

# SITE CLOSURE REPORT

**J. A. AKENS -A- OIL UNIT TANK BATTERY**

**EPI REF: #160043**

**NMOCD: 1RP#~~936~~ 836**

**NMOCD ADMIN: #PPAC0610938028**

**UL-T (SW¼ OF THE SW¼) OF SECTION 3, T 21 S, R 36 E**

**~8 MILES NORTHWEST OF EUNICE,**

**LEA COUNTY, NEW MEXICO**

**LATITUDE: N 32° 30' 10.54"**

**LONGITUDE: W 103° 15' 36.76"**

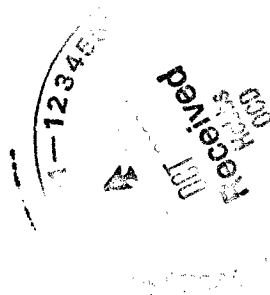
**OCTOBER 2006**

***PREPARED BY:***

**ENVIRONMENTAL PLUS, INC.  
2100 AVENUE O  
EUNICE, NEW MEXICO 88231**

***PREPARED FOR:***

  
**Chesapeake**





## Distribution List

### Site Closure Report

J. A. Akens -A- Oil Unit Tank Battery  
NMOCD Ref. 1RP#386: EPI Ref. #160043

Name	Title	Company or Agency	Mailing Address	e-mail
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## STANDARD OF CARE

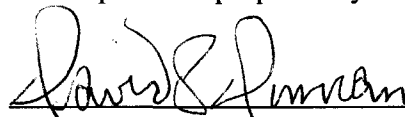
### Site Closure Report

J. A. Akens -A- Oil Unit Tank Battery

NMOCD Ref. 1RP #386: EPI Ref. #160043

The information provided in this report was collected consistent with the New Mexico Oil Conservation Division (NMOCD) *Guidelines for Remediation of Leaks, Spills and Releases* (August 13, 1993), the NMOCD *Unlined Surface Impoundment Closure Guidelines* (February, 1993) and Environmental Plus, Inc. (EPI) *Standard Operating Procedures and Quality Assurance/Quality Control Plan*. The conclusions are based on field observations and laboratory analytical reports as presented in the report. Recommendations follow NMOCD guidance and represent the professional opinions of EPI staff. These opinions were derived using currently accepted geologic, hydrogeologic and engineering practices at this time and location. The report was prepared or reviewed by a certified or registered professional with a background in engineering, environmental and/or natural sciences.

This report was prepared by:

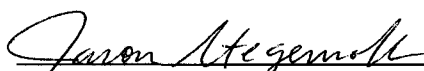


David P. Duncan  
Civil Engineer

10/26/06

Date

This report was reviewed by:



Jason Stegemoller, MS  
Environmental Scientist

October, 26, 2006

Date



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## 1.0 PROJECT SYNOPSIS

### *Site Specific:*

- ◆ **Company Name:** Chesapeake Operating, Inc.
- ◆ **Facility Name:** J. A. Akens -A- Oil Unit Tank Battery
- ◆ **Project Reference:** NMOCD Ref. 1RP #386; EPI Ref. #160043
- ◆ **Company Contacts:** Bradley Blevins
- ◆ **Site Location:** WGS84 N32° 30' 10.54"; W103° 15' 36.76"
- ◆ **Legal Description:** Unit Letter-T, (SW¼ of the SW¼), Section 3, T 21 S, R 36 E
- ◆ **General Description:** Approximately 8-miles northwest of Eunice, New Mexico
- ◆ **Elevation:** 3,579-ft amsl
- ◆ **Land Ownership:** Millard Deck Estate
- ◆ **EPI Personnel:** Project Consultant – Iain Olness  
Site Foreman – Kirt Tyree

### *Release Specific:*

- ◆ **Product Released:** Crude oil
- ◆ **Volume Released:** 277-bbl
- ◆ **Volume Recovered:** 144-bbls
- ◆ **Time of Occurrence:** January 1, 2006
- ◆ **Time of Discovery:** January 2, 2006
- ◆ **Release Source:** Steel storage tank developed a leak in the sidewall
- ◆ **Initial Surface Area Affected:** Release Area ~ 1,070-ft<sup>2</sup>; Overspray Area ~ 10,100 ft<sup>2</sup>

### *Remediation Specific:*

- ◆ **Final Vertical extent of contamination:** 7-feet bgs
- ◆ **Water wells within 1,000-ft:** None
- ◆ **Private domestic water sources within 200-ft:** None
- ◆ **Depth to Groundwater:** >100 ft bgs
- ◆ **Surface water bodies within 1,000-ft:** None
- ◆ **NMOCD Site Ranking Index:** Zero (0) points (>100-ft to top of water table)
- ◆ **Remedial goals for Soil:** TPH – 5,000 mg/Kg; BTEX – 50 mg/Kg; Benzene – 10 mg/Kg; Chloride and sulfate residuals may not be capable of impacting groundwater above NMWQCC groundwater standards of 250 mg/L and 600 mg/L, respectively.
- ◆ **RCRA Waste Classification:** Exempt
- ◆ **Remediation Option Selected:** a) Excavation of contaminated soil above NMOCD remedial goals with repository at a disposal facility; b) laboratory analyses to confirm removal of impacted soil above NMOCD remedial threshold goals; c) backfill excavation with caliche to original ground surface; d) grade area to a smooth, level gradient
- ◆ **Disposal Facility:** J & L Landfarm, Inc. (Hobbs, NM) and Sundance Services, Inc. (Eunice, NM)
- ◆ **Volume disposed:** ~ 322-yd<sup>3</sup>
- ◆ **Project Completion Date:** April 26, 2006



## 2.0 **SITE AND RELEASE INFORMATION**

### 2.1 ***Describe the land use and pertinent geographic features within 1,000 feet of the site.***

The release site is located within the confines of an established oil field. Surrounding land is used for grazing purposes

### 2.2 ***Identify and describe the source or suspected source(s) of the release.***

An existing steel storage tank located in a tank battery developed a leak in the sidewall

### 2.3 ***What was the volume of the release? (if known): 277 barrels***

### 2.4 ***What was the volume recovered ? (if known): 144 barrels***

### 2.5 ***When did the release occur? (if known): January 1, 2006***

### 2.6 ***Geological Description***

The United States Geological Survey (USGS) Ground-Water Report 6, "*Geology and Ground-Water Conditions in Southern Lea County, New Mexico*" (A. Nicholson and A. Clebsch, 1961), describes the near surface geology of Southern Lea County as "an intergrade of the Quaternary Alluvium (QA) sediments (i.e., fine to medium sand) with the mostly eroded Cenozoic Ogallala (CO) formation. Typically, the QA and CO formations in the area are capped by a thick interbed of caliche and generally overlain by sandy soil."

The release site is located in the Eunice physiographic subdivision, described by Nicholson & Clebsch as an area "underlain by a hard caliche surface and is almost entirely covered by reddish-brown dune sand." The thickness of the sand ranges from 2-5 feet in most areas to as much as 20-30 feet in drift areas.

### 2.7 ***Ecological Description***

The area is typical of the Upper Chihuahuan Desert Biome consisting primarily of sandy soil covered with short semi-arid grasses, interspersed with Honey Mesquite, annual and perennial forbs. Mammals represented include Orrd's and Merriam's Kangaroo Rats, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit, Mule Deer, Bobcat, Red Fox and Coyote. Reptiles, amphibians and birds are numerous and typical of the area. A survey of *Listed*, *Threatened* or *Endangered* species was not conducted.

### 2.8 ***Area Groundwater***

The unconfined groundwater aquifer at this site is projected to be ~198-ft bgs based on water depth data obtained from the New Mexico State Engineers Office and United States Geological Survey data base (reference *Table 1*). Groundwater was not encountered during the advancement of SB-1 (20-ft bgs) and SB-2 (16-ft bgs).

### 2.9 ***Area Water Wells***

No public water supply wells exist within 1,000-feet of the release site. Similarly, no private, domestic fresh water wells or springs used by less than five (5) households for domestic or stock watering purposes exist within 200-feet of the release site. However, four (4) water supply wells are located within one (1) mile of the release site (reference *Figure 2* and *Table 1*).

### 2.10 ***Area Surface Water Features***

No surface water features exist within 1,000- feet of the release site (reference *Figure 2*).



### 3.0 NMOCD SITE RANKING

Contaminant delineation and remedial work done at this site indicate chemical parameters of the soil and physical parameters of the groundwater were consistent with the characterization and remediation/abatement goals and objectives set forth in the following New Mexico Oil Conservation Division (NMOCD) publications:

- ◆ *Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)*
- ◆ *Unlined Surface Impoundment Closure Guidelines (February, 1993)*
- ◆ *Pit and Below-Grade Tank Guidelines (November, 2004)*

Acceptable thresholds for contaminants/constituents of concern (CoC) were determined based on the NMOCD Ranking Criteria as follows:

- ◆ *Depth to Groundwater (i.e., distance from the lower most acceptable concentration to groundwater);*
- ◆ *Wellhead Protection Area (i.e., distance from fresh water supply wells);*
- ◆ *Distance to Surface Water Body (i.e., horizontal distance to all down gradient surface water bodies).*

Based on the proximity of the site to protectable area water wells, surface water bodies, and depth to groundwater from the lower most contamination, the NMOCD ranking score for the site is Zero (0) points with the soil remedial goals highlighted in the Site Ranking table presented below:

1. GROUNDWATER	2. WELLHEAD PROTECTION AREA	3. DISTANCE TO SURFACE WATER	
Depth to GW <50 feet: 20 points	If <1,000' from water source, or <200' from private domestic water source: 20 points	<200 horizontal feet: 0 points	
Depth to GW 50 to 99 feet: 10 points		200-1,000 horizontal feet: 10 points	
Depth to GW >100 feet: 0 points	If >1,000' from water source, or >200' from private domestic water source: 0 points	>1,000 horizontal feet: 0 points	
Site Rank (1+2+3) = 0 + 0 + 0 = 0 points			
Total Site Ranking Score and Acceptable Remedial Goal Concentrations			
Parameter	20 or >	10	0
Benzene <sup>1</sup>	10 ppm	10 ppm	10 ppm
BTEX <sup>1</sup>	50 ppm	50 ppm	50 ppm
TPH	100 ppm	1,000 ppm	5,000 ppm

<sup>1</sup> A field soil vapor headspace measurement of 100 ppm can be substituted in lieu of laboratory analyses for benzene and BTEX.



**4.0 EXCAVATED SOIL INFORMATION**

**4.1 Was soil excavated for off-site treatment or disposal?** ☒ Yes ☐ No

**Date excavated:** February 28 through March 29, 2006

**Total volume removed:** ~322 cubic yards

**4.2 Indicated soil treatment type:**

<input checked="" type="checkbox"/>	<b>Disposal</b>
<input type="checkbox"/>	<b>Land Treatment</b>
<input type="checkbox"/>	<b>Composting/Biopiling</b>
<input type="checkbox"/>	<b>Other ( )</b>

**Name and location of treatment/disposal facility:**

J & L Landfarm, Inc. (Hobbs, NM) and Sundance Services, Inc. (Eunice, NM)





## 5.0 **SAMPLING INFORMATION**

### 5.1 ***Briefly describe the field screening methods used to distinguish contaminated from uncontaminated soil.***

Organic Vapor Concentrations – A portion of each soil sample collected was inserted into a self-sealing polyethylene bag to allow volatilization of organic vapors. After the samples equilibrated to ~70° F, they were analyzed for organic vapors utilizing a MiniRae® Photoionization Detector (PID) equipped with a 10.6 electron volt (eV) lamp.

Chloride Concentrations – A LaMotte Chloride Test Kit was utilized for field analyses of chloride concentration.

### 5.2 ***Briefly describe the soil analytical sampling and handling procedures used.***

Soil samples were collected during the advancement of two (2) soil borings utilizing a hollow core drill. Initial soil samples were collected at three (3) and five (5) feet below ground surface (bgs), then at five (5) foot intervals to total depth (TD) of each respective well (reference *Table 2*). During excavation of impacted soil from the release site, soil samples were collected from the bottom and sidewalls of the excavation at different locales and depth. The soil samples were analyzed in the field for organic vapor and chloride concentrations. Excavation of impacted soil continued until organic vapor concentrations were below 100 parts per million (ppm) (reference *Table 3*).

Upon collecting each soil sample, a portion was immediately put into an approved sample container, labeled and placed on ice for submittal to an independent laboratory under standard Chain-of-Custody protocol for quantification of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and total xylenes (BTEX), chloride and/or sulfate concentrations. Remaining portions of each soil sample were analyzed in the field for chloride and organic vapor concentrations utilizing methods described in Section 5.0, *Sampling Information*, Article 5.1.

### 5.3 ***Discuss sample locations and provide rationale for their locations.***

On February 27, 2006 two (2) soil borings were advanced within the confines of the release site. BH-1 was advanced to a total depth (TD) of 20-feet bgs and SB-2 to a TD of 16-feet bgs. The locales chosen were near the point of release in order to delineate the vertical extent of impacted soils (reference *Figure 4*).

From February 28 through March 30, 2006 the release site and earthen berm surrounding the tank battery area were excavated for removal of visibly impacted soils. Impacted soil was temporarily stockpiled “on-site” for transportation to a state approved disposal facility. During the removal activities, soil samples were collected from the bottom and sidewalls of the excavation. Locales and depth of the sample points were determined from visual inspection of the soil and assisted by field analyses of chloride and organic vapor concentrations. Laboratory analytical results were used to verify removal of soil impacted above NMOCD remedial threshold limits.



## 6.0 ANALYTICAL RESULTS

### 6.1 *Describe the vertical and horizontal extent and magnitude of soil contamination.*

Laboratory analytical data on soil samples collected February 27, 2006 from soil boring BH-1 indicated BTEX constituent concentrations ranged from at or below laboratory analytical method detection limits (MDL) (19.5'-20' bgs) to 817 mg/Kg (2'-3' bgs). While the latter concentration is above NMOCD remedial threshold goals of 50 mg/Kg, a review of *Table 1* indicated concentrations of BTEX diminished with depth. TPH concentrations ranged from 38.7 mg/Kg (19.5'-20' bgs) to 15,800 mg/Kg (2'-3' bgs). Elevated TPH concentrations ranged from ground surface to 9.5'-10 feet bgs after which they were below NMOCD remedial threshold goals. Reported chloride and sulfate concentrations from ground surface to the 14.5'-15' bgs intervals were below New Mexico Water Quality Control Commission (NMWQCC) Groundwater Standards of 250 mg/Kg and 600 mg/Kg, respectively (reference *Table 2*).

Laboratory analytical data for soil samples collected February 27, 2006 from soil boring BH-2 indicated BTEX concentrations ranged from at or below laboratory analytical MDL to 33.8 mg/Kg (2'-3' bgs). TPH concentrations ranged from at or below laboratory analytical MDL (14.5'-15' bgs) to 4,590 mg/Kg (2'-3'), below NMOCD remedial threshold goals of 5,000 mg/Kg. Chloride concentrations ranged from 30.6 mg/Kg (2'-3' bgs) to 287 mg/Kg (4.5'-5' bgs) with the latter concentration above NMWQCC Groundwater Standards of 250 mg/Kg. Sulfate concentrations were below NMOCD remedial threshold goals of 600 mg/Kg from ground surface to the well bore TD (14.5'-15' bgs) (reference *Table 2*).

On March 3, 2006 eleven (11) soil samples were collected at various locations and depth from the excavation. Soil samples were analyzed for concentrations of BTEX and TPH. Benzene concentrations ranged from at or below laboratory analytical MDL in several sample points to 6.70 mg/Kg (SP-6 @ 8"). Benzene concentrations were below NMOCD remedial threshold goals of 10 mg/Kg at all sample points. Total BTEX concentrations ranged from at or below laboratory analytical MDL in several sample points to 150 mg/Kg (SP-6 @ 8"). Laboratory analytical data for BTEX concentrations for the eleven (11) sample points indicated only two (2) were above NMOCD remedial goals of 50 mg/Kg (SP-6 @ 8" bgs and SP-8 @ 2' bgs). Laboratory analytical data for TPH concentrations ranged from at or below laboratory analytical MDL in three (3) sample points (SP-1 @ 2', SP-4 @ 0.67' and SP-5 @ 0.67') to 12,230 mg/Kg (SP-8 @ 2' bgs). TPH concentrations were above NMOCD remedial threshold goals of 5,000 mg/L in two (2) of the eleven (11) sample points (SP-8 @ 2' and SP-9 @ 2') (reference *Figure 5* and *Table 3*).

Based on laboratory analytical data from the March 3, 2006 sampling event, additional soil which exceeded NMOCD remedial threshold goals were excavated on March 10, 2006. On March 13, 2006 three (3) soil samples were collected from sample points in areas with contaminant concentrations elevated above NMOCD remedial threshold goals. Benzene concentrations ranged from at or below laboratory analytical MDL in two (2) soil sample points (SP-6A @ 3' and SP-8A @ 7') to 0.014 mg/Kg (SP-9A @ 2.5'), below NMOCD remedial threshold goals of 10 mg/Kg. BTEX concentrations ranged from at or below laboratory analytical MDL (SP-8A @ 7') to 22.4 mg/Kg (SP-9A @ 2.5') with all three (3) soil samples below NMOCD remedial threshold goals of 50 mg/Kg. Concentrations for TPH ranged from 44.9 mg/kg (SP-8A @ 7') to 8,460 mg/Kg (SP-6A @ 3'). Two (2) of the three (3) soil samples were above NMOCD remedial threshold goals of 5,000 mg/Kg with the third sample indicating TPH concentration of 4,498 mg/Kg (SP-6A @ 3') (reference *Figure 6* and *Table 3*).



