



# AE Order Number Banner

## Report Description

This report shows an AE Order Number in Barcode format for purposes of scanning. The Barcode format is Code 39.



**App Number: pLWJ1028751769**

**1RP - 2627**

**APACHE CORP**

# Rice Environmental Consulting & Safety

P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

**July 21<sup>st</sup>, 2011**

**Mr. Geoffrey Leking**

New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau  
1625 N. French Drive  
Hobbs, New Mexico 88240

**RE: ACCIDENTAL DISCHARGE UPDATE**

**Apache Corporation**

**NMGSAU 1631 (1RP 10-12-2627): UL/J sec. 32 T19S R37E**

Mr. Leking:

Apache Corporation (Apache) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site.

The site is located approximately 1 mile southwest of Monument, New Mexico at UL/J, Sec. 32, T19S, R37E as shown on the Site Location Map (Figure 1). A leak was discovered at the site on September 28<sup>th</sup>, 2010. Produced water was released from the collar of the injection line and an unknown amount of water was released.

Beginning on September 28<sup>th</sup>, 2010, the site was excavated to 38 ft x 96 ft x 14 ft 8 in deep to remove the saturated soils and the soils were taken to Sundance Services for disposal. The saturated soils extended down to 14 ft 8 in where they encountered the capillary fringe of the aquifer. On October 7<sup>th</sup>, 2010, three soil bores were installed to determine the extent of the contamination at the site (Figure 2). RECS personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector (PID). Representative samples from the bore were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers (Appendix A). Laboratory readings showed chloride numbers ranging from a high of 1,340 mg/kg at 12 ft bgs in soil bore #3 to a low of 16 mg/kg at 3 ft bgs in soil bore #1. Laboratory readings for Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) showed non-detect in all soil bores.

On October 7<sup>th</sup>, 2010, RECS personnel took a sample of the clean imported soil which was used to backfill the site to a commercial laboratory for analysis. Chloride concentrations, GRO, and DRO from the laboratory sample showed readings of non-detect. On October 11<sup>th</sup>, 2011, RECS personnel field tested the excavation walls for chlorides and screened in the field with a photo-ionization detector (PID) (Figure 3). Representative samples from the west and south walls were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. For all wall samples, the GRO and DRO showed readings of non-detect. Chloride readings ranged from a high of 496 mg/kg at Pt. 3 of the West wall to a low of non-detect at Pt. 2 of the

South wall. At 4.5 ft bgs, a 20-mil reinforced liner was installed throughout the excavation. A 6 inch pad of blow sand was placed below and above the liner for liner protection (Appendix B).

On October 12<sup>th</sup>, 2011, Apache submitted the initial C-141 to NMOCD-Hobbs, which was approved by Larry Johnson the same day (Appendix C). The site was then backfilled on October 15<sup>th</sup>, 2010 with clean imported soil. Soil amendments were added to the site and the site was seeded with native vegetation on October 16<sup>th</sup>, 2010 (Appendix D).

On October 25<sup>th</sup>, 2011, monitor well #1 was installed 45 ft southeast of the line break. Monitor well #2 was installed on December 21<sup>st</sup>, 2010 56 ft NNW of the line break, and monitor well #3 was installed on April 13<sup>th</sup>, 2011, 199 ft southeast of the line break (Figure 4, Appendix E). Depth to water was determined to be approximately 14 ft bgs. Monitor well #1 has been sampled three times since its installation. Monitor well #2 has been sampled twice since its installation and monitor well #3 has been sampled once (Figure 5). Sampling events of monitor well #1 showed chloride and TDS readings well above WQCC standards, although the reading are dropping. In addition, the well showed slight levels of BTEX in the water that have now dissipated. Monitor well #2's most recent readings showed chlorides of 296 mg/kg, a TDS reading of 907 mg/kg, and BTEX showed non-detect and monitor well #3 showed a laboratory reading of 300 mg/kg, a TDS reading of 903 mg/kg, and BTEX showed non-detect. (Appendix F).

## Recommendations

Apache has completed the vadose zone remedy at the site. The contaminated soils have been excavated and disposed of at an NMOCD approved facility. A 20-mil reinforced poly liner was installed to inhibit migration of residual chlorides in the vadose zone. However, monitor well sampling has shown that contamination is evident in the groundwater just down gradient of the site. Therefore, RECS recommends that the site be monitored for groundwater conditions while we prepare a groundwater remedy for the site that will include estimations for chloride mass removal.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-9174 or me if you have any questions or wish to discuss the site.

Sincerely,



Lara Weinheimer  
Project Scientist  
RECS  
(575) 441-0431

Attachments:

Figure 1 – Site location map

Figure 2 – Soil bore installation plat

Figure 3 – Wall sampling plat

Figure 4 – Monitor well installation plat

Figure 5 – Monitor well sampling plat

Appendix A – Soil bore installation and Laboratory analysis

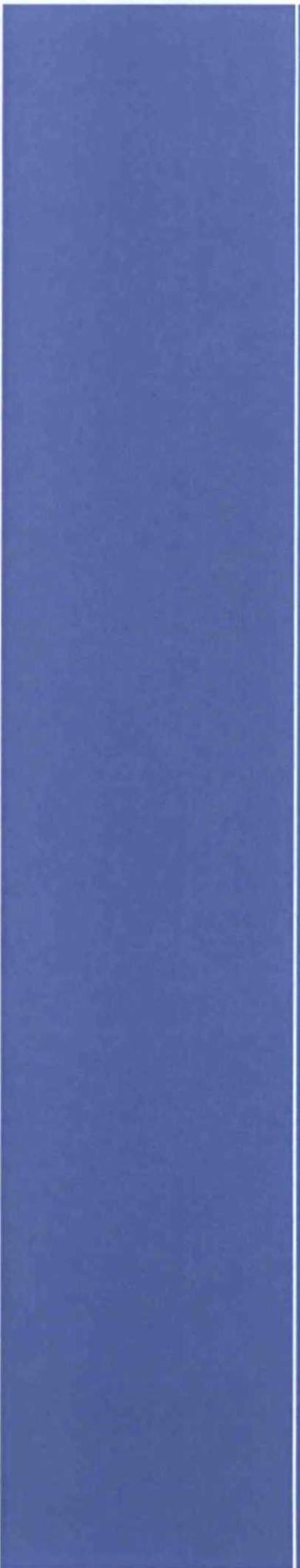
Appendix B – Wall sampling and imported backfill analysis

