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Safety & Environmental Solutions, Inc.

March 8, 2013

To: Christine Alderman, Bob Jennings, Terry Ainsworth
From: Bob Allen
Subject: Cimarex Cottonwood Draw 22 Federal Com #1

Bob Allen met with Jim Amos, BLM, Christine Alderman, Bob Jennings, and Terry Ainsworth, Cimarex, on March 7, 2013 at the Cottonwood Draw 22 Federal Com #1. We all observe the excavation that had been done to date. Previous delineation last year indicated that most areas of the location cleaned up at a depth of 2 feet. Only a couple of areas were found to be any deeper and that was only 4 feet.

Terry requested the downsizing the location to 10 feet outside the dead men. Mr. Amos approved the downsizing with the stipulation that we perform sampling at the west end inside the berm. The existing berm material may be used as backfill with a caliche cap for durability.

Mr. Amos also observed the old drilling pit was leaching chloride residue and requested Cimarex recap the pit in the same manner that we use on the Amoco Federal lease. Mr. Amos also approved a berm on the northside of the old pit to prevent runoff from off site.

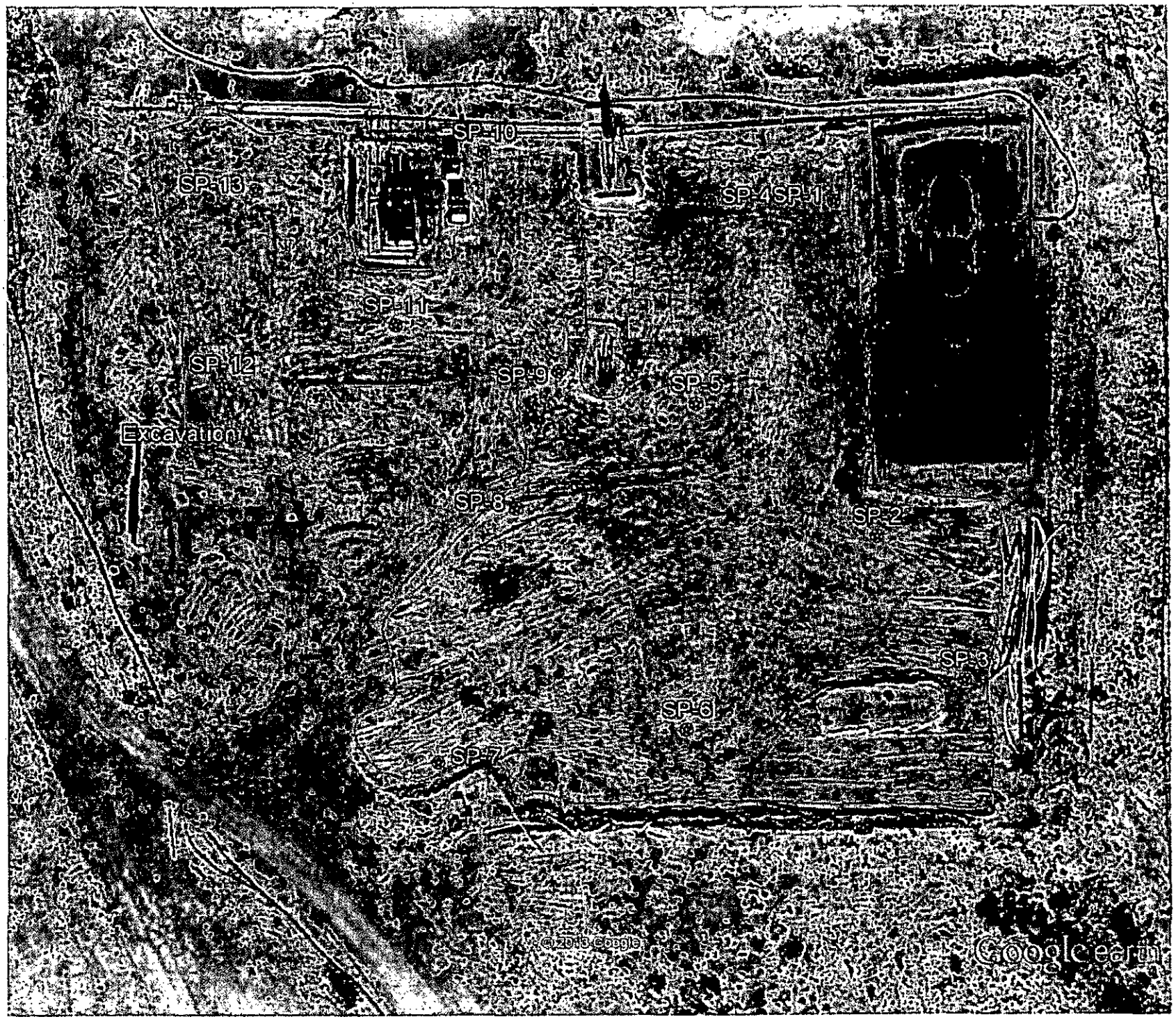
I propose the following Action Plan:

1. Perform NM One Call
2. SESI perform the required sampling in the corner by the berm and perform any remedial action indicated by the sampling.
3. Remove berm and backfill excavation. Cap with caliche.
4. Recap pit as requested.
5. Dirt work company reinstall berms as approved.

Please confirm you concurrence with this plan. We will commence work upon receipt of your agreement.

