CLOSURE REPORT

PRINCIPLE 1 & 2 BATTERY
EPI REF: #160032
NMOCD REF: 1RP-1037

UL-C (NE¼ OF THE NW¼) OF SECTION 27, T 18 S, R 31 E

≈ 8 MILE SOUTHEAST OF LOCO HILLS,

EDDY COUNTY, NEW MEXICO

LATITUDE: N 32° 43' 23.13" LONGITUDE: W 103° 51' 37.13"

SEPTEMBER 2006

PREPARED BY:

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

PREPARED FOR:

Chesapeake

Distribution List

Site Closure Report

Chesapeake Operating, Inc. – Principle 1 & 2 Battery

NMOCD Ref: 1RP-1037; EPI Ref: # 160032

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STANDARD OF CARE

Site Closure Report

Chesapeake Energy – Principle 1 & 2 Battery

NMOCD Ref: 1RP-1037; EPI Ref: #160032

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.

Prepared by:

David P. Duncan
Civil Engineer

Oct. 5, 2006
Date

Reviewed by:

Jason Stegemoller, MS
Environmental Scientist

October 5, 2006
Date

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PROJECT SYNOPSIS

Site Specific:

- ***Company Name:*** Chesapeake Operating, Inc.
- ***Facility Name:*** Principle 1 & 2 Battery
- ***Project Reference:*** 160032
- ***Company Contact(s):*** Bradley Blevins
- ***Site Location:*** WGS84 N32° 43' 23.13"; W103° 51' 37.13"
- ***Legal Description:*** Unit Letter-B (NE¼ of the NW¼), Section 27, T 18 S, R 31 E
- ***General Description:*** Approximately 8-mile southeast of Loco Hills, New Mexico
- ***Elevation:*** ~3,635-ft amsl
- ***Land Ownership:*** United States Federal Government – Bureau of Land Management
- ***EPI Personnel:*** Project Consultant – Iain Olness
  Site Foremen – Felix Hernandez

Release Specific:

- ***Product Released:*** Produced water
- ***Volume Released:*** ~ 154-barrels
- ***Volume Recovered:*** ~ 80-barrels
- ***Time of Occurrence:*** 9-17-05
- ***Time of Discovery:*** 9-18-05
- ***Release Source:*** Lightening struck a 500-barrel fiberglass produced water tank
- ***Initial Surface Area Affected:*** Release Area ~ 5,100 ft^2

Remediation Specific:

- ***Final Vertical extent of contaminates:*** ~ 2-feet bgs
- ***Water wells within 1,000-ft:*** None
- ***Private domestic water sources within 200-ft:*** None
- ***Depth to Ground Water:*** ~ 381-ft bgs
- ***Surface water bodies within 1,000-ft:*** None
- ***NMOCD Site Ranking Index:*** Zero (0) points (>100-ft to top of water table and >1,000-ft from water source)
- ***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 600mg/L, respectively
- ***RCRA Waste Classification:*** Exempt
- ***Remediation Option Proposed:*** a) excavated soil impacted above NMOCD remedial goals with disposal at Lea Landfill, Inc.; b) laboratory analyses confirmed removal of soil impacted above NMOCD remedial threshold goals in sidewalls and bottom of the excavations; c) back- filled excavated areas with caliche and sandy soil; d) graded release site to allow natural drainage of the area; and e) seeding of areas outside the tank battery perimeter with a grass blend preferred by the BLM
- ***Treatment/Disposal Facility:*** Lea Landfill, Inc., Lea County, New Mexico
- ***Volume disposed:*** Approximately 240-yds^3
- ***Project Completion Date:*** April 18, 2006

2.0 SITE AND RELEASE INFORMATION

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

Surface and mineral rights for the land surrounding the release site are owned by the United States Government with management overseen by the Department of the Interior – Bureau of Land Management. The area is an established oil field with pump jacks, tank batteries, pipelines, lease roads and other petroleum related facilities. The surrounding land is also used for livestock grazing.

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

Lightening struck a 500-barrel fiberglass produced water tank

2.3 ***What was the volume of the release? (if known):*** ~154 ***barrels of*** produced water

2.4 ***What was the volume recovered? (if known)***: ~ 80 ***barrels*** of produced water

2.5 ***When did the release occur? (if known):*** 9-17-05

2.6 ***Geological Description***

The New Mexico Bureau of Mines and Mineral Resources Ground-Water Report 3, "*Geology and Ground-Water Resources of Eddy County, New Mexico*" G.E. Hendrickson and R.S. Jones, 1952, describes the surface geology near the release site as the Dockum group overlying the Rustler formation with redbeds and sandstones. The total thickness of the Dockum group east of Artesia, New Mexico, is about 1,000 feet. Rocks of the Dockum group are undifferentiated. The ground surface is covered by a thin layer of drift sand in most places, but local dunes may exist from 20-40 feet high. Sand and gravel exists along dry washes; silt and sand in lake beds; includes some wind deposited sand around depressions.

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 and 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***

Information obtained from the New Mexico Office of the State Engineer's website and United States Geological Survey (USGS) database indicate groundwater in the unconfined aquifer at this site was projected to be >381-ft below ground surface (bgs) (reference *Table 1*). Soil borings BH-1 advanced on October 18, 2005 to depth of thirty (30) feet bgs encountered no groundwater. Groundwater gradient for this area is generally in the southerly direction.

2.9 Area Water Wells

No public water supply wells are located within 1,000-feet 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* and *Table 1)*

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[1]	**10 ppm**	**10 ppm**	**10 ppm**
BTEX[1]	**50 ppm**	**50 ppm**	**50 ppm**
TPH	**100 ppm**	**1,000 ppm**	**5,000 ppm**

[1] 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: April 11 through April 17, 2006

Total volume removed: 240- yds^3

4.2 ***Indicated soil treatment type:***

- ☒ ***Disposal***
- ☐ ***Land Treatment***
- ☐ ***Composting/Biopiling***
- ☐ ***Other*** ( )

Name and location of treatment/disposal facility:
Lea Landfill, Inc., Lea County, New Mexico

5.0 SAMPLING INFORMATION

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

During the advancement of one (1) soil boring (BH-1), soil samples were collected at two (2) feet and five (5) feet intervals initially, then at five (5) feet intervals to total depth (TD) of thirty (30) feet below ground surface (bgs). Soil samples were analyzed in the field for organic vapor and chloride concentrations utilizing the methods described below:

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

Chloride Concentrations – A LaMotte Chloride Test Kit was used for analyses of chloride concentrations.

Soil samples collected during the excavation of impacted material were analyzed for organic vapor and chloride concentrations utilizing the methods as described above.

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

Soil samples were collected during the advancement of one (1) soil boring utilizing a hollow core drill. Soil samples were collected at two (2) feet and five (5) feet intervals initially, then at five (5) foot intervals to total depth of the boring hole.

A portion of each soil sample collected was immediately labeled, put into laboratory containers and placed on ice for submittal to an independent laboratory for quantification of gasoline and diesel range organics (TPH); benzene, toluene, ethylbenzene and total xylenes (BTEX); sulfate and chloride concentrations. The remaining portion of each sample was analyzed in the field for chloride and organic vapor concentrations utilizing methods described in Section 5.0, ***Sampling Information***, subsection 5.1.

5.3 Discuss sample locations and provide rationale for their locations.

One (1) soil boring (BH-1) was advanced to a depth of thirty (30) feet bgs within the perimeter of the release area on October 18, 2005 to delineate vertical extent of contamination (reference *Figure 4*). Soil boring hole BH-1 was advanced to a total depth of thirty (30) feet bgs. Locale for BH-1 was chosen to be within the perimeter of the release area in the vicinity of the most visually contaminated zone.

6.0 ANALYTICAL RESULTS

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

Lithology of soil boring BH-1 was defined as sand to a depth of approximately fifteen (15) feet bgs, underlain by red clayey sand to total depth of approximately twenty (20) to twenty-five (25) bgs. The red clayey sand was underlain with friable caliche from a depth of approximately twenty-five (25) feet bgs to thirty (30) feet bgs (reference Appendix III, *Soil Boring Log*).

Field analyses of soil samples collected from BH-1 indicated organic vapor concentrations ranged from a low of 1.6 parts per million (ppm) at thirty (30) feet bgs to a high of 5.4 ppm at two (2) feet bgs. Chloride concentrations ranged from a low of 240 mg/Kg at thirty (30) feet bgs to a high of 400 mg/Kg at two (2) feet bgs.

Laboratory analytical data for soil samples collected from BH-1 indicated most BTEX constituent (benzene, toluene, ethylbenzene and o-xylenes) concentrations were not detected (ND) at or above laboratory analytical method detection limits (MDL) from ground surface to thirty (30) feet bgs. The one (1) exception was m,p-xylenes which indicated a concentration of 0.0254 mg/Kg at two (2) feet bgs. TPH concentrations ranged from ND at or above laboratory analytical method detection limits at five (5) feet bgs to 13.6 mg/Kg at two (2) feet bgs. Chloride concentrations ranged from 31.3 mg/Kg at ten (10) feet bgs to 407 mg/Kg at two (2) feet bgs (reference *Table 2*).

During excavation of the release area, soil samples were collected from various locations for both laboratory and field analyses. Laboratory and field analytical procedures were identical to those utilized in the advancement of soil boring BH-1 as described previously. Areas where organic vapor or chloride concentrations exceeded remedial threshold goals were excavated until the goals were met. However, compliance with site remedial threshold goals for BTEX, TPH, chloride and sulfate concentrations was determined by laboratory analytical data (reference *Table 3*).

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.

7. 0 DISCUSSION

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

Based on depth to groundwater (>381-ft bgs), sulfate and chloride residual concentrations remaining in the soil should not be capable of impacting groundwater above NMWQCC Groundwater Standards of 600 mg/L and 250 mg/L, respectively.

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.***

To determine the vertical extent of production fluid impacted soil, a soil boring hole (BH-1) was advanced within the perimeter of the release area are on October 18, 2005. After compilation of field and laboratory analytical data as outlined in Article 4, *Subsurface Soil Investigation,* for soil boring BH-1, EPI submitted a *Site Characterization Report* to NMOCD on December 5, 2005 inclusive of Field Work, Analytical Data and Summary of the vertical and lateral extent of impacted soil within the release area. A meeting conducted on December 14, 2005 between representatives of NMOCD, Chesapeake and EPI concluded restoration of adjacent surface area to enhance re-vegetation was of concern. This effort was coordinated with BLM personnel.