Appendix C – Initial C-141

Appendix D – Backfill and seed photos

Appendix E – Monitor well installation logs

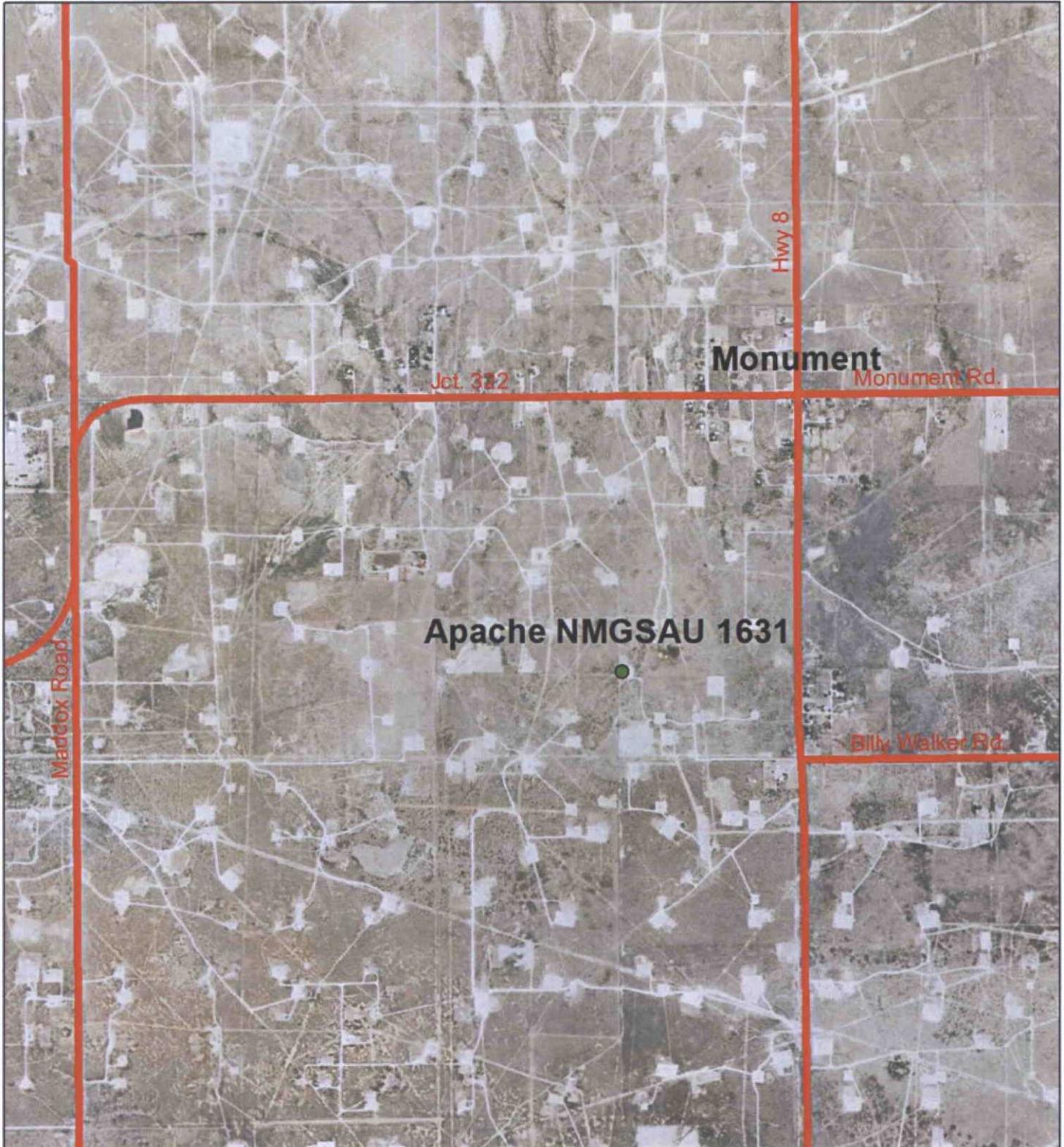
Appendix F – Monitor well sampling analysis



