1R - 427-65

WORKPLANS

Date:

9-20-13

Hansen, Edward J., EMNRD

From: Katie Jones <kjones@riceswd.com>
Sent: Thursday, November 14, 2013 8:01 AM
To: Hansen, Edward J., EMNRD; Lowe, Leonard, EMNRD
Cc: Hack Conder; Lara Weinheimer; Laura Flores
Subject: ROC - EME L-25 (1R427-65) ICP Report and CAP Addendum
Attachments: EME L-25 Photo Page.pdf

Mr. Hansen,

The following is an Addendum to the EME L-25 (1R427-65) ICP Report and CAP submitted to the NMOCD on September 20, 2013 and approved on October 9, 2013. Page 2, section Corrective Action Plan: Vadose Zone Remedy. The paragraph with text in blue lettering, below, will replace the Vadose Zone Remedy, text in red lettering marked with a strike-through.

"Vadose Zone Remedy

Currently, the site is excavated to dimensions of 151 ft x 71 ft to a depth of 10 ft bgs, and field personnel began excavating the southeast of the current excavation to depth of 14 ft bgs. A hard sandstone layer was encountered at approximately 13-14 ft bgs, and groundwater was encountered beneath the sandstone layer at 14 ft bgs. The sandstone layer acts as an infiltration barrier preventing the downward migration of residual constituents to groundwater. Once groundwater was encountered, a sample was field tested to determine the chloride concentration, resulting in a concentration of approximately 60 mg/L. A 8 pt bottom composite sample was then collected at the 10 ft depth, and was field tested for chloride and hydrocarbon. This resulted in a chloride concentration of 427 mg/kg and a PID reading of 1.0 ppm. The groundwater sample and bottom composite were sent to a commercial laboratory for confirmation, but ROC has not received the results. Based on the low field chloride concentration at 10 ft bgs, the sandstone layer from 13-14 ft bgs, and the low chloride concentration of groundwater, ROC requests to pad the current excavation with 6 inches of blow sand and install a 20-mil reinforced liner at approximately 9.5 ft bgs. The liner will be padded with an additional 6 inches of blow sand, and the excavation will be backfilled to ground surface. All backfill material will have a chloride concentration below 500 mg/kg and field PID reading below 100 ppm. Any soil requiring disposal will be properly disposed of at a NMOCD approved facility. The site will be contoured to the surrounding area. Soil amendments will be added as necessary and the site will be seeded with a blend of native vegetation. Vegetation will provide an infiltration barrier for the site, since plants capture water through their roots thereby reducing the amount of water traveling through the vadose zone to groundwater.

~~In order to prevent the migration of residual chloride, RECS recommends that ROC excavate the site to 151 ft x 71 ft to the depth of 14 ft bgs (Figure 5). This excavation will remove the impacted vadose zone above groundwater and the existing 20 x 20 ft clay layer located at 5 ft bgs. Clean soil will be imported to the site and 5 ft of the clean soil will be placed in the bottom of the excavation, up to 9 ft bgs. At 9 ft bgs, a 20-mil reinforced liner will be installed and properly seated. The excavation above the liner will be backfilled with soil containing a chloride concentration below 500 mg/kg and a field 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. The site will be contoured to the surrounding area. Soil amendments will be added as necessary and the site will be seeded with a blend of native vegetation. Vegetation will provide an infiltration barrier for the site, since plants capture water through their roots thereby reducing the amount of water traveling through the vadose zone to groundwater.~~"

If you have any questions or require any additional information, please contact me or Hack Conder at (575)393-2967.'

Thank you.

Katie Jones
Environmental Project Manager
RICE *Operating Company*

EME L-25 (1R427-65)
Unit L, Section 25, T19S, R36E

Excavating the southeast corner to a depth of 14 ft bgs, facing south 11/12/2013

The sandstone layer can be seen in the center of the photo, facing northwest 11/12/2013

Closure up of the sandstone layer 11/12/2013

Rice Environmental Consulting & Safety
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

CERTIFIED MAIL
RETURN RECEIPT NO. 7008 1140 0001 3072 4703

September 20th, 2013

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 Corrective Action Plan (CAP)**
Rice Operating Company – EME SWD System
EME L-25 (1R427-65): UL/L sec. 25 T19S R36E

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. 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 3 miles west of Monument, New Mexico at UL/L sec. 25, T19S R37E as shown on the Site Location Map and Geographical Location Map (Figure 1 and 2). NM OSE records indicated that groundwater would likely be encountered at a depth of approximately 63 +/- feet. However, soil bores drilled at the site found groundwater to be located at 14 +/- feet.

In 2002, ROC initiated work on the former EME L-25 junction box. After the former junction box was removed, the site was delineated using a backhoe to collect soil samples at regular intervals, creating a 20 x 20 x 5 ft deep excavation. Each sample was field titrated for chlorides and field screened using a PID for hydrocarbons. Representative samples were collected from the excavation walls and excavation bottom and sent to a commercial laboratory for analysis. The sidewall sample resulted in a chloride concentration of 1,760 mg/kg and concentrations of gasoline range organics (GRO), diesel range organics (DRO) and BTEX below detectable limits. The bottom composite sample resulted in a chloride concentration of 3,830 mg/kg, GRO and BTEX concentrations below detectable limits and a DRO concentration of 24 mg/kg. The excavation was backfilled with the excavated soil to 5 ft below ground surface (bgs). At 5-4 ft bgs, a 1 foot thick clay barrier was installed. The excavation was then backfilled using the remaining excavated soil and contoured to the surrounding area. The clay layer

will provide a barrier that will inhibit the downward migration of chlorides to groundwater. A new, watertight junction was installed at the site. A Junction Box Closure Report was submitted to NMOCD with all the 2002 junction box closures and disclosures.

To further investigate the depth of chloride concentrations, a soil bore was initiated on February 11th, 2013, at 12 ft northeast of the former junction box site. The boring was advanced to a depth of 10 ft bgs with soil samples collected every 5 ft. Each sample was field titrated for chlorides and field screened using a PID for hydrocarbons. The 5 ft and 10 ft samples were sent to a commercial laboratory for analysis. The 5 ft sample resulted in a chloride concentration of 2,160 mg/kg and GRO and DRO concentrations below detectable limits. The 10 ft sample resulted in a chloride concentration of 2,800 mg/kg and GRO and DRO concentrations below detectable limits. The entire bore hole was plugged in total with bentonite to ground surface.

On April 11th, 2013, ROC submitted an Update Report to NMOCD outlining the activities conducted at the site. NMOCD approved the Update Report on May 2nd, 2013 and stipulated that ROC submit an Investigation and Characterization Plan to NMOCD within 180 days.