In compliance with this agreement, EPI started removal of impacted soil from the release area on April 11 and concluded the process on April 17, 2006. Approximately 240 yds^3 of impacted soil were excavated from the release area with disposal at Lea Landfill, Inc. After extracting impacted soil to a depth of approximately two-feet (2-ft.), six (6) soil samples were collected from the bottom of the excavation and analyzed in the field for organic vapors and chlorides utilizing methods outlined in Section 4, *Subsurface Soil Investigation.* Two (2) areas in the bottom of the excavation were over-excavated due to high chloride concentrations. Four (4) soil samples collected from the bottom of the excavation on April 12, 2006 and three (3) soil samples collected from the sidewalls on April 13, 2006 were transported to an independent laboratory for analyses of BTEX, TPH, chlorides and sulfates. A review of Table 3, *Summary of Excavated Soil Sample Field Analyses and Laboratory Analytical Results,* indicates all soil samples were below site remedial threshold goals with the exception of BH-1 (2') which indicated chloride concentrations of 260 mg/Kg. This value is slightly above site remedial threshold goals of 250 mg/Kg. However, due to the depth of groundwater (>381-ft), possibility of contamination above NMWQCC Groundwater Standards of 250 mg/L was very remote.

Backfilling of the excavation started on April 17 and ended on April 18, 2006. Approximately 200 yds^3 of caliche were transported from a BLM approved pit for use as backfill material. The use of caliche for backfill material was justified as the primary release area was located within the tank battery perimeter. A secondary area contiguous with the primary area was backfilled with sandy soil from nearby dunes. The disturbed surface around the release area was graded to allow natural drainage. Although the sandy soil used to backfill the secondary

area will enhance the growth of indigenous grasses and plants, the area will be seeded with a grass blend approved by the BLM.

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

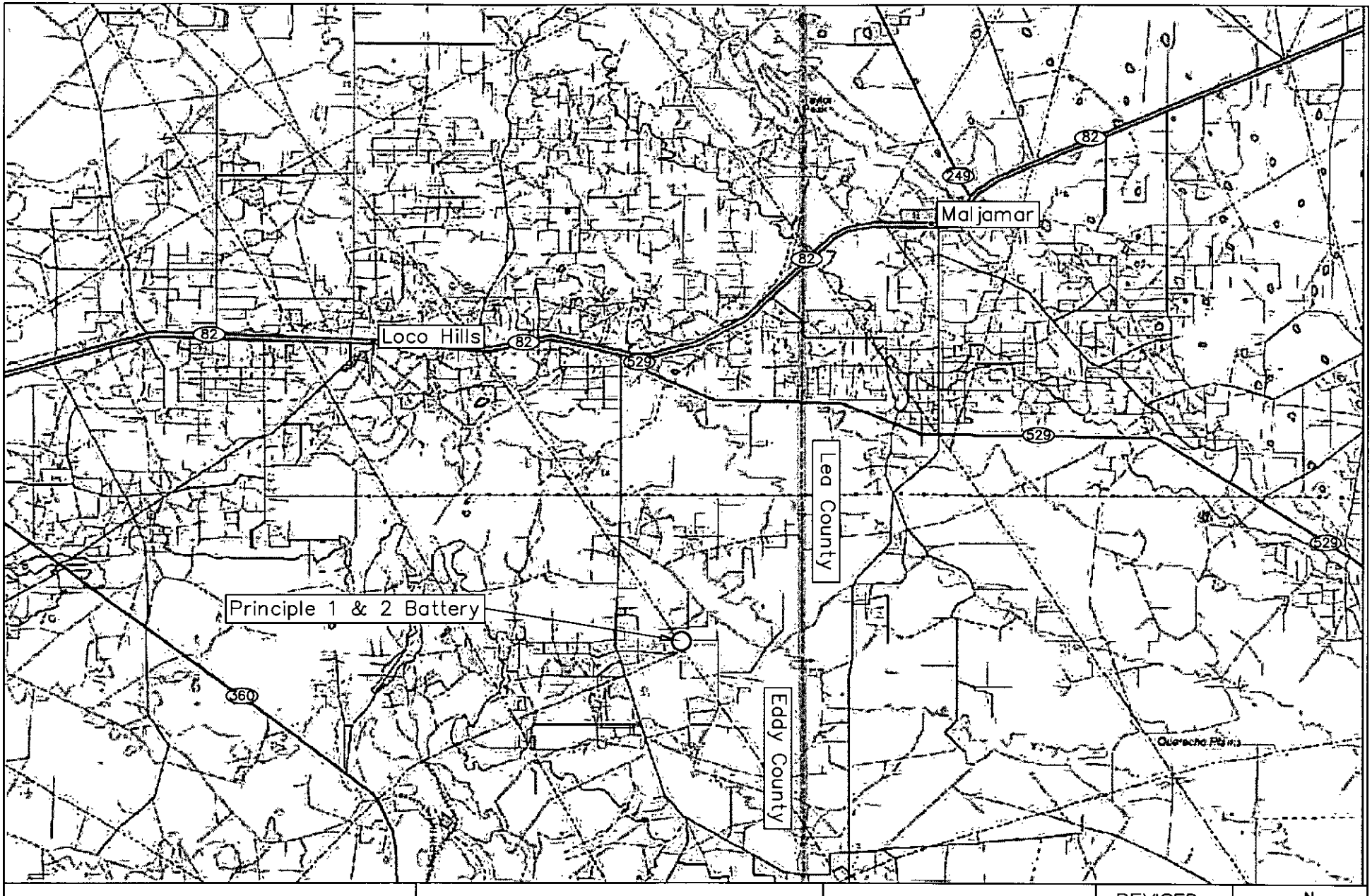

Figure 1
Area Map
Chesapeake Energy
Principle 1 & 2 Battery

Eddy County, New Mexico
NE 1/4 of the NW 1/4, Sec. 27, T18S, R31E
N 32° 43' 23.13" W 103° 51' 37.13"
Elevation: 3,635 feet amsl

DWG By: Jason Stegemoller
September 2005

REVISED:

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SHEET
1 of 1

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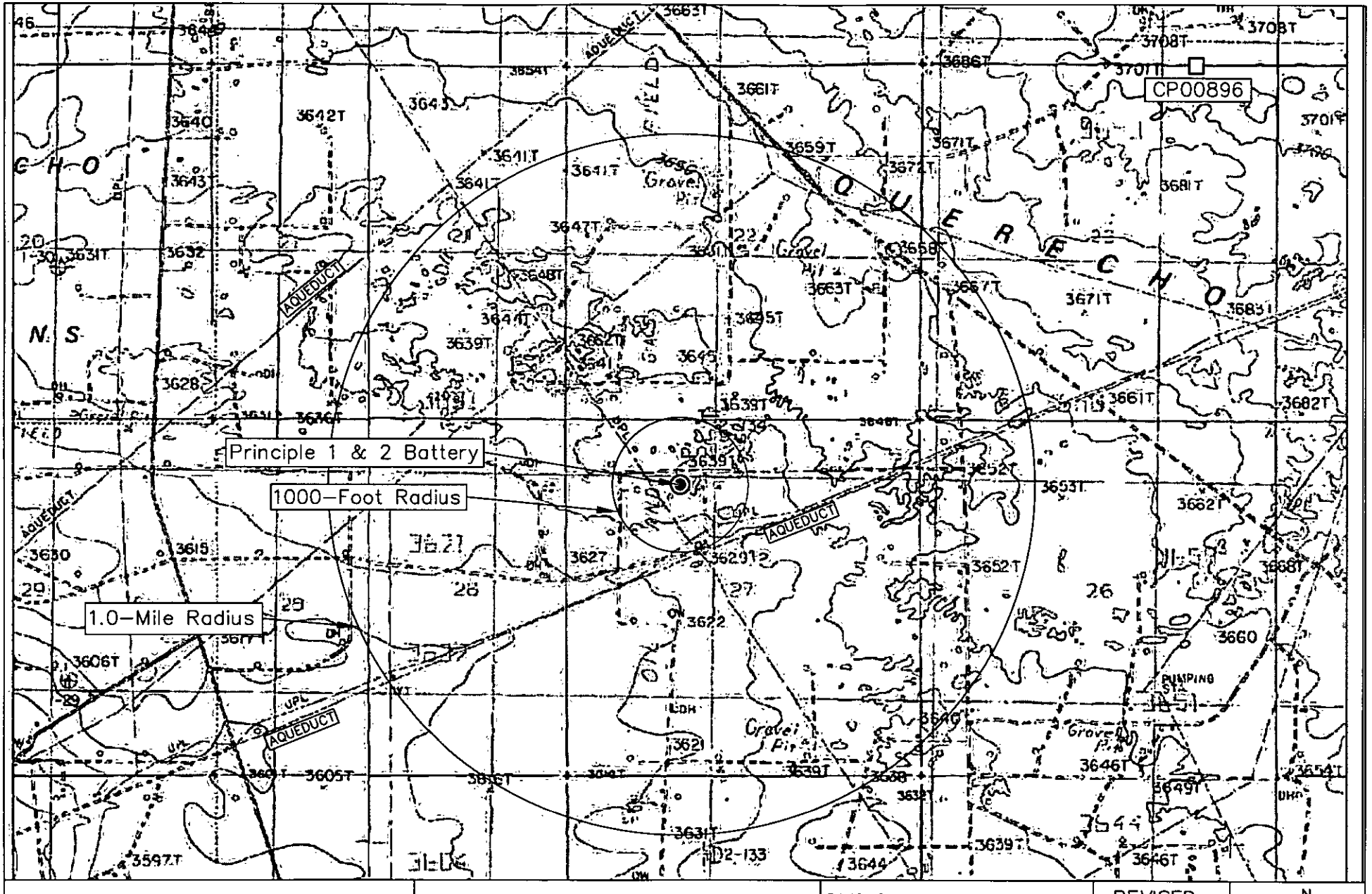

Figure 2 Site Location Map Chesapeake Energy Principle 1 & 2 Battery	Eddy County, New Mexico NE 1/4 of the NW 1/4, Sec. 27, T18S, R31E N 32° 43' 23.13" W 103° 51' 37.13" Elevation: 3,635 feet amsl	DWG By: Jason Stegemoller September 2005 0 2,000 4,000 Feet	REVISED: SHEET 1 of 1