# Figures

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

# Site Map



**Apache NMGSAU 1631**

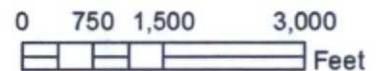


**Apache  
NMGSAU 1631**

LEGALS:UL/J sec. 32  
T19S R37E

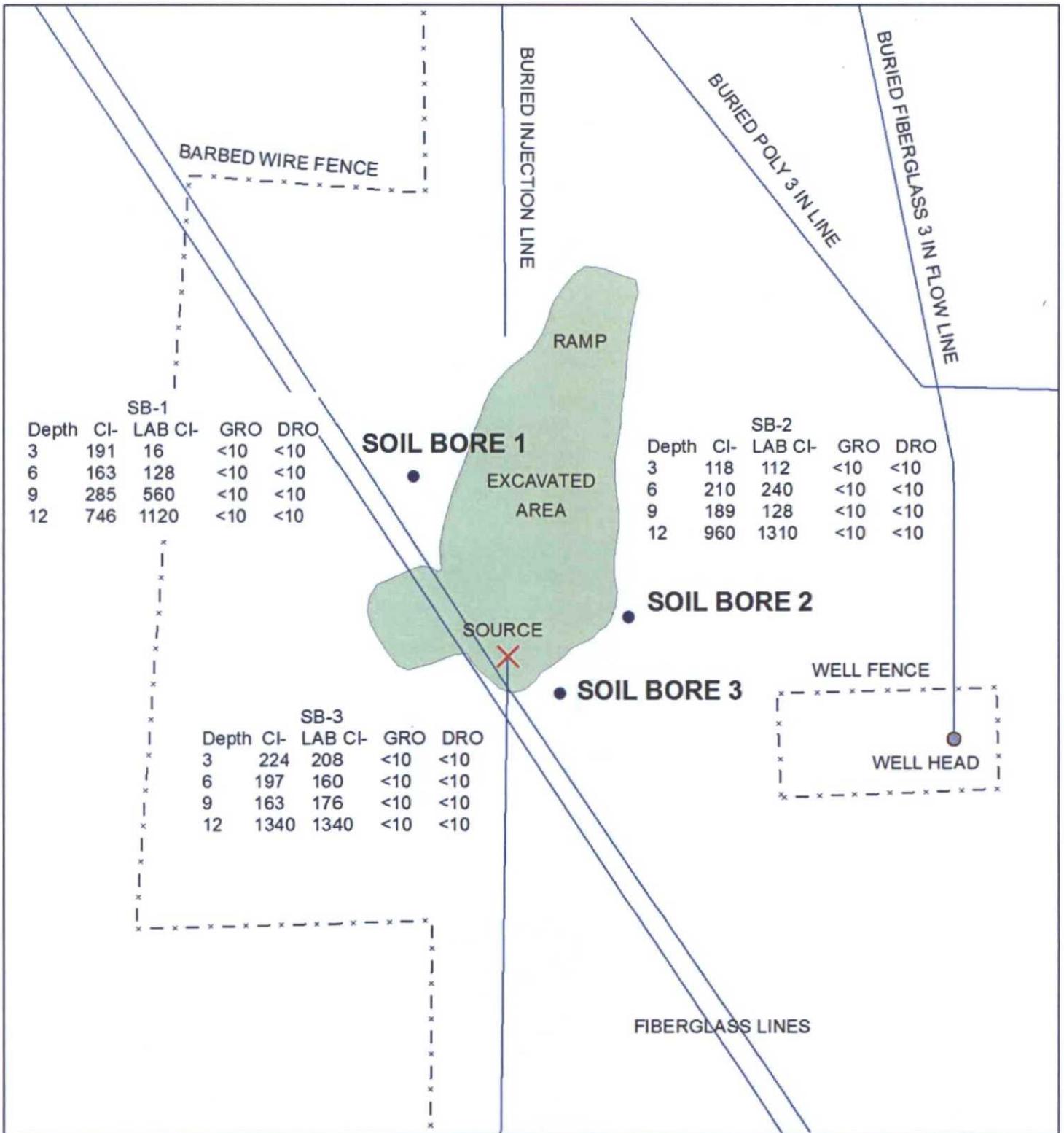
Case #: 1RP 10-12-2627

Figure 1



Drawing date: 5-10-11  
Drafted by: L. Weinheimer

# Soil Bore Information

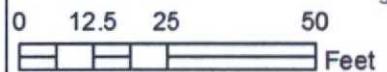


## Apache NMGSAU 1631

Legals: UL/J sec. 32  
T19S R37E

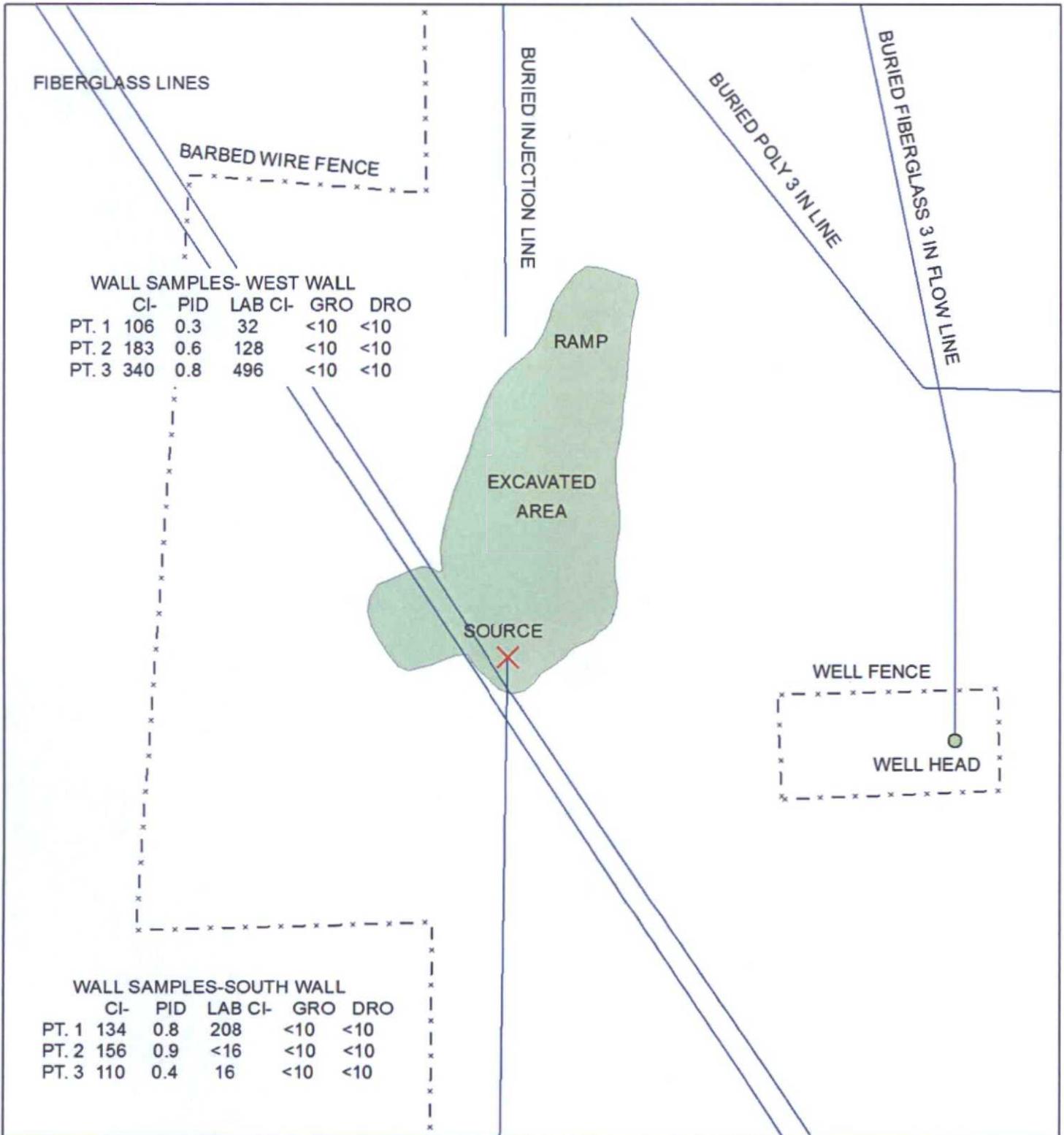
Case #: 1RP 10-12-2627

## Figure 2



Projection: NAD 83/STATE PLANE  
Drawing date: 10-20-10  
Drafted by: L. Weinheimer

# Wall Sampling Data

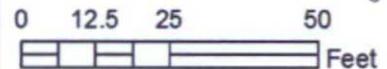


## Apache NMGSAU 1631

Legals: UL/J sec. 32  
T19S R37E

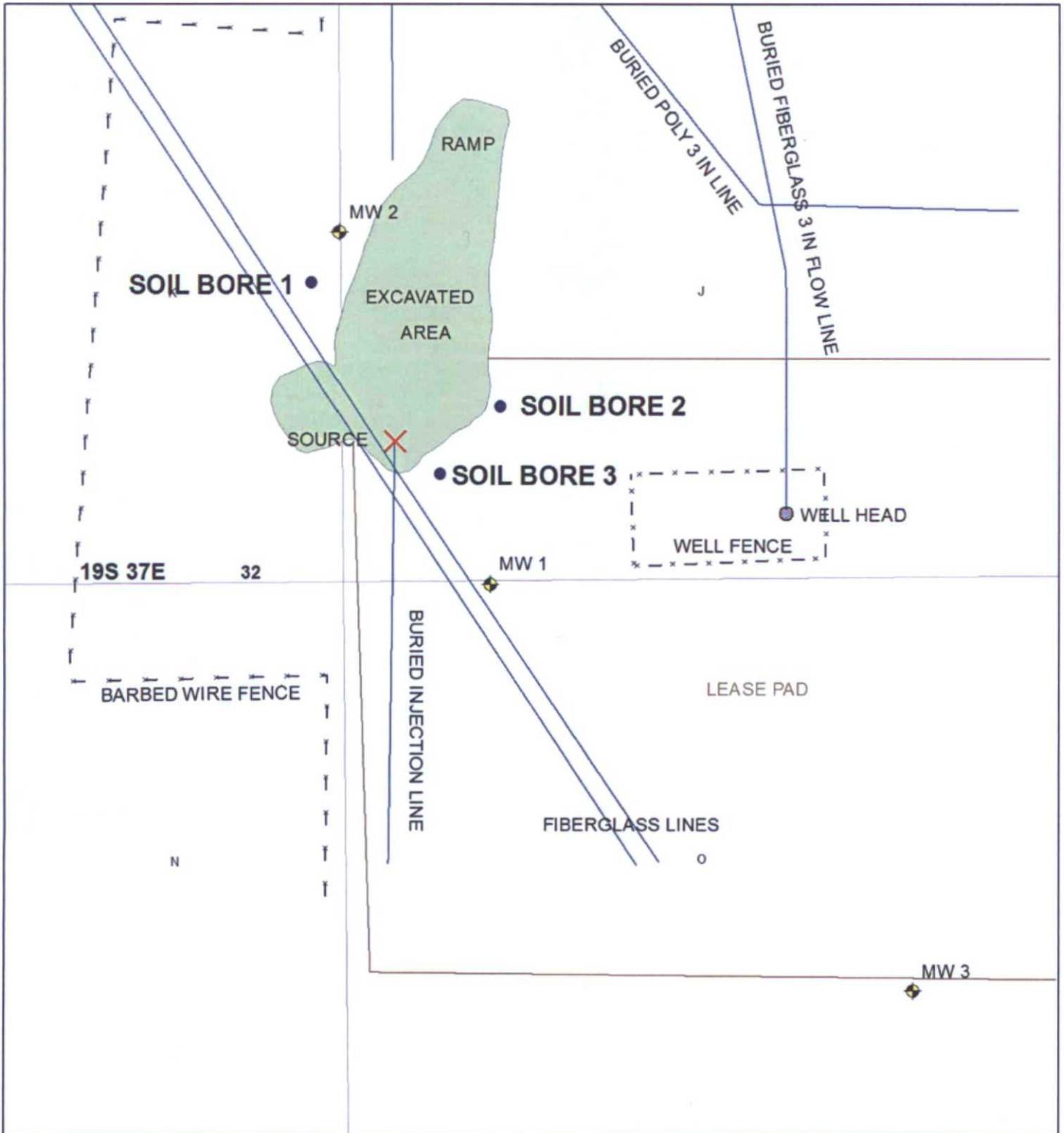
Case #: 1RP 10-12-2627

## Figure 3



Projection: NAD 83/STATE PLANE  
Drawing date: 5-10-11  
Drafted by: L. Weinheimer

