AE Order Number Banner

Report Description

This report shows an AE Order Number in Barcode format for purposes of scanning. The Barcode format is Code 39.

App Number: pGRL1000760432

1RP - 2384

COG OPERATING LLC

3/4/2016

SITE INFORMATION

Report Type: Work Plan

General Site Information:		
Site:	Pronghorn SWD Facility	
Company:	COG Operating LLC	
Section, Township and Range	Unit B Sec 24 T19S R32E	
Lease Number:	API 30-025-32735	
County:	Lea County	
GPS:	32.65218° N	103.71698° W
Surface Owner:	Federal	
Mineral Owner:		
Directions:	From the intersection of 529 and CR-126, travel south on 126 for 9.9 miles, turn left and travel 4.5 miles, turn right (at tin horn) and travel 0.6 miles to location	

Release Data:	Spill #1	Spill #2	Spill #3
Date Released:	10/15/2009	11/20/2009	7/20/2011
Type Release:	Produced Water	Produced Water	Produced Water
Source of Contamination:	Pressure Gauge	1x4 Swedge	Check Valve
Fluid Released:	60bbls	1500bbls	100bbls
Fluids Recovered:	45bbls	1300bbls	95bbls

Official Communication:			
Name:	Robert McNeill		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Suite 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 682-4559
Fax:	(432) 684-7137		
Email:	rmcneill@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

approved
Jeffrey Lekins
Environmental Specialist
NMOCD-DIST I
3/26/14

3/20

TETRA TECH

March 18, 2014

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

Re: Work Plan and Assessment Report for the COG Operating LLC, Pronghorn SWD Facility Spills, Unit B, Section 24, Township 19 South, Range 32 East, Lea County, New Mexico.

Dear Mr. Leking:

Tetra Tech was contacted by COG Operating LLC (COG) to assess the spills from the Pronghorn SWD Facility located in Unit B, Section 24 Township 19 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.65218°, W 103.71698°. The site location is shown on Figures 1 and 2.

Background

Spill #1

According to the State of New Mexico C-141 Initial Report, the leak was discovered on October 15, 2009, and released approximately 60 barrels of produced water when a pressure gauge failed and broke off inside the facility firewall. According to COG, the facility is lined with a plastic liner. Vacuum trucks were used to pick up standing fluids and recovered 45 barrels. The spill breached the firewall and released onto the pad, which migrated off the pad west and south of the facility. The initial C-141 is enclosed in Appendix A. The spill area is shown on Figure 3.

Spill #2

According to the State of New Mexico C-141 Initial Report, the leak was discovered on November 20, 2009 and released approximately 1,500 barrels of produced water. A 1" x 4" swedge broke off the discharge of the pump going to the Pronghorn well. Vacuum trucks were used to pick up standing fluids and recovered 1,300 barrels. The spill area impacted the area top of the previous spill footprint. The spill area is shown on Figure 3. The initial C-141 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

Spill #3

According to the State of New Mexico C-141 Initial Report, the leak was discovered on July 20, 2011 and released approximately 100 barrels of produced water. The check valve on the transfer pump failed, the standing fluid has been removed and 95 bbls were recovered. The spill area released to the west of the facility and encompassed the area of the first and second spills. The initial C-141 is enclosed in Appendix A. The spill area is shown on Figure 4.

Groundwater

The United States Geological Survey (USGS) database did not show any well in Section 24. The closest wells are located in Section 17 and 18, Township 19 South, Range 33 East, with reported depth to water of 116' and 340', respectively. The New Mexico State Engineer Well Reports showed two wells in Section 19 with reported depths of 102' and 345'. The NMOCD groundwater map shows an approximate depth to water at 175' below surface in the area of concern.

On July 14, 2009, Tetra Tech supervised the installation of a temporary well located in Section 24, Township 19 South, Range 32 East. The temporary well is located approximately 4,000' from the site. During a prior assessment, the temporary well was installed to establish depth to groundwater and evaluate the area for the presence of a possible perched aquifer. The well was drilled to a total depth of 131' below surface and encountered no groundwater in the well (dry). The groundwater data and the temporary well log are shown 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.

TETRA TECH

Soil Assessment and Results

Spill #1 and #2

As discussed, the second spill (11/20/09) encompasses the first release to the west and south of the SWD facility. The second spill area measured approximately 110' x 180' to the west of the facility. The south spill area measured approximately 3' x 100' and 150' x 225. Prior to assessing the impacted soils, COG removed approximately 2.0' of impacted soil and transported to CRI for proper disposal.

Once the excavation was completed, Tetra Tech supervised the installation of soil borings using an air rotary rig on January 11, 2010. A total of thirteen (13) soil borings were installed at the Site. Nine (9) soil borings were installed south of the facility to assess the soils. A total of four (4) soil borings were installed west of the facility. Additional soil borings could not be installed in the west area due to overhead power lines in the area. The soil boring locations are shown on Figure 3. The boring logs are shown in Appendix B. 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.

Referring to Table 1, all of the samples selected for TPH and BTEX were below the RRAL. The TPH concentrations ranged from <50 mg/kg to 365 mg/kg.

The chloride results indicate the maximum extent of impact greater than 1,000 mg/kg extending down to 30.0' below the excavated bottom. All the soil borings had chloride concentrations that decreased with depth. On the south spill area, majority of the soil borings (SB-3, SB-7 and SB-8) showed a shallow impact to the soils to approximately 2.0 to 4.0'. The area of SB-6 exhibited a slight chloride impact to the soils. The deeper chloride impact was encountered at SB-1, SB-2, SB-4, SB-5 and SB-9 at depths ranging from 6.0' to 25.0' below excavation bottoms.

On the west spill area, deeper chloride impact was encountered at SB-1, SB-11 and SB-12 at depths ranging from 25.0' to 30.0' below excavation bottom. Soil boring (SB-13) only showed a shallow chloride impact (0-1') to the subsurface soils.

Spill #3

On July 20, 2011, the third spill occurred and encompassed spills #1 and #2 footprint located on the west side of the facility. On August 23, 2011, Tetra Tech personnel supervised the installation of soil borings using an air rotary drilling rig.

A total of three (3) soil borings (SB-1, SB-2 and SB-3) were installed to assess the third spill in the pasture. The soil boring locations are shown on Figure 4. The boring logs are shown in Appendix B. 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 2.

Referring to Table 2, all of the samples selected for TPH and BTEX were below the RRAL. The chloride impact greater than 1,000 mg/kg extends down to approximately 25.0' below the excavated bottom. All three of the soil borings showed chloride concentrations decreased with depth and were vertically defined. The areas of SB-1 and SB-2 showed a deeper impact to the soils to approximately 25' and shallow impact down to approximately 10' in the area of SB-2.

Conclusions and Work Plan

The site is located in a pasture and no receptors were within a one mile radius. During an assessment of a prior release, a temporary well was installed to a total depth of 131' below surface and found no groundwater in the well (dry). Based on the NMOCD groundwater map, the depth to ground water in this area approximately 175' below surface.

The soil assessment did show declining chlorides with depth to a maximum depth defined of approximately 30' to 40' below surface. In addition, the boring logs did show a presence of red clay from 25' to approximately 50' below surface. Referring to the temporary well log, dense red clays were encountered at depths from 45' to 60', to blue/gray clay from 60' to 90' and encountered stiff red clay (red bed) from 90' to 131' below surface.

In order to remediate the site, COG proposes to excavate the impacted soils to re-establish surface growth and to reduce the environmental liabilities for the protection of the groundwater. The proposed excavation depths are highlighted in Table 1 and Table 2 and shown on Figure 5. Due to the size of the release, COG proposes excavating an additional 2.0' of soil for a total excavation depth of 4.0' below surface. Once excavated, to the appropriate depth, the excavation bottom will be capped with either clay material or 40 mil liner and backfilled to grade with clean soil. All of the excavated soil removed will be properly transported to proper disposal.

