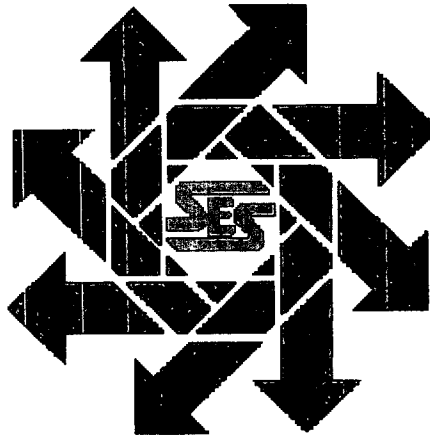


**Key Energy Services, Inc.  
Atha #1 Battery  
Lea County, New Mexico**

**August 17, 2001**



***Prepared for:***

**Key Energy Services, Inc.  
2625 West Marland  
Hobbs, New Mexico 88240**

***By:***

***Safety & Environmental Solutions, Inc.  
703 E. Clinton, Suite 102  
Hobbs, New Mexico 88240  
(505) 397-0510***

*Key 191168  
facility - PPAC0604835446  
incident - nPAC0604835627  
application - PPAC0604835838*

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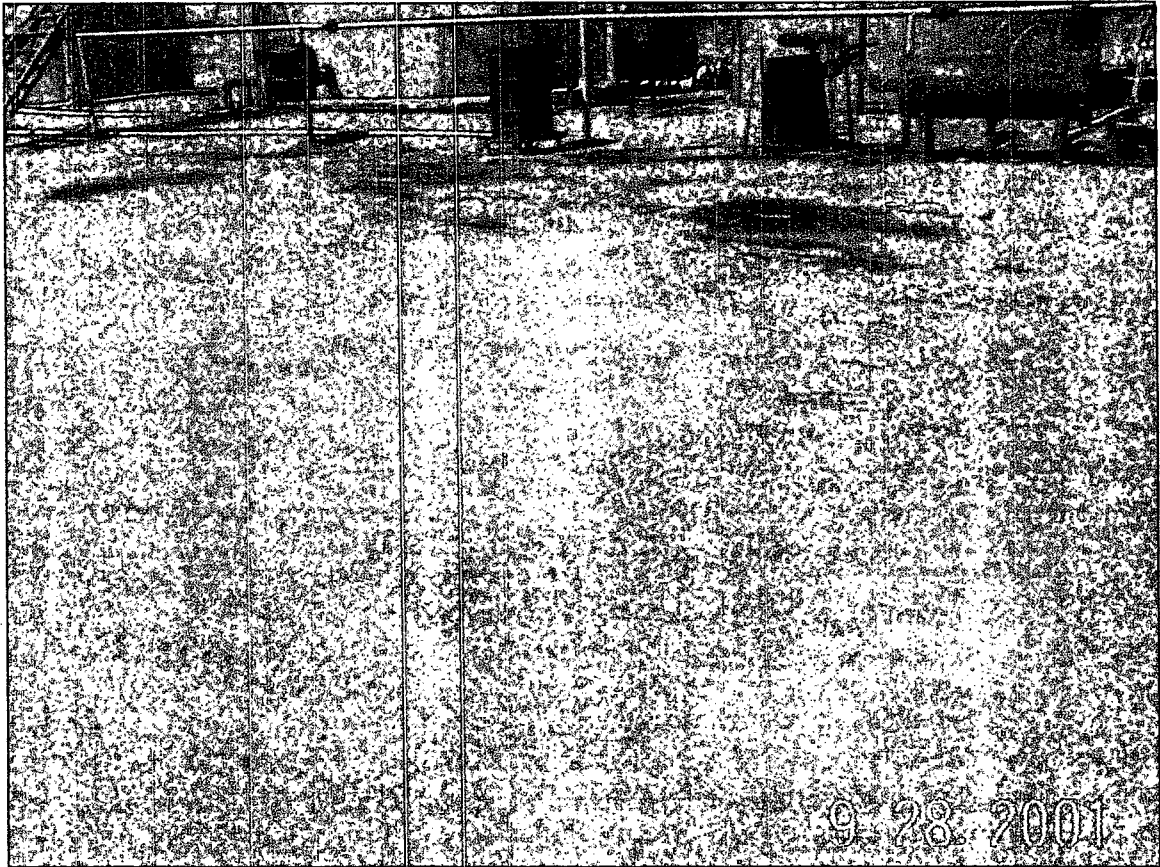
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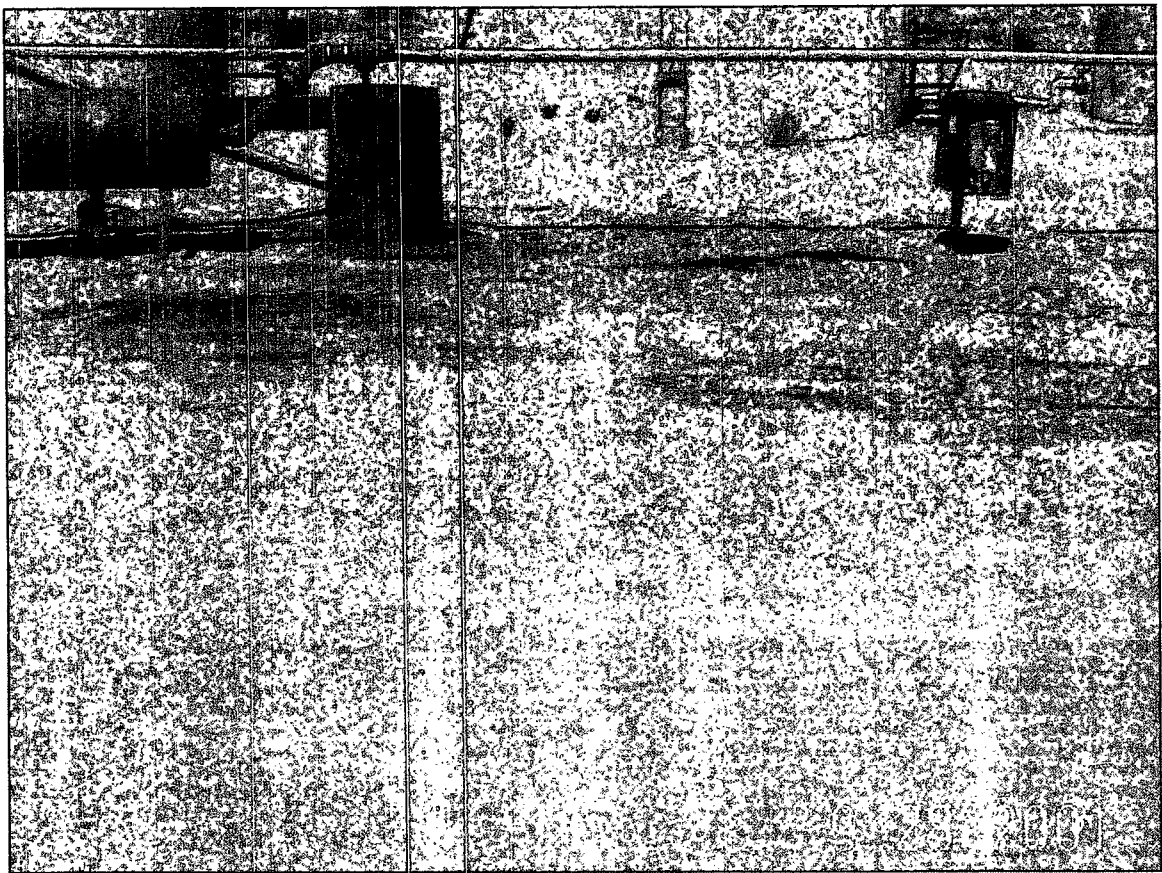
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Appendix A - Photos