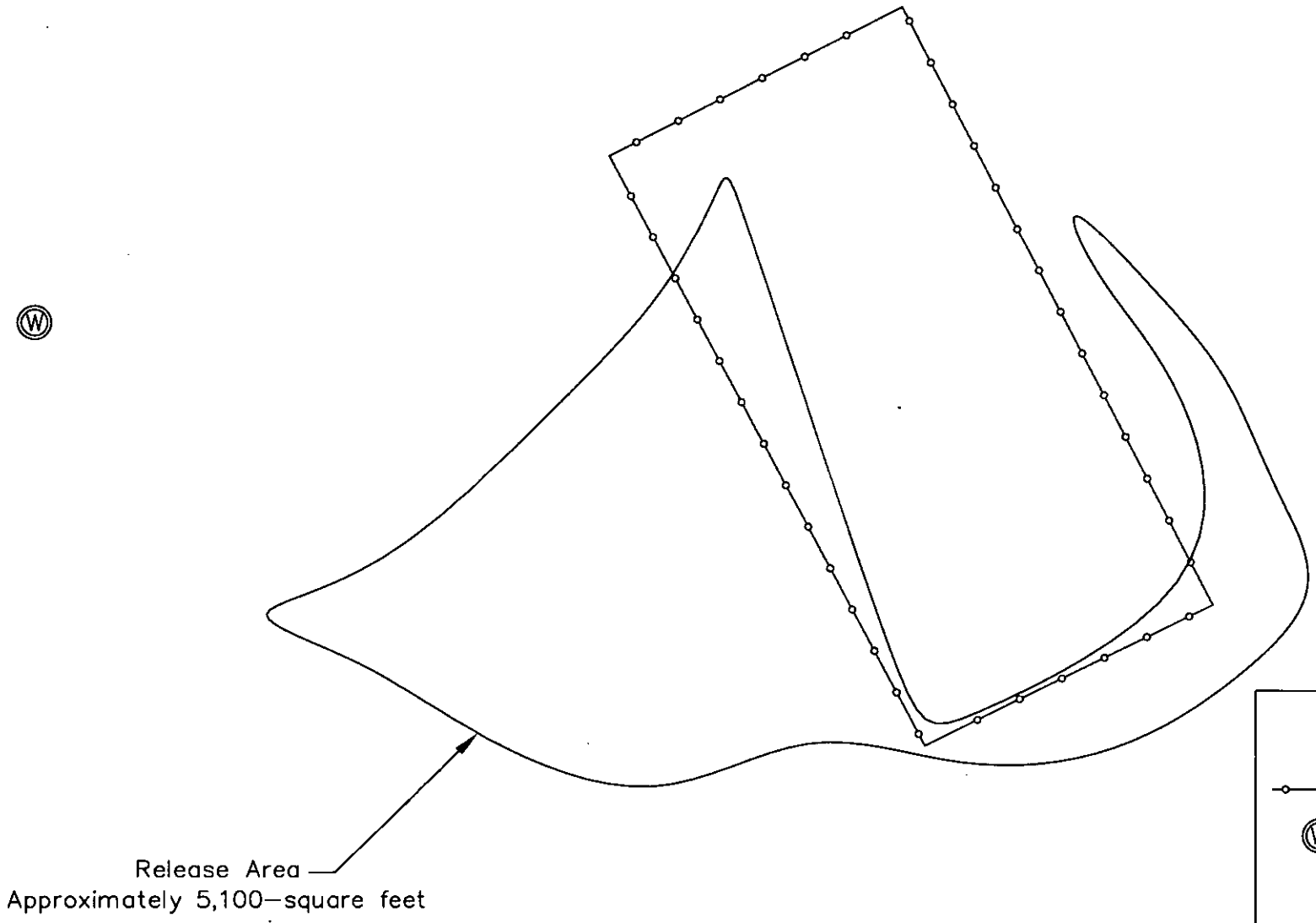

Figure 3 Site Map Chesapeake Energy Principle 1 & 2 Battery	Eddy County, New Mexico NE 1/4 of the NW 1/4, Sec. 27, T18S, R31E N 32 ° 43' 23.13" W 103° 51' 37.13" Elevation: 3,635 feet amsl	DWG By: Jason Stegemoller September 2005 0 25 50 Feet	REVISED: SHEET 1 of 1	N

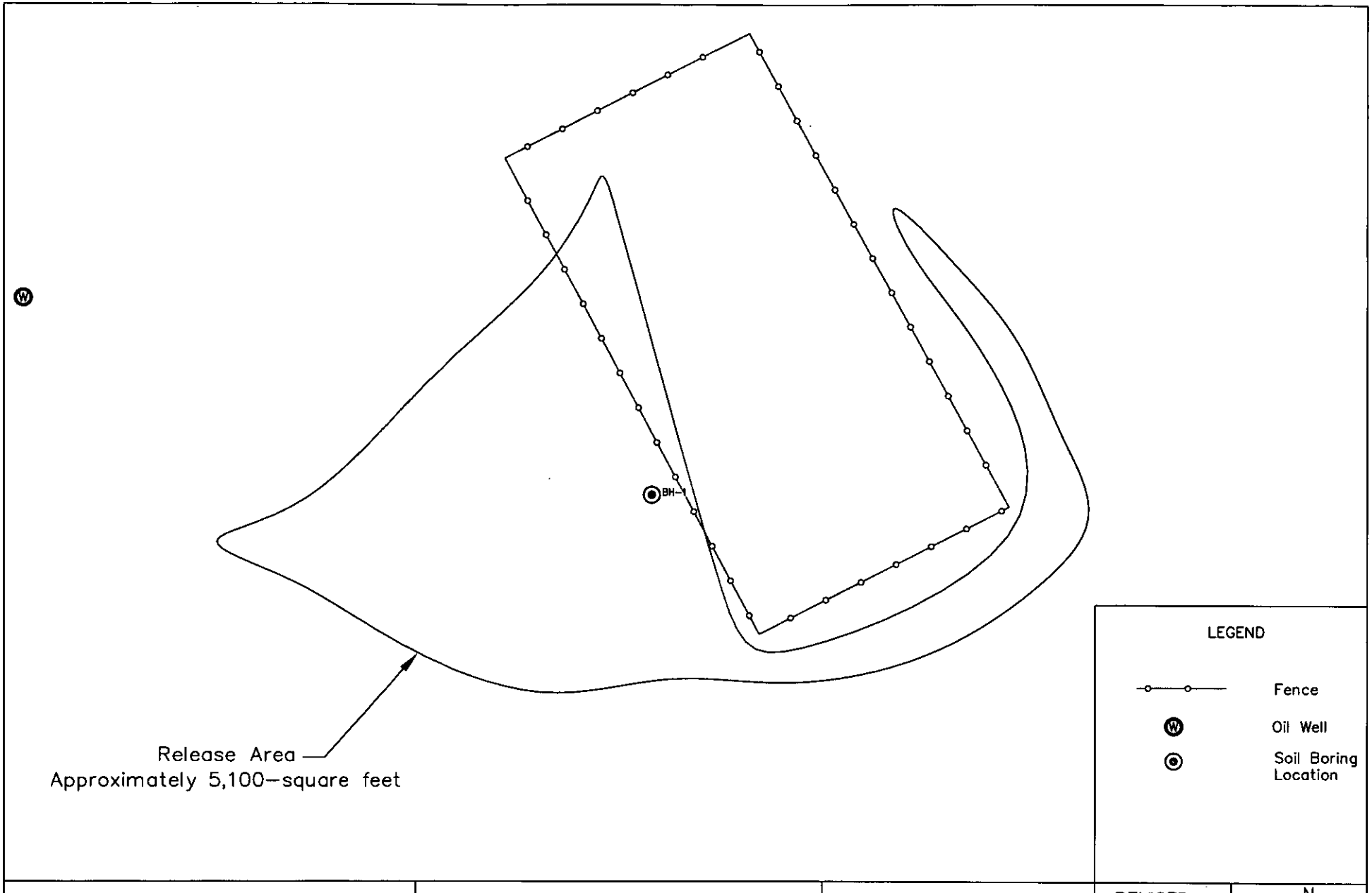

Figure 4 Soil Boring Location Map Chesapeake Energy Principle 1 & 2 Battery	Eddy County, New Mexico NE 1/4 of the NW 1/4, Sec. 27, T18S, R31E N 32 ° 43' 23.13" W 103° 51' 37.13" Elevation: 3,635 feet amsl	DWG By: Jason Stegemoller September 2005	REVISED: June 2006 SHEET 1 of 1