# Monitor Well Installation



## Apache NMGSAU 1631

Legals: UL/J sec. 32  
T19S R37E

Case #: 1RP 10-12-2627

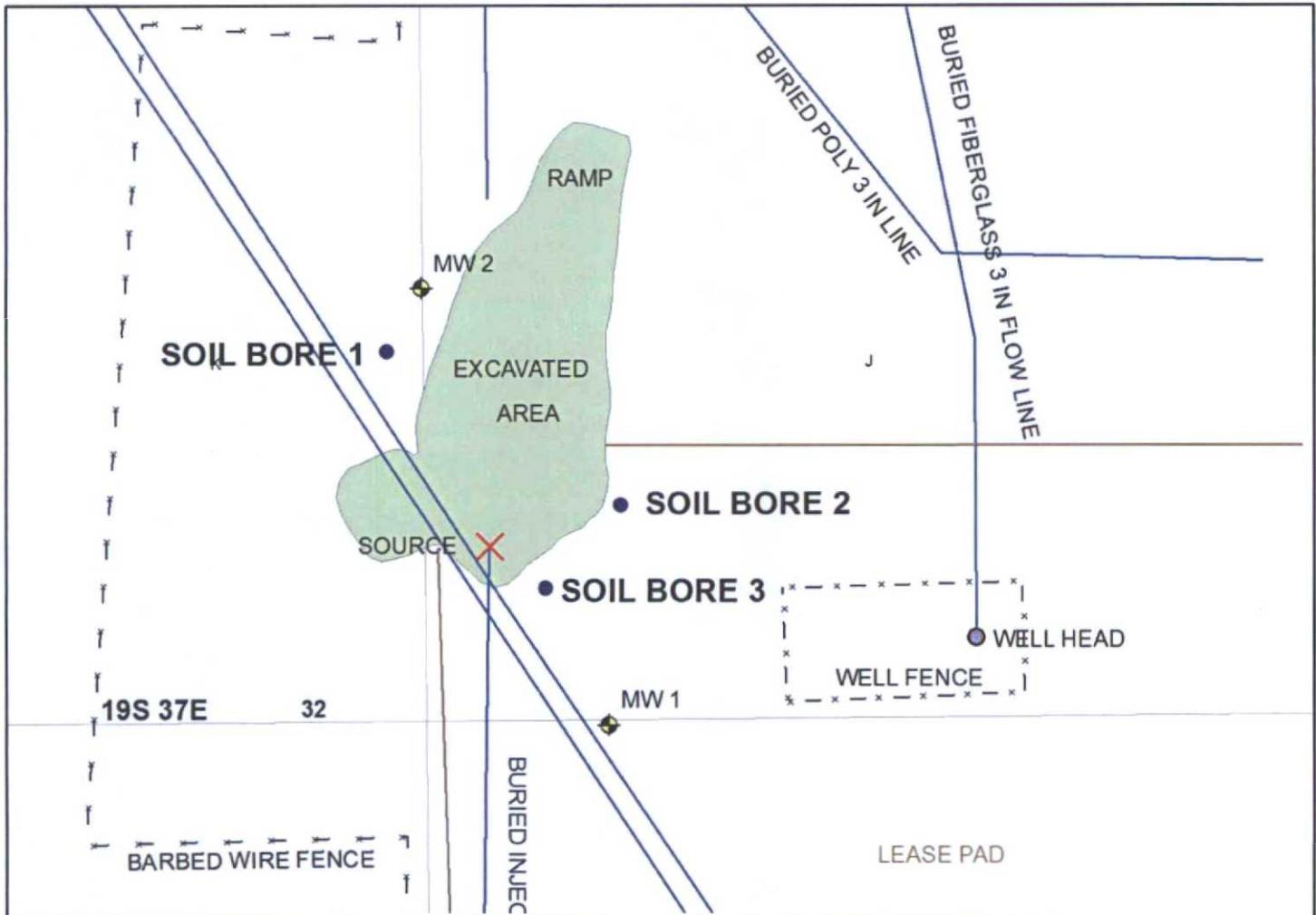
### Figure 4



0 12.5 25 50  
Feet

Projection: NAD 83/STATE PLANE  
Drawing date: 4-27-11  
Drafted by: L. Weinheimer

# Monitor Well Sampling



MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	13.84	50.35	23.7	90	11/3/2010	6400	12700	0.015	0.001	0.004	0.01	1120	Clear Strong odor
1	13.83	50.35	23.7	90	1/6/2011	3250	6600	0.007	<0.001	0.002	0.006	697	Clear Strong odor
1	13.86	50.36	23.7	90	5/19/2011	2420	4770	<0.001	<0.001	<0.001	<0.003	531	Clear Strong odor
MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	13.47	61.15	31	100	1/6/2011	320	878	<0.001	<0.001	<0.001	<0.003	81.1	Clear Strong odor
2	13.52	61.15	31	100	5/19/2011	296	907	<0.001	<0.001	<0.001	<0.003	67.1	Clear Strong odor
MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	18.69	30.05	1.8	8	5/19/2011	300	903	<0.001	<0.001	<0.001	<0.003	69.6	Clear Strong odor

MW 3

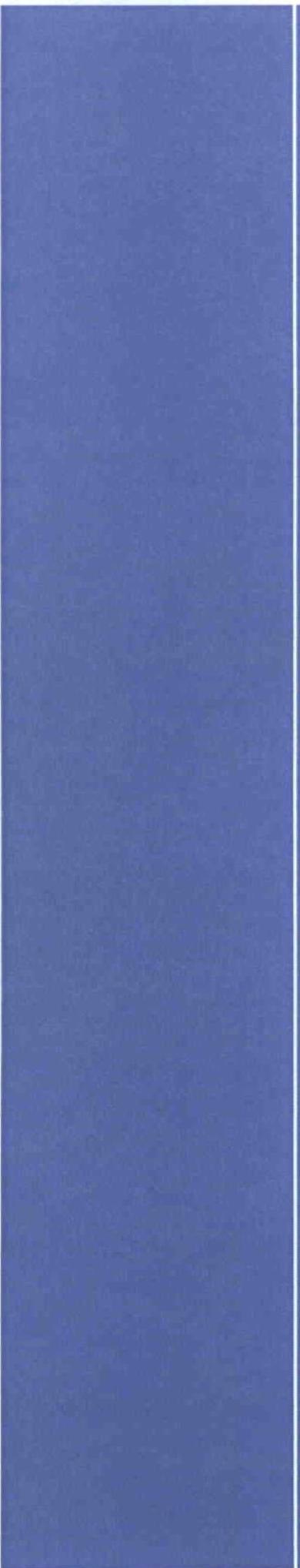


**Apache NMGSAU  
1631**  
Legals: UL/J sec. 32  
T19S R37E  
Case #: 1RP 10-12-2627

**Figure 5**

A north arrow is positioned to the right of the text. Below it is a scale bar marked with 0, 12.5, 25, and 50 feet.

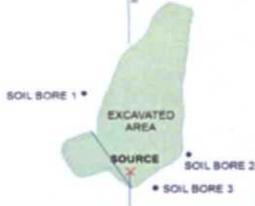
Projection: NAD 83/STATE PLANE  
Drawing date: 4-27-11  
Drafted by: L. Weinheimer



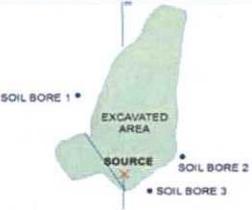
# Appendix A

Soil bore installation and Laboratory analysis

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

<b>Logger:</b>	B. Baker			
<b>Driller:</b>	Harrison & Cooper, Inc.			
<b>Drilling Method:</b>	Air rotary			
<b>Start Date:</b>	10/7/2010			
<b>End Date:</b>	10/7/2010	<b>Project Name:</b> NMGSAU 1631 <b>Project Client:</b> Apache	<b>Well ID:</b> SB-1	
<b>Comments:</b> Located 46 ft NW of the leak source.			<b>Location:</b> UL/J sec. 32 T19S R37E <b>Lat:</b> 32°36'48.223"N <b>Long:</b> 103°16'25.109"W	<b>County:</b> LEA <b>State:</b> NM
<b>DRAFTED BY:</b> Lara Weinheimer TD = 12 ft			GW = 14 ft	

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Light brown very fine sand with caliche. Dry. No odor.	[Brown Lithology Column]	[Green Well Construction Column]
3 ft	191	Cl-16	0.4			
		GRO <10		Light brown very fine sand with substantial caliche and sandstone. Dry. No odor.		
6 ft	163	Cl-128	0.2		[Brown Lithology Column]	} bentonite seal
		GRO <10				
		DRO <10				
9 ft	285	Cl-560	0		[Grey Lithology Column]	
		GRO <10		Light tan very fine sand. Moist. No odor.		
		DRO <10				
12 ft	746	Cl-1120	0.2			
		GRO <10				
		DRO <10				

<b>Logger:</b>	B. Baker					
<b>Driller:</b>	Harrison & Cooper, Inc.					
<b>Drilling Method:</b>	Air rotary					
<b>Start Date:</b>	10/7/2010					
<b>End Date:</b>	10/7/2010	<b>Project Name:</b> NMGSAU 1631 <b>Well ID:</b> SB-2 <b>Project Client:</b> Apache				
<b>Comments:</b> Located 30 ft east of the leak source.				<b>Location:</b> UL/J sec. 32 T19S R37E		
<b>DRAFTED BY:</b> Lara Weinheimer TD = 12 ft      GW = 14 ft				<b>Lat:</b> 32°36'47.898" <b>County:</b> LEA <b>Long:</b> 103°16'24.538" <b>State:</b> NM		
Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Tan very fine sand with substantial sandstone. Dry. No odor.	[Light tan sandstone pattern]	 bentonite seal
3 ft	118	Cl-112	0.5			
		GRO <10		Light orangey tan very fine sand with sandstone. Dry. No odor.	[Light orangey tan sandstone pattern]	
		DRO <10				
6 ft	210	Cl-240	0.4			
		GRO <10				
		DRO <10		Orangey brown very fine sand. Moist. No odor.	[Orangey brown sand pattern]	
9 ft	189	Cl-128	0.4			
		GRO <10				
		DRO <10				
12 ft	960	Cl-1310	0.3			
		GRO <10				
		DRO <10				



