

1R - 427-14

# WORKPLANS

Date:

11-9-11

## Rice Environmental Consulting & Safety

P.O. Box 5630 Hobbs, NM 88241

Phone 575.393.4411 Fax 575.393.0293

CERTIFIED MAIL

RETURN RECEIPT NO. 7008 1140 0001 3070 5924

November 9<sup>th</sup>, 2011

**Mr. Edward Hansen**

New Mexico Energy, Minerals, & Natural Resources

Oil Conservation Division, Environmental Bureau

1220 S. St. Francis Drive

Santa Fe, New Mexico 87505

**RE: ICP Report and CAP**

**Rice Operating Company – EME SWD System**

**EME D-2 boot (1R427-14): UL/D sec. 2 T20S R36E**

**(formerly the EME M-35-2 boot)**

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2011 NOV 10 P 2:33

Mr. Hansen:

RICE Operating Company (ROC) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site in the EME Salt Water Disposal (SWD) system. The site was previously referred to as the EME M-35-2 boot at T19S R36E. However, GIS mapping shows the site to be located within unit letter D, section 2, township 20S, and range 36E (Figure 1). To reflect the geographical location of the site, the name has been changed to the EME D-2 boot at T20S R36E. All correspondence will reference EME D-2 boot.

ROC is the service provider (agent) for the EME SWD System and has no ownership of any portion of the pipeline, well, or facility. The system is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

### **Background and Previous Work**

The site is located approximately 4 miles south-west of Monument, New Mexico at UL/D sec. 2 T20S R36E as shown on the Geographical Location Map (Figure 1). Groundwater at the location is determined to be approximately 49 +/- feet.

In 2003, ROC initiated work on the former EME D-2 boot junction box. The site was delineated using a backhoe to form a trench and soil samples were screened at regular intervals for both hydrocarbons and chlorides. From the excavation, the bottom grab sample was taken to a commercial laboratory for analysis. Laboratory tests of the 12 ft bottom grab sample showed a chloride laboratory reading of 2,690 mg/kg and negligible GRO (gasoline range organics), DRO (diesel range organics), and BTEX readings. The trench was backfilled with the excavated soils and capped with approximately 3 feet of topsoil.

The area was contoured to the surrounding landscape and an identification plate was placed on the surface of the site to mark its location for future environmental considerations. NMOCD was notified of potential groundwater impact on July 31<sup>st</sup>, 2003 and a junction box disclosure report was submitted to NMOCD with all the 2003 junction box closures and disclosures.

ROC proposed additional investigative work at the site to determine if there was potential for groundwater degradation from residual chlorides and hydrocarbons at the site.

### **ICP Investigative Results**

As part of the Investigation and Characterization Plan approved by NMOCD on September 13<sup>th</sup>, 2011, eight soil bores were advanced through the former junction box site on August 29<sup>th</sup> and 31<sup>st</sup>, 2011 (Figure 2). ROC personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector (PID) for hydrocarbons. Representative samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers (Appendix A). Laboratory readings showed chloride numbers increasing with depth at the source bore, SB-1. In all the other bores, laboratory chloride readings decreased with depth. Laboratory GRO and DRO readings were low to non-detect in all the soil bores except for SB-4 at 5 ft bgs. In SB-4 at 5 ft bgs, the laboratory GRO reading was 67.2 mg/kg and the DRO reading was 556 mg/kg. Because the field sample for SB-4 at 5 ft bgs had a PID reading above 100 ppm, the sample was also submitted for BTEX analysis. The sample returned with a laboratory benzene reading of non-detect, a toluene reading of 0.153 mg/kg, an ethyl-benzene reading of 0.495 mg/kg and a xylene reading of 1.58 mg/kg.

On October 27<sup>th</sup> and 28<sup>th</sup>, 2011, two monitor wells and two additional soil bores were installed at the site. MW-1 is located 50 ft southeast of the former junction box and MW-2 is located 163 ft northwest of the former junction box site. As MW-2 was being installed, RECS personnel field tested the soil for chlorides and screened in the field with PID meter for hydrocarbons to determine background soil concentrations. As SB-9 and SB-10 were being advanced, RECS personnel field tested the soil for chlorides and screened in the field with a PID meter for hydrocarbons. Representative samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. In SB-9, chloride numbers peaked at 10 ft bgs with a laboratory chloride reading of 2,240 mg/kg and decreased to 304 mg/kg at 45 ft bgs. In SB-10, chloride numbers peaked at 30 ft bgs with a laboratory chloride reading of 1,100 mg/kg and decreased to 304 mg/kg at 45 ft bgs. In both soil bores, GRO and DRO readings were non-detect.

### **Recommendations**

#### Corrective Action Plan to the Vadose Zone

RECS recommends that ROC install a 20-mil reinforced poly liner at the site measuring 51 ft x 62 ft (Figure 2). The liner will act as an infiltration barrier that will inhibit the downward migration of chlorides to groundwater. The liner will be installed at 5 – 4 ft bgs and padded both above and below with six inches of blow sand to prevent liner punctures. The soils placed on top of the padded liner will have a laboratory chloride reading below 500 mg/kg and a PID reading below 100 ppm. Excavated soil will be evaluated for use as backfill and any soil requiring disposal will be properly disposed of at a NMOCD approved facility.

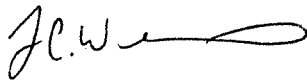
Finally, the site will be seeded. The surface soils over and surrounding the site will be prepared with soil amendments as needed and then seeded with a native vegetative mix. Vegetation above the liner will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

Further Groundwater Delineation

Groundwater samples will be obtained from the newly installed monitoring wells (MW-1 and MW-2) and analyzed on a quarterly basis. Once it is determined whether chloride impact has occurred to groundwater beneath the site, ROC will either suggest a groundwater remedy or request site termination.

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,

A handwritten signature in black ink, appearing to read 'JL.W.' followed by a stylized flourish.