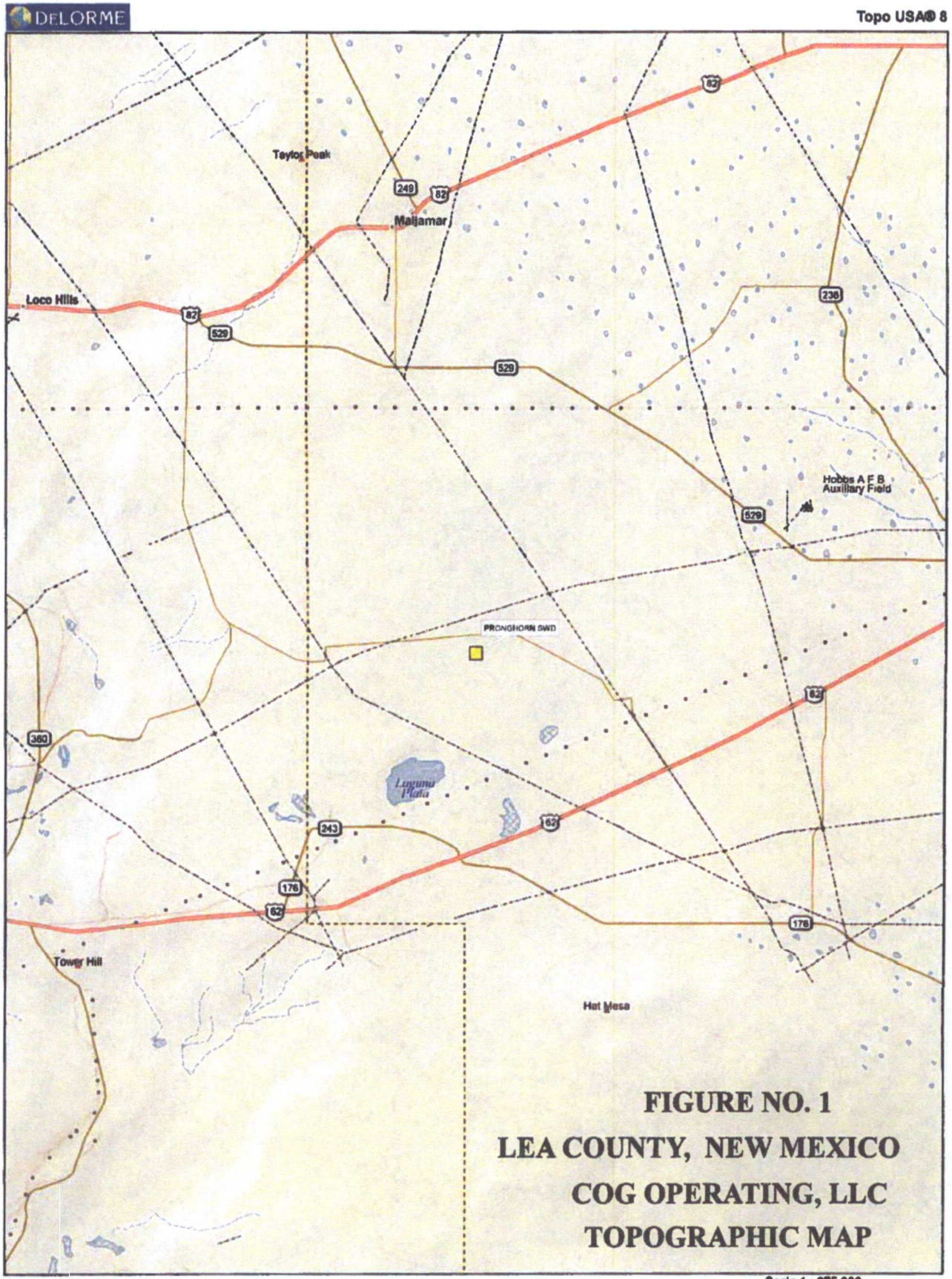
TETRA TECH

In addition, the former facility on the pad will be removed and any impacted soil encountered will be excavated and transported to proper disposal. If you require any additional information or have any questions or comments concerning this Work Plan and Assessment Report, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Senior Project Manager

cc: Robert McNeill – COG
Mike Burton -BLM


DeLORME
Topo USA® 8
Teyloc Peak
Maljamar
Loco Hills
Hobbs A F B
Auxiliary Field
PRONGHORN SWD
Laguna Plata
Tower Hill
Hat Mesa
82
249
529
238
360
243
176
62
FIGURE NO. 1
LEA COUNTY, NEW MEXICO
COG OPERATING, LLC
TOPOGRAPHIC MAP
Data use subject to license.
© DeLorme. Topo USA® 8.
www.delorme.com
TN
MN (7.6°E)
Scale 1 : 275,000
1" = 4.34 mi
Data Zoom 9-5