Cardinal Analytical Results			
Project Owner:	Cimarex	Analysis Date:	04/03/2013
Project Name:	CIM-11-027	Sampling Date:	3/28/2013
	Cottonwood Draw #22 FED COM #1		
Project Location:	Carlsbad, New Mexico	Sampling Type:	SOIL

Lab ID	Sample ID	Cl (mg/kg)
Analysis Date:	-	**04/03/2013**
H300774-01	BGS -1	4320
H300774-02	BGS - 2	5680
H300774-03	BGS - 3	1220
H300774-04	BGS - 4	3600
H300774-05	BGS -5	76800
H300774-06	BGS - 6	1890
H300774-07	BGS -7	144
H300774-08	BGS -8	672
H300774-09	BGS - 9	27600
H300774-10	BGS -10	2960
H300774-11	BGS -11	3480
H300774-12	BGS -12	224
H300774-13	BGS -13	384
EPA Methods		
Chloride, SM4500Cl-B		


SP-10
SP-13
SP-4
SP-1
SP-11
SP-12
SP-9
SP-5
Excavation
SP-8
SP-2
SP-3
SP-6
SP-7
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Google earth

Cimarex Energy Company
Cottonwood Draw 22 Federal Com #1
Delineation Report-2 and Work Plan

Eddy County, New Mexico

June 15, 2012

Prepared for:

Cimarex Energy Company
600 North Marienfeld, Suite 600
Midland, Texas 79701

By:

Safety & Environmental Solutions, Inc.
703 East Clinton
Hobbs, New Mexico 88240
(575) 397-0510

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I. Company Contacts

Representative	Company	Telephone	E-mail
Terry Ainsworth	Cimarex Energy Co.	575-390-1388	tainsworth@cimarex.com
Bob Allen	SESI	575-397-0510	ballen@sesi-nm.com
David Boyer	SESI	575-390-7067	dgboyer@sesi-nm.com

II. Background

Safety and Environmental Solutions, Inc. (SESI) was engaged by Cimarex Energy to perform site assessment of a release area at the Cottonwood Draw 22 Federal Com #1. The release from the wellhead occurred on July 7, 2011 and consisted of an estimated volume of 20 barrels of produced water, one barrel of oil and one barrel of condensate. The production site is located in the southeast ¼ of Section 22 of Township 25 South, Range 26 East, Eddy County, New Mexico. The surface elevation of the production location is approximately 3,295 feet above MSL.

III. Soils

The surface soils in the area are from the Reeves Series. These soils consist of light colored, well drained, calcareous soils that are shallow to moderately deep over gypsiferous rocks. The Reeves Gypsum land complex 0-3 percent slope occurs on plains throughout the central part of the survey area. This complex is used for native pasture and wildlife habitat. The soils are not easily eroded. Good range management is needed to maintain a cover of desirable forage. Reestablishment of the native vegetation is difficult because temperatures are high and rainfall is undependable.

IV. Surface and Ground Water

Surface water is not present in the area and in general groundwater is hard to locate and, in places, is of poor quality. According to data provided by the New Mexico Office of State Engineer's online database, the closest water well to the Cottonwood Draw site is in the NW/4 NW/4 of Section 22 at a distance of just under one mile with a depth to water of 118 feet measured in 1967. The surface elevation at this location is approximately 3,375 feet with the result that groundwater in this well is at an elevation of about 3,257 feet above MSL. If the water table was flat and groundwater continuous, water would be expected to be present at a depth of 38 feet below the production location.

Typically the groundwater gradient is not flat and follows the surface or topographic gradient which would mean it would be at a depth greater than 38 feet. The topographic map shows a well identified as the "Bailey Well" south of the location at a distance of 0.3 miles. This well is located adjacent to the dry Cottonwood Draw drainage. There is no readily available information on this well including depth to water. However the surface elevation of the well is at 3,245 feet, 50 feet lower than the Cottonwood production site. The well is not flowing artesian water therefore water is lower than the surface elevation. The difference between the surface elevation at the Cottonwood production site and the water well is 50 feet so water at the Cottonwood site is at a minimum depth of 50 feet. As the groundwater surface is sloping to follow the surface gradient, depth to groundwater is more likely to be in the 80 to 100 foot range at the Cottonwood production location.

V. Work Performed

Cimarex Energy requested that Safety and Environmental Solutions, Inc. (SESI) perform on-site chloride delineation at the location. On September 23 and again on October 18, 2011, SESI met Backhoe Services Inc. on site to excavate exploratory trenches at the location of the reported release, test field samples for chloride and submit samples to the analytical laboratory for chloride verification.

Three test trenches in the release area were dug on October 18 (CTT-1, CTT-2, CTT-3); previously two trenches (TT-1 and TT-2) adjacent to the release area were dug on September 23. Trenches were dug to 4 feet or bedrock if less than four feet. The locations of the test trenches are shown on the attached figure. Samples were taken at depths of 2 feet and 4 feet (if necessary) and tested in the field for the approximate concentration of chlorides. If the upper sample was less than 250 ppm it was sent to the laboratory for confirmation analysis. If the sample was greater than 250 ppm the deeper sample was tested.

Samples obtained from the test trenches were properly preserved and transported under chain of custody to Cardinal Laboratories in Hobbs, New Mexico and analyzed for Chlorides (EPA Method SM4500Cl-B). The results of the laboratory analyses are shown in the below table.

Sample ID	Sample Date	Sample Distance and Direction from well	Sample Depth (feet below land surface)	Chlorides (mg/kg)	418.1 TPH (mg/kg)
TT-1, SP-1	09/23/11	94 ft. SE	2 ft.	48.0	280
TT-2, SP-2	09/23/11	116 ft. SSE	2 ft.	64.0	368
CTT-1	10/18/11	52 ft. ESE	2 ft.	16.0	<100
CTT-2	10/18/11	48 ft. SSW, shallow depression	2 ft.	2,360	<100
CTT-2	10/18/11	48 ft. SSW, shallow depression	3' 7" (bedrock)	800	<100
CTT-3	10/18/11	104 ft. SE	2 ft.	160	<100

The only location where elevated chloride concentrations were found is a shallow depression in the pad at a distance of approximately 48 feet south-southwest of the well head. The analysis of the 2 foot sample from this location (CTT-2) resulted in a chloride concentration of 2,360 mg/Kg. The next deeper sample was taken at 3 feet 7 inches depth which was the top of the bedrock. The chloride concentration at this depth was 800 mg/Kg. Deeper excavation was not possible without breaking through bedrock which is not desirable for initial delineation as it would provide a pathway for downward chloride migration.

