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App Number: pSEB0811960554

## 2RP - 162

## DAVID H ARRINGTON OIL & GAS INC

4/30/2009

1625 N. French Dr., Hobbs, NM 88240       Energy Mineral         District II       Ill         1301 W Grand Avenue, Artesia, NM 88210       Oil Conse         District III       0100 Rto Brazos Road, Aztec, NM 87410         District IV       1220 Sou	f New Mex s and Natura ervation Div th St. Franc Fe, NM 875	l Resources vision is Dr. M	• Ar 3 1 2009 <sup>s</sup>	Form C-141 Revised October 10, 2003 ubmit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form
Release Notificati			ction	
NSEDDAU 957960 OPERATOR			Final Report	
Name of Company: David H. Arrington Oil & Gas, Inc.	Contact: Ja			
Address: PO Box 2071, Midland, Texas 79702		No. 432-682-66		
Facility Name: Federal 34 #1Tank Battery	Facility Typ	e: Production	Tank Battery	
Surface Owner: Federal Mineral Owner			Lease N	lo. 21028
3001522738 LOCATI	ON OF RE	LEASE		
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N 34 20S 26E 960	South	1980	West	Eddy
Latitude <u>32° 31' 29.6</u>		h'. '	·	
			10	
Type of Release: Condensate & Produced Water	E OF REL	EASE Release: 4 bbls	Volume P	Recovered: 0 bbls
Source of Release: Overflow of gunbarrel		lour of Occurrenc		Hour of Discovery
	4/01/08	W/I 0	4/01/08, 1	000 hrs
Was Immediate Notice Given?	If YES, To 1	wnom?		
By Whom?	Date and H	lour;		
Was a Watercourse Reached?	If YES, Vo	olume Impacting t	he Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		,		
Describe Cause of Problem and Remedial Action Taken.*				
Water dump on gas separator stuck open allowing gas to enter gunban Produced water to run out on ground inside firewall of tank battery.				ng 4 bbls of condensate &
Describe Area Affected and Cleanup Action Taken.*				,
All areas within firewall of tank battery impacted. Most heavily impacted soil was placed back into excavation along with clean soil and then ca				
I hereby certify that the information given above is true and complete to regulations all operators are required to report and/or file certain release public health or the environment. The acceptance of a C-141 report by should their operations have failed to adequately investigate and remedi or the environment. In addition, NMOCD acceptance of a C-141 report federal, state, or local laws and/or regulations.	notifications as the NMOCD mate contamination	nd perform correc arked as "Final R on that pose a thr	tive actions for rele eport" does not reli eat to ground water	eases which may endanger eve the operator of liability ; surface water, human health
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Signature: Stimme Cel			1.1	
Printed Name: Shane Estep	Approved by	District Supervise	or:	
Title: Project Manager	Approval Dat	e & KIA	Expiration	Date: N/A
E-mail Address: shane@etechenv.com	Conditions of	Approval;		Attached
Date: <i>March 30, 2009</i> Phone: <i>432-563-2200</i>		f	<u></u>	Pla
* Attach Additional Sheets If Necessary			ZRP.	-162



# Federal 34 #1 Remediation Report

# DAVID H. ARRINGTON OIL & GAS, INC. EDDY COUNTY, NEW MEXICO



# Federal 34 #1 Remediation Report

# DAVID H. ARRINGTON OIL & GAS, INC. EDDY COUNTY, NEW MEXICO

DATE PREPARED: March 26, 2008

**ETECH PROJECT NO.** 163-1724-000

**PREPARED FOR:** State of New Mexico Oil Conservation Division

> **PREPARED ON BEHALF OF:** David H. Arrington Oil & Gas, Inc.