An Investigation and Characterization Plan (ICP) was submitted to NMOCD on August 6th, 2013 and approved on August 20th, 2013. As part of the ICP, 14 additional soil bores were installed at the site (Figure 3 and 4). As the bores were advanced, samples were taken at regular intervals and field tested for chlorides and hydrocarbons. Representative samples were taken to a commercial laboratory for analysis (Appendix A). Laboratory analysis of the bores showed that the interior bores had elevated chloride levels. As the bores were drilled farther away from the abandoned box, the laboratory chloride readings dropped until SB-5, SB-14 and SB-15, the outermost bores, achieved readings below 250 mg/kg at all depths. However, this pattern was not observed in the bores going to the east. As the bores were drilled farther from the abandoned box to the east, the laboratory chloride levels increased. It is evident from this data, that the abandoned box was not the source of the increased chlorides heading to the east, towards an abandoned production well head.

Corrective Action Plan

Vadose Zone Remedy

In order to prevent the migration of residual chloride, RECS recommends that ROC excavate the site to 151 ft x 71 ft to the depth of 14 ft bgs (Figure 5). This excavation will remove the impacted vadose zone above groundwater and the existing 20 x 20 ft clay layer located at 5 ft bgs. Clean soil will be imported to the site and 5 ft of the clean soil will be placed in the bottom of the excavation, up to 9 ft bgs. At 9 ft bgs, a 20-mil reinforced liner will be installed and properly seated. The excavation above the liner will be backfilled with soil containing a chloride concentration below 500 mg/kg and a field 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. The site will be contoured to the surrounding area. Soil amendments will be added as necessary and the site will be seeded with a blend of native vegetation. Vegetation will provide an infiltration barrier for the site, since plants capture water through their roots thereby reducing the amount of water traveling through the vadose zone to groundwater.

Groundwater Remedy

Once the vadose zone remedy has been completed, RECS recommends that ROC install two monitor wells at the site (Figure 5). MW-1, the near-source well, will be installed outside the excavation to determine what, if any affect, the residual chlorides in the vadose zone have had on the groundwater. MW-2 will be installed approximately 100 ft up-gradient of the site to determine if there is an up-gradient source of chlorides impacting the site. Additional monitor wells may need to be installed to adequately evaluate groundwater at the site. The monitor wells will be sampled quarterly and once analyzed for chlorides and TPH readings, ROC will either submit a groundwater remedy to NMOCD to address groundwater quality at the site or submit a 'remediation termination' request for site closure.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-2967 or me if you have any questions or wish to discuss the site.

Sincerely,

Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

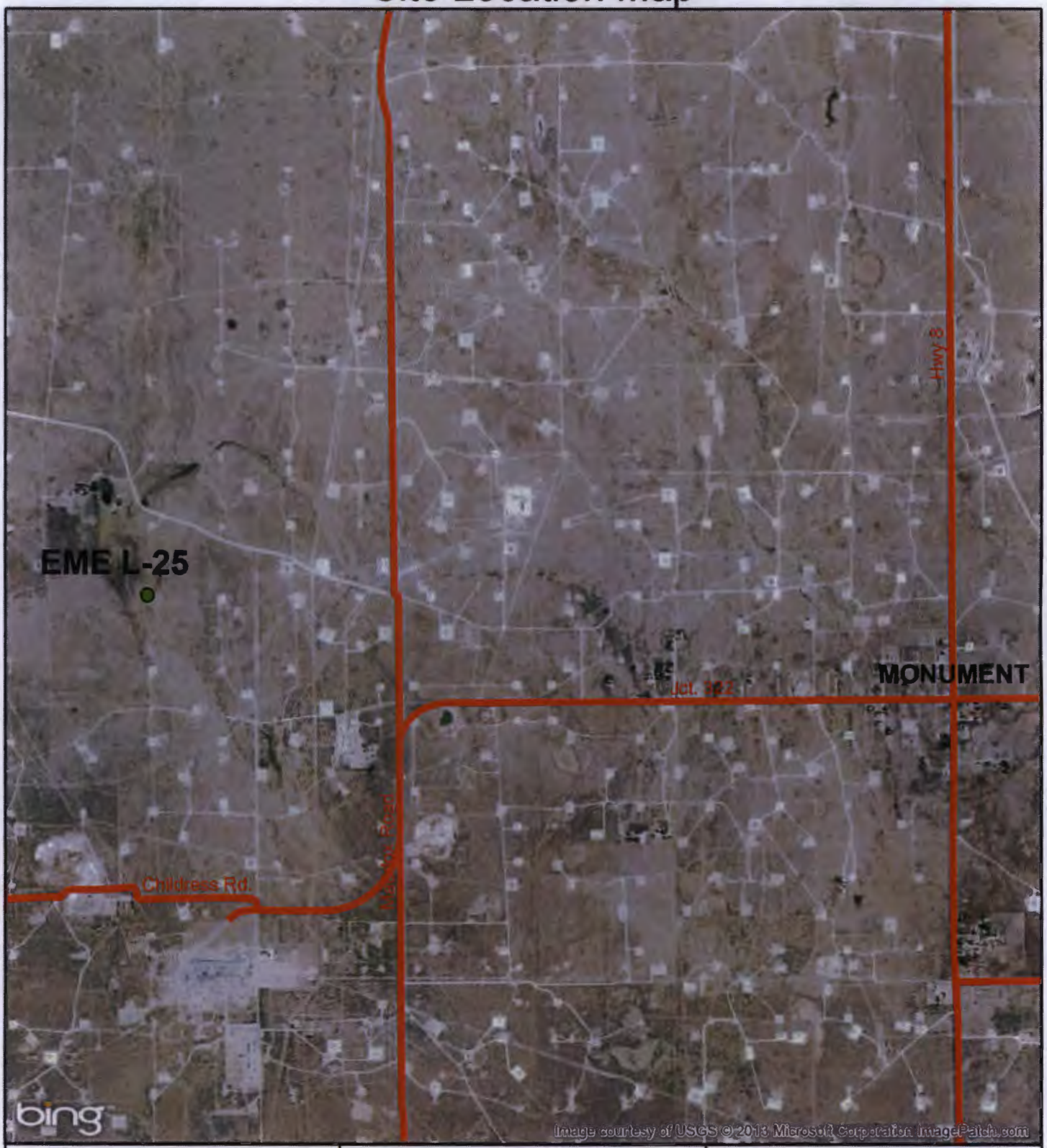
Attachments:

- Figure 1 – Site Location Map
- Figure 2 – Geographical Location Map
- Figure 3 – Detailed Site Map
- Figure 4 – Soil Bore Installation Map with proposed liner
- Figure 5 – Proposed Excavation and MW Installation
- Appendix A – Soil Bore Installation Documentation