On March 22, 2012, Mr. Sergio Contreras, SESI representative, arrived at the Cottonwood Draw 22 Federal Com #1 at 0845 for field chloride testing on the surface of the location pad, as requested by Bureau of Land Management (BLM) representative Ms. Terry Gregston, in her email dated February 28, 2012. A 50 ft. grid was mapped and chloride field testing was conducted onsite to delineate chlorides on the location pad. As stipulated by Ms. Gregston, all samples less than 250 ppm chlorides were to be properly preserved and transported to Cardinal Labs for confirmation. Ms. Gregston was not

onsite for the sampling procedure, but was notified 48 hrs prior to sampling by Mr. Contreras; he was directed to sample without a BLM witness. The weather was 90 degrees with clear skies 5-10 mph winds. Mr. Contreras contacted Ms. Gregston via cell to advise her that SESI had started sampling on location on March 22, 2012.

On March 23, 2012, Mr. Contreras, SESI supervisor, was onsite at 0800 to complete surface chloride testing on the location pad. The weather was 80 degrees with the wind blowing 5-10 mph with clear skies.

A total of 28 surface samples were obtained from the location pad. As a result of the field chloride testing Surface Sample # 12 was the only sample less than 250 ppm and was properly preserved and transported to Cardinal Labs for confirmation as presented in the table below.

Date	Time	Surface Sample	Field Results Chlorides (ppm)	Analytical Results Chlorides (mg/kg)
03/22/12	0948	SS #1	>25,340	-
03/22/12	1007	SS #2	16,444	-
03/22/12	1025	SS #3	22,484	-
03/22/12	1039	SS #4	4,188	-
03/22/12	1105	SS #5	25,340	-
03/22/12	1124	SS #6	1,260	-
03/22/12	1140	SS #7	1,880	-
03/22/12	1208	SS #8	688	-
03/22/12	1225	SS #9	8,660	-
03/22/12	1237	SS #10	688	-
03/22/12	1253	SS #11	388	-
03/22/12	1312	SS #12	184	192
03/22/12	1328	SS #13	1,344	-
03/22/12	1345	SS #14	9,432	-
03/22/12	1358	SS #15	3,020	-
03/22/12	1401	SS #16	312	-
03/22/12	1420	SS #17	6,752	-
03/22/12	1435	SS #18	1,640	-
03/22/12	1514	SS #19	4,908	-
03/22/12	1527	SS #20	2,004	-
03/22/12	1544	SS #21	1,752	-
03/23/12	0834	SS #22	1,016	-
03/23/12	0845	SS #23	2,144	-
03/23/12	0907	SS #24	3,864	-
03/23/12	0916	SS #25	5,752	-
03/23/12	0930	SS #26	5,752	-
03/23/12	0945	SS #27	7,328	-
03/23/12	1010	SS #28	12,340	-

The results of the sampling reported above indicate almost the entire location pad currently exhibits elevated levels of chlorides.

On May 22-23, 2012, in order to determine the volume of chloride contaminated soil on the location, SESI was onsite Backhoe Services install test trenches at sites where the surface sampling has indicated chloride concentrations at or near 5,000 ppm. The 13 sites are highlighted in red in the table above. Ms. Gregston (BLM) was also onsite to look over test trenches and field test results.

A total of 13 test trenches were installed to depths ranging from 1 ft to 6 ft The field test were conducted on the samples and only samples field tested at or under 250 ppm were properly packaged and transported under chain of custody to a third party laboratory for analysis.

Date	Surface Sample	Field Results Chlorides (ppm)	Analytical Results Chlorides (mg/kg)
5/22/12	TT-1 6' bgs	184	176
5/23/12	TT-2 2' bgs	<132	48.0
5/23/12	TT-3 2' bgs	212	288
5/22/12	TT-4 2' bgs	102	80.0
5/22/12	TT-5 2' bgs	102	96.0
5/23/12	TT-9 2' bgs	<132	<16.0
5/23/12	TT-14 2' bgs	<132	32.0
5/23/12	TT-17 1' bgs	<132	<16.0
5/23/12	TT-19 2' bgs	<132	80.0
5/22/12	TT-25 2' bgs	<132	32.0
5/22/12	TT-26 1' bgs	244	256
5/22/12	TT-27 3' bgs	160	128
5/22/12	TT-28 4' bgs	184	160

VI. Action Plan

The analysis from the previously installed test trenches indicated the contamination had not migrated past a depth of 1-2 ft, with the exception of TT-1, TT-27, TT-28 which were at depths of 3-6 ft.