**PREPARED BY:** Etech Environmental & Safety Solutions, Inc.



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### **1.0 Executive Summary**

On February 27, 2009, Etech Environmental & Safety Solutions, Inc. (Etech) completed the final soil sampling to conclude the remediation of hydrocarbon and chloride impacted soil at the Federal 34 #1 tank battery site owned by David H. Arrington Oil & Gas, Inc. (DHA). The remediation activities were associated with historic small releases occurring over the approximate twenty-six (26) year life of the tank battery.

The scope of work for remediation of the site was approved by the New Mexico Oil Conservation Division (NMOCD) in a letter dated October 14, 2008. The initial remediation was to consist of excavation and off-site disposal of the areas with chloride contamination exceeding 1,000 ppm. The remainder of the soil impacted with chlorides and hydrocarbons was to be blended with clean soil to reduce the contaminant levels.

During the remediation phase of the project Ms. Terry Gregston with the Bureau of Land Management (BLM) conducted an inspection of the site. After discussing the project with Ms. Gregston, it was determined the BLM would not allow blending of the impacted soil for remediation of the site.

Discussions with the NMOCD and BLM were held to determine the best approach to completion of the site remediation. BLM was not concerned with placing the low level impacted soil back into the excavation around the tank battery but the NMOCD was not receptive to action and preferred to have the remaining impacted soil transported off-site for disposal. Etech and DHA expressed concerns with transporting the remaining soil for off-site disposal based on the cost of the proposal and the fact that the site is an active oil & gas production site and another release was highly likely to occur in the future.

A compromise was reached with the NMOCD and agreed to by the BLM. This approach would place the low level impacted soil back into the excavation and then cover the impacted soil with a plastic liner to prevent rainwater and future releases from driving the chlorides deeper to the groundwater.

Final remediation of the site was started on January 27, 2009 by placing the low level impacted soil back into the excavation surrounding the tank battery. This phase of the remediation was completed on February 4, 2009 with the placement of the 20 mil plastic liner around the existing tank battery.

Final clearance samples were collected from the area of the location pad where the impacted soil was stock piled. The sample laboratory analytical results revealed low levels of chloride impacts at one point with the level at 432 mg/kg.

## 2.0 Introduction

The Federal 34 Well #1 and tank battery site is located in Eddy County, New Mexico. The well and tank battery site are located approximately 12.5 miles northwest of Carlsbad, New Mexico on the south side of Lake Brantley Dam. The site is located in Unit N Section 34, T20S, R26E, Eddy County, New Mexico and has an API #30-015-22738. The New Mexico Lease number is NM-96833.

The immediate area consists of strong slopping to the east and southeast in the direction of the Pecos River. To the north and northeast of the site are the dam of Lake Brantley and Brantley Lake State Park. The area immediately surrounding the site is pasture and undeveloped range lands. A topographic map showing the location of the site is provided as Figure 1.

On July 28, 2008, DHA personnel contacted Etech assist in the delineation and remediation of the Federal 34 #1 tank battery site. A pervious assessment had been conducted at the site by another environmental company with the collection of near surface samples within the firewalls of the tank battery. This initial assessment revealed hydrocarbon and chloride impacted soil within the top 2 feet of the site.

Etech conducted an initial site inspection on July 29, 2008. On August 1, 2008 during the removal of a produced water tank, impacted soil was excavated from under the old tank. A soil sample was collected from the bottom of the excavation to determine the levels of contamination in the rock layer immediately underlying the surface soil.

Etech then scheduled and completed another sampling event with the collection of samples from soil borings conducted at the site August 7, 2008. This sampling completed the vertical delineation of the impacted soil within the firewalls of the tank battery.

### 3.0 Site Description

#### 3.1 General Location Setting

The site is located in Eddy County approximately 12.5 miles northwest of Carlsbad, New Mexico east of State Highway 285.

The spill site lies within the United States Geological Survey (USGS) 7.5-minute Topographic Quadrangle Map Lake McMillan South dated 1995 at the following coordinate:

N 32° 31' 29.6" W 104° 22' 20.1"

According to the topographic map the surface slope in the area of the spill site is to the southeast. The surrounding land is unimproved range land with oil & gas operations.

