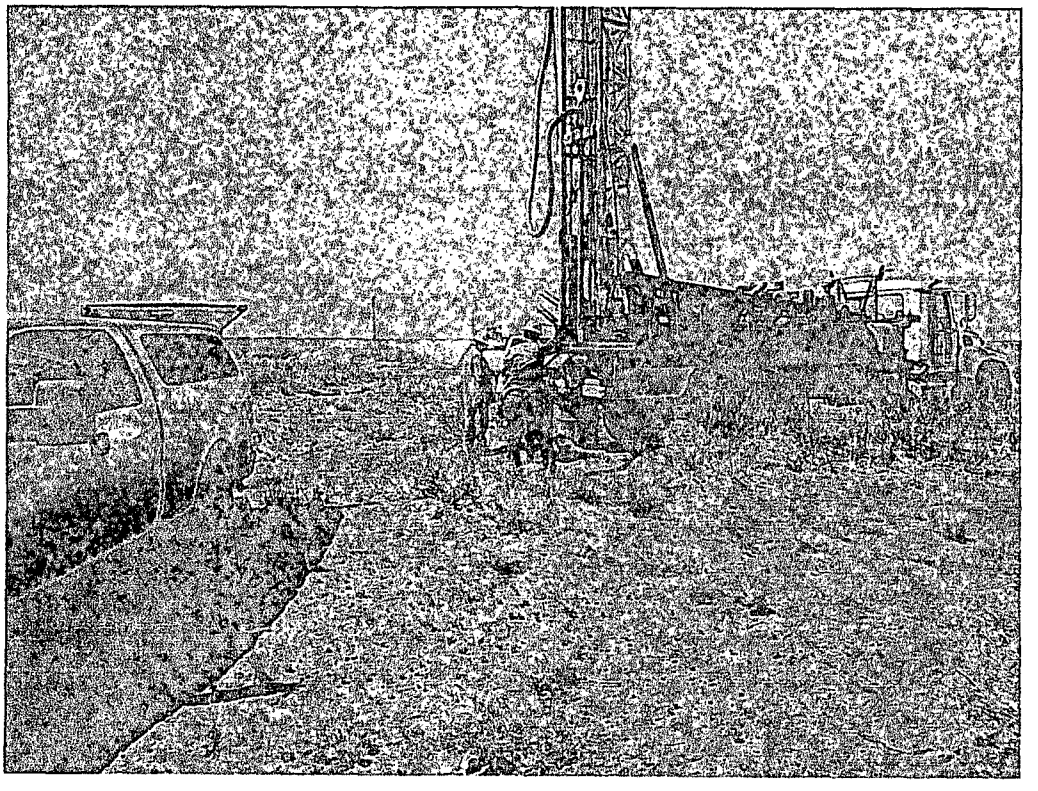


View south – AH-8

COG Operating LLC
BKU #146
Eddy County, New Mexico



View north – Installing BH-1 near AH-1



View south – Installing BH-2 near AH-2

TETRA TECH

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	COG OPERATING LLC	Contact	Pat Ellis
Address	550 W. Texas, Suite 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	BKU #146	Facility Type	Flowline

Surface Owner	Mineral Owner	Lease No. (API#)
Federal		30-015-04394

LOCATION OF RELEASE

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

Latitude 32 48.725 **Longitude** 104 00.541

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 75bbls	Volume Recovered 1bbls
Source of Release Steel flowline	Date and Hour of Occurrence 02/02/2012	Date and Hour of Discovery 02/02/2012 8:00 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-OCD, Jim Amos-BLM, Terry Gregston-BLM	
By Whom? Josh Russo	Date and Hour 02/03/2012 2:33 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.*

Steel flowline ruptured due to erosion. This section of the line has been cut and a new section has been added.

