CURA
EMERGENCY SERVICES

ENVIRONMENTAL

13 July 2012

Mr. Mike Bratcher
New Mexico Oil Conservation Division, District 2
811 South First Street
Artesia, New Mexico 88210

RE: **LIMITED SUBSURFACE INVESTIGATION**
ASSESSMENT OF CHLORIDE CONCENTRATIONS IN SURFICIAL SOIL
SALTWATER SPILL
COG OPERATING ELECTRA FEDERAL #5 FLOWLINE
SECTION 21, TOWNSHIP 17 SOUTH, RANGE 30 EAST
EDDY COUNTY, NEW MEXICO (SITE)
FEDERAL TRACKING NO. 11NU010TG

CURA PROJECT NO. TS120223

Dear Mr. Bratcher:

CURA Environmental and Emergency Services (CURA) is pleased to submit this letter report documenting the findings of a Limited Subsurface Investigation for the above-referenced site. This project was conducted in accordance with CURA's *Proposal and Workplan for the Assessment of Chloride Background Concentrations within the Surficial Soil, Saltwater Spill, COG Operating, Electra Federal #5 Flowline, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (site)* dated February 27, 2012 (Appendix E).

1.0 BACKGROUND

According to Tetra Tech, Inc. (Tetra Tech) *Work Plan for the COG Operating LLC., Electra Federal #5 Flow line, Unit A, section 21, Township 17 south, Range 30 East, Eddy County, New Mexico* dated January 16, 2012 (Appendix F), produced saltwater was released from a 4-inch poly line associated with the Electra Federal #5 well site on November 03, 2010. Ferguson Construction was attempting to move the line when it parted at a weld. Approximately 30 barrels of produced water was released, and 25 barrels was recovered by vacuum trucks within a few hours of the release. Therefore, approximately 5 barrels net (210 gallons) of produced saltwater was not recovered and infiltrated into the surface soil. An initial assessment and subsequent delineation activities were conducted by Tetra Tech to assess the vertical and horizontal extent of the contaminants of concern. A total of 58 soil samples from borings AH-1 through AH-6 and BH-1 and BH-2 were collected within the immediate vicinity of the saltwater release to a maximum depth of 70 feet below ground

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surface (BGS) (Figure 4). The soil samples were sampled for total petroleum hydrocarbons (TPH), benzene, toluene, ethyl benzene, xylenes (BTEX), and chloride. All analytical results were below the Recommended Remediation Action Levels (RRALs) for TPH and BTEX. The chloride analytical results ranged from less than 200 mg/kg to 14,900 mg/kg. Extreme variability between sample locations and depths of samples was observed. Elevated chloride concentrations were exhibited in samples as deep as 60 feet BGS (Table 1).

The Tetra Tech *Work Plan* recommended extensive excavation of soil impacted by this saltwater release. Background levels for chlorides in surficial soil had not been established for this site. Therefore, CURA recommended that further site assessment be conducted in order to establish background concentrations for chlorides in the site vicinity and to further delineate the extent of chlorides impact.

2.0 SCOPE OF SERVICES

The purpose of the Limited Subsurface Investigation was to determine whether concentrations of chlorides at the subject site were naturally occurring (background) and to delineate the areal extent of chlorides impact to near surface soil. This Limited Subsurface Investigation was conducted in general accordance with New Mexico Oil Conservation Division *Guidelines for Remediation of Leaks, Spills, and Releases* and CURA's *Proposal and Workplan for the Assessment of Chloride Background Concentrations within the Surficial Soil, Saltwater Spill, COG Operating, Electra Federal #5 Flowline, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (site)* dated February 27, 2012 (Appendix E).

On May 31, 2012 CURA and drilling contractor Atkins Engineering installed four (4) soil borings with a hollow stem auger drilling rig. The 4 soil borings were permitted by the New Mexico Office of the State Engineer (Appendix G). Boring locations are shown on Figures 3 and 4. All 4 borings are located outside of the impacted area as defined in the Tetra Tech *Work Plan* (Figure 4). The 4 borings were advanced to 5.5' BGS. Soil samples were collected via a steel "split spoon" sampler at intervals of 0-1', 1-1.5', 2-2.5', 3-3.5', 4-4.5', and 5-5.5'; mirroring the sampling intervals utilized in the Tetra Tech *Work Plan*. After sample collection, each boring was plugged with hydrated bentonite chips, in accordance with New Mexico Office of the State Engineer *Well Plugging Plan of Operations for RA-11826* (Appendix H).

Soil samples collected were immediately placed on ice in the field and delivered under chain-of-custody documentation to Oxidor Corporation Environmental Laboratories in Plano, Texas within 48 hours of sample collection. All samples were analyzed for chlorides by EPA Method 9056. Laboratory analytical reports are attached in Appendix D.

The soil boring locations are depicted on the attached Figures 3 and 4. Detailed boring logs for each of the borings are attached in Appendix C. Photographic documentation is presented in Appendix B.

As an additional part of this investigation, CURA interviewed persons who had firsthand knowledge of the spill site and/or the actual spill event. On July 12, 2012 CURA interviewed Mr. Conrad Falcon (former employee with Ferguson Construction with 22 years of pipeline installation and repair experience). Mr. Falcon had historical knowledge of the spill site and was present at the site at the time of the spill. Mr. Falcon stated that Ferguson Construction was attempting to move the poly line when it parted at a weld. Mr. Falcon immediately utilized field equipment to push up soil in order to contain the spill. He stated that the spill was contained to an area approximately 50 feet in diameter. The contained saltwater was then pumped into vacuum trucks within a few hours of the spill. He considered the reported estimates of 30 barrels spilled and 25 barrels recovered to be accurate.

Mr. Falcon also stated that he had worked in the spill area for several months before the spill occurred. He had noticed a large area of dead and stunted vegetation in the topographic depression surrounding the immediate spill area for several months before the spill occurred. This area of affected vegetation was several times larger than the area affected by the subsequent spill. Mr. Falcon further stated that the crew of roustabouts that fixed the parted line told him that they had repaired the same line on two prior occasions at the same location where the spill occurred.

3.0 CONCLUSIONS

Salient findings and conclusions of this investigation are summarized, as follows:

1. Concentrations of chorides in the surficial soil in the vicinity of the Electra Federal #5 flowline saltwater release indicate that the elevated concentrations of chlorides are not naturally occurring background and that a much larger area has been affected. Soil borings BH-3, BH-4, and BH-5 exhibited elevated chlorides concentrations. BH-6 is the only boring installed to date which shows no elevated chloride concentrations. Figure 4 shows the approximate area of elevated chlorides compared to the area of excavation proposed in the Tetra Tech *Work Plan.*

2. The deep borings BH-1 and BH-2 exhibited significantly elevated chlorides concentrations from near surface to depths of 60 feet BGS.

3. The 5 barrel (210 gallon) net release of saltwater from the Electra Federal #5 flowline spill could not possibly have caused impact of this magnitude – horizontally and vertically.

4. The Electra Federal #5 spill site is located in a pronounced topographic depression that is surrounded by active oil wells which produce significant quantities of saltwater. Please review topographic maps (Figures 1 and 2), historical and recent aerial photographs (Appendix A), and photographic documentation (Appendix B). The spill site is crossed by numerous flowlines carrying saltwater. Historical releases from these well sites and/or flowlines over time would have flowed downgradient into the Electra Federal #5 flowline spill area.

5. Oil well drilling and production in the site vicinity dates back to 1939 when the Loco Hills field was discovered in this area of New Mexico. Thousands of wells have been drilled in this area since that time (Appendix A). Prior to the 1980s, surface disposal of saltwater was a common practice in the oilfield. The saltwater was simply dumped into surface topographic depressions and left to infiltrate into the ground and/or evaporate to make room for more saltwater disposal. The areal extent and the 60 feet plus vertical penetration of the saltwater impact at the Electra Federal #5 flowline spill site is much more consistent with this historical disposal practice than with a net 5 barrel one event spill.

6. The interview with Mr. Conrad Falcon indicates clearly that the Electra Federal #5 flowline spill was contained to an area much smaller that the affected area delineated by Tetra Tech and CURA soil borings (Figure 4) and was very small in volume (5 barrels net). Furthermore, Mr. Falcon's observations of affected vegetation prior to the spill and roustabout crew reports of previous line repairs at the spill site clearly indicate that significant saltwater releases at the spill site predated the November 3, 2010 spill.

Elevated concentrations of chlorides in soil at the Electra Federal #5 flowline spill site are the result of a long history of spills and surface saltwater disposal practices in the area – not the result of a single spill of 5 barrels of saltwater on November 3, 2010.

4.0 RECOMMENDATIONS

Based on the results of this Limited Subsurface Investigation, CURA respectfully requests a 'no further action" letter from the New Mexico Oil Conservation Division as regards the November 3, 2010 Electra Federal #5 flowline spill. Please feel free to contact our office at 214.914.7263 or rick@curaes.com if you have any questions regarding this investigation.

Sincerely,
CURA, Inc.

Rick Railsback

Rick Railsback
Professional Geoscientist
Senior Project Geologist

Attachments:

Table 1	Soil Chloride Concentrations
Figure 1	Site Vicinity Topographic Map
Figure 2	Site Topographic Map
Figure 3	Site Aerial Photograph
Figure 4	Site Map with Area Affected by Chlorides
Appendix A	Historical Aerial Photographs
Appendix B	Photographic Documentation
Appendix C	Boring Logs
Appendix D	Laboratory Report with Chain of Custody
Appendix E	CURA *Proposal and Workplan for the Assessment of Chloride Background Concentrations within the Surficial Soil, Saltwater Spill, COG Operating, Electra Federal #5 Flowline, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (site)* dated February 27, 2012.
Appendix F	Tetra Tech *Work Plan for the COG Operating Electra Federal #5 Flowline, Unit A, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico* dated January 16, 2012.
Appendix G	Well Permit from New Mexico Office of the State Engineer
Appendix H	Well Plugging Plan from New Mexico Office of the State Engineer

Cc: Terry Gregston, Environmental Protection Specialist
Bureau of Land Management
620 E. Greene Street
Carlsbad, NM 88220

Bill Hoffman
Great American Insurance Company
401 Plymouth Meeting Road
Plymouth Meeting, PA 19462

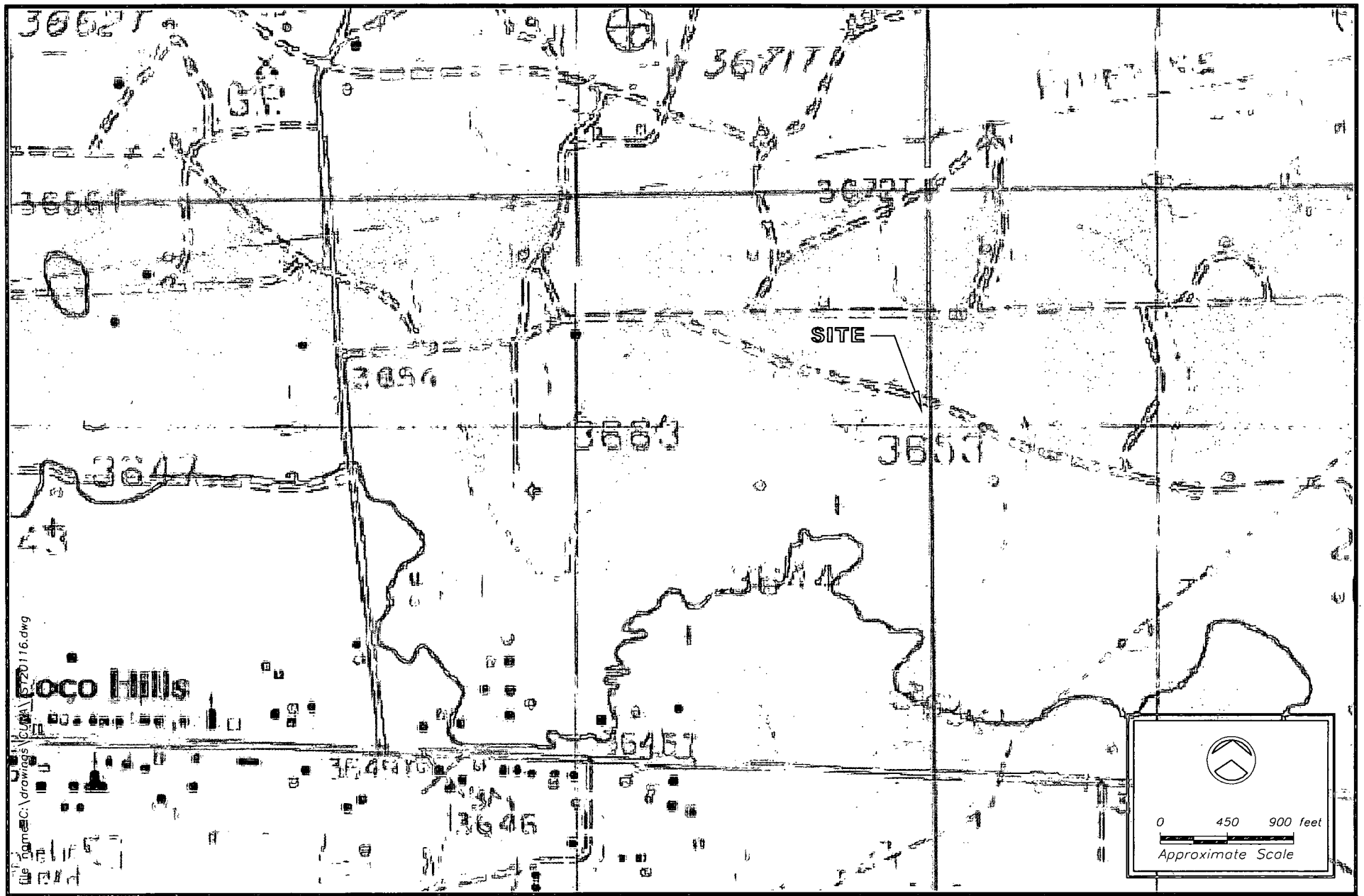
Misty Hein
Ferguson Construction Company
2200 South Commercial Street
Lovinton, NM 88260

Table 1
Soil Chloride Concentrations
Electra Federal #5
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Chloride (mg/kg)
AH-1	12/7/2010	0-1'	<200
		1-1.5'	<200
		2-2.5'	<200
		3-3.5'	630
AH-2	12/7/2010	0-1'	<200
		1-1.5'	434
		2-2.5'	1,480
		3-3.5'	1,350
		4-4.5'	2,360
		5-5.5'	8,130
AH-3	12/7/2010	0-1'	389
		1-1.5'	489
		2-2.5'	2,350
		3-3.5'	14,900
		4-4.5'	14,800
BH-2	11/4/2011	0-1'	<200
		3'	<200
		5'	12,400
		7'	13,300
		10'	6,380
		15'	8,670
		20'	5,850
		25'	3,490
		30'	535
		40'	5,040
		50'	1,350
		60'	1,130
		70'	<200
AH-4	12/7/2010	0-1'	744
		1-1.5'	1,070
		2-2.5'	2,810
		3-3.5'	5,370
		4-4.5'	5,040
		5-5.5'	5,190

Table 1
Soil Chloride Concentrations
Electra Federal #5
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Chloride (mg/kg)
BH-1	11/4/2011	0-1"	791
		3'	461
		5'	2,470
		7'	3,980
		10'	9,370
		15'	13,500
		20'	4,340
		25'	6,340
		30'	8,880
		40'	507
		50'	1,100
		60'	226
AH-5	12/7/2010	0-1'	1,710
		1-1.5'	<200
		2-2.5'	<200
		3-3.5'	<200
		4-4.5'	380
		5-5.5'	290
AH-6	12/7/2010	0-1'	5,870
		1-1.5'	7,710
		2-2.5'	4,840
		3-3.5'	3,440
		4-4.5'	874
		5-5.5'	245
BH-3	5/31/2012	0-1'	<51
		1-1.5'	<52
		2-2.5'	<52
		3-3.5'	422
		4-4.5'	4,900
		5-5.5'	22,300
BH-4	5/31/2012	0-1'	<51
		1-1.5'	820
		2-2.5'	5,580
		3-3.5'	19,600
		4-4.5'	22,200
		5-5.5'	13,000



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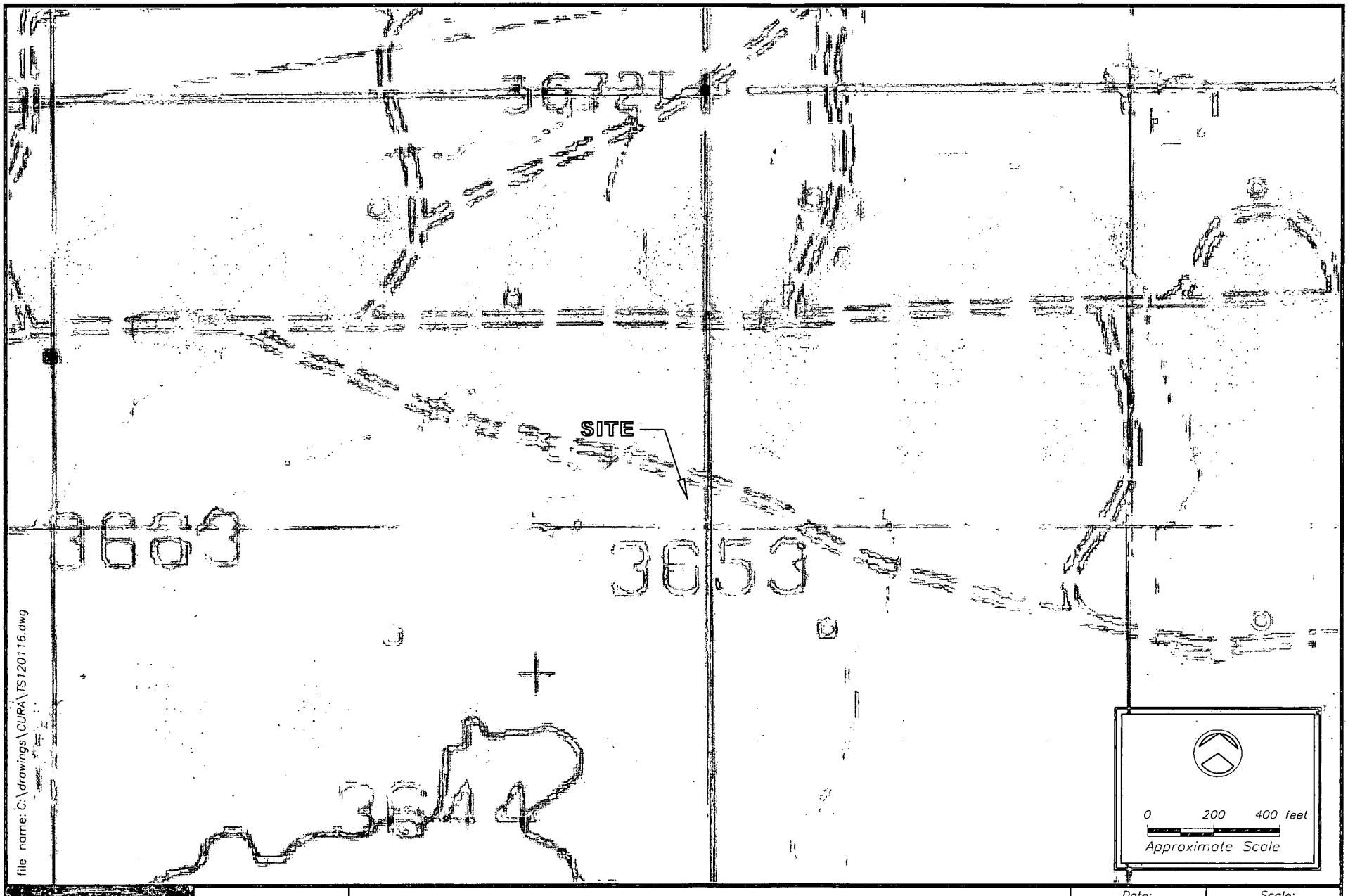
SITE VICINITY TOPOGRAPHIC MAP