#### 3.2 Geologic and Hydrogeologic Setting

The soil at this site appears to be part of the Upton gravelly loam. Typically, this type of soil is gently sloping to steep, deep and moderately deep, loamy soils over sandstone or strongly cemented limestone gravels.

Thickness of the soil above the Bkm horizon ranges from 7 to 20 inches. Texture of the fineearth fraction of the A and Bk horizons ranges from sandy loam to clay loam. The texture varies little between horixons within a given pedon, the fine-earth fraction having a clay content between about 15 and 30 percent, and sand content between 20 to 60 percent. Volume of coarse fragments, generally of limestone or hardened calcium carbonate gravel, ranges from 15 to 35 percent. More than 40 percent of the soil mass less than 20 mm consist of limestone fragments and secondary carbonates.

A review of records on the New Mexico Office of the State Engineer revealed one (1) water well within the same section as the tank battery. The depth to groundwater within this water well was determined to be 135 feet below the surface. Also, there were no identified other water sources within 1,000 feet of the tank battery and the distance to surface water was measured at approximately 3,000 feet to the Pecos River. With all of these factors considered it was determine the site ranking score was 0 points allowing for a remediation level of 5,000 mg/Kg for TPH.





## 4.0 Remediation

The following contains details of each phase of the remediation and presents summaries of the analytical data collected from each phase.

#### 4.1 Initial Remediation Activities

Initial remediation activities were started at the site in October 27 2008. This phase of the remediation involved the excavation and stockpiling of the impacted soil. Impacted soil was excavated from around the storage tanks and all areas within the firewall of the tank battery. The excavation was completed until bedrock was encountered at approximately 2 to 3 feet in depth.

Samples were collected from the bottom of the excavation. The samples were analyzed for chlorides; the laboratory analytical results are presented in the following table:

Analyt	tical Results from Rem	nediation Excavation A	Activities – November (	5, 2008 (mg/kg)
Sample #	N. of West Tanks	S. of West Tanks	NW Gun Barrel	SE Gun Barrel
Chlorides	16	<16	320	96
	1	7		•

Analy	tical Results from Reme	ediation Excavatior	n Activities – November	5, 2008 (mg/kg)
Sample #	Between West Tanks	NE Gun Barrel	Between East Tanks	-
Chlorides	336	336	<16	_
,	· M.		51 5	* v

Analyt	ical Results from Rem	ediation Excavation /	Activitiès – November	5, 2008 (mg/kg)
Sample #	NE Corner	Central	SW Corner	NW Corner
Chlorides	192	192	48	304
	,	, 3 ,		

Sample #	TPH-GRO	TPH-DRO	Benzene	Toluene	Ethylbenzene	Xylene
NE Corner	<10.0	58.0	< 0.050	< 0.050	0.083	0.458
Central	.333	. 1,660	<0:050	<0:050	0.261	1:01
SW Corner	39.8	324	< 0.050	< 0.050	0.111	0.449

NR - Indicates analysis not run on sample

Site maps detailing the sample collections points are as follows:



After a review of the initial analytical results, additional excavation activities were conducted within areas determined to still be exceeding the approved remediation levels. The excavation was continued around the gun barrel, between the west storage tanks and within the northwest corner of the tank battery firewall.

After completion of this additional excavation, samples were collected from the bottom of the excavations and submitted to the laboratory for chloride analysis. The laboratory results are summarized in the following table:

Analy	tical Results from Rem	ediation Excavation A	Activities – November	7, 2008 (mg/kg)
Sample #	Main NW Gun Barrel	Main NE Gun Barrel	Between West Tanks	East Side NW Corner
Chlorides	16	<16	144	48

Based on the results of this new analytical data, all soil impacted above the established remediation levels had been removed from the tank battery area with the exception of the soil remaining under the existing storage tanks.