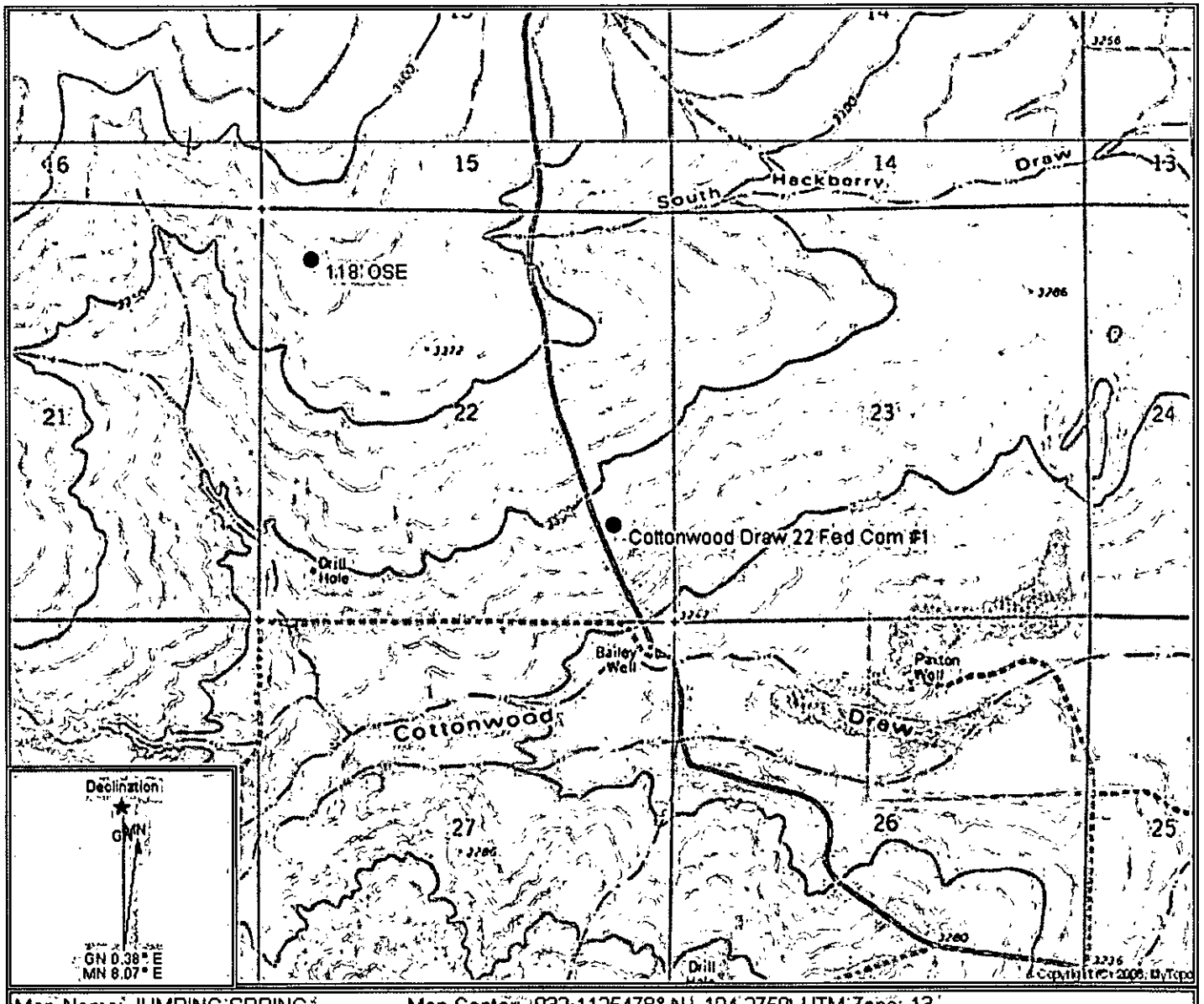
This site is an active tank battery. It is proposed that the most highly impacted chloride contaminated areas, in excess of 1000 ppm, will be excavated in quarter sections and transported to an approved disposal facility.

Upon completion of this delineation, an appropriate work plan for the remediation of the location will be submitted.

VII. Figures & Appendices

Figure 1 – Vicinity Map
Figure 2 – Site Plan: Location of Chloride Samples
Appendix A – Analytical Results
Appendix B – Site Photographs

Figure 1
Vicinity Map



Map Name: JUMPING SPRING
Scale: 1 inch = 2,000 ft

Map Center: 032.1125478° N, 104.2750 UTM Zone: 13
Horizontal Datum: WGS84

Map Type: Topographic

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Subbasin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 01388	C		ED	1	1	22	25S	26E		567261	3554059*	143	118	25

