

SITE INFORMATION

Report Type: Work Plan

General Site Information:

Site:	Dogwood Federal	
Company:	COG Operating LLC	
Section, Township and Range	Unit F - Section 25 - Township 17 South - Range 27 East	
Lease Number:	30-015-32927	
County:	Eddy County	
GPS:	32 48.351	104 14.115
Surface Owner:	Federal	
Mineral Owner:		
Directions:	From the intersection of Hwy 82 and Hwy 360, travel west on 82 4.3 miles, turn left on CR-225 and travel 0.3 miles, turn left and travel 0.1 miles to location.	

Release Data:

Date Released:	3/1/2011
Type Release:	Produced Water
Source of Contamination:	Water tank over ran
Fluid Released:	10 bbls
Fluids Recovered:	8 bbls

Official Communication:

Name:	Pat Ellis	Kim Dorey
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) 631-0348
Fax:	(432) 684-7137	
Email:	pellis@conchoresources.com	kim.dorey@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	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:		0

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

RECEIVED

OCT 17 2011

NMOCD ARTESIA



TETRA TECH

September 14, 2011

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., Dogwood Federal Tank Battery, Unit F, Section 25, Township 17 South, Range 27 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 Dogwood Federal Tank Battery, Unit F, Section 25, Township 17 South, Range 27 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32° 48.352, W 104° 14.115. 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 March 1, 2011, and approximately ten (10) barrels of produced fluids were released when a scheduled water transporter failed to make a pickup, allowing a water tank to overflow. Eight (8) barrels of standing fluids were recovered. The spill initiated from the tank and impacted areas approximately 8' x 60' and 8' x 20'. The entire spill was contained within the facility firewalls. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 25. According to the NMOCD groundwater map, the average depth to groundwater in this area is 125' to 150' below surface. The groundwater well report data is included in Appendix B.



Regulatory

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

Soil Assessment and Analytical Results

On March 25, 2011, Tetra Tech personnel inspected and sampled the spill areas. Three auger holes (AH-1, AH-2, and AH-3) 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 sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, auger hole (AH-1) samples were below the RRAL for TPH and BTEX. AH-2 and AH-3 exceeded the RRAL at 0-1' for total BTEX, with concentrations of 172 mg/kg and 158 mg/kg, respectively. AH-3 was defined at 1-1.5' below surface.

Elevated chloride concentrations were detected in AH-2 and AH-3. Auger hole (AH-2) showed a chloride concentration of 9,780 mg/kg at 0-1', which declined to 252 mg/kg at 3.0' below surface. However, a chloride concentration of 2,330 mg/kg was detected at 5.0' and did not appear vertically defined. The area of AH-3 showed elevated chloride concentrations from 0-1' of 7,720 mg/kg, which declined with depth to 2,140 mg/kg.

In order to define the extent of the chloride impact, deeper samples were collected utilizing an air rotary drilling rig. On June 27, 2011, Tetra Tech personnel supervised the installation of two soil bores (SB-1 and SB-2). Due to the limited access of the site, the facility berm was removed to gain access for the drilling rig. Samples were collected to a depth of 20' and



submitted for laboratory analysis. The sampling results are summarized in Table 1. The soil bore locations are shown on Figure 3. Referring to Table 1, SB-1 and SB-2 were vertically defined.

Work Plan

Based on the results, the chloride impact appears to be limited and confined to the area inside the dike. In order to remediate the site, COG proposes to remove chloride impacted soils as highlighted (green) in Table 1. In the area of AH-2 and AH-3, the proposed excavation depths are estimated at 2.0' to 5.0' below surface. In addition, a confirmation sample will be collected in the area of AH-2 to confirm the removal of the Total BTEX exceeding the RRAL. Once excavated to the appropriate depths, the excavation will be backfill with clean material. All of the excavated soil will be transported to proper disposal.

Due to the limited access issues within the facility, 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 safety concerns. As such, Tetra Tech will excavate the soils to the maximum extent practicable. If deeper impact is encountered, the impacted area will be capped with clay or 40 mil liner.