October 08, 2010

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE NM6SAU 1631

Enclosed are the results of analyses for samples received by the laboratory on 10/07/10 13:10.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

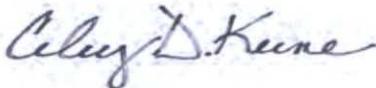
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received:	10/07/2010	Sampling Date:	10/07/2010
Reported:	10/08/2010	Sampling Type:	Soil
Project Name:	APACHE NM6SAU 1631	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 1 @ 3' (H021003-01)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>16.0</b>	16.0	10/08/2010	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		

Surrogate: 1-Chlorooctane 89.7 % 70-130  
 Surrogate: 1-Chlorooctadecane 90.3 % 70-130

**Sample ID: SB 1 @ 6' (H021003-02)**

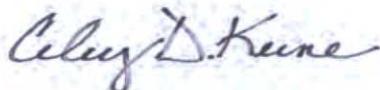
Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>128</b>	16.0	10/08/2010	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		

Surrogate: 1-Chlorooctane 88.5 % 70-130  
 Surrogate: 1-Chlorooctadecane 89.1 % 70-130

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received: 10/07/2010  
 Reported: 10/08/2010  
 Project Name: APACHE NM6SAU 1631  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

Sampling Date: 10/07/2010  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SB 1 @ 9' (H021003-03)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>560</b>	16.0	10/08/2010	ND	432	108	400	3.77	
TPH 8015M		mg/kg		Analyzed By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57	
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9	
<i>Surrogate: 1-Chlorooctane</i>	<i>84.3 %</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>90.1 %</i>	<i>70-130</i>							

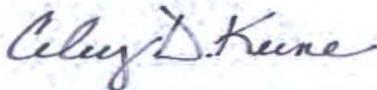
**Sample ID: SB 1 @ 12' (H021003-04)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1120</b>	16.0	10/08/2010	ND	432	108	400	3.77	
TPH 8015M		mg/kg		Analyzed By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57	
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9	
<i>Surrogate: 1-Chlorooctane</i>	<i>85.8 %</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>90.0 %</i>	<i>70-130</i>							

Cardinal Laboratories

\*=Accredited Analyte

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Celestine D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received: 10/07/2010  
 Reported: 10/08/2010  
 Project Name: APACHE NM6SAU 1631  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

Sampling Date: 10/07/2010  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SB 2 @ 3' (H021003-05)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>112</b>	16.0	10/08/2010	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		
<i>Surrogate: 1-Chlorooctane</i>		<i>83.0 %</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>81.1 %</i>	<i>70-130</i>							

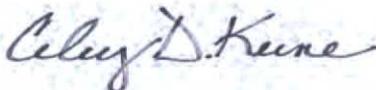
**Sample ID: SB 2 @ 6' (H021003-06)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>240</b>	16.0	10/08/2010	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		
<i>Surrogate: 1-Chlorooctane</i>		<i>82.8 %</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>81.9 %</i>	<i>70-130</i>							

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

 Received: 10/07/2010  
 Reported: 10/08/2010  
 Project Name: APACHE NM6SAU 1631  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 10/07/2010  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SB 2 @ 9' (H021003-07)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>128</b>	16.0	10/08/2010	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		

Surrogate: 1-Chlorooctane 82.0 % 70-130

Surrogate: 1-Chlorooctadecane 83.3 % 70-130

**Sample ID: SB 2 @ 12' (H021003-08)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1310</b>	16.0	10/08/2010	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		

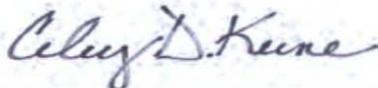
Surrogate: 1-Chlorooctane 84.0 % 70-130

Surrogate: 1-Chlorooctadecane 85.9 % 70-130

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Celestine D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

 Received: 10/07/2010  
 Reported: 10/08/2010  
 Project Name: APACHE NM6SAU 1631  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 10/07/2010  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SB 3 @ 3' (H021003-09)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>208</b>	16.0	10/08/2010	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		
<i>Surrogate: 1-Chlorooctane</i>		<i>81.5 %</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>83.6 %</i>	<i>70-130</i>							

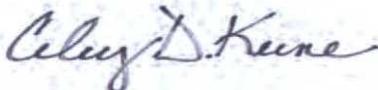
**Sample ID: SB 3 @ 6' (H021003-10)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>160</b>	16.0	10/08/2010	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57		
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9		
<i>Surrogate: 1-Chlorooctane</i>		<i>84.6 %</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>82.2 %</i>	<i>70-130</i>							

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Celestine D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

 Received: 10/07/2010  
 Reported: 10/08/2010  
 Project Name: APACHE NM6SAU 1631  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 10/07/2010  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SB 3 @ 9' (H021003-11)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>176</b>	16.0	10/08/2010	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57	
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9	

Surrogate: 1-Chlorooctane 82.4 % 70-130

Surrogate: 1-Chlorooctadecane 77.2 % 70-130

**Sample ID: SB 3 @ 12' (H021003-12)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1840</b>	16.0	10/08/2010	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	10/08/2010	ND	176	88.1	200	6.57	
DRO >C10-C28	<10.0	10.0	10/08/2010	ND	188	94.2	200	11.9	

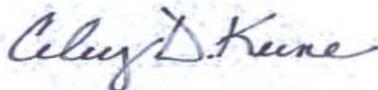
Surrogate: 1-Chlorooctane 85.8 % 70-130

Surrogate: 1-Chlorooctadecane 85.9 % 70-130

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

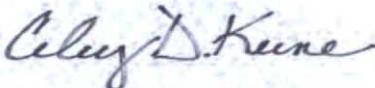
- QM-05      The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
- ND           Analyte NOT DETECTED at or above the reporting limit
- RPD         Relative Percent Difference
- \*\*            Samples not received at proper temperature of 6°C or below.
- \*\*\*          Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

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\*=Accredited Analyte

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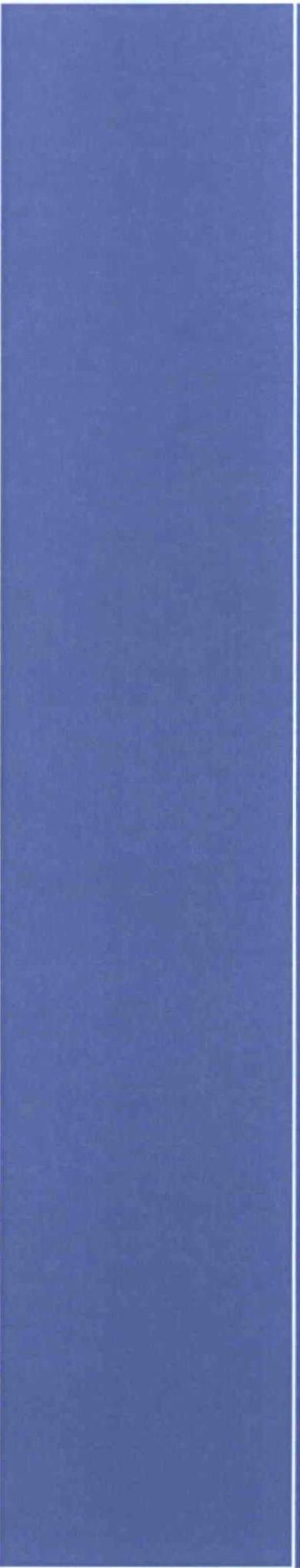


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Celey D. Keene, Lab Director/Quality Manager







# Appendix B

Wall sampling and imported backfill analysis

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

October 12, 2010

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE NM6SAU 1631

Enclosed are the results of analyses for samples received by the laboratory on 10/11/10 10:55.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