After the areas of elevated contamination identified in the March 13, 2006 sampling event were excavated, four (4) soil samples were collected on March 30, 2006 from the sidewalls and bottom of the excavation. Benzene concentrations were below NMOCD remedial threshold goals of 10 mg/Kg. BTEX constituent concentrations ranged from at or below laboratory analytical MDL (NSW @ 3.5') to 76.9 mg/Kg (BH @ 7') above NMOCD remedial threshold goals of 50 mg/Kg. TPH concentrations ranged from 84 mg/Kg (NSW @ 3.5') to 5,600 mg/Kg (BH @ 7') above NMOCD remedial threshold goals of 5,000 mg/Kg. Chloride concentrations ranged from 17 mg/Kg (ESW @ 3.5') to 1,200 mg/Kg (WSW @ 3.5') exceeding NMWQCC Groundwater Standards of 250 mg/Kg. Sulfate concentrations were below NMOCD remedial threshold goals of 600 mg/Kg for all samples (reference Figure 7 and Table 3).

**6.2** *Is surface soil contamination present at the site (i.e., soil in the uppermost two feet that is visibly stained, contaminated at greater than 10 ppm (PID) or hydrocarbon saturated)?*

☐ *yes*      ☒ *no*

*If yes, attach a site map identifying extent(s) of surface soil contamination.*

Visibly stained soil was excavated and disposed at J & L Landfarm, Inc. The overspray area (~10,100-ft<sup>2</sup>) was immediately sprayed with Micro-Blaze Spill Control® to remediate surface contamination.



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## 7.0 **DISCUSSION**

### 7.1 ***Discuss the risks associated with the remaining soil contamination:***

Based on laboratory analytical results from the March 30, 2006 sampling event, possibility of groundwater contamination from either TPH or chlorides is remote due to depth of groundwater (~198-ft bgs) and dense caliche formation overlaying the groundwater bearing strata.

### 7.2 ***Discuss the risks associated with the impacted groundwater:*** Not applicable

### 7.3 ***Discuss other concerns not mentioned above:*** Not applicable



## 8.0 **CONCLUSIONS AND RECOMMENDATIONS**

- 8.1 **Recommendation for the site:**
- ☒ **Site Closure**  
☐ **Additional Groundwater Monitoring**  
☐ **Corrective Action**

- 8.2 **Base the recommendation above on Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993). Describe below how you applied the policy to support your recommendation. If closure is recommended, please summarize significant site investigative events and describe how site specific risk issues have been adequately addressed or minimized to acceptable low risk levels.**

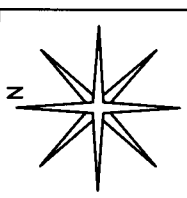
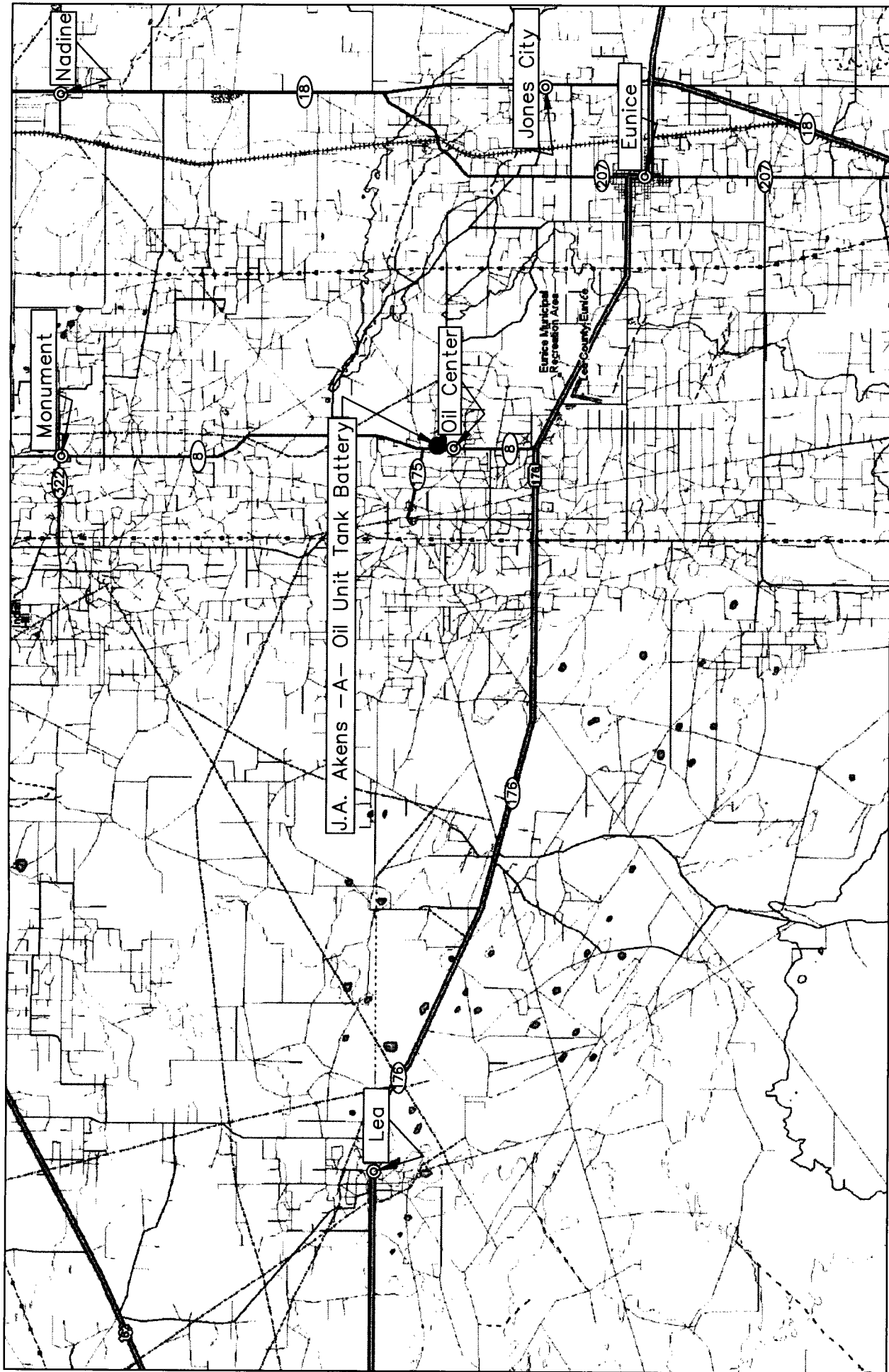
The majority of hydrocarbon impacted soil above NMOCD remedial thresholds for TPH constituents and chloride was excavated from the release area. TPH concentrations are slightly above NMOCD remedial threshold goals of 5,000 mg/Kg while chloride concentrations exceeded respective values of 250 mg/Kg in three (3) areas. However, these contaminants should have no effect on groundwater. Both sidewalls and bottom of the excavated areas are composed of caliche starting at approximately 3.5-feet bgs. This impermeable overburden will retard vertical migration of contaminants.

Soil impacted above the NMOCD remedial thresholds goals was disposed at J & L Landfarm, Inc., (Hobbs, New Mexico) and Sundance Services, Inc., (Eunice, New Mexico).

In accordance with Chesapeake Operating, Inc., specifications, a polyvinyl chloride (PVC) liner was placed on top of the backfilled area. After the tanks were erected and plumbed, an earthen berm was constructed around the perimeter to provide a containment basin. The PVC liner advanced up the sidewalls and overlapped the top of the earthen berm to provide a leak proof barrier (note Appendix II, *Project Photographs*).

- 8.3 **If additional groundwater and monitoring is recommended, indicate the proposed monitoring schedule and frequency. Conduct quarterly monitoring until the NMOCD responds to this report.** Not applicable
- 8.4 **If corrective action is recommended, provide a conceptual approach.** Not applicable

## FIGURES



DWG By: Daniel Dominguez  
January 2006

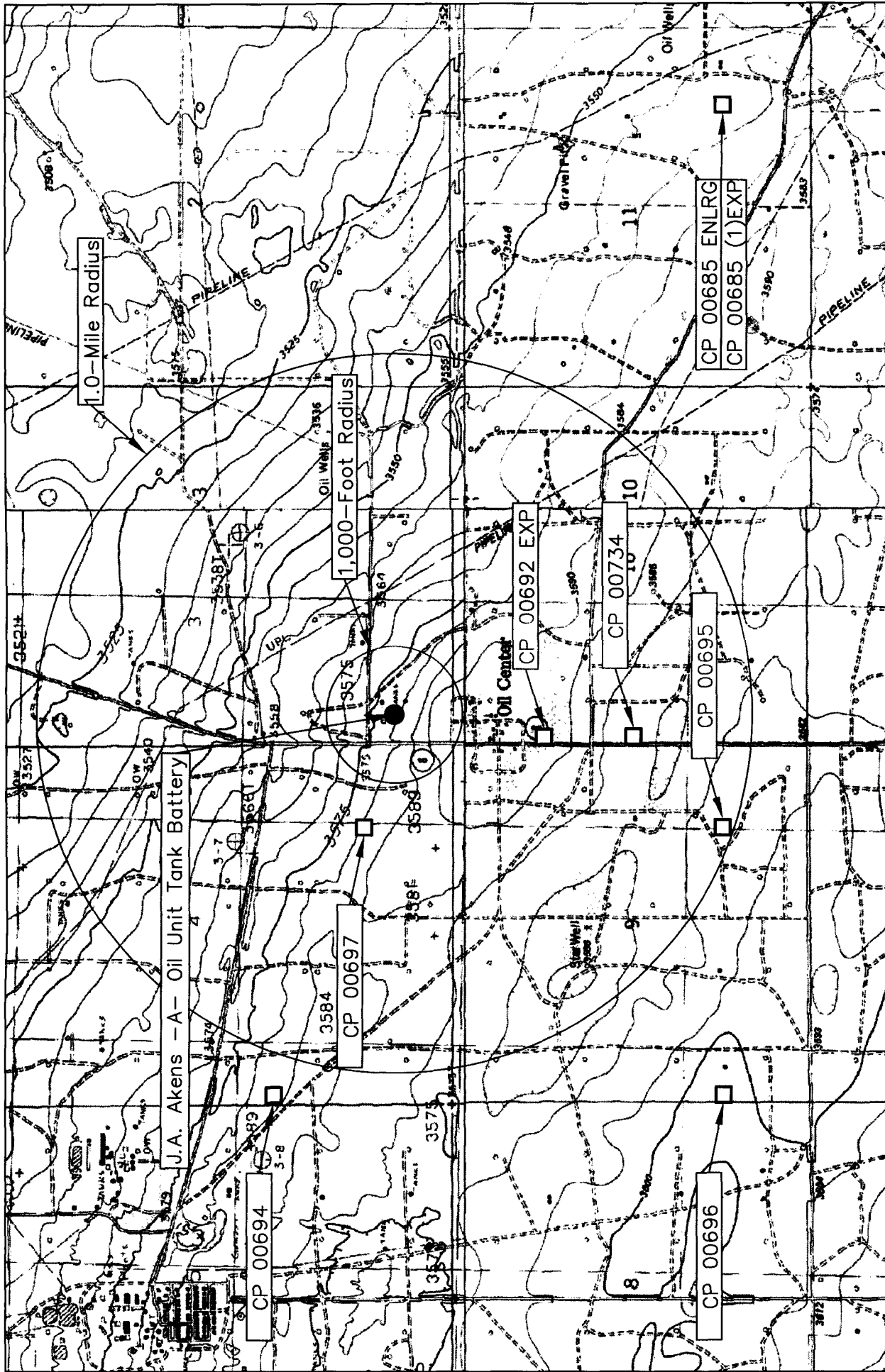
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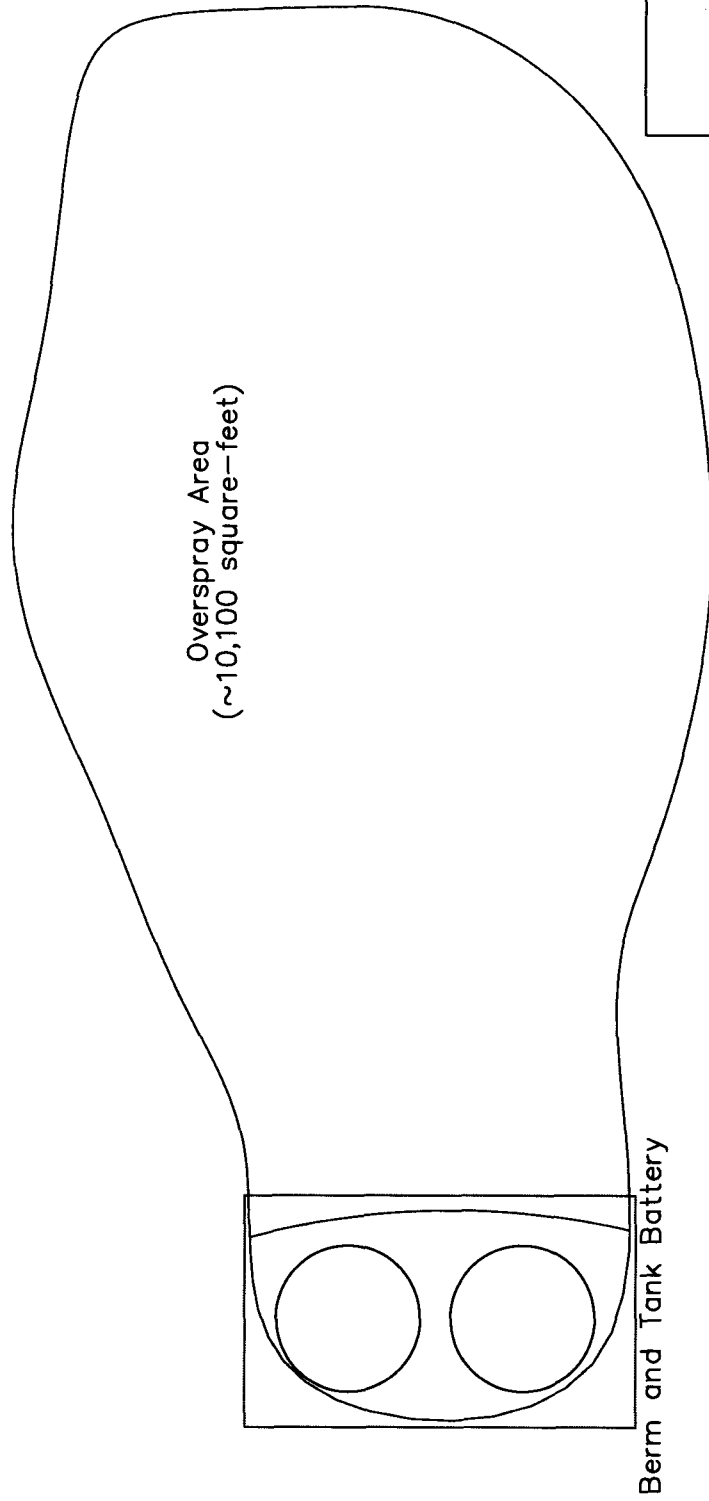
Lea County, New Mexico  
SW 1/4 of the SW 1/4, Sec. 3, T21S, R36E  
N 32° 30' 10.54" W 103° 15' 36.76"  
Elevation: 3,579 feet amsl

Figure 1  
Area Map  
Chesapeake Energy  
J.A. Akens - A - Oil Unit Tank Battery

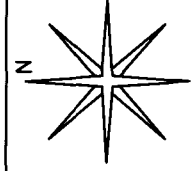


<p>Figure 2</p> <p>Site Location Map</p> <p>Chesapeake Energy</p> <p>J.A. Akens - A- Oil Unit Tank Battery</p>	<p>Lea County, New Mexico</p> <p>SW 1/4 of the SW 1/4, Sec. 3, T21S, R36E</p> <p>N 32° 30' 10.54" W 103° 15' 36.76"</p> <p>Elevation: 3,579 feet amsl</p>	<p>DWG By: Daniel Dominguez</p> <p>January 2006</p>	<p>REVISED:</p>
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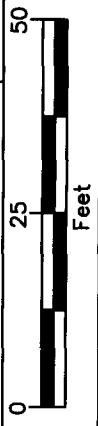




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DWG By: Daniel Dominguez January 2006	REVISED:	SHEET 1 of 1



Lea County, New Mexico  
SW 1/4 of the SW 1/4, Sec. 3, T21S, R36E  
N 32° 30' 10.54" W 103° 15' 36.76"  
Elevation: 3,579 feet amsl