Average Depth to Water: 118 feet

Minimum Depth: 118 feet

Maximum Depth: 118 feet

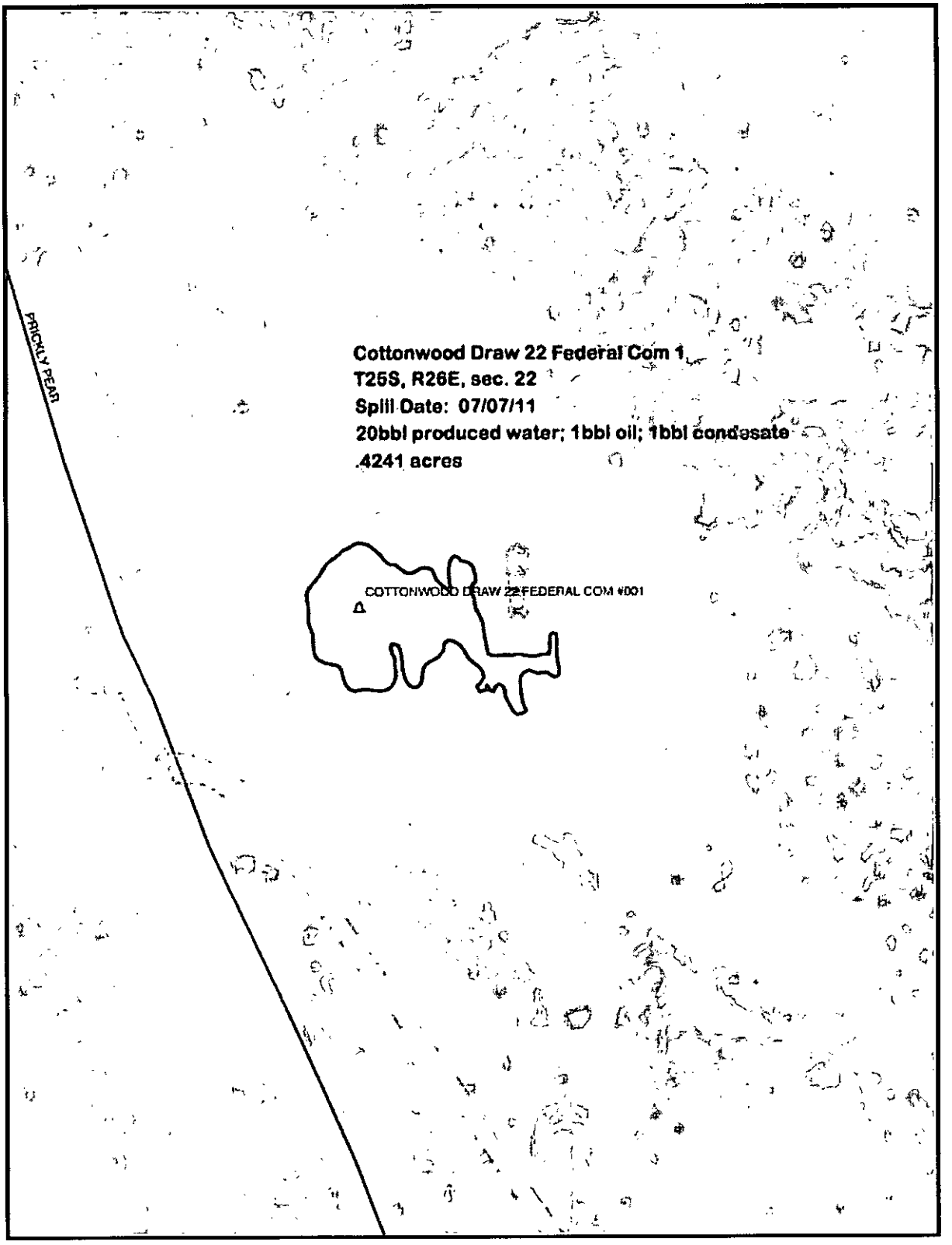
Record Count: 1

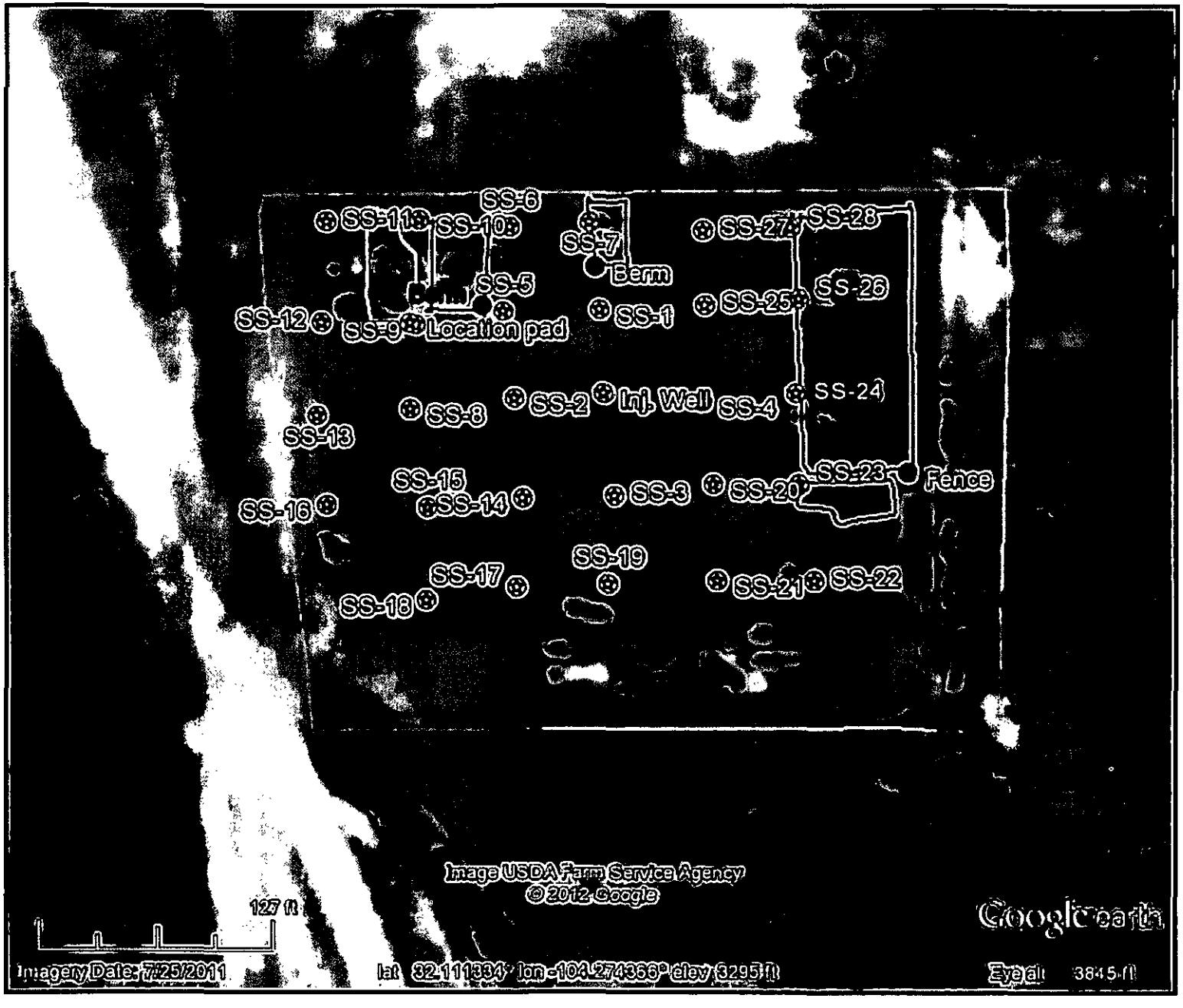
PLSS Search:

Section(s): 22 Township: 25S Range: 26E

*UTM location was derived from PLSS - see Help

Figure 2
Site Plan

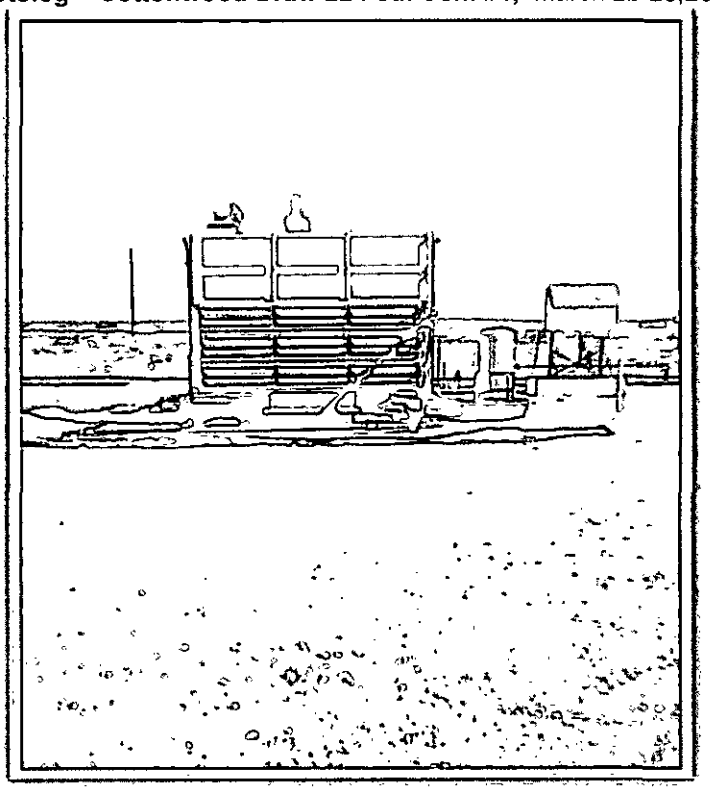

PRICKLY PEAR
Cottonwood Draw 22 Federal Com 1
T25S, R26E, sec. 22
Spill Date: 07/07/11
20bbl produced water; 1bbl oil; 1bbl condesate
.4241 acres
COTTONWOOD DRAW 22 FEDERAL COM #001