Figures

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

Site Location Map



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC
RECS

EME L-25

Legals: UL/L sec. 25
T-19-S R-36-E
LEA COUNTY, NM

NMOCD Case #: 1R427-65

Figure 1

N
W E
S

0 1,900 3,800
Feet

Drawing date: 7/31/13
Drafted by: L. Weinheimer

Geographical Location Map

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME L-25

Legals: UL/L sec. 25
T-19-S R-36-E
LEA COUNTY, NM

NMOCD Case #: 1R427-65

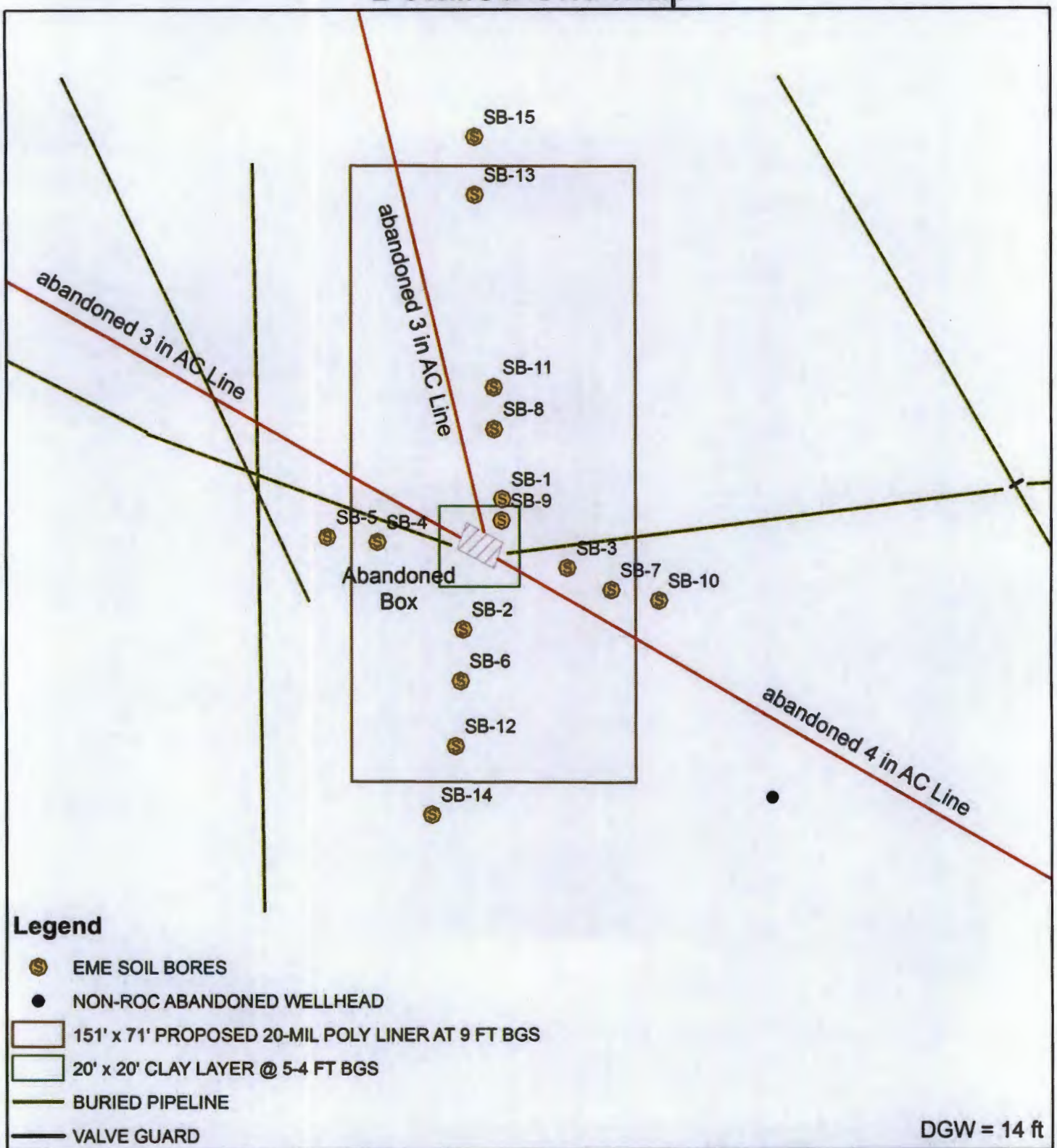
Figure 2

N W E S

0 710 1,420 Feet

Drawing date: 8/5/13
Drafted by: L. Weinheimer

Detailed Site Map



RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME L-25

Legals: UL/L sec. 25
T-19-S R-36-E
LEA COUNTY, NM

NMOCD Case #: 1R427-65

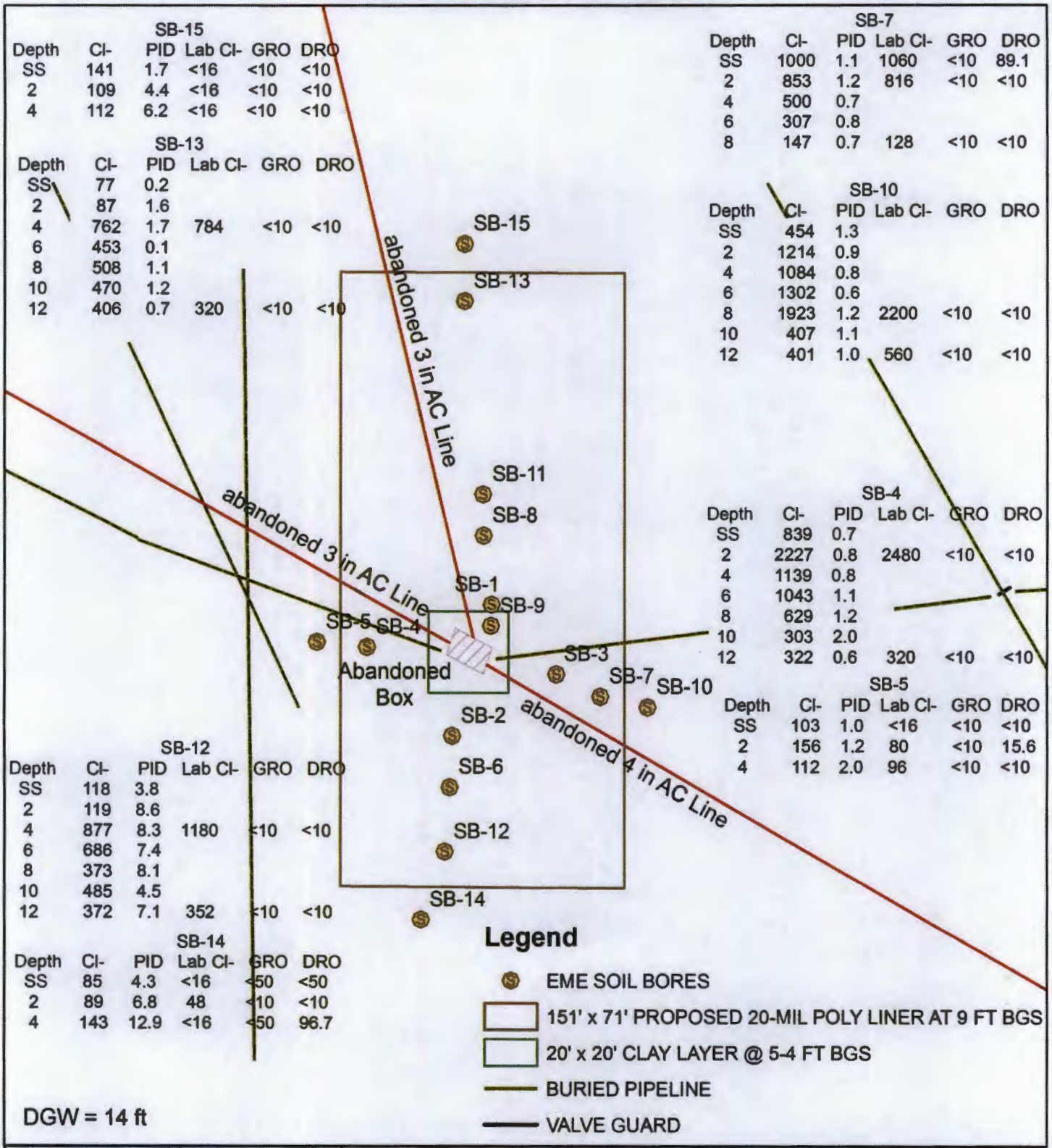
Figure 3

N W E S

0 25 50 Feet

Drawing date: 9/16/13
Drafted by: L. Weinheimer

Soil Bore Installation



SB-15

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	141	1.7	<16	<10	<10
2	109	4.4	<16	<10	<10
4	112	6.2	<16	<10	<10

SB-13

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	77	0.2			
2	87	1.6			
4	762	1.7	784	<10	<10