Figure 3  
Site Map  
Chesapeake Energy  
J.A. Akens -A- Oil Unit Tank Battery

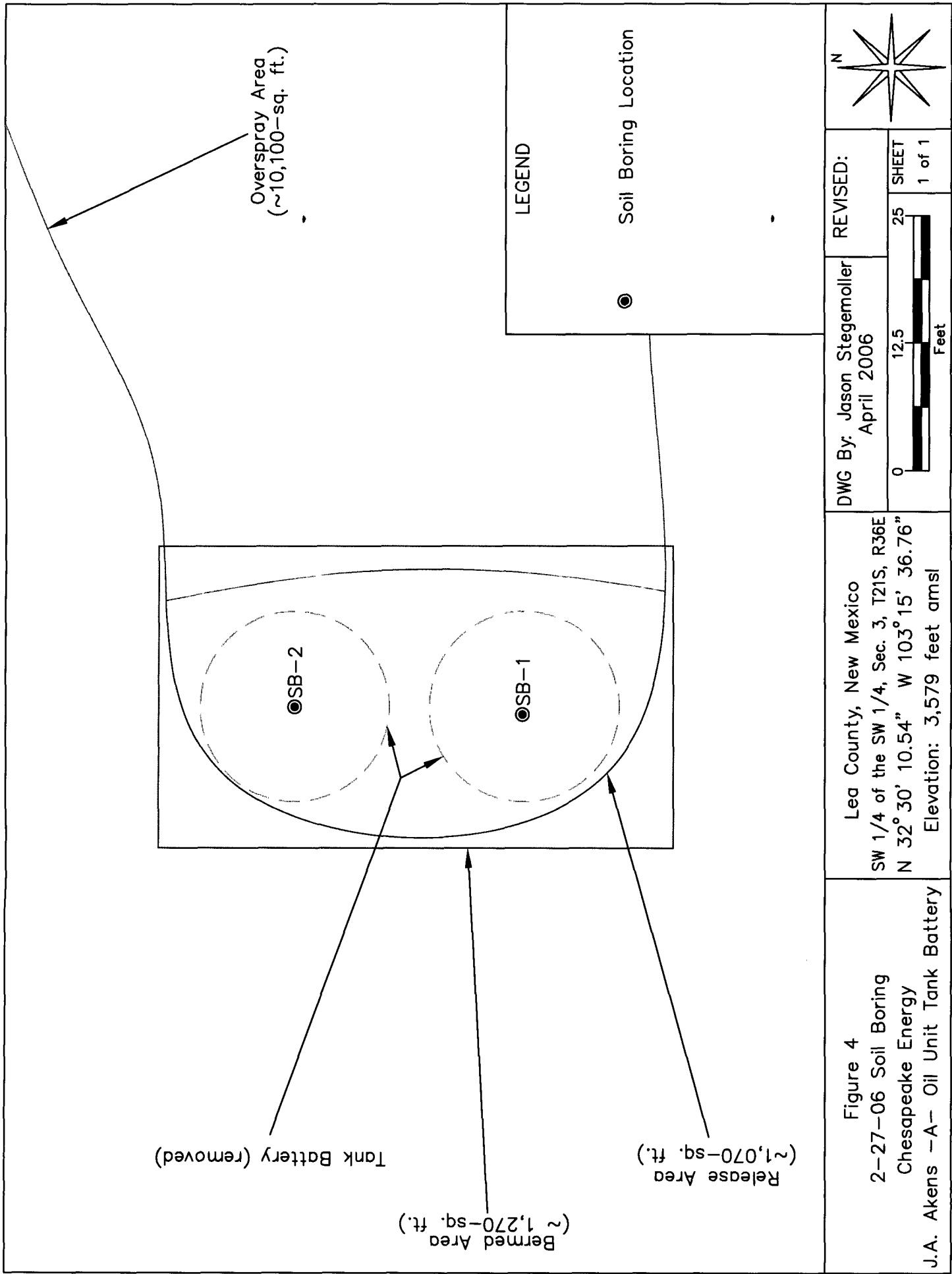
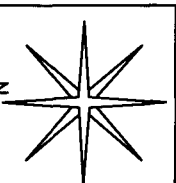


Figure 4  
2-27-06 Soil Boring  
Chesapeake Energy  
J.A. Akens -A- Oil Unit Tank Battery

Lea County, New Mexico  
SW 1/4 of the SW 1/4, Sec. 3, T21S, R36E  
N 32° 30' 10.54" W 103° 15' 36.76"  
Elevation: 3,579 feet amsl

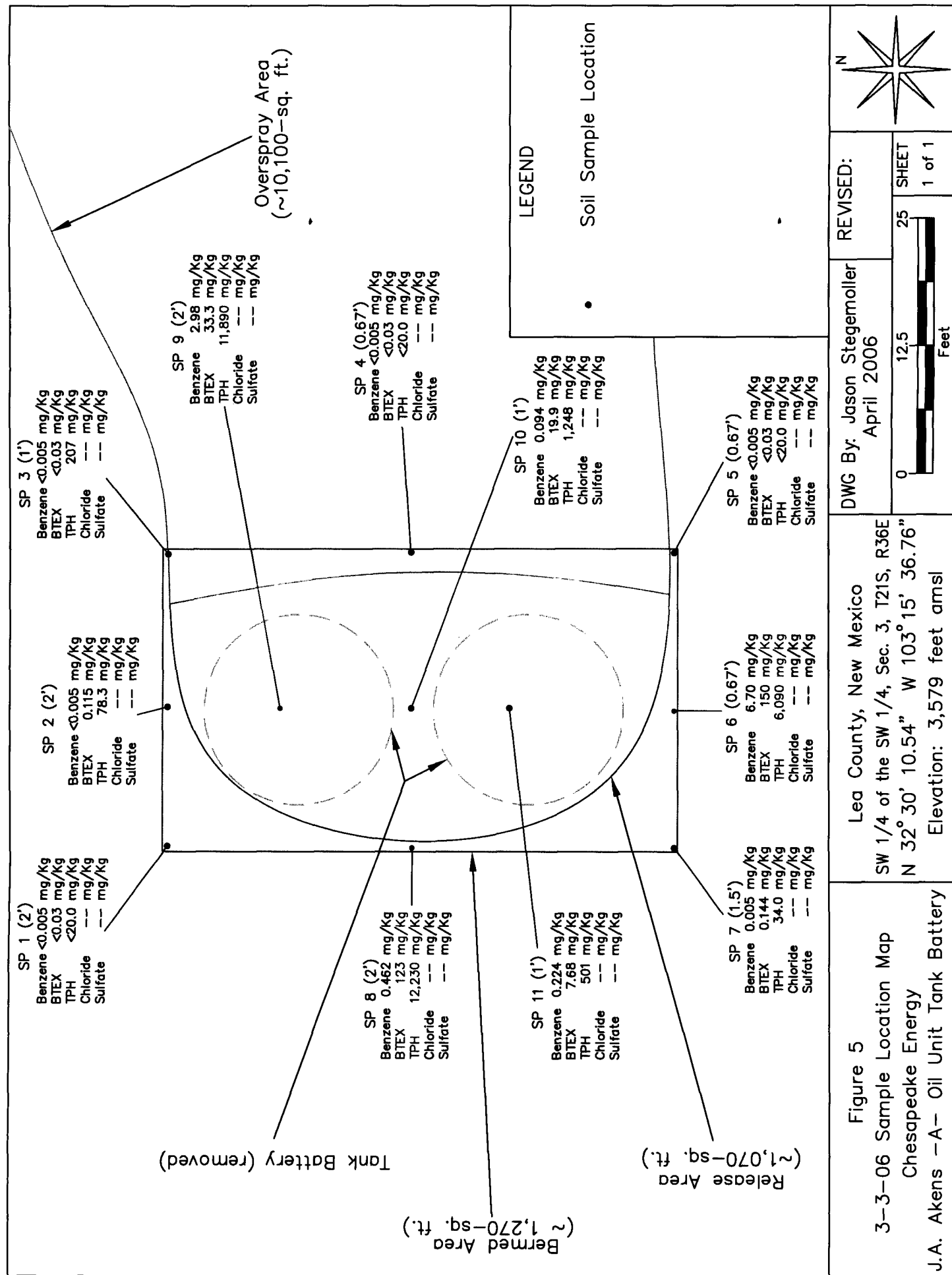
DWG By: Jason Stegemoller  
April 2006

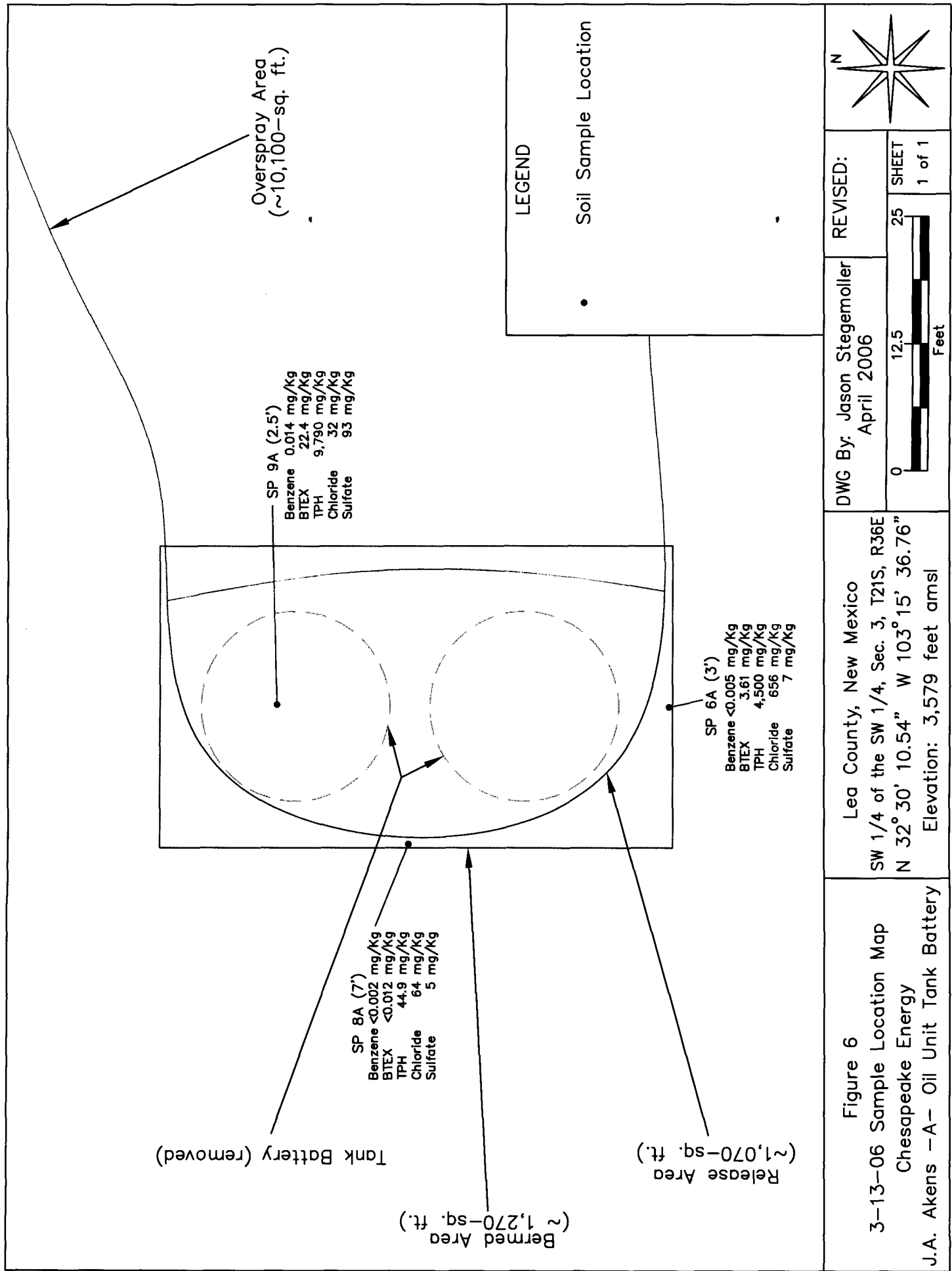
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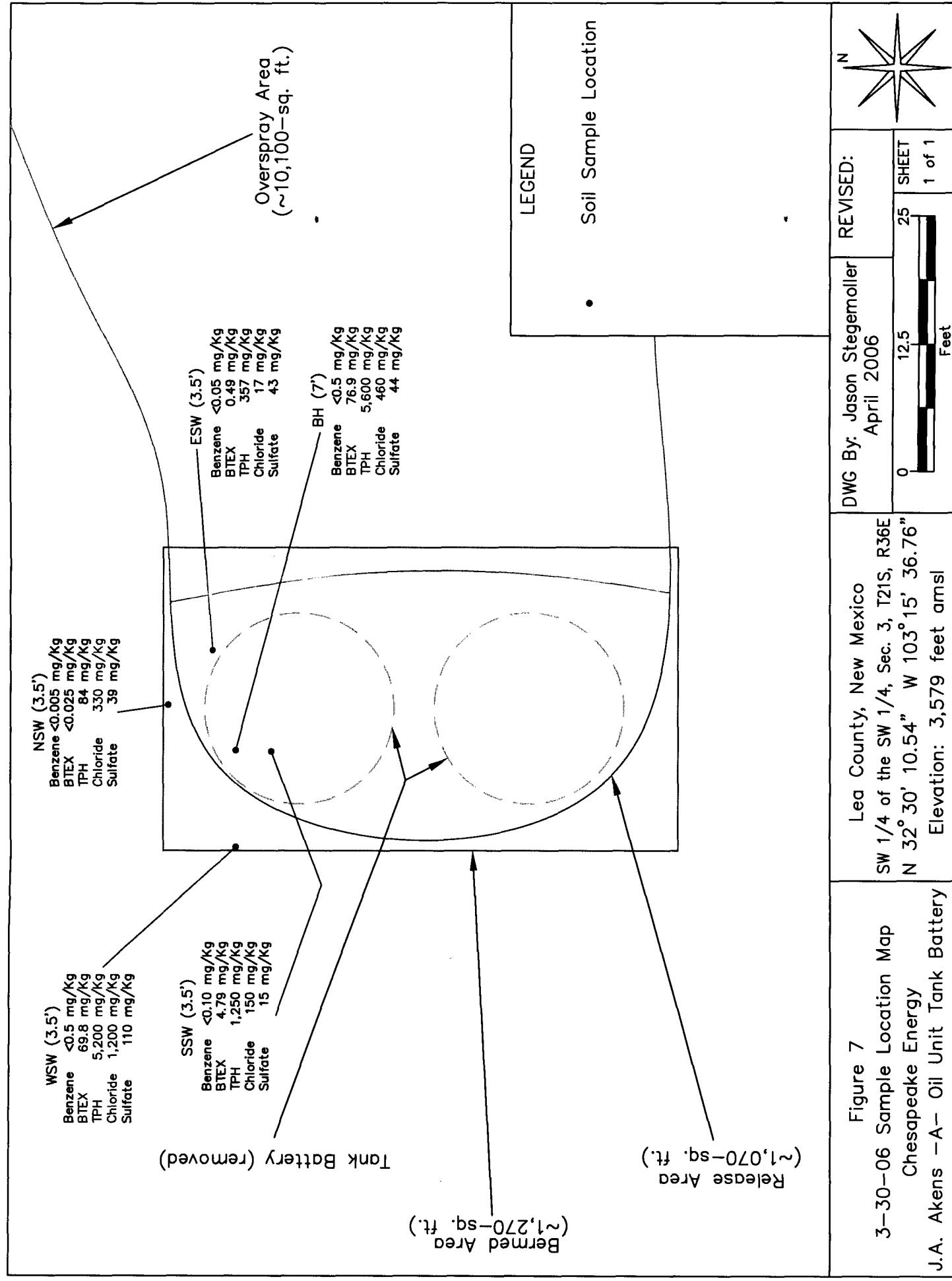


LEGEND

Soil Boring Location







## TABLES

TABLE 1

Well Data

Chesapeake Energy - J.A. Akens -A- Oil Unit Tank Battery (Ref. # 160043)

Well Number	Diversion <sup>A</sup>	Owner	Use	Twsp	Rng	Sec q q q	Latitude	Longitude	Date Measured	Surface Elevation <sup>B</sup>	Depth to Water (ft bgs)
CP 00694	0	CHEVRON U.S.A. INC.	SRO	21S	36E	04 1	N32° 30' 28.08"	W103° 16' 42.46"		3,589	
CP 00697	0	CHEVRON U.S.A. INC.	SRO	21S	36E	04 4 2 3	N32° 30' 14.93"	W103° 15' 56.01"		3,586	
CP 00695	0	CHEVRON U.S.A. INC.	SRO	21S	36E	09 4 2 4	N32° 29' 22.69"	W103° 15' 56.00"		3,589	
CP 00696	0	CHEVRON U.S.A. INC.	SRO	21S	36E	09 3 1 1	N32° 29' 22.78"	W103° 16' 42.39"		3,606	
CP 00692 EXP	0	W. L. VAN NOY	DOM	21S	36E	10 1 1 3	N32° 29' 48.76"	W103° 15' 40.54"		3,586	
CP 00734	3	W. L. VAN NOY	DOM	21S	36E	10 1	N32° 29' 35.71"	W103° 15' 40.54"	22-Jun-88	3,580	200
CP 00685 ENLRG	0	WILL J. MCCASLAND	COM	21S	36E	11 4 2	N32° 29' 22.71"	W103° 13' 52.54"		3,571	
CP 00685 (1) EXP	0	USA INC. CHEVRON	PRO	21S	36E	11 4 2	N32° 29' 22.71"	W103° 13' 52.54"		3,571	

<sup>B</sup> = Elevation interpolated from USGS topographical map based on referenced location.