Upon completion a final report will be submitted to the NMOCD and BLM. 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



Ilke Tavaréz, PG
Project Manager

cc: Pat Ellis – COG
Terry Gregston - BLM

Figures

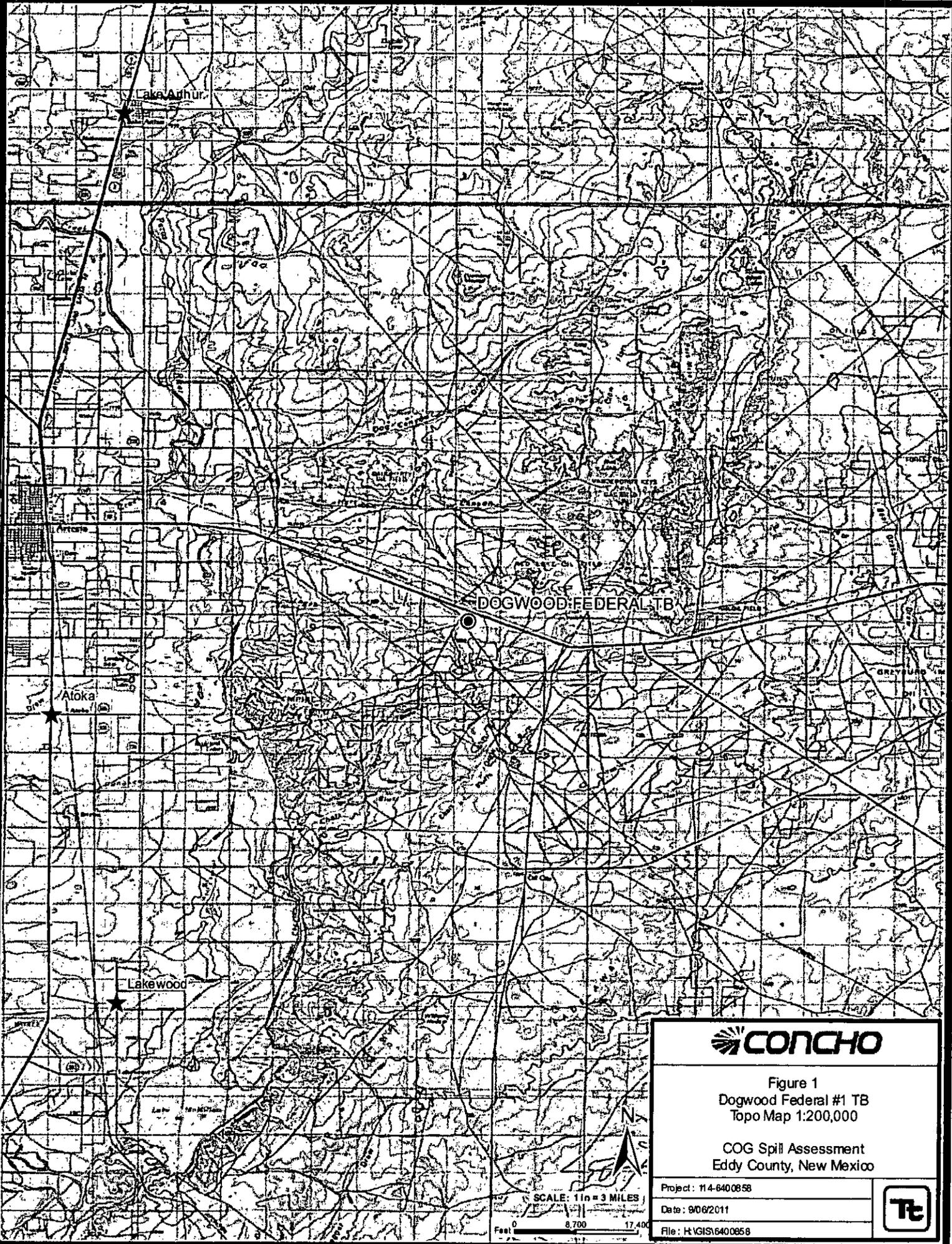