## **I. Background**

In August 2001, Safety & Environmental Solutions, Inc. (SESI) was engaged by Key Energy Services, Inc. to perform a site investigation at the Atha # 1 tank battery. The investigation was conducted as a result of vandalism at the battery that occurred on ~~August 3, 2001.~~ Approximately 189 barrels of water and oil was released from the valves of the tanks that were opened by the vandals. Approximately 120 barrels of the fluid was recovered after the release. The subject area is located in of Section 31, Township 21S, Range 36E in Lea County, New Mexico. This location is used as a site for the storage of fluids produced by oil and gas wells. (Figure 1). Eleven storage tanks and associated piping are located on the subject area. The release remained within the confines of the location and with the majority of the pooling on the north and east end of the battery site. The release was primarily limited to the roadway encircling the battery.

The purpose of the investigation was to delineate the horizontal and vertical extent of any remaining hydrocarbon and/or salt materials at the site of the storage tanks.

## **II. Work Performed**

### **Soil Boring and Sampling**

On August 17, 2001, the spill area was sectioned into three (3) pooling areas, and three (3) spill areas. In addition, the depressed area on the west end of the tank battery was a pooling area for the oil released from the west most tank. (Figure 2) The pooling areas were sampled at a depth on 1', the spill areas were composite sampled at a depth of 0" – 6", and the oil pooling area was sampled at a depth of 4'. All samples were taken by SESI personnel using SOPs found in Environmental Protection Agency, 1984, Characterization of Hazardous Waste Site - A Methods Manual: Vol. II.

Field-testing for Total Petroleum Hydrocarbons (TPH) was performed on each soil samples (EPA Method 418.1) using a GAC Mega Total Petroleum Hydrocarbon analyzer serial # 01196 and Chlorides using Quanatab Titration strips.

Key Energy Services, Inc. excavated and placed on plastic the most highly contaminated soils from the pooling area and the oil pooling area. This soil may be land-farmed onsite or used as berming material.

## **III. Results of Soil Testing**

### **Soil Sampling Results**

The results for the soil sampling are tabulated in Table 1, Table 2, and Table 3.

The surface samples from the spill areas results show no areas with TPH contamination greater that 786 ppm in the field test. The greatest chloride levels are found in areas 2

and 3 where the water and oil mixture ran out of the tanks where the valves were opened. The level of 6156 ppm chlorides in areas 2 and 3 are in the roadway encircling the battery, which may indicate that the levels are a result of historical releases from vehicles using the facility.

The samples from the pooling areas results show no areas with TPH contamination greater than 786 ppm in the field test. The soil samples taken from the pooling areas 1, 2, and 3 indicated only moderate chloride contamination no greater than 3128 ppm. The pooling areas are also within the roadway encircling the battery and chloride contamination may be the result of historical releases.

The oil pooling area was sampled at a depth of 4' in two test holes. The samples from the oil pooling area results show no areas with TPH contamination greater than 764 ppm in the field test. The chloride concentrations in these samples were less than 100 ppm.

The groundwater in the area of the subject sites is in excess of ~~150~~<sup>1502</sup> as published in the New Mexico State Engineer database. The wells listed within a 1-mile radius are as follows:

Legal	Date Sampled	Depth to Water
21S.36E.30.42221	19960213	230.69'
22S.36E.06.32111	19960214	179.53'
22S.36E.06.41200	19910501	171.04'

The NMOCD guidelines would indicate a cleanup level of 5000 ppm TPH. No TPH levels above 800 ppm were noted.

Table 1. Surface 0"-6," Spill Areas Soil Sampling Results, Atha #1 Battery Site Investigation, Lea County, New Mexico

LOCATION	DEPTH	TPH	CHLORIDES
Area #1	0-6"	78	1944
Area #2	0-6"	453	6156
Area #3	0-6"	238	6156

Table 2. Pooling Areas Soil Sampling Results, Atha #1 Battery Site Investigation, Lea County, New Mexico

LOCATION	DEPTH	TPH	CHLORIDES
Pooling Area #1	1'	163	3128
Pooling Area #2	1'	764	1464
Pooling Area #3	1'	74	1944

Table 3. Oil Pooling Area Soil Sampling Results, Atha #1 Battery Site Investigation, Lea County, New Mexico

LOCATION	DEPTH	TPH	CHLORIDES
Test Hole #1	4'	595	56
Test Hole #2	4'	46	32

#### **IV. Conclusions and Recommendations**

Results of the soil-sampling program show no levels of TPH above regulatory limits in any of the samples. Moderate chloride levels were detected in the surface samples and at 1'. It is evident from the sampling results, that this site contains no levels of contamination that are above regulatory limits found in "**Unlined Surface Impoundment Closure Guidelines**" *New Mexico Oil Conservation Division* - February 1993 regarding Total Petroleum Hydrocarbons (TPH). The levels of chloride contamination detected would pose no threat to the surface or the groundwater in the area.

SESI feels that the extent of contamination at the site warrants no further remedial action. However, Key Energy Services, Inc. should make application to the NMOCD to either use the stained soils excavated from the site to construct a berm around the battery for containment purposes or, in the alternative, land farm the material onsite.