Saltwater Spill, COG Operating, Electra Federal
#5 Flowline, Eddy County, New Mexico

Date:	Scale:
June, 2012	See Above
Project No.: TS120116	Figure No. 1



file name: C:\drawings\CURA\TS120116.dwg

SITE TOPOGRAPHIC MAP

Saltwater Spill, COG Operating, Electra Federal
#5 Flowline, Eddy County, New Mexico

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972.378.7333

Date:	Scale:
June, 2012	See Above
Project No.:	Figure No. 2
TS120116	

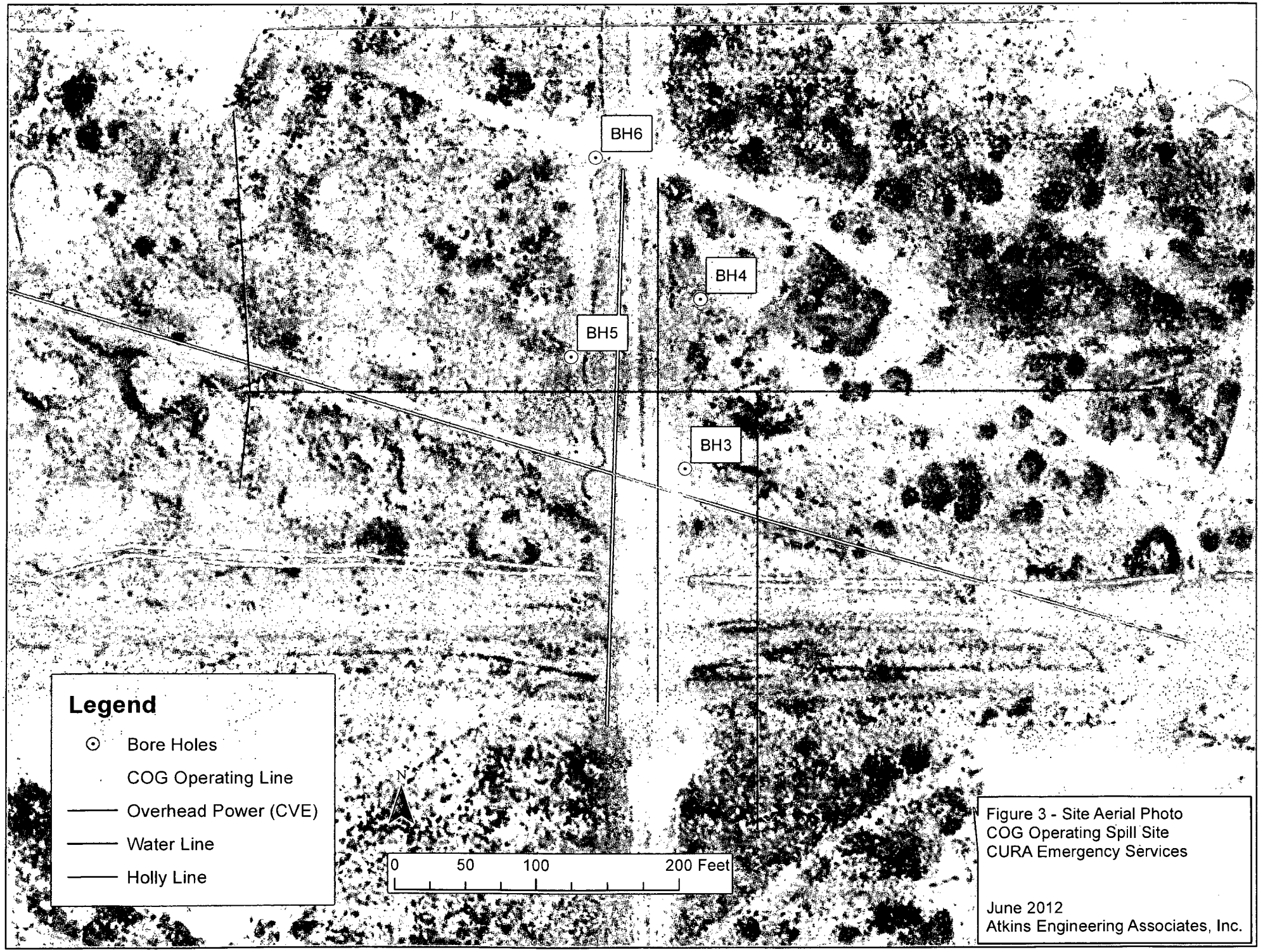
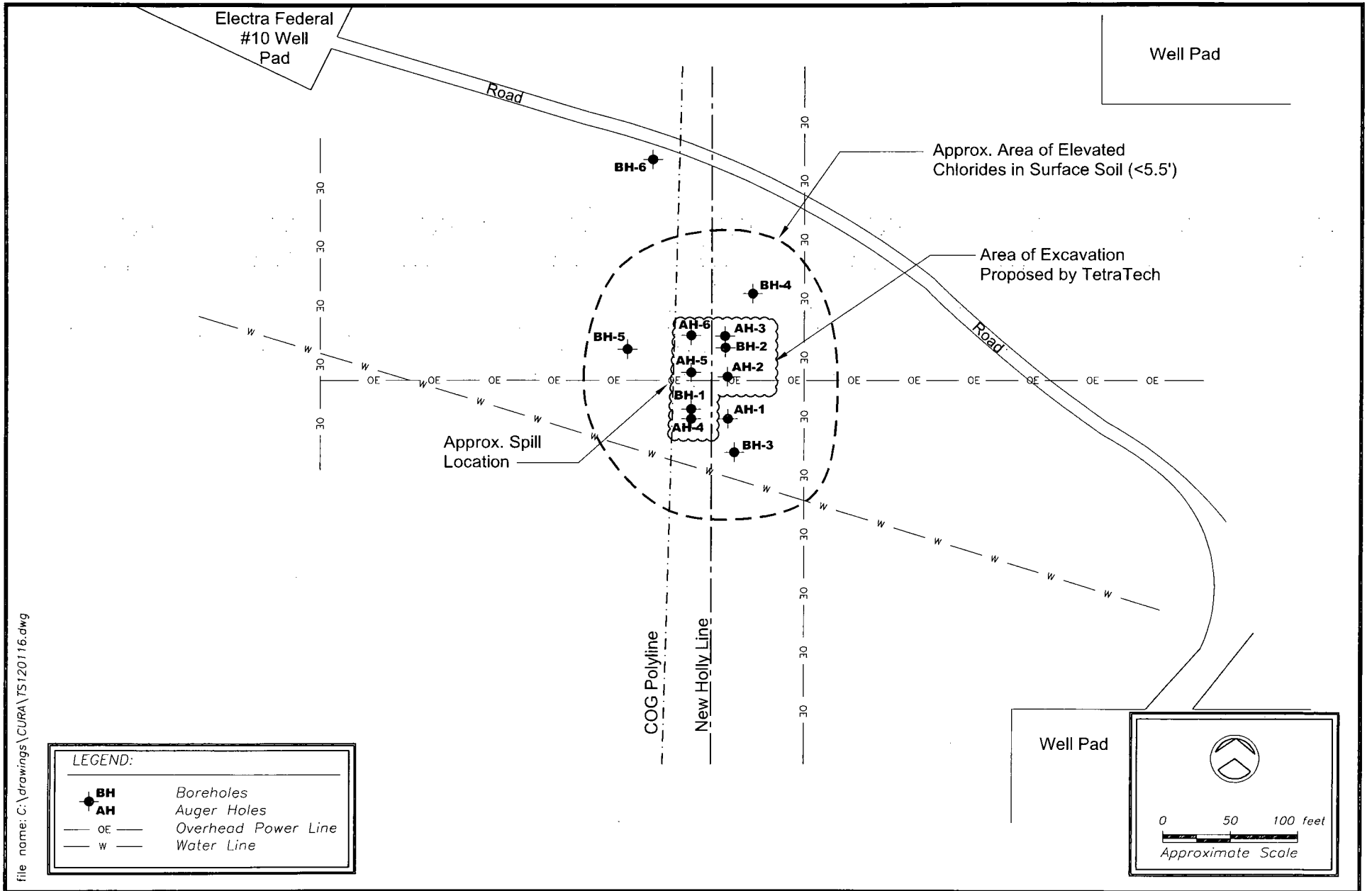


Figure 3 - Site Aerial Photo
COG Operating Spill Site
CURA Emergency Services

June 2012
Atkins Engineering Associates, Inc.



file name: C:\drawings\CURA\TS120116.dwg

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SITE MAP

Saltwater Spill, COG Operating, Electra Federal
#5 Flowline, Eddy County, New Mexico

Date:	Scale:
June, 2012	See Above
Project No.:	Figure No.
TS120116	4

Electra Federal #5 Flow Line
Goat Ropers Rd/Highway 82
Artesia, NM 88210

Inquiry Number: 3349422.5
June 21, 2012

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

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EDR Aerial Photo Decade Package

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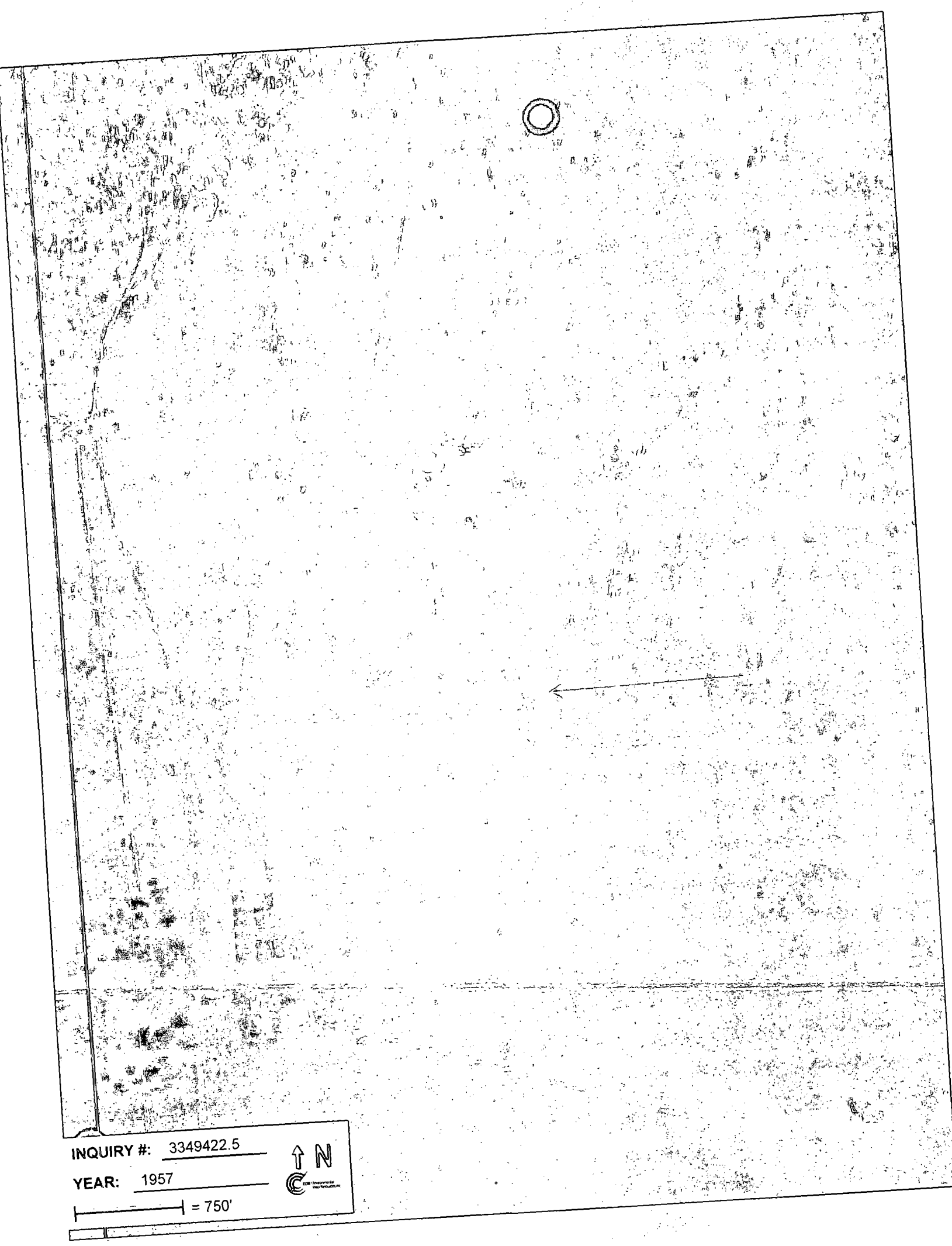
INQUIRY #: 3349422.5
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= 750'
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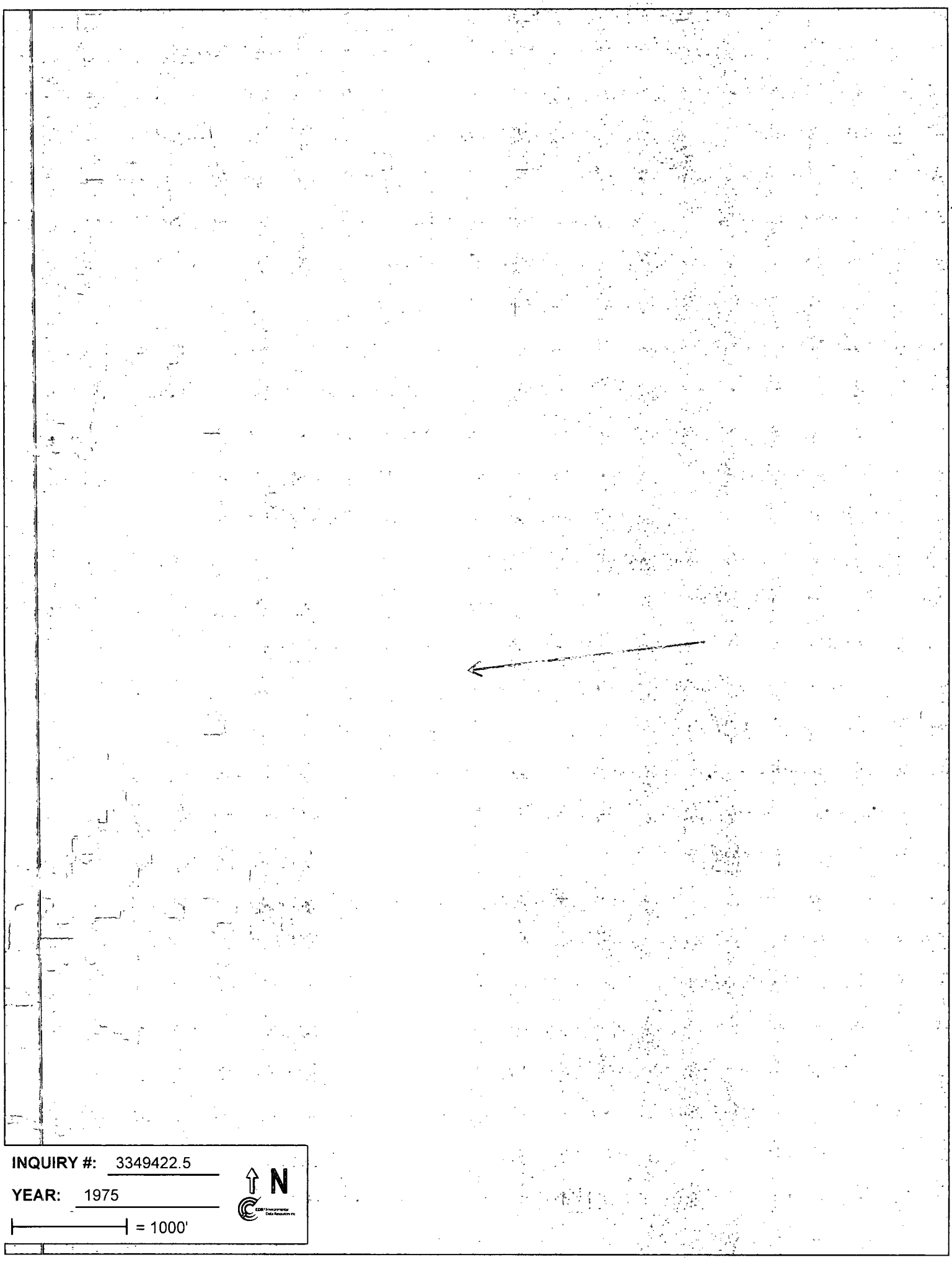

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YEAR: 1975

= 1000'