6	453	0.1			
8	508	1.1			
10	470	1.2			
12	406	0.7	320	<10	<10

SB-12

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	118	3.8			
2	119	8.6			
4	877	8.3	1180	<10	<10
6	686	7.4			
8	373	8.1			
10	485	4.5			
12	372	7.1	352	<10	<10

SB-14

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	85	4.3	<16	<50	<50
2	89	6.8	48	<10	<10
4	143	12.9	<16	<50	96.7

SB-7

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	1000	1.1	1060	<10	89.1
2	853	1.2	816	<10	<10
4	500	0.7			
6	307	0.8			
8	147	0.7	128	<10	<10

SB-10

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	454	1.3			
2	1214	0.9			
4	1084	0.8			
6	1302	0.6			
8	1923	1.2	2200	<10	<10
10	407	1.1			
12	401	1.0	560	<10	<10

SB-4

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	839	0.7			
2	2227	0.8	2480	<10	<10
4	1139	0.8			
6	1043	1.1			
8	629	1.2			
10	303	2.0			
12	322	0.6	320	<10	<10

SB-5

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	103	1.0	<16	<10	<10
2	156	1.2	80	<10	15.6
4	112	2.0	96	<10	<10

Legend

- EME SOIL BORES
- 151' x 71' PROPOSED 20-MIL POLY LINER AT 9 FT BGS
- 20' x 20' CLAY LAYER @ 5-4 FT BGS
- BURIED PIPELINE
- VALVE GUARD