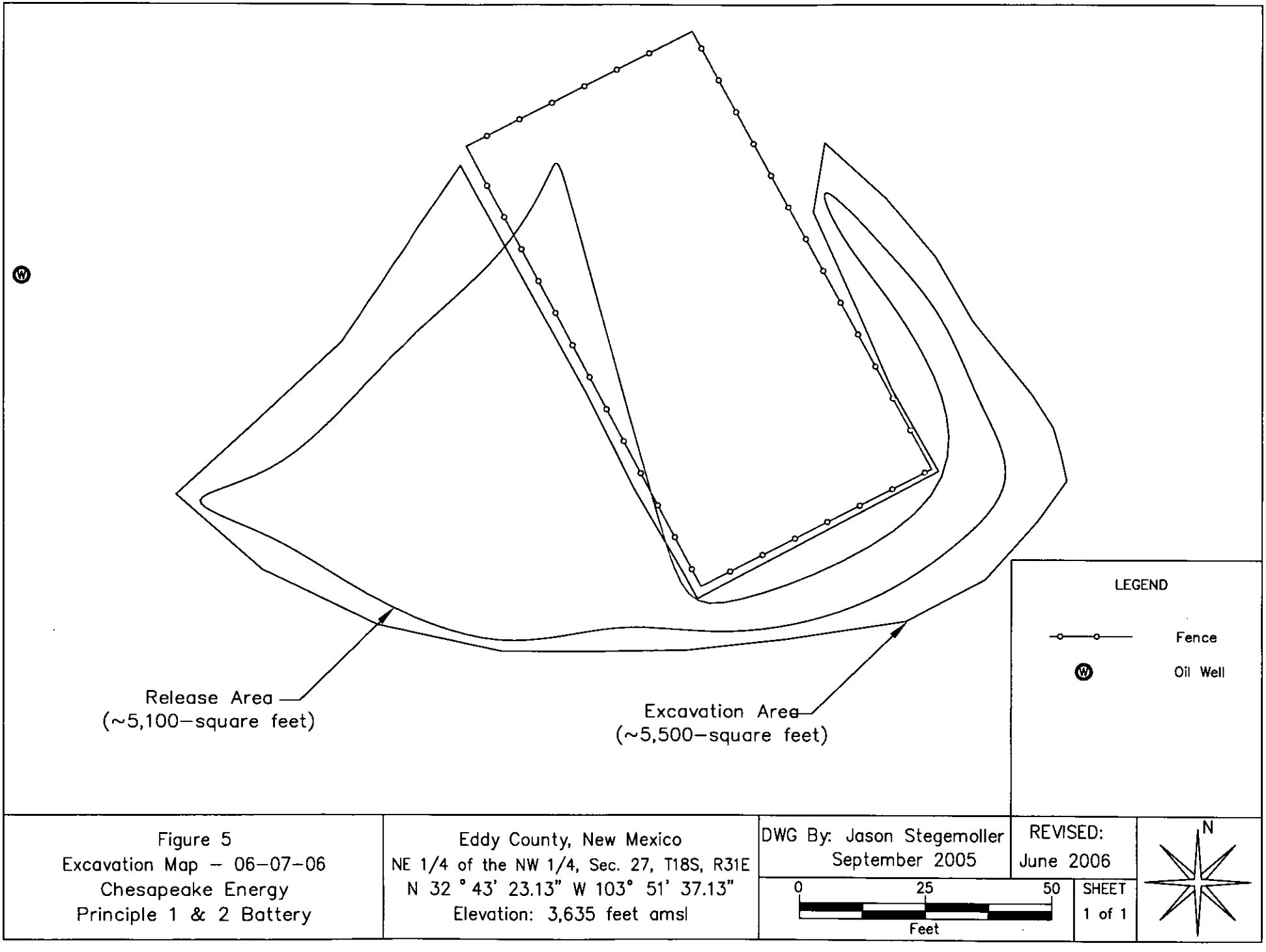

Figure 5 Excavation Map – 06–07–06 Chesapeake Energy Principle 1 & 2 Battery	Eddy County, New Mexico NE 1/4 of the NW 1/4, Sec. 27, T18S, R31E N 32 ° 43' 23.13" W 103° 51' 37.13" Elevation: 3,635 feet amsl	DWG By: Jason Stegemoller September 2005	REVISED: June 2006	SHEET 1 of 1

TABLES

TABLE 1

Well Data

Chesapeake Energy Principle 1 & 2 Battery (Ref. #160032)

Well Number	Diversion[A]	Owner	Use	Twsp	Rng	Sec q q q	Latitude	Longitude	Date Measured	Surface Elevation[B]	Well Depth (ft bgs)	Depth to Water (ft bgs)
CP.00896	3	Thelma A. Webber & B.L.M.	STK	18S	31E	14 4 4 1	N 32° 44' 24.75"	W 103° 50' 7.41"			400	
USGS #1				18S	31E	01 4 4 4			17-Mar-94			454.25
USGS #2				18S	31E	12 2 3 1			17-Mar-94			434.14
USGS #3				18S	31E	14 2 2 1			17-Mar-94			376.82
USGS #4				18S	31E	35 3 1 3			17-Mar-94			260.67

* = Data obtained from the New Mexico Office of the State Engineer Website (http://iwaters.ose.state.nm.us:7001/iWATERS/wr_RegisServlet) and the USGS website (http://waterdata.usgs.gov/nwis).

Shaded areas indicate well locations shown on Figure 2

[A] = in acre feet per annum

[B] = Elevation interpolated from USGS topographical map based on referenced location.

STK = Livestock Watering

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

TABLE 2

Summary of Soil Boring Soil Sample Analytical Results

Chesapeake Energy - Principle 1 & 2 Battery (Ref. #160032)

Soil Boring	Depth (feet)	Soil Status	Sample Date	PID Reading (ppm)	Field Chloride (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	m,p-Xylenes (mg/Kg)	o-Xylene (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
BH-1	2	Excavated	18-Oct-05	5.4	400	<0.0250	<0.0250	<0.0250	0.0254	<0.0250	0.0254	<10.0	13.6	13.6	**407**
	5	In-situ	18-Oct-05	2.5	400	<0.0250	<0.0250	<0.0250	0.0235 [1]	<0.0250	0.0235 [1]	<10.0	<10.0	<10.0	51.1
	10	In-situ	18-Oct-05	3.3	320	--	--	--	--	--	--	--	--	--	31.3
	15	In-situ	18-Oct-05	3.5	320	--	--	--	--	--	--	--	--	--	--
	20	In-situ	18-Oct-05	1.6	240	--	--	--	--	--	--	--	--	--	--
	25	In-situ	18-Oct-05	1.7	240	--	--	--	--	--	--	--	--	--	--
	30	In-situ	18-Oct-05	1.6	240	--	--	--	--	--	--	--	--	--	--
NMOCD Remedial Thresholds				100 [2]		10					50			5,000	250 [3]

Bolded *values are in excess of NMOCD Remediation Threshold Goals*

[1] *Estimated value concentration below Labatory Limits*

-- *: Not Analyzed*

[2] *In lieu of laboratory analyes of benzene, toluene, ethylbenzene and total xylenes.*

[3] *Chloride residuals may not be capable of impacting local groundwaterabove the NMWQCCstandard of 250 mg/L*

Shaded cells indicate soil samples collected from In-situ sample points

TABLE 3

Summary of Excavation Soil Sample Field Analyses and Laboratory Analytical Results

Chesapeake Energy - Principle 1 & 2 Battery (Ref. #160032)

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 BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	C29 - C35 Range Organics (mg/Kg)	Total TPH (mg/Kg)	Chloride (mg/Kg)	Sulfates (mg/Kg)
BH-1	2	In-situ	12-Apr-06	16.8	360	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	**260**	**35**
BH-2	2	In-situ	12-Apr-06	30.4	360	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	**140**	**22**
BH-3	2	In-situ	12-Apr-06	6.8	360	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	**190**	**14**
BH-4	2	In-situ	12-Apr-06	10.1	400	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	**74**	<5.0
SW-1	1.3	In-situ	13-Apr-06	21.8	400	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	<10	<5.0
SW-2	1.3	In-situ	13-Apr-06	15.6	360	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	<10	<5.0
SW-3	1.3	In-situ	13-Apr-06	25.0	360	<0.005	<0.005	<0.005	<0.010	<0.025	<10	<10	<20	<40	<10	<5.0
NMOCD Remedial Thresholds				100		10				50				5,000	250 [1]	600 [1]

Bolded values are in excess of NMOCD Remediation Thresholds

BH = Bottom Hole

SW = Sidewall

[1] = Chloride and sulfate residuals may not be capable of impacting local groundwater above NMWQCC standards of 250 mg/Kg and 600 mg/Kg, respectively

Shaded cells indicate soil samples collected from In-situ sample points

APPENDICES

APPENDIX I

LABORATORY ANALYTICAL REPORTS
AND
CHAIN-OF-CUSTODY FORM

ENVIRONMENTAL 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/ Principle 1 & 2 Batt.

Project Number: 160032

Location: UL-C, Sect. 27, T 18 S, R 31 E

Lab Order Number: 5J19009

Report Date: 10/31/05

Environmental Plus, Incorporated	Project: Chesapeake/ Principle 1 & 2 Batt.	Fax: 505-394-2601
P.O. Box 1558	Project Number: 160032	**Reported:**
Eunice NM, 88231	Project Manager: Iain Olness	10/31/05 11:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH-1 2'	5J19009-01	Soil	10/18/05 09:10	10/19/05 14:10
BH-1 5'	5J19009-02	Soil	10/18/05 09:15	10/19/05 14:10
BH-1 10'	5J19009-03	Soil	10/18/05 09:20	10/19/05 14:10

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-1 2' (5J19009-01) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EJ51903	10/19/05	10/19/05	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	**0.0254**	0.0250	"	"	"	"	"	"	
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*85.8 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*102 %*	*80-120*		"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EJ51913	10/19/05	10/20/05	EPA 8015M	
Diesel Range Organics >C12-C35	**13.6**	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	**13.6**	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		*86.0 %*	*70-130*		"	"	"	"	
Surrogate: 1-Chlorooctadecane		*76.8 %*	*70-130*		"	"	"	"	
BH-1 5' (5J19009-02) Soil									
Benzene	ND	0.0250	mg/kg dry	25	EJ51903	10/19/05	10/19/05	EPA 8021B	
Toluene	ND	0.0250	"	"	"	"	"	"	
Ethylbenzene	ND	0.0250	"	"	"	"	"	"	
Xylene (p/m)	**J [0.0235]**	0.0250	"	"	"	"	"	"	J
Xylene (o)	ND	0.0250	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*83.5 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*90.2 %*	*80-120*		"	"	"	"	
Gasoline Range Organics C6-C12	ND	10.0	mg/kg dry	1	EJ51913	10/19/05	10/20/05	EPA 8015M	
Diesel Range Organics >C12-C35	ND	10.0	"	"	"	"	"	"	
Total Hydrocarbon C6-C35	ND	10.0	"	"	"	"	"	"	
Surrogate: 1-Chlorooctane		*94.0 %*	*70-130*		"	"	"	"	
Surrogate: 1-Chlorooctadecane		*80.6 %*	*70-130*		"	"	"	"	

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-1 2' (5J19009-01) Soil									
Chloride	**407**	10.0	mg/kg	20	EJ52107	10/20/05	10/21/05	EPA 300.0	
% Moisture	**1.4**	0.1	%	1	EJ51912	10/19/05	10/20/05	% calculation	
BH-1 5' (5J19009-02) Soil									
Chloride	**51.1**	5.00	mg/kg	10	EJ52107	10/20/05	10/21/05	EPA 300.0	
% Moisture	**0.3**	0.1	%	1	EJ51912	10/19/05	10/20/05	% calculation	
BH-1 10' (5J19009-03) Soil									
Chloride	**31.3**	5.00	mg/kg	10	EJ52616	10/25/05	10/26/05	EPA 300.0	