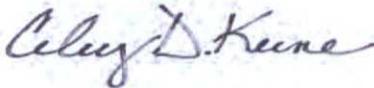
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene  
Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received:	10/11/2010	Sampling Date:	10/11/2010
Reported:	10/12/2010	Sampling Type:	Soil
Project Name:	APACHE NM6SAU 1631	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOUTH WALL SAMPLE PT. 1 (H021023-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	208	16.0	10/11/2010	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		

Surrogate: 1-Chlorooctane 97.0 % 70-130  
 Surrogate: 1-Chlorooctadecane 111 % 70-130

**Sample ID: SOUTH WALL SAMPLE PT. 2 (H021023-02)**

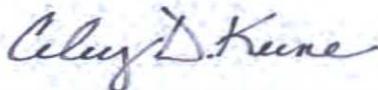
Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	10/11/2010	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		

Surrogate: 1-Chlorooctane 86.9 % 70-130  
 Surrogate: 1-Chlorooctadecane 108 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received: 10/11/2010  
 Reported: 10/12/2010  
 Project Name: APACHE NM6SAU 1631  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

Sampling Date: 10/11/2010  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SOUTH WALL SAMPLE PT. 3 (H021023-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>16.0</b>	16.0	10/11/2010	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		
<i>Surrogate: 1-Chlorooctane</i>	<i>90.9 %</i>	<i>70-130</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>109 %</i>	<i>70-130</i>								

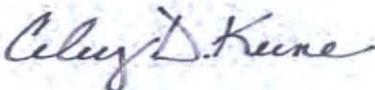
**Sample ID: WEST WALL SAMPLE PT. 1 (H021023-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>32.0</b>	16.0	10/11/2010	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		
<i>Surrogate: 1-Chlorooctane</i>	<i>94.0 %</i>	<i>70-130</i>								
<i>Surrogate: 1-Chlorooctadecane</i>	<i>110 %</i>	<i>70-130</i>								

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received:	10/11/2010	Sampling Date:	10/11/2010
Reported:	10/12/2010	Sampling Type:	Soil
Project Name:	APACHE NM6SAU 1631	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: WEST WALL SAMPLE PT. 2 (H021023-05)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>128</b>	16.0	10/11/2010	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		

Surrogate: 1-Chlorooctane 91.9 % 70-130  
 Surrogate: 1-Chlorooctadecane 106 % 70-130

**Sample ID: WEST WALL SAMPLE PT. 3 (H021023-06)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>496</b>	16.0	10/11/2010	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		

Surrogate: 1-Chlorooctane 88.8 % 70-130  
 Surrogate: 1-Chlorooctadecane 101 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

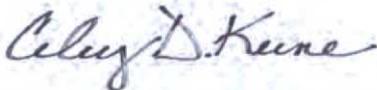
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

---

Cardinal Laboratories

\*=Accredited Analyte

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---

Celey D. Keene, Lab Director/Quality Manager



**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

101 East Marland, Hobbs, NM 88240  
(505) 393-2326 FAX (505) 393-2476

BILL TO		ANALYSIS REQUEST													
Company Name: Apache		P.O. #:													
Project Manager: Natalie Glendon		Company:													
Address:		Attn:													
City:		Address:													
Phone #:		City:													
Project #:		State:													
Project Name: Apache MISC-SPIL 10-31		Phone #:													
Project Location: Apache MISC-SPIL 10-31		Fax #:													
Sampler Name: Bruce Baker															
FOR LAB USE ONLY															
Lab I.D.	Sample I.D.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	MATRIX	SLUDGE	OTHER	ACID/BASE	ICE / COOL	OTHER	PRESERV.	SAMPLING	DATE	TIME
H24231	South Well Sample #1	1												10-24-10	7:20 AM
2	South Well Sample #2	1												10-24-10	7:55 AM
3	South Well Sample #3	1												10-24-10	7:10 AM
4	West Well Sample #1	1												10-24-10	7:30 AM
5	West Well Sample #2	1												10-24-10	7:35 AM
6	West Well Sample #3	1												10-24-10	7:45 AM

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

Relinquished By: Bruce Baker	Date: 10-11-10	Received By: G. Di. Anderson	Date: 10-11-10
Relinquished By:	Time: 10:55 AM	Checked By: (Initials) [Signature]	Time:
Delivered By: (Circle One)	Sample Condition	Cool / Intact	Checked By:
(Sampler - UPS - Bus - Other)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	(Initials) [Signature]
Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
REMARKS: MEMORIE RISE - RES. CONC. NATHALIE CLANDON@USA.MPHLABOR.COM RUSH!			

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476 #26

October 12, 2010

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE NM6SAU 1631

Enclosed are the results of analyses for samples received by the laboratory on 10/11/10 10:56.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received:	10/11/2010	Sampling Date:	10/07/2010
Reported:	10/12/2010	Sampling Type:	Soil
Project Name:	APACHE NM6SAU 1631	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: IMPORTED SOIL (H021024-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	10/11/2010	ND	432	108	400	3.77		

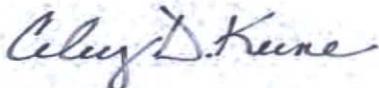
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/12/2010	ND	187	93.7	200	13.2		
DRO >C10-C28	<10.0	10.0	10/12/2010	ND	192	96.1	200	3.60		

Surrogate: 1-Chlorooctane      97.1 %      70-130  
 Surrogate: 1-Chlorooctadecane      104 %      70-130

Cardinal Laboratories

\*=Accredited Analyte

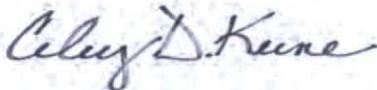
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived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



Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report





# Apache NMGSAU 1631 Liner Installation



collecting soil samples from the south wall,  
facing south 10/11/2010



collecting soil samples from the west wall,  
facing west 10/11/2010



padding the site with 6 inches of blow sand,  
facing north 10/11/2010



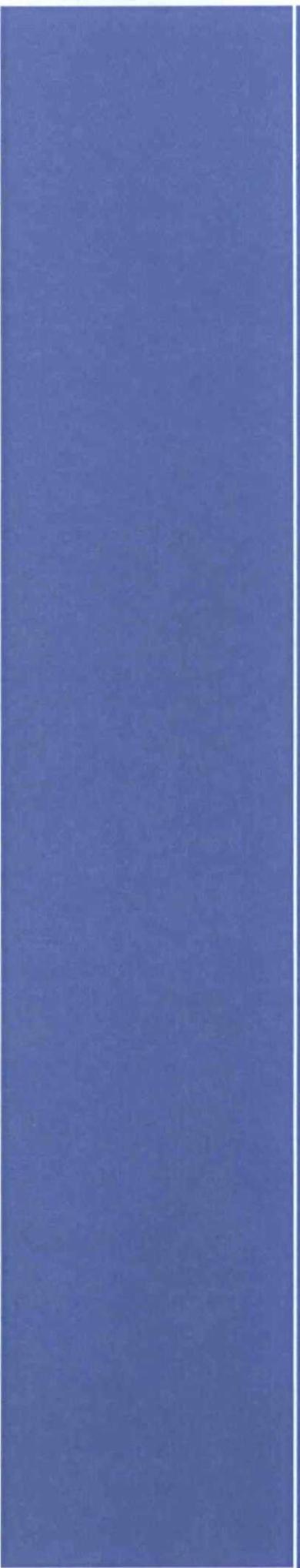
bedrock layer on the east wall,  
facing east 10/11/2010



48x55-ft, 20-mil reinforced liner installed at  
4.5' bgs, facing southwest 10/11/2010



padding the liner with blow sand,  
facing north 10/11/2010



# Appendix C

Initial C-141

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W Grand Avenue, Artesia, NM 88201  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S St Francis Dr., Santa Fe, NM 87505

RECEIVED  
OCT 12 2010  
HOBBSCOCD

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 Apache Corporation	B73	Contact Natalie Gladden
Address P.O. Box 1849 Eunice, NM 8823		Telephone No. 575-390-4186
Facility Name NMGSAU #1631 (329) nearest well		Facility Type

Surface Owner Ed Johnston	Mineral Owner NMOCD	Lease No. 30-025-35608
---------------------------	---------------------	------------------------

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	32	19S	37E	1330'	FSL	2520'	FEL	Lea

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

**NATURE OF RELEASE**

Type of Release PW	Volume of Release >5	Volume Recovered 0
Source of Release collar on injection line	Date and Hour of Occurrence 09/28/2010 11:26	Date and Hour of Discovery 09/28/2010 11:26
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Larry Johnson	
By Whom? Natalie Gladden	Date and Hour 09/28/2010 1pm	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.\*

Describe Cause of Problem and Remedial Action Taken.\*  
Saturated area was found at the surface, once the line was excavated, it was determined that the leak had just surfaced. Unknown amount released.