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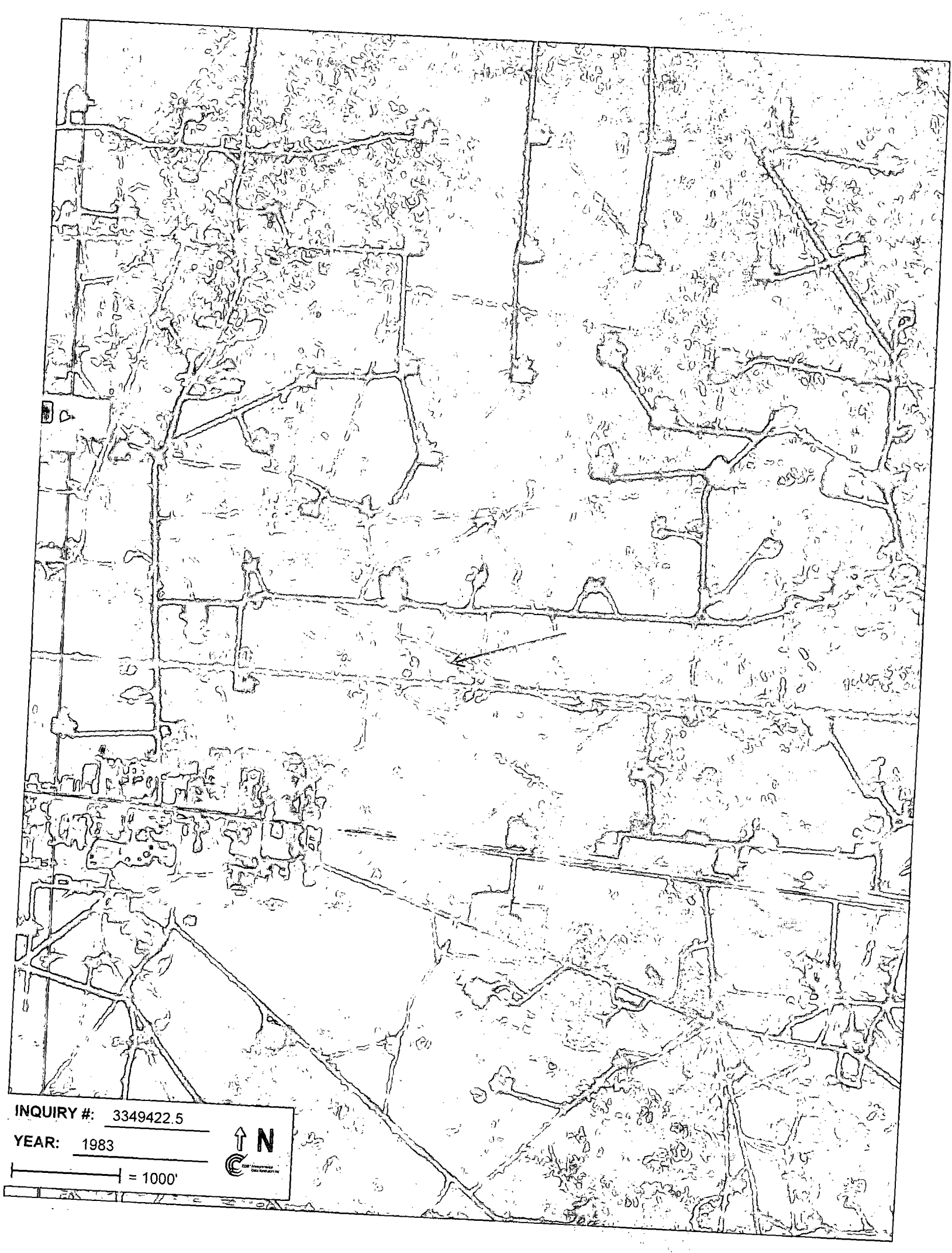
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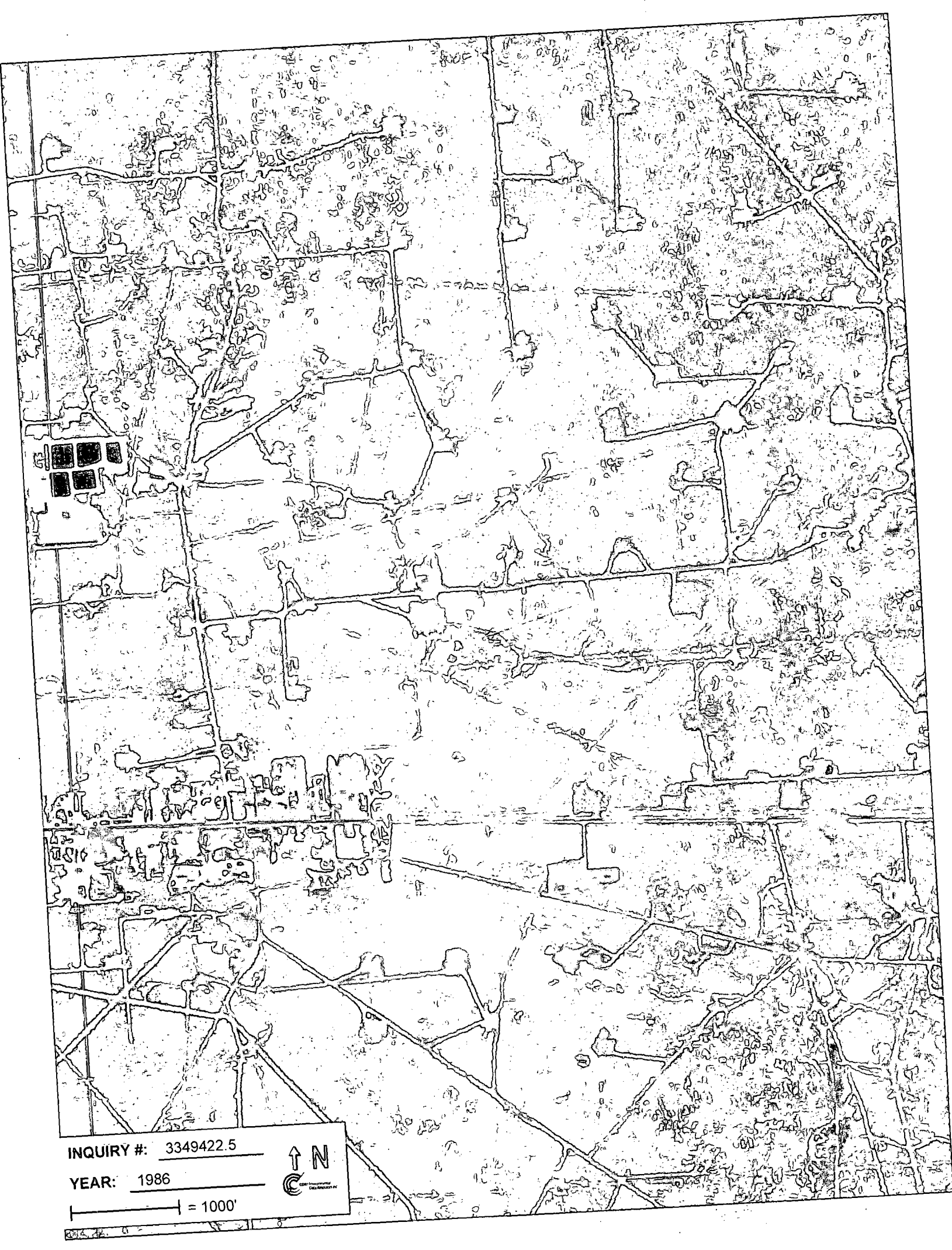
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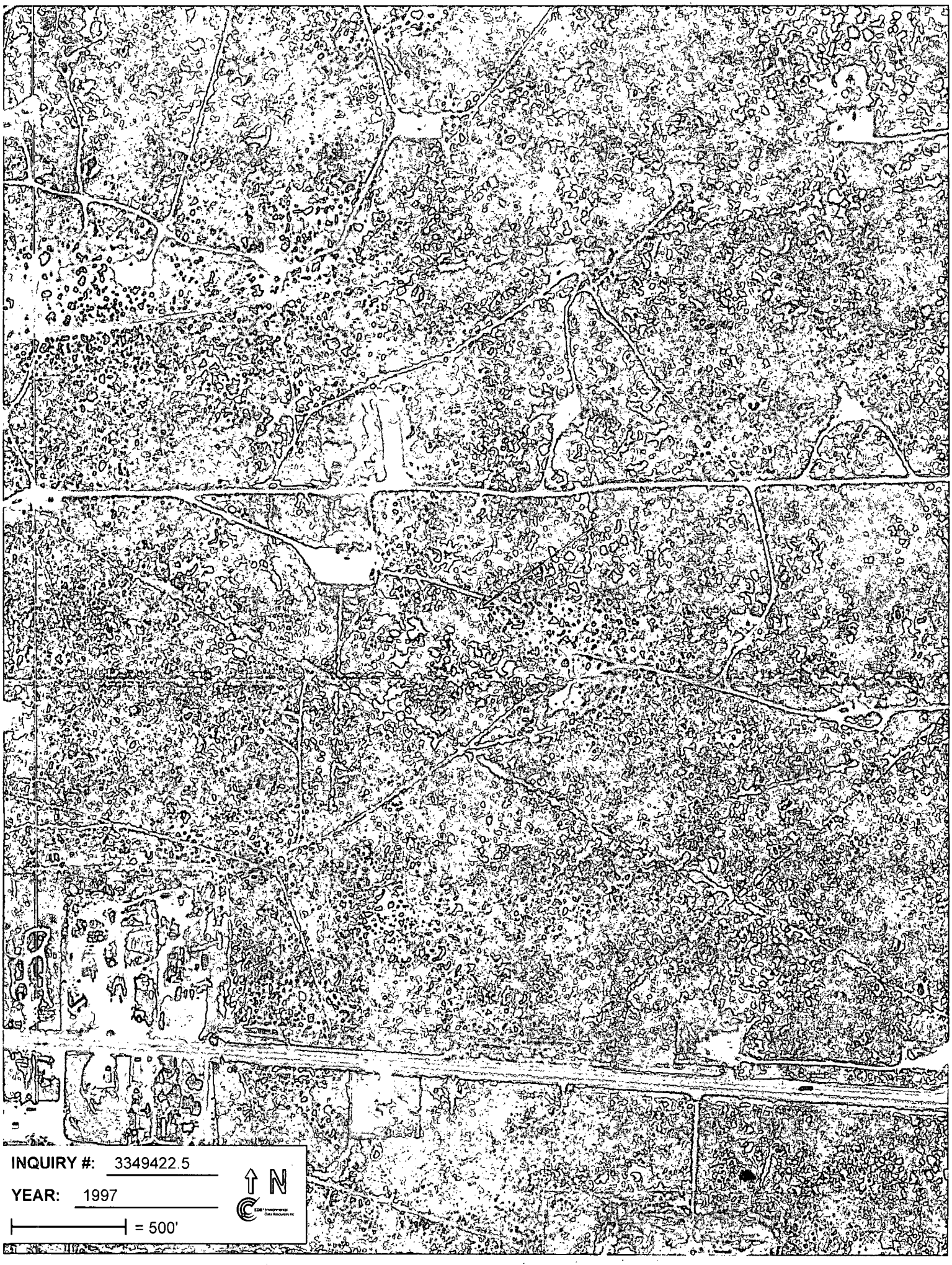
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YEAR: 1997
= 500'
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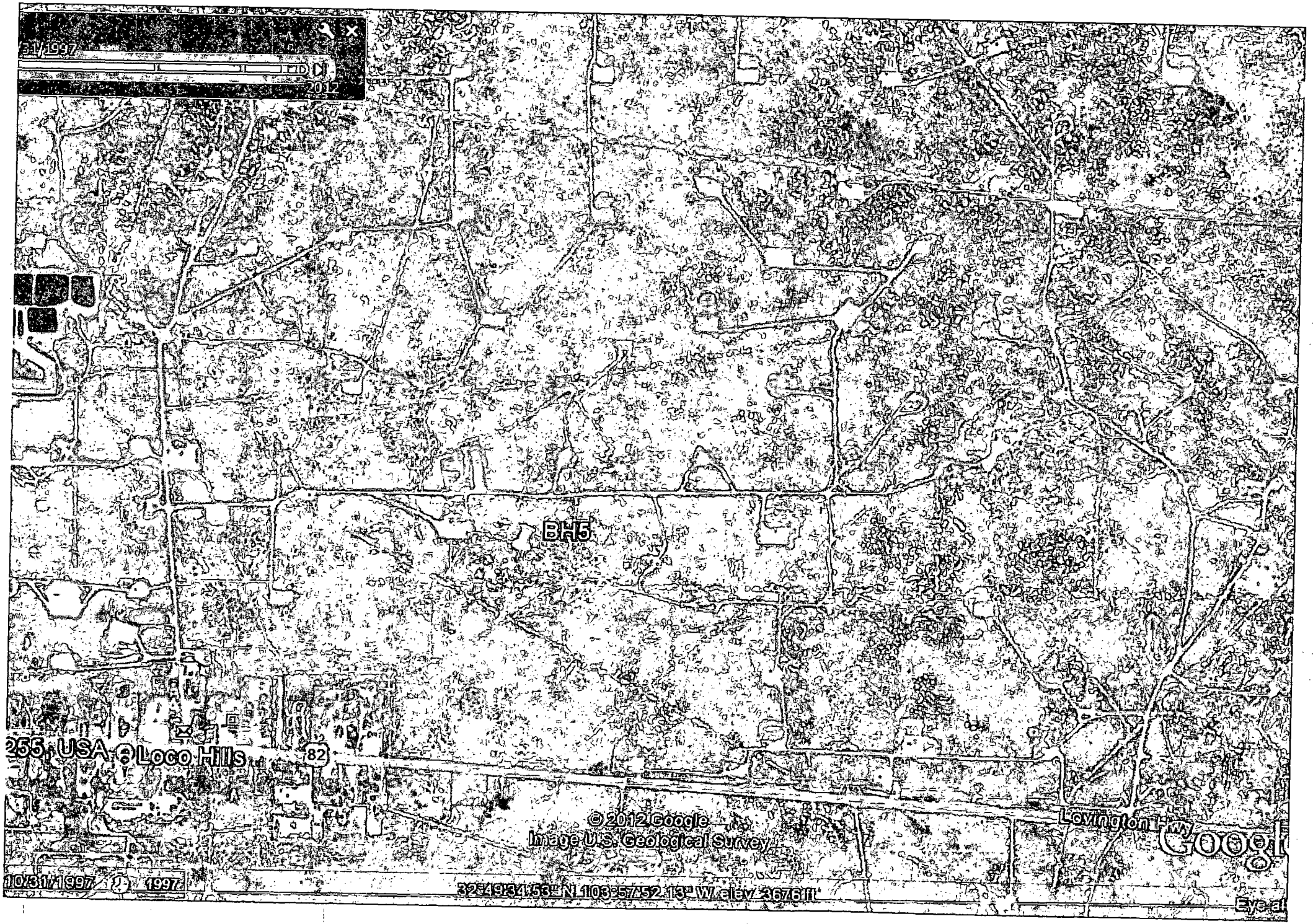
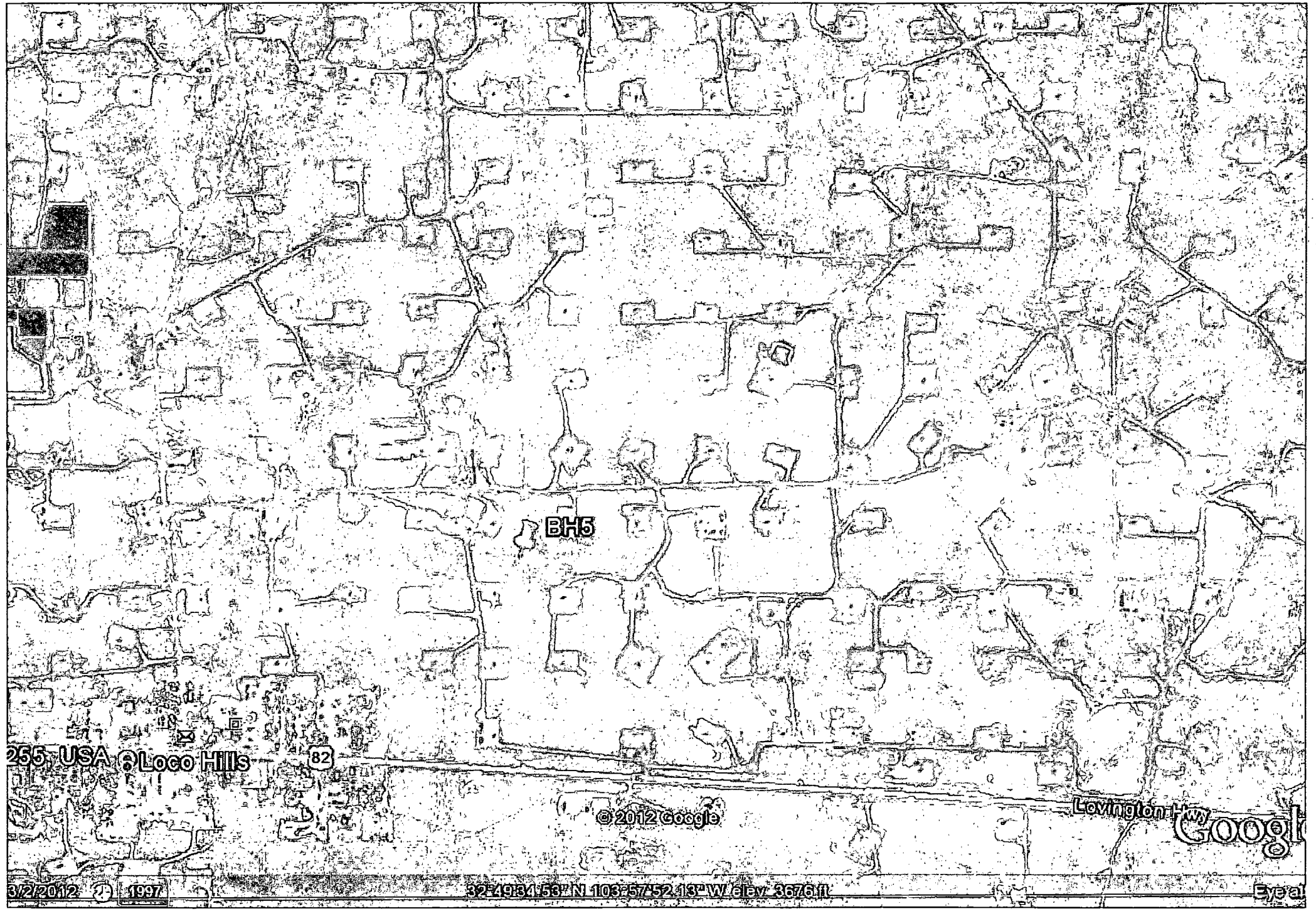
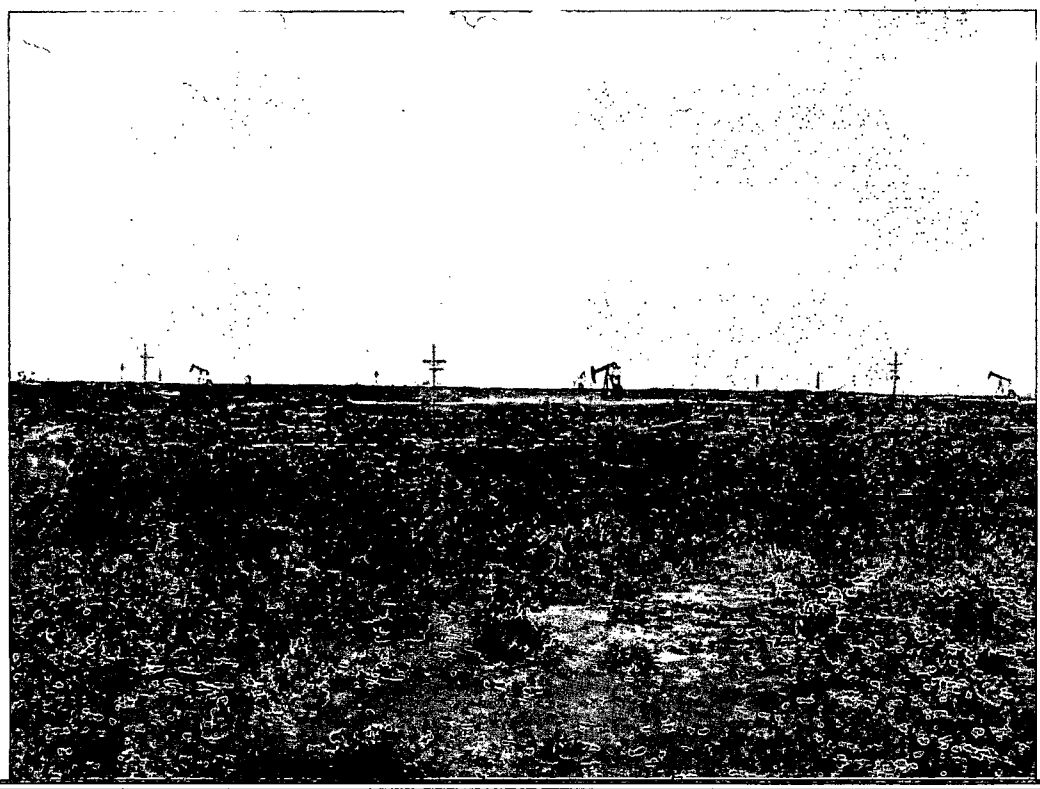