DeLORME

Topo USA® 8

FIGURE NO. 2

LEA COUNTY, NEW MEXICO

COG OPERATING, LLC

TOPOGRAPHIC MAP

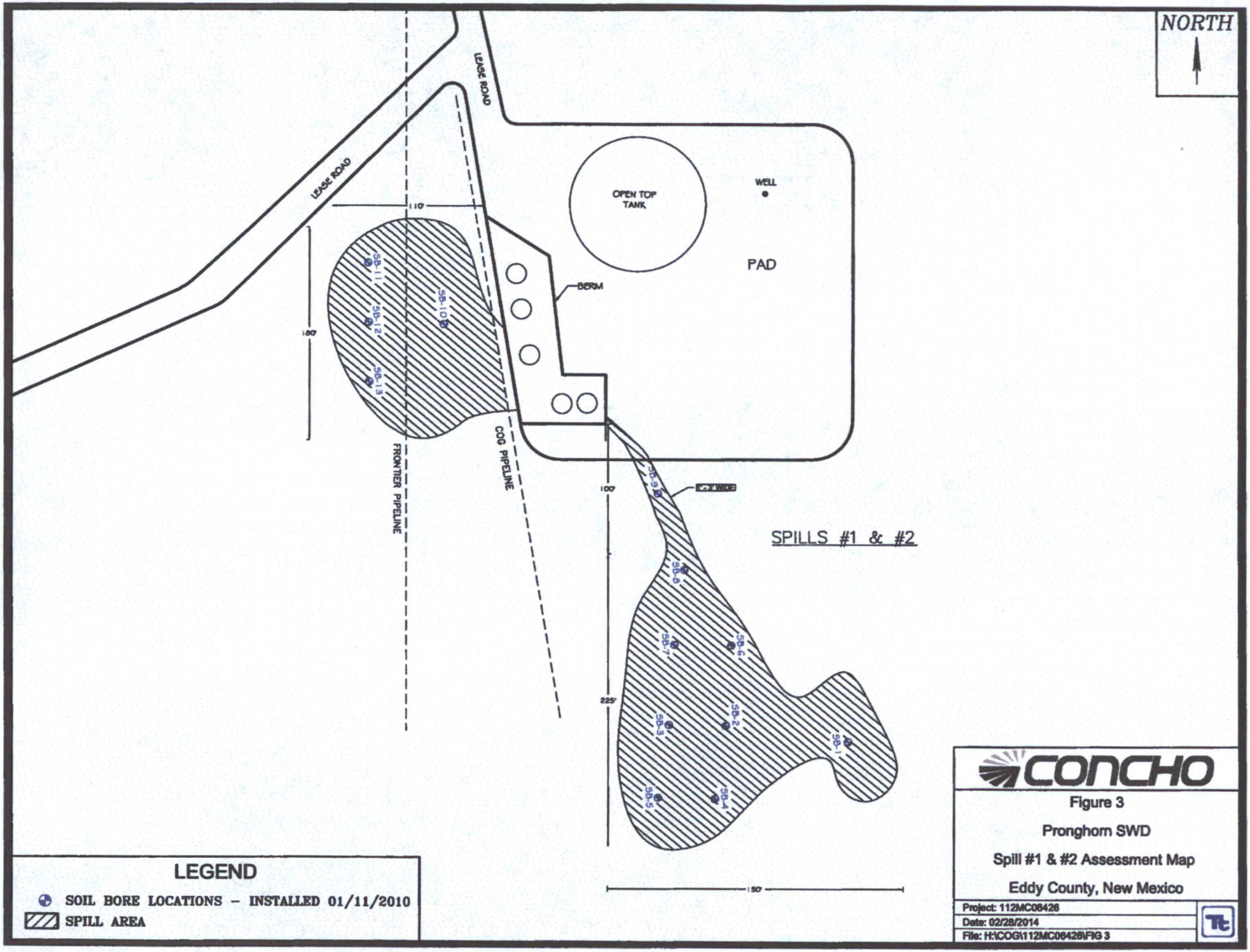
TN

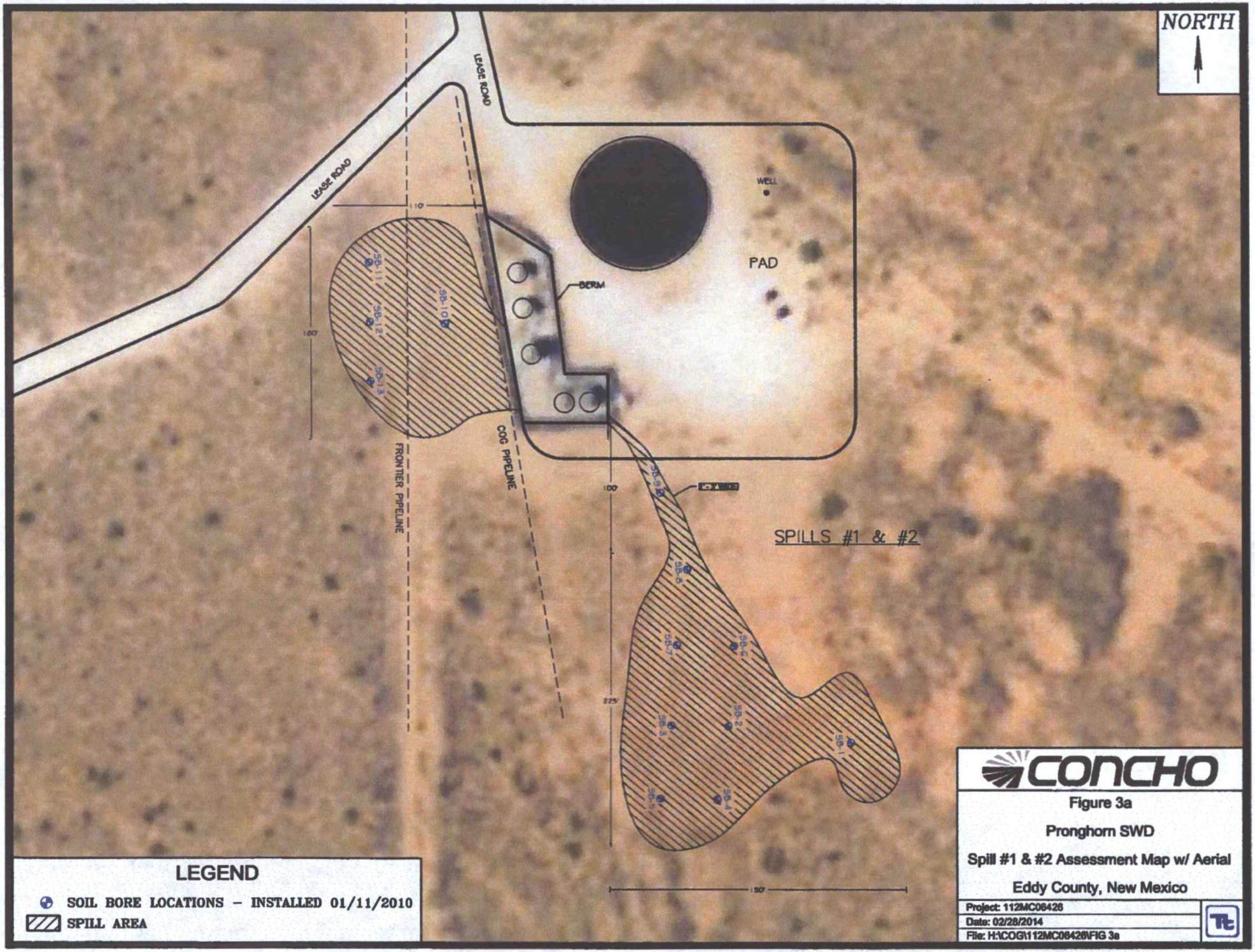
MN (7.6°E)