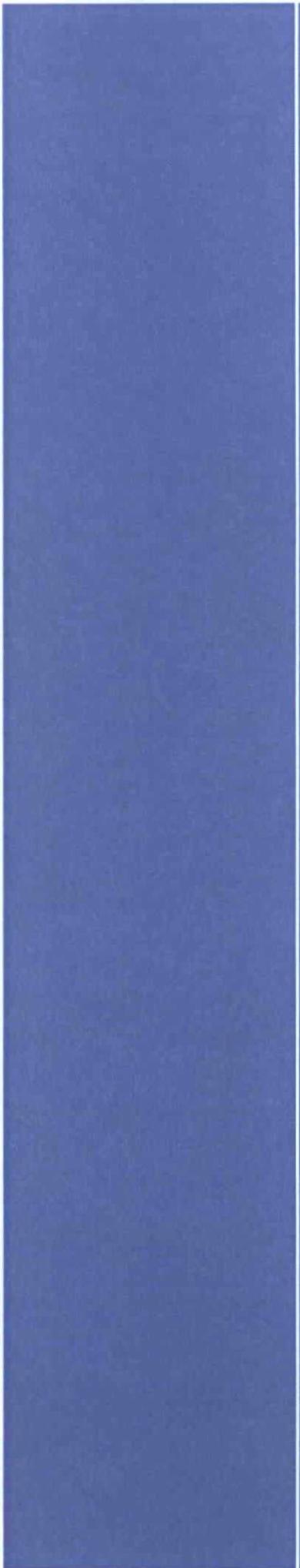
Describe Area Affected and Cleanup Action Taken.\*  
Site has been excavated according to NMOCD guidelines, a liner has been placed to prevent any future leaks only. All of the contaminated soil has been excavated and hauled to Sundance Services. Area has been backfilled after confirmation samples have been taken. Area will be reseeded per the landowners request. The saturated soil extended down 14'8 ft to ground water depth. Due to contamination of ground water, monitoring wells will be drilled in two weeks from today.

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

Signature: <i>Natalie Gladden</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Natalie Gladden	<i>[Signature]</i> Approved by District Supervisor <b>ENVIRONMENTAL ENGINEER</b>	
Title: EHS Environmental Tech	Approval Date: 10.12.10	Expiration Date: 12.12.10
E-mail Address: natalie.gladden@apachecorp.com	Conditions of Approval: <i>Submit Final C-141 &amp; Docs by</i> Attached <input type="checkbox"/> <i>TRP# 10.12.2627</i>	
Date: 10/12/10 Phone: 575-390-4186		

\* Attach Additional Sheets If Necessary

nLWJ1028751329  
PLWJ1028751329  
52067



# Appendix D

Backfill and seed photos

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

Apache NMGSAU 1631  
Backfilling and Seeding



pipeline installed and padded prior to backfilling, facing north 10/15/2010



hauling in top soil, facing northeast 10/15/2010



backfilling with top soil, facing north 10/15/2010



watering site for dust control, facing north 10/15/2010



leveling the site, facing southwest 10/15/2010



importing soil amendments, facing northeast 10/15/2010



spreading amendments and contouring site  
10/15/2010



silt net fencing, facing west 10/16/2010



disking the site in preparation of seeding,  
facing southwest 10/16/2010



seeding the site, facing northeast 10/16/2010



covering seed, facing northeast 10/16/2010



site complete, facing northwest 10/16/2010



# Appendix E

Monitor well installation logs

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

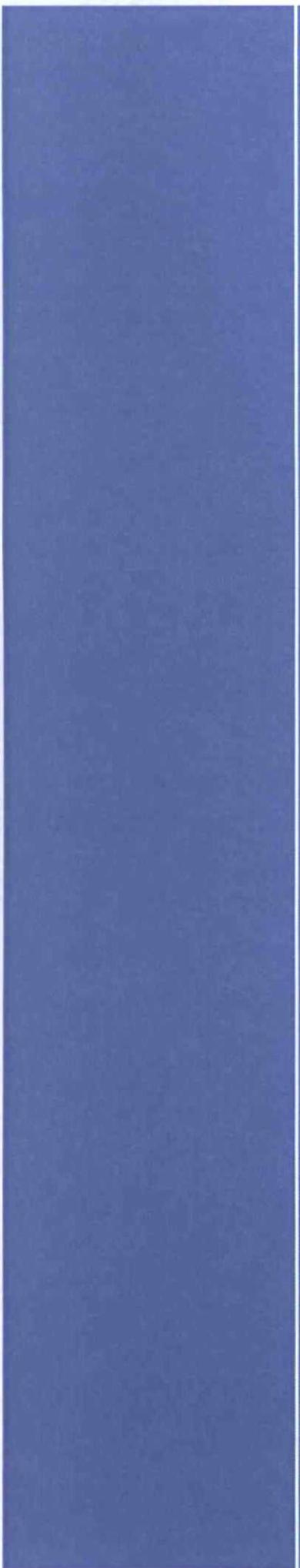


<b>Logger:</b>	Jordan Woodfin		
<b>Driller:</b>	Harrison & Cooper, Inc.		
<b>Drilling Method:</b>	Air rotary		
<b>Start Date:</b>	12/21/2010		
<b>End Date:</b>	12/21/2010		
<b>Comments:</b> Located 56 ft NNW of the leak source.		<b>Project Name:</b> Apache NMGSAU 1631 <b>Well ID:</b> MW-2 <b>Project Consultant:</b> RECS <b>Location:</b> UL/K sec. 32 T19S R37E <b>Lat:</b> 32°36'48.341"N <b>Long:</b> 103°16'25.035"W <b>County:</b> Lea <b>State:</b> NM	
<b>DRAFTED BY:</b> L. Weinheimer TD = 60 GW = 14 ft			

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction	
5 ft				NO SAMPLES TAKEN			
10 ft							
15 ft							
20 ft							
25 ft							
30 ft							
35 ft							
40 ft							

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
45 ft						
50 ft						
55 ft						
60 ft						





# Appendix F

Monitor well sampling analysis

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

May 31, 2011

NATALIE GLADDEN  
APACHE - EUNICE  
P. O. BOX 1849  
EUNICE, NM 88231

RE: APACHE NMGSAU 1631-ACCIDENTAL DISCHARGE

Enclosed are the results of analyses for samples received by the laboratory on 05/23/11 14:16.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene  
Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received:	05/23/2011	Sampling Date:	05/19/2011
Reported:	05/31/2011	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

**Sample ID: MONITOR WELL #1 (H101041-01)**

BTEX 8021B		mg/L		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	05/26/2011	ND	0.055	109	0.0500	7.04		
Toluene*	<0.001	0.001	05/26/2011	ND	0.054	108	0.0500	6.44		
Ethylbenzene*	<0.001	0.001	05/26/2011	ND	0.056	111	0.0500	6.44		
Total Xylenes*	<0.003	0.003	05/26/2011	ND	0.166	110	0.150	6.08		

Surrogate: 4-Bromofluorobenzene (PIE) 89.0 % 80-120

Chloride, SM4500Cl-B		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2420	4.00	05/31/2011	ND	104	104	100	7.41		

Sulfate 375.4		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate	531	10.0	05/31/2011	ND	39.3	98.2	40.0	2.07		

TDS 160.1		mg/L		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS	4770	5.00	05/24/2011	ND				0.154		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

 Received: 05/23/2011  
 Reported: 05/31/2011  
 Project Name: APACHE NMGSAU 1631-ACCIDENTAL DI:  
 Project Number: NONE GIVEN  
 Project Location: T19S-R37E-SEC32 J-LEA CTY., NM

 Sampling Date: 05/19/2011  
 Sampling Type: Water  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: MONITOR WELL #2 (H101041-02)**

BTEX 8021B		mg/L		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	05/26/2011	ND	0.055	109	0.0500	7.04		
Toluene*	<0.001	0.001	05/26/2011	ND	0.054	108	0.0500	6.44		
Ethylbenzene*	<0.001	0.001	05/26/2011	ND	0.056	111	0.0500	6.44		
Total Xylenes*	<0.003	0.003	05/26/2011	ND	0.166	110	0.150	6.08		