COM = Commercial

PRO = Prospecting or development of a natural resource

DOM = Domestic

SRO = Secondary recovery of oil

SAN = Sanitary in conjunction with commercial

quarters are 1=NW, 2=NE, 3=SW, 4=SE; quarters are biggest to smallest

**Shaded area indicates wells not shown in Figure 2**

TABLE 2

## Summary of Soil Boring Field Analyses and Laboratory Analytical Results

Chesapeake Operating, Inc. - J. A. Akens -A- Oil Unit Tank Battery (Ref. #160043)

Soil Boring	Soil Sample I.D.	Depth (feet)	Sample Date	Soil Status	PID Reading (ppm)	Field Chloride Analyses (ppm)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	Carbon Ranges (C6-C12) (mg/Kg)	Carbon Ranges (C12-C28) (mg/Kg)	Carbon Ranges (C28-C35) (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)	Sulfate (mg/Kg)
SB-1	SB-1 2'-3'	2-3	27-Feb-06	Excavated	1,336	160	49.2	250	112	406	817	6,210	7,970	1,650	15,800	17.3	32
	SB-1 4.5'-5'	4.5-5	27-Feb-06	Excavated	850	160	3.72	18.3	10.1	32.3	64.4	549	1,540	325	2,410	36.1	25.9
	SB-1 9.5'-10'	9.5-10	27-Feb-06	In Situ	436	160	0.268	2.00	2.17	20.9	23.4	1,140	3,600	614	5,350	20.9	41.4
	SB-1 14.5'-15'	14.5-15	27-Feb-06	In Situ	9.0	160	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	124	77.0	201	90.5	114
	SB-1 19.5'-20'	19.5-20	27-Feb-06	In Situ	2.9	--	--	--	--	--	--	<10.0	38.7	8.90 <sup>A</sup>	38.7	--	--
SB-2	SB-2 2'-3'	2-3	27-Feb-06	Excavated	786	240	1.03	4.00	3.03	25.8	33.8	1,610	2,590	393	4,590	30.6	30.7
	SB-2 4.5'-5'	4.5-5	27-Feb-06	Excavated	145	320	<0.0250	0.173	0.216	0.688	1.08	81.5	316	64.4	462	287	37.2
	SB-2 9.5'-10'	9.5-10	27-Feb-06	In Situ	9.6	400	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	35.6	10.3	45.9	213	16.8
	SB-2 14.5'-15'	14.5-15	27-Feb-06	In Situ	2.6	320	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0	<10.0	52.0	27.2
<b>NMOCD Remedial Thresholds</b>																	
											<b>50</b>				<b>5,000</b>	<b>250<sup>B</sup></b>	<b>600<sup>B</sup></b>

Bolted values are in excess of the NMOCD Remediation Thresholds and/or NMWQCC groundwater standards.

-- = Not Analyzed

<sup>A</sup> Detected below laboratory method detection limits, therefore an estimate.<sup>B</sup> Chloride and sulfate residuals may not be capable of impacting groundwater above NMWQCC groundwater standards of 250 ppm and 600 ppm, respectively.



Table 3

## Summary of Excavation Soil Sample Field Analyses and Laboratory Analytical Results

Chesapeake Operating, Inc. - J.A. Akens - A- Oil Unit Battery (Ref. #160043)

Sample I.D.	Depth (feet)	Soil Status	Sample Date	PID Field Analysis (ppm)	Field Chloride Analyses (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTX (mg/Kg)	Gasoline Range Organics (mg/Kg)	Diesel Range Organics (mg/Kg)	C <sub>29</sub> -C <sub>35</sub> Range Organics	Total Petroleum Hydrocarbons (mg/Kg)	Chloride (mg/Kg)	Sulfates (mg/Kg)
SP-1 (2')	2	In Situ	03-Mar-06	3.9	--	<0.005	<0.005	<0.005	<0.015	<0.030	<10.0	<10.0	--	<20.0	--	--
SP-2 (2')	2	In Situ	03-Mar-06	791	--	<0.005	<0.005	0.014	0.101	0.115	<10.0	78.3	--	78.3	--	--
SP-3 (1')	1	In Situ	03-Mar-06	30	--	<0.005	<0.005	<0.005	<0.015	<0.030	<10.0	207	--	207	--	--
SP-4 (8")	0.67	In Situ	03-Mar-06	10	--	<0.005	<0.005	<0.005	<0.015	<0.030	<10.0	<10.0	--	<20.0	--	--
SP-5 (8")	0.67	In Situ	03-Mar-06	38.6	--	<0.005	<0.005	<0.005	<0.015	<0.030	<10.0	<10.0	--	<20.0	--	--
SP-6 (3')	3	In Situ	13-Mar-06	388	--	<0.005	<0.005	0.139	3.47	3.61	268	4,230	--	4,498	656	7
SP-8A (7')	7	In Situ	13-Mar-06	2.6	--	<0.002	<0.002	<0.002	<0.006	<0.012	<10.0	44.9	--	44.9	64	5
SP-8A (2.5')	2.5	In Situ	13-Mar-06	588	320	<0.5	0.98	15	61	77	1,700	3,900	<100	5,600	460	93
BH (7')	7	In Situ	30-Mar-06	1,005	720	<0.5	0.82	19	50	70	1,400	3,800	<100	5,200	1,200	44
WSW (3.5')	3.5	In Situ	30-Mar-06	38	400	<0.005	<0.005	<0.005	<0.010	<0.025	<10	84	<10	84	330	110
NSW (3.5')	3.5	In Situ	30-Mar-06	210	320	<0.050	<0.050	0.19	0.30	0.49	47	310	<10	357	17	39
ESW (3.5')	3.5	In Situ	30-Mar-06	210	320	<0.10	0.19	1.3	3.3	4.8	150	1,100	<20	1,250	150	43
SSW (3.5')	3.5	In Situ	30-Mar-06	100	--	10	--	--	--	50	--	--	--	5,000	250 <sup>1</sup>	15
NMOCD Remedial Thresholds																

Bolded values are in excess of NMOCD Remediation Thresholds

-- = Not Analyzed

<sup>1</sup> = Chloride and sulfate residuals may not be capable of impacting local groundwater above NMWQCC Groundwater Standards of 250 mg/L and 600 mg/L, respectively.

## **APPENDICES**

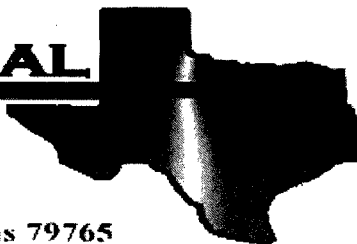
**APPENDIX I**

**LABORATORY ANALYTICAL REPORTS**

**AND**

**CHAIN-OF-CUSTODY FORM**

# **E** NVIRONMENTAL LAB OF



12600 West I-20 East - Odessa, Texas 79765

## Analytical Report

**Prepared for:**

Iain Olness

Environmental Plus, Incorporated

P.O. Box 1558

Eunice, NM 88231

Project: Chesapeake/ J.A. Akens

Project Number: 160043

Location: UL-T, Sect. 03, T 21 S, R 36 E

Lab Order Number: 6B28014

Report Date: 03/02/06

Environmental Plus, Incorporated  
P.O. Box 1558  
Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

**Reported:**  
03/02/06 09:58

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-1 2'-3'	6B28014-01	Soil	02/27/06 08:00	02/28/06 15:15
SB-1 4.5'-5'	6B28014-02	Soil	02/27/06 08:24	02/28/06 15:15
SB-1 9.5'-10'	6B28014-03	Soil	02/27/06 08:48	02/28/06 15:15
SB-1 14.5'-15'	6B28014-04	Soil	02/27/06 09:44	02/28/06 15:15
SB-1 19.5'-20'	6B28014-05	Soil	02/27/06 11:00	02/28/06 15:15
SB-2 2'-3'	6B28014-06	Soil	02/27/06 11:50	02/28/06 15:15
SB-2 4.5'-5'	6B28014-07	Soil	02/27/06 12:00	02/28/06 15:15
SB-2 9.5'-10'	6B28014-08	Soil	02/27/06 12:20	02/28/06 15:15
SB-2 14.5'-15'	6B28014-09	Soil	02/27/06 13:00	02/28/06 15:15

Environmental Plus, Incorporated  
P.O. Box 1558  
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Reported:  
03/02/06 09:58

**Organics by GC**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>SB-1 2'-3' (6B28014-01) Soil</b>									
Benzene	49.2	5.00	mg/kg dry	5000	EC60106	03/01/06	03/01/06	EPA 8021B	
Toluene	250	5.00	"	"	"	"	"	"	
Ethylbenzene	112	5.00	"	"	"	"	"	"	
Xylene (p/m)	307	5.00	"	"	"	"	"	"	
Xylene (o)	99.1	5.00	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		101 %		80-120	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		85.8 %		80-120	"	"	"	"	
Carbon Ranges C6-C12	6210	100	mg/kg dry	10	EC60108	03/01/06	03/02/06	EPA 8015M	
Carbon Ranges C12-C28	7970	100	"	"	"	"	"	"	
Carbon Ranges C28-C35	1650	100	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	15800	100	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		17.9 %		70-130	"	"	"	"	S-06
Surrogate: 1-Chlorooctadecane		10.4 %		70-130	"	"	"	"	S-06
<b>SB-1 4.5'-5' (6B28014-02) Soil</b>									
Benzene	3.72	1.00	mg/kg dry	1000	EC60106	03/01/06	03/01/06	EPA 8021B	
Toluene	18.3	1.00	"	"	"	"	"	"	
Ethylbenzene	10.1	1.00	"	"	"	"	"	"	
Xylene (p/m)	23.3	1.00	"	"	"	"	"	"	
Xylene (o)	9.00	1.00	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		90.8 %		80-120	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		87.0 %		80-120	"	"	"	"	
Carbon Ranges C6-C12	549	20.0	mg/kg dry	2	EC60108	03/01/06	03/02/06	EPA 8015M	
Carbon Ranges C12-C28	1540	20.0	"	"	"	"	"	"	
Carbon Ranges C28-C35	325	20.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	2410	20.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		53.6 %		70-130	"	"	"	"	S-06
Surrogate: 1-Chlorooctadecane		55.8 %		70-130	"	"	"	"	S-06
<b>SB-1 9.5'-10' (6B28014-03) Soil</b>									
Benzene	0.268	0.100	mg/kg dry	100	EC60106	03/01/06	03/01/06	EPA 8021B	
Toluene	2.00	0.100	"	"	"	"	"	"	
Ethylbenzene	2.17	0.100	"	"	"	"	"	"	
Xylene (p/m)	14.4	0.100	"	"	"	"	"	"	
Xylene (o)	6.52	0.100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		106 %		80-120	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		154 %		80-120	"	"	"	"	S-04
Carbon Ranges C6-C12	1140	20.0	mg/kg dry	2	EC60108	03/01/06	03/02/06	EPA 8015M	

Environmental Lab of Texas

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Page 2 of 12

Environmental Plus, Incorporated  
P.O. Box 1558  
Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**Organics by GC**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>SB-1 9.5'-10' (6B28014-03) Soil</b>									
<b>Carbon Ranges C12-C28</b>	<b>3600</b>	20.0	mg/kg dry	2	EC60108	03/01/06	03/02/06	EPA 8015M	
<b>Carbon Ranges C28-C35</b>	<b>614</b>	20.0	"	"	"	"	"	"	
<b>Total Hydrocarbon C6-C35</b>	<b>5350</b>	20.0	"	"	"	"	"	"	
<i>Surrogate: 1-Chlorooctane</i>		60.0 %	70-130		"	"	"	"	S-06
<i>Surrogate: 1-Chlorooctadecane</i>		51.6 %	70-130		"	"	"	"	S-06
<b>SB-1 14.5'-15' (6B28014-04) Soil</b>									
Benzene	ND	0.0250	mg/kg dry	25	EC60106	03/01/06	03/01/06	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	ND	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		86.8 %	80-120		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		93.2 %	80-120		"	"	"	"	
<b>Carbon Ranges C6-C12</b>	<b>ND</b>	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	
<b>Carbon Ranges C12-C28</b>	<b>124</b>	10.0	"	"	"	"	"	"	
<b>Carbon Ranges C28-C35</b>	<b>77.0</b>	10.0	"	"	"	"	"	"	
<b>Total Hydrocarbon C6-C35</b>	<b>201</b>	10.0	"	"	"	"	"	"	
<i>Surrogate: 1-Chlorooctane</i>		103 %	70-130		"	"	"	"	
<i>Surrogate: 1-Chlorooctadecane</i>		104 %	70-130		"	"	"	"	
<b>SB-1 19.5'-20' (6B28014-05) Soil</b>									
<b>Carbon Ranges C6-C12</b>	<b>ND</b>	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	
<b>Carbon Ranges C12-C28</b>	<b>38.7</b>	10.0	"	"	"	"	"	"	
<b>Carbon Ranges C28-C35</b>	<b>J [8.90]</b>	10.0	"	"	"	"	"	"	J
<b>Total Hydrocarbon C6-C35</b>	<b>38.7</b>	10.0	"	"	"	"	"	"	
<i>Surrogate: 1-Chlorooctane</i>		96.6 %	70-130		"	"	"	"	
<i>Surrogate: 1-Chlorooctadecane</i>		98.4 %	70-130		"	"	"	"	
<b>SB-2 2'-3' (6B28014-06) Soil</b>									
<b>Benzene</b>	<b>1.03</b>	0.0250	mg/kg dry	25	EC60106	03/01/06	03/01/06	EPA 8021B	
<b>Toluene</b>	<b>4.00</b>	0.0250	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>3.03</b>	0.0250	"	"	"	"	"	"	
<b>Xylene (p/m)</b>	<b>21.2</b>	0.0250	"	"	"	"	"	"	
<b>Xylene (o)</b>	<b>4.57</b>	0.0250	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		2650 %	80-120		"	"	"	"	S-04
<i>Surrogate: 4-Bromofluorobenzene</i>		219 %	80-120		"	"	"	"	S-04
<b>Carbon Ranges C6-C12</b>	<b>1610</b>	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	

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Environmental Plus, Incorporated  
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Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**Organics by GC**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>SB-2 2'-3' (6B28014-06) Soil</b>									
<b>Carbon Ranges C12-C28</b>	<b>2590</b>	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	
<b>Carbon Ranges C28-C35</b>	<b>393</b>	10.0	"	"	"	"	"	"	
<b>Total Hydrocarbon C6-C35</b>	<b>4590</b>	10.0	"	"	"	"	"	"	
<i>Surrogate: 1-Chlorooctane</i>		121 %	70-130		"	"	"	"	
<i>Surrogate: 1-Chlorooctadecane</i>		149 %	70-130		"	"	"	"	S-04
<b>SB-2 4.5'-5' (6B28014-07) Soil</b>									
<b>Benzene</b>	<b>ND</b>	0.0250	mg/kg dry	25	EC60106	03/01/06	03/01/06	EPA 8021B	
<b>Toluene</b>	<b>0.173</b>	0.0250	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.216</b>	0.0250	"	"	"	"	"	"	
<b>Xylene (p/m)</b>	<b>0.552</b>	0.0250	"	"	"	"	"	"	
<b>Xylene (o)</b>	<b>0.136</b>	0.0250	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		96.5 %	80-120		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		117 %	80-120		"	"	"	"	
<b>Carbon Ranges C6-C12</b>	<b>81.5</b>	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	
<b>Carbon Ranges C12-C28</b>	<b>316</b>	10.0	"	"	"	"	"	"	
<b>Carbon Ranges C28-C35</b>	<b>64.4</b>	10.0	"	"	"	"	"	"	
<b>Total Hydrocarbon C6-C35</b>	<b>462</b>	10.0	"	"	"	"	"	"	
<i>Surrogate: 1-Chlorooctane</i>		101 %	70-130		"	"	"	"	
<i>Surrogate: 1-Chlorooctadecane</i>		105 %	70-130		"	"	"	"	
<b>SB-2 9.5'-10' (6B28014-08) Soil</b>									
<b>Benzene</b>	<b>ND</b>	0.0250	mg/kg dry	25	EC60106	03/01/06	03/01/06	EPA 8021B	
<b>Toluene</b>	<b>ND</b>	0.0250	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>ND</b>	0.0250	"	"	"	"	"	"	
<b>Xylene (p/m)</b>	<b>ND</b>	0.0250	"	"	"	"	"	"	
<b>Xylene (o)</b>	<b>ND</b>	0.0250	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		85.8 %	80-120		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		88.2 %	80-120		"	"	"	"	
<b>Carbon Ranges C6-C12</b>	<b>ND</b>	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	
<b>Carbon Ranges C12-C28</b>	<b>35.6</b>	10.0	"	"	"	"	"	"	
<b>Carbon Ranges C28-C35</b>	<b>10.3</b>	10.0	"	"	"	"	"	"	
<b>Total Hydrocarbon C6-C35</b>	<b>45.9</b>	10.0	"	"	"	"	"	"	
<i>Surrogate: 1-Chlorooctane</i>		102 %	70-130		"	"	"	"	
<i>Surrogate: 1-Chlorooctadecane</i>		103 %	70-130		"	"	"	"	