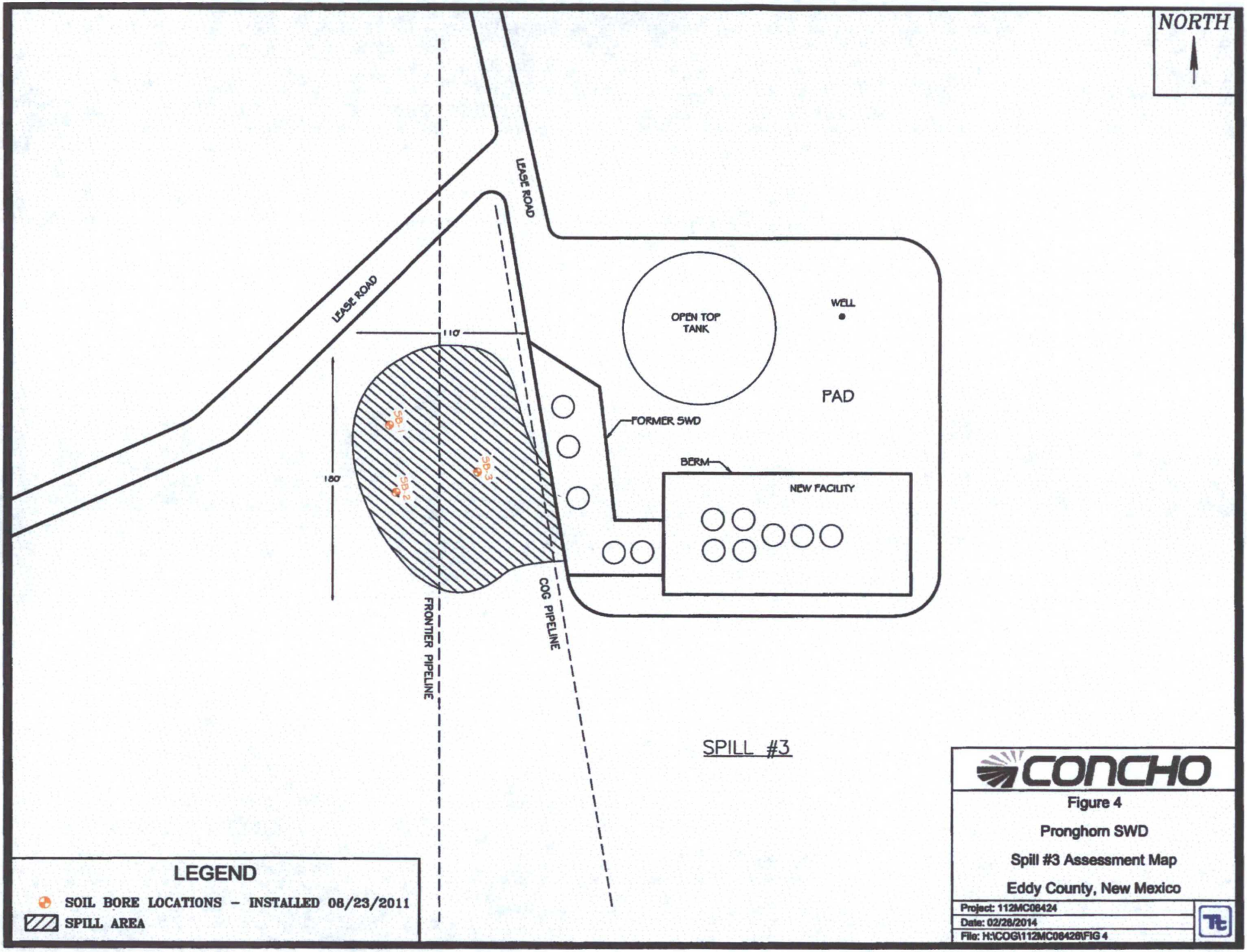
Scale 1 : 46,875

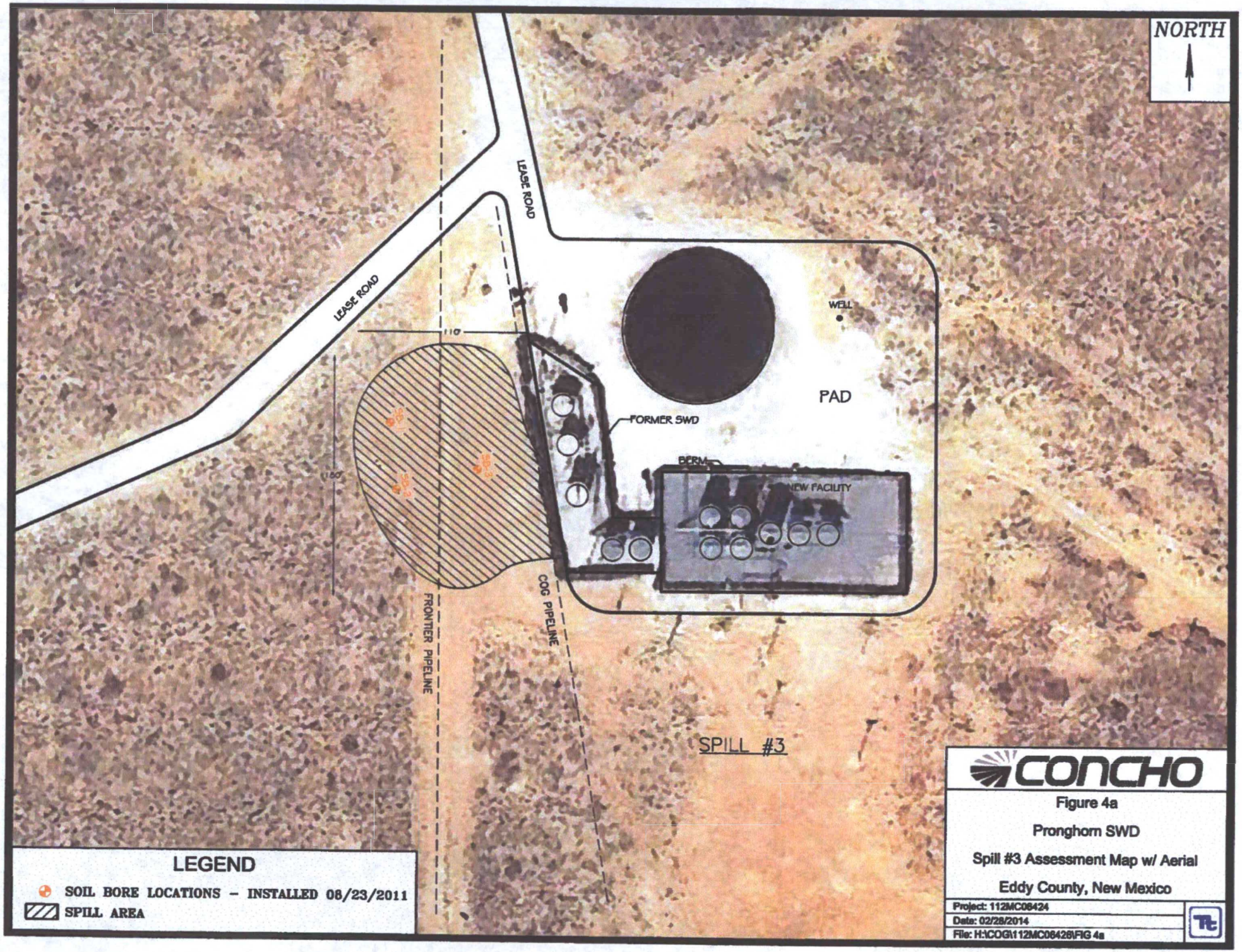
1" = 3,906.3 ft

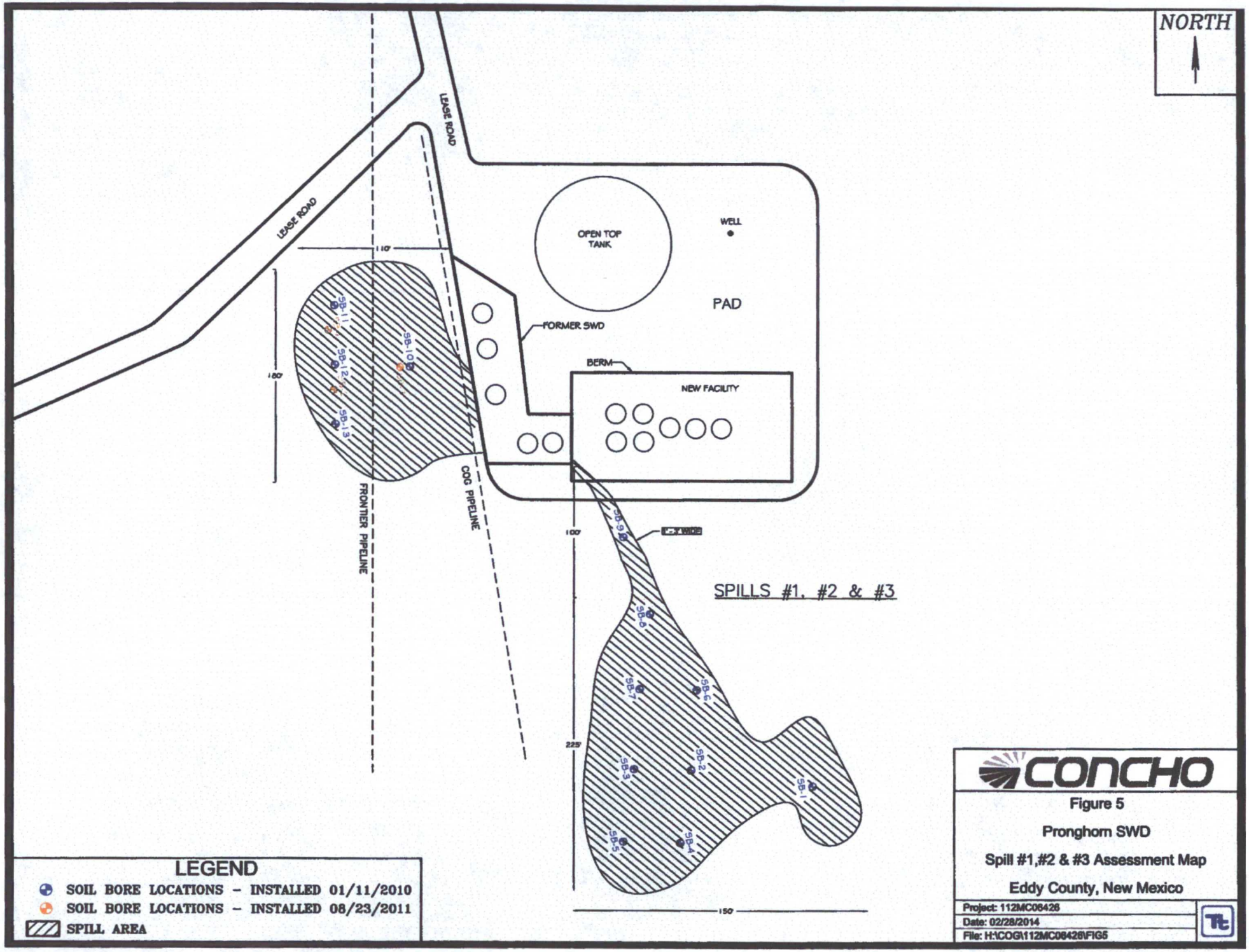
Data Zoom 12-1


NORTH
LEASE ROAD
LEASE ROAD
OPEN TOP TANK
WELL
PAD
BERM
110'
180'
SB-11
SB-12
SB-13
SB-10
FRONTIER PIPELINE
COG PIPELINE
100'
SB-9
SB-8
SB-6
SB-7
SB-6
SB-3
SB-2
SB-1
SB-5
SB-4
225'
150'
SPILLS #1 & #2
LEGEND
SOIL BORE LOCATIONS - INSTALLED 01/11/2010
SPILL AREA
CONCHO
Figure 3
Pronghorn SWD
Spill #1 & #2 Assessment Map
Eddy County, New Mexico
Project: 112MC08426
Date: 02/28/2014
File: H:\COG\112MC08426\FIG 3