Lara Weinheimer  
Project Scientist  
RECS  
(575) 441-0431

Attachments:

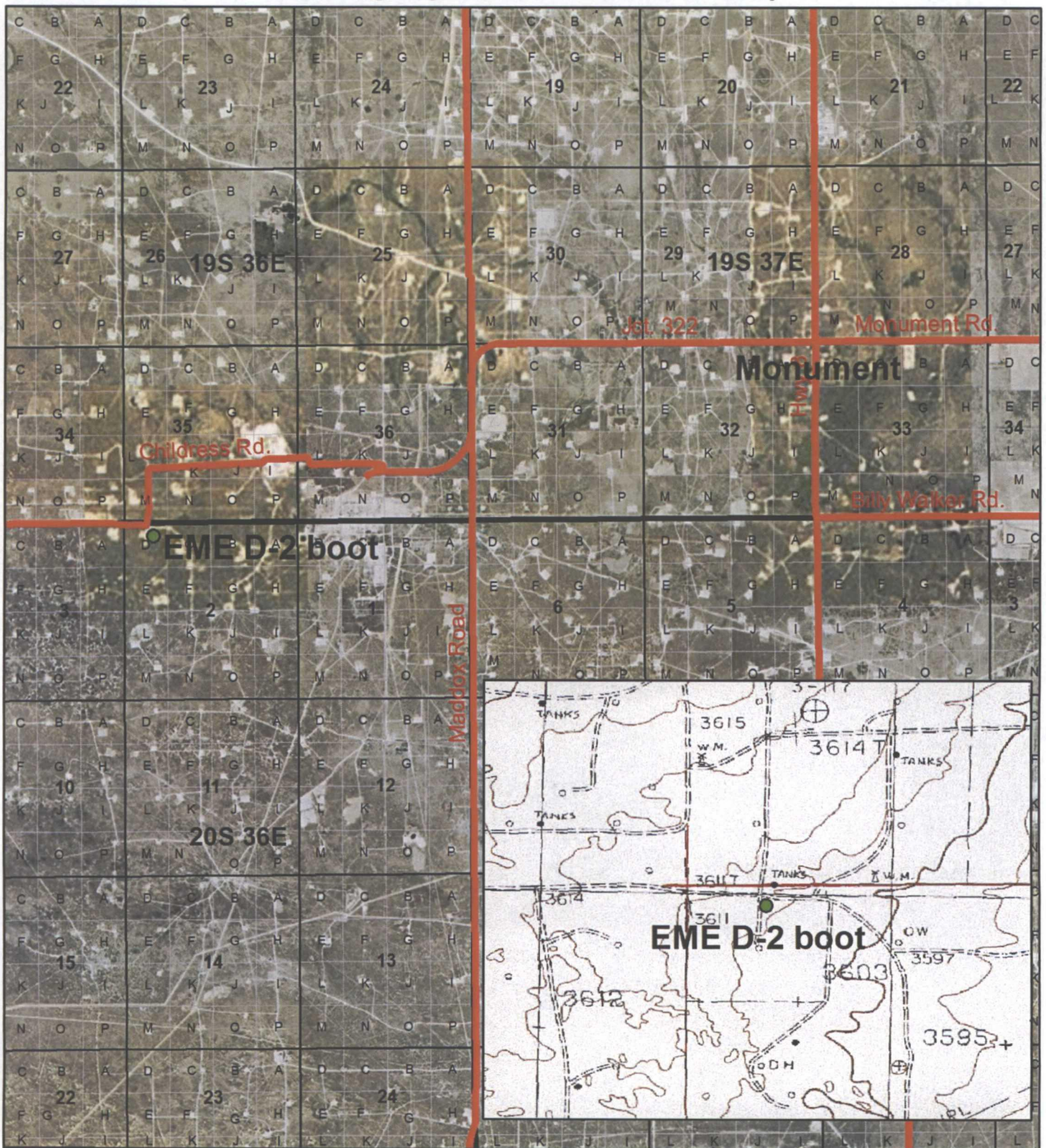
- Figure 1 – Geographical Location Map
- Figure 2 – Proposed Liner Map
- Appendix A – ICP soil bore and MW logs and laboratory confirmation