31/1997
2012
BH5
Loco Hills
82
255, USA
Lovington Hwy
© 2012 Google
Image U.S. Geological Survey
10/31/1997
1997
32°49'31.53" N 103°57'52.13" W elev 3676 ft
Eye al

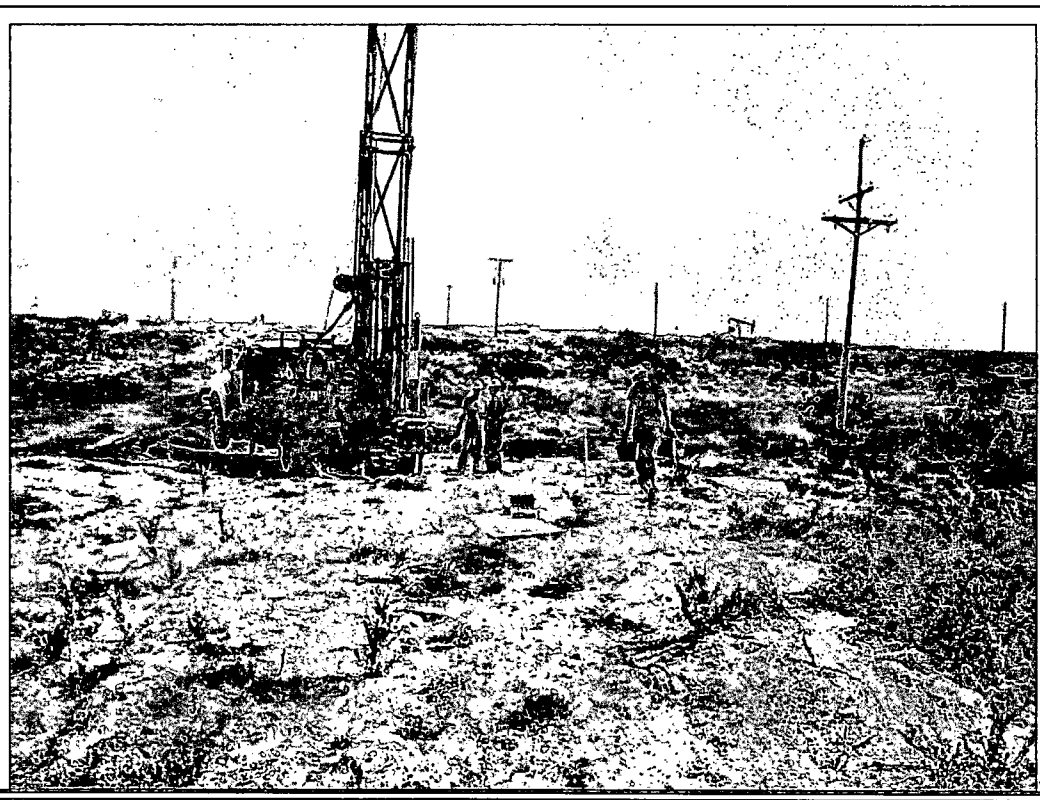

BH5
255, USA
Loco Hills
82
© 2012 Google
Lovington Hwy
Google
3/2/2012
1997
32°49'34.53" N 103°57'52.13" W elev 3676 ft
Eye al

APPENDIX B

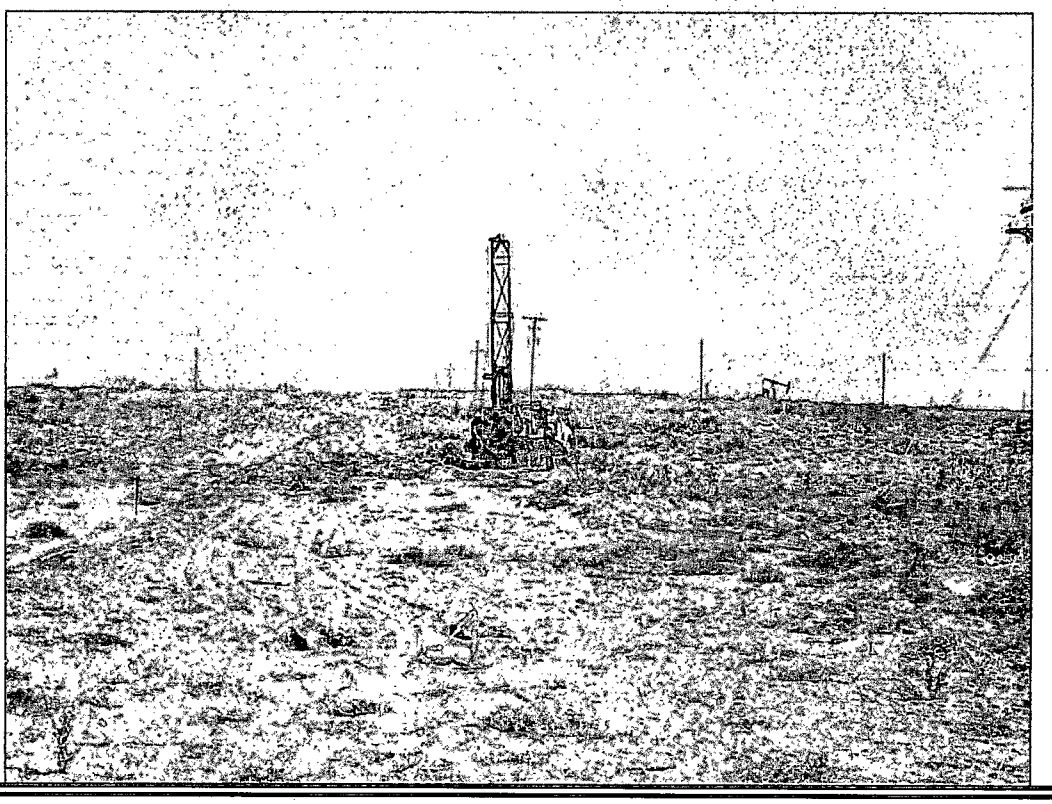
PHOTOGRAPHIC DOCUMENTATION



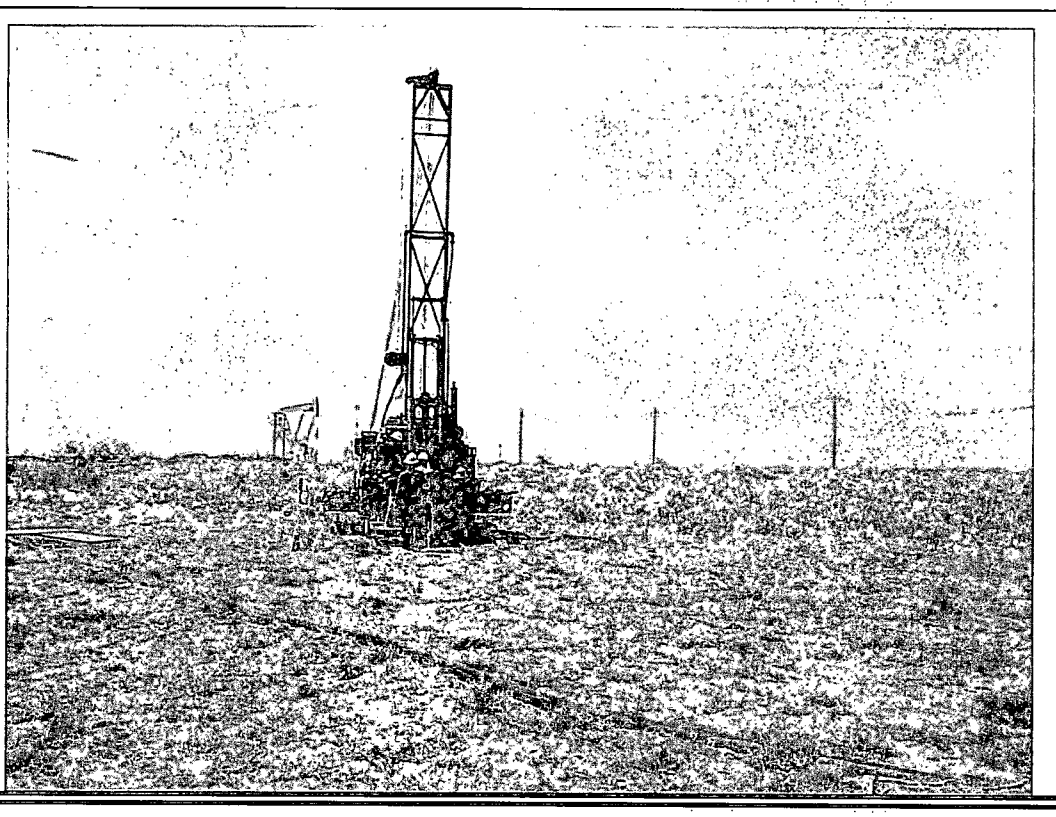
Photograph 1. View looking southeast of the topographic depression spill area from the well pad for Electra Federal #10. Electra Federal #5 is in center background.



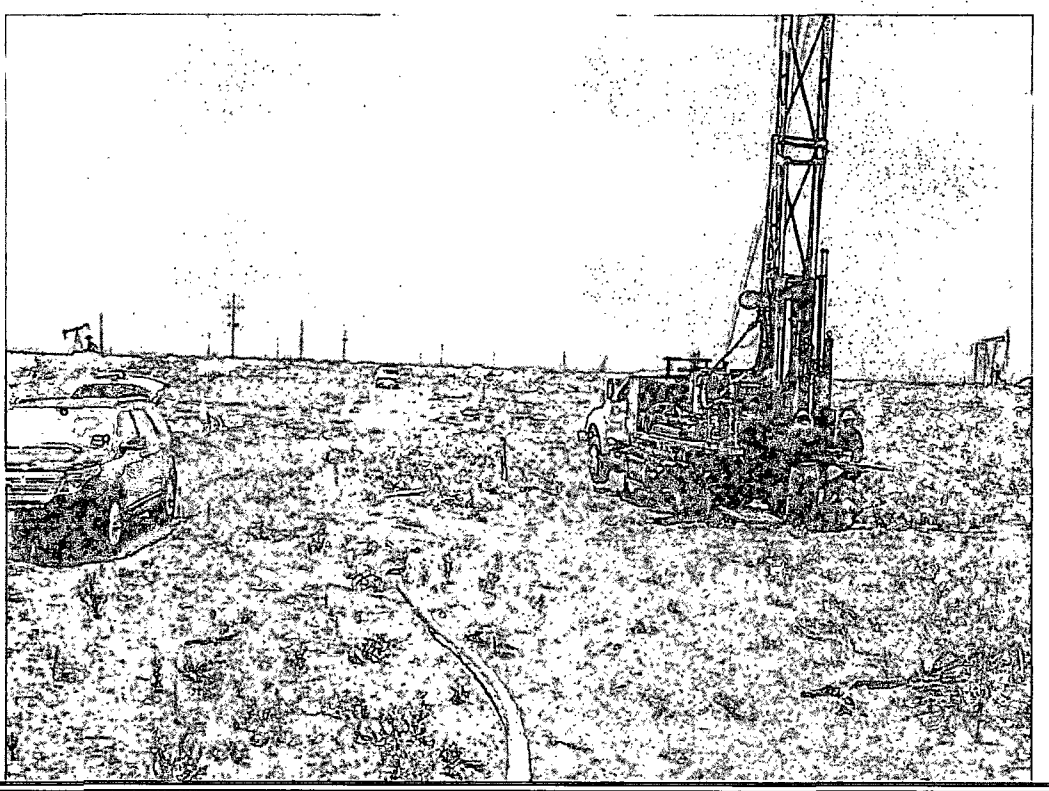
Photograph 2. View looking north of the installation of boring BH-3.



Photograph 3. View looking north of the installation of boring BH-4. Boring BH-3 is flagged in the foreground.



Photograph 4. View looking southwest of the installation of boring BH-5.



Photograph 5. View looking south of the installation of boring BH-6.

APPENDIX C

BORING LOGS

CURA, Inc.

Environmental and Emergency Services
6205 Chapel Hill Blvd
Plano, TX 75093
Phone (972) 378 7333
www.curaes.com

RECORD OF SUBSURFACE EXPLORATION

Project: Saltwater Spill, Electra Federal #5 Flowline, Eddy County, NM

Client / Job Number: GAIC, TS120116

MW/Boring No BH-3 Date Drilled 5/31/12 Drilling Company Atkins Engineering

Logged by Rick Railsback Drilled by Kenneth Bates Conditions Light wind; partly Cloudy, ~85 degrees

Drilling Method Push Probe, Cont. Sampling, SS Latitude 32 deg 49 min 24.31393 Longitude 103 deg 58 min 06.20004

Depth (ft)	Soil Description	Sample ID No.	Sample Type	OVM (ppm)	LEL (%)	Remarks	Screen Setting
			SS	N/A	N/A		
-0	Reddish brown, slightly moist,	0-1'	-	-	-	No hydrocarbon odors or staining 0-	
-	soft, unconsolidated, very fine	1-1.5'				-	
-2	clayey SAND (SC)	2-2.5'				2-	
-		3-3.5'				-	
-4		4-4.5'	-			4-	
-	White, dry, hard CALICHE	5-5.5'		-	-	-	
-6	Total Depth 5.5'					6-	
-						-	
-8						8-	
-						-	
-10			-	-	-	10-	
-						-	
-12						12-	
-						-	
-14						14-	
-			-	-	-	-	
-16						16-	
-						-	
-18						18-	
-						-	
-20			-	-	-	20-	
-						-	
-22						-	
-						-	
-24						24-	
-			-	-	-	-	
-26						26-	
-						-	
-28						28-	
-						-	
-30			-		-	30-	

CURA, Inc.

Environmental and Emergency Services
6205 Chapel Hill Blvd
Plano, TX 75093
Phone (972) 378 7333
www.curaes.com

RECORD OF SUBSURFACE EXPLORATION

Project: Saltwater Spill, Electra Federal #5 Flowline, Eddy County, NM

Client / Job Number: GAIC, TS120116

MW/Boring No BH-4 Date Drilled 5/31/12 Drilling Company Atkins Engineering

Logged by Rick Railsback Drilled by Kenneth Bates Conditions Light wind; partly Cloudy, ~85 degrees

Drilling Method Push Probe, Cont. Sampling, SS Latitude 32 deg 49 min 25.50627 Longitude 103 deg 58 min 06.07055

Depth (ft)	Soil Description	Sample ID No.	Sample Type	OVM (ppm)	LEL (%)	Remarks	Screen Setting
			SS	N/A	N/A		
-0	Reddish brown, slightly moist,	0-1'	-	-	-	No hydrocarbon odors or staining 0-	
-	soft, unconsolidated, very fine	1-1.5'				-	
-2	clayey SAND (SC)	2-2.5'				2-	
-		3-3.5'				-	
-4	White & pink, dry, hard CALICHE	4-4.5'	-			4-	
-	Reddish brown, slightly moist,	5-5.5'		-	-	-	
-6	soft, unconsolidated, very fine					6-	
-	clayey SAND (SC)					-	
-8	Total Depth 5.5'					8-	
-						-	
-10			-	-	-	10-	
-						-	
-12						12-	
-						-	
-14						14-	
-			-	-	-	-	
-16						16-	
-						-	
-18						18-	
-						-	
-20			-	-	-	20-	
-						-	
-22						-	
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-24						24-	
-			-	-	-	-	
-26						26-	
-						-	
-28						28-	
-						-	
-30			-		-	30-	

CURA, Inc.

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RECORD OF SUBSURFACE EXPLORATION

Project: Saltwater Spill, Electra Federal #5 Flowline, Eddy County, NM

Client / Job Number: GAIC, TS120116

MW/Boring No BH-5 Date Drilled 5/31/12 Drilling Company Atkins Engineering

Logged by Rick Railsback Drilled by Kenneth Bates Conditions Light wind; partly Cloudy, ~85 degrees

Drilling Method Push Probe, Cont. Sampling, SS Latitude 32 deg 49 min 25.10747 Longitude 103 deg 58 min 07.13148

Depth (ft)	Soil Description	Sample ID No.	Sample Type	OVM (ppm)	LEL (%)	Remarks	Screen Setting
			SS	N/A	N/A		
-0	Reddish brown, slightly moist,	0-1'	-	-	-	No hydrocarbon odors or staining 0-	
-	soft, unconsolidated, very fine	1-1.5'				-	
-2	clayey SAND (SC)	2-2.5'				2-	
-		3-3.5'				-	
-4		4-4.5'	-			4-	
-		5-5.5'		-	-	-	
-6	Total Depth 5.5'					6-	
-						-	
-8						8-	
-						-	
-10			-	-	-	10-	
-						-	
-12						12-	
-						-	
-14						14-	
-			-	-	-	-	
-16						16-	
-						-	
-18						18-	
-						-	
-20			-	-	-	20-	
-						-	
-22						-	
-						-	
-24						24-	
-			-	-	-	-	
-26						26-	
-						-	
-28						28-	
-						-	
-30			-		-	30-	

CURA, Inc.