DGW = 14 ft

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

EME L-25

Legals: UL/L sec. 25
T-19-S R-36-E
LEA COUNTY, NM

NMOCD Case #: 1R427-65

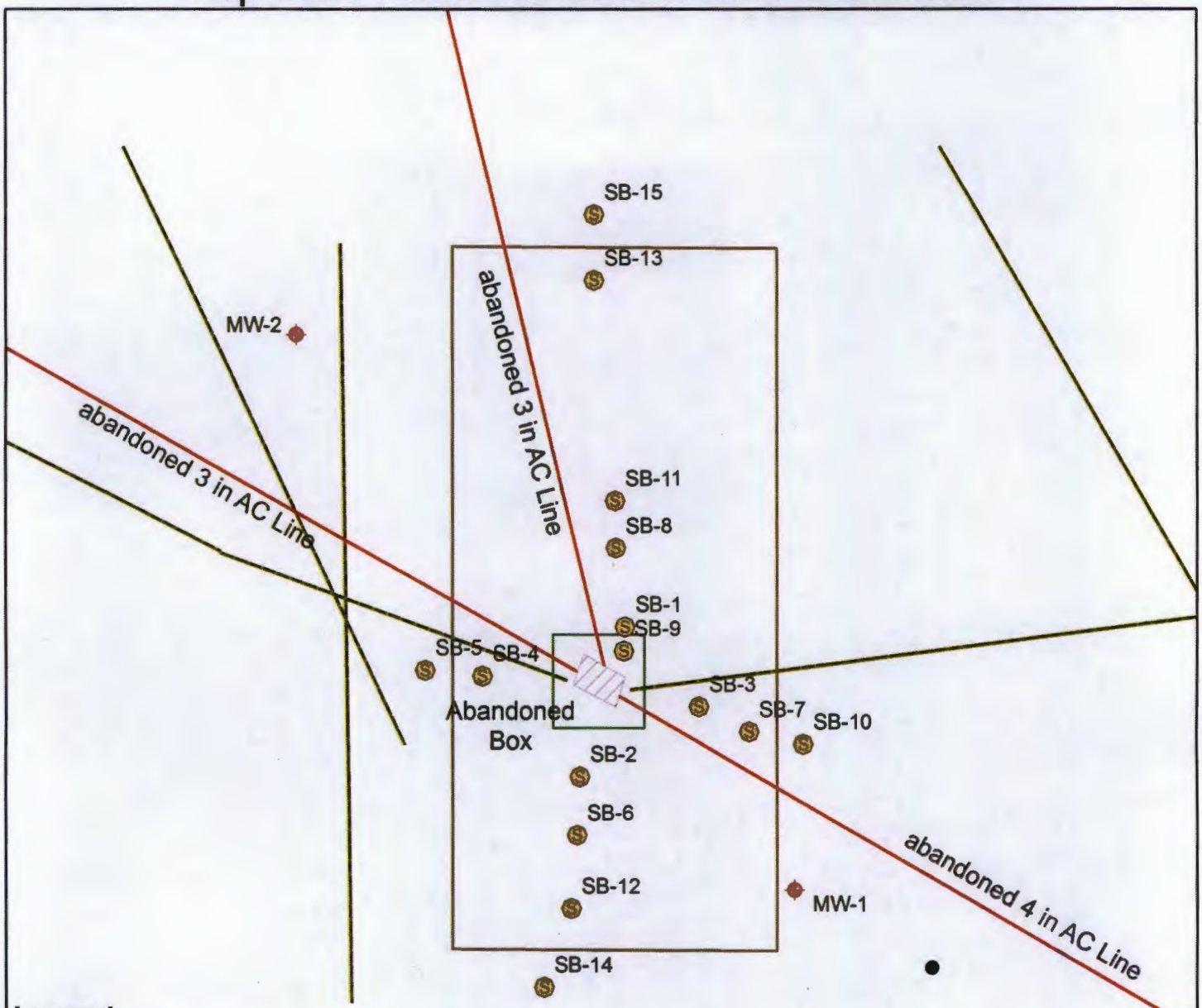
Figure 4

N W E S

0 25 50 Feet

Drawing date: 9/16/13
Drafted by: L. Weinheimer

Proposed Excavation and MW Installation



Legend

- APPROXIMATE LOCATION OF PROPOSED MW INSTALLATION
- EME SOIL BORES
- NON-ROC ABANDONED WELLHEAD
- 151' x 71' PROPOSED 20-MIL POLY LINER AT 9 FT BGS
- 20' x 20' CLAY LAYER @ 5-4 FT BGS
- BURIED PIPELINE
- VALVE GUARD

DGW = 14 ft

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC (RECS)

EME L-25

Legals: UL/L sec. 25
T-19-S R-36-E
LEA COUNTY, NM

NMOCD Case #: 1R427-65

Figure 5

N W E S

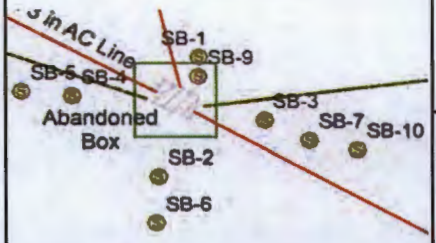
0 25 50 Feet

Drawing date: 9/16/13
Drafted by: L. Weinheimer

Appendix A

Soil Bore Documentation

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

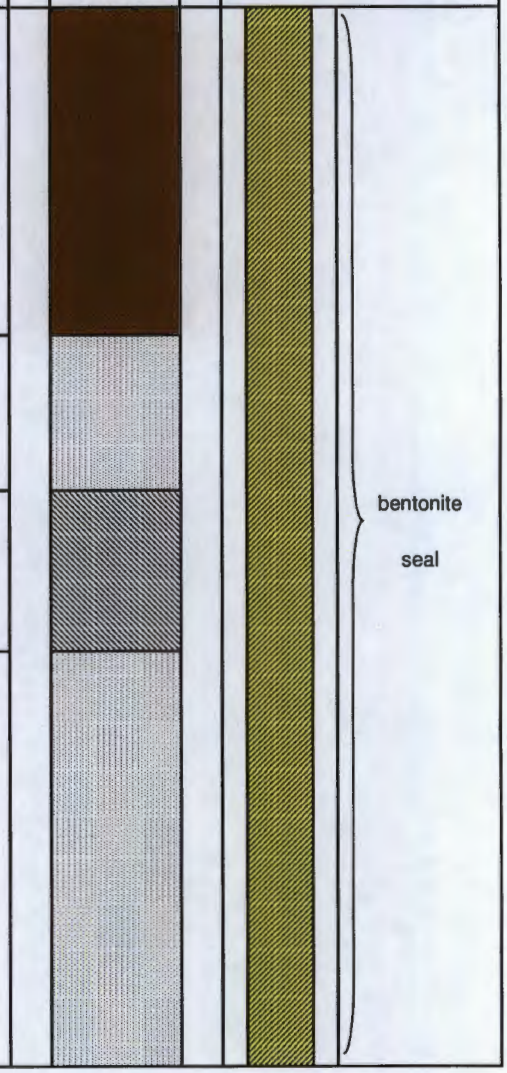
Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-2
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/21/2013		**Lat:** 32°37'46.854"N **Long:** 103°18'51.768"W **County:** Lea **State:** NM
End Date:	8/21/2013		

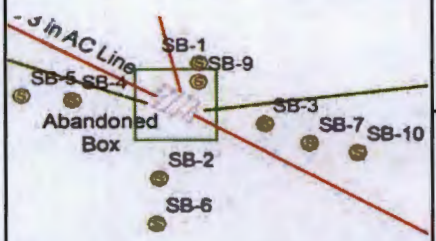
Comments: SB-2 is located 22 ft south of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 10 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	1835	Cl- 1920	1.2	
		GRO <10		
		DRO 33.6		
2 ft	1794		2.1	
				Caliche
4 ft	1106	Cl- 1440	1.1	
		GRO <10		Caliche With Sandstone
		DRO <10		
6 ft	828		1.1	
				Caliche
8 ft	374		0.9	
10 ft	246	Cl- 192	0.7	
		GRO <10		
		DRO <10		



Logger:	Edward Cesareo		RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS
Driller:	Harrison & Cooper, Inc.		**Project Name:** EME L-25 — **Well ID:** SB-3
Drilling Method:	Air rotary		**Project Consultant:** RECS
Start Date:	8/21/2013		
End Date:	8/21/2013		

Comments: SB-3 is located 22 ft east of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 8 ft GW = 14 ft

Location: UL/L sec. 25 T19S R36E

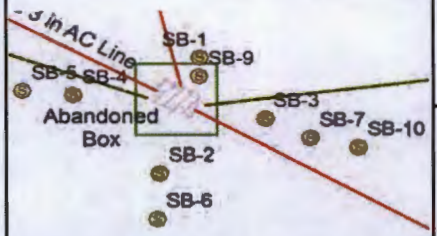
Lat: 32°37'46.996"N **County:** Lea

Long: 103°18'51.462"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	347		0.4	
2 ft	683		0.7	
				Caliche
4 ft	927	Cl- 1250	0.7	
		GRO <10		Caliche With Sandstone
		DRO <10		
6 ft	421		0.5	
				Caliche
8 ft	222	Cl- 224	0.6	
		GRO <10		
		DRO <10		

Lithology

Well Construction: bentonite seal

Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-4
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/21/2013		
End Date:	8/21/2013		

Comments: SB-4 is located 26 ft west of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