#### **V. Report Figures**

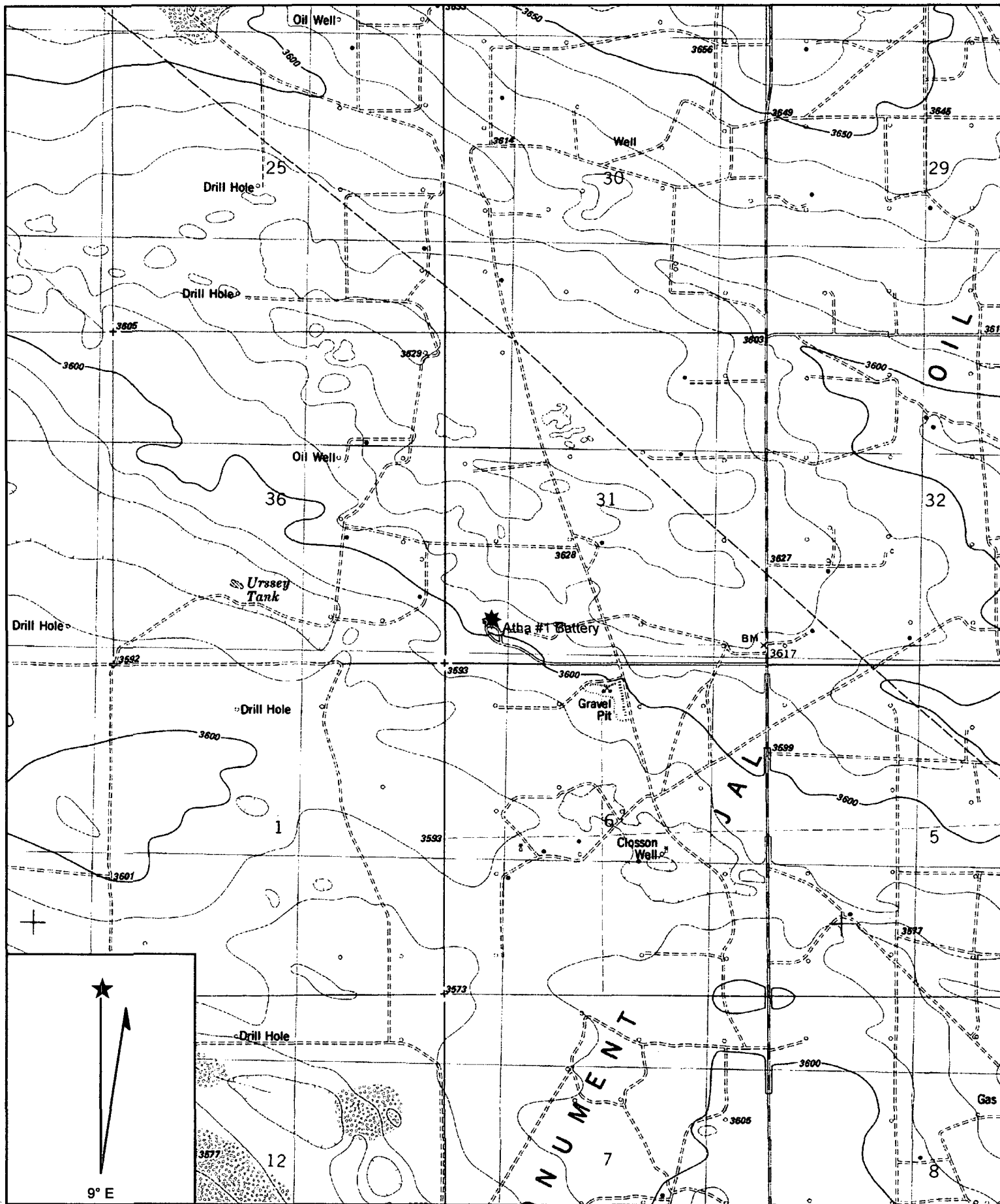
Figure 1. - Vicinity Map  
Figure 2. - Site Plan

#### **VI. Report Appendices**

Appendix A. Laboratory Analytical Reports - Soil



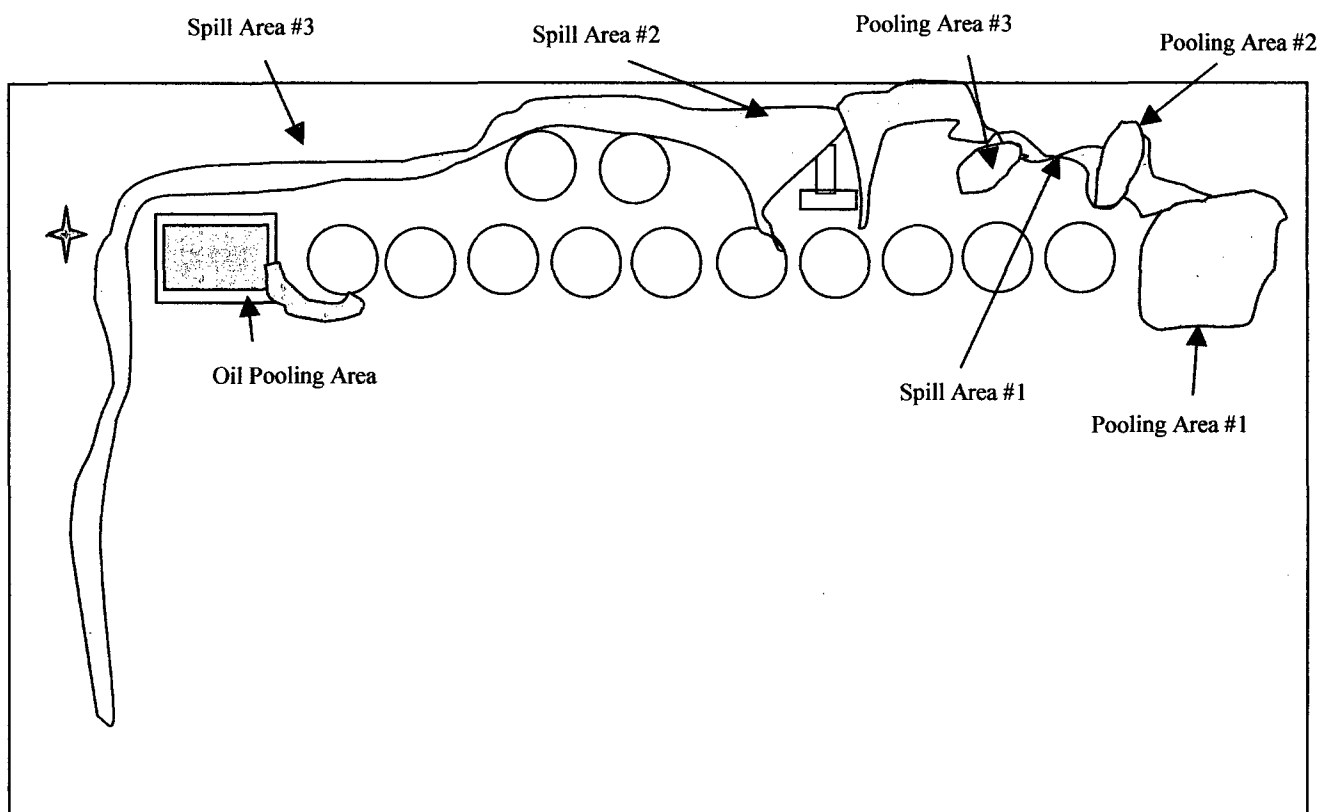
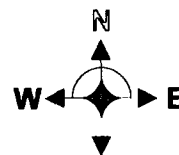
Figure 1.  
Vicinity Map