Figure 1
Dogwood Federal #1 TB
Topo Map 1:200,000

COG Spill Assessment
Eddy County, New Mexico

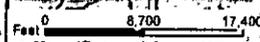
Project: 114-6400858

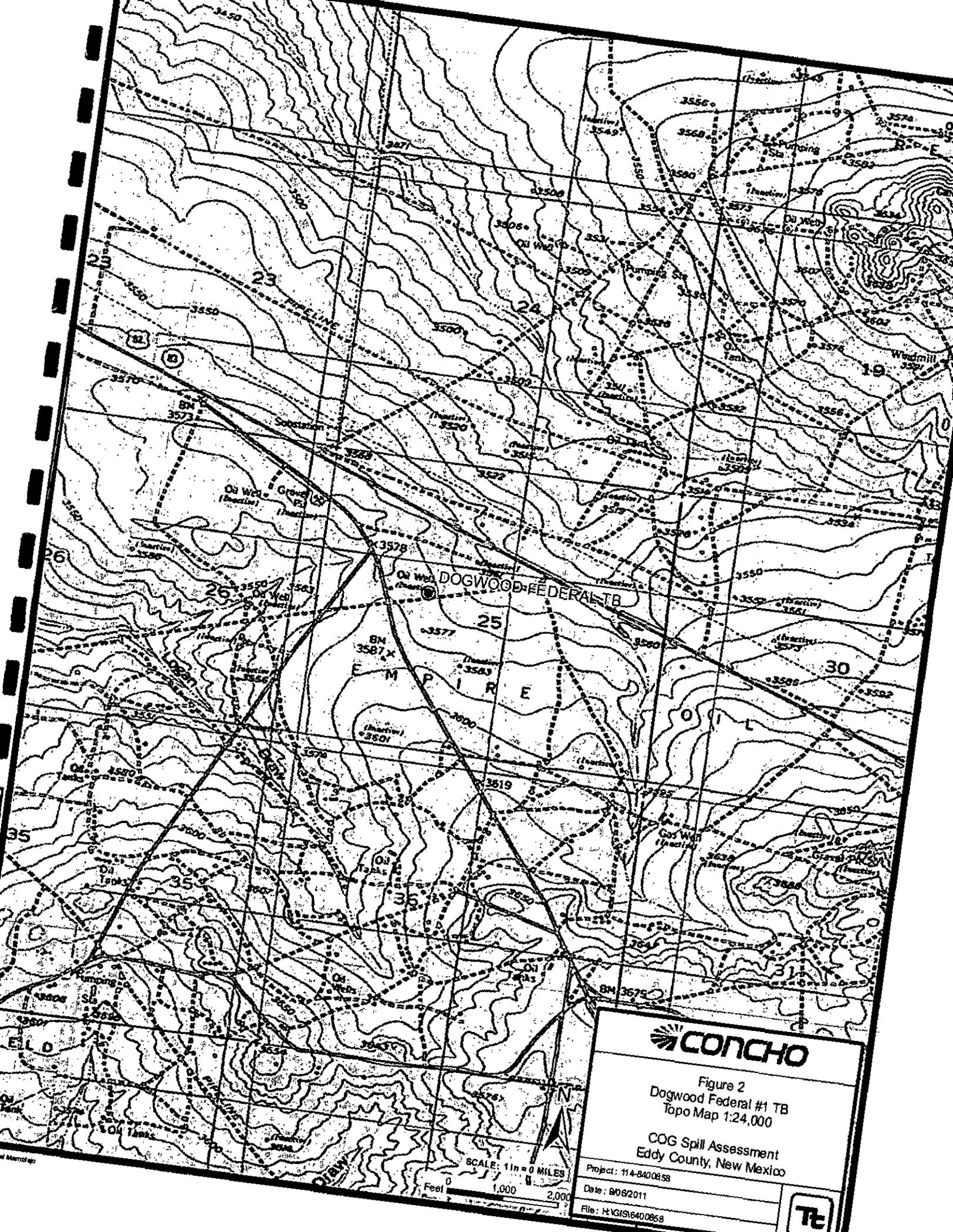
Date: 9/06/2011

File: H:\GIS\16400858