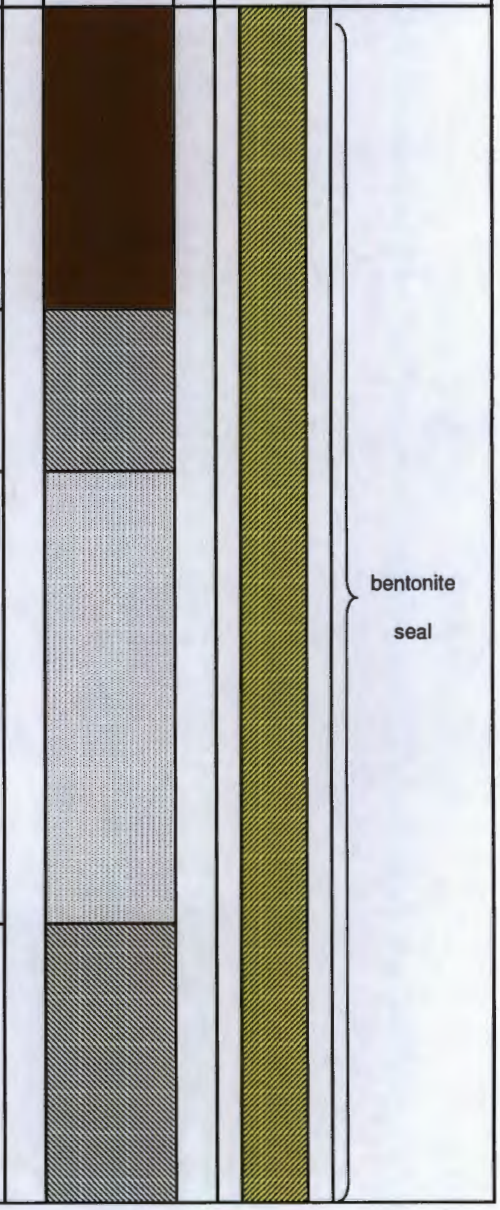
TD = 12 ft GW = 14 ft

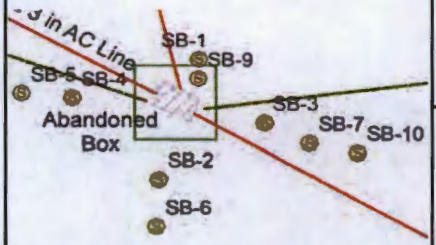
Location: UL/L sec. 25 T19S R36E

Lat: 32°37'47.073"N **County:** Lea

Long: 103°18'52.006"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	839		0.7	
2 ft	2227	Cl- 2480	0.8	
		GRO <10		Caliche With Sandstone
		DRO <10		
4 ft	1139		0.8	
				Caliche
6 ft	1043		1.1	
8 ft	629		1.2	
10 ft	303		2.0	
				Caliche With Sandstone
12 ft	322	Cl- 320	0.6	
		GRO <10		
		DRO <10		



Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-5
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/21/2013		**Lat:** 32°37'47.084"N **County:** Lea
End Date:	8/21/2013		**Long:** 103°18'52.148"W **State:** NM

Comments: SB-5 is located 40 ft west of the center of the abandoned box. All samples were from cuttings.

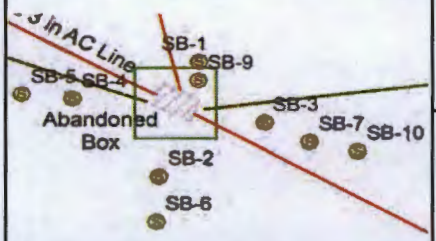
DRAFTED BY: L. Weinheimer

TD = 4 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	103	Cl- <16	1	
		GRO <10		
		DRO <10		
2 ft	156	Cl- 80	1.2	
		GRO <10		Caliche
		DRO 15.6		
4 ft	112	Cl- 96	2	
		GRO <10		
		DRO <10		

Lithology

Well Construction: bentonite seal

Logger:	Edward Cesareo		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		
Start Date:	8/21/2013		
End Date:	8/21/2013		

Project Name: EME L-25 **Well ID:** SB-6

Project Consultant: RECS

Comments: SB-6 is located 33 ft south of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 10 ft GW = 14 ft

Location: UL/L sec. 25 T19S R36E

Lat: 32°37'46.728"N **County:** Lea

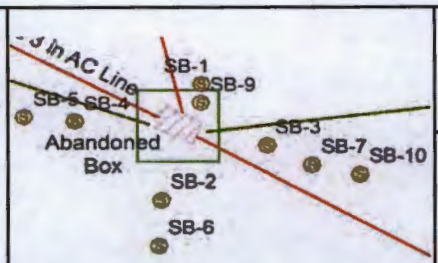
Long: 103°18'51.767"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	165		0.8	
2 ft	1796	Cl- 1800	0.6	
		GRO <10		Caliche With Sandstone
		DRO <10		
4 ft	972		1.2	
				Caliche
6ft	581		1.2	
8 ft	278		2	
10 ft	189	Cl- 128	0.7	
		GRO <10		
		DRO <10		

Lithology

Well Construction

bentonite seal

Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-7
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/21/2013		**Lat:** 32°37'46.95"N **County:** Lea
End Date:	8/21/2013		**Long:** 103°18'51.324"W **State:** NM

Comments: SB-7 is located 34 ft east of the center of the abandoned box. All samples were from cuttings.

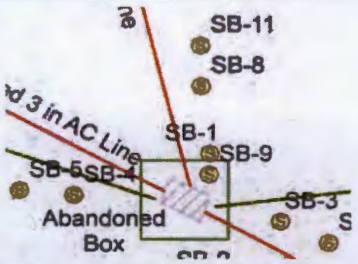
DRAFTED BY: L. Weinheimer

TD = 8 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	1000	Cl- 1060	1.1	
		GRO <10		
		DRO 89.1		
2 ft	853	Cl- 816	1.2	
		GRO <10		Caliche With Sandstone
		DRO <10		
4 ft	500		0.7	
				Caliche
6 ft	307		0.8	
8 ft	147	Cl- 128	0.7	
		GRO <10		
		DRO <10		

Lithology

Well Construction: bentonite seal

Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-8
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/21/2013		
End Date:	8/21/2013		

Comments: SB-8 is located 29 ft north of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