Environmental Lab of Texas

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Environmental Plus, Incorporated  
P.O. Box 1558  
Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**Organics by GC**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>SB-2 14.5'-15' (6B28014-09) Soil</b>									
Benzene	ND	0.0250	mg/kg dry	25	EC60106	03/01/06	03/01/06	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	ND	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		83.0 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.0 %	80-120		"	"	"	"	
Carbon Ranges C6-C12	ND	10.0	mg/kg dry	1	EC60108	03/01/06	03/02/06	EPA 8015M	
Carbon Ranges C12-C28	ND	10.0	"	"	"	"	"	"	
Carbon Ranges C28-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		105 %	70-130		"	"	"	"	
Surrogate: 1-Chlorooctadecane		109 %	70-130		"	"	"	"	

Environmental Plus, Incorporated  
P.O. Box 1558  
Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**General Chemistry Parameters by EPA / Standard Methods**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>SB-1 2'-3' (6B28014-01) Soil</b>									
Chloride	17.3	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	15.5	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	31.8	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
<b>SB-1 4.5'-5' (6B28014-02) Soil</b>									
Chloride	36.1	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	10.6	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	25.9	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
<b>SB-1 9.5'-10' (6B28014-03) Soil</b>									
Chloride	20.9	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	7.3	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	41.4	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
<b>SB-1 14.5'-15' (6B28014-04) Soil</b>									
Chloride	90.5	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	11.4	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	114	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
<b>SB-1 19.5'-20' (6B28014-05) Soil</b>									
% Moisture	7.0	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
<b>SB-2 2'-3' (6B28014-06) Soil</b>									
Chloride	30.6	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	14.0	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	30.7	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
<b>SB-2 4.5'-5' (6B28014-07) Soil</b>									
Chloride	287	10.0	mg/kg	20	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	10.7	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	37.2	10.0	mg/kg	20	EC60111	02/28/06	03/01/06	EPA 300.0	

Environmental Lab of Texas

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Environmental Plus, Incorporated  
P.O. Box 1558  
Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**General Chemistry Parameters by EPA / Standard Methods**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>SB-2 9.5'-10' (6B28014-08) Soil</b>									
Chloride	213	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	6.3	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	16.8	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
<b>SB-2 14.5'-15' (6B28014-09) Soil</b>									
Chloride	52.0	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	
% Moisture	12.0	0.1	%	1	EC60101	02/28/06	03/01/06	% calculation	
Sulfate	27.2	5.00	mg/kg	10	EC60111	02/28/06	03/01/06	EPA 300.0	

Environmental Plus, Incorporated  
P.O. Box 1558  
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Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**Organics by GC - Quality Control**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch EC60106 - EPA 5030C (GC)**

**Blank (EC60106-BLK1)**

Prepared & Analyzed: 03/01/06

Benzene	ND	0.0250	mg/kg wet							
Toluene	ND	0.0250	"							
Ethylbenzene	ND	0.0250	"							
Xylene (p/m)	ND	0.0250	"							
Xylene (o)	ND	0.0250	"							
Surrogate: a,a,a-Trifluorotoluene	32.0		ug/kg	40.0		80.0	80-120			
Surrogate: 4-Bromofluorobenzene	32.7		"	40.0		81.8	80-120			

**LCS (EC60106-BS1)**

Prepared & Analyzed: 03/01/06

Benzene	0.0431	0.00100	mg/kg wet	0.0500		86.2	80-120			
Toluene	0.0486	0.00100	"	0.0500		97.2	80-120			
Ethylbenzene	0.0554	0.00100	"	0.0500		111	80-120			
Xylene (p/m)	0.116	0.00100	"	0.100		116	80-120			
Xylene (o)	0.0567	0.00100	"	0.0500		113	80-120			
Surrogate: a,a,a-Trifluorotoluene	35.4		ug/kg	40.0		88.5	80-120			
Surrogate: 4-Bromofluorobenzene	37.6		"	40.0		94.0	80-120			

**Calibration Check (EC60106-CCV1)**

Prepared & Analyzed: 03/01/06

Benzene	40.6		ug/kg	50.0		81.2	80-120			
Toluene	41.2		"	50.0		82.4	80-120			
Ethylbenzene	42.7		"	50.0		85.4	80-120			
Xylene (p/m)	88.9		"	100		88.9	80-120			
Xylene (o)	43.8		"	50.0		87.6	80-120			
Surrogate: a,a,a-Trifluorotoluene	33.3		"	40.0		83.2	80-120			
Surrogate: 4-Bromofluorobenzene	32.8		"	40.0		82.0	80-120			

**Matrix Spike (EC60106-MS1)**

Source: 6B28014-09

Prepared & Analyzed: 03/01/06

Benzene	1.20	0.0250	mg/kg dry	1.42	ND	84.5	80-120			
Toluene	1.30	0.0250	"	1.42	ND	91.5	80-120			
Ethylbenzene	1.47	0.0250	"	1.42	ND	104	80-120			
Xylene (p/m)	3.11	0.0250	"	2.84	ND	110	80-120			
Xylene (o)	1.51	0.0250	"	1.42	ND	106	80-120			
Surrogate: a,a,a-Trifluorotoluene	33.2		ug/kg	40.0		83.0	80-120			
Surrogate: 4-Bromofluorobenzene	36.5		"	40.0		91.2	80-120			

Environmental Lab of Texas

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Environmental Plus, Incorporated  
P.O. Box 1558  
Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**Organics by GC - Quality Control**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

**Batch EC60106 - EPA 5030C (GC)**

**Matrix Spike Dup (EC60106-MSD1)**

Source: 6B28014-09

Prepared & Analyzed: 03/01/06

Benzene	1.19	0.0250	mg/kg dry	1.42	ND	83.8	80-120	0.832	20	
Toluene	1.29	0.0250	"	1.42	ND	90.8	80-120	0.768	20	
Ethylbenzene	1.46	0.0250	"	1.42	ND	103	80-120	0.966	20	
Xylene (p/m)	3.09	0.0250	"	2.84	ND	109	80-120	0.913	20	
Xylene (o)	1.50	0.0250	"	1.42	ND	106	80-120	0.00	20	
Surrogate: a,a,a-Trifluorotoluene	32.4		ug/kg	40.0		81.0	80-120			
Surrogate: 4-Bromofluorobenzene	33.0		"	40.0		82.5	80-120			

**Batch EC60108 - Solvent Extraction (GC)**

**Blank (EC60108-BLK1)**

Prepared: 03/01/06 Analyzed: 03/02/06

Carbon Ranges C6-C12	ND	10.0	mg/kg wet							
Carbon Ranges C12-C28	ND	10.0	"							
Carbon Ranges C28-C35	ND	10.0	"							
Total Hydrocarbon C6-C35	ND	10.0	"							
Surrogate: 1-Chlorooctane	46.8		mg/kg	50.0		93.6	70-130			
Surrogate: 1-Chlorooctadecane	46.4		"	50.0		92.8	70-130			

**LCS (EC60108-BS1)**

Prepared: 03/01/06 Analyzed: 03/02/06

Carbon Ranges C6-C12	544	10.0	mg/kg wet	500		109	75-125			
Carbon Ranges C12-C28	496	10.0	"	500		99.2	75-125			
Total Hydrocarbon C6-C35	1040	10.0	"	1000		104	75-125			
Surrogate: 1-Chlorooctane	62.9		mg/kg	50.0		126	70-130			
Surrogate: 1-Chlorooctadecane	59.3		"	50.0		119	70-130			

**Calibration Check (EC60108-CCV1)**

Prepared: 03/01/06 Analyzed: 03/02/06

Carbon Ranges C6-C12	238		mg/kg	250		95.2	80-120			
Carbon Ranges C12-C28	264		"	250		106	80-120			
Total Hydrocarbon C6-C35	502		"	500		100	80-120			
Surrogate: 1-Chlorooctane	57.4		"	50.0		115	70-130			
Surrogate: 1-Chlorooctadecane	54.3		"	50.0		109	70-130			

Environmental Plus, Incorporated  
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Eunice NM, 88231

Project: Chesapeake/ J.A. Akens  
Project Number: 160043  
Project Manager: Iain Olness

Fax: 505-394-2601

Reported:  
03/02/06 09:58

**Organics by GC - Quality Control**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

**Batch EC60108 - Solvent Extraction (GC)**

**Matrix Spike (EC60108-MS1)**

Source: 6B24010-14

Prepared: 03/01/06 Analyzed: 03/02/06

Carbon Ranges C6-C12	510	10.0	mg/kg dry	534	ND	95.5	75-125			
Carbon Ranges C12-C28	465	10.0	"	534	34.9	80.5	75-125			
Total Hydrocarbon C6-C35	975	10.0	"	1070	45.1	86.9	75-125			
Surrogate: 1-Chlorooctane	55.6		mg/kg	50.0		111	70-130			
Surrogate: 1-Chlorooctadecane	52.1		"	50.0		104	70-130			

**Matrix Spike Dup (EC60108-MSD1)**

Source: 6B24010-14

Prepared: 03/01/06 Analyzed: 03/02/06

Carbon Ranges C6-C12	510	10.0	mg/kg dry	534	ND	95.5	75-125	0.00	20	
Carbon Ranges C12-C28	462	10.0	"	534	34.9	80.0	75-125	0.647	20	
Total Hydrocarbon C6-C35	972	10.0	"	1070	45.1	86.6	75-125	0.308	20	
Surrogate: 1-Chlorooctane	56.0		mg/kg	50.0		112	70-130			
Surrogate: 1-Chlorooctadecane	52.3		"	50.0		105	70-130			

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Reported:  
03/02/06 09:58

**General Chemistry Parameters by EPA / Standard Methods - Quality Control**  
**Environmental Lab of Texas**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch EC60101 - General Preparation (Prep)**

**Blank (EC60101-BLK1)**

Prepared: 02/28/06 Analyzed: 03/01/06

% Solids 100 %

**Duplicate (EC60101-DUP1)**

Source: 6B28005-01

Prepared: 02/28/06 Analyzed: 03/01/06

% Solids 79.6 % 81.9 2.85 20

**Duplicate (EC60101-DUP2)**

Source: 6B28014-06

Prepared: 02/28/06 Analyzed: 03/01/06

% Solids 86.5 % 86.0 0.580 20

**Batch EC60111 - Water Extraction**

**Blank (EC60111-BLK1)**

Prepared: 02/28/06 Analyzed: 03/01/06

Sulfate ND 0.500 mg/kg

Chloride ND 0.500 "

**LCS (EC60111-BS1)**

Prepared: 02/28/06 Analyzed: 03/01/06

Sulfate 8.46 0.500 mg/kg 10.0 84.6 80-120

Chloride 9.28 0.500 " 10.0 92.8 80-120

**Calibration Check (EC60111-CCV1)**

Prepared: 02/28/06 Analyzed: 03/01/06

Chloride 9.77 mg/L 10.0 97.7 80-120

Sulfate 9.34 " 10.0 93.4 80-120

**Duplicate (EC60111-DUP1)**

Source: 6B28014-01

Prepared: 02/28/06 Analyzed: 03/01/06

Chloride 17.3 5.00 mg/kg 17.3 0.00 20

Sulfate 32.0 5.00 " 31.8 0.627 20

Environmental Plus, Incorporated  
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Project: Chesapeake/ J.A. Akens  
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Fax: 505-394-2601

**Reported:**  
03/02/06 09:58

### Notes and Definitions

S-06 The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.

S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

J Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

LCS Laboratory Control Spike

MS Matrix Spike

Dup Duplicate

Report Approved By: \_\_\_\_\_

*Raland K. Tuttle*

Date: \_\_\_\_\_

3/2/2006

Raland K. Tuttle, Lab Manager  
Celey D. Keene, Lab Director, Org. Tech Director  
Peggy Allen, QA Officer

Jeanne Mc Murrey, Inorg. Tech Director  
LaTasha Cornish, Chemist  
Sandra Sanchez, Lab Tech.

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If you have received this material in error, please notify us immediately at 432-563-1800.

Environmental Lab of Texas

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# Environmental Plus, Inc.

2100 Avenue O, Eunice, NM 88231  
(505) 394-3481 FAX: (505) 394-2601

P.O. Box 1558, Eunice, NM 88231

Chain of Custody Form

Company Name		Environmental Plus, Inc.		Bill To		ANALYSIS REQUEST																					
EPI Project Manager		Iain Olness				PRESERV.		MATRIX		SAMPLING		TPH 8015M		CHLORIDES (Cl)		SULFATES (SO <sub>4</sub> )		PH		TCLP		OTHER >>>		PAH			
Mailing Address		P.O. BOX 1558				ACID/BASE		OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.		DATE		TIME	
City, State, Zip		Eunice New Mexico 88231				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
EPI Phone#/Fax#		505-394-3481 / 505-394-2601				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
Client Company		Chesapeake Energy				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
Facility Name		J.A. Akens				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
Location		UL-T, Section 03, T 21 S, R 36 E				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
Project Reference		160043				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
EPI Sampler Name		George Blackburn				OTHER:		SLUDGE		CRUDE OIL		SOIL		WASTEWATER		GROUND WATER		# CONTAINERS		(G)RAB OR (C)OMP.				DATE		TIME	
LAB I.D.		SAMPLE I.D.																									
-01		1 SB-1 (2'-3')																									
-02		2 SB-1 (4.5'-5')																									
-03		3 SB-1 (9.5'-10')																									
-04		4 SB-1 (14.5'-15')																									
-05		5 SB-1 (19.5'-20') *see note																									
-06		6 SB-2 (2'-3')																									
-07		7 SB-2 (4.5'-5')																									
-08		8 SB-2 (9.5'-10')																									
-09		9 SB-2 (14.5'-15')																									
-10																											

Sample Delivered by: Iain Olness

Received By: Joan Boone

Received By: (lab staff) Joan Boone

Sample Cool & Intact: Yes

Checked By: COE

4.5

E-mail results to: iolness@envplus.net

**RUSH** 24 Hour 2/28/06

NOTES: for glass w/ seal jar / labels

Alcohol bottle → 2/28/06 Thursday morning

Alcohol bottle → 2/28/06 Thursday morning

# Environmental Lab of Texas

## Variance / Corrective Action Report – Sample Log-In

Client: EP1

Date/Time: 2/28/06 3:15

Order #: WB28014

Initials: ck

### Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	4.5 C
Shipping container/cooler in good condition?	Yes	No	
Custody Seals intact on shipping container/cooler?	Yes	No	<del>Not present</del>
Custody Seals intact on sample bottles?	Yes	No	Not present
Chain of custody present?	Yes	No	
Sample Instructions complete on Chain of Custody?	Yes	No	
Chain of Custody signed when relinquished and received?	Yes	No	
Chain of custody agrees with sample label(s)	Yes	No	
Container labels legible and intact?	Yes	No	
Sample Matrix and properties same as on chain of custody?	Yes	No	
Samples in proper container/bottle?	Yes	No	
Samples properly preserved?	Yes	No	
Sample bottles intact?	Yes	No	
Preservations documented on Chain of Custody?	Yes	No	
Containers documented on Chain of Custody?	Yes	No	
Sufficient sample amount for indicated test?	Yes	No	ATB
All samples received within sufficient hold time?	Yes	No	
VOC samples have zero headspace?	Yes	No	Not Applicable

Other observations:

\* All samples except SB-1 19.5-20' has no seal, headspace and may not be enough sample.

### Variance Documentation:

Contact Person: Jaron B. Date/Time: 2/28/06 3:15 Contacted by: Carmel K.

Regarding:

Headspace, sample amount

Corrective Action Taken:

As discussed - proceed w/ analysis.

**Jeanne McMurrey**

---

**From:** "Iain Olness" <iolness@hotmail.com>  
**To:** "Jeanne McMurrey" <jeanne@elabtxas.com>  
**Sent:** Tuesday, February 28, 2006 4:20 PM  
**Subject:** J. A. Akens Samples (Ref. #160043)

Dear Ms. McMurrey:

Please analyze sample *SB-1 (19.5'-20')* for total petroleum hydrocarbons only at this time. Should enough sample remain upon completion of the analysis, and there be a need, I will notify ELT of any other analyses I would like completed.

Should you have any questions or concerns, please feel free to contact me at (505) 394-3481 or via e-mail at [iolness@envplus.net](mailto:iolness@envplus.net).

Sincerely,

ENVIRONMENTAL PLUS, INC.