NORTH
LEASE ROAD
LEASE ROAD
WELL
PAD
BERM
SB-10
SB-11
SB-12
SB-13
10'
150'
FRONTIER PIPELINE
COG PIPELINE
100'
SB-9
SB-8
SB-6
SB-7
SB-4
SB-5
SB-2
SB-3
SB-1
225'
150'
SPILLS #1 & #2
LEGEND
SOIL BORE LOCATIONS - INSTALLED 01/11/2010
SPILL AREA
CONCHO
Figure 3a
Pronghorn SWD
Spill #1 & #2 Assessment Map w/ Aerial
Eddy County, New Mexico
Project: 112MC06426
Date: 02/28/2014
File: H:\COG\112MC06426\FIG 3a


NORTH
LEASE ROAD
LEASE ROAD
110'
180'
SB-1
SB-2
SB-3
OPEN TOP TANK
WELL
PAD
FORMER SWD
BERM
NEW FACILITY
FRONTIER PIPELINE
COG PIPELINE
SPILL #3
LEGEND
SOIL BORE LOCATIONS - INSTALLED 08/23/2011
SPILL AREA
CONCHO
Figure 4
Pronghorn SWD
Spill #3 Assessment Map
Eddy County, New Mexico
Project: 112MC08424
Date: 02/28/2014
File: H:\COG\112MC08424\FIG 4


NORTH
LEASE ROAD
LEASE ROAD
110'
180'
WELL
PAD
FORMER SWD
BERM
NEW FACILITY
FRONTIER PIPELINE
COG PIPELINE
SPILL #3
LEGEND
SOIL BORE LOCATIONS - INSTALLED 08/23/2011
SPILL AREA
CONCHO
Figure 4a
Pronghorn SWD
Spill #3 Assessment Map w/ Aerial
Eddy County, New Mexico
Project: 112MC08424
Date: 02/28/2014
File: H:\COG\112MC08426\FIG 4a


NORTH
LEASE ROAD
LEASE ROAD
OPEN TOP TANK
WELL
PAD
FORMER SWD
BERM
NEW FACILITY
110'
180'
SB-11
SB-12
SB-13
SB-10
FRONTIER PIPELINE
COG PIPELINE
100'
SB-9
SB-8
SB-7
SB-6
SB-1
SB-2
SB-3
SB-4
SB-5
225'
150'
SPILLS #1, #2 & #3
LEGEND
SOIL BORE LOCATIONS - INSTALLED 01/11/2010
SOIL BORE LOCATIONS - INSTALLED 08/23/2011
SPILL AREA
CONCHO
Figure 5
Pronghorn SWD
Spill #1,#2 & #3 Assessment Map
Eddy County, New Mexico
Project: 112MC08426
Date: 02/28/2014
File: H:\COG\112MC08426\FIG5

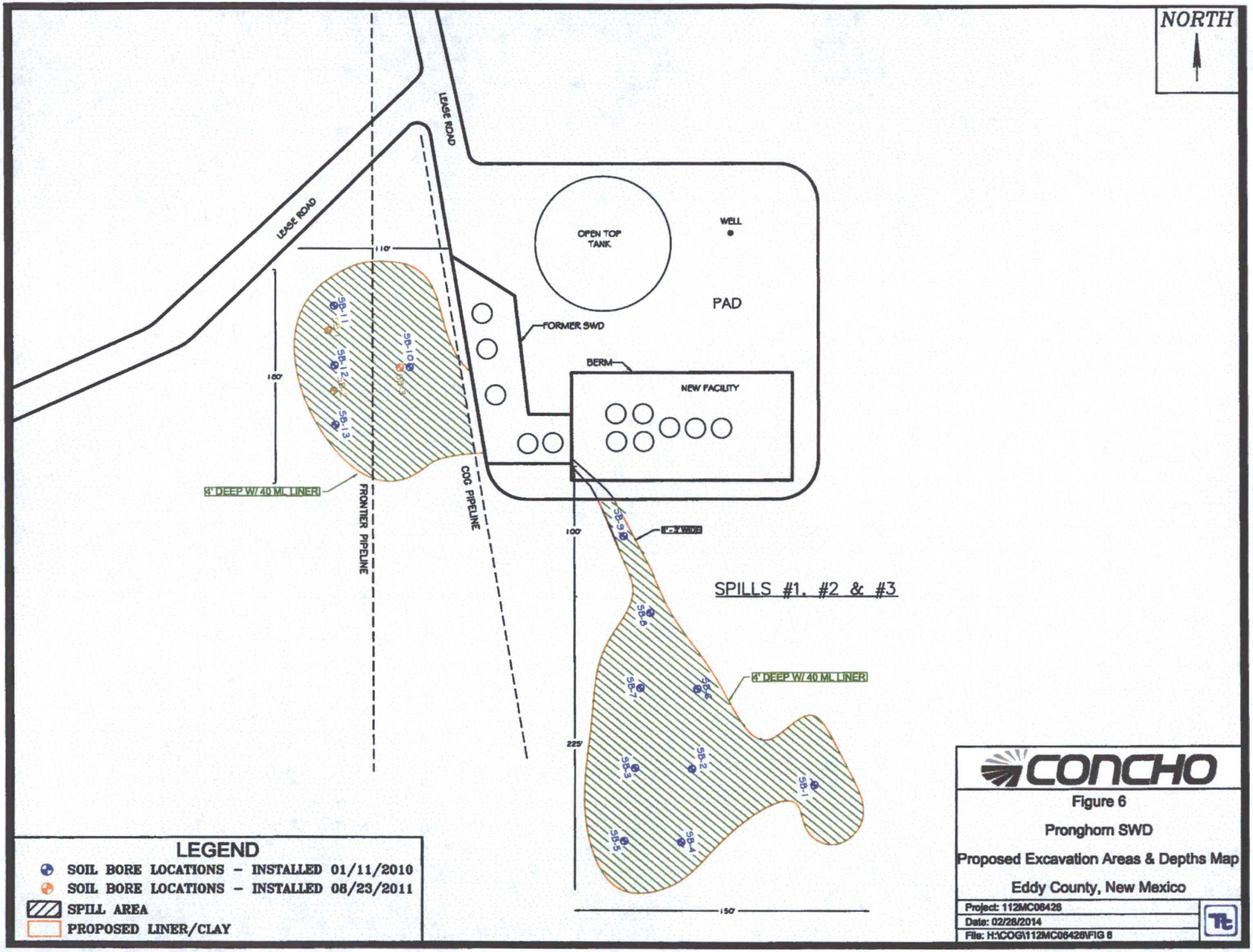

NORTH
LEASE ROAD
LEASE ROAD
OPEN TOP TANK
WELL
PAD
FORMER SWD
BERM
NEW FACILITY
110'
160'
SB-11
SB-12
SB-13
SB-10
4' DEEP W/ 40 MIL LINER
FRONTIER PIPELINE
COG PIPELINE
100'
SB-9
SB-6
SB-7
SB-8
SB-3
SB-2
SB-1
SB-5
SB-4
225'
150'
SPILLS #1, #2 & #3
LEGEND
SOIL BORE LOCATIONS - INSTALLED 01/11/2010
SOIL BORE LOCATIONS - INSTALLED 08/23/2011
SPILL AREA
PROPOSED LINER/CLAY
CONCHO
Figure 6
Pronghorn SWD
Proposed Excavation Areas & Depths Map
Eddy County, New Mexico
Project: 112MC06426
Date: 02/28/2014
File: H:\COG\112MC06426\FIG 6

Table 1
COG Operating LLC.
Pronghorn SWD #1
SPILL #1 and #2
LEA COUNTY, NEW MEXICO

Sample ID	Date Sampled	Sample Depth (ft)	Excavation Depth	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
SB-13	1/12/2010	0-1'	2'	X		7.24	59.1	66.34	<0.0100	<0.0100	<0.0100	<0.0100	1,880
		2-3'		X		-	-	-	-	-	-	-	<200
		4-5'		X		-	-	-	-	-	-	-	205
		6-7'		X		-	-	-	-	-	-	-	<200
		10-11'		X		-	-	-	-	-	-	-	<200
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	<200
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200

BEB Below Excavation Bottom

Proposed Excavation Depths

Proposed Liner Installation

Table 1
COG Operating LLC.
Pronghorn SWD #1
SPILL #1 and #2
LEA COUNTY, NEW MEXICO