Environmental and Emergency Services
6205 Chapel Hill Blvd
Plano, TX 75093
Phone (972) 378 7333
www.curaes.com

RECORD OF SUBSURFACE EXPLORATION

Project: Saltwater Spill, Electra Federal #5 Flowline, Eddy County, NM

Client / Job Number: GAIC, TS120116

MW/Boring No BH-6 Date Drilled 5/31/12 Drilling Company Atkins Engineering

Logged by Rick Railsback Drilled by Kenneth Bates Conditions Light wind; partly Cloudy, ~85 degrees

Drilling Method Push Probe, Cont. Sampling, SS Latitude 32 deg 49 min 26.50894 Longitude 103 deg 58 min 06.92822

Depth (ft)	Soil Description	Sample ID No.	Sample Type	OVM (ppm)	LEL (%)	Remarks	Screen Setting
			SS	N/A	N/A		
-0	Reddish brown, slightly moist,	0-1'	-	-	-	No hydrocarbon odors or staining 0-	
-	soft, unconsolidated, very fine	1-1.5'				-	
-2	clayey SAND (SC)	2-2.5'				2-	
-		3-3.5'				-	
-4	White & pink, dry, hard CALICHE	4-4.5'	-			4-	
-	Reddish brown, slightly moist,	5-5.5'		-	-	-	
-6	soft, unconsolidated, very fine					6-	
-	clayey SAND (SC)					-	
-8	Total Depth 5.5'					8-	
-						-	
-10			-	-	-	10-	
-						-	
-12						12-	
-						-	
-14						14-	
-			-	-	-	-	
-16						16-	
-						-	
-18						18-	
-						-	
-20			-	-	-	20-	
-						-	
-22						-	
-						-	
-24						24-	
-			-	-	-	-	
-26						26-	
-						-	
-28						28-	
-						-	
-30			-		-	30-	

APPENDIX D

LABORATORY REPORT WITH CHAIN OF CUSTODY

Friday, June 08, 2012

Cura Emergency Services
Rick Railsback
6205 Chapel Hill Blvd, Suite 100
Plano, TX 75093
Tel: (972) 378-7333 Fax: (972) 378-6789

Re: Project Name: Electra Faderal #5
Project Number: TS120116
Project Location: Loco Hills, NM

Oxidor received 24 solid sample(s). The analysis performed were as follows:

Sample	Sample ID	Matrix	Collected	Analysis
12060024-001	BH-3-0-1'	Solid	5/31/2012 09:40	Chloride, Solid, Dry Weight
12060024-002	BH-3-1-1.5'	Solid	5/31/2012 09:50	Chloride, Solid, Dry Weight
12060024-003	BH-3-2-2.5'	Solid	5/31/2012 09:50	Chloride, Solid, Dry Weight
12060024-004	BH-3-3-3.5'	Solid	5/31/2012 10:00	Chloride, Solid, Dry Weight
12060024-005	BH-3-4-4.5	Solid	5/31/2012 10:00	Chloride, Solid, Dry Weight
12060024-006	BH-3-5-5.5'	Solid	5/31/2012 10:05	Chloride, Solid, Dry Weight
12060024-007	BH-4-0-1'	Solid	5/31/2012 10:25	Chloride, Solid, Dry Weight
12060024-008	BH-4-1-1.5'	Solid	5/31/2012 10:30	Chloride, Solid, Dry Weight
12060024-009	BH-4-2-2.5'	Solid	5/31/2012 10:35	Chloride, Solid, Dry Weight
12060024-010	BH-4-3-3.5'	Solid	5/31/2012 10:35	Chloride, Solid, Dry Weight
12060024-011	BH-4-4-4.5'	Solid	5/31/2012 10:40	Chloride, Solid, Dry Weight
12060024-012	BH-4-5-5.5'	Solid	5/31/2012 10:40	Chloride, Solid, Dry Weight
12060024-013	BH-5-0-1'	Solid	5/31/2012 11:05	Chloride, Solid, Dry Weight
12060024-014	BH-5-1-1.5'	Solid	5/31/2012 11:15	Chloride, Solid, Dry Weight
12060024-015	BH-5-2-2.5'	Solid	5/31/2012 11:15	Chloride, Solid, Dry Weight
12060024-016	BH-5-3-3.5'	Solid	5/31/2012 11:20	Chloride, Solid, Dry Weight
12060024-017	BH-5-4-4.5'	Solid	5/31/2012 11:20	Chloride, Solid, Dry Weight
12060024-018	BH-5-5-5.5'	Solid	5/31/2012 11:25	Chloride, Solid, Dry Weight
12060024-019	BH-6-0-1'	Solid	5/31/2012 11:35	Chloride, Solid, Dry Weight
12060024-020	BH-6-1-1.5'	Solid	5/31/2012 11:40	Chloride, Solid, Dry Weight
12060024-021	BH-6-2-2.5'	Solid	5/31/2012 11:40	Chloride, Solid, Dry Weight
12060024-022	BH-6-3-3.5'	Solid	5/31/2012 11:45	Chloride, Solid, Dry Weight
12060024-023	BH-6-4-4.5'	Solid	5/31/2012 11:55	Chloride, Solid, Dry Weight
12060024-024	BH-6-5-5.5'	Solid	5/31/2012 12:00	Chloride, Solid, Dry Weight

Respectfully submitted,

Charles Brungardt
President

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-0-1'**
Oxidor Sample ID: 12060024-001 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 09:40**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.4	ND	mg/Kg	06/06/12 18:14	9056	M.H.	D-1
% Solids	0.1	0.1	**97.3**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-1-1.5'**
Oxidor Sample ID: 12060024-002 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 09:50**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.5	ND	mg/Kg	06/06/12 18:27	9056	M.H.	D-1
% Solids	0.1	0.1	**97.0**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-2-2.5'**
Oxidor Sample ID: 12060024-003 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 09:50**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	52.1	ND	mg/Kg	06/06/12 18:40	9056	M.H.	D-1
% Solids	0.1	0.1	**95.9**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-3-3.5'**
Oxidor Sample ID: 12060024-004 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:00**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	103	**422**	mg/Kg	06/06/12 12:33	9056	M.H.	D-1
% Solids	0.1	0.1	**97.4**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-4-4.5**
Oxidor Sample ID: 12060024-005 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:00**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	1070	**4900**	mg/Kg	06/06/12 19:20	9056	M.H.	D-1
% Solids	0.1	0.1	**93.2**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-5-5.5'**
Oxidor Sample ID: 12060024-006 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:05**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	2420	**22300**	mg/Kg	06/06/12 20:01	9056	M.H.	D-1
% Solids	0.1	0.1	**82.8**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-0-1'**
Oxidor Sample ID: 12060024-007 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:25**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.2	ND	mg/Kg	06/06/12 18:54	9056	M.H.	D-1
% Solids	0.1	0.1	**97.7**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-1-1.5'**
Oxidor Sample ID: 12060024-008 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:30**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	105	**820**	mg/Kg	06/06/12 13:26	9056	M.H.	D-1
% Solids	0.1	0.1	**95.6**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-2-2.5'**
Oxidor Sample ID: 12060024-009 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:35**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	1070	**5580**	mg/Kg	06/06/12 20:14	9056	M.H.	D-1
% Solids	0.1	0.1	**93.5**	%	06/01/12 15:20	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-3-3.5'**
Oxidor Sample ID: 12060024-010 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:35**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	2270	**19600**	mg/Kg	06/06/12 20:27	9056	M.H.	D-1
% Solids	0.1	0.1	**88.0**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-4-4.5'**
Oxidor Sample ID: 12060024-011 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:40**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	2310	**22200**	mg/Kg	06/06/12 20:41	9056	M.H.	D-1
% Solids	0.1	0.1	**86.6**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-5-5.5'**
Oxidor Sample ID: 12060024-012 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 10:40**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	2220	**13000**	mg/Kg	06/06/12 20:54	9056	M.H.	D-1
% Solids	0.1	0.1	**90.2**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-0-1'**
Oxidor Sample ID: 12060024-013 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:05**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.2	ND	mg/Kg	06/06/12 15:00	9056	M.H.	D-1
% Solids	0.1	0.1	**97.6**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-1-1.5'**
Oxidor Sample ID: 12060024-014 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:15**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.1	**115**	mg/Kg	06/06/12 15:13	9056	M.H.	D-1
% Solids	0.1	0.1	**97.8**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-2-2.5'**
Oxidor Sample ID: 12060024-015 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:15**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.7	**389**	mg/Kg	06/06/12 15:27	9056	M.H.	D-1
% Solids	0.1	0.1	**96.7**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-3-3.5'**
Oxidor Sample ID: 12060024-016 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:20**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.2	**101**	mg/Kg	06/06/12 15:40	9056	M.H.	D-1
% Solids	0.1	0.1	**97.7**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-4-4.5'**
Oxidor Sample ID: 12060024-017 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:20**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	104	**1130**	mg/Kg	06/06/12 19:07	9056	M.H.	D-1
% Solids	0.1	0.1	**96.1**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-5-5.5'**
Oxidor Sample ID: 12060024-018 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:25**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.1	**91.6**	mg/Kg	06/06/12 16:07	9056	M.H.	D-1
% Solids	0.1	0.1	**97.8**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-0-1'**
Oxidor Sample ID: 12060024-019 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:35**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	67.8	ND	mg/Kg	06/06/12 16:26	9056	M.H.	D-1
% Solids	0.1	0.1	**73.8**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-1-1.5'**
Oxidor Sample ID: 12060024-020 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:40**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.4	ND	mg/Kg	06/06/12 16:40	9056	M.H.	D-1
% Solids	0.1	0.1	**97.2**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-2-2.5'**
Oxidor Sample ID: 12060024-021 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:40**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.7	ND	mg/Kg	06/06/12 17:20	9056	M.H.	D-1
% Solids	0.1	0.1	**96.8**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-3-3.5'**
Oxidor Sample ID: 12060024-022 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:45**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	52.4	ND	mg/Kg	06/06/12 17:33	9056	M.H.	D-1
% Solids	0.1	0.1	**95.4**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-4-4.5'**
Oxidor Sample ID: 12060024-023 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 11:55**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	53.9	ND	mg/Kg	06/07/12 12:29	9056	M.H.	D-1
% Solids	0.1	0.1	**92.7**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Analytical Report

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-5-5.5'**
Oxidor Sample ID: 12060024-024 Matrix: **Solid**
Sample Received: 6/1/2012 Sample Collected: **5/31/2012 12:00**

Parameter	MQL	SQL	Result	Units	Date Analyzed	Method	Analyst	Flags
General Chemistry								
Chloride	10	51.8	ND	mg/Kg	06/06/12 18:00	9056	M.H.	D-1
% Solids	0.1	0.1	**96.6**	%	06/01/12 15:45	Dry Weight	L.C.	

Cura Emergency Services
Rick Railsback

Sample Cross Reference

Project Name: **Electra Faderal #5**

Customer ID:	Lab ID:	Test	Method	QCBatchID:
BH-3-0-1'	12060024-001	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-3-1-1.5'	12060024-002	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-3-2-2.5'	12060024-003	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-3-3-3.5'	12060024-004	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-3-4-4.5	12060024-005	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-3-5-5.5'	12060024-006	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-4-0-1'	12060024-007	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-4-1-1.5'	12060024-008	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-4-2-2.5'	12060024-009	Dry Weight	Dry Weight	DW___11625_S
		Chloride, Solid	9056	IC___12512_S
BH-4-3-3.5'	12060024-010	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-4-4-4.5'	12060024-011	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-4-5-5.5'	12060024-012	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-5-0-1'	12060024-013	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-5-1-1.5'	12060024-014	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-5-2-2.5'	12060024-015	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-5-3-3.5'	12060024-016	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-5-4-4.5'	12060024-017	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-5-5-5.5'	12060024-018	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-6-0-1'	12060024-019	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-6-1-1.5'	12060024-020	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12512_S
BH-6-2-2.5'	12060024-021	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12612_S
BH-6-3-3.5'	12060024-022	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12612_S
BH-6-4-4.5'	12060024-023	Dry Weight	Dry Weight	DW___11725_S

Cura Emergency Services
Rick Railsback

Sample Cross Reference

Project Name: **Electra Faderal #5**

Customer ID:	Lab ID:	Test	Method	QCBatchID:
		Chloride, Solid	9056	IC___12612_S
BH-6-5-5.5'	12060024-024	Dry Weight	Dry Weight	DW___11725_S
		Chloride, Solid	9056	IC___12612_S

Cura Emergency Services
Rick Railsback

QC Summary

Project Name: **Electra Faderal #5**

QC Type	Parameter	Result	Reference Value	Spike Conc	Rec	Rec Limits	RPD	RPD Limits	Flags
QCBatchID DW___11625_S									
Replicate	% Solids	98.9 %	98.7 %				0.2%	0-20%	
QCBatchID DW___11725_S									
Replicate	% Solids	97.0 %	97.6 %				0.6%	0-20%	
QCBatchID IC___12512_S									
Blank	Chloride	ND mg/Kg							
LCS	Chloride	2.8 mg/L		3 mg/L	95%	90-110%			
LCSD	Chloride	2.8 mg/L		3 mg/L	94%	90-110%	0.3%	0-20%	
MS	Chloride	2.9 mg/Kg	ND	3 mg/Kg	97%	80-120%			
MSD	Chloride	2.9 mg/Kg	ND	3 mg/Kg	97%	80-120%	0.0%	0-20%	
QCBatchID IC___12612_S									
Blank	Chloride	ND mg/Kg							
LCS	Chloride	2.8 mg/L		3 mg/L	94%	90-110%			
LCSD	Chloride	2.8 mg/L		3 mg/L	94%	90-110%	0.5%	0-20%	
MS	Chloride	3.7 mg/Kg	0.76 mg/Kg	3 mg/Kg	98%	80-120%			
MSD	Chloride	3.6 mg/Kg	0.76 mg/Kg	3 mg/Kg	95%	80-120%	2.7%	0-20%	

Cura Emergency Services
Rick Railsback

Case Narrative

Project Name: **Electra Faderal #5**

D-1	Elevated reporting limit(s) due to dilution. Dilution resulted from sample matrix interference, high target analyte(s), high non-target analyte(s) or a combination thereof.
ppm	Parts per million = mg/Kg or mg/L
ppb	Parts per billion = ug/Kg or ug/L
MQL	Method quantitation limit
SDL	Sample detection limit (reflects any laboratory adjustments made to the sample during analysis such as dry weight or dilutions)
SQL	Sample quantitation limit (reflects any laboratory adjustments made to the sample during analysis such as dry weight or dilution
ND	Analyte not detected at or above SQL
LCS/LCSD	Laboratory control spike / Laboratory control spike duplicate
MS/MSD	Matrix spike / Matrix spike duplicate
RPD	Relative percent difference
Sub	Analysis performed by subcontract laboratory
*	Refer to QC section

Solid sample results reported on a dry weight basis for all applicable analysis, unless otherwise noted. Dry weight calculations based upon % solids obtained as outlined in EPA method 5035 section 7.5

Oxidor Laboratories, LLC certifies to the best of its knowledge that all results contained in this report are consistent with the National Environmental Laboratory Accreditation Program, except where otherwise noted.

Cura Emergency Services
Rick Railsback

Sample Preservation Verification

Project Name: **Electra Faderal #5**

Receipt temp: **4.2 °C on Ice**
Receipt method: **Client**
Custody seal intact: **Not Present**

All applicable VOA's received free of headspace: **N/A**

All samples / labels received intact: **Yes**

Customer Sample ID: **BH-3-0-1'**
Oxidor Sample ID: **12060024-001**
Collected: **05/31/12 09:40**

Collected By: **Rick Railsback**
Collector Affiliation: **Cura Emergency Services**
Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-3-1-1.5'**
Oxidor Sample ID: **12060024-002**
Collected: **05/31/12 09:50**

Collected By: **Rick Railsback**
Collector Affiliation: **Cura Emergency Services**
Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-3-2-2.5'**
Oxidor Sample ID: **12060024-003**
Collected: **05/31/12 09:50**

Collected By: **Rick Railsback**
Collector Affiliation: **Cura Emergency Services**
Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-3-3-3.5'**
Oxidor Sample ID: **12060024-004**
Collected: **05/31/12 10:00**

Collected By: **Rick Railsback**
Collector Affiliation: **Cura Emergency Services**
Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-3-4-4.5**
Oxidor Sample ID: **12060024-005**
Collected: **05/31/12 10:00**

Collected By: **Rick Railsback**
Collector Affiliation: **Cura Emergency Services**
Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Cura Emergency Services
Rick Railsback

Sample Preservation Verification

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-3-5-5.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-006** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:05** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-4-0-1'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-007** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:25** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-4-1-1.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-008** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:30** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-4-2-2.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-009** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:35** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-4-3-3.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-010** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:35** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-4-4-4.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-011** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:40** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Cura Emergency Services
Rick Railsback

Sample Preservation Verification

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-4-5-5.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-012** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 10:40** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-5-0-1'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-013** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:05** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-5-1-1.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-014** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:15** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-5-2-2.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-015** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:15** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-5-3-3.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-016** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:20** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-5-4-4.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-017** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:20** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Cura Emergency Services
Rick Railsback

Sample Preservation Verification

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-5-5-5.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-018** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:25** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-6-0-1'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-019** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:35** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-6-1-1.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-020** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:40** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-6-2-2.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-021** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:40** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-6-3-3.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-022** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:45** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Customer Sample ID: **BH-6-4-4.5'** | Collected By: **Rick Railsback**
Oxidor Sample ID: **12060024-023** | Collector Affiliation: **Cura Emergency Services**
Collected: **05/31/12 11:55** | Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Cura Emergency Services
Rick Railsback

Sample Preservation Verification

Project Name: **Electra Faderal #5**

Customer Sample ID: **BH-6-5-5.5'**
Oxidor Sample ID: **12060024-024**
Collected: **05/31/12 12:00**

Collected By: **Rick Railsback**
Collector Affiliation: **Cura Emergency Services**
Matrix: **Solid**

Bottle Type	Count	Collection Method	Parts / Interval	Indicated Preservation	pH
4 oz Glass Jar	1	Grab		Temp	-

Sample conditions at time of receipt at laboratory verified in part or in whole by:

A.B.

Chain of Custody

PROJECT DESCRIPTION: **Electra Faderal #5**

OXIDOR Laboratories, LLC
1825 East Plano Parkway, #160
Plano, TX 75074-6570
P: 972.424.6422 F: 972.424.6508
customerservice@oxidor.com

Chain of Custody Record

Page 1 of 2

Send Report To

Company Name: Cura Emergency Services
Address: 6205 Chapel Hill Blvd, Ste 100
City: Plano State: Tx Zip: 75093
Contact Name: Rick Railsback
Contact Email: rick@curaes.com
Phone: 214 914 7263 Fax:

Send Invoice To (Only If Different from above)

Company Name:
Address:
City: State: Zip:
Contact Name:
Phone: Fax:

Project / Report Information

Circle Requested Turn Around Time (Less than 2 Days must be verified with lab)
7-10 Days (circled) 5-7 Days RUSH 3-4 Days 2 Days ASAP

Project Name: Electra Federal #5
Project Location: Loco Hills, NM PO #:
Project #: TS120116
Sampler Name: Rick Railsback Sampler Company: Cura
Sampler Signature: Rick Railsback

Special Instructions:

Matrix Codes: L - Liquid S - Solid W - Wipes A - Air
Preservation Codes: 1 - None 4 - HCl 2 - HNO_3 5 - NaOH 3 - H_2SO_4 6 - Ice 7 - Other
Container Codes: P - Plastic G - Glass O - Other

*Please confirm conditional requests prior to additional analysis

Requested Analysis: Chlorides

OXIDOR Order ID 12060024	Customer Sample ID	Sample Info Date	Time	Matrix	# of Containers	Container Type	Pres Code	(C)omp / (G)rab	Parts / Interval	Hold	Chlorides	Total Solids / Dry Weight	Laboratory Review Checklist	Chromatograms / Data Pages
001	1 BH-3-0-1'	5/31	0940	S	1	G	G	G			X	X		
002	2 BH-3-1-1.5'		0950											
003	3 BH-3-2-2.5'		0950											
004	BH-3-3-3.5'		1000											
005	5 BH-3-4-4.5'		1000											
006	6 BH-3-5-5.5'		1005											
007	7 BH-4-0-1'		1025											
008	8 BH-4-1-1.5'		1030											
009	9 BH-4-2-2.5'		1035											
010	10 BH-4-3-3.5'		1035											
011	11 BH-4-4-4.5'		1040											
012	12 BH-4-5-5.5'		1040											
013	13 BH-5-0-1'		1105											
014	14 BH-5-1-1.5'		1115											
015	15 BH-5-2-2.5'		1115											

Relinquished by	Affiliation	Date	Time	Received by	Affiliation	Date	Time
x RL Railsback	Cura	6/1/12	2:30p	x			
Relinquished by	Affiliation	Date	Time	Received by	Affiliation	Date	Time
x				x			
Relinquished by	Affiliation	Date	Time	Received by Oxidor		Date	Time
x				x MARK FANES		6-1-12	14:40

Submittal of samples signifies acceptance of OXIDOR's Standard Terms and Conditions
OXIDOR cannot accept verbal changes to this document. Please fax or email written modifications

5/22/2008 - Rev. 4.0

Temp at Reciept 4.2°C 06-48

Chain of Custody

PROJECT DESCRIPTION: **Electra Faderal #5**

OXIDOR Laboratories, LLC
1825 East Plano Parkway, #160
Plano, TX 75074-8570
P: 972 424 6422 F: 972 424 6508
customerservice@oxidor.com

Chain of Custody Record

Page 2 of 2

Send Report To		Project / Report Information	
Company Name	Cura Emergency Services	Circle Requested Turn Around Time (Less than 2 Days must be verified with lab)	7-10 Days (circled) 5-7 Days RUSH 3-4 Days 2 Days ASAP
Address		Project Name	Electra Federal #5
City / State / Zip		Project Location	Loco Hills, NM
Contact Name		Project #	TS120116 PO #
Contact Email	rick@curaes.com	Sampler Name	Rick Railsback
Phone / Fax	2149147263	Sampler Company	Cura
		Sampler Signature	Rick Railsback
Send Invoice To (Only if Different from above)		Matrix Codes	Special Instructions
Company Name		L - Liquid S - Solid	
Address		W - Wipes A - Air	
City / State / Zip		Preservation Codes	
Contact Name		1 - None 4 - HCl	
Phone / Fax		2 - HNO_3 5 - NaOH	
		3 - H_2SO_4 6 - Ice	
		7 - Other	
		Container Codes	
		P - Plastic G - Glass	
		O - Other	

*Please confirm conditional requests prior to additional analysis

OXIDOR Order ID		Customer Sample ID	Sample Info Date	Sample Info Time	Matrix	# of Containers	Container Type	Preservation Code	(Comp) / (Grab)	Parts / Interval	Requested Analysis: Hold	Chlorides	Total Solids / Dry Weight	Laboratory Review Checklist	Chromatograms / Data Pages
12060024															
016	1	BH-5-3-3.5'	5/31	1120	S	1	G	6	G			X	X		
017	2	BH-5-4-4.5'		1120											
018	3	BH-5-5-5.5'		1125											
019	4	BH-6-0-1'		1135											
020	5	BH-6-1-1.5'		1140											
021	6	BH-6-2-2.5'		1140											
022	7	BH-6-3-3.5'		1145											
023	8	BH-6-4-4.5'		1155											
024	9	BH-6-5-5.5'		1200											
	10														
	11														
	12														
	13														
	14														
	15														

Relinquished by	Affiliation	Date	Time	Received by	Affiliation	Date	Time
x Rick Railsback	Cura	6/1/12	2:40p	x			
Relinquished by	Affiliation	Date	Time	Received by	Affiliation	Date	Time
x				x			
Relinquished by	Affiliation	Date	Time	Received by	Affiliation	Date	Time
x				x MARK HANES	OXIDOR	6-1-12	14:40

5/22/2008 - Rev 4.0

Submittal of samples signifies acceptance of OXIDOR's Standard Terms and Conditions.
OXIDOR cannot accept verbal changes to this document. Please fax or email written modifications.