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 EJ51903 - EPA 5030C (GC)										
Blank (EJ51903-BLK1)				Prepared & Analyzed: 10/19/05						
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	*37.0*		*ug/kg*	*40.0*		*92.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*35.9*		"	*40.0*		*89.8*	*80-120*			
LCS (EJ51903-BS1)				Prepared & Analyzed: 10/19/05						
Benzene	0.0423	0.00100	mg/kg wet	0.0500		84.6	80-120			
Toluene	0.0476	0.00100	"	0.0500		95.2	80-120			
Ethylbenzene	0.0539	0.00100	"	0.0500		108	80-120			
Xylene (p/m)	0.0997	0.00100	"	0.100		99.7	80-120			
Xylene (o)	0.0544	0.00100	"	0.0500		109	80-120			
Surrogate: a,a,a-Trifluorotoluene	*38.1*		*ug/kg*	*40.0*		*95.2*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*35.9*		"	*40.0*		*89.8*	*80-120*			
Calibration Check (EJ51903-CCV1)				Prepared: 10/19/05 Analyzed: 10/20/05						
Benzene	42.0		ug/kg	50.0		84.0	80-120			
Toluene	48.4		"	50.0		96.8	80-120			
Ethylbenzene	59.3		"	50.0		119	80-120			
Xylene (p/m)	109		"	100		109	80-120			
Xylene (o)	59.7		"	50.0		119	80-120			
Surrogate: a,a,a-Trifluorotoluene	*38.2*		"	*40.0*		*95.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*38.8*		"	*40.0*		*97.0*	*80-120*			
Matrix Spike (EJ51903-MS1)	**Source: 5J19002-07**			Prepared & Analyzed: 10/19/05						
Benzene	1.11	0.0250	mg/kg dry	1.30	ND	85.4	80-120			
Toluene	1.27	0.0250	"	1.30	ND	97.7	80-120			
Ethylbenzene	1.48	0.0250	"	1.30	ND	114	80-120			
Xylene (p/m)	2.73	0.0250	"	2.60	ND	105	80-120			
Xylene (o)	1.44	0.0250	"	1.30	ND	111	80-120			
Surrogate: a,a,a-Trifluorotoluene	*40.5*		*ug/kg*	*40.0*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*39.9*		"	*40.0*		*99.8*	*80-120*			

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 EJ51903 - EPA 5030C (GC)										
Matrix Spike Dup (EJ51903-MSD1)	**Source: 5J19002-07**			Prepared: 10/19/05 Analyzed: 10/20/05						
Benzene	1.22	0.0250	mg/kg dry	1.30	ND	93.8	80-120	9.38	20	
Toluene	1.37	0.0250	"	1.30	ND	105	80-120	7.20	20	
Ethylbenzene	1.53	0.0250	"	1.30	ND	118	80-120	3.45	20	
Xylene (p/m)	3.12	0.0250	"	2.60	ND	120	80-120	13.3	20	
Xylene (o)	1.56	0.0250	"	1.30	ND	120	80-120	7.79	20	
Surrogate: a,a,a-Trifluorotoluene	*37.8*		*ug/kg*	*40.0*		*94.5*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*39.8*		*"*	*40.0*		*99.5*	*80-120*			
Batch EJ51913 - Solvent Extraction (GC)										
Blank (EJ51913-BLK1)				Prepared & Analyzed: 10/19/05						
Gasoline Range Organics C6-C12	ND	10.0	mg/kg wet							
Diesel Range Organics >C12-C35	ND	10.0	"							
Total Hydrocarbon C6-C35	ND	10.0	"							
Surrogate: 1-Chlorooctane	*41.6*		*mg/kg*	*50.0*		*83.2*	*70-130*			
Surrogate: 1-Chlorooctadecane	*42.5*		*"*	*50.0*		*85.0*	*70-130*			
LCS (EJ51913-BS1)				Prepared & Analyzed: 10/19/05						
Gasoline Range Organics C6-C12	415	10.0	mg/kg wet	500		83.0	75-125			
Diesel Range Organics >C12-C35	414	10.0	"	500		82.8	75-125			
Total Hydrocarbon C6-C35	829	10.0	"	1000		82.9	75-125			
Surrogate: 1-Chlorooctane	*48.3*		*mg/kg*	*50.0*		*96.6*	*70-130*			
Surrogate: 1-Chlorooctadecane	*53.8*		*"*	*50.0*		*108*	*70-130*			
Calibration Check (EJ51913-CCV1)				Prepared: 10/19/05 Analyzed: 10/20/05						
Gasoline Range Organics C6-C12	469		mg/kg	500		93.8	80-120			
Diesel Range Organics >C12-C35	443		"	500		88.6	80-120			
Total Hydrocarbon C6-C35	912		"	1000		91.2	80-120			
Surrogate: 1-Chlorooctane	*54.9*		*"*	*50.0*		*110*	*70-130*			
Surrogate: 1-Chlorooctadecane	*52.1*		*"*	*50.0*		*104*	*70-130*			

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 EJ51913 - Solvent Extraction (GC)										
Matrix Spike (EJ51913-MS1)	**Source: 5J19007-01**			Prepared & Analyzed: 10/19/05						
Gasoline Range Organics C6-C12	427	10.0	mg/kg dry	512	ND	83.4	75-125			
Diesel Range Organics >C12-C35	426	10.0	"	512	ND	83.2	75-125			
Total Hydrocarbon C6-C35	853	10.0	"	1020	ND	83.6	75-125			
Surrogate: 1-Chlorooctane	*50.8*		*mg/kg*	*50.0*		*102*	*70-130*			
Surrogate: 1-Chlorooctadecane	*52.6*		"	*50.0*		*105*	*70-130*			
Matrix Spike Dup (EJ51913-MSD1)	**Source: 5J19007-01**			Prepared & Analyzed: 10/19/05						
Gasoline Range Organics C6-C12	429	10.0	mg/kg dry	512	ND	83.8	75-125	0.467	20	
Diesel Range Organics >C12-C35	412	10.0	"	512	ND	80.5	75-125	3.34	20	
Total Hydrocarbon C6-C35	841	10.0	"	1020	ND	82.5	75-125	1.42	20	
Surrogate: 1-Chlorooctane	*50.2*		*mg/kg*	*50.0*		*100*	*70-130*			
Surrogate: 1-Chlorooctadecane	*51.4*		"	*50.0*		*103*	*70-130*			

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
Batch EJ51912 - General Preparation (Prep)										
Blank (EJ51912-BLK1)				Prepared: 10/19/05 Analyzed: 10/20/05						
% Solids	100		%							
Duplicate (EJ51912-DUP1)		**Source: 5J18008-01**		Prepared: 10/19/05 Analyzed: 10/20/05						
% Solids	89.1		%		89.2			0.112	20	
Duplicate (EJ51912-DUP2)		**Source: 5J19008-02**		Prepared: 10/19/05 Analyzed: 10/20/05						
% Solids	92.2		%		91.9			0.326	20	
Batch EJ52107 - Water Extraction										
Blank (EJ52107-BLK1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	ND	0.500	mg/kg							
LCS (EJ52107-BS1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	8.90		mg/L	10.0		89.0	80-120			
Calibration Check (EJ52107-CCV1)				Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	9.05		mg/L	10.0		90.5	80-120			
Duplicate (EJ52107-DUP1)		**Source: 5J19009-01**		Prepared: 10/20/05 Analyzed: 10/21/05						
Chloride	360	10.0	mg/kg		407			12.3	20	
Batch EJ52616 - Water Extraction										
Blank (EJ52616-BLK1)				Prepared: 10/25/05 Analyzed: 10/26/05						
Chloride	ND	0.500	mg/kg							

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
Batch EJ52616 - Water Extraction										
LCS (EJ52616-BS1)				Prepared: 10/25/05 Analyzed: 10/26/05						
Chloride	8.39		mg/L	10.0		83.9	80-120			
Calibration Check (EJ52616-CCV1)				Prepared: 10/25/05 Analyzed: 10/26/05						
Chloride	8.49		mg/L	10.0		84.9	80-120			
Duplicate (EJ52616-DUP1)		**Source: 5J19002-01**		Prepared: 10/25/05 Analyzed: 10/26/05						
Chloride	390	10.0	mg/kg		394			1.02	20	

Notes and Definitions

J

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not ReportedDetected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
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: Celey D. Keene Date: 10/31/2005

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
James L. Hawkins, Chemist/Geologist
Sandra Sanchez, Lab Tech.

Environmental Plus, Inc.

Chain of Custody Form

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

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	Principle 1 & 2 Batt.
Location	UL-C, Sect. 27, T 18 S, R 31 E
Project Reference	160032
EPI Sampler Name	John Robinson

Bill To

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

ANALYSIS REQUEST

LAB I.D. 5J19009		SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015M	CHLORIDES (Cl⁻)	SULFATES ($SO_4^{=}$)	pH	TCLP	OTHER >>>	PAH			
-01	1	BH-1 (2')	G	1			1					X		18-Oct-05	9:10	X	X	X							
-02	2	BH-1 (5')	G	1			1					X		18-Oct-05	9:15	X	X	X							
-03	3	BH-1 (10')	G	1			1					X		18-Oct-05	9:20			X			See Notes				
-04	4	BH-1 (15')	G	1			1					X		18-Oct-05	9:30			X			See Notes				
-05	5	BH-1 (20')	G	1			1					X		18-Oct-05	9:46	X	X	X			See Notes				
-06	6	BH-1 (25')	G	1			1					X		18-Oct-05	9:57	X	X	X			See Notes				
-07	7	BH-1 (30')	G	1			1					X		18-Oct-05	10:10			X			See Notes				
	8																								
	9																								
	10																								

Sampler Relinquished: Iain Olness — Date: 10/19/05 — Time: 1055 — Received By: Jesse Millan

Relinquished by: Jesse Millan — Date: 10/19/05 — Time: 2:10 — Received By: (lab staff) Carrie Kelly

Delivered by:

Sample Cool & Intact: Yes / No

Checked By:

E-mail results to: iolness@envplus.net

NOTES: Analyze subsequent samples for chloride until two consecutive samples are below 250 mg/Kg. Only Analyze BH-1 (20') and BH-1 (25') for TPH and BTEX if analytical results for BH-1 (5') indicate TPH >5.000 ppm, benzene >10 ppm and/or BTEX >50 ppm.

chlorides have plastic bags / 4oz

Labels seals on jars

5.0

Environmental Lab of Texas
Variance / Corrective Action Report – Sample Log-In

Client: EPI

Date/Time: 10/19/15 2:15

Order #: 5J19009

Initials: CK

Sample Receipt Checklist

Temperature of container/cooler?	Yes	No	5.0 C
Shipping container/cooler in good condition?	(Yes)	No	
Custody Seals intact on shipping container/cooler?	(Yes)	No	Not present
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	
All samples received within sufficient hold time?	(Yes)	No	
VOC samples have zero headspace?	(Yes)	No	(Not Applicable) for Chloride samples

Other observations:

_____

_____

_____

Variance Documentation:

Contact Person: - _____ Date/Time: _____ Contacted by: _____

Regarding:

_____

_____

_____

Corrective Action Taken:

_____

_____

_____

_____

_____

_____

_____

_____

argon laboratories

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

REPORT DATE: 04/25/06
SAMPLE DATE(S): 04/12/06
04/13/06
AL JOB #: A04191

ATTN: IAIN OLNESS
CLIENT PROJ. ID: 160032
Principle 1 & 2 Batt.
UL-I, Sect. 27, T 18 S, R 31 E

Project Summary:

On April 19, 2006, this laboratory received 7 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

2126 W. Marland Ave., Hobbs, NM 88240 • Phone (505) 397-0295 • Fax (505) 397-0296
email: info@argonlabs.com

argon laboratories

Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-1 (2') (A04191 Soil) Sampled: 04/12/06 Received: 04/19/06							
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 106%

Volatile Organics - EPA Method 8021B

BH-1 (2') (A04191 Soil) Sampled: 04/12/06 Received: 04/19/06							
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 105%

Anions by Ion Chromatography - EPA Method 300.0

BH-1 (2') (A04191 Soil) Sampled: 04/12/06 Received: 04/19/06							
Chloride	260	20	mg/Kg	2	04/23/06	EPA 300.0	
Sulfate	35	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

Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-2 (2') (A04192 Soil) Sampled: 04/12/06 Received: 04/19/06							
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 80%

Volatile Organics - EPA Method 8021B

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-2 (2') (A04192 Soil) Sampled: 04/12/06 Received: 04/19/06							
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 92%

Anions by Ion Chromatography - EPA Method 300.0

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-2 (2') (A04192 Soil) Sampled: 04/12/06 Received: 04/19/06							
Chloride	140	10	mg/Kg	1	04/23/06	EPA 300.0	
Sulfate	22	5.0	"	"	"	"	

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

Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-3 (2') (A04193 Soil)	**Sampled: 04/12/06**	**Received: 04/19/06**					
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 81%

Volatile Organics - EPA Method 8021B

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-3 (2') (A04193 Soil)	**Sampled: 04/12/06**	**Received: 04/19/06**					
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 110%

Anions by Ion Chromatography - EPA Method 300.0

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-3 (2') (A04193 Soil)	**Sampled: 04/12/06**	**Received: 04/19/06**					
Chloride	190	20	mg/Kg	2	04/23/06	EPA 300.0	
Sulfate	14	10	"	"	"	"	

Approved By
Argon Laboratories

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Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-4 (2') (A04194 Soil) Sampled: 04/12/06 Received: 04/19/06							
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 95%

Volatile Organics - EPA Method 8021B

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-4 (2') (A04194 Soil) Sampled: 04/12/06 Received: 04/19/06							
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 109%

Anions by Ion Chromatography - EPA Method 300.0

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
BH-4 (2') (A04194 Soil) Sampled: 04/12/06 Received: 04/19/06							
Chloride	74	10	mg/Kg	1	04/23/06	EPA 300.0	
Sulfate	<5.0	5.0	"	"	"	"	

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Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-1 (1.3') (A04195 Soil) Sampled: 04/13/06 Received: 04/19/06							
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 100%

Volatile Organics - EPA Method 8021B

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-1 (1.3') (A04195 Soil) Sampled: 04/13/06 Received: 04/19/06							
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 95%

Anions by Ion Chromatography - EPA Method 300.0

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-1 (1.3') (A04195 Soil) Sampled: 04/13/06 Received: 04/19/06							
Chloride	<10	10	mg/Kg	1	04/23/06	EPA 300.0	
Sulfate	<5.0	5.0	"	"	"	"	

Approved By
Argon Laboratories

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Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-2 (1.3') (A04196 Soil) Sampled: 04/13/06 Received: 04/19/06							
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 98%

Volatile Organics - EPA Method 8021B

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-2 (1.3') (A04196 Soil) Sampled: 04/13/06 Received: 04/19/06							
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 106%

Anions by Ion Chromatography - EPA Method 300.0

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-2 (1.3') (A04196 Soil) Sampled: 04/13/06 Received: 04/19/06							
Chloride	<10	10	mg/Kg	1	04/23/06	EPA 300.0	
Sulfate	<5.0	5.0	"	"	"	"	

Approved By
Argon Laboratories

QC Officer

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Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

Total Petroleum Hydrocarbons - EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Analyzed	Method	Notes
SW-3 (1.3') (A04197 Soil) Sampled: 04/13/06 Received: 04/19/06							
Gas Range Organics	<10	10	mg/Kg	1	04/25/06	8015M	
Diesel Range Organics	<10	"	"	"	"	"	
C29 - C35 Range Organics	<20	20	"	"	"	"	
Total Petroleum Hydrocarbons	<40	40	"	"	"	"	

Surrogate Recovery: 93%

Volatile Organics - EPA Method 8021B

SW-3 (1.3') (A04197 Soil) Sampled: 04/13/06 Received: 04/19/06							
Benzene	<0.005	0.005	mg/Kg	1	04/25/06	EPA 8021B	
Toluene	<0.005	"	"	"	"	"	
Ethyl Benzene	<0.005	"	"	"	"	"	
Xylenes	<0.010	0.010	"	"	"	"	

Surrogate Recovery: 113%

Anions by Ion Chromatography - EPA Method 300.0

SW-3 (1.3') (A04197 Soil) Sampled: 04/13/06 Received: 04/19/06							
Chloride	<10	10	mg/Kg	1	04/23/06	EPA 300.0	
Sulfate	<5.0	5.0	"	"	"	"	

Approved By
Argon Laboratories

QC Officer

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Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

TPH 8015M - Quality Control

Analyte	MS Rec	MSD Rec	RPD	Reporting Limit	Units	Notes
Matrix Spike / Matrix Spike Duplicate						*Spiked Sample ID: A04197*
TPH	100	101	1	40	mg/Kg	

Analyte	LCS Rec	LCSD Rec	RPD	Reporting Limit	Units	Notes
Laboratory Control Spike / Laboratory Control Spike Duplicate						*LCS ID: LCS0425A*
TPH	89%	82%	8%	40	mg/Kg	

Note: Daily method blank showed no contamination at or above the reporting limits.

BTEX 8021B - Quality Control

Analyte	MS Rec	MSD Rec	RPD	Reporting Limit	Units	Notes
Matrix Spike / Matrix Spike Duplicate						*Spiked Sample ID: A04197*
m,p-Xylenes	90%	95%	5%	0.005	mg/Kg	

Analyte	LCS Rec	LCSD Rec	RPD	Reporting Limit	Units	Notes
Laboratory Control Spike / Laboratory Control Spike Duplicate						*LCS ID: LCS0425A*
Benzene	107%	97%	10%	0.005	mg/Kg	

Note: Daily method blank showed no contamination at or above the reporting limits.

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argon laboratories

Environmenal Plus, Inc.	Project Number: 160032	
2100 Avenue O	Project Name: Principle 1 & 2 Batt.	Work Order #:
Eunice, NM 88231	Project Manager: Iain Olness	A04191

EPA Method 300.0 - Quality Control

Analyte	MS Rec	MSD Rec	RPD	Reporting Limit	Units	Notes
Matrix Spike / Matrix Spike Duplicate						*Spiked Sample ID: A04196*
Chloride	118%	111%	6%	10	mg/Kg	

Analyte	LCS Rec	LCSD Rec	RPD	Reporting Limit	Units	Notes
Laboratory Control Spike / Laboratory Control Spike Duplicate						*LCS ID: LCS0423A*
Chloride	106%	104%	2%	10	mg/Kg	
Sulfate	100%	99%	1%	5.0	"	

Note: Daily method blank showed no contamination at or above the reporting limits.

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email: info@argonlabs.com

Argon Laboratories Sample Receipt Checklist

Client Name: Environmental Plus, Inc. Date & Time Received: 4/19/2006 14:20

Project Name: Principle 1 & 2 Batt. Client Project Number: 160032

Received By: HC Matrix: Water ☐ Soil ☑

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

Argon Labs Project Number: A04191

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 test	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: _____

Environmental Plus, Inc.

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

Chain of Custody Form

LAB: 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	Principle 1 & 2 Batt.
Location	UL-C, Sect. 27, T 18 S, R 31 E
Project Reference	160032
EPI Sampler Name	Felix Hernandez

Bill To

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

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX 8021B	TPH 8015M	CHLORIDES (Cl^-)	SULFATES ($SO_4^{=}$)	pH	TCLP	OTHER >>>	PAH
1	BH-1 (2')	G	1			1					X		12-Apr-06	12:45	X	X	X	X				
2	BH-2 (2')	G	1			1					X		12-Apr-06	13:00	X	X	X	X				
3	BH-3 (2')	G	1			1					X		12-Apr-06	14:00	X	X	X	X				
4	BH-4 (2')	G	1			1					X		12-Apr-06	14:05	X	X	X	X				
5	SW-1 (1.3')	G	1			1					X		13-Apr-06	11:15	X	X	X	X				
6	SW-2 (1.3')	G	1			1					X		13-Apr-06	11:20	X	X	X	X				
7	SW-3 (1.3')	G	1			1					X		13-Apr-06	11:25	X	X	X	X				
8																						
9																						
10																						

Sampler Relinquished: Iain Olness Date 4/5/06 Time 1330 Received By:

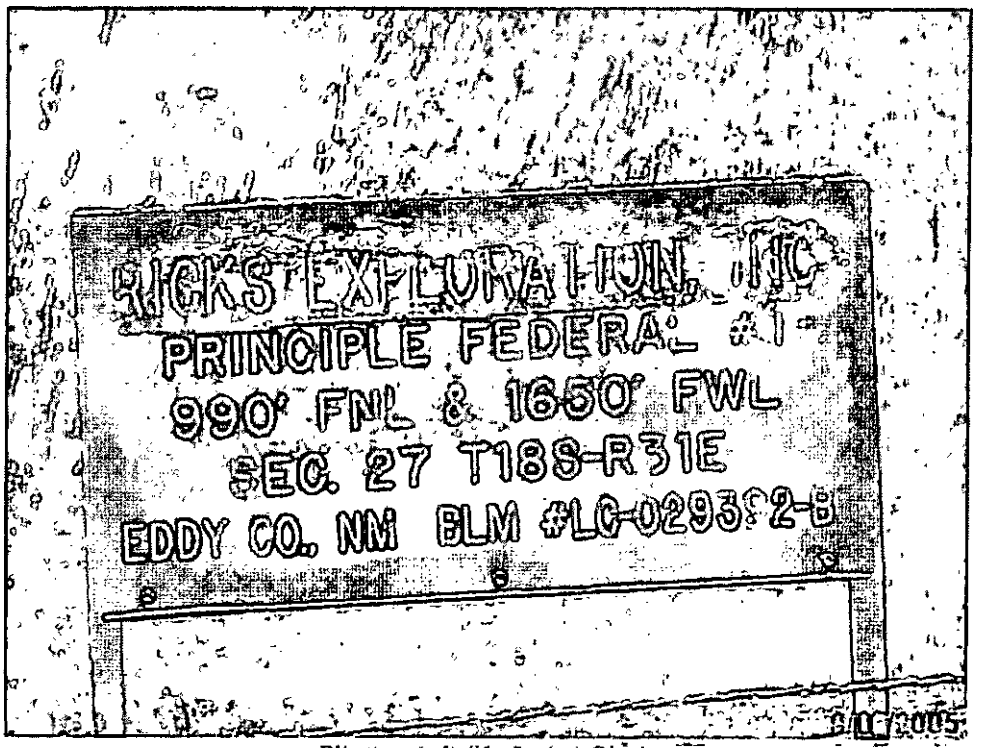
Relinquished by: Date 041906 Time 14:20 Received By: (lab staff)