SCALE: 1 in = 3 MILES





CONCHO

Figure 2
Dogwood Federal #1 TB
Topo Map 1:24,000

COG Spill Assessment
Eddy County, New Mexico

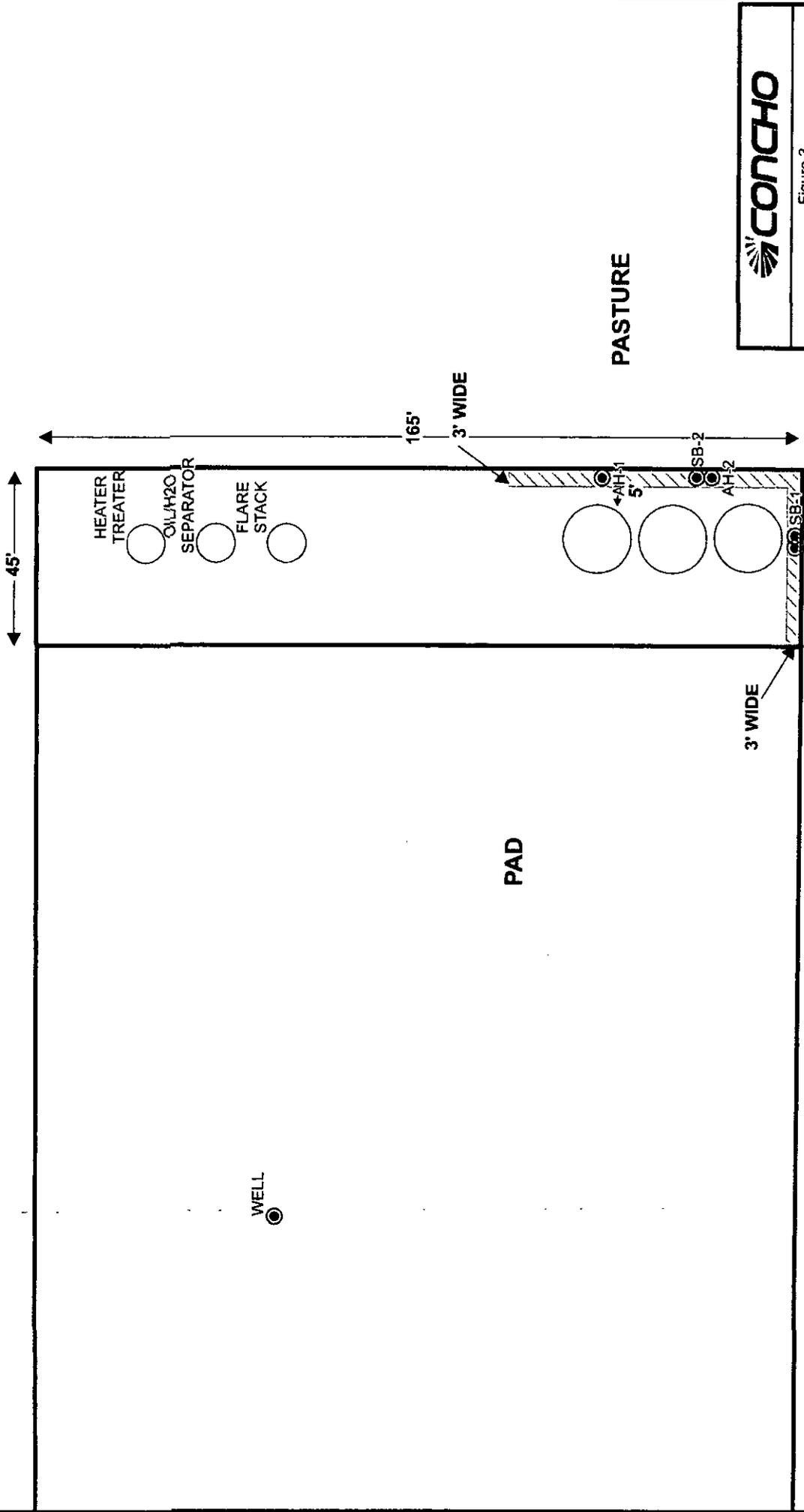
Project: 114-8400858

Date: 06/2011

File: H:\GIS\16400858