# Figures

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

# Geographical Location Map



## EME D-2 boot

LEGALS: UL/D sec. 2  
T20S R36E

Case#: 1R427-14

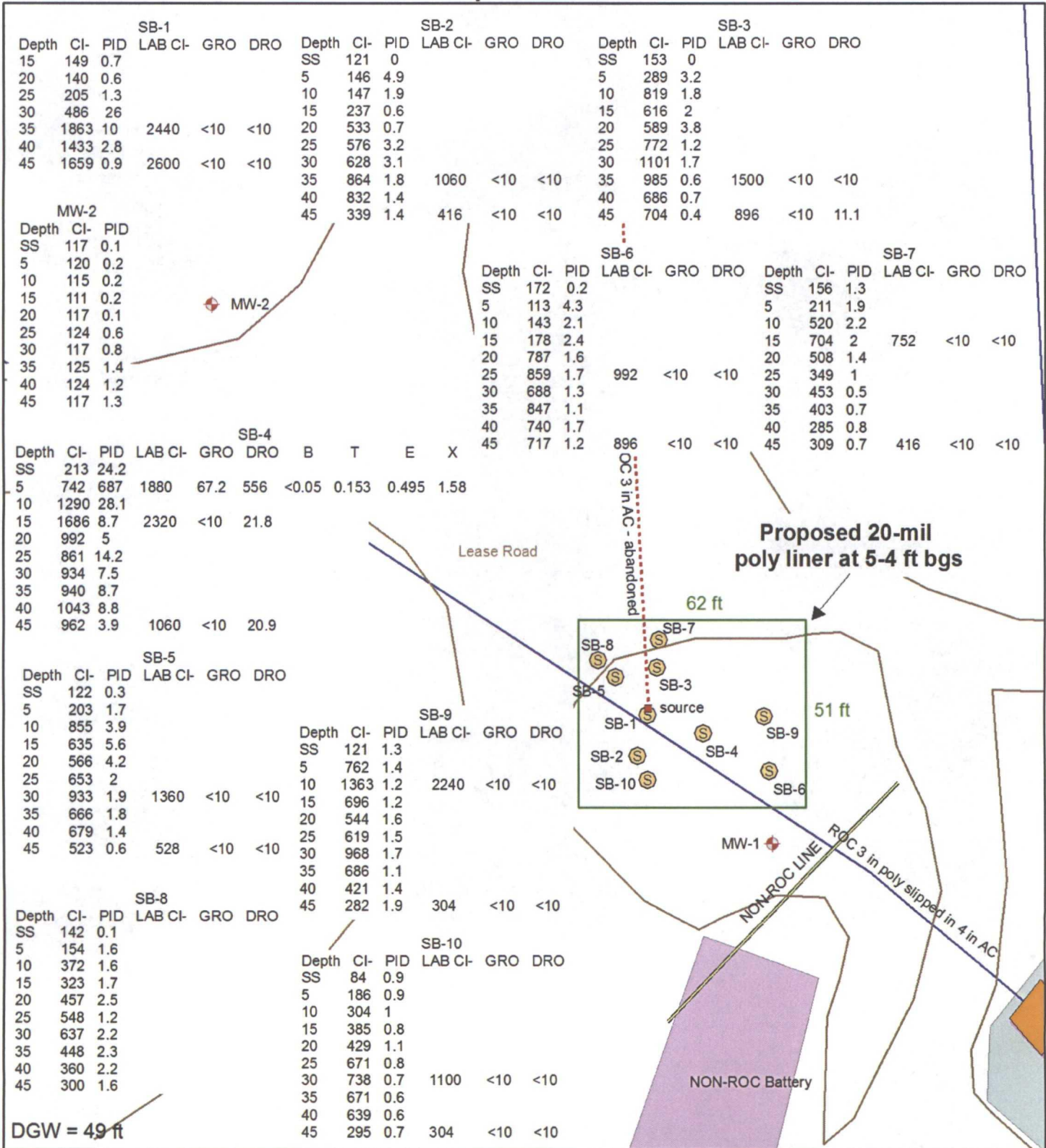
## Figure 1



0 0.3 0.6 1.2  
Miles

Drawing date: 8-3-11  
Drafted by: L. Weinheimer

# Proposed Liner

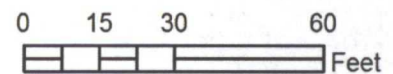


**EME D-2 boot**

LEGALS: UL/D sec. 2  
T20S R36E

Case#: 1R427-14

**Figure 2**



Drawing date: 11-4-11  
Drafted by: L. Weinheimer



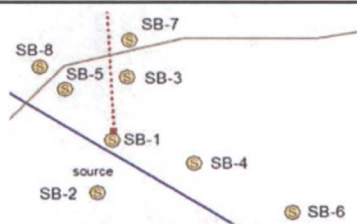

# Appendix A

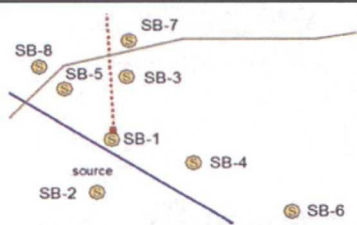


ICP soil bore and MW logs and laboratory confirmation

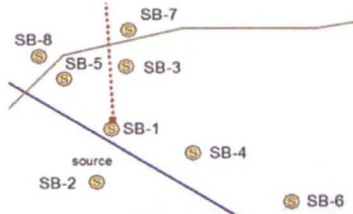

**RICE Environmental Consulting and Safety (RECS)**

P.O. Box 5630 Hobbs, NM 88241

Phone 575.393.4411 Fax 575.393.0293

<b>Logger:</b>	Kyle Norman						
<b>Driller:</b>	Harrison & Cooper, Inc.						
<b>Drilling Method:</b>	Air rotary		<b>Project Name:</b>	<b>Well ID:</b>			
<b>Start Date:</b>	8/29/2011		EME D-2 boot	SB-1			
<b>End Date:</b>	8/29/2011	<b>Project Consultant:</b> RECS		<b>Location:</b> UL/D sec. 2 T20S R36E			
Comments: All samples were from cuttings. Located at the source of the former junction box site. DRAFTED BY: L. Weinheimer TD = 45 ft                      GW = 49 ft			<b>Lat:</b> 32°36'32.683"N <b>County:</b> Lea <b>Long:</b> 103°19'51.876"W <b>State:</b> NM				
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
5 ft				Sandy Red Clay			
10 ft				Sandy Red Clay			
15 ft	149		0.7	Sandy Red Clay			
20 ft	140		0.6	Sandy Tan Reddish Clay			
25 ft	205		1.3	Sandy Tan Reddish Clay			bentonite seal
30 ft	486		26	Sandy Tan Reddish Clay			
35 ft	1863	CI-2440	10	Sandy Tan Reddish Clay			
		GRO <10					
		DRO <10					
40 ft	1433		2.8	Sandy Tan Reddish Clay			
45 ft	1659	CI-2600	0.9	Sandy Red Clay			
		GRO <10					
		DRO <10					

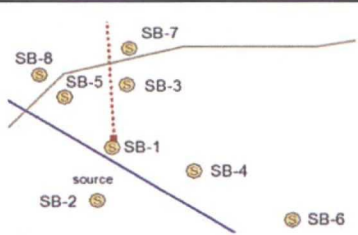


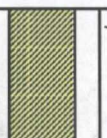
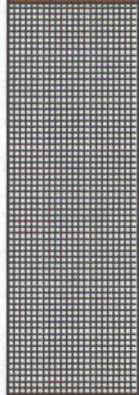
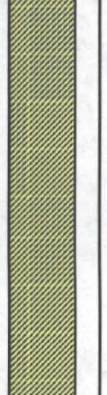

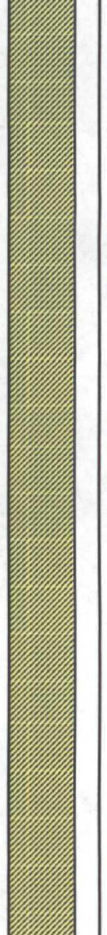
Logger:	Kyle Norman						
Driller:	Harrison & Cooper, Inc.						
Drilling Method:	Air rotary						
Start Date:	8/29/2011						
End Date:	8/29/2011	Comments: All samples were from cuttings. Located 13 ft south of the former junction box site. DRAFTED BY: L. Weinheimer TD = 45 ft                      GW = 49 ft		Project Name: EME D-2 boot                      Well ID: SB-2 Project Consultant: RECS Location: UL/D sec. 2 T20S R36E Lat: 32°36'32.578"N                      County: Lea Long: 103°19'51.909"W                      State: NM			
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Brown sand			
SS	121		0.0				
				Sandy Red Clay			
5 ft	146		4.9				
				Sandy Tan Clay			
10 ft	147		1.9				
				Sandy Tan Reddish Clay			
15 ft	237		0.6				
				Sandy Red Clay			
20 ft	533		0.7				
				Sandy Tan Reddish Clay			
25 ft	576		3.2				
30 ft	628		3.1				
35 ft	864	CI-1060	1.8				
		GRO <10					
		DRO <10					
40 ft	832		1.4				
45 ft	339	CI-416	1.4	Sandy Red Clay			
		GRO <10					
		DRO <10					