Delivered by: Sample Cool & Intact Yes No Checked By:

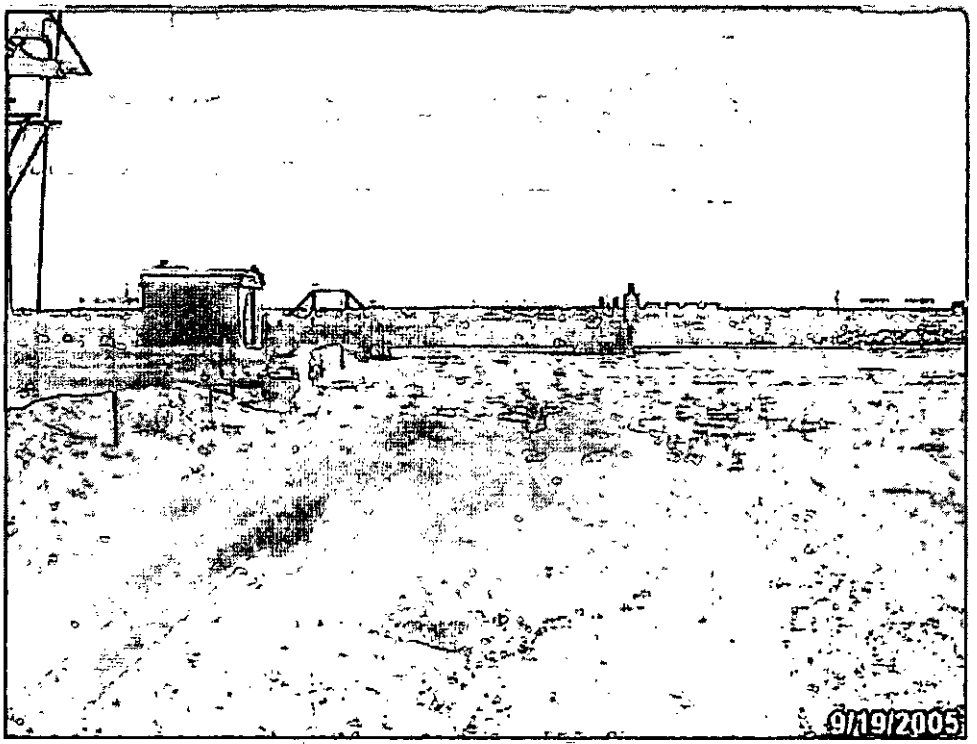
E-mail results to: iolness@envplus.net
NOTES:

APPENDIX II

PROJECT PHOTOGRAPHS

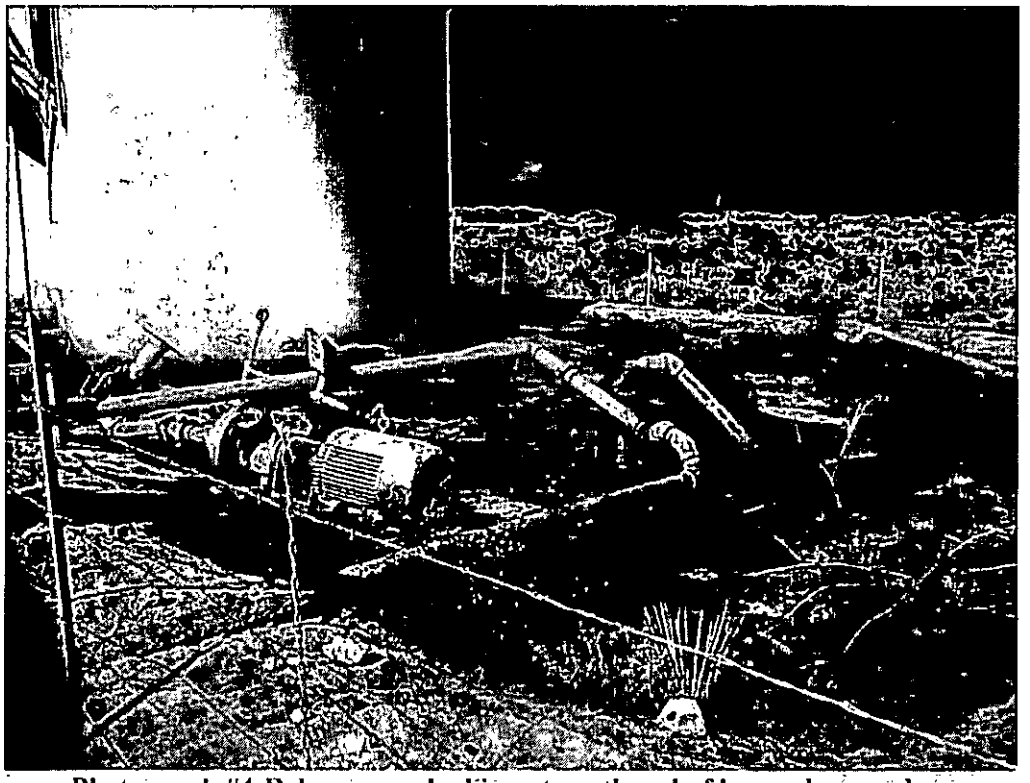


Photograph #1- Lease Sign.

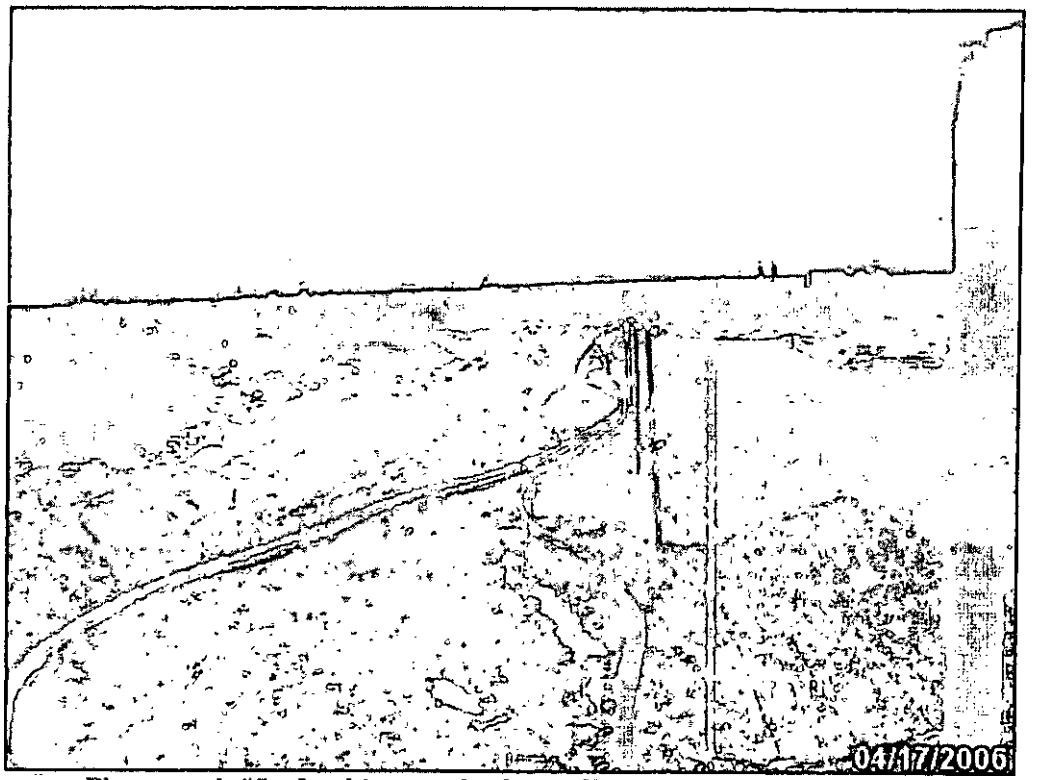


Photograph #2- Release area looking northerly. Dark colored soil indicates contamination.