#### 4.2 Off-Site Disposal of Impacted Soil

As approved in the remediation scope of work, the impacted soil with chloride levels exceeding 1,000 mg/kg was transported off-site for disposal at CRI. Approximately 220 cubic yards of impacted soil was transported for off-site disposal. Clean soil was transported to the site to be blended with the remaining impacted soil prior to placing back into the excavation.

#### 4.3 Blending and Backfilling of Excavation

As Etech was preparing to complete the remediation of the site by blending the remaining impacted soil with clean soil to reduce the contaminant levels, Ms. Terry Gregston with the BLM arrived at the site to check on the progress of the project.

Ms. Gregston was informed of the activities conducted to date and of the next step in the completion of the remediation as per the OCD approved remediation work plan. Ms. Gregston stated the BLM does not allow blending of contamination for remediation. After detailing the contaminant levels remaining in the soil at the site she said the BLM would allow the impacted soil to be placed back into the excavation as is since it would have to be dealt with when the site was closed and based on the fact that additional spills are likely to happen again in the future at the site.

The details of the conversion with the BLM were forwarded to the OCD but the OCD did not concur with just placing the impacted soil back into the excavation to complete the remediation of the site. After discussions with the OCD a compromise was reached and agreed to by the BLM.

The final remedial method agreed to was to complete the backfilling of the excavation with the impacted soil and clean soil. Next the area of impacted soil would be covered with a 20 mil thick polyethylene liner. The liner would be cut out around the tanks and equipment and would be over the firewall surrounding the tank battery. This liner would reduce the amount of rainfall hitting the impacted soil and would capture most of any future releases at the site.

The final phase of the remediation was started January 27, 2009. Samples were collected of the remaining impacted soil to document levels of contamination. Backfilling of the excavation, construction of the firewalls and lining of the area was completed by February 2, 2009.

Analytical results from samples collected from the remaining impacted soil are presented in the following table:

Analytical Results from Bac		ckfilled Soil – Dece	ember 3, 2008 (mg/	kg)
Sample #	Chlorides	TPH-GRO	TPH-DRO	Total TPH
Composite Smp #1	148	1,730	1,070	2,800
Composite Smp #2	72.6	508	1,090	1,598
Composite Smp #3	178	1,630	944	2,574
Composite Smp #4	183	1,870	896	2,766
Composite Smp #5 178		1,200	960	2,160
Composite Smp #6	167	1,630	992	2,622

A site map detailing the sample collections points is presented in the following site map:





### 5.0 Conclusions

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According to the original remediation scope of work and the amended scope of work approved by the OCD and BLM all aspects of the field work have been completed. This report provides the documentation to close out the remediation of the Federal 34 #1 site.

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### 6.0 References

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- 1) Soil Survey of Eddy County, New Mexico United States Department of Agriculture Soil Conservation Service
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- 3) National Research Council. 1995. Wetlands: Characteristics and boundaries.

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Appendix A – Waste Disposal Manifest

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Appendix B – Laboratory Analytical Data

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PHONE (575) 393-2326 • 101 E MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: SHANE ESTEP P.O. BOX 8469 **MIDLAND, TX 79708** FAX TO: (432) 563-2213

Receiving Date: 11/05/08 Reporting Date: 11/05/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 MAIN BATTERY Project Location: CARLSBAD, NM

Analysis Date: 11/05/08 Sampling Date: 11/05/08 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: HM

		CI
LAB NO.	SAMPLE ID	(mg/kg)
H16272-1	N. OF WEST TANKS	, 16
H16272-2	S. OF WEST TANKS	<sup>°</sup> < 16
H16272-3	NW GUN BARREL	320
H16272-4	SE GUN BARREL	96
H16272-5	BETWEEN WEST TANKS	336
H16272-6	NE GUN BARREL	336
H16272-7	BETWEEN EAST TANKS	< 16
Quality Con		500
True Value	QC	500
% Recovery	1	100
<b>Relative Pe</b>	rcent Difference	< 0.1

METHOD: Standard Methods 4500-CI'B Note: Analyses performed on 1:4 w:v aqueous extracts.