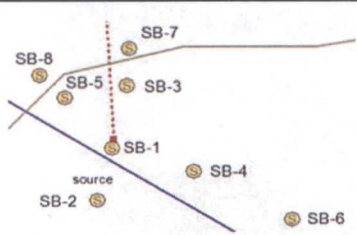

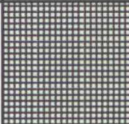






Logger:	Kyle Norman					
Driller:	Harrison & Cooper, Inc.					
Drilling Method:	Air rotary					
Start Date:	8/31/2011					
End Date:	8/31/2011			Project Name: EME D-2 boot Well ID: SB-3 Project Consultant: RECS		
Comments: All samples were from cuttings. Located 11 ft north of the former junction box site. DRAFTED BY: L. Weinheimer TD = 45 ft                      GW = 49 ft				Location: UL/D sec. 2 T20S R36E Lat: 32°36'32.813"N      County: Lea Long: 103°19'51.843"W      State: NM		
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
SS	153		0	Sandy Red Clay		
5 ft	289		3.2			
10 ft	819		1.8	Sandy Tan Clay		
15 ft	616		2	Sandy Red Clay		
20 ft	589		3.8			
25 ft	772		1.2	Sandy Tan Clay		
30 ft	1,101		1.7			
35 ft	985	CI-1500	0.6	Sandy Tan Reddish Clay		
		GRO <10				
		DRO <10				
40 ft	686		0.7			
45 ft	704	CI-896	0.4	Sandy Red Clay		
		GRO <10				
		DRO 11.1				

<b>Logger:</b>	Kyle Norman					
<b>Driller:</b>	Harrison & Cooper, Inc.					
<b>Drilling Method:</b>	Air rotary		<b>Project Name:</b>	<b>Well ID:</b>		
<b>Start Date:</b>	8/31/2011		EME D-2 boot	SB-4		
<b>End Date:</b>	8/31/2011	<b>Project Consultant:</b> RECS		<b>Location:</b> UL/D sec. 2 T20S R36E		
<b>Comments:</b> All samples were from cuttings. Located 16 ft ESE of the former junction box site. <b>DRAFTED BY:</b> L. Weinheimer TD = 45 ft                      GW = 49 ft			<b>Lat:</b> 32°36'32.635"N <b>County:</b> Lea <b>Long:</b> 103°19'51.698"W <b>State:</b> NM			
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Sandy Red Clay		
SS	213		24.2			
				Black Oily Sand Hydrocarbon Odor		
5 ft	742	CI-1880	687			
	B <0.05 T 0.153	GRO 67.2		Tan to Gray Hydrocarbon Odor		
	E 0.495 X 1.58	DRO 556				
10 ft	1290		28.1			
				Sandy Red Clay Hydrocarbon Odor		
15 ft	1686	CI-2320	8.7			
		GRO <10		Sandy Red Clay Slight Hydrocarbon Odor		
		DRO 21.8				
20 ft	992		5			
25 ft	861		14.2			
30 ft	934		7.5			
35 ft	940		8.7	Sandy Red Clay		
40 ft	1043		8.8			
45 ft	962	CI-1060	3.9			
		GRO <10				
		DRO 20.9				

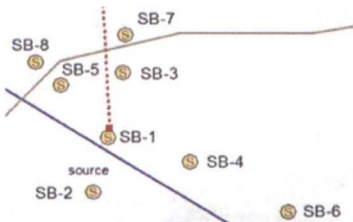

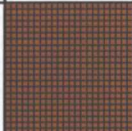

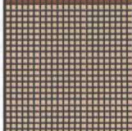





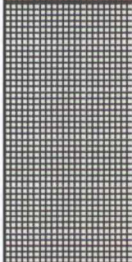





<b>Logger:</b>	Kyle Norman						
<b>Driller:</b>	Harrison & Cooper, Inc.						
<b>Drilling Method:</b>	Air rotary		<b>Project Name:</b>	<b>Well ID:</b>			
<b>Start Date:</b>	8/31/2011		EME D-2 boot	SB-5			
<b>End Date:</b>	8/31/2011		<b>Project Consultant:</b> RECS				
<b>Comments:</b> All samples were from cuttings. Located 12 ft North west of the former junction box site. <b>DRAFTED BY:</b> L. Weinheimer TD = 45 ft                      GW = 49 ft		<b>Location:</b> UL/D sec. 2 T20S R36E <b>Lat:</b> 32°36'32.785"N <b>County:</b> Lea <b>Long:</b> 103°19'51.977"W <b>State:</b> NM					
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Sandy Red Clay			
SS	122		0.3				
5 ft	203		1.7				
				Sandy Tan Reddish Clay			
10 ft	855		3.9				
15 ft	635		5.6				
20 ft	566		4.2				
25 ft	653		2				
30 ft	933	CI-1360	1.9				
		GRO <10		Sandy Red Clay			
		DRO <10					
35 ft	666		1.8				
40 ft	679		1.4				
45 ft	523	CI-528	0.6				
		GRO <10					
		DRO <10					

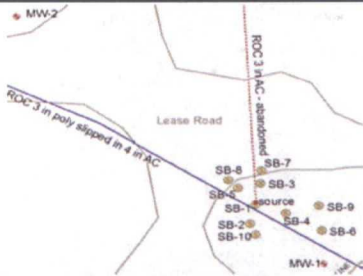

bentonite seal

Logger:	Kyle Norman						
Driller:	Harrison & Cooper, Inc.						
Drilling Method:	Air rotary			Project Name:		Well ID:	
Start Date:	8/31/2011			EME D-2 boot		SB-6	
End Date:	8/31/2011			Project Consultant: RECS			
Comments: All samples were from cuttings. Located 37 ft south east of the former junction box site. DRAFTED BY: L. Weinheimer TD = 45 ft                      GW = 49 ft				Location: UL/D sec. 2 T20S R36E Lat: 32°36'32.536"N                      County: Lea Long: 103°19'51.489"W                  State: NM			
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Brown sand			
SS	172		0.2				
				Sandy Tan Clay			
5 ft	113		4.3				
10 ft	143		2.1				
15 ft	178		2.4	Sandy Red Clay		 bentonite seal	
20 ft	787		1.6				
25 ft	859	CI-992	1.7				
		GRO <10					
		DRO <10					
30 ft	688		1.3				
35 ft	847		1.1				
40 ft	740		1.7				
45 ft	717	CI-896	1.2				
		GRO <10					
		DRO <10					