Name: OIL CENTER  
 Date: 9/10/2001  
 Scale: 1 inch equals 2000 feet

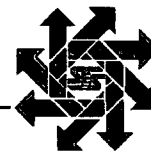
Location: 032° 25' 50.0" N 103° 18' 32.3" W  
 Caption: Key Energy Services, Inc.  
 Atha #1 Battery  
 Section 31 T21S R36E

Figure 2.  
Site Plan



**Section 31,  
Township 21 South  
Range 36 East**

NOT TO SCALE



**Key Energy  
Services, Inc.**

**Atha #1 Battery  
Site Plan**

**Safety & Environmental  
Solutions, Inc.  
Hobbs, New Mexico**

## Appendix A

### Photos

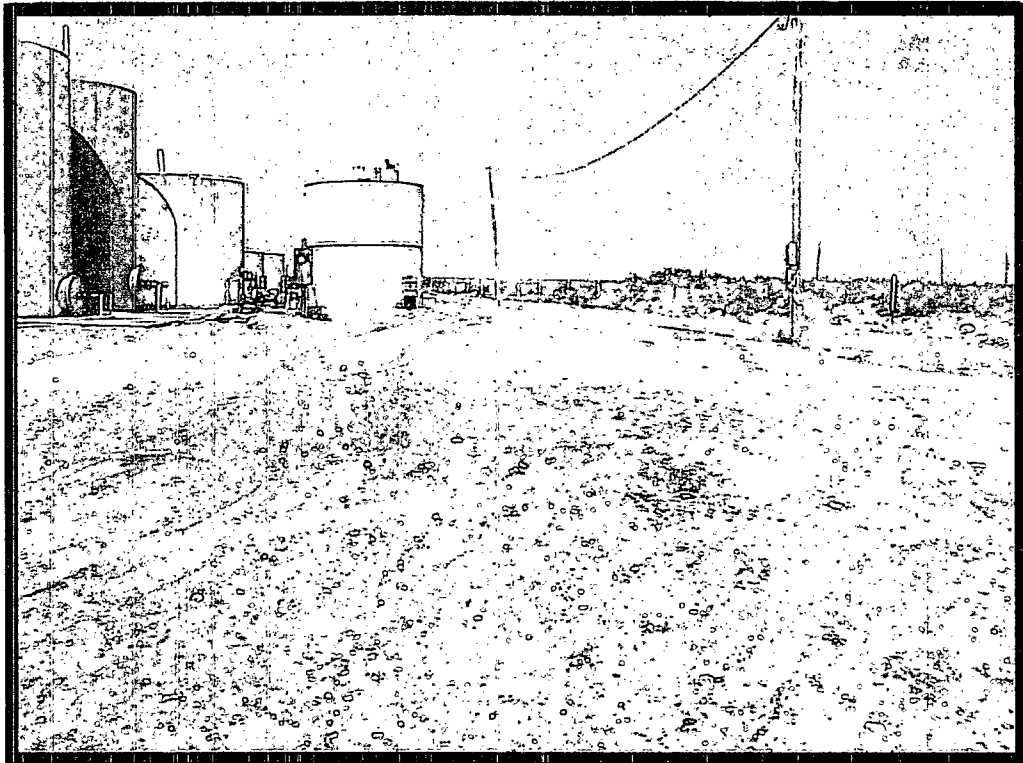


Photo #1 Pooling Area #3

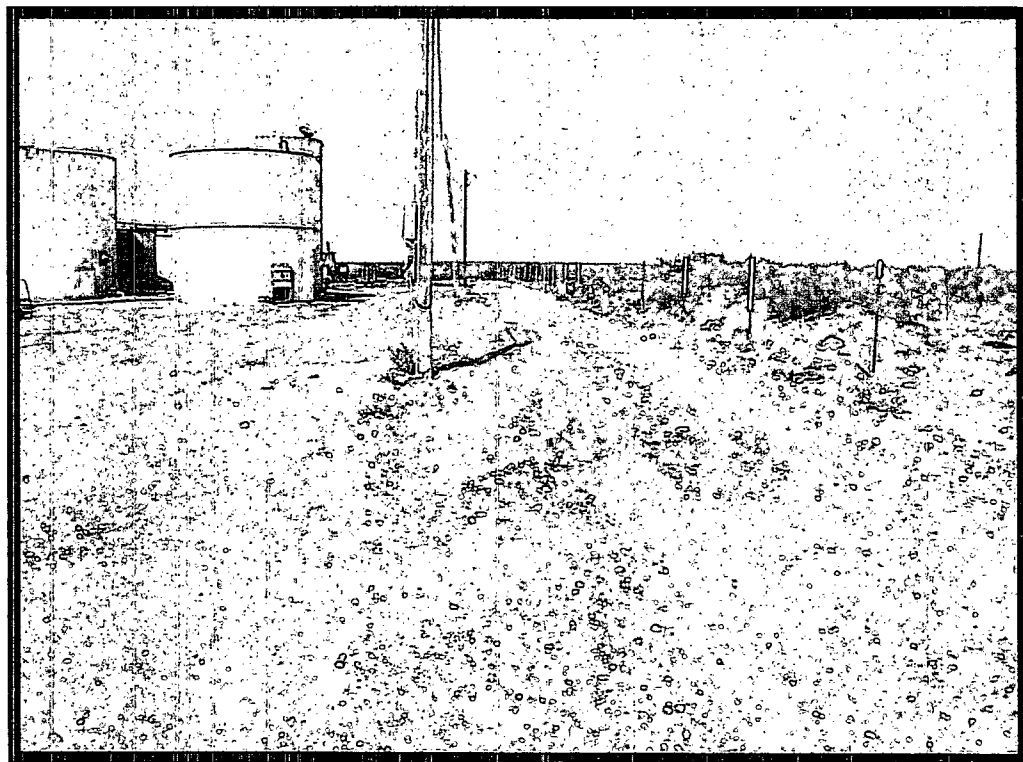


Photo #2 Spill Area #2