Morino

11-05-08 Date



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		ETECH ENVIRC ATTN: SHANE		SAFETY SOLU	JTIONS, INC.	
		P.O. BOX 8469				
		MIDLAND, TX 7				
		FAX TO (432)	•			
Receiving Date: 11/05/08		(402)	000-2210	Sampling Da	te: 11/05/08	
Reporting Date: 11/07/08				Sample Type		
Project Owner: DAOG				• • • •	dition INTAC	г
Project Name: FEDERAL 34 #1 MAIN B/	ATTERY		•	•	eived By: ML	
Project Location: CARLSBAD, NM			1	Analyzed By.	-	
	GRO	DRO	ł		ETHYL	TOTAL
LAB NO. SAMPLE ID	(C <sub>6</sub> -C <sub>10</sub> )	(>C <sub>10</sub> -C <sub>28</sub> )	BENZENE	TOLUENE	BENZENE	XYLENES
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
			(*********	( 5.5)	( 5 5/	(***3***3)
ANALYSIS DATE:	11/06/08	11/06/08	11/07/08	11/07/08	11/07/08	11/07/08
H16272-1 N. OF WEST TANKS	270	556	0.140	0.456	0.859	7.18
H16272-2 S OF WEST TANKS	546	1,450	0.061	0.270	0 738	7.91
H16272-4 SE GUN BARREL	115	82 5	0 059	0.314	0 931	5.32
H16272-7 BETWEEN EAST TANKS	64.7	289	0.103	0.320	0 672	5 02
			8	1		
				1		
Quality Control	543	474	0 042	0.055	0.055	0.160
True Value QC	500	500	0.050	0 050	0.050	0 150
% Recovery	109	94.8	84 0	110	110	107
Relative Percent Difference	2.2	1.6	12.0	09	1.8	1.8

ANALYTICAL RESULTS FOR

METHODS. TPH GRO & DRO - EPA SW-846 8015 M; BTEX - SW-846 8021B.

Heene Le. Lab Director

1/10/10 Date

H16272 BTEX8015 ETECH

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(575) 393-2326 Fax (576) 393-2476		Page of
Company Name: Etech Environmental	BILL TO	ANALYSIS REQUEST
Project Manager: Shane Ester	P.O. #:	
Address: PO BUK, 8469	Company:	
City Midland State: TK Zip: 79708	Attn:	
Phone #: 432-563-22011 Fax #: 432-563-221-	Address:	
Project # Project Owner: DAOG	City:	
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	E A P N	NALYTICAL RE TECH ENVIRO TTN' SHANE E O. BOX 8469 MDLAND, TX 79 AX TO (432) 5	NMENTAL & S ETEP 9708	SAFETY SOLU	TIONS, INC	
Receiving Date: 11/05/08 Reporting Date: 11/07/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 EAST SID Project Location. CARLSBAD, NM				Sampling Dat Sample Type Sample Cond Sample Rece Analyzed By	SOIL ition INTACT ived By. ML	
	GRO	DRO			ETHYL	TOTAL
LAB NO. SAMPLE ID	(C <sub>6</sub> -C <sub>10</sub> )	(>C <sub>10</sub> -C <sub>28</sub> )	BENZENE	TOLUENE	BENZENE	XYLENES
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
ANALYSIS DATE:	11/07/08	11/07/08	11/07/08	11/07/08	11/07/08	11/07/08
H16273-1 NE CORNER	<10.0	58.0	<0 050	<0 050	0.083	0.458
H16273-2 CENTRAL	333	1,660	<0.050	<0.050	0.261	1.01
H16273-3 SW CORNER	39.8	324	<0 050	<0 050	0.111	0 449
						· · · · · · · · · · · · · · · · · · ·
Quality Control	543	474	0.042	0 055	0.055	0 160
True Value QC	500	500	0 050	0.050	0.050	0.150
% Recovery	) 109	94 8	84.0	110	110	107
Relative Percent Difference	2.2	1.6	12 0	0.9	18	18