Logger:	Kyle Norman						
Driller:	Harrison & Cooper, Inc.						
Drilling Method:	Air rotary			Project Name:		Well ID:	
Start Date:	8/31/2011			EME D-2 boot		SB-7	
End Date:	8/31/2011	Project Consultant: RECS		Location: UL/D sec. 2 T20S R36E			
Comments: All samples were from cuttings. Located 18 ft north of the former junction box site.				Lat: 32°36'32.887"N		County: Lea	
DRAFTED BY: L. Weinheimer				Long: 103°19'51.836"W		State: NM	
TD = 45 ft				GW = 49 ft			
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Sandy Tan Clay			
SS	156		1.3				
				Tan Sand with Some Caliche			
5 ft	211		1.9				
10 ft	520		2.2				
				Sandy Red Clay			
15 ft	704	CI-752	2.0				
		GRO <10					
		DRO <10					
20 ft	508		1.4				
				Tan Sand with Some Caliche			
25 ft	349		1.0				
				Red Sand with Some Caliche			
30 ft	453		0.5				
				Sandy Red Clay			
35 ft	403		0.7				
40 ft	285		0.8				
45 ft	309	CI-416	0.7				
		GRO <10					
		DRO <10					



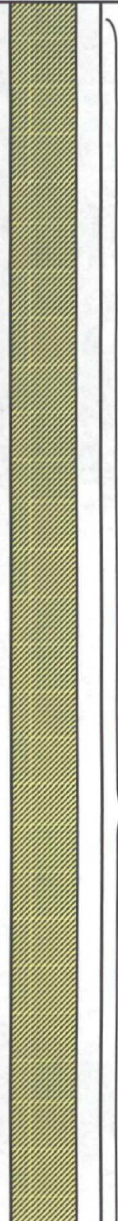
bentonite  
seal

Logger:	Kyle Norman						
Driller:	Harrison & Cooper, Inc.						
Drilling Method:	Air rotary			Project Name:		Well ID:	
Start Date:	8/31/2011			EME D-2 boot		SB-8	
End Date:	8/31/2011	Project Consultant: RECS					
Comments: All samples were from cuttings. Located 19 ft north west of the former junction box site.				Location: UL/D sec. 2 T20S R36E			
DRAFTED BY: L. Weinheimer				Lat: 32°36'32.835"N			
TD = 45 ft				County: Lea			
GW = 49 ft				State: NM			
Long: 103°19'52.034"W							
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Sandy Red Clay			
SS	142		0.1				
				Sandy Tan Reddish Clay			
5 ft	154		1.6				
				Tan Sand with Some Caliche			
10 ft	372		1.6				
15 ft	323		1.7				
				Sandy Red Clay			
20 ft	457		2.5				
				Sandy Tan Clay			
25 ft	548		1.2				
30 ft	637	CI-1120	2.2				
		GRO <10					
		DRO <10					
35 ft	448		2.3				
40 ft	360		2.2	Sandy Red Clay			
45 ft	300	CI-336	1.6				
		GRO <10					
		DRO <10					

Logger:	Kyle Norman						
Driller:	Harrison & Cooper, Inc.						
Drilling Method:	Air rotary			Project Name:		Well ID:	
Start Date:	10/27/2011			EME D-2 boot		SB-9	
End Date:	10/27/2011	Project Consultant: RECS					
Comments: SB-9 is located 32 ft east of the former junction box site. All samples were from cuttings.				Location: UL/D sec. 2 T20S R36E			
DRAFTED BY: L. Weinheimer				Lat: 32°36'32.681"N		County: Lea	
TD = 45 ft				Long: 103°19'51.5"W		State: NM	
GW = 49 ft							
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Brown Sand			
SS	121		1.3				
				Red Sand With Some Caliche			
5 ft	762		1.4				
				Tan Sand With Some Caliche			
10 ft	1363	CI-2240	1.2				
		GRO <10		Red Sand With Some Caliche			
		DRO <10					
15 ft	696		1.2				
20 ft	544		1.6				
25 ft	619		1.5				
30 ft	968		1.7				
35 ft	686		1.1				

bentonite  
seal

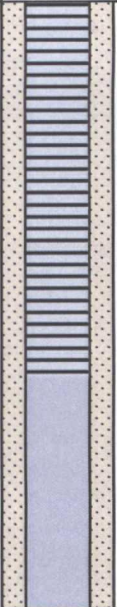
Depth (feet)	Chloride field tests	LAB	PID	Description		Lithology		Well Construction		
				Red Sand With Some Caliche						
40 ft	421		1.4							
45 ft	282	CI-304	1.9							
		GRO <10								
		DRO <10								

Logger:	Kyle Norman						
Driller:	Harrison & Cooper, Inc.			Project Name:		Well ID:	
Drilling Method:	Air rotary			EME D-2 boot		SB-10	
Start Date:	10/28/2011			Project Consultant:		RECS	
End Date:	10/28/2011	Comments: SB-10 is located 20 ft south of the former junction box site. All samples were from cuttings.		Location: UL/D sec. 2 T20S R36E			
DRAFTED BY: L. Weinheimer		Lat: 32°36'32.512"N		County: Lea			
TD = 45 ft		GW = 49 ft		State: NM			
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction	
				Brown Sand		 bentonite seal	
SS	84		0.9				
5 ft	186		0.9				
				Red Sand With Some Caliche			
10 ft	304		1.0				
15 ft	385		0.8				
				Red Sand			
20 ft	429		1.1				
				Tan Sand			
25 ft	671		0.8				
				Red Sand			
30 ft	738	CI-1100	0.7				
		GRO <10					
		DRO <10					
35 ft	671		0.6				

Depth (feet)	Chloride field tests	LAB	PID	Description		Lithology		Well Construction		
				Red Sand						
40 ft	639		0.6							
45 ft	295	CI-304	0.7							
		GRO <10								
		DRO <10								


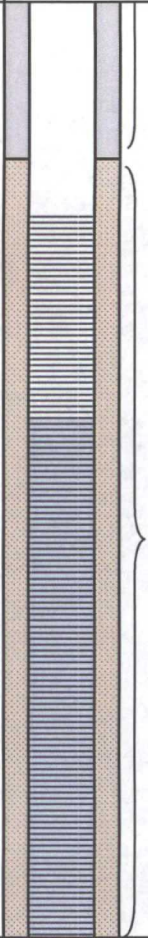

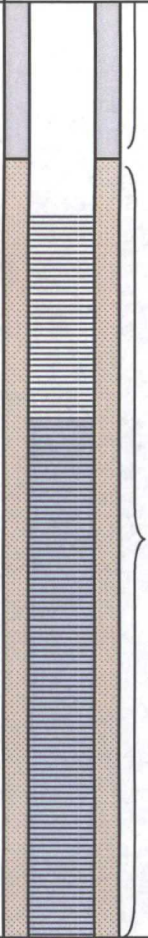
Logger:	Kyle Norman			
Driller:	Harrison & Cooper, Inc.			
Drilling Method:	Air rotary		Project Name:	Well ID:
Start Date:	10/27/2011		EME D-2 boot	MW-1
End Date:	10/27/2011		Project Consultant: RECS	
Comments: MW-1 is located 50 ft southeast of the former junction box site. No samples were taken. DRAFTED BY: L. Weinheimer TD = 92 ft                      GW = 49 ft			Location: UL/D sec. 2 T20S R36E Lat: 32°36'32.336"N      County: Lea Long: 103°19'51.474"W      State: NM	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
SS				NO SAMPLES TAKEN		<div>4 in PVC</div> <div>bentonite seal</div>
5 ft						
10 ft						
15 ft						
20 ft						
25 ft						
30 ft						
35 ft						
40 ft						
45 ft						
50 ft						
55 ft						
60 ft						