Temp at Reciept 4.2°C 0048

APPENDIX E

CURA *Proposal and Workplan for the Assessment of Chloride Background Concentrations within the Surficial Soil, Saltwater Spill, COG Operating, Electra Federal #5 Flowline, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (site)* DATED FEBRUARY 27, 2012

ENVIRONMENTAL

February 27, 2012

Mr. Mike Bratcher
New Mexico Oil Conservation Division, District 2
811 South First Street
Artesia, New Mexico 88210

RE: Proposal and Workplan for the Assessment of Chloride Background Concentrations within the Surficial Soil, Saltwater Spill, COG Operating, Electra Federal #5 Flowline, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (site)

CURA Emergency Services, Inc. (CURA) on behalf of COG Operating is pleased to submit this proposal for the assessment of chloride background concentrations within the surficial soil at the above-captioned location.

Background

According to Tetra Tech, Inc. (Tetra Tech) *Workplan for the COG Operating LLC., Electra Federal #5 Flow line, Unit A, section 21, Township 17 south, Range 30 East, Eddy County, New Mexico*, produced water was released from a 4-inch poly line associated with the Electra Federal #5 well site on November 03, 2010. Apparently, approximately 30 bbls was released and 25 bbls of produced water was recovered by vacuum trucks. An initial assessment and subsequent delineation activities were conducted to assess the vertical and horizontal delineation of the contaminants of concern. A total of 58 soil samples were collected within the immediate vicinity of the release area to a maximum depth of 70 feet. The soil samples were sampled for Total Petroleum Hydrocarbons (TPH), benzene, toluene, ethyl benzene, xylenes (BTEX), and chloride. All analytical results were below the Recommended Remediation Action Levels (RRALs) for TPH and BTEX. The chloride analytical results ranged from less than 200 mg/kg to 14,900 mg/kg. Extreme variability between sample locations and depths of samples was observed.

The Tetra Tech workplan further recommends extensive excavation of soil impacted by this saltwater release. Background levels for chlorides in surficial soil have not been established for this site. The attached Memorandum on Naturally Occurring Chlorides in Southeastern New Mexico dated February 15, 2012 summarizes the facets of this geologic issue. Naturally occurring chlorides concentrations in surficial soil may show extreme variations in this area of New Mexico. CURA recommends that further site assessment be conducted in order to establish background concentrations for chlorides in the site vicinity.

6205 Chapel Hill Blvd., Suite 100, Plano, TX 75093

(972) 378-7333 • 972.378.6789 fax

www.spillsolutions.com

Proposed Assessment of Chloride Background Concentrations

The assessment conducted by Tetra Tech and summarized in the workplan cited above did not include the collection and analysis of surficial soil samples in areas not affected by the spill. In light of the extreme variability of chloride concentrations within the affected areas sampled, background concentrations of chlorides in unaffected areas should be assessed. Therefore, CURA proposes to install three soil borings in unaffected areas to the north, south, and west of the release area. Soil borings will be installed by hand augering or push probing to a depth of 5.5 feet below ground surface (bgs). A total of 6 soil samples will be collected from each boring at depths corresponding to the sample depths of the Tetra Tech assessment (0-1', 1-1.5', 2-2.5', 3-3.5', 4-4.5', 5-5.5'). The samples will be analyzed for chlorides by EPA Method 300.0. Soil samples will be collected in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993 Section 2.a Sampling Procedures.

The analytical results from these three background soil borings will determine the next step of remedial action. As this area of New Mexico has documented highly variable chloride concentrations in surficial soils, CURA anticipates that the chlorides concentrations documented in the Tetra Tech assessment may be naturally occurring and may not the result of impact from the minimal spill from the Electra Federal #5 flowline.

Your review and approval of this workplan will be very much appreciated. If you have any questions pertaining to the above proposed scope of work, please do not hesitate to contact me at (214) 914-7263 or rick@curaes.com. Upon receipt of your approval of this proposal, CURA will mobilize to the site and conduct this additional assessment work.

Respectfully submitted,

Rick Railsback

CURA Environmental & Emergency Services

Attachments: Memorandum on Naturally Occurring Chlorides in Southeastern New Mexico dated February 15, 2012

APPENDIX F

TETRA TECH ***Work Plan for the COG Operating LLC., Electra Federal #5 Flow line, Unit A, section 21, Township 17 south, Range 30 East, Eddy County, New Mexico*** **DATED JANUARY 16, 2012**

TETRA TECH

January 16, 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., Electra Federal #5 Flow line, Unit A, Section 21, 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 release from a 4-inch poly line associated with the Electra Federal #5, Unit A, Section 21, Township 17 South, Range 30 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.82343°, W 103.96848°. The site location is shown on Figures 1 and 2.

Background

On November 3, 2010, Ferguson Construction was installing an underground line for Holly Energy. Prior to trenching, Ferguson moved a COG 4-inch poly line and which parted while being moved. As results, the leak released approximately 30 barrels of produced water. COG immediately responded and recovered 25 barrels of fluid with a vacuum truck. According to the C-141, the spill affected an area measuring 70' x 85' directly on and adjacent the poly line right-of-way. Ferguson has since installed the Holly Energy line and backfilled the site. The initial C-141 form is enclosed in Appendix A.

Groundwater

No water wells were listed within Section 21. According to the NMOCD groundwater map, the average depth to groundwater in the area is approximately 300' below surface. The average depth to groundwater map is shown in Appendix A.

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 December 7, 2010, Tetra Tech personnel inspected and sampled the spill area. Six auger holes (AH-1 through AH-6) were installed using a stainless steel hand auger to assess the impacted soils. Select 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, all submitted samples were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the majority of the auger holes. Auger hole (AH-1) did not show chloride impact to the soils. The areas of AH-5 and AH-6 showed a shallow impact to the soils, which were vertically defined at 1.0' and 4.0', respectively. The remaining auger holes (AH-2, AH-3 and AH-4) showed chloride impact which was not vertically defined.

In order to define the chloride impact, boreholes were proposed in the areas of AH-2, AH-3 and AH-4. The area of AH-2 was not drilled due to an overhead power line. Based on the proximity of AH-3, the data from AH-3 will be utilized for the area of AH-2. On December 7, 2011, Tetra Tech

personnel supervised the installation of two (2) boreholes (BH-1 and BH-2) utilizing an air rotary rig. The results of the sampling are summarized in Table 1. The borehole locations are shown on Figure 3.

Referring to Table 1, a deeper chloride impact was encountered in the areas of BH-1 and BH-2. In the area of borehole (BH-1), the chloride concentration spiked at 15.0' with a concentrations of 13,500 mg/kg, which declined with depth to 225 mg/kg at 60.0' below surface. In addition, borehole (BH-2) spiked at 7.0' with a concentration of 13,300 mg/kg and declined with depth to <200 mg/kg at 70.0' below surface.

Work Plan

The goal of the remediation is to reduce the environmental liabilities for the protection of the groundwater. Based on the results and depth to groundwater, the proposed excavation areas and depths are highlighted (green) in Table 1 and shown on Figure 4. As shown in Table 1, the proposed excavation depths will range from 1.0' to 10.0' below surface in majority of the impacted areas.

COG has two lines in the vicinity of the spill area. The underground line and a poly line are located on the west edge of the spill area. The Holly Energy underground line is located in the center of the spill area. The distance between the COG lines and Holly line measured approximately 35.0'. Due to the proximity of the lines, the area of AH-4 (BH-1) will be excavated to an approximate depth of 4.0' to 7.0' below surface. Deeper excavation in this area will not be performed due to safety concerns and for structural integrity of the active lines. The proposed excavation area will measure approximately 25' x 30'. Once excavated to the appropriate depth, the area will be capped with a 40 mil liner at 4.0' below surface.

The area of AH-2 and AH-3 (BH-2) will be excavated to a depth of 7.0' to 10.0 below surface to remove the chloride impact exceeding over 10,000 mg/kg. Once excavated to the appropriate depth, the area will be capped with a 40 mil liner at 4.0' below surface.

Based on site formation, 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.

TETRA TECH

Once the areas are excavated to the appropriate depths, the excavation will be backfilled with clean soil. 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
cc: Terry Gregston - BLM

Tables

Table 1
COG Operating LLC.
Electra Federal #5
EDDY 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)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
AH-1	12/7/2010	0-1'		X		<2.00	662	662	<0.0200	<0.0200	<0.0200	<0.0200	<200
		1-1.5'		X		-	-	-	-	-	-	-	<200
		2-2.5'		X		-	-	-	-	-	-	-	<200
		3-3.5'		X		-	-	-	-	-	-	-	630
AH-2	12/7/2010	0-1'		X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<200
		1-1.5'		X		-	-	-	-	-	-	-	434
		2-2.5'		X		-	-	-	-	-	-	-	1,480
		3-3.5'		X		-	-	-	-	-	-	-	1,350
		4-4.5'		X		-	-	-	-	-	-	-	2,360
		5-5.5'		X		-	-	-	-	-	-	-	8,130

Table 1
COG Operating LLC.
Electra Federal #5
EDDY 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)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
AH-3	12/7/2010	0-1'		X		3.94	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	389
		1-1.5'		X		-	-	-	-	-	-	-	489
		2-2.5'		X		-	-	-	-	-	-	-	2,350
		3-3.5'		X		-	-	-	-	-	-	-	14,900
		4-4.5'		X		-	-	-	-	-	-	-	14,800
BH-2	11/4/2011	0-1'	-	X		-	-	-	-	-	-	-	<200
	"	3'	-	X		-	-	-	-	-	-	-	<200
	"	5'	-	X		-	-	-	-	-	-	-	12,400
	"	7'	-	X		-	-	-	-	-	-	-	13,300
	"	10'	-	X		-	-	-	-	-	-	-	6,380
	"	15'	-	X		-	-	-	-	-	-	-	8,670
	"	20'	-	X		-	-	-	-	-	-	-	5,850
	"	25'	-	X		-	-	-	-	-	-	-	3,490
	"	30'	-	X		-	-	-	-	-	-	-	535
	"	40'	-	X		-	-	-	-	-	-	-	5,040
	"	50'	-	X		-	-	-	-	-	-	-	1,350
	"	60'	-	X		-	-	-	-	-	-	-	1,130
	"	70'	-	X		-	-	-	-	-	-	-	<200

Table 1
COG Operating LLC.
Electra Federal #5
EDDY COUNTY, NEW MEXICO

Sample ID	Sample Date	Sample Depth (ft)	Depth (BEB)	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					
AH-4	12/7/2010	0-1'		X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	744
		1-1.5'		X		-	-	-	-	-	-	-	1,070
		2-2.5'		X		-	-	-	-	-	-	-	2,810
		3-3.5'		X		-	-	-	-	-	-	-	5,370
		4-4.5'		X		-	-	-	-	-	-	-	5,040
		5-5.5'		X		-	-	-	-	-	-	-	5,190
BH-1	11/4/2011	0-1'	-	X		-	-	-	-	-	-	-	791
	"	3'	-	X		-	-	-	-	-	-	-	461
	"	5'	-	X		-	-	-	-	-	-	-	2,470
	"	7'	-	X		-	-	-	-	-	-	-	3,980
	"	10'	-	X		-	-	-	-	-	-	-	9,370
	"	15'	-	X		-	-	-	-	-	-	-	13,500
	"	20'	-	X		-	-	-	-	-	-	-	4,340
	"	25'	-	X		-	-	-	-	-	-	-	6,340
	"	30'	-	X		-	-	-	-	-	-	-	8,880
	"	40'	-	X		-	-	-	-	-	-	-	507
	"	50'	-	X		-	-	-	-	-	-	-	1,100
	"	60'	-	X		-	-	-	-	-	-	-	226

Table 1
COG Operating LLC.
Electra Federal #5
EDDY 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)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total					
AH-5	12/7/2010	0-1'		X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	1,710
		1-1.5'		X		-	-	-	-	-	-	-	<200
		2-2.5'		X		-	-	-	-	-	-	-	<200
		3-3.5'		X		-	-	-	-	-	-	-	<200
		4-4.5'		X		-	-	-	-	-	-	-	380
		5-5.5'		X		-	-	-	-	-	-	-	290
AH-6	12/7/2010	0-1'		X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	5,870
		1-1.5'		X		-	-	-	-	-	-	-	7,710
		2-2.5'		X		-	-	-	-	-	-	-	4,840
		3-3.5'		X		-	-	-	-	-	-	-	3,440
		4-4.5'		X		-	-	-	-	-	-	-	874
		5-5.5'		X		-	-	-	-	-	-	-	245