SS-6
SS-11
SS-10
SS-7
SS-27
SS-28
Berm
SS-5
SS-26
SS-12
SS-9
Location pad
SS-1
SS-25
SS-24
SS-8
SS-2
Inj. Well
SS-4
SS-13
SS-15
SS-23
Fence
SS-16
SS-14
SS-3
SS-20
SS-19
SS-17
SS-21
SS-22
SS-18
Image USDA Farm Service Agency
© 2012 Google
127 ft
Google earth
Imagery Date: 7/25/2011
lat 32.111334° lon -104.274366° elev 3295 ft
Eye alt 3845 ft

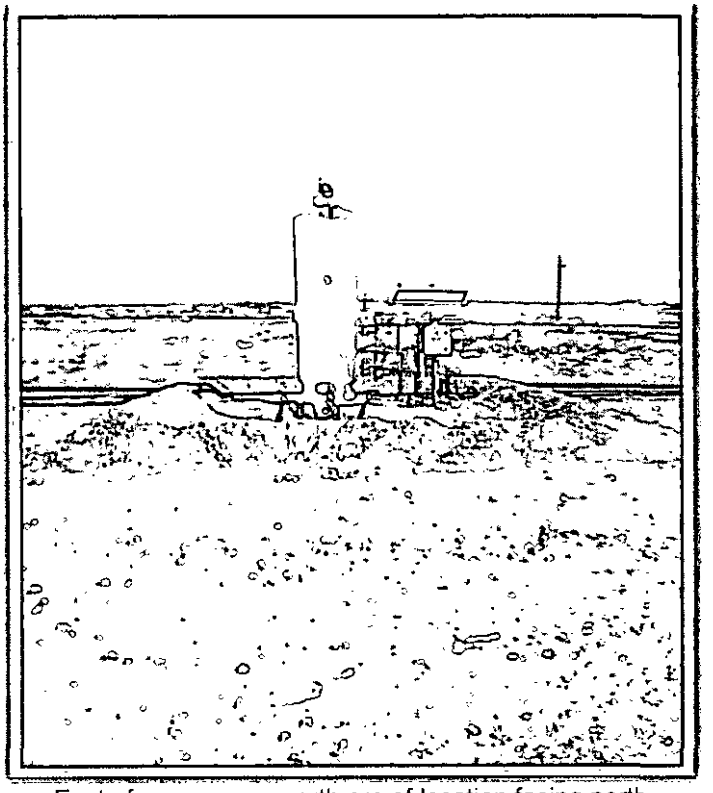
Appendix A
Analytical Results

Appendix B
Site Photographs

Photolog – Cottonwood Draw 22 Fed. Com #1, March 22-23,2012

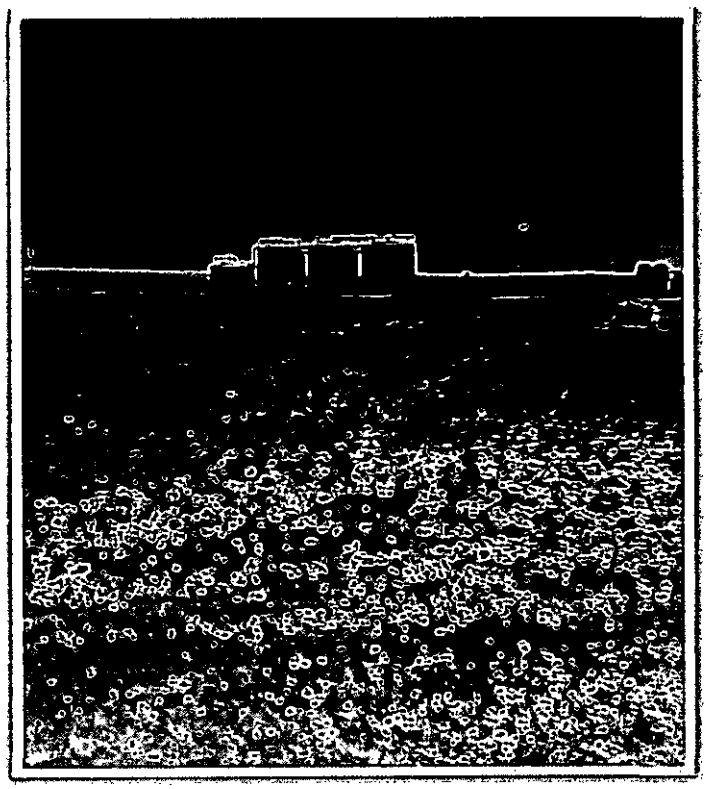


Compressor north area of location facing north



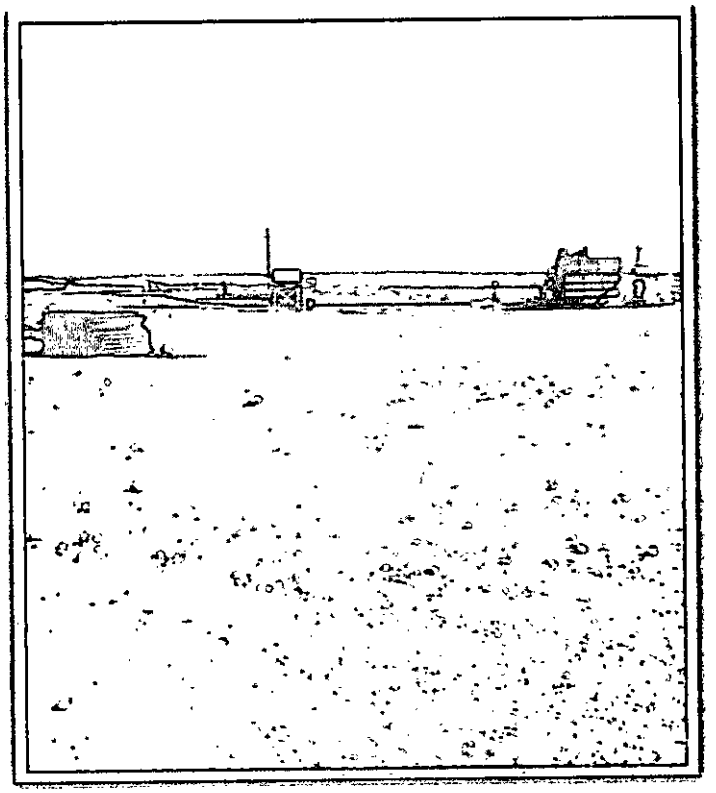
East of compressor north are of location facing north