Iain A. Olness, P.G.  
Hydrogeologist

Environmental Plus, Inc.  
P.O. Box 1558  
Eunice, NM 88231

(505) 394-3481  
(505) 394-2601 (facsimile)

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2/28/2006



# ARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

## ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC.

ATTN: IAIN OLNESS

P.O. BOX 1558

EUNICE, NM 88231

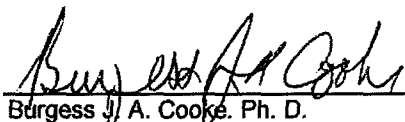
FAX TO: (505) 394-2601

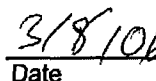
Receiving Date: 03/03/06  
Reporting Date: 03/08/06  
Project Owner: CHESAPEAKE  
Project Name: AIKEN  
Project Location: NOT GIVEN

Sampling Date: 03/03/06  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC

LAB NO.	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE:		03/06/06	03/06/06	03/07/06	03/07/06	03/07/06	03/07/06
H10848-1	SP 1 2'	<10.0	<10.0	<0.005	<0.005	<0.005	<0.015
H10848-2	SP 2 2'	<10.0	78.3	<0.005	<0.005	0.014	0.101
H10848-3	SP 3 1'	<10.0	207	<0.005	<0.005	<0.005	<0.015
H10848-4	SP 4 8"	<10.0	<10.0	<0.005	<0.005	<0.005	<0.015
H10848-5	SP 5 8"	<10.0	<10.0	<0.005	<0.005	<0.005	<0.015
H10848-6	SP 6 8"	2050	4040	6.70	52.2	25.4	65.6
H10848-7	SP 7 1'5"	<10.0	34.0	0.005	0.043	0.025	0.071
H10848-8	SP 8 2'	4680	7550	0.462	4.68	7.93	110
H10848-9	SP 9 2'	4310	7580	2.98	1.51	6.86	21.9
H10848-10	SP 10 1'	301	947	0.094	0.045	4.73	15.0
H10848-11	SP 11 1'	103	398	0.224	1.92	1.21	4.33
Quality Control		756	761	0.097	0.097	0.091	0.267
True Value QC		800	800	0.100	0.100	0.100	0.300
% Recovery		94.5	95.1	96.7	96.7	91.3	88.9
Relative Percent Difference		4.0	8.2	0.9	3.5	0.3	1.5

METHODS: TPH GRO & DRO - EPA SW-846 8015 M; BTEX - SW-846 8260.

  
Burgess J. A. Cooke, Ph. D.

  
Date

H10848.XLS


PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

# Environmental Plus, Inc.

2100 Avenue O, Eunice, NM 88231  
(505) 394-3481 FAX: (505) 394-2601

P.O. Box 1558, Eunice, NM 88231

## Chain of Custody Form

Company Name Environmental Plus, Inc.		Billing		Analysis Request	
EPI Project Manager Iain Olness		 <p>Attn: Iain Olness PO Box 1558 Eunice, NM 88231</p>		TPH 8015M	
Mailing Address P.O. BOX 1558				CHLORIDES (Cl)	
City, State, Zip Eunice New Mexico 88231				SULFATES (SO <sub>4</sub> )	
EPI Phone# / Fax# 505-394-3481 / 505-394-2601				PH	
Client Company Chesapeake				TCLP	
Facility Name				OTHER >>>	
Location Aiken				PAH	
Project Reference				Texas 1005	
EPI Sampler Name 6-20-02					

LAB I.D.	SAMPLE I.D.	# CONTAINERS	MATRIX								PRESERV.		SAMPLING		TIME
			GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER	ACID/BASE	ICE/COOL	Drilling Mud	DATE			
SP1	2'													3-3-06	
SP2	2'													3-3-06	
SP3	1'													3-3-06	
SP4	8"													3-3-06	
SP5	8"													3-3-06	
SP6	8" 15"													3-3-06	
SP7	8" 15"													3-3-06	
SP8	2'													3-3-06	
SP9	7'													3-3-06	
SP10	1'													3-3-06	

Sampler Relinquished:		Received By:	
Signature: <i>[Signature]</i>	Date: 3-3-06	Signature: <i>[Signature]</i>	Date: 3-3-06
Relinquished by:		Received By: (lab staff)	
		Signature: <i>[Signature]</i>	
Delivered by:		Sample Cool & Intact	Checked By:
		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Signature: <i>[Signature]</i>

E-mail results to: iain.olness@envplus.net

REMARKS:

# Environmental Plus, Inc.

2100 Avenue O, Eunice, NM 88231  
(505) 394-3481 FAX: (505) 394-2601  
P.O. Box 1558, Eunice, NM 88231

## Chain of Custody Form

Company Name Environmental Plus, Inc.		Bill To		ANALYSIS REQUEST																									
EPI Project Manager Iain Olness		Attn: Iain Olness		PRESERV.		SAMPLING		DATE		TIME		BTEX 8021B		TPH 8015M		CHLORIDES (Cl)		SULFATES (SO <sub>4</sub> )		PH		TCLP		OTHER >>>		PAH		Texas 1005	
Mailing Address P.O. BOX 1558		Eunice, NM 88231		ACID/BASE		ICE/COOL		Drilling Mud		3-3-06		2:22 PM																	
City, State, Zip Eunice New Mexico 88231				OTHER:																									
EPI Phone#/Fax# 505-394-3481 / 505-394-2601				SLUDGE																									
Client Company Chesapeake				CRUDE OIL																									
Facility Name				SOIL																									
Location Allen Aiken				WASTEWATER																									
Project Reference				GROUND WATER																									
EPI Sampler Name George				# CONTAINERS																									
LAB I.D.		SAMPLE I.D.		(GRAB OR (C)OMP)																									
110648-11		SP11		11																									
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													

Sampler Relinquished:		Date: 3-3-06		Received By:	
Relinquished by: <i>[Signature]</i>		Time: 2:00		Received By: (lab staff)	
Delivered by:		Date:		Sample Cool & Intact	
		Time:		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
				Checked By: <i>[Signature]</i>	

REMARKS:  
E-mail results to: iain.olness@envplus.net



# ARDINAL LABORATORIES

PHONE (325) 873-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

## ANALYTICAL RESULTS FOR ENVIRONMENTAL PLUS, INC.

ATTN: IAIN OLNESS

PO BOX 1558

EUNICE, NM 88231

FAX TO: 505-394-2601

Receiving Date: 3/14/06

Reporting Date: 3/20/06

Project Number: #160043

Project Name: J.A. AKENS

Project Location: UL-T, SECTION 03, T 21 S, R 36 E

Sampling Date: 3/13/06

Sample Type: SOIL

Sample Condition: COOL & INTACT

Sample Received By: HM

Analyzed By: JC

LAB NUMBER	SAMPLE ID	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYLBENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE:		03/16/06	03/16/06	03/16/06	03/16/06
H10895-1	SP-6A(3')	<0.005	<0.005	0.139	3.47
H10895-2	SP-8A (7')	<0.002	<0.002	<0.002	<0.006
H10895-3	SP-9A (2.5')	0.014	0.885	2.8	18.7
Quality Control		0.097	0.094	0.098	0.297
True Value QC		0.100	0.100	0.100	0.300
% Recovery		97	94	98	99
Relative Percent Difference		9.2	5.7	4.7	5.2

METHODS: EPA - SW 846-8021B, 5030B; Gas Chromatography

Chemist

Date



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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

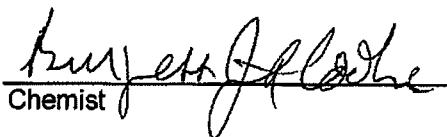
ANALYTICAL RESULTS FOR  
ENVIRONMENTAL PLUS, INC.  
ATTN: IAIN OLNES  
P.O. BOX 1558  
EUNICE, NM 88231  
FAX TO: (505) 394-2601

Receiving Date: 03/14/06  
Reporting Date: 03/18/06  
Project Number: CHESAPEAKE ENERGY (160043)  
Project Name: J.A. AKENS  
Project Location: UL-T, SECTION 03, T 21 S, R 36 E

Sampling Date: 03/13/06  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: HM  
Analyzed By: BC

LAB NUMBER	SAMPLE ID	GRO (C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	DRO (>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)
		03/17/06	03/17/06
H10895-1	SP-6A (3')	268	4230
H10895-2	SP-8A (7')	<10.0	44.9
H10895-3	SP-9A (2.5')	1330	8460
Quality Control		810	791
True Value QC		800	800
% Recovery		101	98.9
Relative Percent Difference		3.5	3.1

METHOD: SW-846 8015 M

  
Chemist

3/18/06  
Date

H10895A.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.





# ARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 383-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
ENVIRONMENTAL PLUS, INC.  
ATTN: IAIN OLNESS  
P.O. BOX 1558  
EUNICE, NM 88231  
FAX TO: (505) 394-2601

Receiving Date: 03/14/06  
Reporting Date: 03/15/06  
Project Owner: CHESAPEAKE ENERGY (160043)  
Project Name: J.A. AKENS  
Project Location: UL-T, SECTION 03, T 21 S, R 36 E

Sampling Date: 03/13/06  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: HM  
Analyzed By: AB/HM

LAB NUMBER	SAMPLE ID	SO <sub>4</sub> (mg/Kg)	Cl (mg/Kg)
ANALYSIS DATE:		03/15/06	03/15/06
H10895-1	SP-6A (3')	7	656
H10895-2	SP-8A (7')	5	64
H10895-3	SP-9A (2.5')	93	32
Quality Control		26.7	500
True Value QC		25.0	500
% Recovery		107.0	100
Relative Percent Difference		2.0	0.0

METHODS: EPA 600/4-79-020	375.4	SM 4500 ClB
---------------------------	-------	-------------

NOTE: Analyses performed on 1:4 w:v aqueous extracts.

Super S. Moreno  
Chemist

03-16-06  
Date

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# argon laboratories

ENVIRONMENTAL PLUS, INC.  
2100 AVENUE O  
EUNICE, NM 88231

REPORT DATE: 04/07/06  
SAMPLE DATE: 03/30/06

ATTN: IAIN OLNESS  
CLIENT PROJ. ID: 160043  
J.A. AKENS  
UL-T, Section 03, T 21 S, R 36 E

AL JOB #: A03011

## Project Summary:

On March 31, 2006, this laboratory received 5 soil samples.

Samples were analyzed according to instructions in accompanying chain-of-custody. Results of analysis are summarized on the following pages. Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Sample Control at (505) 397-0295

  
Hiram Cueto  
Lab Manager

# argon laboratories

Environmental Plus, Inc.  
2100 Avenue O  
Eunice, NM 88231

Project Number: 160043  
Project Name: J.A. Akens  
Project Manager: Iain Olness

Work Order #: -  
A03011

## Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
WSW (3.5') (A03011 Soil) Sampled: 03/30/06 Received: 03/31/06							
Gas Range Organics	1,400	100	mg/Kg	10	04/05/06	8015M	
Diesel Range Organics	3,800	"	"	"	"	"	
C29 - C35 Range Organics	ND	"	"	"	"	"	
Total Petroleum Hydrocarbons	5,200	"	"	"	"	"	

## Volatile Organics - EPA Method 8021B


WSW (3.5') (A03011 Soil) Sampled: 03/30/06 Received: 03/31/06							
Benzene	ND	0.5	mg/Kg	100	03/31/06	EPA 8021B	
Toluene	0.82	"	"	"	"	"	
Ethyl Benzene	19	"	"	"	"	"	
Xylenes	50	1.0	"	"	"	"	

Surrogate Recovery: 106%

## Anions by Ion Chromatography - EPA Method 300.0

WSW (3.5') (A03011 Soil) Sampled: 03/30/06 Received: 03/31/06							
Chloride	1,200	250	mg/Kg	25	04/04/06	EPA 300.0	
Sulfate	110	25	"	5	"	"	

Approved By  
Argon Laboratories

  
QC Officer

2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296

email: info@argonlabs.com

# argon laboratories

Environmental Plus, Inc.  
2100 Avenue O  
Eunice, NM 88231

Project Number: 160043  
Project Name: J.A. Akens  
Project Manager: Iain Olness

Work Order #: -  
A03011

## Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
NSW (3.5') (A03012 Soil) Sampled: 03/30/06 Received: 03/31/06							
Gas Range Organics	ND	10	mg/Kg	1	04/05/06	8015M	
Diesel Range Organics	84	"	"	"	"	"	
C29 - C35 Range Organics	ND	"	"	"	"	"	
Total Petroleum Hydrocarbons	84	"	"	"	"	"	

## Volatile Organics - EPA Method 8021B

NSW (3.5') (A03012 Soil) Sampled: 03/30/06 Received: 03/31/06							
Benzene	ND	0.005	mg/Kg	1	03/31/06	EPA 8021B	
Toluene	ND	"	"	"	"	"	
Ethyl Benzene	ND	"	"	"	"	"	
Xylenes	ND	0.010	"	"	"	"	

Surrogate Recovery: 98%

## Anions by Ion Chromatography - EPA Method 300.0

NSW (3.5') (A03012 Soil) Sampled: 03/30/06 Received: 03/31/06							
Chloride	330	50	mg/Kg	5	04/04/06	EPA 300.0	
Sulfate	39	10	"	2	"	"	

Approved By  
Argon Laboratories

  
QC Officer

# argon laboratories

Environmental Plus, Inc.  
2100 Avenue O  
Eunice, NM 88231

Project Number: 160043  
Project Name: J.A. Akens  
Project Manager: Iain Olness

Work Order #: -  
A03011

## Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
ESW (3.5') (A03013 Soil) Sampled: 03/30/06 Received: 03/31/06							
Gas Range Organics	47	10	mg/Kg	1	04/05/06	8015M	
Diesel Range Organics	310	"	"	"	"	"	
C29 - C35 Range Organics	ND	"	"	"	"	"	
Total Petroleum Hydrocarbons	357	"	"	"	"	"	

## Volatile Organics - EPA Method 8021B


ESW (3.5') (A03013 Soil) Sampled: 03/30/06 Received: 03/31/06							
Benzene	ND	0.050	mg/Kg	10	03/31/06	EPA 8021B	
Toluene	ND	"	"	"	"	"	
Ethyl Benzene	0.19	"	"	"	"	"	
Xylenes	0.30	0.10	"	"	"	"	

Surrogate Recovery: 106%

## Anions by Ion Chromatography - EPA Method 300.0

ESW (3.5') (A03013 Soil) Sampled: 03/30/06 Received: 03/31/06							
Chloride	17	10	mg/Kg	1	04/04/06	EPA 300.0	
Sulfate	43	10	"	2	"	"	

Approved By  
Argon Laboratories

  
QC Officer

2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296

email: info@argonlabs.com

# argon laboratories

Environmental Plus, Inc.  
2100 Avenue O  
Eunice, NM 88231

Project Number: 160043  
Project Name: J.A. Akens  
Project Manager: Iain Olness

Work Order #: -  
A03011

## Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SSW (3.5') (A03014 Soil) Sampled: 03/30/06 Received: 03/31/06							
Gas Range Organics	150	20	mg/Kg	2	04/05/06	8015M	
Diesel Range Organics	1,100	"	"	"	"	"	
C29 - C35 Range Organics	ND	"	"	"	"	"	
Total Petroleum Hydrocarbons	1,250	"	"	"	"	"	

## Volatile Organics - EPA Method 8021B

SSW (3.5') (A03014 Soil) Sampled: 03/30/06 Received: 03/31/06							
Benzene	ND	0.10	mg/Kg	20	03/31/06	EPA 8021B	
Toluene	0.19	"	"	"	"	"	
Ethyl Benzene	1.3	"	"	"	"	"	
Xylenes	3.3	0.20	"	"	"	"	

Surrogate Recovery: 98%

## Anions by Ion Chromatography - EPA Method 300.0

SSW (3.5') (A03014 Soil) Sampled: 03/30/06 Received: 03/31/06							
Chloride	150	20	mg/Kg	2	04/04/06	EPA 300.0	
Sulfate	15	5	"	1	"	"	

Approved By  
Argon Laboratories

QC Officer

2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296

email: info@argonlabs.com

# argon laboratories

Environmental Plus, Inc.  
2100 Avenue O  
Eunice, NM 88231

Project Number: 160043  
Project Name: J.A. Akens  
Project Manager: Iain Olness

Work Order #: -  
A03011

## Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH (7') (A03015 Soil) Sampled: 03/30/06 Received: 03/31/06							
Gas Range Organics	1,700	100	mg/Kg	10	04/05/06	8015M	
Diesel Range Organics	3,900	"	"	"	"	"	
C29 - C35 Range Organics	ND	"	"	"	"	"	
Total Petroleum Hydrocarbons	5,600	"	"	"	"	"	

## Volatile Organics - EPA Method 8021B

BH (7') (A03015 Soil) Sampled: 03/30/06 Received: 03/31/06							
Benzene	ND	0.5	mg/Kg	100	03/31/06	EPA 8021B	
Toluene	0.98	"	"	"	"	"	
Ethyl Benzene	15	"	"	"	"	"	
Xylenes	61	1.0	"	"	"	"	

Surrogate Recovery: 98%

## Anions by Ion Chromatography - EPA Method 300.0

BH (7') (A03015 Soil) Sampled: 03/30/06 Received: 03/31/06							
Chloride	460	50	mg/Kg	5	04/04/06	EPA 300.0	
Sulfate	44	10	"	2	"	"	

Approved By  
Argon Laboratories

QC Officer

2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296

email: info@argonlabs.com

# Argon Laboratories Sample Receipt Checklist

Client Name: Environmental Plus, Inc. Date & Time Received: 3/31/2006 08:41 AM

Project Name: J. A. Akens - UL-T, Section 03, Client Project Number: 160043

Received By: HC Matrix: Water ☐ Soil ☒

Sample Carrier: Client ☒ Laboratory ☐ Fed Ex ☐ UPS ☐ Other ☐

Argon Labs Project Number: A03011

Shipper Container in good condition?

N/A ☐ Yes ☒ No ☐

Samples received in proper containers? Yes ☒ No ☐

Samples received intact? Yes ☒ No ☐

Samples received under refrigeration? Yes ☒ No ☐

Sufficient sample volume for requested tests? Yes ☒ No ☐

Chain of custody present? Yes ☒ No ☐

Samples received within holding time? Yes ☒ No ☐

Chain of Custody signed by all parties? Yes ☒ No ☐

Do samples contain proper preservative?