Depth (feet)	Chloride field tests	LAB	PID	Description		Lithology		Well Construction
65 ft				NO SAMPLES TAKEN				 sand pack
70 ft								
75 ft								
80 ft								
85 ft								
90 ft								
92 ft								

<b>Logger:</b>	Kyle Norman			
<b>Driller:</b>	Harrison & Cooper, Inc.			
<b>Drilling Method:</b>	Air rotary			
<b>Start Date:</b>	10/27/2011			
<b>End Date:</b>	10/27/2011			
<b>Project Name:</b> EME D-2 boot <b>Well ID:</b> MW-2 <b>Project Consultant:</b> RECS		<b>Location:</b> UL/D sec. 2 T20S R36E <b>Lat:</b> 32°36'33.805"N <b>Long:</b> 103°19'53.262"W <b>County:</b> Lea <b>State:</b> NM		
<b>Comments:</b> MW-2 is located 163 ft northwest of the former junction box site. All samples were from cuttings. No samples to lab. <b>DRAFTED BY:</b> L. Weinheimer TD = 62 ft      GW = 49 ft				

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Brown Sand		
SS	117		0.1			
				Tan Sand With Some Caliche		
5 ft	120		0.2			
				Red Sand With Some Caliche		
10 ft	115		0.2			
15 ft	111		0.2			
20 ft	117		0.1			
25 ft	124		0.6			
30 ft	117		0.8			
35 ft	125		1.4			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red Sand		
40 ft	124		1.2			
45 ft	117		1.3	NO SAMPLES TAKEN		
50 ft						
55 ft						
60 ft						
62 ft						

September 02, 2011

Hack Conder  
Rice Operating Company  
112 W. Taylor  
Hobbs, NM 88240

RE: EME D-2 BOOT (20/36)

Enclosed are the results of analyses for samples received by the laboratory on 08/30/11 8:05.

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:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/30/2011	Sampling Date:	08/29/2011
Reported:	09/02/2011	Sampling Type:	Soil
Project Name:	EME D-2 BOOT (20/36)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #1 @ 35' (H101831-01)**

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>2440</b>	16.0	08/31/2011	ND	416	104	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	09/01/2011	ND	163	81.5	200	1.53		
DRO >C10-C28	<10.0	10.0	09/01/2011	ND	161	80.3	200	2.07		
<i>Surrogate: 1-Chlorooctane</i>			98.9 %	55.5-154						
<i>Surrogate: 1-Chlorooctadecane</i>			107 %	57.6-158						

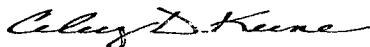
**Sample ID: SOIL BORE #1 @ 45' (H101831-02)**

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>2600</b>	16.0	08/31/2011	ND	416	104	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	09/01/2011	ND	163	81.5	200	1.53		
DRO >C10-C28	<10.0	10.0	09/01/2011	ND	161	80.3	200	2.07		
<i>Surrogate: 1-Chlorooctane</i>			94.3 %	55.5-154						
<i>Surrogate: 1-Chlorooctadecane</i>			106 %	57.6-158						

Cardinal Laboratories

\*=Accredited Analyte

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Celest D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/30/2011	Sampling Date:	08/29/2011
Reported:	09/02/2011	Sampling Type:	Soil
Project Name:	EME D-2 BOOT (20/36)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #2 @ 35' (H101831-03)**

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>1060</b>	16.0	08/31/2011	ND	416	104	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	09/01/2011	ND	163	81.5	200	1.53	
DRO >C10-C28	<10.0	10.0	09/01/2011	ND	161	80.3	200	2.07	

Surrogate: 1-Chlorooctane 97.9 % 55.5-154

Surrogate: 1-Chlorooctadecane 108 % 57.6-158

**Sample ID: SOIL BORE #2 @ 45' (H101831-04)**

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>416</b>	16.0	08/31/2011	ND	416	104	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	09/02/2011	ND	172	86.1	200	1.25	
DRO >C10-C28	<10.0	10.0	09/02/2011	ND	181	90.6	200	3.69	

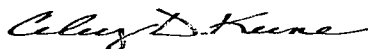
Surrogate: 1-Chlorooctane 99.5 % 55.5-154

Surrogate: 1-Chlorooctadecane 109 % 57.6-158

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

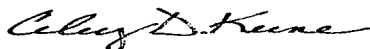
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received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

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



# CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603  
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

BILL TO										ANALYSIS REQUEST												
Company Name: Rice										P.O. #:												
Project Manager: Hack Conder										Company:												
Address:										Attn:												
City:										Address:												
Phone #:										City:												
Project #:										State:												
Project Name:										Phone #:												
Project Location: FME D-2 Boor 20-36										Fax #:												
Sampler Name: Kyle Norman																						
FOR LAB USE ONLY																						
Lab I.D.	Sample I.D.	# CONTAINERS	(G) RABOR (COMP)	MATRIX	GROUNDWATER	WASTEWATER	SOIL	SLUDGE	OTHER	ACID/BASE	ICE/COOL	OTHER	PRESERV	SAMPLING	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
HID1831	Soil Bore #1 @ 35'	1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8-29-11	10:00	✓	✓	✓	✓	✓	✓
	Soil Bore #1 @ 45'	1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8-29-11	10:10	✓	✓	✓	✓	✓	✓
	Soil Bore #2 @ 35'	1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8-29-11	10:40	✓	✓	✓	✓	✓	✓
	Soil Bore #2 @ 45'	1	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	8-29-11	10:45	✓	✓	✓	✓	✓	✓

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Relinquished By:	Date:	Received By:	Date:	Relinquished By:	Date:	Received By:	Date:
Kyle Norman	8-30-11	[Signature]	8-30-11	[Signature]	8-30-11	[Signature]	8-30-11
Delivered By: (Circle One)		Sample Condition:		Checked By:		Sample Condition:	
Sampler - UPS		Cool		[Signature]		Cool	
- Bus		Intact				Intact	
- Other:		Yes				Yes	
		No				No	

Phone Result: ☐ Yes ☒ No Add'l Phone #:   
Fax Result: ☐ Yes ☒ No Add'l Fax #:   
email results: kcnorman@riceswd.com  
Zconder@rice-ecs.com; Bbaker@riceswd.com  
hconder@riceswd.com; Lweinheimer@riceswd.com

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

#26

September 09, 2011

Hack Conder  
Rice Operating Company  
112 W. Taylor  
Hobbs, NM 88240

RE: D-2 BOOT EME (20/37)

Enclosed are the results of analyses for samples received by the laboratory on 08/31/11 16:12.