SCALE: 1 in = 0 MILES
0 1,000 2,000 Feet



CONCHO

Figure 3

Dogwood Federal #1 TB
Spill Assessment Map

COG Spill Assessment
Eddy County, New Mexico

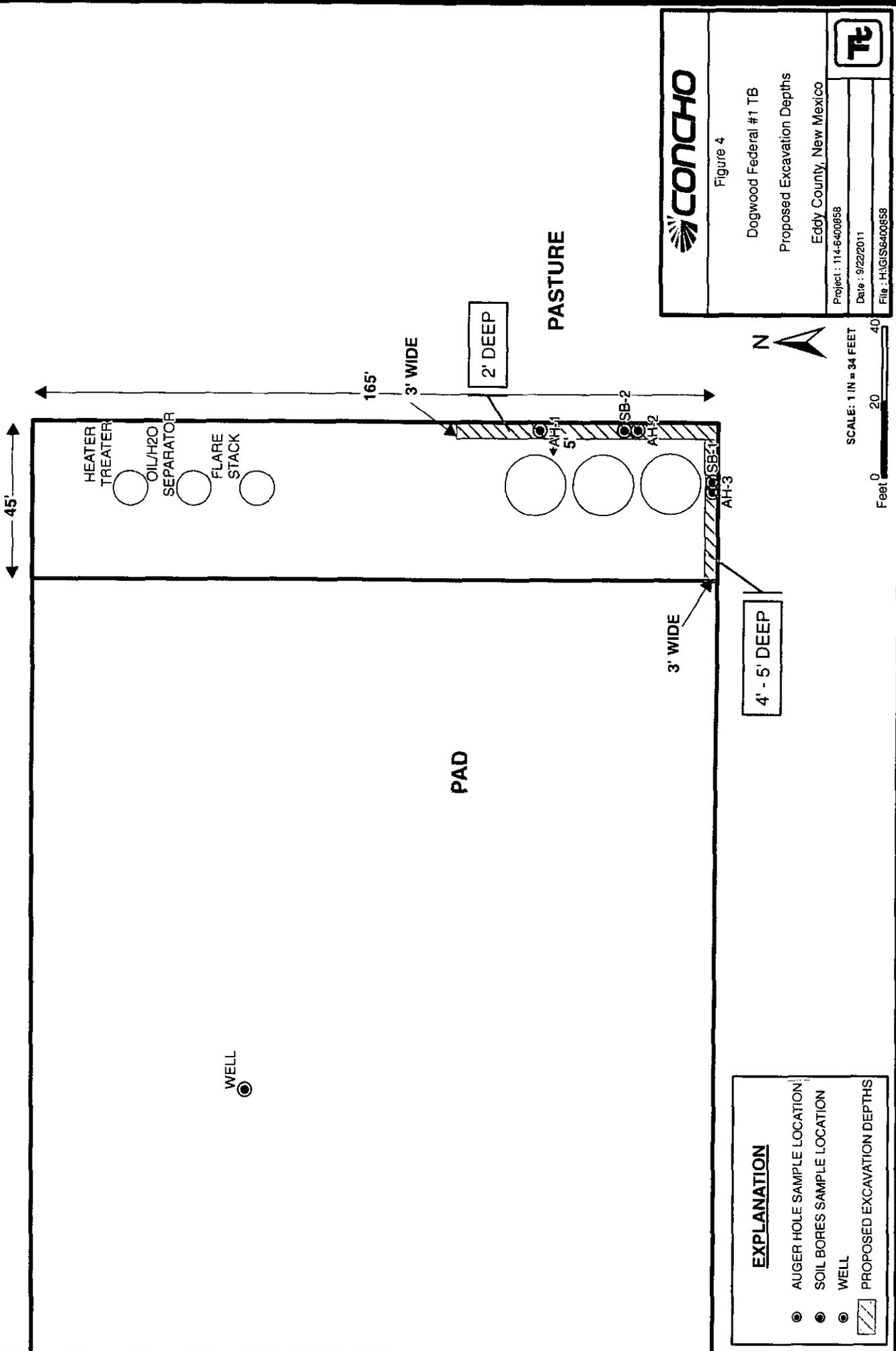
Project : 114-6400858
Date : 9/2/2011
File : H:\GIS\6400858