Describe Area Affected and Cleanup Action Taken.*

Initially an estimated 75bbls of produced water and a slight trace of hydrocarbons were released from the ruptured steel line. We have repaired the steel line and returned the well back into service. The closest well location to the release is the BKU #301. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD/BLM for approval prior to any significant remediation work.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Josh Russo	Approved by District Supervisor:	
Title: HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: jrusso@conchoresources.com	Conditions of Approval:	Attached ☐
Date: 02/15/2012 Phone: 432-212-2399		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - BKU #146
Eddy County, New Mexico

16 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19 **110**	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

16 South 30 East

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

16 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 **288**
18	17	16	15	14	13 **113**
19	20	21	22	23	24
30	29	28	27	26	25
31 **290**	32	33	34	35	36

17 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22 **80**	23	24
30	29 **210** **208'**	28	27	26	25
31	32	33	34	35 153	36

17 South 30 East

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

17 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34 **271**	35	36

18 South 29 East

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

18 South 30 East

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

18 South 31 East

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

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

Appendix C

Summary Report

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

Report Date: March 14, 2012

Work Order: 12030926

Project Location: Eddy Co., NM
Project Name: COG/BKU #146 Flowline
Project Number: 114-6401310

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
290959	AH-1 0-1'	soil	2012-03-08	00:00	2012-03-09
290960	AH-2 0-1'	soil	2012-03-08	00:00	2012-03-09
290961	AH-3 0-1'	soil	2012-03-08	00:00	2012-03-09
290962	AH-4 0-1'	soil	2012-03-08	00:00	2012-03-09
290963	AH-5 0-1'	soil	2012-03-08	00:00	2012-03-09
290964	AH-6 0-1'	soil	2012-03-08	00:00	2012-03-09
290965	AH-7 0-1'	soil	2012-03-08	00:00	2012-03-09
290966	AH-8 0-1'	soil	2012-03-08	00:00	2012-03-09

	BTEX				TPH DRO - NEW	TPH GRO
Sample - Field Code	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
290959 - AH-1 0-1'	<0.0200 Qs	<0.0200 Qs	**0.198** Qs	**0.600** Qs	**301**	**46.3**
290960 - AH-2 0-1'	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	**136**	**4.88**
290961 - AH-3 0-1'	<0.100 Qs	<0.100 Qs	**1.22** Qs	**2.75** Qs	**1260**	**391**
290962 - AH-4 0-1'	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	**569**	**6.18**
290963 - AH-5 0-1'	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	**92.1**	**6.21**
290964 - AH-6 0-1'	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	**109**	<2.00
290965 - AH-7 0-1'	<0.100 Qs	**0.634** Qs	**1.52** Qs	**3.28** Qs	**3040**	**146**
290966 - AH-8 0-1'	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	<0.0200 Qs	**65.4**	**2.91**

Sample: 290959 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		**8580**	mg/Kg	4

Sample: 290960 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		**8390**	mg/Kg	4

Sample: 290961 - AH-3 0-1'

Param	Flag	Result	Units	RL
Chloride		**8730**	mg/Kg	4

Sample: 290962 - AH-4 0-1'

Param	Flag	Result	Units	RL
Chloride		**8260**	mg/Kg	4

Sample: 290963 - AH-5 0-1'

Param	Flag	Result	Units	RL
Chloride		**7630**	mg/Kg	4

Sample: 290964 - AH-6 0-1'

Param	Flag	Result	Units	RL
Chloride		**11000**	mg/Kg	4

Sample: 290965 - AH-7 0-1'

Param	Flag	Result	Units	RL
Chloride		**6530**	mg/Kg	4

Sample: 290966 - AH-8 0-1'

Param	Flag	Result	Units	RL
Chloride		**6310**	mg/Kg	4

Summary Report

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

Report Date: May 4, 2012

Work Order: 12042420

Project Location: Eddy Co., NM
Project Name: COG/BKU #146 Flowline
Project Number: 114-6401310