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.

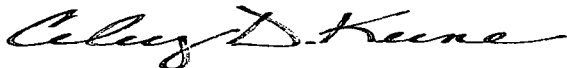
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

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:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #3 @ 35' (H101855-01)**

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>1500</b>	16.0	09/01/2011	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	09/04/2011	ND	179	89.3	200	0.599	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	168	84.1	200	6.80	
Surrogate: 1-Chlorooctane		106 %	55.5-154						
Surrogate: 1-Chlorooctadecane		108 %	57.6-158						

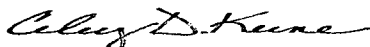
**Sample ID: SOIL BORE #3 @ 45' (H101855-02)**

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>896</b>	16.0	09/01/2011	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	09/04/2011	ND	179	89.3	200	0.599	
<b>DRO &gt;C10-C28</b>	<b>11.1</b>	10.0	09/04/2011	ND	168	84.1	200	6.80	
Surrogate: 1-Chlorooctane		103 %	55.5-154						
Surrogate: 1-Chlorooctadecane		103 %	57.6-158						

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #4 @ 5' (H101855-03)**

BTEX 8021B		mg/kg		Analyzed By: CMS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/02/2011	ND	2.11	106	2.00	10.0	
Toluene*	0.153	0.050	09/02/2011	ND	2.03	101	2.00	8.54	
Ethylbenzene*	0.495	0.050	09/02/2011	ND	2.02	101	2.00	6.29	
Total Xylenes*	1.58	0.150	09/02/2011	ND	6.03	100	6.00	5.93	

Surrogate: 4-Bromofluorobenzene (PIL) 161 % 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1880	16.0	09/01/2011	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	67.2	10.0	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	556	10.0	09/04/2011	ND	177	88.3	200	0.760	

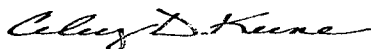
Surrogate: 1-Chlorooctane 109 % 55.5-154

Surrogate: 1-Chlorooctadecane 106 % 57.6-158

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #4 @ 15' (H101855-04)**

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>2320</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
<b>DRO &gt;C10-C28</b>	<b>21.8</b>	10.0	09/04/2011	ND	177	88.3	200	0.760	

Surrogate: 1-Chlorooctane 105 % 55.5-154

Surrogate: 1-Chlorooctadecane 109 % 57.6-158

**Sample ID: SOIL BORE #4 @ 45' (H101855-05)**

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>1060</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
<b>DRO &gt;C10-C28</b>	<b>20.9</b>	10.0	09/04/2011	ND	177	88.3	200	0.760	

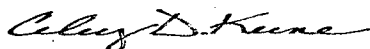
Surrogate: 1-Chlorooctane 137 % 55.5-154

Surrogate: 1-Chlorooctadecane 139 % 57.6-158

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #5 @ 30' (H101855-06)**

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>1360</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	

Surrogate: 1-Chlorooctane 107 % 55.5-154

Surrogate: 1-Chlorooctadecane 110 % 57.6-158

**Sample ID: SOIL BORE #5 @ 45' (H101855-07)**

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>528</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	

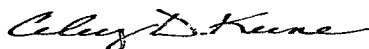
Surrogate: 1-Chlorooctane 121 % 55.5-154

Surrogate: 1-Chlorooctadecane 127 % 57.6-158

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\*=Accredited Analyte

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Celest D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #6 @ 25' (H101855-08)**

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>992</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	

Surrogate: 1-Chlorooctane 108 % 55.5-154

Surrogate: 1-Chlorooctadecane 110 % 57.6-158

**Sample ID: SOIL BORE #6 @ 45' (H101855-09)**

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>896</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	

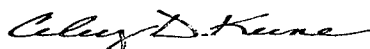
Surrogate: 1-Chlorooctane 105 % 55.5-154

Surrogate: 1-Chlorooctadecane 107 % 57.6-158

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #7 @ 15' (H101855-10)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	752	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	
Surrogate: 1-Chlorooctane		109 %	55.5-154						
Surrogate: 1-Chlorooctadecane		111 %	57.6-158						

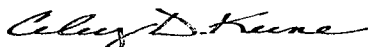
**Sample ID: SOIL BORE #7 @ 45' (H101855-11)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	416	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	
Surrogate: 1-Chlorooctane		130 %	55.5-154						
Surrogate: 1-Chlorooctadecane		133 %	57.6-158						

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	08/31/2011	Sampling Date:	08/31/2011
Reported:	09/09/2011	Sampling Type:	Soil
Project Name:	D-2 BOOT EME (20/37)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SOIL BORE #8 @ 30' (H101855-12)**

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>1120</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	
Surrogate: 1-Chlorooctane		109 %	55.5-154						
Surrogate: 1-Chlorooctadecane		111 %	57.6-158						

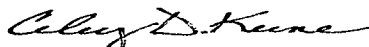
**Sample ID: SOIL BORE #8 @ 45' (H101855-13)**

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>336</b>	16.0	09/01/2011	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	09/04/2011	ND	174	87.2	200	0.657	
DRO >C10-C28	<10.0	10.0	09/04/2011	ND	177	88.3	200	0.760	
Surrogate: 1-Chlorooctane		114 %	55.5-154						
Surrogate: 1-Chlorooctadecane		116 %	57.6-158						

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

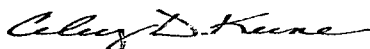
A-01	Surrogate failed high due to objective matrix interference.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require 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