METHODS. TPH GRO & DRO - EPA SW-846 8015 M; BTEX - SW-846 8021B.

hA Keyne Lab Director

11/10/08

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H16273 BTEX8015 ETECH

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ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: SHANE ESTEP P.O. BOX 8469 **MIDLAND, TX 79708** FAX TO: (432) 563-2213

Receiving Date: 11/05/08 Reporting Date: 11/05/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 EAST SIDE Project Location: CARLSBAD, NM

Analysis Date: 11/05/08 Sampling Date: 11/05/08 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: HM

LAB NO.	SAMPLE ID	(mg/kg)
H16273-1	NE CORNER	192
H16273-2	CENTRAL	192
H16273-3	SW CORNER	48
H16273-4	NW CORNER	304
Quality Con	trol	500
True Value	QC	500
% Recovery	/	100
<b>Relative Pe</b>	rcent Difference	< 0.1

4500-CI<sup>-</sup>B METHOD: Standard Methods Note: Analyses performed on 1:4 w:v aqueous extracts.

dini

Chemist

11-05-08 Date



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101 East Marland, Hobbs, NM 88240 Page of (575) 393-2326 Fax (575) 393-2476 ANALYSIS REQUEST BILL TO Company Name Envien mester Project Manager. Shang ster? P.O. #: 5 9 Address: Company: State: 771 Zip: 79700 City. Attn: Fax #: 432-56.7. 2200 Phone #: 5% 2 2213 Address: AAA Project # Project Owner: City: 50 Project Name: Frank 211 State Zip Or Project Location: Phone #: Sampler Name Fax #: L SAMPLING 508 LAS USE 01.1 MATRIX PRESERV AGRAB OR (C)OMP SROUNDWATER CONTAINERS ASTEWATER Lab I.D. Sample I.D. CIDIBASE CE/COOL SLUDGE OTHER **OTHER** ŝ 뤈 DATE TIME 3-11-5.08 HILEZ 000000 1148 3 -2 Ŵ 1153 innor 1204 U. reputs V 4 U 1 ي. 1 in 117 1204 Carper calcel 1 t 1 PLEASE NOTE: Latury and Camagas Co dota tabuty and clears exclusive remeay (a), any clears anong whether based in contract of tart, shell be limited to the amount paid by the cleant for the Terms and Conditions; Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the organal date of micico ------ I's fire exection an Calana de value for consequential de consequential demages including unitidu funciatan, business interruptions, loss of uso or toss of profis inclured by chant, ils subsidiaries, and all costs of collections, including attorney's fees. 

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#### ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: SHANE ESTEP P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

Receiving Date: 11/07/08 Reporting Date: 11/07/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 Project Location: CARLSBAD, NM Analysis Date: 11/07/08 Sampling Date: 11/07/08 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: TR

		i Cl
LAB NO.	SAMPLE ID	(mg/kg)
H16281-1	MAIN NW GUN BARREL	16
H16281-2	MAIN NE GUN BARREL	< 16
H16281-3	MAIN BETWEEN WEST TANKS	144
H16281-4	EAST SIDE NW CORNER	48
		400
Quality Con		490
True Value	QC	500
% Recovery		98.0
<b>Relative Per</b>	rcent Difference	2.0

METHOD: Standard Methods 4500-CI'B Note: Analyses performed on 1:4 w:v aqueous extracts.