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
295112	BH-1 @ AH-1 0-1'	soil	2012-04-20	00:00	2012-04-24
295113	BH-1 @ AH-1 2-3'	soil	2012-04-20	00:00	2012-04-24
295114	BH-1 @ AH-1 4-5'	soil	2012-04-20	00:00	2012-04-24
295115	BH-1 @ AH-1 6-7'	soil	2012-04-20	00:00	2012-04-24
295116	BH-1 @ AH-1 9-10'	soil	2012-04-20	00:00	2012-04-24
295117	BH-1 @ AH-1 14-15'	soil	2012-04-20	00:00	2012-04-24
295118	BH-1 @ AH-1 19-20'	soil	2012-04-20	00:00	2012-04-24
295119	BH-1 @ AH-1 24-25'	soil	2012-04-20	00:00	2012-04-24
295120	BH-1 @ AH-1 29-30'	soil	2012-04-20	00:00	2012-04-24
295122	BH-1 @ AH-1 49-50'	soil	2012-04-20	00:00	2012-04-24
295123	BH-2 @ AH-2 0-1'	soil	2012-04-20	00:00	2012-04-24
295124	BH-2 @ AH-2 2-3'	soil	2012-04-20	00:00	2012-04-24
295125	BH-2 @ AH-2 4-5'	soil	2012-04-20	00:00	2012-04-24
295126	BH-2 @ AH-2 6-7'	soil	2012-04-20	00:00	2012-04-24
295127	BH-2 @ AH-2 9-10'	soil	2012-04-20	00:00	2012-04-24
295128	BH-2 @ AH-2 14-15'	soil	2012-04-20	00:00	2012-04-24
295129	BH-2 @ AH-2 19-20'	soil	2012-04-20	00:00	2012-04-24
295132	BH-3 @ AH-3 0-1'	soil	2012-04-19	00:00	2012-04-24
295133	BH-3 @ AH-3 2-3'	soil	2012-04-19	00:00	2012-04-24
295134	BH-3 @ AH-3 4-5'	soil	2012-04-19	00:00	2012-04-24
295135	BH-3 @ AH-3 6-7'	soil	2012-04-19	00:00	2012-04-24
295136	BH-3 @ AH-3 9-10'	soil	2012-04-19	00:00	2012-04-24
295137	BH-3 @ AH-3 14-15'	soil	2012-04-19	00:00	2012-04-24
295138	BH-3 @ AH-3 19-20'	soil	2012-04-19	00:00	2012-04-24
295139	BH-3 @ AH-3 24-25'	soil	2012-04-19	00:00	2012-04-24
295140	BH-3 @ AH-3 29-30'	soil	2012-04-19	00:00	2012-04-24
295141	BH-3 @ AH-3 39-40'	soil	2012-04-19	00:00	2012-04-24
295142	BH-3 @ AH-3 49-50'	soil	2012-04-19	00:00	2012-04-24
295145	BH-4 @ AH-4 0-1'	soil	2012-04-19	00:00	2012-04-24
295146	BH-4 @ AH-4 2-3'	soil	2012-04-19	00:00	2012-04-24

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
295147	BH-4 @ AH-4 4-5'	soil	2012-04-19	00:00	2012-04-24
295148	BH-4 @ AH-4 6-7'	soil	2012-04-19	00:00	2012-04-24
295149	BH-4 @ AH-4 9-10'	soil	2012-04-19	00:00	2012-04-24
295150	BH-4 @ AH-4 14-15'	soil	2012-04-19	00:00	2012-04-24
295151	BH-4 @ AH-4 19-20'	soil	2012-04-19	00:00	2012-04-24
295152	BH-4 @ AH-4 24-25'	soil	2012-04-19	00:00	2012-04-24
295153	BH-4 @ AH-4 29-30'	soil	2012-04-19	00:00	2012-04-24
295154	BH-4 @ AH-4 39-40'	soil	2012-04-19	00:00	2012-04-24

Sample: 295112 - BH-1 @ AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		**8090**	mg/Kg	4

Sample: 295113 - BH-1 @ AH-1 2-3'

Param	Flag	Result	Units	RL
Chloride		**12500**	mg/Kg	4

Sample: 295114 - BH-1 @ AH-1 4-5'

Param	Flag	Result	Units	RL
Chloride		**15200**	mg/Kg	4

Sample: 295115 - BH-1 @ AH-1 6-7'

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

Sample: 295116 - BH-1 @ AH-1 9-10'

Param	Flag	Result	Units	RL
Chloride		**12600**	mg/Kg	4

Sample: 295117 - BH-1 @ AH-1 14-15'

Param	Flag	Result	Units	RL
Chloride		**10200**	mg/Kg	4

Sample: 295118 - BH-1 @ AH-1 19-20'

Param	Flag	Result	Units	RL
Chloride		**1110**	mg/Kg	4

Sample: 295119 - BH-1 @ AH-1 24-25'

Param	Flag	Result	Units	RL
Chloride		**2530**	mg/Kg	4

Sample: 295120 - BH-1 @ AH-1 29-30'