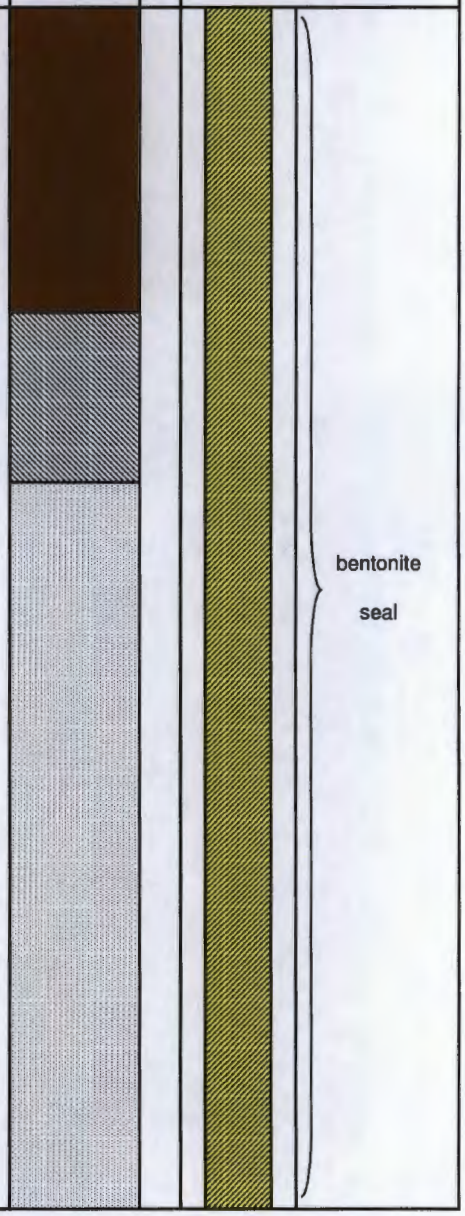
TD = 12 ft GW = 14 ft

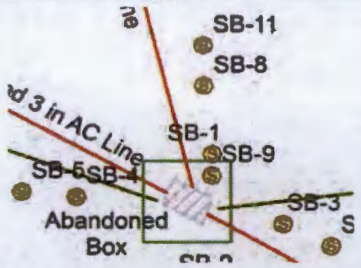
Location: UL/L sec. 25 T19S R36E

Lat: 32°37'47.337"N **County:** Lea

Long: 103°18'51.666"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	192		1	
2 ft	2120	Cl- 2480	1.1	
		GRO <10		Caliche With Sandstone
		DRO <10		
4 ft	1762		1.3	
				Caliche
6 ft	1069		0.9	
8 ft	1247		0.6	
10 ft	1066		0.6	
12 ft	869	Cl- 992	0.5	
		GRO <10		
		DRO <10		



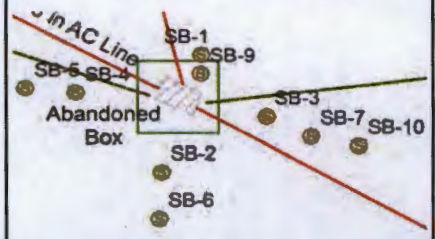
Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-9
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/21/2013		**Lat:** 32°37'47.121"N **County:** Lea
End Date:	8/21/2013		**Long:** 103°18'51.64"W **State:** NM

Comments: SB-9 is located 8 ft northeast of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 8 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Regolith		bentonite seal
SS	875		0.2			
2 ft	1001	Cl- 1500	0.8			
		GRO <10				
		DRO <10				
4 ft	789		1			
6 ft	1350	Cl- 2040	1.2			
		GRO <10				
		DRO <10				
8 ft	1440	Cl- 2160	0.9			
		GRO <10				
		DRO <10				

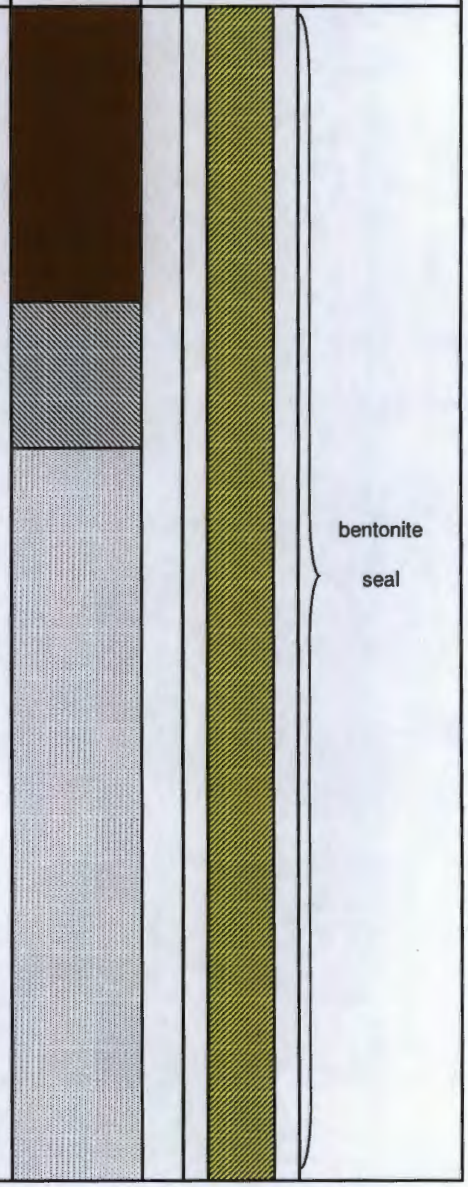
Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-10
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/21/2013		**Lat:** 32°37'46.922"N **County:** Lea
End Date:	8/21/2013		**Long:** 103°18'51.187"W **State:** NM

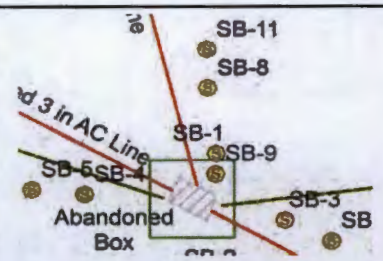
Comments: SB-10 is located 46 ft east of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 12 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	454		1.3	
2 ft	1214		0.9	
				Caliche With Sandstone
4 ft	1084		0.8	
				Caliche
4 ft	1302		0.6	
8 ft	1923	Cl- 2200	1.2	
		GRO <10		
		DRO <10		
10 ft	407		1.1	
12 ft	401	Cl- 560	1	
		GRO <10		
		DRO <10		



Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-11
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/22/2013		**Lat:** 32°37'47.447"N **County:** Lea
End Date:	8/22/2013		**Long:** 103°18'51.665"W **State:** NM

Comments: SB-11 is located 38 ft north of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

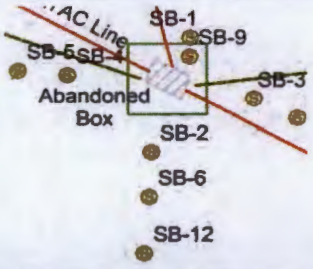
TD = 12 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
SS	255		31.7	BROWN SAND
2 ft	2923	Cl- 2720	26	
		GRO <10		TAN SAND
		DRO <10		
4 ft	2195		10.1	
6 ft	2316		5.3	
				TAN SAND WITH SOME PEA GRAVEL
8 ft	1949		13.6	
10 ft	1654		12.1	
				TAN SAND
12 ft	1509	Cl- 1490	16.7	
		GRO <10		
		DRO <10		

Lithology

Well Construction

bentonite seal

Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-12
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/23/2013		
End Date:	8/23/2013		