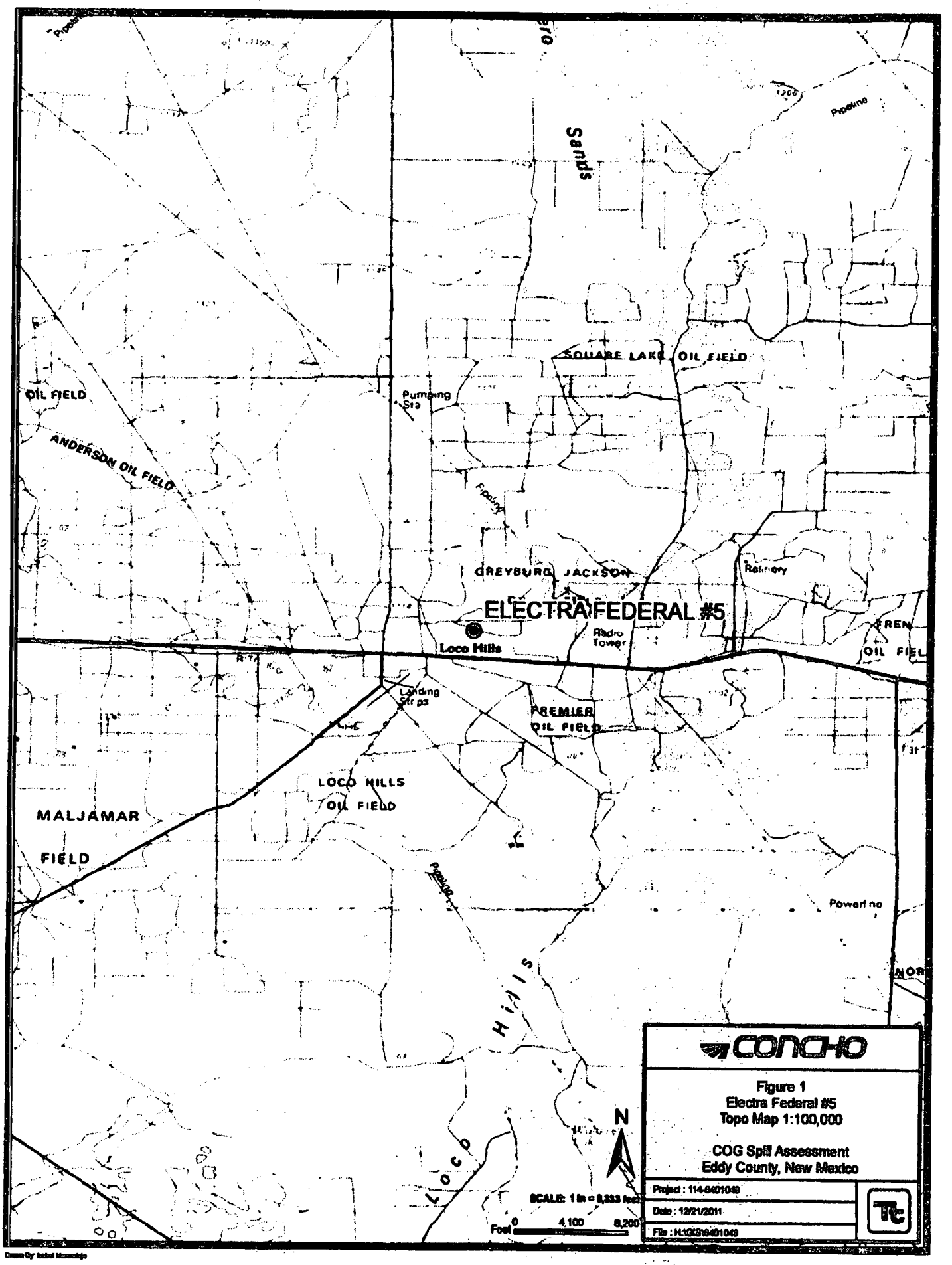
BEB Below Excavation Bottom

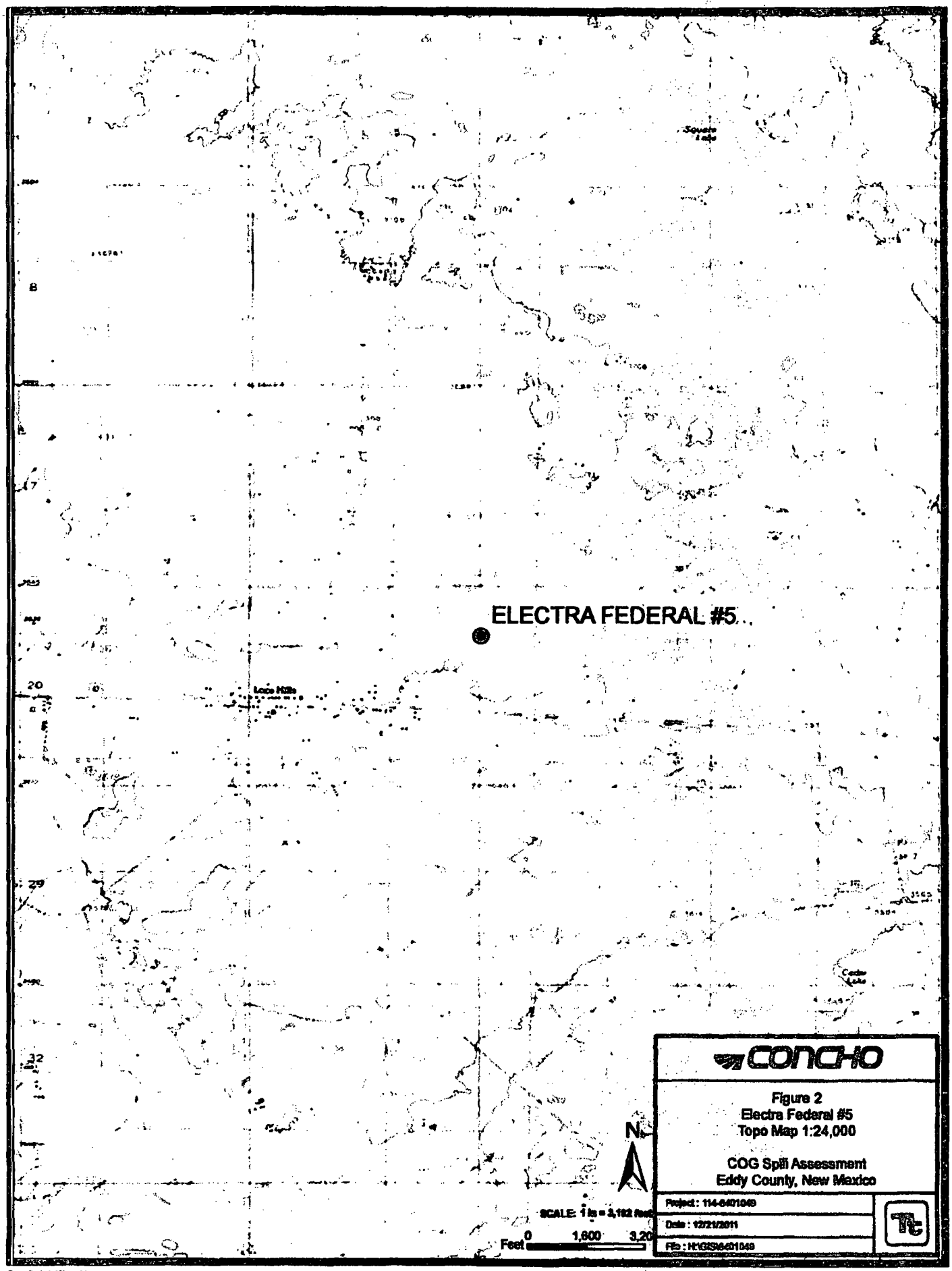
(--) Not Analyzed

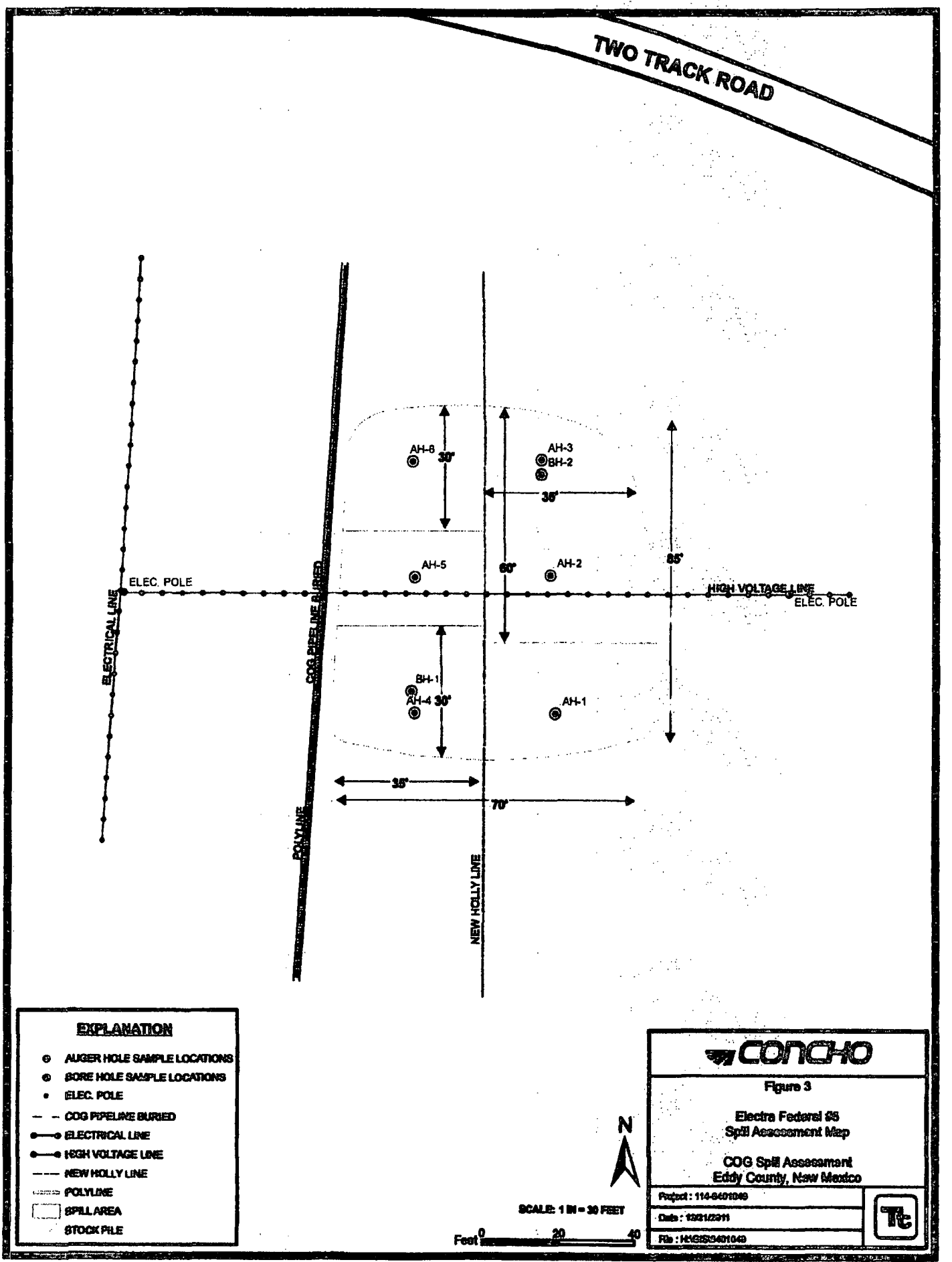
Proposed Excavation Depth

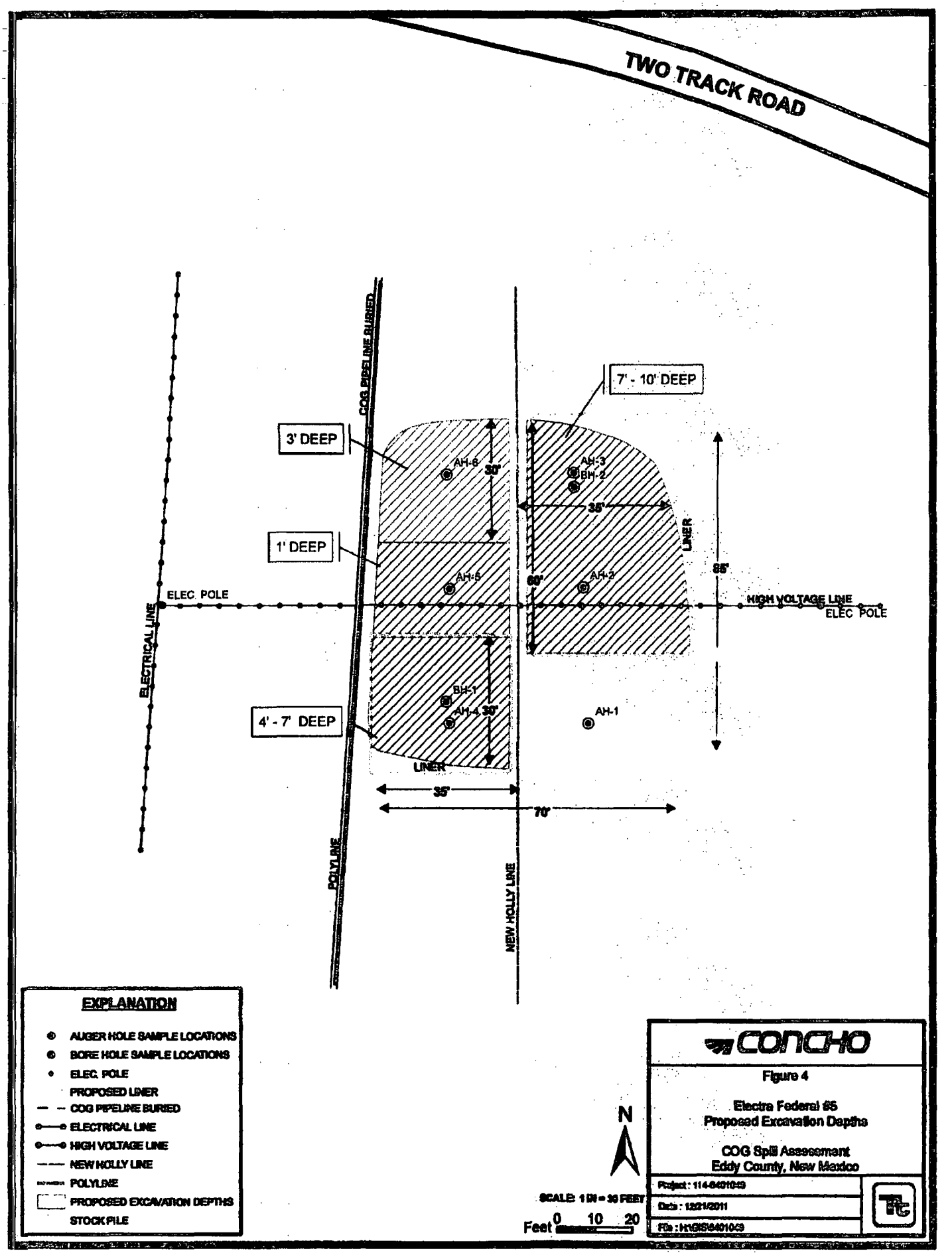
Liner Installation

Figures


Sands
Pipeline
SQUARE LAKE OIL FIELD
OIL FIELD
Pumping Sta
ANDERSON OIL FIELD
GREYBURG JACKSON
Refinery
ELECTRA FEDERAL #5
Loco Hills
Radio Tower
Landing Strips
PREMIER OIL FIELD
LOCO HILLS OIL FIELD
MALJAMAR FIELD
Powerline
LOCO HILLS
N
SCALE: 1 in = 8,333 feet
Feet 0 4,100 8,200
conoco
Figure 1
Electra Federal #5
Topo Map 1:100,000
COG Spill Assessment
Eddy County, New Mexico
Project : 114-9401049
Date : 12/21/2011
File : H:\GIS\9401049


ELECTRA FEDERAL #5
Squalo Lake
Loco Hills
Cedar Lake
20
29
32
B
N
SCALE: 1 in = 3,192 feet
0
1,600
3,200
Feet
CONCHO
Figure 2
Electra Federal #5
Topo Map 1:24,000
COG Spill Assessment
Eddy County, New Mexico
Project: 114-6401049
Date: 12/21/2011
File: H:\GIS\6401049


TWO TRACK ROAD
AH-6
30'
AH-3
BH-2
35'
AH-5
60'
AH-2
85'
ELEC. POLE
HIGH VOLTAGE LINE
ELEC. POLE
ELECTRICAL LINE
COG PIPELINE BURIED
BH-1
AH-4
30'
AH-1
35'
70'
POLYLINE
NEW HOLLY LINE
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
BORE HOLE SAMPLE LOCATIONS
ELEC. POLE
COG PIPELINE BURIED
ELECTRICAL LINE
HIGH VOLTAGE LINE
NEW HOLLY LINE
POLYLINE
SPILL AREA
STOCK PILE
N
SCALE: 1 IN = 30 FEET
Feet 0 20 40
CONCHO
Figure 3
Electra Federal #5
Spill Assessment Map
COG Spill Assessment
Eddy County, New Mexico
Project : 114-6401049
Date : 12/21/2011
File : H:\GIS\6401049


TWO TRACK ROAD
COG PIPELINE BURIED
3' DEEP
1' DEEP
4' - 7' DEEP
7' - 10' DEEP
AH-6
AH-5
BH-1
AH-4
AH-3
BH-2
AH-2
AH-1
30'
30'
35'
70'
60'
85'
LINER
LINER
ELEC. POLE
ELECTRICAL LINE
HIGH VOLTAGE LINE
ELEC. POLE
POLYLINE
NEW HOLLY LINE
EXPLANATION
AUGER HOLE SAMPLE LOCATIONS
BORE HOLE SAMPLE LOCATIONS
ELEC. POLE
PROPOSED LINER
COG PIPELINE BURIED
ELECTRICAL LINE
HIGH VOLTAGE LINE
NEW HOLLY LINE
POLYLINE
PROPOSED EXCAVATION DEPTHS
STOCK PILE
N
SCALE: 1 IN = 10 FEET
Feet 0 10 20
concho
Figure 4
Electra Federal #5
Proposed Excavation Depths
COG Spill Assessment
Eddy County, New Mexico
Project : 114-6401049
Date : 12/21/2011
File : H:\GIS\6401049

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	Electra Federal #5	Facility Type	4" Water Line

Surface Owner Federal	Mineral Owner	Lease No. NMNM-074935 (API#) 30-015-34211

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
A	21	17S	30E					Eddy

Latitude 32 49.413 Longitude 103 58.116

NATURE OF RELEASE

Type of Release Produced water	Volume of Release 30bbls	Volume Recovered 25bbls
Source of Release 4" Electra Federal #5 water line	Date and Hour of Occurrence 11/03/2010	Date and Hour of Discovery 11/03/2010 1:40 p.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher—OCD	
By Whom? Josh Russo	Date and Hour 11/04/2010 6:25 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.*

As Ferguson was moving our 4" poly line so they could trench for the installation of a buried line, they broke our 4" poly line. The 4" poly line has been refused and put back into service.

Describe Area Affected and Cleanup Action Taken.*

Initially 30bbls of produced water was released from the line and we were able to recover 25bbls with a vacuum truck. The spill area measured 75' x 100' directly on and adjacent to the ROW. All free fluid was recovered and disposed of accordingly. (The closest well location to the release is the Apache Corp., E L Federal #10, A-21-17S-30E, 32.8245 – 103.9695, 990' FNL 330' FEL). 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: 11/15/2010 Phone: 432-212-2399		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Electra #5 Water Line Leak
Eddy County, New Mexico

16 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 220 dry	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	12 266
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	29 210 299	28	27	26	25
31	32	33	34	35 159	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 Site	22	23	24
30	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

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)
Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

Appendix C

Summary Report

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

Report Date: December 15, 2010

Work Order: 10121026

Project Location: Eddy Co., NM
Project Name: COG/Electra Federal #5
Project Number: 114-6400741

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
252900	AH-1 0-1'	soil	2010-12-07	00:00	2010-12-10
252901	AH-1 1-1.5'	soil	2010-12-07	00:00	2010-12-10
252902	AH-1 2-2.5'	soil	2010-12-07	00:00	2010-12-10
252903	AH-1 3-3.5'	soil	2010-12-07	00:00	2010-12-10
252904	AH-2 0-1'	soil	2010-12-07	00:00	2010-12-10
252905	AH-2 1-1.5'	soil	2010-12-07	00:00	2010-12-10
252906	AH-2 2-2.5'	soil	2010-12-07	00:00	2010-12-10
252907	AH-2 3-3.5'	soil	2010-12-07	00:00	2010-12-10
252908	AH-2 4-4.5'	soil	2010-12-07	00:00	2010-12-10
252909	AH-2 5-5.5'	soil	2010-12-07	00:00	2010-12-10
252910	AH-3 0-1'	soil	2010-12-07	00:00	2010-12-10
252911	AH-3 1-1.5'	soil	2010-12-07	00:00	2010-12-10
252912	AH-3 2-2.5'	soil	2010-12-07	00:00	2010-12-10
252913	AH-3 3-3.5'	soil	2010-12-07	00:00	2010-12-10
252914	AH-3 4-4.5'	soil	2010-12-07	00:00	2010-12-10
252915	AH-4 0-1'	soil	2010-12-07	00:00	2010-12-10
252916	AH-4 1-1.5'	soil	2010-12-07	00:00	2010-12-10
252917	AH-4 2-2.5'	soil	2010-12-07	00:00	2010-12-10
252918	AH-4 3-3.5'	soil	2010-12-07	00:00	2010-12-10
252919	AH-4 4-4.5'	soil	2010-12-07	00:00	2010-12-10
252920	AH-4 5-5.5'	soil	2010-12-07	00:00	2010-12-10
252921	AH-5 0-1'	soil	2010-12-07	00:00	2010-12-10
252922	AH-5 1-1.5'	soil	2010-12-07	00:00	2010-12-10
252923	AH-5 2-2.5'	soil	2010-12-07	00:00	2010-12-10
252924	AH-5 3-3.5'	soil	2010-12-07	00:00	2010-12-10
252925	AH-5 4-4.5'	soil	2010-12-07	00:00	2010-12-10
252926	AH-5 5-5.5'	soil	2010-12-07	00:00	2010-12-10
252927	AH-6 0-1'	soil	2010-12-07	00:00	2010-12-10
252928	AH-6 1-1.5'	soil	2010-12-07	00:00	2010-12-10
252929	AH-6 2-2.5'	soil	2010-12-07	00:00	2010-12-10

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
252930	AH-6 3-3.5'	soil	2010-12-07	00:00	2010-12-10
252931	AH-6 4-4.5'	soil	2010-12-07	00:00	2010-12-10
252932	AH-6 5-5.5'	soil	2010-12-07	00:00	2010-12-10

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)
252900 - AH-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	662	<2.00
252904 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
252910 - AH-3 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	3.94
252915 - AH-4 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
252921 - AH-5 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
252927 - AH-6 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00

Sample: 252900 - AH-1 0-1'

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

Sample: 252901 - AH-1 1-1.5'

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

Sample: 252902 - AH-1 2-2.5'