( Miching

11-09-28 Date



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Receiving Date: 11/07/08 Reporting Date: 11/12/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 Project Location: CARLSBAD, NM Sampling Date: 11/07/08 Sample Type. SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: CK

GRO .	DRO
(C <sub>6</sub> -C <sub>10</sub> )	(>C <sub>10</sub> -C <sub>28</sub> )
(mg/kg)	(mg/kg)

LAB NUMBER SAMPLE ID

ANALYSIS D	DATE	11/10/08	11/10/08
H16281-1	MAIN NW GUN BARREL	64.7	288
H16281-2	MAIN NE GUN BARREL	1,090	747
H16281-3	MAIN BETWEEN WEST TANKS	8,250	5,900
H16281-4	EAST SIDE NW CORNER	69.6	277
Quality Cont	rol	429	411
True Value (	2C	500	500
% Recovery		85.8	82.2
<b>Relative</b> Per	cent Difference	12.7	0.6

METHODS: TPH GRO & DRO: EPA SW-846 8015 M

Keene Lab Director

1/12/08 Date



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ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: SHANE ESTEP P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

Receiving Date: 11/07/08 Reporting Date: 11/12/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 Project Location: CARLSBAD, NM Sampling Date: 11/07/08 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: ZL

	,		ETHYL	TOTAL
	BENZENE	TOLUENE	BENZENE	XYLENES
LAB NUMBI SAMPLE ID	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
ANALYSIS DATE	11/11/08	11/11/08	11/11/08	11/11/08
H16281-1 MAIN NW GUN BARREL	< 0.050	< 0.050	< 0.050	<0.150
H16281-2 MAIN NE GUN BARREL	<0.050	<0.050	0.385	4.97
H16281-3 MAIN BETWEEN WEST TANKS	0.174	0.363	3.44	8.13
H16281-4 EAST SIDE NW CORNER	<0.050	<0.050	<0.050	0.547
	0.010	0.054	0.055	0.455
Quality Control	0.048	0.051	0.055	0.155
True Value QC	0.050	0.050	0.050	0.150
% Recovery	96.0	102	110	103
Relative Percent Difference	6.1	4.0	11.1	11.2

METHOD: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

11/12/08

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 analyse: All claims, its 22.65 the distribution of the applicable service. In no event shall 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 ansing 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. Result relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240		
(575),393,2326 Fax (575) 393-2476		Page of
Company Name: Stech Envilormental	BILL TO	ANALYSIS REQUEST
Project Manager: Shane Estep	P.O. #:	
Address: DD 13.X 5469	Company:	
City: Midland State: 121p: 74708	Attn:	
Phone #: 432-563-2200 Fax #: 492-563-2213	Address:	
Project # Project Owner: DADG	City	
Project Name: Foderal 34 #1	State: Zip:	
Project Location Carlsby &, NM	Phone #	
Sampler Name: Sline	Fax #:	
FOR LA USE ONLY MATRIX	PRESERV SAMPLING	
Lab I.D. Sample I.D. HIUZSI-1 Main NW Gun barrel -2 Main NE Gun barrel -3 Main Between West Tanks -4 East Side NW Corner	АПТ ТАД ОТНЕК: ЭТПОСЕ ОТНЕК: ОТНЕ	
LEASE NOTE: Latury and Carrayas, Co Unars Latury and clience archieve remony for any claim ensurg whether based in contr	act or ron, shall be limited to the emount path by the client	ient for the Terms and Conditions, Interest will be charged on all accounts more inae
annyaus, an cakita, dicheang bhasa far, kag gance and any dinar dakas unascaaver anal pe deames wanad unasar mana in witing 	and received by Cardinal within 30 days after completion o ns, loss of use, or loss of profes incurred by ckent, its subsid	ann ei the applicable 10 days pass due at the rate of 24% per annum from the original date of invoice ubscrieties, and all costs of collections including aborneys fees internae.
Sampler Relutquished: Date: Received By.	//// Fax Res	e Result:   No  Add'  Phone #- Result:  No  Add'  Fax #:
Relindúisned By: / Dátě: Receivéd By: /	Xerbut REMAR	ARKS: . 432-557-6180
Delivered By: (Circle One) Temp Sample Con Cool Intac Sampler - UPS - Bus - Other: Qyes Q No	dition CHECKED BY: (Initials) Yes MCAB	