N/A ☒ Yes ☐ No ☐

Chain of Custody matches all sample labels?

Yes ☒ No ☐

Do VOA vials contain zero headspace?

(None submitted ☒ ) Yes ☐ No ☐

ANY "No" RESPONSE MUST BE DETAILED IN THE COMMENTS SECTION BELOW

Date Client Contacted: \_\_\_\_\_

Person Contacted: \_\_\_\_\_

Contacted By: \_\_\_\_\_

Subject: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Action Taken: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## ADDITIONAL TEST(S) REQUEST / OTHER

Contacted By: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Call Received By: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_




## Chain of Custody Form

**P.O. Box 1558, Eunice, NM 88231**

Laboratory: Argon

Company Name		Environmental Plus, Inc.																				
EPI Project Manager		Iain Olness																				
Mailing Address		P.O. BOX 1558																				
City, State, Zip		Eunice New Mexico 88231																				
EPI Phone#/Fax#		505-394-3481 / 505-394-2601																				
Client Company		Chesapeake Energy																				
Facility Name		J.A. Akens																				
Location		UL-T, Section 03, T 21 S, R 36 E																				
Project Reference		160043																				
EPI Sampler Name		Felix Hernandez																				
LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	ACID/BASE	ICE/COOL	OTHER	DATE	TIME	BTEX 8021B	TPH 8015M	CHLORIDES (Cl)	SULFATES (SO <sub>4</sub> )	pH	TCLP	OTHER >>>	PAH
1 WSW (3.5')		G 1	1			X					X		30-Mar-06	14:00	X	X	X	X				
2 NSW (3.5)		G 1	1			X					X		30-Mar-06	14:05	X	X	X	X				
3 ESW (3.5')		G 1	1			X					X		30-Mar-06	14:10	X	X	X	X				
4 SSW (3.5)		G 1	1			X					X		30-Mar-06	14:15	X	X	X	X				
5 BH (7')		G 1	1			X					X		30-Mar-06	14:20	X	X	X	X				
6																						
7																						
8																						
9																						
10																						



Attn: Iain Olness  
P.O. Box 1558  
Eunice, NM 88231

**Bill To:**

**ANALYSIS REQUEST**

**Company Name** Environmental Plus, Inc.

**EPI Project Manager** Iain Olness

**Mailing Address** P.O. BOX 1558

**City, State, Zip** Eunice New Mexico 88231

**EPI Phone#/Fax#** 505-394-3481 / 505-394-2601

**Client Company** Chesapeake Energy

**Facility Name** J.A. Akens

**Location** UL-T, Section 03, T 21 S, R 36 E

**Project Reference** 160043

**EPI Sampler Name** Felix Hernandez

**LAB I.D.**

**SAMPLE I.D.**

**(G)RAB OR (C)OMP.**

**# CONTAINERS**

**GROUND WATER**

**WASTEWATER**

**SOIL**

**CRUDE OIL**

**SLUDGE**

**OTHER:**

**ACID/BASE**

**ICE/COOL**

**OTHER**

**DATE**

**TIME**

**BTEX 8021B**

**TPH 8015M**

**CHLORIDES (Cl)**

**SULFATES (SO<sub>4</sub>)**

**pH**

**TCLP**

**OTHER >>>**

**PAH**

**Company Name** Environmental Plus, Inc.

**EPI Project Manager** Iain Olness

**Mailing Address** P.O. BOX 1558

**City, State, Zip** Eunice New Mexico 88231

**EPI Phone#/Fax#** 505-394-3481 / 505-394-2601

**Client Company** Chesapeake Energy

**Facility Name** J.A. Akens

**Location** UL-T, Section 03, T 21 S, R 36 E

**Project Reference** 160043

**EPI Sampler Name** Felix Hernandez

**LAB I.D.**

**SAMPLE I.D.**

**(G)RAB OR (C)OMP.**

**# CONTAINERS**

**GROUND WATER**

**WASTEWATER**

**SOIL**

**CRUDE OIL**

**SLUDGE**

**OTHER:**

**ACID/BASE**

**ICE/COOL**

**OTHER**

**DATE**

**TIME**

**BTEX 8021B**

**TPH 8015M**

**CHLORIDES (Cl)**

**SULFATES (SO<sub>4</sub>)**

**pH**

**TCLP**

**OTHER >>>**

**PAH**

**Company Name** Environmental Plus, Inc.

**EPI Project Manager** Iain Olness

**Mailing Address** P.O. BOX 1558

**City, State, Zip** Eunice New Mexico 88231

**EPI Phone#/Fax#** 505-394-3481 / 505-394-2601

**Client Company** Chesapeake Energy

**Facility Name** J.A. Akens

**Location** UL-T, Section 03, T 21 S, R 36 E

**Project Reference** 160043

**EPI Sampler Name** Felix Hernandez

**LAB I.D.**

**SAMPLE I.D.**

**(G)RAB OR (C)OMP.**

**# CONTAINERS**

**GROUND WATER**

**WASTEWATER**

**SOIL**

**CRUDE OIL**

**SLUDGE**

**OTHER:**

**ACID/BASE**

**ICE/COOL**

**OTHER**

**DATE**

**TIME**

**BTEX 8021B**

**TPH 8015M**

**CHLORIDES (Cl)**

**SULFATES (SO<sub>4</sub>)**

**pH**

**TCLP**

**OTHER >>>**

**PAH**

**Company Name** Environmental Plus, Inc.

**EPI Project Manager** Iain Olness

**Mailing Address** P.O. BOX 1558

**City, State, Zip** Eunice New Mexico 88231

**EPI Phone#/Fax#** 505-394-3481 / 50

**Environmental Plus, Inc.**

2100 Avenue O, Eunice, NM 88231  
(505) 394-3481 FAX: (505) 394-2601

P.O. Box 1558, Eunice, NM 88231

**Chain of Custody Form**

Laboratory: Cardinal

Company Name		Environmental Plus, Inc.		Bill To		ANALYSIS REQUEST																																					
EPI Project Manager		Iain Olness																																									
Mailing Address		P.O. BOX 1558																																									
City, State, Zip		Eunice New Mexico 88231																																									
EPI Phone#/Fax#		505-394-3481 / 505-394-2601																																									
Client Company		Chesapeake Energy																																									
Facility Name		J.A. Akens																																									
Location		UL-T, Section 03, T 21 S, R 36 E																																									
Project Reference		160043																																									
EPI Sampler Name		George Blackburn																																									
LAB I.D.		SAMPLE I.D.		# CONTAINERS		GROUND WATER		WASTEWATER		SOIL		CRUDE OIL		SLUDGE		OTHER:		ACID/BASE		ICE/COOL		OTHER		DATE		TIME		BTX 8021B		TPH 8015M		CHLORIDES (Cl)		SULFATES (SO <sub>4</sub> )		pH		TCLP		OTHER >>		PAH	
416895-1 SP-6A (3')				G 1						X										X		X		13-Mar-06		14:57		X		X		X		X		X		X		X		X	
- 2 SP-8A (7')				G 1						X										X		X		13-Mar-06		14:41		X		X		X		X		X		X		X		X	
- 3 SP-9A (2.5')				G 1						X										X		X		13-Mar-06		14:37		X		X		X		X		X		X		X			
4																																											
5																																											
6																																											
7																																											
8																																											
9																																											
10																																											

Sampler Relinquished:

Received By:

Date: 3/14/06  
Time: 11:42

Relinquished by:

Received By: (lab staff)

Date: 3-14-06  
Time: 3:10

Delivered by:

Sample Cool & Intact

Yes

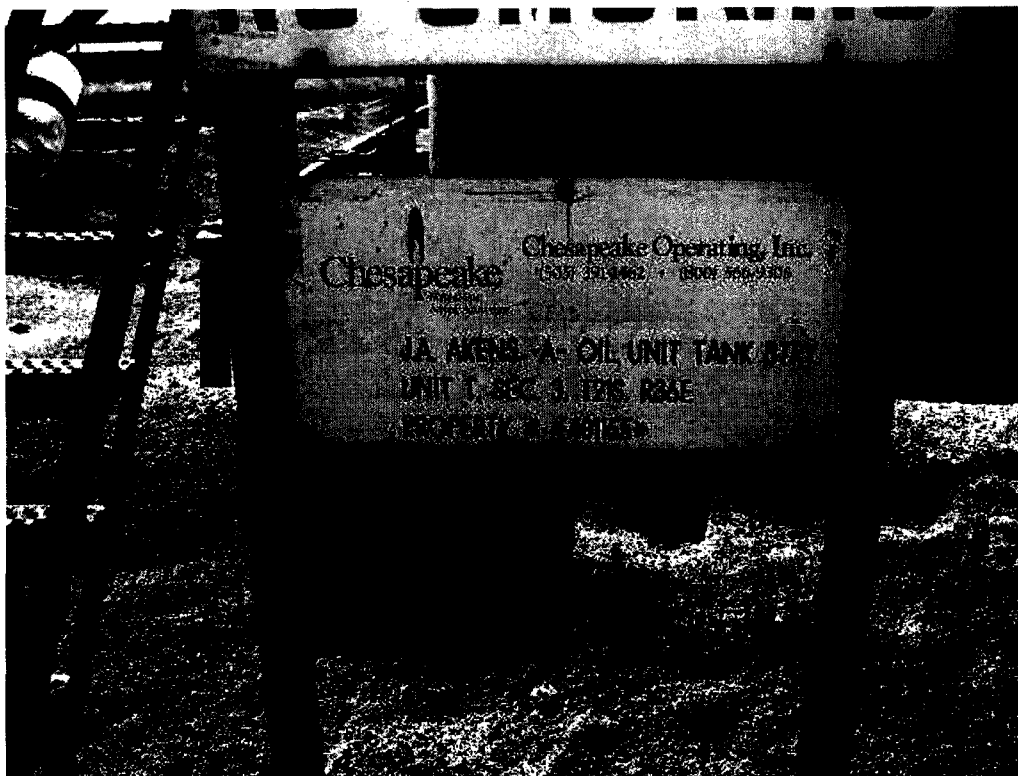
Checked By:

E-mail results to: iolness@envplus.net

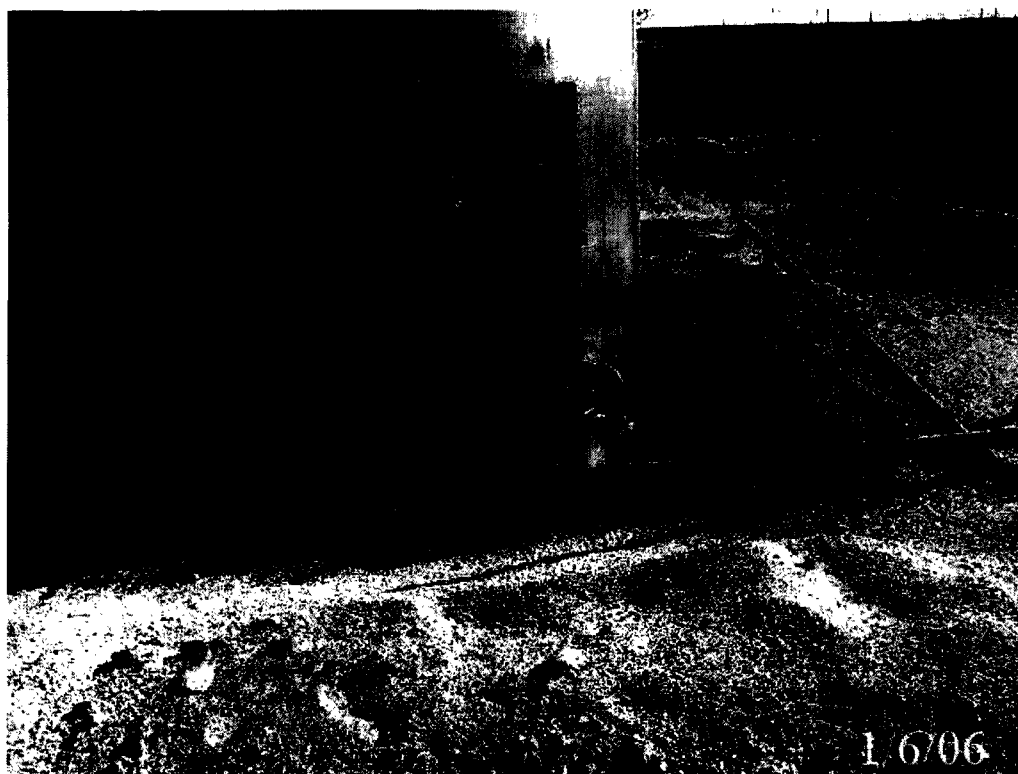
NOTES:

**APPENDIX II**

**PROJECT PHOTOGRAPHS**



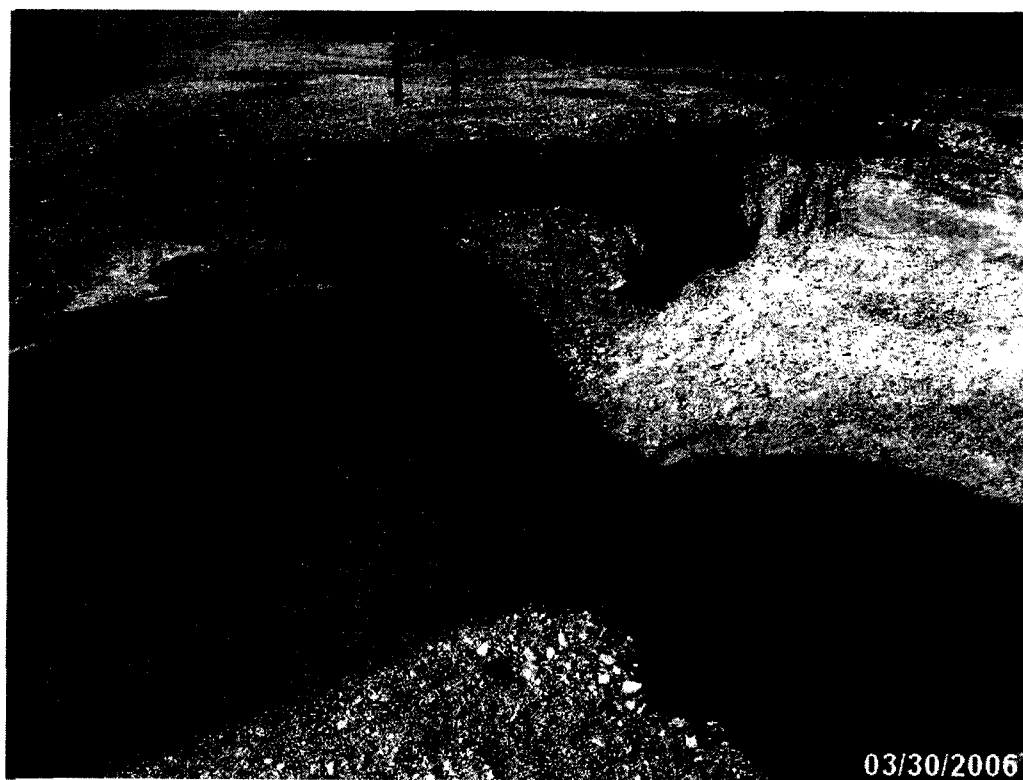
Photograph #1 – Lease Sign



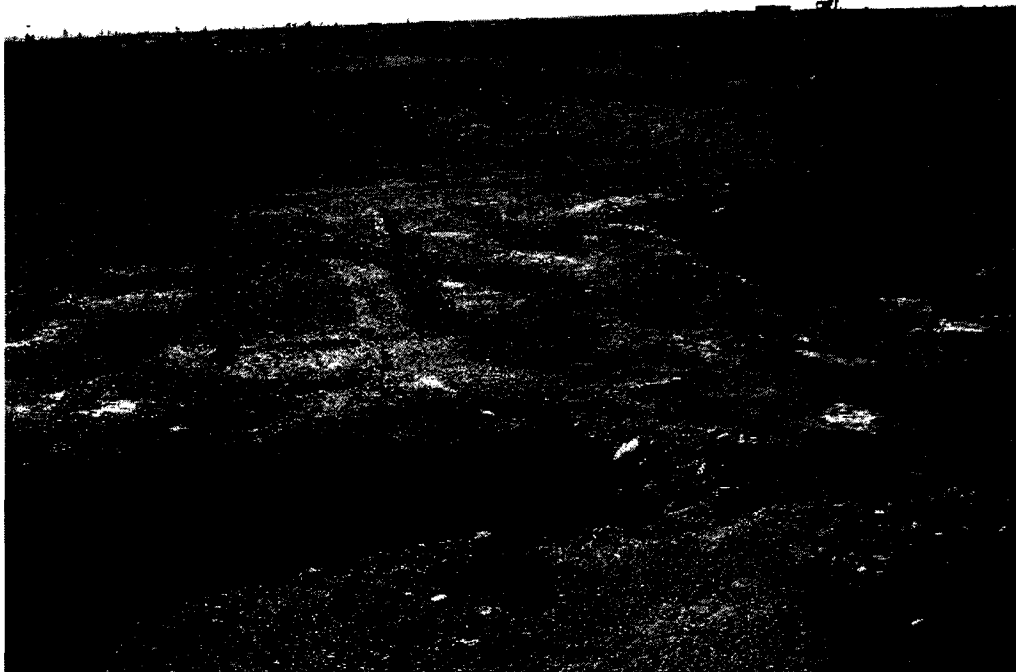
Photograph #2 – Looking east from southwest corner of bermed area at contamination