10/22

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

## CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603  
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020

Company Name: <b>BEES Rice</b>		P.O. #:		<b>BILL TO</b>										ANALYSIS REQUEST																					
Project Manager: <b>Hack Conder</b>		Address:		City: <b>Hobbs</b>		State: <b>NM</b>		Zip: <b>88240</b>		Attn:		Address:		City:		State:		Zip:		Phone #:		Fax #:		Chlorides		TPH 8015 M		BTX		Texas TPH		Complete Cations/Anions		TDS	
Project #: <b>01811 ch</b>		Project Owner:		Project Name:		Project Location: <b>D-2 Boot EME 20-37</b>		Sampler Name: <b>Kyle Norman</b>		Matrix		PRESERV		SAMPLING		DATE		TIME																	
FOR LAB USE ONLY		Sample I.D.		# CONTAINERS		(G) RAB OR (C) OMP.		GROUNDWATER		WASTEWATER		SOIL		SLUDGE		OTHER:		ACID/BASE:		ICE / COOL		OTHER:													
Lab I.D.		H101855		-1		Soil Bore #3 @ 35'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				2		Soil Bore #3 @ 45'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				3		Soil Bore #4 @ 5'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				4		Soil Bore #4 @ 15'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				5		Soil Bore #4 @ 45'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				6		Soil Bore #5 @ 30'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				7		Soil Bore #5 @ 45'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				8		Soil Bore #6 @ 25'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				9		Soil Bore #6 @ 45'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
				10		Soil Bore #7 @ 15'		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	

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Relinquished By: <b>Kyle Norman</b>	Date: <b>8-31-11</b>	Received By: <b>Arti Benson</b>	Date: <b>9-12</b>
Relinquished By:	Date:	Received By:	Date:

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

Sample Condition  
 Cool Intact  
☒ Yes ☐ No

CHECKED BY: **[Signature]**

email results  
 Knorman@rice-ecs.com  
 KJones@riceswd.com; Bbaker@rice-ecs.com;  
 hconder@rice-ecs.com; Lweinheimer@rice-ecs.com  
 zconder@rice-ecs.com

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

#26

**ARDINAL LABORATORIES**

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603  
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020

[illegible]

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#26



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

---

October 31, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME D-2 BOOT (20/36)

Enclosed are the results of analyses for samples received by the laboratory on 10/28/11 7:55.

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:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	10/28/2011	Sampling Date:	10/27/2011
Reported:	10/31/2011	Sampling Type:	Soil
Project Name:	EME D-2 BOOT (20/36)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB-9 @ 10' (H102337-01)**

Chloride, SM4500CI-B			mg/kg							
			Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>2240</b>	16.0	10/28/2011	ND	432	108	400	0.00		
TPH 8015M			mg/kg							
			Analyzed By: CK							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/29/2011	ND	178	89.0	200	3.30		
DRO >C10-C28	<10.0	10.0	10/29/2011	ND	193	96.3	200	2.49		
<i>Surrogate: 1-Chlorooctane</i>										
	82.9 %	55.5-154								
<i>Surrogate: 1-Chlorooctadecane</i>										
	95.1 %	57.6-158								

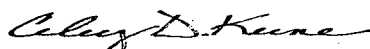
**Sample ID: SB-9 @ 45' (H102337-02)**

Chloride, SM4500CI-B			mg/kg							
			Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>304</b>	16.0	10/28/2011	ND	432	108	400	0.00		
TPH 8015M			mg/kg							
			Analyzed By: CK							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	10/29/2011	ND	178	89.0	200	3.30		
DRO >C10-C28	<10.0	10.0	10/29/2011	ND	193	96.3	200	2.49		
<i>Surrogate: 1-Chlorooctane</i>										
	75.3 %	55.5-154								
<i>Surrogate: 1-Chlorooctadecane</i>										
	101 %	57.6-158								

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

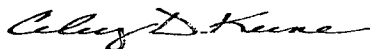
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received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

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Celey D. Keene, Lab Director/Quality Manager

**ARDINAL LABORATORIES**

1601 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603  
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020

[illegible]

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November 02, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME D-2 BOOT (20/36)

Enclosed are the results of analyses for samples received by the laboratory on 10/28/11 13:12.

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.

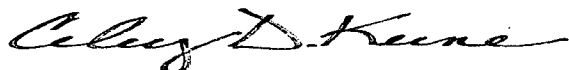
Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

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:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	10/28/2011	Sampling Date:	10/28/2011
Reported:	11/02/2011	Sampling Type:	Soil
Project Name:	EME D-2 BOOT (20/36)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB-10 @ 30' (H102346-01)**

Chloride, SM4500CI-B			mg/kg							Analyzed By: AP
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1100</b>	16.0	11/01/2011	ND	432	108	400	0.00		
TPH 8015M			mg/kg							Analyzed By: MS
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	11/01/2011	ND	157	78.4	200	3.93		
DRO >C10-C28	<10.0	10.0	11/01/2011	ND	181	90.6	200	4.73		
<i>Surrogate: 1-Chlorooctane</i>			83.9 %	55.5-154						
<i>Surrogate: 1-Chlorooctadecane</i>			105 %	57.6-158						

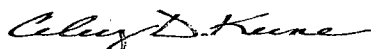
**Sample ID: SB-10 @ 45' (H102346-02)**

Chloride, SM4500CI-B			mg/kg							Analyzed By: AP
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>304</b>	16.0	11/01/2011	ND	432	108	400	0.00		
TPH 8015M			mg/kg							Analyzed By: MS
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	11/01/2011	ND	157	78.4	200	3.93		
DRO >C10-C28	<10.0	10.0	11/01/2011	ND	181	90.6	200	4.73		
<i>Surrogate: 1-Chlorooctane</i>			84.3 %	55.5-154						
<i>Surrogate: 1-Chlorooctadecane</i>			97.8 %	57.6-158						

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

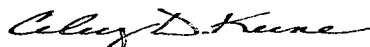
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Celey D. Keene, Lab Director/Quality Manager

**ARDINAL LABORATORIES**

Company Name: ABC

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Relinquished By: <i>[Signature]</i>		Received By: <i>[Signature]</i>		Date: <i>10/28/11</i>		Time: <i>1:12</i>		Date: <i>1/12</i>		Time: <i></i>	
Relinquished By: <i>[Signature]</i>		Received By: <i>[Signature]</i>		Date: <i>1/12</i>		Time: <i></i>		Date: <i>1/12</i>		Time: <i></i>	
Delivered By: (Circle One)		Sample Condition		Checked By: (Initials)		Cool		Intact		Yes	
Sampler - UPS		Bus		Other:		Yes		No		Yes	
Sampler - UPS		Bus		Other:		Yes		No		Yes	

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