SCALE: 1 IN = 34 FEET

0 20 40
Feet

EXPLANATION	
	AUGER HOLE SAMPLE LOCATION
	SOIL BORES SAMPLE LOCATION
	WELL
	SPILL AREA



CONCHO

Figure 4

Dogwood Federal #1 TB

Proposed Excavation Depths

Eddy County, New Mexico

Project : 114-6400658

Date : 9/22/2011

File : HGIS6400658




SCALE: 1 IN = 34 FEET

0 20 40

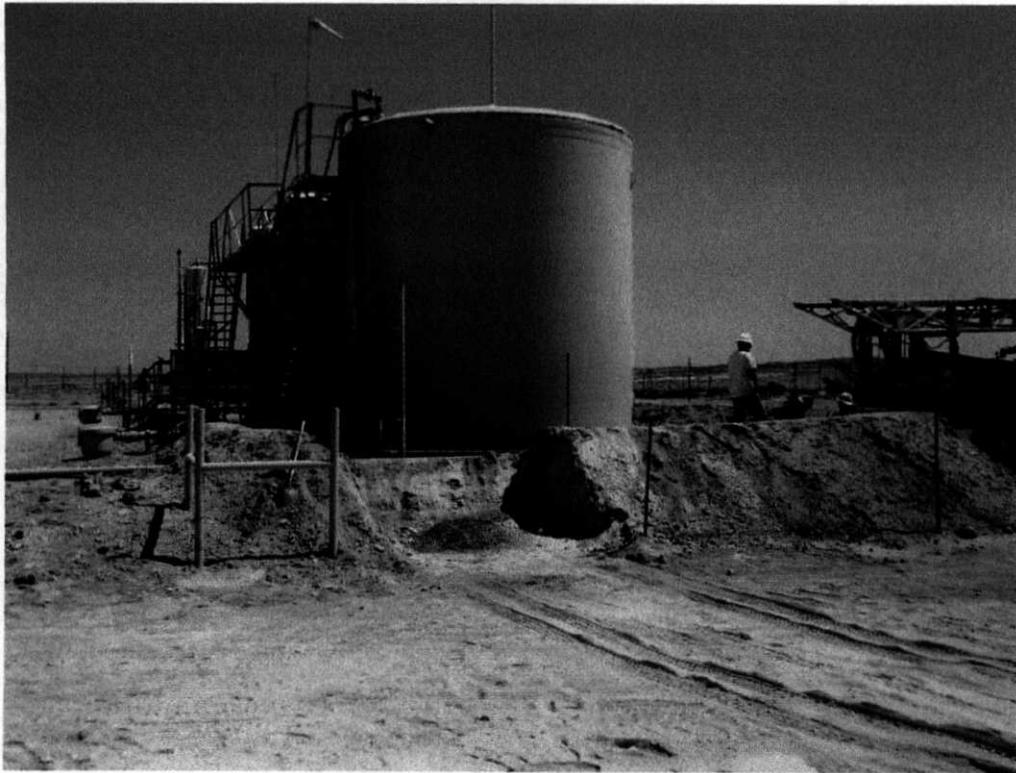
Feet

EXPLANATION	
	AUGER HOLE SAMPLE LOCATION
	SOIL BORES SAMPLE LOCATION
	WELL
	PROPOSED EXCAVATION DEPTHS

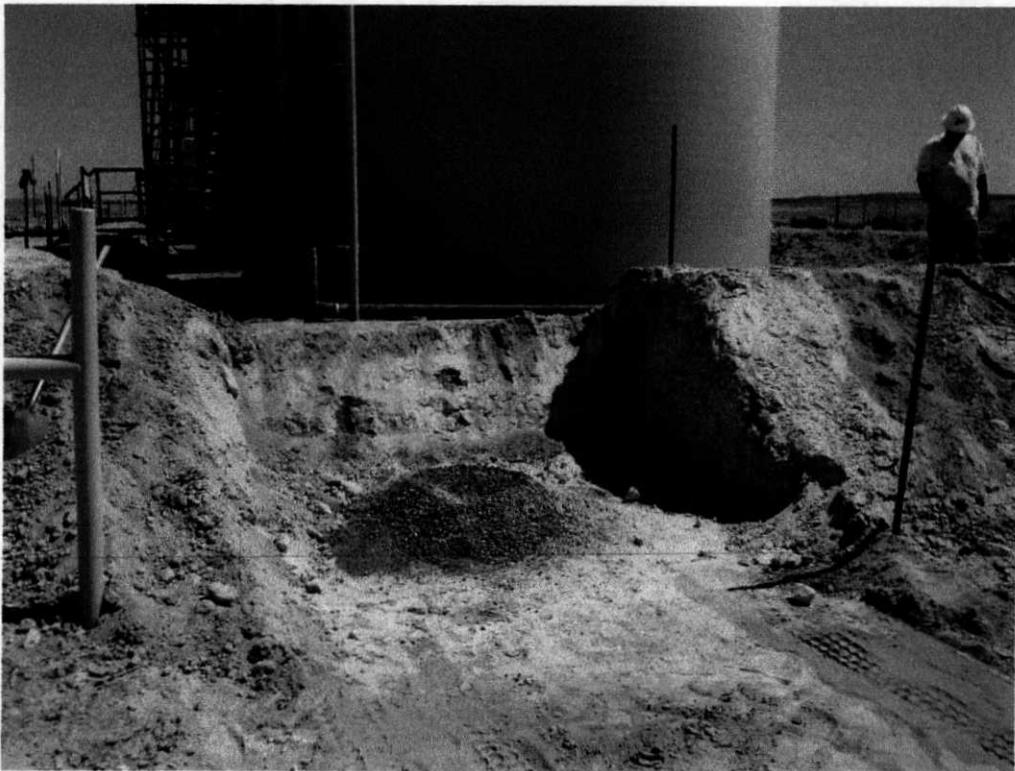
COG Operating LLC
Dogwood Federal
Eddy County, New Mexico
Site Drilling: June 27, 2011