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

Sample: 252903 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride		630	mg/Kg	4.00

Sample: 252904 - AH-2 0-1'

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

Sample: 252905 - AH-2 1-1.5'

Param	Flag	Result	Units	RL
Chloride		434	mg/Kg	4.00

Sample: 252906 - AH-2 2-2.5'

Param	Flag	Result	Units	RL
Chloride		1480	mg/Kg	4.00

Sample: 252907 - AH-2 3-3.5'

Param	Flag	Result	Units	RL
Chloride		1350	mg/Kg	4.00

Sample: 252908 - AH-2 4-4.5'

Param	Flag	Result	Units	RL
Chloride		2360	mg/Kg	4.00

Sample: 252909 - AH-2 5-5.5'

Param	Flag	Result	Units	RL
Chloride		8130	mg/Kg	4.00

Sample: 252910 - AH-3 0-1'

Param	Flag	Result	Units	RL
Chloride		389	mg/Kg	4.00

Sample: 252911 - AH-3 1-1.5'

Param	Flag	Result	Units	RL
Chloride		489	mg/Kg	4.00

Sample: 252912 - AH-3 2-2.5'

Param	Flag	Result	Units	RL
Chloride		2350	mg/Kg	4.00

Sample: 252913 - AH-3 3-3.5'

Param	Flag	Result	Units	RL
Chloride		14900	mg/Kg	4.00

Sample: 252914 - AH-3 4-4.5'

Param	Flag	Result	Units	RL
Chloride		14800	mg/Kg	4.00

Sample: 252915 - AH-4 0-1'

Param	Flag	Result	Units	RL
Chloride		744	mg/Kg	4.00

Sample: 252916 - AH-4 1-1.5'

Param	Flag	Result	Units	RL
Chloride		1070	mg/Kg	4.00

Sample: 252917 - AH-4 2-2.5'

Param	Flag	Result	Units	RL
Chloride		2810	mg/Kg	4.00

Sample: 252918 - AH-4 3-3.5'

Param	Flag	Result	Units	RL
Chloride		5370	mg/Kg	4.00

Sample: 252919 - AH-4 4-4.5'

Param	Flag	Result	Units	RL
Chloride		5040	mg/Kg	4.00

Sample: 252920 - AH-4 5-5.5'

Param	Flag	Result	Units	RL
Chloride		5190	mg/Kg	4.00

Sample: 252921 - AH-5 0-1'

Param	Flag	Result	Units	RL
Chloride		1710	mg/Kg	4.00

Sample: 252922 - AH-5 1-1.5'

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

Sample: 252923 - AH-5 2-2.5'

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

Sample: 252924 - AH-5 3-3.5'

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

Sample: 252925 - AH-5 4-4.5'

Param	Flag	Result	Units	RL
Chloride		380	mg/Kg	4.00

Sample: 252926 - AH-5 5-5.5'

Param	Flag	Result	Units	RL
Chloride		290	mg/Kg	4.00

Sample: 252927 - AH-6 0-1'

Param	Flag	Result	Units	RL
Chloride		5870	mg/Kg	4.00

Sample: 252928 - AH-6 1-1.5'

Param	Flag	Result	Units	RL
Chloride		7710	mg/Kg	4.00

Sample: 252929 - AH-6 2-2.5'

Param	Flag	Result	Units	RL
Chloride		4840	mg/Kg	4.00

Sample: 252930 - AH-6 3-3.5'

Param	Flag	Result	Units	RL
Chloride		3440	mg/Kg	4.00

Sample: 252931 - AH-6 4-4.5'

Param	Flag	Result	Units	RL
Chloride		874	mg/Kg	4.00

Sample: 252932 - AH-6 5-5.5'

Param	Flag	Result	Units	RL
Chloride		245	mg/Kg	4.00

Summary Report

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

Report Date: November 11, 2011

Work Order: 11110809

Project Location: Eddy Co, NM
Project Name: COG/Electra Federal #5
Project Number: 114-6401049

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
281835	BH-1 0-1'	soil	2011-11-04	00:00	2011-11-08
281836	BH-1 3'	soil	2011-11-04	00:00	2011-11-08
281837	BH-1 5'	soil	2011-11-04	00:00	2011-11-08
281838	BH-1 7'	soil	2011-11-04	00:00	2011-11-08
281839	BH-1 10'	soil	2011-11-04	00:00	2011-11-08
281840	BH-1 15'	soil	2011-11-04	00:00	2011-11-08
281841	BH-1 20'	soil	2011-11-04	00:00	2011-11-08
281842	BH-1 25'	soil	2011-11-04	00:00	2011-11-08
281843	BH-1 30'	soil	2011-11-04	00:00	2011-11-08
281844	BH-1 40'	soil	2011-11-04	00:00	2011-11-08
281845	BH-1 50'	soil	2011-11-04	00:00	2011-11-08
281846	BH-1 60'	soil	2011-11-04	00:00	2011-11-08
281849	BH-2 0-1'	soil	2011-11-04	00:00	2011-11-08
281850	BH-2 3'	soil	2011-11-04	00:00	2011-11-08
281851	BH-2 5'	soil	2011-11-04	00:00	2011-11-08
281852	BH-2 7'	soil	2011-11-04	00:00	2011-11-08
281853	BH-2 10'	soil	2011-11-04	00:00	2011-11-08
281854	BH-2 15'	soil	2011-11-04	00:00	2011-11-08
281855	BH-2 20'	soil	2011-11-04	00:00	2011-11-08
281856	BH-2 25'	soil	2011-11-04	00:00	2011-11-08
281857	BH-2 30'	soil	2011-11-04	00:00	2011-11-08
281858	BH-2 40'	soil	2011-11-04	00:00	2011-11-08
281859	BH-2 50'	soil	2011-11-04	00:00	2011-11-08
281860	BH-2 60'	soil	2011-11-04	00:00	2011-11-08
281861	BH-2 70'	soil	2011-11-04	00:00	2011-11-08

Sample: 281835 - BH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		791	mg/Kg	4

Sample: 281836 - BH-1 3'

Param	Flag	Result	Units	RL
Chloride		461	mg/Kg	4

Sample: 281837 - BH-1 5'

Param	Flag	Result	Units	RL
Chloride		2470	mg/Kg	4

Sample: 281838 - BH-1 7'

Param	Flag	Result	Units	RL
Chloride		3980	mg/Kg	4

Sample: 281839 - BH-1 10'

Param	Flag	Result	Units	RL
Chloride		9370	mg/Kg	4

Sample: 281840 - BH-1 15'

Param	Flag	Result	Units	RL
Chloride		13500	mg/Kg	4

Sample: 281841 - BH-1 20'

Param	Flag	Result	Units	RL
Chloride		4340	mg/Kg	4

Sample: 281842 - BH-1 25'

Param	Flag	Result	Units	RL
Chloride		6340	mg/Kg	4

Sample: 281843 - BH-1 30'

Param	Flag	Result	Units	RL
Chloride		8880	mg/Kg	4

Sample: 281844 - BH-1 40'

Param	Flag	Result	Units	RL
Chloride		507	mg/Kg	4

Sample: 281845 - BH-1 50'

Param	Flag	Result	Units	RL
Chloride		1100	mg/Kg	4

Sample: 281846 - BH-1 60'

Param	Flag	Result	Units	RL
Chloride		226	mg/Kg	4

Sample: 281849 - BH-2 0-1'

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

Sample: 281850 - BH-2 3'

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

Sample: 281851 - BH-2 5'

Param	Flag	Result	Units	RL
Chloride		12400	mg/Kg	4

Sample: 281852 - BH-2 7'

Param	Flag	Result	Units	RL
Chloride		13300	mg/Kg	4

Sample: 281853 - BH-2 10'

Param	Flag	Result	Units	RL
Chloride		6380	mg/Kg	4

Sample: 281854 - BH-2 15'

Param	Flag	Result	Units	RL
Chloride		8670	mg/Kg	4

Sample: 281855 - BH-2 20'

Param	Flag	Result	Units	RL
Chloride		5850	mg/Kg	4

Sample: 281856 - BH-2 25'

Param	Flag	Result	Units	RL
Chloride		3490	mg/Kg	4

Sample: 281857 - BH-2 30'

Param	Flag	Result	Units	RL
Chloride		535	mg/Kg	4

Sample: 281858 - BH-2 40'

Param	Flag	Result	Units	RL
Chloride		5040	mg/Kg	4

Sample: 281859 - BH-2 50'

Param	Flag	Result	Units	RL
Chloride		1350	mg/Kg	4

Sample: 281860 - BH-2 60'

Param	Flag	Result	Units	RL
Chloride		1130	mg/Kg	4

Sample: 281861 - BH-2 70'

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

APPENDIX G

WELL PERMIT FROM NEW MEXICO OFFICE OF THE STATE ENGINEER

Scott A. Verhines, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 504343
File Nbr: RA 11826

May. 21, 2012

CHRIS CORTEZ
ATKINS ENGINEERING ASSOCIATES, INC
2904 WEST SECOND STREET
ROSWELL, NM 88201

Greetings:

Enclosed is your copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page. In accordance with the conditions of approval, the well can only be tested for 10 cumulative days, and the well is to be plugged on or before 05/31/2013, unless a permit to use the water is acquired from this office.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 05/31/2013.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

Melinda Spivey
(575)622-6521

Enclosure

explore

File No.

NEW MEXICO OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO DRILL A WELL WITH NO CONSUMPTIVE USE OF WATER

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/ 2-314/64 B5=

☐ Exploratory	☐ De-Watering	☐ Geo-Thermal
■ Monitoring	■ Pollution Control And / Or Recovery	
☐ Temporary Request - Requested Start Date:	Requested End Date:	

1. APPLICANT(S)

Name: Atkins Engineering Associates, Inc.	Name: COG Operating Company C/O CURA Emergency Services
Contact or Agent: check here if Agent ■ Chris Cortez	Contact or Agent: check here if Agent ■ Rick Railsback
Mailing Address: 2904 W 2nd St.	Mailing Address: 6205 Chapel Hill Boulevard Suite 100
City: Roswell	City: Plano
State: NM Zip Code: 88201	State: TX Zip Code: 75093
Phone: ☐ Home ☐ Cell Phone (Work): (575) 624-2420	Phone: ☐ Home ☐ Cell Phone (Work): (972) 378-7340
E-mail: chris@atkinseng.com	E-mail: rick@curaes.com

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO
2012 MAY 16 P 3:30

FOR OSE INTERNAL USE — Application for Permit, Form wr-07, Rev 1/20/11

File Number: RA-11826	Trn Number: 504343
Trans Description (optional): MONITOR WELLS	
Sub-Basin:	
~~PCW~~/LOG Due Date: 5/31/2013	~~PBU Due Date:~~

Describe the well applicable to this application.

2. PROPOSED WELL

NOTE: If more than one (1) well, complete Attachment 1

OSE Well No. (if existing):	n/a					
Location (Required): Coordinate location must be New Mexico State Plane (NAD 83), UTM (NAD 83), or Lat/Long (WGS84)						
NM State Plane (NAD83) - In feet	NM West Zone ☐ NM Central Zone ☐ NM East Zone ☐			X (in feet): Y (in feet):		
UTM (NAD83) - In meters	UTM Zone 13N ☐ UTM Zone 12N ☐			Easting (in meters): Northing (in meters):		
Lat/Long (WGS84) - To 1/10th of second	Latitude:	32	deg	49	min	24.4 sec
	Longitude:	-103	deg	58	min	06.5 sec
Land Grant (if applicable): n/a						
Well is on Land Owned by (required): BLM						
Other Location Information (complete the below, if applicable):						
PLSS Quarters or Halves: E/2	Section: 21	Township: 17S	Range: 30E	County: Eddy		
Lot No:	Block No:	Unit/Tract:	Subdivision:			
Hydrographic Survey:	Map:	Tract:				
Other description relating well to common landmarks, streets, or other:						
Well Information:						
Approximate depth of well (feet): n/d	Outside Diameter of Well Casing (inches): varies					
Driller Name: Atkins Engineering Associates, Inc.	Driller License Number: 1249					
Additional well descriptions are attached: ☐ **Yes** ☒ **No**	If yes, how many_____					

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

General Site Application
Current workplan calls for 3 borings to 6 feet for background levels.
Additional borings may be scheduled and will be added to the OSE issued permit.

2012 MAY 16 P 3:30

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO

FOR OSE INTERNAL USE — Application for Permit, Form wr-07

File Number:	Trn Number:

SPECIFIC REQUIREMENTS

The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory:	Monitoring:	Pollution Control And / Or Recovery:	De-Watering:	Geo-Thermal:
☐ include a description of any proposed pump test, if applicable.	☒ include the reason for the monitoring well, and, ☐ the duration of the planned monitoring.	☐ include a plan for pollution control/recovery, that includes the following: ☐ a description of the need for the pollution control or recovery operation. ☐ the estimated maximum period of time for completion of the operation. ☐ the annual diversion amount. ☐ the annual consumptive use amount. ☐ the maximum amount of water to be diverted and injected for the duration of the operation. ☐ the method and place of discharge. ☐ the method of measurement of water produced and discharged. ☐ the source of water to be injected. ☐ the method of measurement of water injected. ☐ the characteristics of the aquifer. ☐ the method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ proof of any permit required from the New Mexico Environment Department. ☐ an access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	☐ include a description of the proposed dewatering operation, ☐ the estimated duration of the operation, ☐ the maximum amount of water to be diverted, ☐ a description of the need for the dewatering operation, and, ☐ a description of how the diverted water will be disposed of.	☐ include a description of the geothermal heat exchange project, ☐ the amount of water to be diverted and re-injected for the project, ☐ the time frame for constructing the geothermal heat exchange project, and, ☐ the duration of the project. ☐ preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Chris Cortez Rick Railsback, Cura
Print Name(s)

affirm that the forgoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is (check one):

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval (*please see attachment*).

Witness my hand and seal this 21 day of May 20 12, for the State Engineer,

By: Signature Melinda Spivey Print

Title: Water Resource Technician
Print

2012 MAY 16 P 3:30

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO

FOR OSE INTERNAL USE — Application for Permit, Form wr-07

File Number: RA-11826	Trn Number: 504343

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

1A Depth of the well shall not exceed the thickness of the valley fill.

4 No water shall be appropriated and beneficially used under this permit.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated.

C Driller's well record must be filed with the State Engineer within 20 days after the well is drilled or driven. Well record forms will be provided by the State Engineer upon request.

C2 No water shall be diverted from this well except for testing purposes which shall not exceed twenty (20) cumulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

LOG The Point of Diversion RA 11826 POD1 must be completed and the Well Log filed on or before 05/31/2013.

LOG The Point of Diversion RA 11826 POD2 must be completed and the Well Log filed on or before 05/31/2013.

LOG The Point of Diversion RA 11826 POD3 must be completed and the Well Log filed on or before 05/31/2013.

Trn Desc: MONITORING WELLS

File Number: RA 11826
Trn Number: 504343

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

ACTION OF STATE ENGINEER

Notice of Intention Rcvd: Date Rcvd. Corrected:
Formal Application Rcvd: 05/16/2012 Pub. of Notice Ordered:
Date Returned - Correction: Affidavit of Pub. Filed:

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 21 day of May A.D., 2012

Scott A. Verhines, P.E., State Engineer

By: _____
Melinda Spivey

Trn Desc: MONITORING WELLS File Number: RA 11826
Trn Number: 504343

APPENDIX H

WELL PLUGGING PLAN FROM NEW MEXICO OFFICE OF THE STATE ENGINEER

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
District 2 Office, Roswell, NM

Scott A. Verhines, P.E.
State Engineer

1900 West Second Street
Roswell, New Mexico 88201
(575) 622-6521
FAX: (575) 623-8559

May 25, 2012

Atkins Engineering Associates, Inc.
PO Box 3156
Roswell, NM 88202

ATTN: Chris Cortez
RE: Well Plugging Plan of Operations for RA-11826
COG Operating c/o CURA Emergency Service

Greetings:

Enclosed is your copy of the Well Plugging Plan of Operations for the above referenced wells. The proposed method of plugging for the subject well is found to be acceptable and in accordance with the Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells 19.27.4 NMAC adopted August 31, 2005 by the State Engineer.

Sincerely,

AM for

Andy Morley
Acting District II Supervisor
Water Resource Allocation Program
Water Rights Division

Enclosure

cc Santa Fe
File

WELL PLUGGING PLAN OF OPERATIONS

NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: n/a RA-11826

Name of well owner: COG Operating c/o CURA Emergency Service via Atkins Engineering Associates, Inc.

Mailing address: 6205 Chapel Hill Boulevard Suite 100

City: Plano State: TX Zip code: 75093

Phone number: (972) 378-7340 E-mail: rick@curaes.com

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Atkins Engineering Associates, Inc.

New Mexico Well Driller License No.: 1249 Expiration Date: 4/2013

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location: Latitude: 32 deg, 49 min, 24.4 sec
Longitude: -103 deg, 58 min, 06.5 sec, NAD 83

2) Reason(s) for plugging well: borings

3) Was well used for any type of monitoring program? yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? unk If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: unknown feet below land surface / feet above land surface (circle one)

6) Depth of well: unknown feet

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ROSWELL, NEW MEXICO
STATE ENGINEER OFFICE

7) Inside diameter of innermost casing: varies inches.

8) Casing material: open borehole or PVC casing

9) The well was constructed with:

X an open-hole production interval, state the open interval: _____

_____ a well screen or perforated pipe, state the screened interval(s): _____

10) What annular interval surrounding the artesian casing of this well is cement-grouted? n/d

11) Was the well built with surface casing? n/d If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? n/d If yes, please describe: _____

_____

12) Has all pumping equipment and associated piping been removed from the well? yes If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well: tremie pipe from bottom.

_____

_____

2) Will well head be cut-off below land surface after plugging? yes

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface: n/d

4) Type of Cement proposed: Baroid Hole Plug/Baroid Quik Grout

5) Proposed cement grout mix: n/a gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

X mixed on site

7) Grout additives requested, and percent by dry weight relative to cement: _____

8) Additional notes and calculations: _____

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

COG operating produced water spill site general operation. Current scope calls for three borings to 6 feet bgs. these borings will be filled with Baroid Hole plug from Total Depth to land surface. Future borings that do not reach water will be backfilled to 10 feet bgs (below ground surface) From 10 feet bgs to land surface will be plugged with Baroid Hole Plug. Future borings that reach water will be plugged from bottom to land surface using Baroid Quik Grout If borings reach water and are plugged, plugging records will be submitted. Any wells landed will have WR-20s submitted, and an updated WD-08 will be submitted before plugging

VIII. SIGNATURE:

I, Chris Cortez , say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them; and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

_____ _____

Signature of Applicant Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.
_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 25th day of May, 2012

Scott Verkines, P.E.
~~John R. D'Antonio, Jr.~~, State Engineer

By: Melinda Spurrier
Water Resource Technician

2012 MAY 16 P 3:31
STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			
Bottom of proposed interval of grout placement (ft bgl)			
Theoretical volume of grout required per interval (gallons)			
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			
Mixed on-site or batch-mixed and delivered?			
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)	0		
Bottom of proposed sealant of grout placement (ft bgl)	6		
Theoretical volume of sealant required per interval (gallons)	10.74 gallons		
Proposed abandonment sealant (manufacturer and trade name)	Baroid Hole Plug		