Sample ID	Date Sampled	Sample Depth (ft)	Excavation Depth	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
South Spill Area													
SB-1	1/11/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	14,100
		2-3'		X		-	-	-	-	-	-	-	14,100
		4-5'		X		-	-	-	-	-	-	-	7,330
		6-7'		X		-	-	-	-	-	-	-	3,250
		10-11'		X		-	-	-	-	-	-	-	440
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	312
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200
SB-2	1/11/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	14,900
		2-3'		X		-	-	-	-	-	-	-	13,600
		4-5'		X		-	-	-	-	-	-	-	16,000
		6-7'		X		-	-	-	-	-	-	-	9,760
		10-11'		X		-	-	-	-	-	-	-	435
		15-16'		X		-	-	-	-	-	-	-	1,350
		20-21'		X		-	-	-	-	-	-	-	656
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200
SB-3	1/11/2010	0-1'	1'	X		12.3	<50.0	<50.0	<0.0100	<0.0100	<0.0100	0.0523	8,660
		2-3'		X		-	-	-	-	-	-	-	9,220
		4-5'		X		-	-	-	-	-	-	-	1,010
		6-7'		X		-	-	-	-	-	-	-	<200
		10-11'		X		-	-	-	-	-	-	-	<200
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	<200
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200

Table 1
COG Operating LLC.
Pronghorn SWD #1
SPILL #1 and #2
LEA COUNTY, NEW MEXICO

Sample ID	Date Sampled	Sample Depth (ft)	Excavation Depth	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
SB-4	1/11/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	11,800
		2-3'		X		-	-	-	-	-	-	-	10,500
		4-5'		X		-	-	-	-	-	-	-	4,920
		6-7'		X		-	-	-	-	-	-	-	6,790
		10-11'		X		-	-	-	-	-	-	-	1,050
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	227
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200
SB-5	1/11/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	9,750
		2-3'		X		-	-	-	-	-	-	-	10,400
		4-5'		X		-	-	-	-	-	-	-	7,530
		6-7'		X		-	-	-	-	-	-	-	557
		10-11'		X		-	-	-	-	-	-	-	5,570
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	354
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200
SB-6	1/11/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	<200
		2-3'		X		-	-	-	-	-	-	-	<200
		4-5'		X		-	-	-	-	-	-	-	510
		6-7'		X		-	-	-	-	-	-	-	<200
		10-11'		X		-	-	-	-	-	-	-	<200
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	<200
		25-26'		X		-	-	-	-	-	-	-	<200
		30-31'		X		-	-	-	-	-	-	-	<200

Table 1
COG Operating LLC.
Pronghorn SWD #1
SPILL #1 and #2
LEA COUNTY, NEW MEXICO

Sample ID	Date Sampled	Sample Depth (ft)	Excavation Depth	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
SB-7	1/11/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	17,400
		2-3'		X									14,100
		4-5'		X									16,100
		6-7'		X									878
		10-11'		X									465
		15-16'		X									<200
		20-21'		X									207
		25-26'		X									<200
		30-31'		X									<200
SB-8	1/12/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	14,800
		2-3'		X		-	-	-	-	-	-	-	9,250
		4-5'		X		-	-	-	-	-	-	-	7,980
		6-7'		X		-	-	-	-	-	-	-	595
		10-11'		X		-	-	-	-	-	-	-	330
		15-16'		X		-	-	-	-	-	-	-	<200
		20-21'		X		-	-	-	-	-	-	-	<200
		25-26'		X		-	-	-	-	-	-	-	208
		30-31'		X		-	-	-	-	-	-	-	<200
SB-9	1/12/2010	0-1'	1'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	503
		2-3'		X		-	-	-	-	-	-	-	4,040
		4-5'		X		-	-	-	-	-	-	-	534
		6-7'		X		-	-	-	-	-	-	-	778
		10-11'		X		-	-	-	-	-	-	-	2,850
		15-16'		X		-	-	-	-	-	-	-	5,650
		20-21'		X		-	-	-	-	-	-	-	3,490
		25-26'		X		-	-	-	-	-	-	-	1,240
		30-31'		X		-	-	-	-	-	-	-	<200
		40-41'		X		-	-	-	-	-	-	-	<200

Table 1
COG Operating LLC.
Pronghorn SWD #1
SPILL #1 and #2
LEA COUNTY, NEW MEXICO

Sample ID	Date Sampled	Sample Depth (ft)	Excavation Depth	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
West Spill Area													
SB-10	1/12/2010	0-1'	2'	X		<1.00	<50.0	<50.0	<0.0100	<0.0100	<0.0100	<0.0100	10,600
		2-3'		X		-	-	-	-	-	-	-	6,150
		4-5'		X		-	-	-	-	-	-	-	4,550
		6-7'		X		-	-	-	-	-	-	-	1,960
		10-11'		X		-	-	-	-	-	-	-	1,010
		15-16'		X		-	-	-	-	-	-	-	671
		20-21'		X		-	-	-	-	-	-	-	574
		25-26'		X		-	-	-	-	-	-	-	1,110
		30-31'		X		-	-	-	-	-	-	-	625
SB-11	1/12/2010	0-1'	2'	X		744	520	1,264	0.484	5.18	1.26	7.37	2,120
		2-3'		X		-	-	-	-	-	-	-	981
		4-5'		X		-	-	-	-	-	-	-	803
		6-7'		X		-	-	-	-	-	-	-	701
		10-11'		X		-	-	-	-	-	-	-	867
		15-16'		X		-	-	-	-	-	-	-	3,380
		20-21'		X		-	-	-	-	-	-	-	3,740
		25-26'		X		-	-	-	-	-	-	-	4,800
		30-31'		X		-	-	-	-	-	-	-	1,450
SB-12	1/12/2010	0-1'	2'	X		43.9	<50.0	43.9	<0.0100	<0.0100	<0.0100	<0.0100	2,720
		2-3'		X		-	-	-	-	-	-	-	576
		4-5'		X		-	-	-	-	-	-	-	586
		6-7'		X		-	-	-	-	-	-	-	1,210
		10-11'		X		-	-	-	-	-	-	-	2,210
		15-16'		X		-	-	-	-	-	-	-	4,420
		20-21'		X		-	-	-	-	-	-	-	1,850
		25-26'		X		-	-	-	-	-	-	-	454
		30-31'		X		-	-	-	-	-	-	-	275

Table 2
COG Operating LLC
Pronghorn SWD #1
SPILL #3
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	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						
SB-1	8/23/2011	0-1'	2'	X		<2.00	358	358	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4,980
	"	3'		X		-	-	-	-	-	-	-	-	4,570
	"	5'		X		-	-	-	-	-	-	-	-	1,230
	"	7'		X		-	-	-	-	-	-	-	-	1,310
	"	10'		X		-	-	-	-	-	-	-	-	2,260
	"	15'		X		-	-	-	-	-	-	-	-	5,580
	"	20'		X		-	-	-	-	-	-	-	-	7,190
	"	25'		X		-	-	-	-	-	-	-	-	1,350
	"	30'		X		-	-	-	-	-	-	-	-	857
	"	40'		X		-	-	-	-	-	-	-	-	<200
	"	50'		X		-	-	-	-	-	-	-	-	<200
SB-2	8/23/2011	0-1'	2'	X		<2.00	216	216	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	16,100
	"	3'		X		-	-	-	-	-	-	-	-	1,770
	"	5'		X		-	-	-	-	-	-	-	-	2,660
	"	7'		X		-	-	-	-	-	-	-	-	4,190
	"	10'		X		-	-	-	-	-	-	-	-	3,010
	"	15'		X		-	-	-	-	-	-	-	-	620
	"	20'		X		-	-	-	-	-	-	-	-	308
	"	25'		X		-	-	-	-	-	-	-	-	<200
	"	30'		X		-	-	-	-	-	-	-	-	<200
	"	40'		X		-	-	-	-	-	-	-	-	<200
	"	50'		X		-	-	-	-	-	-	-	-	<200