Injection well facing northeast

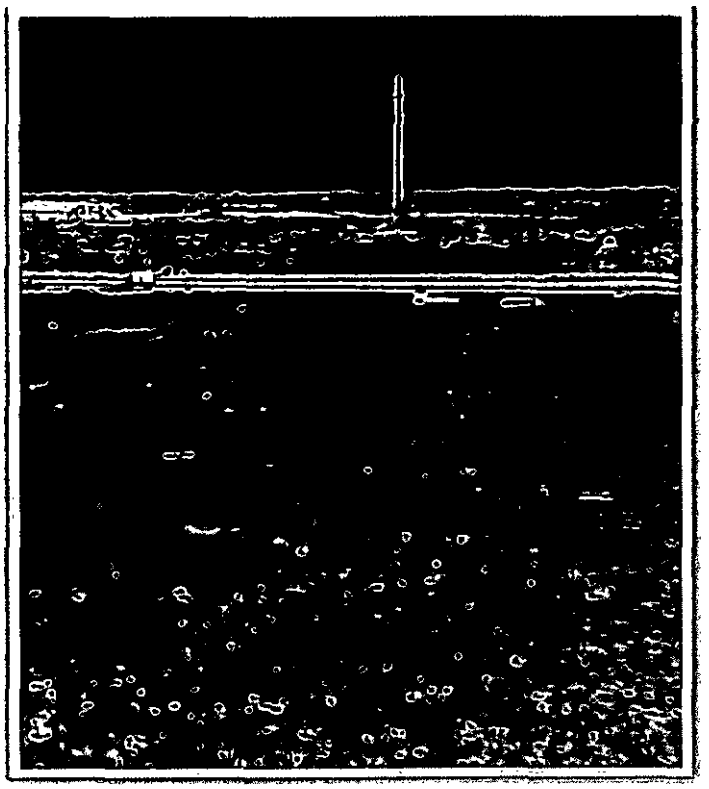


Location facing east

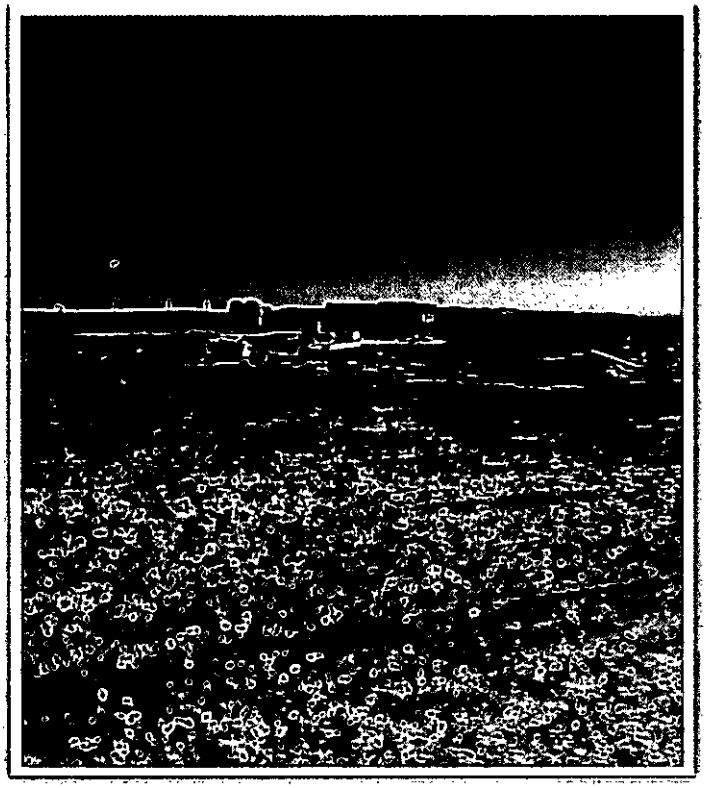
Location facing northeast



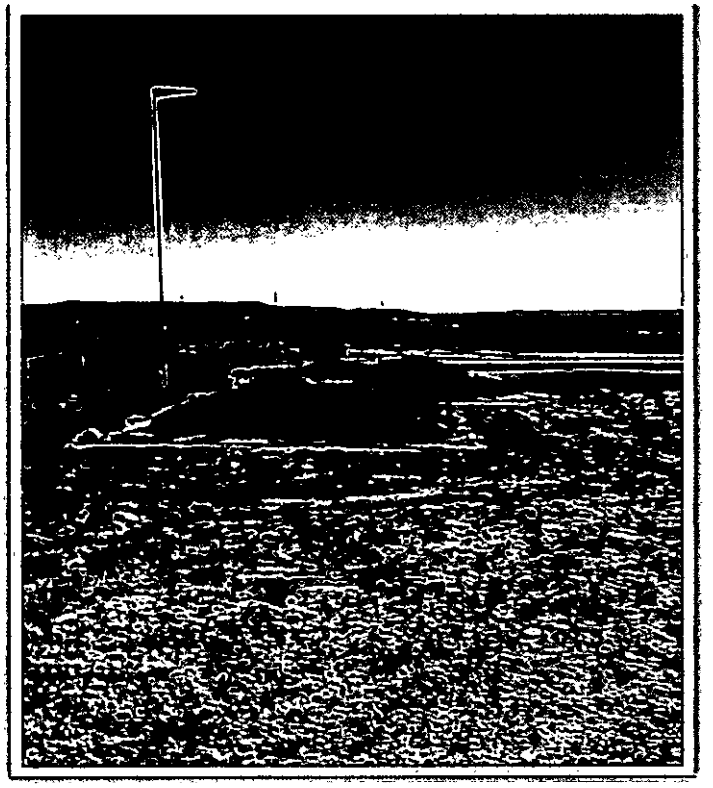
Northwest corner of location facing north