Surrogate: 4-Bromofluorobenzene (PIL) 95.1 % 80-120

Chloride, SM4500Cl-B		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	296	4.00	05/31/2011	ND	104	104	100	7.41		

Sulfate 375.4		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate	67.1	10.0	05/31/2011	ND	39.3	98.2	40.0	2.07		

TDS 160.1		mg/L		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS	907	5.00	05/24/2011	ND				0.154		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

 Received: 05/23/2011  
 Reported: 05/31/2011  
 Project Name: APACHE NMGSAU 1631-ACCIDENTAL DI  
 Project Number: NONE GIVEN  
 Project Location: T19S-R37E-SEC32 J-LEA CTY., NM

 Sampling Date: 05/19/2011  
 Sampling Type: Water  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: MONITOR WELL #3 (H101041-03)**

BTEX 8021B		mg/L		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	05/26/2011	ND	0.055	109	0.0500	7.04		
Toluene*	<0.001	0.001	05/26/2011	ND	0.054	108	0.0500	6.44		
Ethylbenzene*	<0.001	0.001	05/26/2011	ND	0.056	111	0.0500	6.44		
Total Xylenes*	<0.003	0.003	05/26/2011	ND	0.166	110	0.150	6.08		

Surrogate: 4-Bromofluorobenzene (PIL) 94.4 % 80-120

Chloride, SM4500CI-B		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	300	4.00	05/31/2011	ND	104	104	100	7.41		

Sulfate 375.4		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Sulfate	69.6	10.0	05/31/2011	ND	39.3	98.2	40.0	2.07		

TDS 160.1		mg/L		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
TDS	903	5.00	05/24/2011	ND				0.154		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

---

Cardinal Laboratories

\*=Accredited Analyte

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---

Celey D. Keene, Lab Director/Quality Manager



### Notes and Definitions

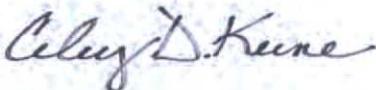
S-LOW	Low surrogate recovery confirmed as a matrix effect by a second analysis.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

---

Cardinal Laboratories

\*=Accredited Analyte

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---

Celey D. Keene, Lab Director/Quality Manager

# Cardinal Laboratories, Inc.

101 East Meriland - Hobbs, New Mexico 88240  
 Tel (575) 393-2326  
 Fax (575) 393-2476

**Company Name:** Apache  
**Project Manager:** Hack Conder  
**Address:** (Street, City, Zip) 122 W Taylor Street - Hobbs, New Mexico 88240  
**Phone #:** (575) 393-9174  
**Fax #:** (575) 393-9174

**LAB Order ID #**  
**ANALYSIS REQUEST**  
 (Circle or Specify Method No.)

**Project Name:** Apache NMGSAU 1631-Accidental Discharge  
**Project Location:** T19S-R37E-Sec32 J ~ Lea County New Mexico  
**Sample Signatures:** Rozanne Johnson (575) 631-9310  
 rozanne@valornet.com

LAB #	FIELD CODE	# CONTAINERS	MATRIX	PRESERVATIVE METHOD				SAMPLING DATE (2010)	TIME
				HCL (2.40ml VOA)	HNO <sub>3</sub>	NAHSO <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>		
H212271	Monitor Well #1	2	AIR	2				11-3 14:55	

**Relinquished by:** Rozanne Johnson  
**Date:** 11/4/10  
**Time:** 11:14  
**Received by:** Rozanne Johnson  
**Date:** 11/4/10  
**Time:** 11:14

**Delivered By:** (Circle One)  UPS - Bus - Other:  Other:

**Sample Condition:** Cool  Intact

**Yrs No:** 2.58

**Checked By:** (Initials) *RJA*

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GCMS Vol. 8260B/624	GCMS Seml. Vol. 8270C/625	PCBs 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO <sub>4</sub> , CO <sub>3</sub> , HCO <sub>3</sub> )	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours	
X																			

**REMARKS:**

**Phone Results:** Yes No  
**Fax Results:** Yes No  
**Additional Fax Number:**

**Email Results to:** hconder@riceswd.com  
 ktjones@rice2bwg.com  
 rozanne@valornet.com

January 12, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE NMGSAU 1631-ACCIDENTAL DISCHARGE

Enclosed are the results of analyses for samples received by the laboratory on 01/07/11 15:05.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

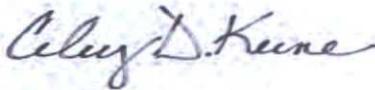
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received: 01/07/2011  
 Reported: 01/12/2011  
 Project Name: APACHE NMGSAU 1631-ACCIDENTAL DI  
 Project Number: NONE GIVEN  
 Project Location: T19S-R37E-SEC32 J-LEA CTY., NM

Sampling Date: 01/06/2011  
 Sampling Type: Water  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: MONITOR WELL #1 (H100052-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>3250</b>	4.00	01/11/2011	ND	104	104	100	3.77		
Sulfate 375.4		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate</b>	<b>697</b>	10.0	01/11/2011	ND	40.4	101	40.0	7.90		
TDS 160.1		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS</b>	<b>6600</b>	5.00	01/10/2011	ND				2.76		

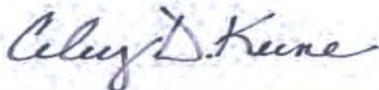
**Sample ID: MONITOR WELL #2 (H100052-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>320</b>	4.00	01/11/2011	ND	104	104	100	3.77		
Sulfate 375.4		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Sulfate</b>	<b>81.1</b>	10.0	01/11/2011	ND	40.4	101	40.0	7.90		
TDS 160.1		mg/L		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>TDS</b>	<b>878</b>	5.00	01/10/2011	ND				2.76		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

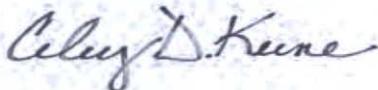
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



January 14, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE NMGSAU 1631-ACCIDENTAL DISCHARGE

Enclosed are the results of analyses for samples received by the laboratory on 01/07/11 15:05.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

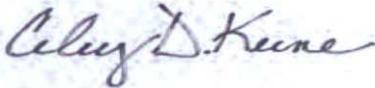
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

APACHE - EUNICE  
 NATALIE GLADDEN  
 P. O. BOX 1849  
 EUNICE NM, 88231  
 Fax To: 394-2425

Received:	01/07/2011	Sampling Date:	01/06/2011
Reported:	01/14/2011	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

**Sample ID: MONITOR WELL #1 (H100051-01)**

BTEX 8021B		mg/L		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	0.007	0.001	01/13/2011	ND	0.045	89.9	0.0500	10.2		
Toluene*	<0.001	0.001	01/13/2011	ND	0.046	92.6	0.0500	8.87		
Ethylbenzene*	0.002	0.001	01/13/2011	ND	0.050	99.9	0.0500	9.37		
Total Xylenes*	0.006	0.003	01/13/2011	ND	0.156	104	0.150	9.38		

Surrogate: 4-Bromofluorobenzene (PIL) 108 % 80-120

**Sample ID: MONITOR WELL #2 (H100051-02)**

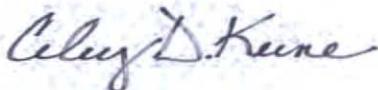
BTEX 8021B		mg/L		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.001	0.001	01/13/2011	ND	0.045	89.9	0.0500	10.2		
Toluene*	<0.001	0.001	01/13/2011	ND	0.046	92.6	0.0500	8.87		
Ethylbenzene*	<0.001	0.001	01/13/2011	ND	0.050	99.9	0.0500	9.37		
Total Xylenes*	<0.003	0.003	01/13/2011	ND	0.156	104	0.150	9.38		

Surrogate: 4-Bromofluorobenzene (PIL) 110 % 80-120

Cardinal Laboratories

\*=Accredited Analyte

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Celestine D. Keene, Lab Director/Quality Manager

### Notes and Definitions

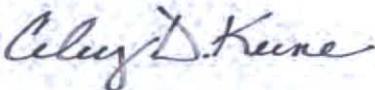
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

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Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