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+ Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

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ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: SHANE ESTEP P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

Receiving Date: 11/17/08 Reporting Date: 11/18/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 Project Location: CARLSBAD, NM Sampling Date: 11/17/08 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: AB

	GRO	DRO
("	C <sub>6</sub> -C <sub>10</sub> )	(>C <sub>10</sub> -C <sub>28</sub> )
(	mg/kg)	(mg/kg)

LAB NUMBER SAMPLE ID

ANALYSIS DATE	11/17/08	11/17/08
H16341-1 SE GUNBARREL	44.9	138
Quality Control	538	443
True Value QC	500	500
% Recovery	108	88.6
Relative Percent Difference	0.5	14.8

METHODS: TPH GRO & DRO: EPA SW-846 8015 M

Lab Director

Date



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Receiving Date: 11/17/08 Reporting Date: 11/18/08 Project Owner: DAOG Project Name: FEDERAL 34 #1 Project Location: CARLSBAD, NM Analysis Date: 11/17/08 Sampling Date: 11/17/08 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: TR

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	CI
LAB NO. SAMPLE ID	(mg/kg)
H16341-2 STOCK PILE	1,310
	·····
Quality Control	510
True Value QC	500
% Recovery	102
Relative Percent Difference	2.0

METHOD: Standard Methods 4500-Cl<sup>-</sup>B Note: Analysis performed on a 1:4 w:v aqueous extract.

-> Morno Chemist

Date



PLEASE NOTE: Llability and Damages. Cardinal's hability and client's exclusive remody 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 waved 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 subsidianes, 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. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240			
(575) 393-2326 Fax (575) 393-2470	6 1		
Crete Child Child	lat	<b>BILL TO</b> P.O. #:	ANALYSIS REQUEST
			4
Address: PU Box 5464	1-0:-117	Company:	
$\frac{\text{City: } \left[ \frac{M}{d} \right] \left[ \frac{G_{M}}{d} \right]}{d} = \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \right]}{d} \right] = \frac{1}{2} \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \left[ \frac{1}{2} \left[ \frac{1}{2} \right] \left[ \frac{1}{2} \right] \left[ \frac{1}{2} \right] \right]}{d} \right]}$		Attn:	
Phone #: 432563-2200 Fax #: 432-	5632213	Address:	
Project #: Project Owner:	DAUCT	City:	
Project Name: Federal 34 #1		State: Zip:	
Project Location: (11/15/24 C		Phone #:	
Sampler Name:	MATRIX	Fax #: PRESERV SAMPLING	
Lab I.D. Sample I.D. H]10341-1 5E Grunbarrel 6 -2 5toch pile	A CONTAINERS CONTAINERS GROUNDWATER WASTEWATER SOIL OIL SLUDGE	ОТНЕR. 4 СПОГВАЗЕ: 4 СПОГРАЗЕ: 4 СПОГРАЗЕ: 4 СПОГВАЗЕ: 4 СПОГРАЗЕ: 4 СПОГРА: 4 СПОГРА:	
Rélinquished By: / Date: R	ed waived unloss made in writing and out limitation, business interruptions, h	I received by Cardinal within 30 days after completion of this cas of use, or loss of profits incurred by client, its subsidian is based upon any of the above stated reasons or otherwis- Market Completion Completion Completion Completion Phone Res Fax Result REMARKS	he applicablo nes, 20 25 25 Ult: No   Add'l Phone #: 11: No   Add'l Fax #:
Sampler - UPS - Bus - Other:	Cool Intact/ Yes Yes	s (Initials)	

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**†** Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

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Appendix C – Supporting Documentation



Photo 1 - Backside of tank battery after excavation.



Photo 2 - Between tanks after excavation.



Photo 3 - Tank battery after backfilling.



Photo 4 - Gunbarrel after backfilling.

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Photo 5 - Front side of tank battery after lining.

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Photo 6 - Tank battery after remediation and lining.