Photograph #3 – Looking southeasterly from the northwesterly corner of bermed area



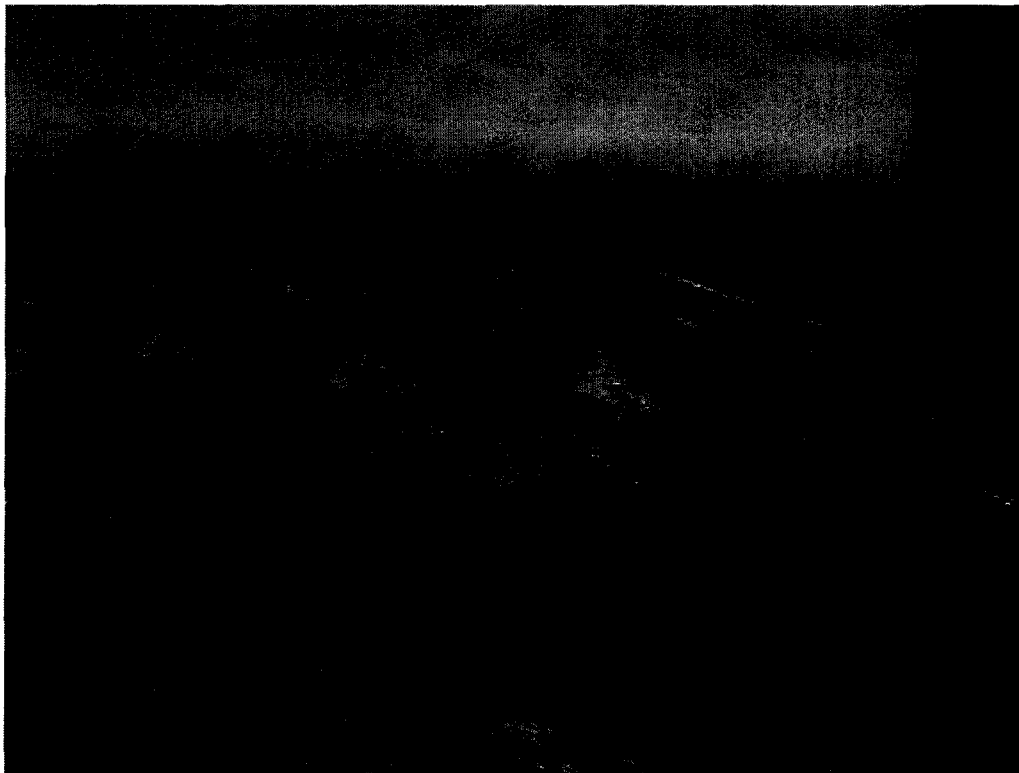
Photograph #4- Looking north at west sidewall of the excavation



Photograph #5 – Looking southeasterly at end of the excavation



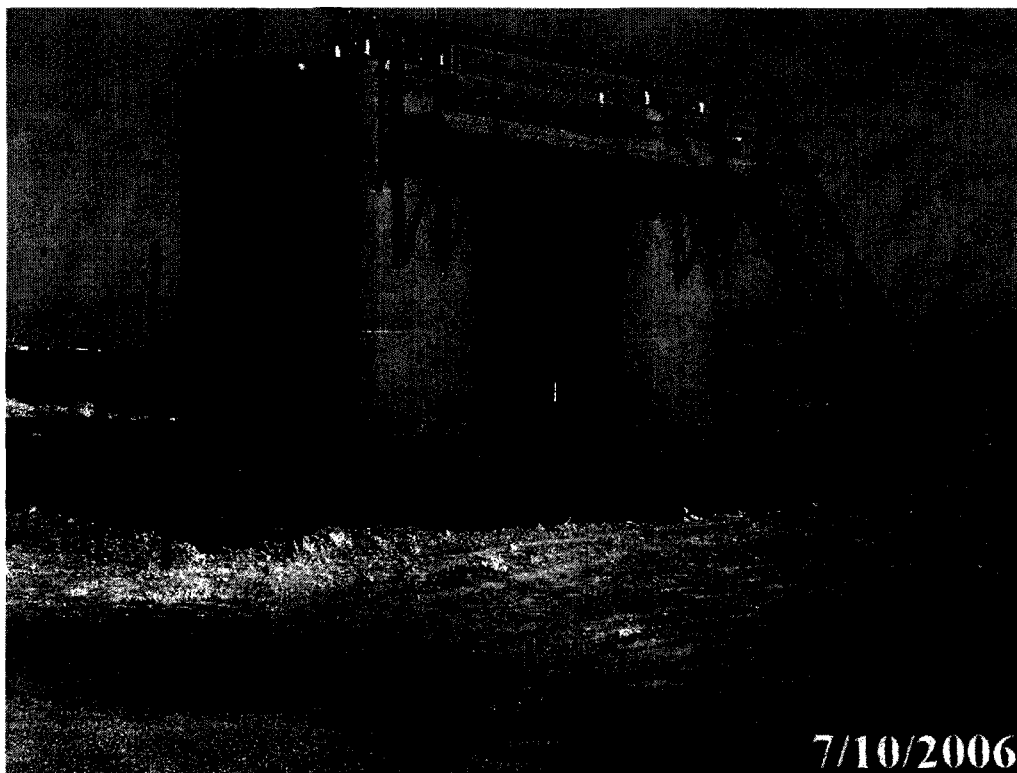
Photograph # 6 – Looking at northerly end of the excavation



Photograph #7 – Looking southerly at backfilled and graded area



Photograph #8 – Looking northwesterly at backfilled and graded area



Photograph #9 – Looking westerly at completed Tank Battery and PVC liner



Photograph #10 – Looking southeasterly at Tank Battery and piping



**APPENDIX III**  
**SOIL BORING LOGS**

## Log Of Test Borings

(NOTE - Page 1 of 1)



ENVIRONMENTAL PLUS, INC.  
STATE APPROVED LAND FARM AND  
ENVIRONMENTAL SERVICES  
EUNICE  
505-394-3481

Project Number: 160043

Project Name: Chesapeake J.A. Akens-A-Oil Unit Battery

Location: UL-M, Section 3, Township 21 South, Range 36 East

Boring Number: SB-1

Surface Elevation: 3,579-feet amsl

Time	Sample Type	Recovery (Inches)	Moisture	PID Readings (ppm)	Chloride Analysis (mg/Kg)	U.S.C.S. Symbol	Depth (feet)	Start Date: 2-27-06 Time: 0715 hrs	Completion Date: 2-27-06 Time: 1136 hrs	Description
0800	DS	6	DRY	1,336	160					
0824	SS	6	DRY	850	160		5			
0848	SS	6	DRY	436	160		10			SAND, Brown to Tan/CALICHE
0944	SS	6	DRY	9.0	160		15			
1100	SS	6	DRY	2.9			20			End of Soil Boring at 20' bgs
							25			
							30			

Water Level Measurements (feet)						Drilling Method: HSA 3.5' ID
Date	Time	Sample Depth	Casing Depth	Cave-in Depth	Water Level	Backfill Method: Bentonite
-	-	-	-	-	-	Field Representative: GB
-	-	-	-	-	-	

(NOTE - Page 1 of 1)



Surface Elevation: 3,579-feet amsl

Time	Sample Type	Recovery (Inches)	Moisture	PID Readings (ppm)	Chloride Analysis (mg/Kg)	U.S.C.S. Symbol	Depth (feet)	Start Date: <u>2-27-06</u> Time: <u>1140 hrs</u> Completion Date: <u>2-27-06</u> Time: <u>1510 hrs</u> Description
1150	DS		DRY	786	240			SAND, Red to Tan/CALICHE
1200	SS	6	DRY	145	320		5	
1220	SS	6	DRY	9.6	400		10	
1300	SS	6	DRY	2.6	320		15	
							20	
							25	
							30	End of Soil Boring at 16' bgs
Water Level Measurements (feet)								Drilling Method: HSA 3.5' ID
Date	Time	Sample Depth	Casing Depth	Cave-In Depth	Water Level	Backfill Method: Bentonite		
-	-	-	-	-	-	Field Representative: GB		

**APPENDIX IV**

**FINAL COPY OF**

**NMOCD C-141 FORM**

**Chesapeake**

Information and Metrics

**Incident Date:**  
1 January 2006

**NMOCD Notified:**  
2 January 2006

<b>Site:</b> J.A. Akens -A- Oil Unit Tank Battery		<b>Assigned Site Reference :</b> #160043	
<b>Company:</b> Chesapeake Energy			
<b>Street Address:</b> 1616 West Bender			
<b>Mailing Address:</b> P.O. Box 190			
<b>City, State, Zip:</b> Hobbs, New Mexico 88240			
<b>Representative:</b> Bradley Blevins			
<b>Representative Telephone:</b> (505) 391-1462 ext. 6224			
<b>Telephone:</b>			
<b>Fluid volume released (bbls):</b> ~277 barrels		<b>Recovered (bbls):</b> ~144 barrels	
<b>&gt;25 bbls: Notify NMOCD verbally within 24 hrs and submit form C-141 within 15 days.</b> <b>(Also applies to unauthorized releases &gt;500 mcf Natural Gas)</b>			
<b>5-25 bbls: Submit form C-141 within 15 days (Also applies to unauthorized releases of 50-500 mcf Natural Gas)</b>			
<b>Leak, Spill, or Pit (LSP) Name:</b> J.A. Akens -A- Oil Unit Tank Battery			
<b>Source of contamination:</b> Tank Battery			
<b>Land Owner, i.e., BLM, ST, Fee, Other:</b> Millard Deck Estate			
<b>LSP Dimensions:</b> 100 feet by 101 feet			
<b>LSP Area:</b> ~10,100 ft <sup>2</sup>			
<b>Location of Reference Point (RP):</b>			
<b>Location distance and direction from RP:</b>			
<b>Latitude:</b> N 32° 30' 10.54"			
<b>Longitude:</b> W 103° 15' 36.76"			
<b>Elevation above mean sea level:</b> 3,579 feet			
<b>Feet from North Section Line:</b>			
<b>Feet from West Section Line:</b>			
<b>Location- Unit or ¼/4:</b> SW¼ of the SW¼		<b>Unit Letter:</b> T	
<b>Location- Section:</b> 3			
<b>Location- Township:</b> T21S			
<b>Location- Range:</b> R36E			
<b>Surface water body within 1000' radius of site:</b> none			
<b>Domestic water wells within 1000' radius of site:</b> none			
<b>Agricultural water wells within 1000' radius of site:</b> none			
<b>Public water supply wells within 1000' radius of site:</b> none			
<b>Depth from land surface to groundwater (DG):</b> ~198 feet			
<b>Depth of contamination (DC):</b> unknown			
<b>Depth to groundwater (DG – DC = DtGW):</b> ~198 feet			
<b>1. Groundwater</b>		<b>2. Wellhead Protection Area</b>	
If Depth to GW <50 feet: <i>20 points</i>		If <1000' from water source, or; <200' from private domestic water source: <i>20 points</i>	
If Depth to GW 50 to 99 feet: <i>10 points</i>		If >1000' from water source, or; >200' from private domestic water source: <i>0 points</i>	
If Depth to GW >100 feet: <i>0 points</i>			
		<b>3. Distance to Surface Water Body</b>	
		<200 horizontal feet: <i>20 points</i>	
		200-1000 horizontal feet: <i>10 points</i>	
		>1000 horizontal feet: <i>0 points</i>	
<b>Site Rank (1+2+3) = 0</b>			
<b>Total Site Ranking Score and Acceptable Concentrations</b>			
Parameter	>19	10-19	0-9
Benzene <sup>1</sup>	10 ppm	10 ppm	10 ppm
BTEX <sup>1</sup>	50 ppm	50 ppm	50 ppm
TPH	100 ppm	1,000 ppm	5,000 ppm

<sup>1</sup>100 ppm field VOC headspace measurement may be substituted for lab analysis

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

<b>Name of Company:</b> Chesapeake Energy	<b>Contact:</b> Bradley Blevins
<b>Address:</b> P.O. Box 190	<b>Telephone No.:</b> (505) 391-1462 ext. 6224
<b>Facility Name:</b> J.A. Akens -A- Oil Unit Tank Battery	<b>Facility Type:</b> Tank Battery

<b>Surface Owner:</b> Millard Deck Estate	<b>Mineral Owner:</b>	<b>Lease No.:</b>
---	-----------------------	-------------------

**LOCATION OF RELEASE**

<b>Unit Letter</b> T	<b>Section</b> 3	<b>Township</b> 21S	<b>Range</b> 36E	<b>Feet from the</b>	<b>North/South Line</b>	<b>Feet from the</b>	<b>East/West Line</b>	<b>County</b> Lea
-------------------------	---------------------	------------------------	---------------------	----------------------	-------------------------	----------------------	-----------------------	----------------------

**Latitude:** N 32° 30' 10.54" **Longitude:** W 103° 15' 36.76"

**NATURE OF RELEASE**

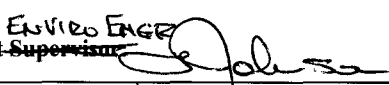
<b>Type of Release:</b> Crude Oil	<b>Volume of Release:</b> ~ 277 bbls	<b>Volume Recovered:</b> ~144 bbls
<b>Source of Release:</b> Tank Battery	<b>Date and Hour of Occurrence:</b> January 1, 2006, P. M.	<b>Date and Hour of Discovery:</b> January 2, 2006, A. M.
<b>Was Immediate Notice Given?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	<b>If YES, To Whom?</b> Gary Wink, NMOCD	
<b>By Whom?</b> Ralph Skinner	<b>Date and Hour:</b> January 2, 2006, A. M.	
<b>Was a Watercourse Reached?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If YES, Volume Impacting the Watercourse:</b> Not Applicable	

**If a Watercourse was Impacted, Describe Fully.\*** Not Applicable

**Describe Cause of Problem and Remedial Action Taken.\*** A steel storage tank located in a tank battery developed a leak in the sidewall near the interface with the bottom. Approximately 277 barrels of crude oil were released on the ground with recovery of approximately 144 barrels. After remedial action on the location is completed, a new tank battery will be erected within the confines of an earthen berm and underlain with a polyvinyl chloride liner acting as an impervious barrier.

**Describe Area Affected and Cleanup Action Taken.\*** The primary release area consisted of approximately 1,070 ft<sup>2</sup> with an overspray area of approximately 10,100 ft<sup>2</sup>. The overspray area was immediately sprayed with MicroBlaze to treat surface contamination. Remediation activities for the release area were conducted as follows: a.) approximately 322 cubic yards of contaminated soil were excavated with disposal at J & L Landfarm, Inc. and Sundance Services, Inc.; b.) laboratory analyses confirmed removal of soil above NMOCD remedial threshold goals with the exception of some isolated areas; c.) areas with elevated chloride and TPH concentrations should not be capable of impacting groundwater above NMWQCC groundwater standards due to depth of groundwater and dense caliche overburden; d.) backfilled excavated areas with caliche to top of original ground; e.) graded disturbed area to a level, uniform gradient; f) demolished old facilities and replaced with new tankage and piping system underlain with a polyethylene barrier and enclosed within an earthen berm

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.

<b>Signature:</b>		<b>OIL CONSERVATION DIVISION</b>	
<b>Printed Name:</b> Bradley Blevins		Approved by District Supervisor 	
<b>Title:</b> Field Supervisor		<b>Approval Date:</b> 11.8.06	<b>Expiration Date:</b>
<b>E-mail Address:</b> bblevins@chkenegy.com		<b>Conditions of Approval:</b>	<b>Attached</b> <input type="checkbox"/>
<b>Date:</b> 16 February 2006 <b>Phone:</b> (505) 391-1462 ext. 6224			

\* Attach Additional Sheets If Necessary

IRP# 386

# LETTER OF TRANSMITTAL

ENVIRONMENTAL  
PLUS, INC.



Date: October 26, 2006  
To: **Mr. Larry Johnson**  
Company Name: New Mexico Oil Conservation Division - Hobbs  
Address: 1625 North French Drive  
City / State / Zip: Hobbs, New Mexico 88240  
From: David P. Duncan  
CC: Bradley Blevins – Chesapeake Energy – Hobbs, NM  
Curtis Blake – Chesapeake Energy – Hobbs, NM  
Harlan Brown – Chesapeake Energy – Oklahoma City, OK  
Tim Wolters – Estate Manager – Midland, TX  
Project #: NMOCD Ref.1RP#386; EPI Ref. #160043  
Project Name: J.A. Akens –A- Oil Unit Tank Battery  
Subject: **Closure Report**

# of originals	# of copies	Description
1		Chesapeake Operating : J.A. Akens –A- Oil Unit Tank Battery

## Remarks:

Dear Mr. Johnson:

Enclosed is the Closure Report for the above referenced site. Copies of the report were distributed to appropriate Chesapeake Operating personnel and the Estate Manager for the Millard Deck Estate as noted above. Should you have any questions or concerns, please contact me at (505) 394-3481 or via email at [dduncan@envplus.net](mailto:dduncan@envplus.net).

Sincerely,

David P. Duncan  
Civil Engineer



P. O. Box 1558  
Eunice, NM 88240  
(505) 394-3481  
Fax: (505) 394-2601