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

Sample: 295122 - BH-1 @ AH-1 49-50'

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

Sample: 295123 - BH-2 @ AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		**5570**	mg/Kg	4

Sample: 295124 - BH-2 @ AH-2 2-3'

Param	Flag	Result	Units	RL
Chloride		**13800**	mg/Kg	4

Sample: 295125 - BH-2 @ AH-2 4-5'

Param	Flag	Result	Units	RL
Chloride		**9120**	mg/Kg	4

Sample: 295126 - BH-2 @ AH-2 6-7'

Param	Flag	Result	Units	RL
Chloride		**1890**	mg/Kg	4

Sample: 295127 - BH-2 @ AH-2 9-10'

Param	Flag	Result	Units	RL
Chloride		**517**	mg/Kg	4

Sample: 295128 - BH-2 @ AH-2 14-15'

Param	Flag	Result	Units	RL
Chloride		**117**	mg/Kg	4

Sample: 295129 - BH-2 @ AH-2 19-20'

Param	Flag	Result	Units	RL
Chloride		**43.9**	mg/Kg	4

Sample: 295132 - BH-3 @ AH-3 0-1'

Param	Flag	Result	Units	RL
Chloride		**6380**	mg/Kg	4

Sample: 295133 - BH-3 @ AH-3 2-3'

Param	Flag	Result	Units	RL
Chloride		**5280**	mg/Kg	4

Sample: 295134 - BH-3 @ AH-3 4-5'

Param	Flag	Result	Units	RL
Chloride		**14900**	mg/Kg	4

Sample: 295135 - BH-3 @ AH-3 6-7'

Param	Flag	Result	Units	RL
Chloride		**11600**	mg/Kg	4

Sample: 295136 - BH-3 @ AH-3 9-10'

Param	Flag	Result	Units	RL
Chloride		**10200**	mg/Kg	4

Sample: 295137 - BH-3 @ AH-3 14-15'

Param	Flag	Result	Units	RL
Chloride		**10800**	mg/Kg	4

Sample: 295138 - BH-3 @ AH-3 19-20'

Param	Flag	Result	Units	RL
Chloride		**3560**	mg/Kg	4

Sample: 295139 - BH-3 @ AH-3 24-25'

Param	Flag	Result	Units	RL
Chloride		**6790**	mg/Kg	4

Sample: 295140 - BH-3 @ AH-3 29-30'

Param	Flag	Result	Units	RL
Chloride		**6900**	mg/Kg	4

Sample: 295141 - BH-3 @ AH-3 39-40'

Param	Flag	Result	Units	RL
Chloride		**321**	mg/Kg	4

Sample: 295142 - BH-3 @ AH-3 49-50'

Param	Flag	Result	Units	RL
Chloride		**97.3**	mg/Kg	4

Sample: 295145 - BH-4 @ AH-4 0-1'

Param	Flag	Result	Units	RL
Chloride		**6960**	mg/Kg	4

Sample: 295146 - BH-4 @ AH-4 2-3'

Param	Flag	Result	Units	RL
Chloride		**11900**	mg/Kg	4

Sample: 295147 - BH-4 @ AH-4 4-5'

Param	Flag	Result	Units	RL
Chloride		**14900**	mg/Kg	4

Sample: 295148 - BH-4 @ AH-4 6-7'

Param	Flag	Result	Units	RL
Chloride		**13000**	mg/Kg	4

Sample: 295149 - BH-4 @ AH-4 9-10'

Param	Flag	Result	Units	RL
Chloride		**13400**	mg/Kg	4

Sample: 295150 - BH-4 @ AH-4 14-15'

Param	Flag	Result	Units	RL
Chloride		**6520**	mg/Kg	4

Sample: 295151 - BH-4 @ AH-4 19-20'

Param	Flag	Result	Units	RL
Chloride		**3080**	mg/Kg	4

Sample: 295152 - BH-4 @ AH-4 24-25'

Param	Flag	Result	Units	RL
Chloride		**734**	mg/Kg	4

Sample: 295153 - BH-4 @ AH-4 29-30'

Param	Flag	Result	Units	RL
Chloride		**2170**	mg/Kg	4

Sample: 295154 - BH-4 @ AH-4 39-40'

Param	Flag	Result	Units	RL
Chloride		**151**	mg/Kg	4