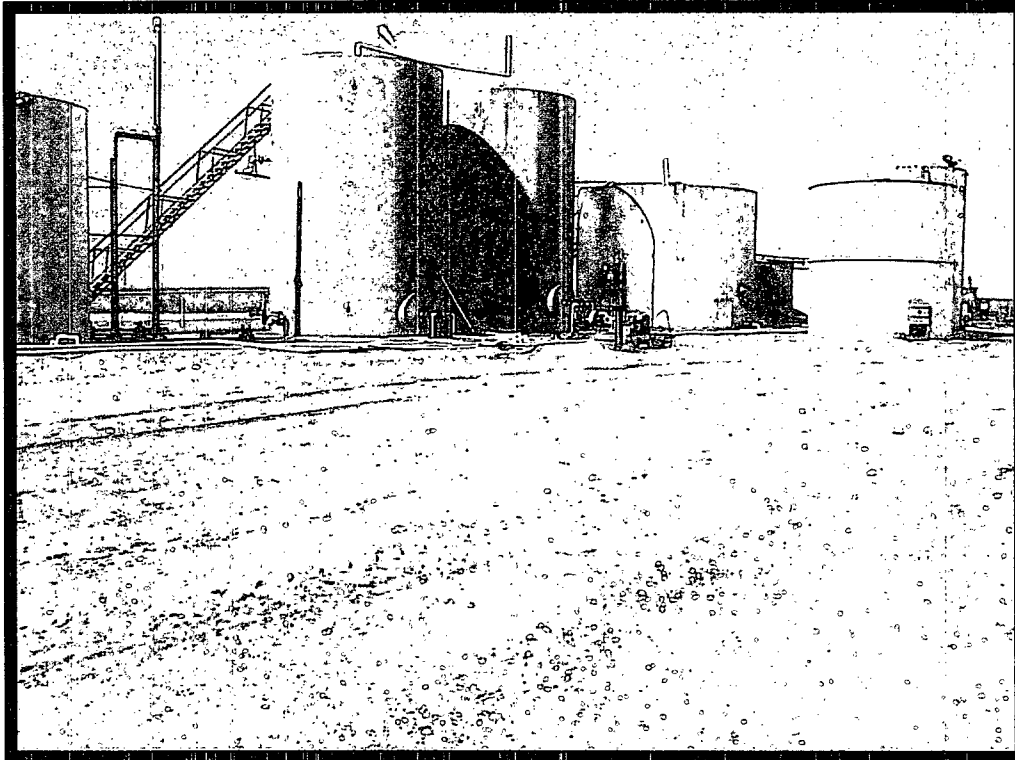


Photo #3 Spill Area #1 & #2

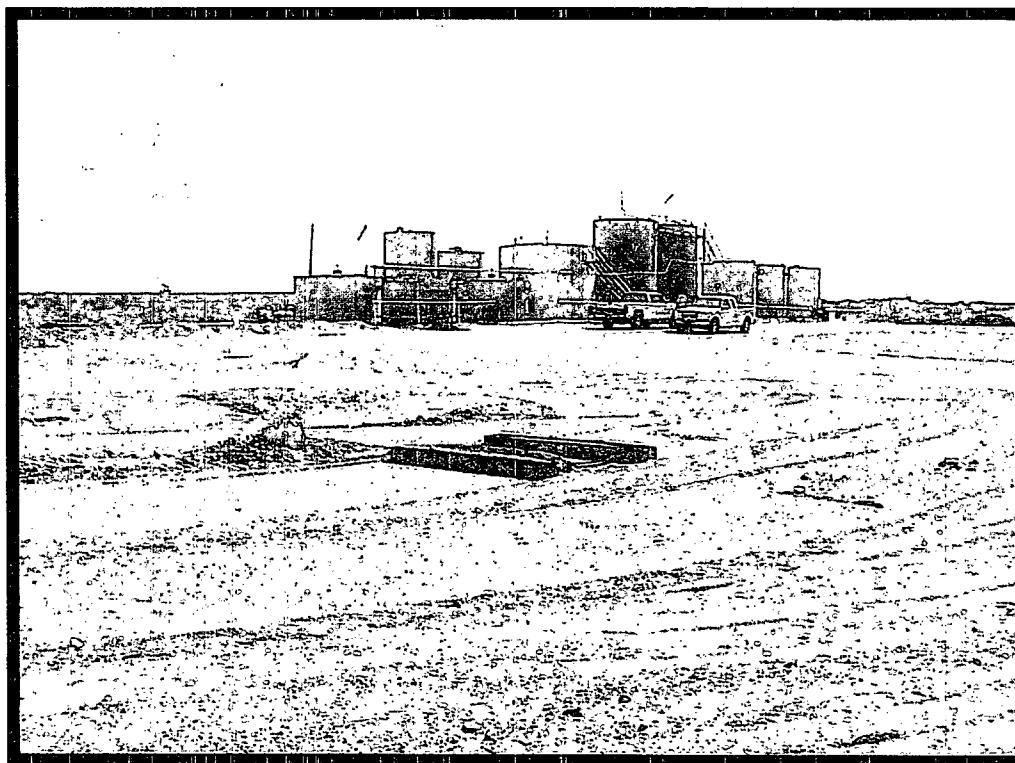


Photo #4 Battery from SW Corner

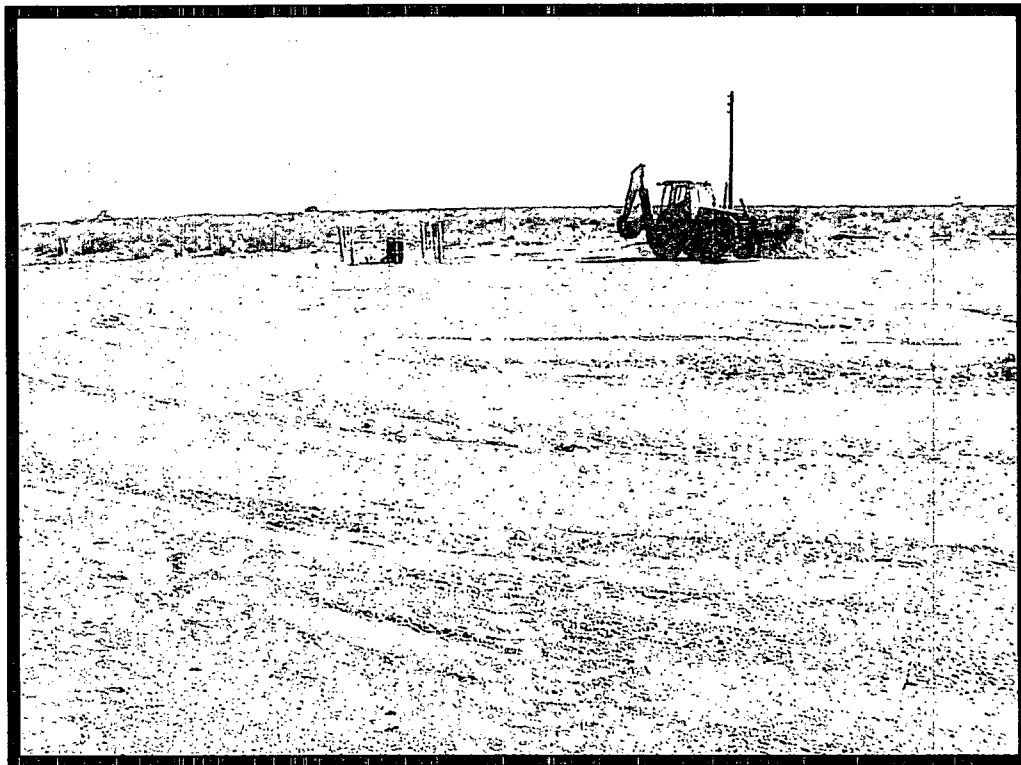


Photo #5 Spill Area # 3

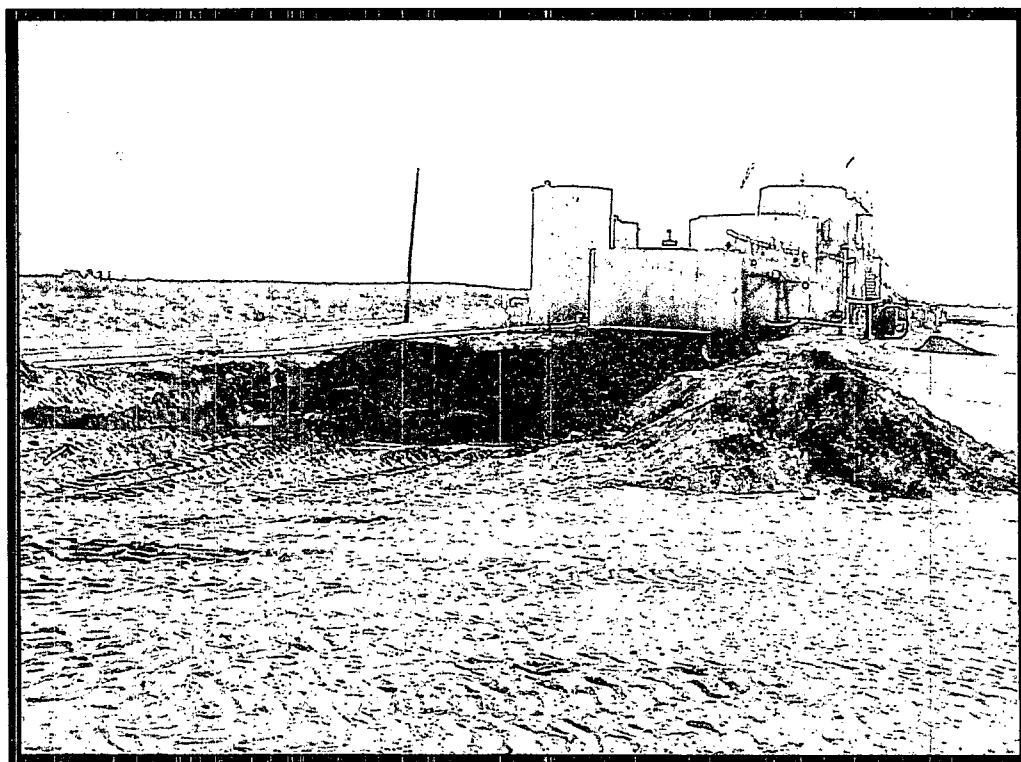


Photo #6 Oil Pooling Area