Table 2
COG Operating LLC
Pronghorn SWD #1
SPILL #3
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	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						
SB-3	8/23/2011	0-1'	2'	X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	12,800
	"	3'		X		-	-	-	-	-	-	-	-	5,570
	"	5'		X		-	-	-	-	-	-	-	-	3,000
	"	7'		X		-	-	-	-	-	-	-	-	3,440
	"	10'		X		-	-	-	-	-	-	-	-	4,230
	"	15'		X		-	-	-	-	-	-	-	-	5,500
	"	20'		X		-	-	-	-	-	-	-	-	7,200
	"	25'		X		-	-	-	-	-	-	-	-	1,380
	"	30'		X		-	-	-	-	-	-	-	-	<200
	"	40'		X		-	-	-	-	-	-	-	-	<200
	"	50'		X		-	-	-	-	-	-	-	-	<200

(--) Not Analyzed

Proposed Excavation Depths

Proposed Liner Installed

COG - Pronghorn SWD Facility

Lea County, New Mexico

Former Pronghorn SWD Facility

Former Pronghorn SWD Facility

COG - Pronghorn SWD Facility

Lea County, New Mexico

New Pronghorn SWD Facility

New Pronghorn SWD Facility

COG - Pronghorn SWD Facility

Lea County, New Mexico

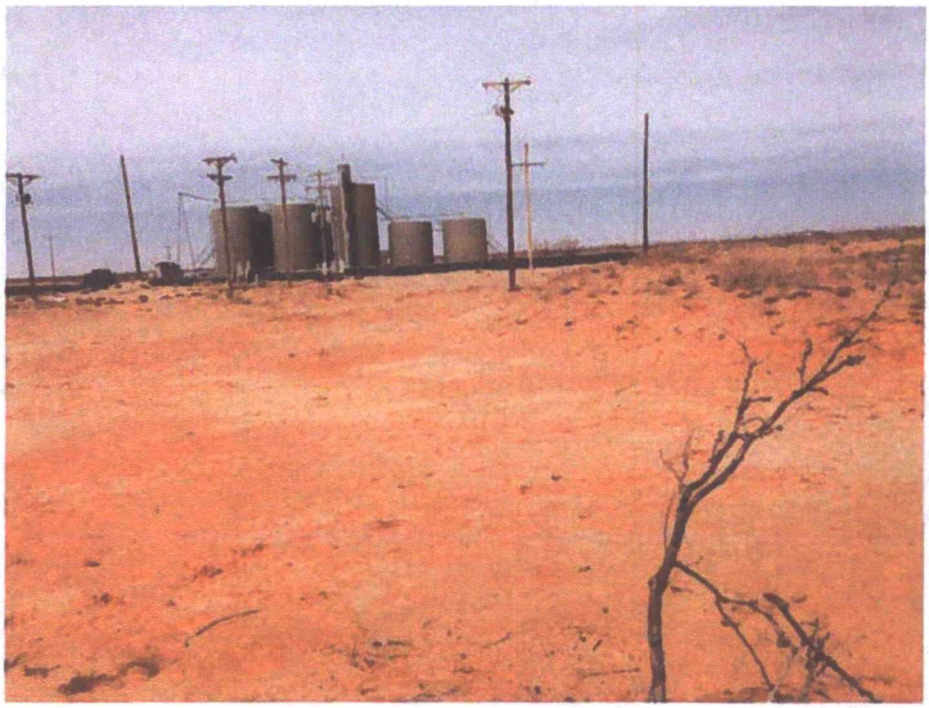
Excavated Area West of Facility

Excavated Area West of the Facility