TETRA TECH



Berm removed to gain access for drilling rig



SB-1

Tables

Table 1
 COG Operating LLC.
 DOGWOOD FEDERAL #1 TANK BATTERY
 Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Total BTEX	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
AH-3	3/24/2011	0-0.5'		X		1,820	1,160	2,980	6.09	45.2	36.5	69.9	158	7,720
	"	1'		X		15.6	<50.0	15.6	<0.0200	0.166	<0.0200	0.443	0.61	3,780
	"	2'		X		-	-	-	-	-	-	-	-	2,490
	"	3'		X		-	-	-	-	-	-	-	-	5,060
	"	4'		X		-	-	-	-	-	-	-	-	2,140
SB-1	6/27/2011	0-1'	3'	X		-	-	-	-	-	-	-	-	3,700
	"	3'		X		-	-	-	-	-	-	-	-	325
	"	5'		X		-	-	-	-	-	-	-	-	<200
	"	7'		X		-	-	-	-	-	-	-	-	<200
	"	10'		X		-	-	-	-	-	-	-	-	<200
	"	15'		X		-	-	-	-	-	-	-	-	<200
	"	20'		X		-	-	-	-	-	-	-	-	<200

(-) Not Analyzed
 BEB Below Excavation Bottom
 Proposed Excavation Depth

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	Dogwood Federal	Facility Type	Tank Battery

Surface Owner	Federal	Mineral Owner		Lease No. (API#)	30-015-32927 NMNM-94594
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LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County	Eddy
F	25	17S	27E						

Latitude 32 48.351 Longitude 104 14.115

NATURE OF RELEASE

Type of Release	Produced water	Volume of Release	10bbls	Volume Recovered	8bbls
Source of Release	Water tank	Date and Hour of Occurrence	03/01/2011	Date and Hour of Discovery	03/01/2011 3:30 p.m.
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?			
By Whom?		Date and Hour			
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.*

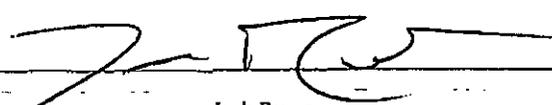
Describe Cause of Problem and Remedial Action Taken.*

Water haulers failed to pick up water after the well was turned back on.

Describe Area Affected and Cleanup Action Taken.*

Initially 10bbls was released from the water tank and we were able to recover 8bbls with a vacuum truck. The entire release was contained inside the facility berm walls and it measure and area of 3' x 50'. All standing fluid has been removed and contamination has been dug out. 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:	
Date:	03/10/2011	Phone:	432-212-2399
			Attached <input type="checkbox"/>

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Dogwood Federal #1
Eddy County, New Mexico

16 South 26 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 27 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 28 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

17 South 26 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

17 South 27 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

17 South 28 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 26 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 27 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 28 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

- New Mexico State Engineers Well Reports
- USGS Well Reports
- Field water level
- New Mexico Water and Infrastructure Data System
- SITE - Dogwood Federal

Appendix C

Summary Report

Victoria Inman
Tetra Tech
1910 N. Big Spring Street
Midland, TX 79705

Report Date: April 4, 2011

Work Order: 11032820



Project Location: Eddy Co., NM
Project Name: COG/Dogwood Fed. #1 TB
Project Number: 114-6400858

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
261891	AH-1 0-0.5'	soil	2011-03-25	00:00	2011-03-28
261892	AH-1 1'	soil	2011-03-25	00:00	2011-03-28
261893	AH-1 2'	soil	2011-03-25	00:00	2011-03-28
261894	AH-1 3'	soil	2011-03-25	00:00	2011-03-28
261895	AH-1 4'	soil	2011-03-25	00:00	2011-03-28
261896	AH-1 5'	soil	2011-03-25	00:00	2011-03-28
261897	AH-2 0-0.5'	soil	2011-03-25	00:00	2011-03-28
261898	AH-2 1'	soil	2011-03-25	00:00	2011-03-28
261899	AH-2 2'	soil	2011-03-25	00:00	2011-03-28
261900	AH-2 3'	soil	2011-03-25	00:00	2011-03-28
261901	AH-2 4'	soil	2011-03-25	00:00	2011-03-28
261902	AH-2 5'	soil	2011-03-25	00:00	2011-03-28
261903	AH-3 0-0.5'	soil	2011-03-25	00:00	2011-03-28
261904	AH-3 1'	soil	2011-03-25	00:00	2011-03-28
261905	AH-3 2'	soil	2011-03-25	00:00	2011-03-28
261906	AH-3 3'	soil	2011-03-25	00:00	2011-03-28
261907	AH-3 4'	soil	2011-03-25	00:00	2011-03-28