Pad west of compressor facing north

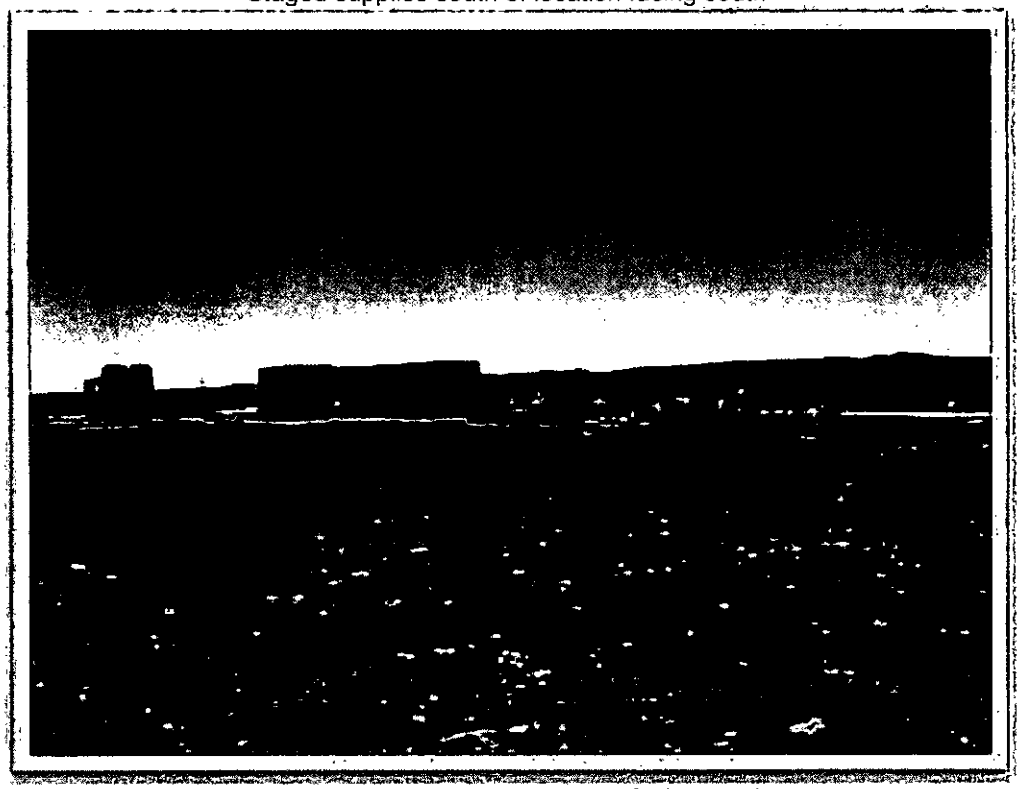


South area of location facing east

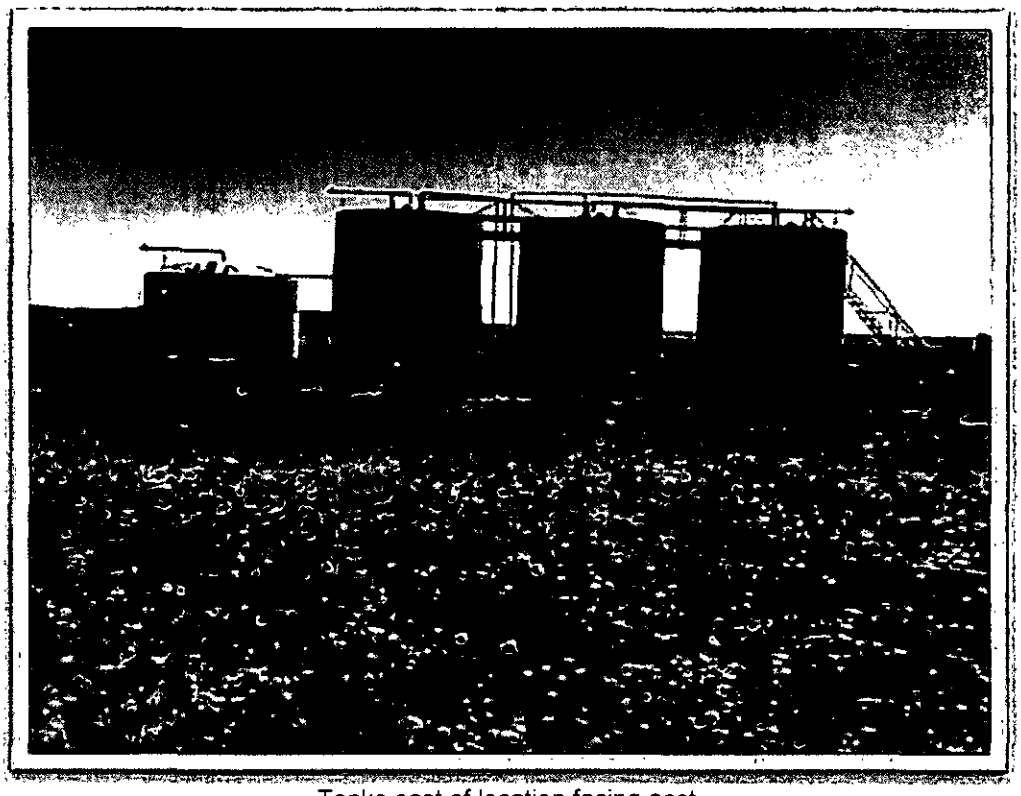


Spoils pile on liner south of tanks facing east

Staged supplies south of location facing south



Staged supplies south of location facing south



Tanks east of location facing east