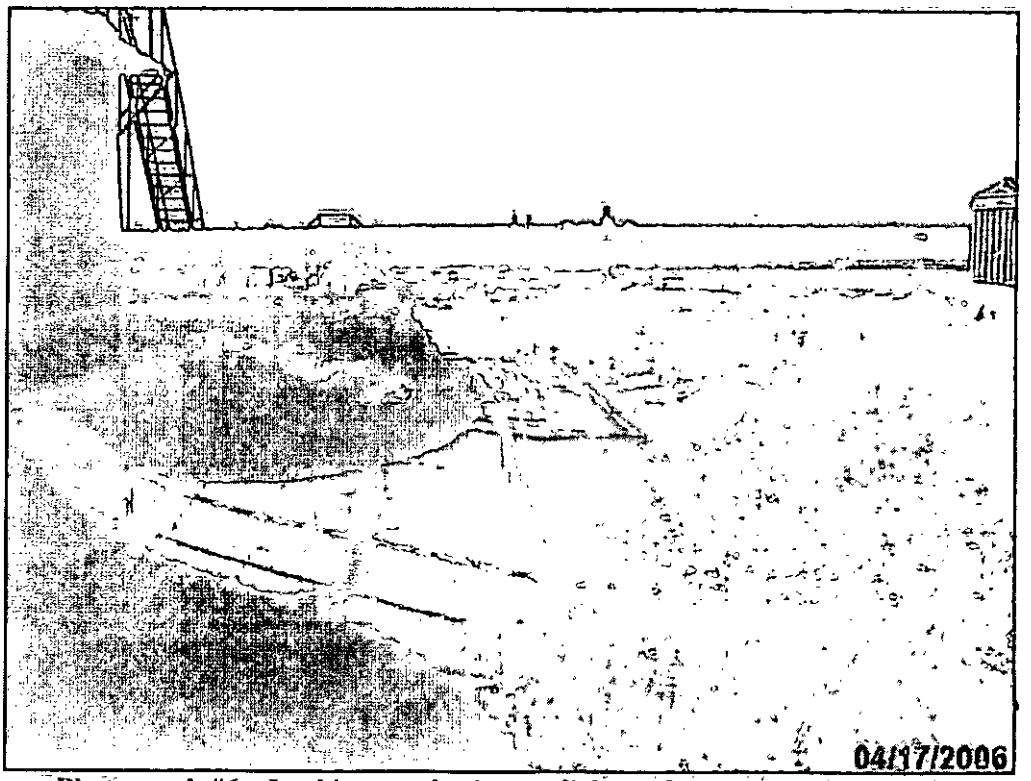
Photograph #3-Release area looking northerly noting contaminated area within the berm



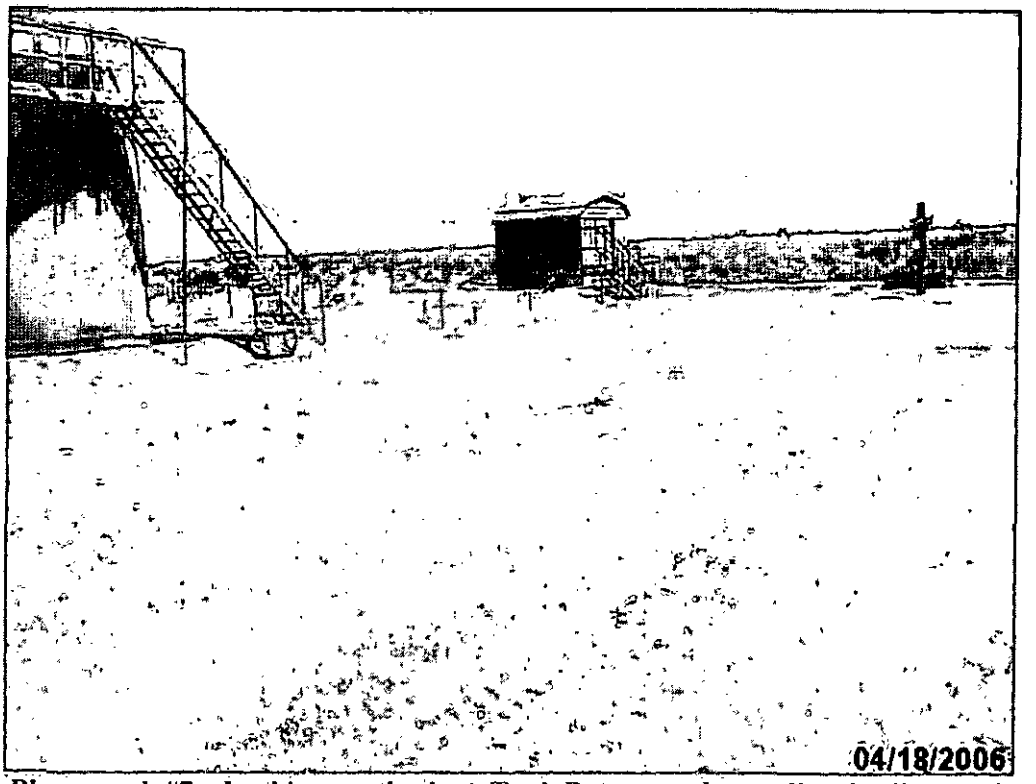
Photograph #4-Release area looking at north end of bermed area where the 500-bbl FG Tank was located



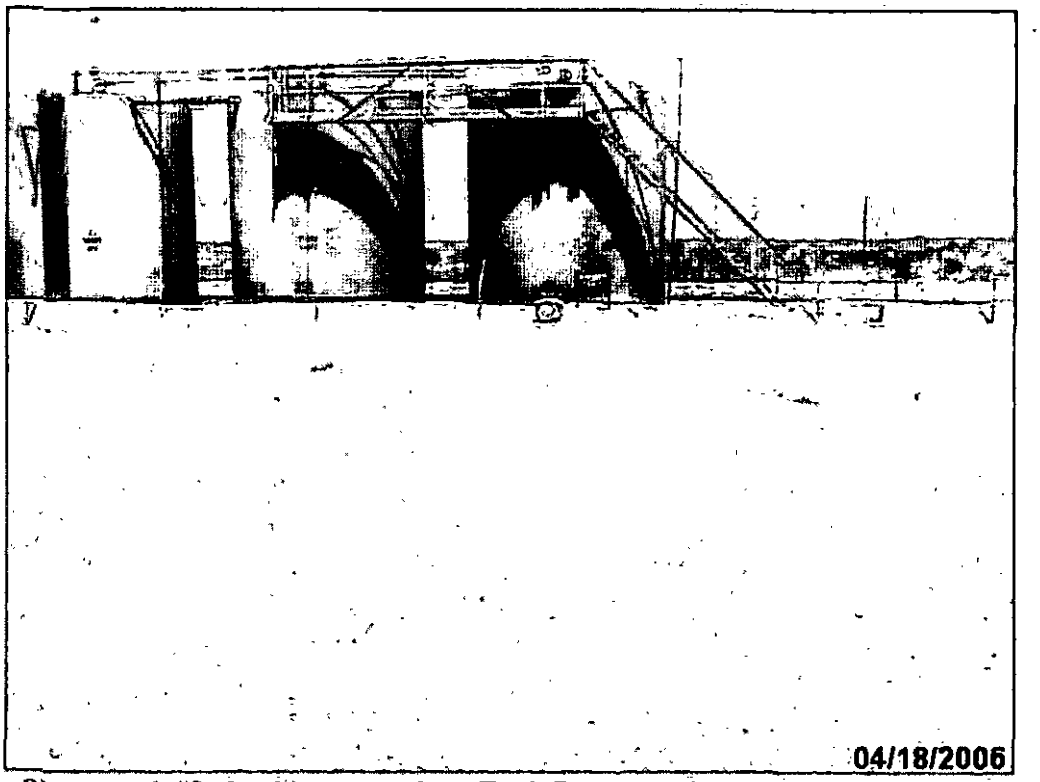
Photograph #5 – Looking northerly at off pad excavation (west side)



Photograph #6 – Looking northerly at caliche pad excavation (east side)



Photograph #7 – Looking northerly at Tank Battery and remediated calicke pad



Photograph #8– Looking westerly at Tank Battery and remediated caliche pad

APPENDIX III

SOIL BORING LOG

Log Of Test Borings

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

Project Number: 160032

Project Name: Chesapeake Principle #1 & #2 Battery

Location: UL-C, Section 27, Township 18 South, Range 31 East

Boring Number: BH-1 | Surface Elevation: 3,635

Start Date: 10/18/05 Time: 0910 hrs

Completion Date: 10/18/05 Time: 1010 hrs

Sample # and Time	Sample Type	Recovery (inches)	Moisture	PID Readings (ppm)	U.S.C.S. Symbol	Depth (feet)	Description
0910				5.4	SP	2	SAND, Oil Stained
						5	
0915				2.5	SP	10	SAND
0920				3.3	SP	15	SAND
0930				3.5	SP	20	SAND
0946				1.6	SP	25	SAND, Clay
0957				1.3	SP	30	SAND, Clay
1010				1.6	SP		Caliche SAND End of Boring at 30.0'

Water Level Measurements (feet)

Date	Time	Sample Depth	Casing Depth	Cave-in Depth	Water Level
10/18/05	-	-	-	-	-
-	-	-	-	-	-

Drilling Method: HSA 3.5' ID

Backfill Method: Bentonite

Field Representative: JR

APPENDIX IV

FINAL COPY
NMOCD C-141 FORM

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company: Chesapeake Energy	**Contact:** Bradley Blevins
Address: 5014 Carlsbad Highway	**Telephone No.:** (505) 391-1462 ext. 24
Facility Name: Principle 1 & 2 Battery	**Facility Type:** Tank Battery

Surface Owner: United States Government-Bureau of Land Management	**Mineral Owner:** United States Government-Bureau of Land Management	**Lease No.:** BLM #LC-029392-B

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	27	18S	31E	990	North	1650	West	Eddy

Latitude: N 32° 43' 23.131" **Longitude:** W 103° 51' 37.137"

NATURE OF RELEASE

Type of Release: Produced Water	**Volume of Release:** 154 barrels	**Volume Recovered:** 80 barrels
Source of Release: Tank Battery	**Date and Hour of Occurrence:** September 17, 2005 P.M.	**Date and Hour of Discovery:** September 18, 2005 A.M.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	**If YES, To Whom?** Gerry Guye, NMOCD- Artesia	
By Whom? Bradley Blevins, Chesapeake	**Date and Hour:** September 18, 2005 @ 1100 hours	
Was a Watercourse Reached? ☐ Yes ☒ No	**If YES, Volume Impacting the Watercourse:** Not Applicable	

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

Describe Cause of Problem and Remedial Action Taken.* Lightening strike threw 500 barrel fiberglass water tank approximately 100-feet from tank battery location. Wells were shut in upon discovery.

Describe Area Affected and Cleanup Action Taken* Approximately 5,100 square feet of surface area was impacted by the release. A soil boring (BH-1) was advanced to a total depth of thirty feet (30-ft) to delineate the vertical extent of impacted soil. After delineation of vertical impacts, the following remedial activities were undertaken: a) Excavated soil impacted above NMOCD remedial threshold goals with disposal at Lea Landfill, Inc; b) laboratory analytical data confirmed removal of soil impacted above NMOCD remedial threshold goals in sidewalls and bottom of excavation; c) backfilled excavated area with caliche and sandy soil; d) graded release site for natural drainage of the area; and e) seeding of area with a grass blend approved by the BLM

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Bradley Blevins	**Approved by District Supervisor:**	
Title: Field Technician	**Approval Date:**	**Expiration Date:**
E-mail Address: bblevins@chkenergy.com	**Conditions of Approval:**	**Attached** ☐
Date: **Phone:** (505) 391-1462 ext. 24		

*** Attach Additional Sheets If Necessary**

2RP - 3828