COG - Pronghorn SWD Facility

Lea County, New Mexico

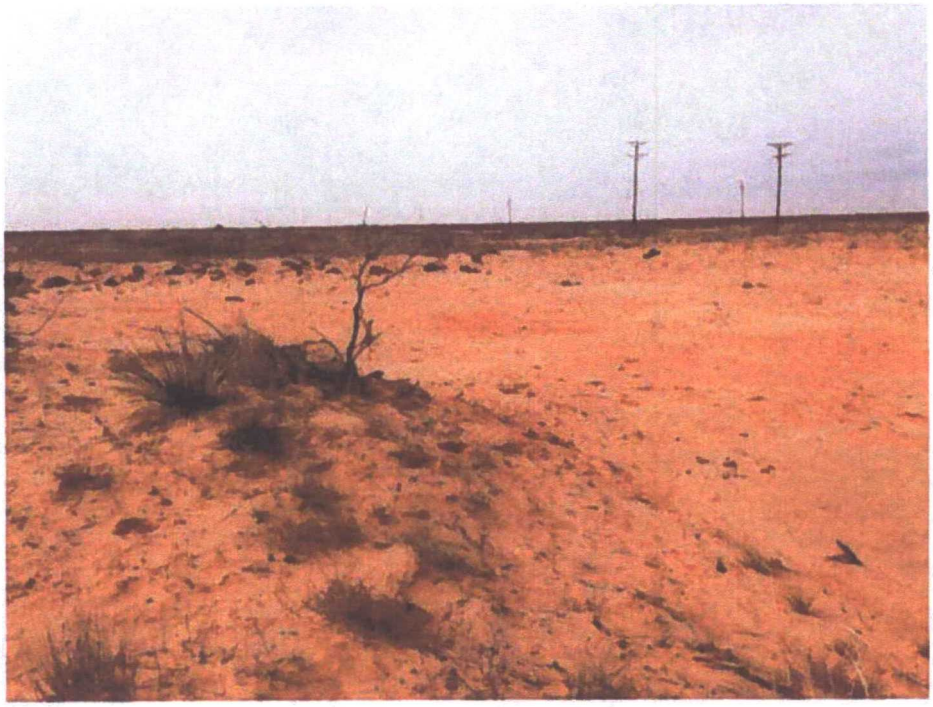
Excavated Area West of Facility



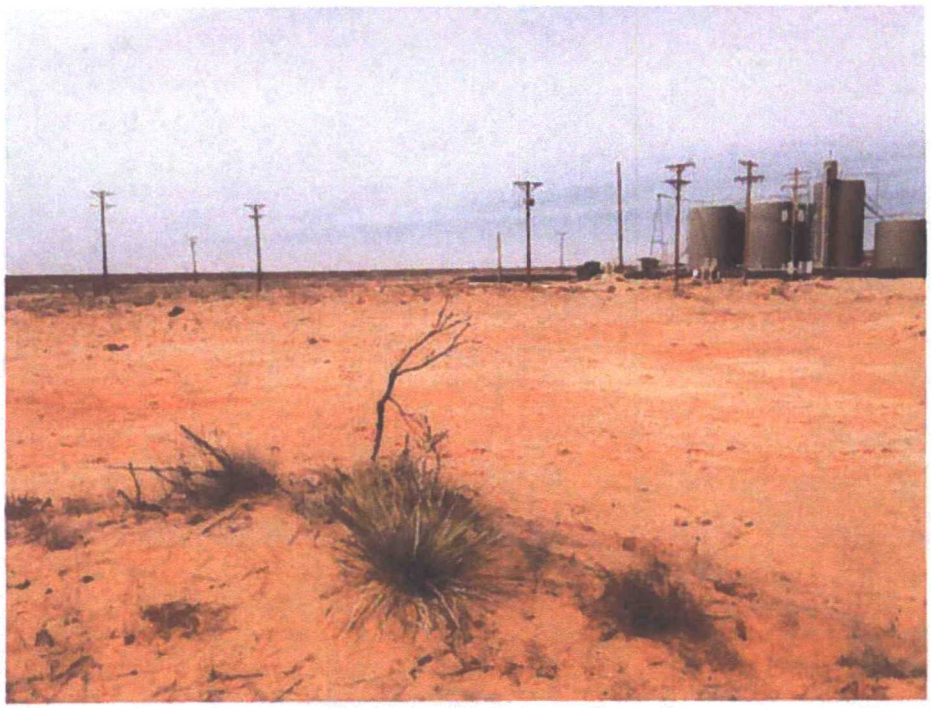
Excavated Area South of the Facility

COG - Pronghorn SWD Facility

Lea County, New Mexico



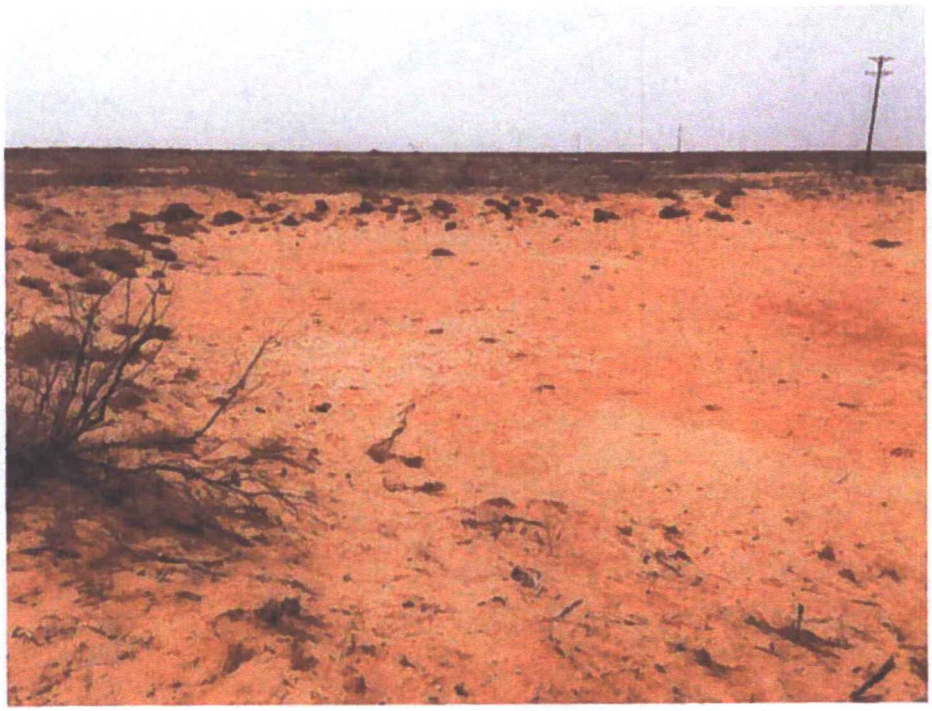
Excavated Area South of Facility



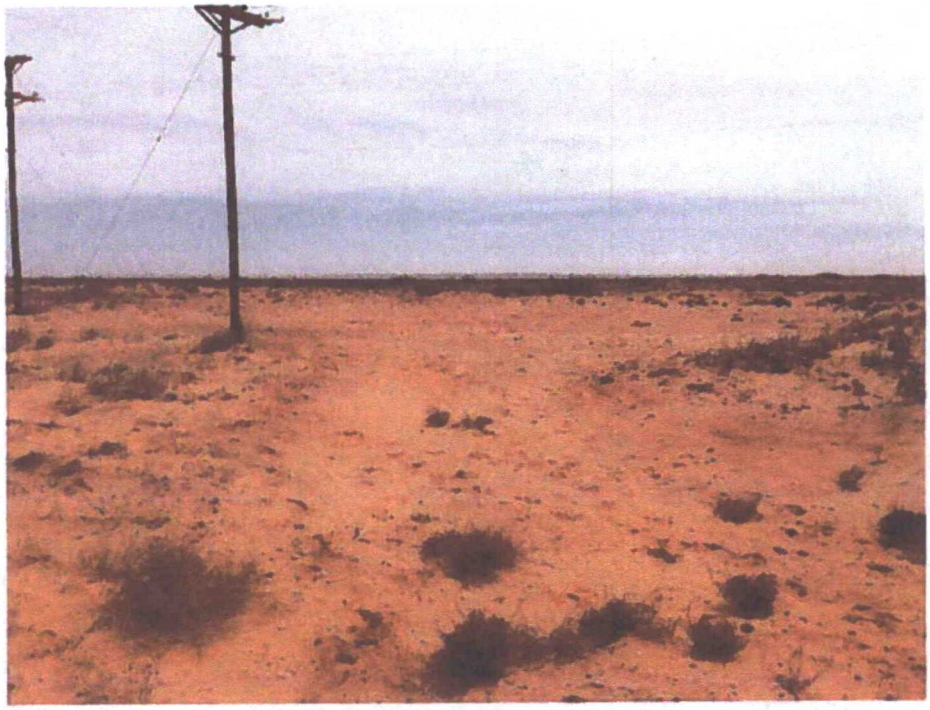
Excavated Area South of the Facility

COG - Pronghorn SWD Facility

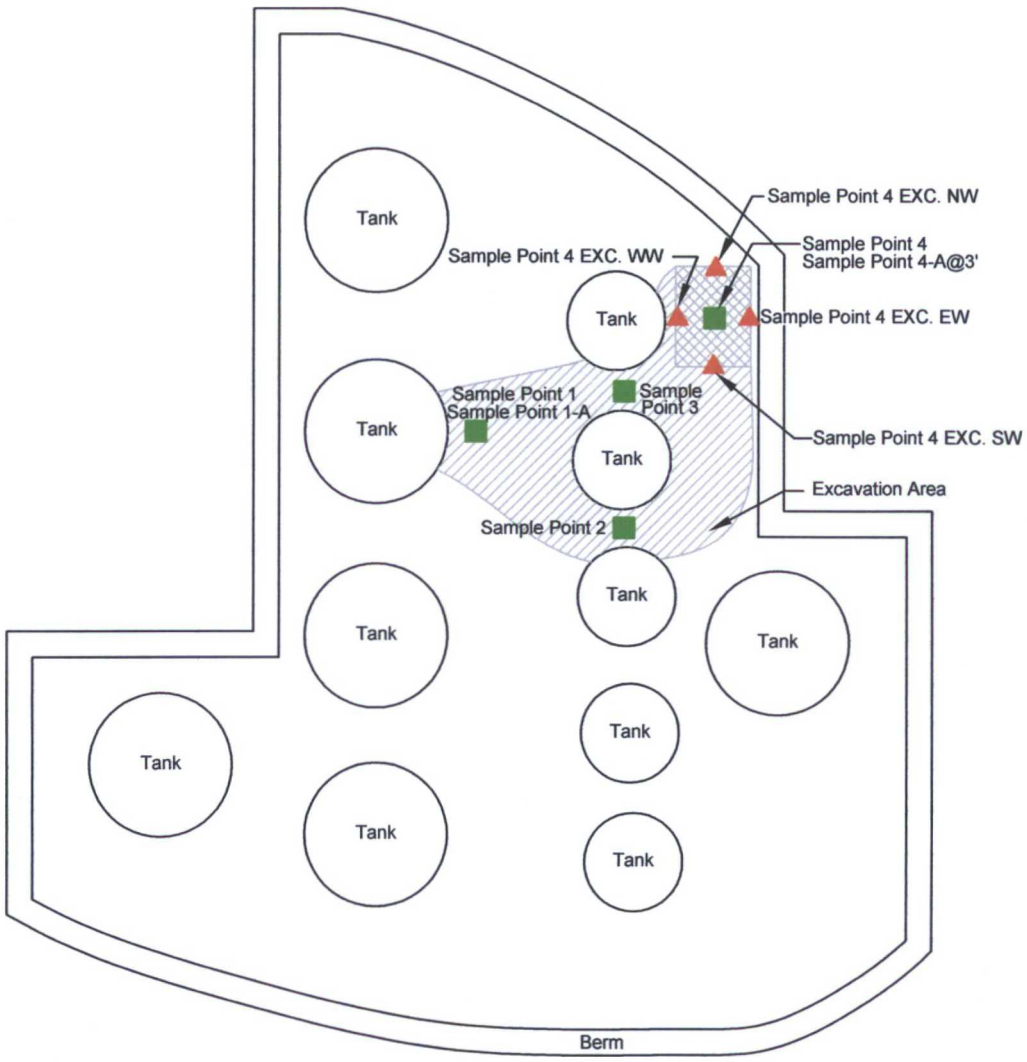
Lea County, New Mexico



View West - Excavated Area South of Facility



View South - Excavated Area South of the Facility



30 15 0 15 30

Distance in Feet

LEGEND:

- Sidewall Soil Sample Location
- Floor Soil Sample Location

Figure 3

Site Location Map
High Sierra Transportation
Carpenter Station
Lea County, NM

NOVA safety and environmental

2057 Commerce Drive
Midland, Texas 79703
432.520.7720

www.novasafetyandenvironmental.com

December 10, 2013	Scale: 1" = 30'	CAD By: TA	Checked By: CS
Lat. N 32° 34' 38.38" Long. W 103° 7' 25.84"			