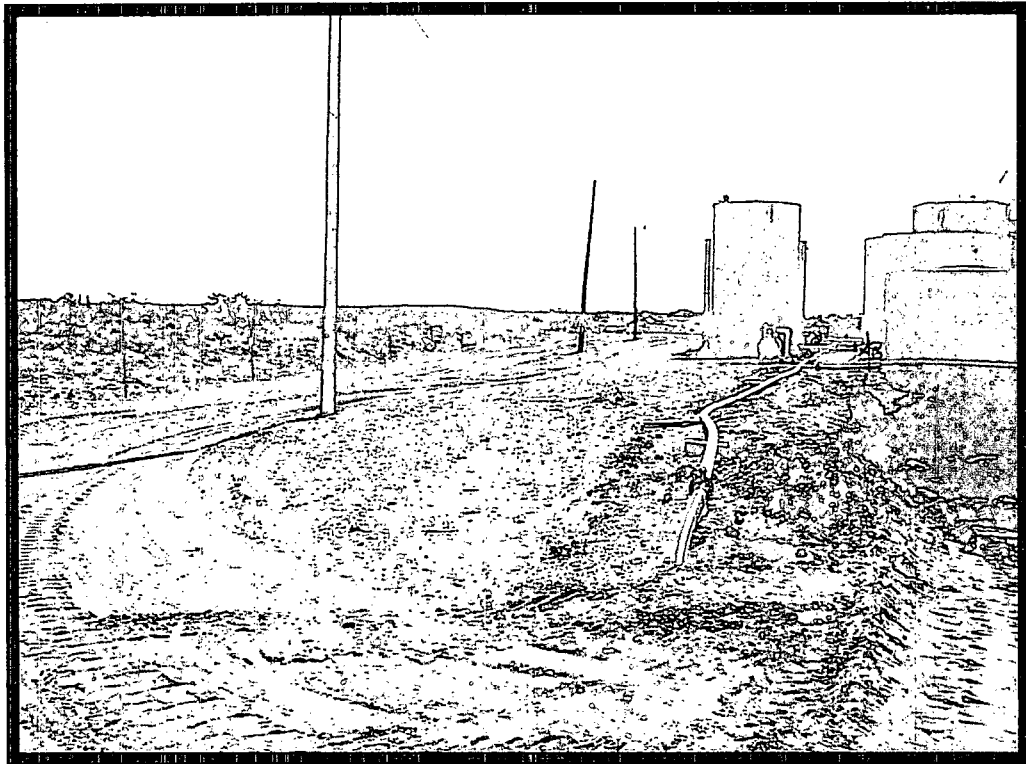


Photo #7 Spill Area # 2

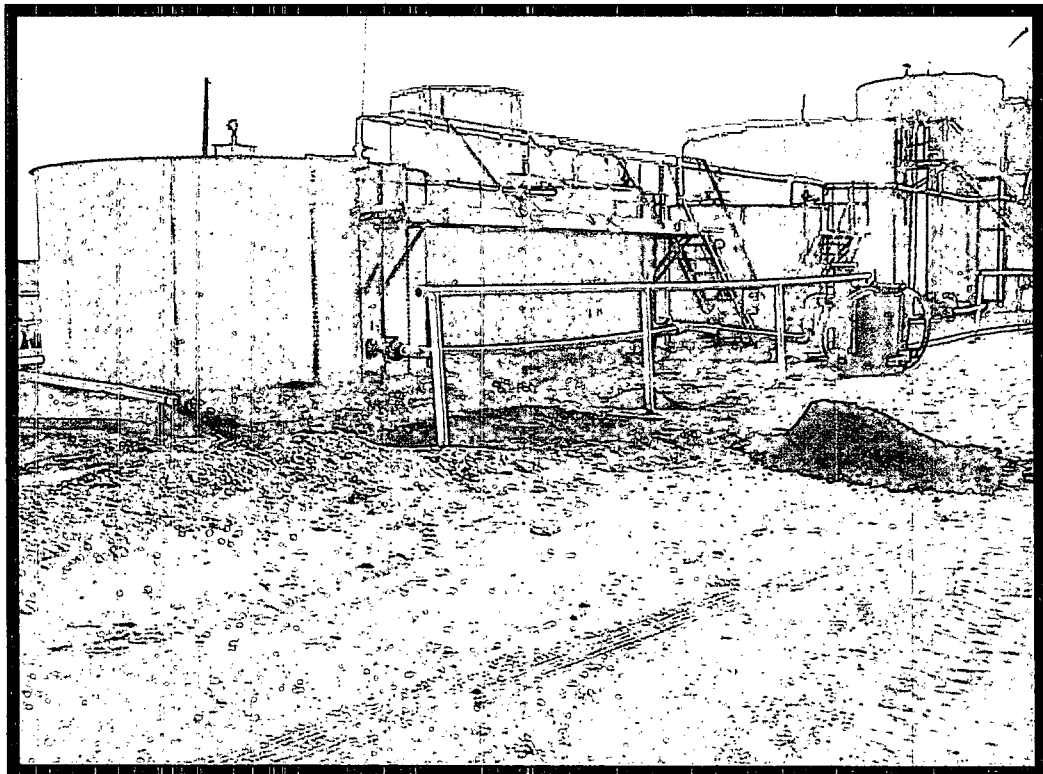


Photo #8 Oil Tanks and Spill



Photo #9 Pooling Area # 1

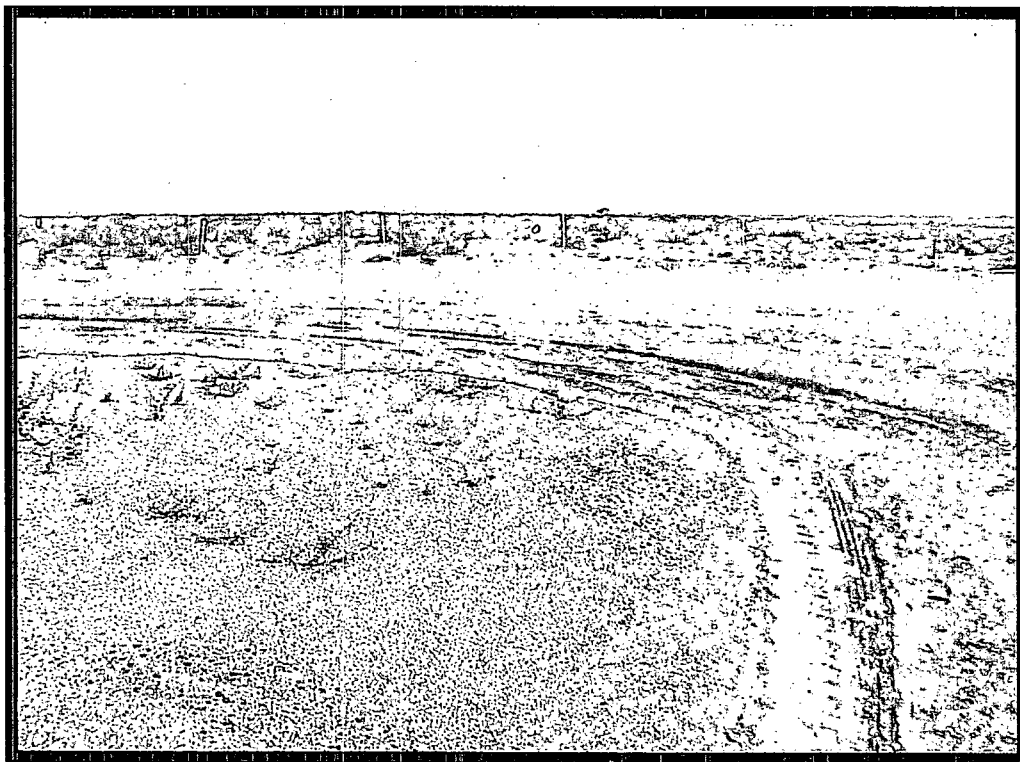


Photo #10 Pooling Areas #2 & #3

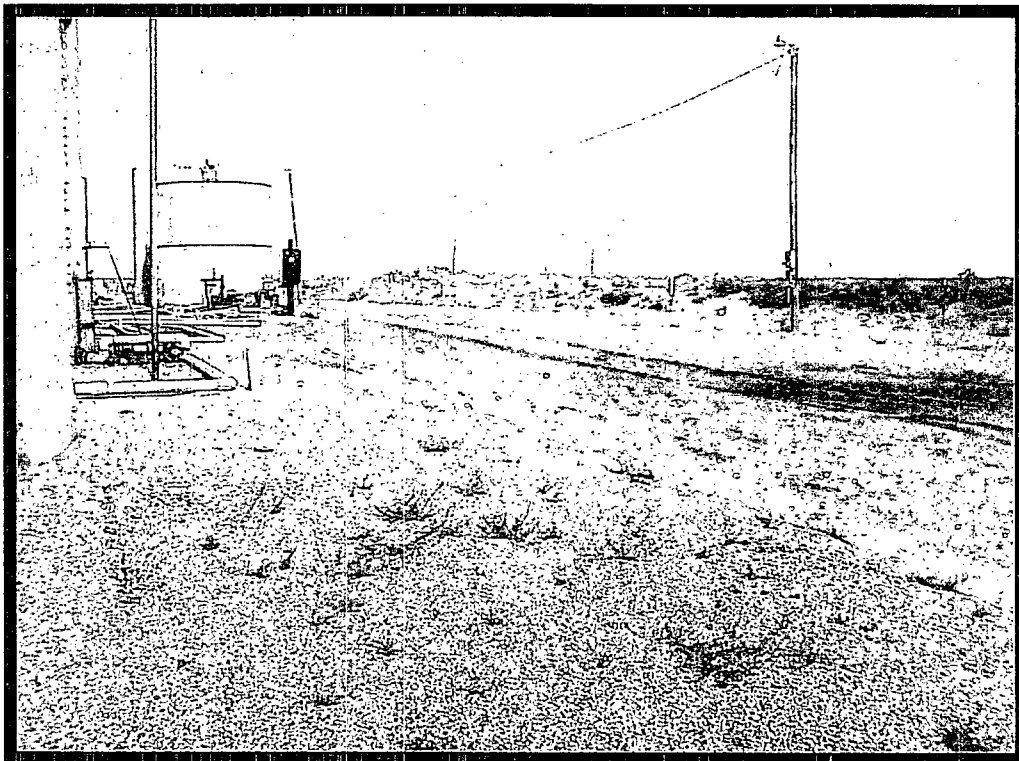
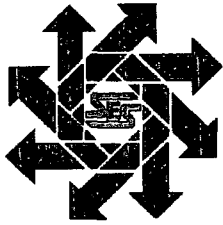