Sample - Field Code	BTEX				TPH DRO - NEW DRO (mg/Kg)	TPH GRO GRO (mg/Kg)
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)		
261891 - AH-1 0-0.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
261897 - AH-2 0-0.5'	3.54	45.5	40.6	82.1	672	1590
261903 - AH-3 0-0.5'	6.09	45.2	36.5	69.9	1160	1820
261904 - AH-3 1'	<0.0200	0.166	<0.0200	0.443	<50.0	15.6

Sample: 261891 - AH-1 0-0.5'

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

Sample: 261892 - AH-1 1'

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

Sample: 261893 - AH-1 2'

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

Sample: 261894 - AH-1 3'

Param	Flag	Result	Units	RL
Chloride		205	mg/Kg	4.00

Sample: 261895 - AH-1 4'

Param	Flag	Result	Units	RL
Chloride		214	mg/Kg	4.00

Sample: 261896 - AH-1 5'

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

Sample: 261897 - AH-2 0-0.5'

Param	Flag	Result	Units	RL
Chloride		9780	mg/Kg	4.00

Sample: 261898 - AH-2 1'

Param	Flag	Result	Units	RL
Chloride		3430	mg/Kg	4.00

Sample: 261899 - AH-2 2'

Param	Flag	Result	Units	RL
Chloride		1750	mg/Kg	4.00

Sample: 261900 - AH-2 3'

Param	Flag	Result	Units	RL
Chloride		252	mg/Kg	4.00

Sample: 261901 - AH-2 4'

Param	Flag	Result	Units	RL
Chloride		370	mg/Kg	4.00

Sample: 261902 - AH-2 5'

Param	Flag	Result	Units	RL
Chloride		2330	mg/Kg	4.00

Sample: 261903 - AH-3 0-0.5'

Param	Flag	Result	Units	RL
Chloride		7720	mg/Kg	4.00

Sample: 261904 - AH-3 1'

Param	Flag	Result	Units	RL
Chloride		3780	mg/Kg	4.00

Sample: 261905 - AH-3 2'

Param	Flag	Result	Units	RL
Chloride		2490	mg/Kg	4.00

Sample: 261906 - AH-3 3'

Param	Flag	Result	Units	RL
Chloride		5060	mg/Kg	4.00

Summary Report

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

Report Date: July 12, 2011

Work Order: 11070111



Project Location: Eddy Co., NM
Project Name: COG/Dogwood Fed. #1 TB
Project Number: 114-6400858

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
270978	SB-1 0-1' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270979	SB-1 3' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270980	SB-1 5' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270981	SB-1 7' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270982	SB-1 10' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270983	SB-1 15' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270984	SB-1 20' (3' BEB)	soil	2011-06-27	00:00	2011-06-30
270987	SB-2 0-1' (4' BEB)	soil	2011-06-27	00:00	2011-06-30
270988	SB-2 3' (4' BEB)	soil	2011-06-27	00:00	2011-06-30
270989	SB-2 5' (4' BEB)	soil	2011-06-27	00:00	2011-06-30
270990	SB-2 7' (4' BEB)	soil	2011-06-27	00:00	2011-06-30
270991	SB-2 10' (4' BEB)	soil	2011-06-27	00:00	2011-06-30
270992	SB-2 15' (4' BEB)	soil	2011-06-27	00:00	2011-06-30
270993	SB-2 20' (4' BEB)	soil	2011-06-27	00:00	2011-06-30

Sample: 270978 - SB-1 0-1' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		3700	mg/Kg	4

Sample: 270979 - SB-1 3' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		325	mg/Kg	4

Sample: 270980 - SB-1 5' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270981 - SB-1 7' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270982 - SB-1 10' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270983 - SB-1 15' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270984 - SB-1 20' (3' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270987 - SB-2 0-1' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		255	mg/Kg	4

Sample: 270988 - SB-2 3' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		320	mg/Kg	4

Sample: 270989 - SB-2 5' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		390	mg/Kg	4

Sample: 270990 - SB-2 7' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270991 - SB-2 10' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 270992 - SB-2 15' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		343	mg/Kg	4

Sample: 270993 - SB-2 20' (4' BEB)

Param	Flag	Result	Units	RL
Chloride		218	mg/Kg	4