Photo #11 Pooling Area #3 and Spill Area #2



P.O. Box 1613  
703 E. Clinton Suite 102  
Hobbs, New Mexico 88240  
505/397-0510  
Fax 505/393-4388  
[www.sesi-nm.com](http://www.sesi-nm.com)

## **Safety & Environmental Solutions, Inc.**

September 14, 2001

Mr. Paul Sheeley  
New Mexico Oil Conservation Division  
1625 N. French  
Hobbs, New Mexico 88240

RE: Key Energy Services, Inc. Atha #1 Disposal Spill

Dear Mr. Sheeley:

Enclosed please find a copy of the Assessment Report prepared by Safety & Environmental Solutions, Inc. for the Key Energy Services, Inc. Atha #1 Disposal Spill. The results of the assessment indicate that there is minimal opportunity for the contamination of the groundwater in the area from this spill.

Key Energy has excavated some of the soil that was impacted by the spill and has it stockpiled on plastic. Please consider this letter as a request of behalf of Key Energy for permission to use this soil as berming material around the Atha Battery. In the alternative, Key would like permission to land farm the soil on-site.

If you have any questions, or I can be of further assistance please contact me at (505) 397-0510.

Sincerely,

Bob Allen CHMM, REM, CET, CES  
President

November 5, 2001

Safety and Environmental Solutions, Inc.  
Attn: Bob Allen  
703 E. Clinton, Suite 102  
Hobbs, NM 88240

Re: Remediation Work Plan Approval by Safety and Environmental Solutions, Inc. for  
Key Energy Services, Inc., Alpha #1 Battery, Dated: August 17, 2001  
Site Location: UL-M, Sec 31-T21S-R36E

Dear Mr. Allen,

The work plan referenced above submitted to the New Mexico Oil Conservation Division (OCD) by Safety and Environmental Solutions, Inc. for Key Energy Services, Inc. is **hereby approved** under the following conditions.

1. Sample one bottom hole point for Benzene, BTEX, TPH and chlorides and analyze in an OCD approved laboratory to determine if the field tests and the lab tests agree. Report results to the OCD before proceeding.
2. Land farm any soil above OCD guidelines or above 2000 mg/Kg chlorides.
3. The OCD shall be notified at least 48 hours in advance of any sampling event.
4. Document Benzene, BTEX, TPH and chloride concentrations in material to be used for containment purposes.
5. Implement remediation and secondary containment plans to address contamination from vehicles using the facility in the past and in the future.

Please be advised that OCD approval of this plan does not relieve Key Energy Services, Inc., of liability should their operations fail to adequately investigate and remediate contaminants that threaten ground water, surface water, human health or the environment. In addition, OCD approval does not relieve Key Energy Services, Inc., of responsibility for compliance with any other federal, state, or local laws and/or regulations.

If you have any questions or need assistance please feel free to write or call me at (505) 393-6161, x113 or email [psheeley@state.nm.us](mailto:psheeley@state.nm.us)

Sincerely,

Paul Sheeley  
Environmental Engineer  
cc: Roger Anderson-Environmental Bureau Chief  
Chris Williams-District I Supervisor  
Bill Olson-OCD Hydrologist  
Bob Patterson-Key Energy Services, Inc.

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 March 17, 1999

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	Key Energy Services, Inc. SENM	Contact	<input type="checkbox"/> Bob Patterson
Address	2625 /West Marland Hobbs, NM 88240	Telephone No.	<input type="checkbox"/> (505) 393-9171
Facility Name	Atha SWD # 1	Facility Type	<input type="checkbox"/> SWD
Surface Owner	Ben Alexander	Mineral Owner	BLM
		Lease No.	<input type="checkbox"/> 1

LOCATION OF RELEASE

Unit Letter	Section 31	Township 21 S	Range 36 E	Feet from the	North/South Line N/A	Feet from the	East/West Line N/A	County LEA
-------------	---------------	------------------	---------------	---------------	-------------------------	---------------	-----------------------	---------------

NATURE OF RELEASE

Type of Release	Disposal Water & Oil	Volume of Release	189 BBLs	Volume Recovered	<input type="checkbox"/> 120 BBLs
Source of Release	Vandalism - SWD	Date and Hour of Occurrence	Btwn 08-02-01 5:30 p.m. 08-03-01 5:30 a.m.	Date and Hour of Discovery	08-03-01 @ 5:30 a.m.
Was Immediate Notice Given?	X <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required				
	If YES, To Whom? Gary Wink of Oil Conservation Division - District I 1625 North French Drive - Hobbs				
By Whom?	<input type="checkbox"/> Bob Patterson Sr. Area Manager for Key Energy Services		Date and Hour <input type="checkbox"/> 08-03-01 @ 6:55 a.m.		
Was a Watercourse Reached?	<input type="checkbox"/> Yes X <input type="checkbox"/> No		If YES, Volume Impacting the Watercourse.		

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*

Vandals unscrewed bull - plugs from discharge lines and released production water and oil on to the ground.

Describe Area Affected and Cleanup Action Taken.\*

Cleaned affected area with vacuum trucks, backhoe, and dump truck. Placed contaminated dirt on plastic and disposed contaminated dirt at the Sundance SWD.

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: <i>Terry A. Thomas</i>		OIL CONSERVATION DIVISION	
Printed Name: Terry Thomas		Approved by <input type="checkbox"/> District Supervisor:	
Title: Key Energy Services, Inc. Regional Safety Director		Approval Date:	Expiration Date:
Date: 08-08-01	Phone: (505)393-9171	Conditions of Approval:	Attached <input type="checkbox"/>

\* Attach Additional Sheets If Necessary