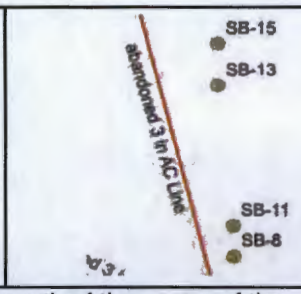
Comments: SB-12 is located 49 ft south of the center of the abandoned box. All samples were from cuttings.
DRAFTED BY: L. Weinheimer
TD = 12 ft GW = 14 ft

Location: UL/L sec. 25 T19S R36E
Lat: 32°37'46.571"N **County:** Lea
Long: 103°18'51.786"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				BROWN SAND
SS	118		3.8	
2 ft	119		8.6	
4 ft	877	Cl- 1180	8.3	
		GRO <10		TAN SAND WITH PEA STONE
		DRO <10		
6 ft	686		7.4	
8 ft	373		8.1	
10 ft	485		4.5	
12 ft	372	Cl- 352	7.1	
		GRO <10		
		DRO <10		

Lithology

Well Construction: bentonite seal

Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-13
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/23/2013		
End Date:	8/23/2013		

Comments: SB-13 is located 86 ft north of the center of the abandoned box. All samples were from cuttings.
DRAFTED BY: L. Weinheimer

TD = 12 ft GW = 14 ft

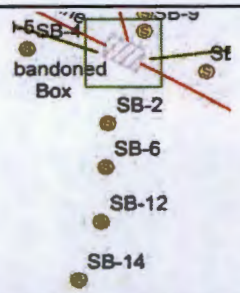
Location: UL/L sec. 25 T19S R36E

Lat: 32°37'47.91"N **County:** Lea
Long: 103°18'51.708"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				BROWN SAND
SS	77		0.2	
2 ft	87		1.6	
4 ft	762	Cl- 784	1.7	
		GRO <10		TAN SAND WITH PEA STONE
		DRO <10		
6 ft	453		0.1	
8 ft	508		1.1	
10 ft	470		1.2	
12 ft	406	Cl- 320	0.7	
		GRO <10		
		DRO <10		

Lithology

Well Construction: bentonite seal

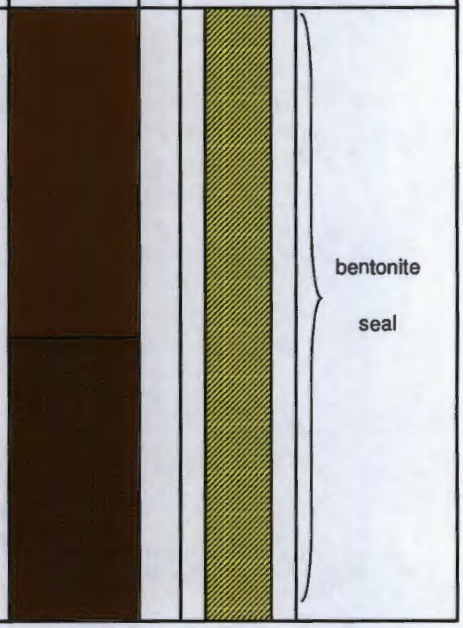
Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-14
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/L sec. 25 T19S R36E
Start Date:	8/23/2013		**Lat:** 32°37'46.406"N **County:** Lea
End Date:	8/23/2013		**Long:** 103°18'51.858"W **State:** NM

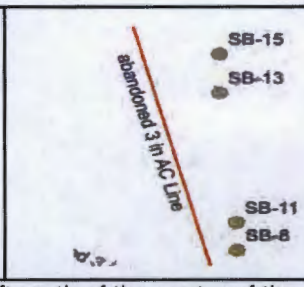
Comments: SB-14 is located 68 ft south of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 4 ft GW = 14 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
				BROWN SAND
SS	85	Cl- <16	4.3	
		GRO <10		
		DRO <10		
2 ft	89	Cl- 48	6.8	
		GRO <10		BROWN SAND WITH SOME ROCK
		DRO <10		
4 ft	143	Cl- <16	12.9	
		GRO <10		
		DRO 96.7		



Logger:	Edward Cesareo		**Project Name:** EME L-25 **Well ID:** SB-15
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/26/2013		
End Date:	8/26/2013		

Comments: SB-15 is located 100 ft north of the center of the abandoned box. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

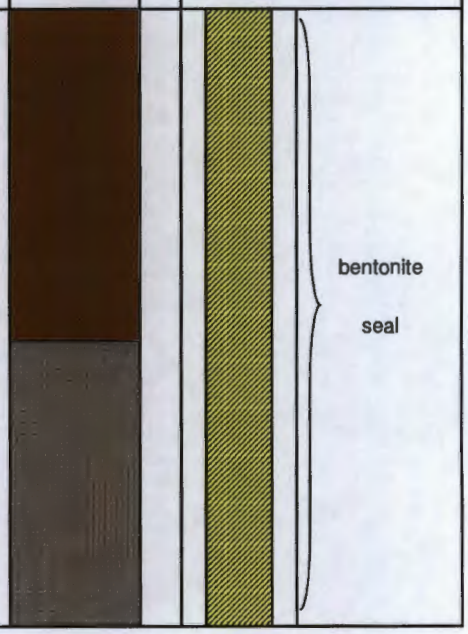
TD = 4 ft GW = 14 ft

Location: UL/L sec. 25 T19S R36E

Lat: 32°37'48.052"N **County**: Lea

Long: 103°18'51.707"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				BROWN SAND
SS	141	Cl- <16	1.7	
		GRO <10		
		DRO <10		
2 ft	109	Cl- <16	4.4	
		GRO <10		TAN SAND WITH SOME ROCK
		DRO <10		
4 ft	112	Cl- <16	6.2	
		GRO <10		
		DRO <10		



CARDINAL Laboratories

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

August 28, 2013

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME L-25

Enclosed are the results of analyses for samples received by the laboratory on 08/22/13 13:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated 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 (V1, 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 2 @ SURFACE (H302017-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1920**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/26/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	**33.6**	10.0	08/26/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*88.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*91.1 %*	*63.6-154*

Sample ID: SB 2 @ 4' (H302017-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1440**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*93.3 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.0 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 2 @ 10' (H302017-03)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**192**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*93.7 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*98.5 %*	*63.6-154*

Sample ID: SB 3 @ 4' (H302017-04)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1250**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*89.8 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*93.9 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 3 @ 8' (H302017-05)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**224**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*89.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*94.8 %*	*63.6-154*

Sample ID: SB 4 @ 2' (H302017-06)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2480**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*94.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.6 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 4 @ 12' (H302017-07)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**320**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*94.8 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.2 %*	*63.6-154*

Sample ID: SB 5 @ SURFACE (H302017-08)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*94.3 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.3 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 5 @ 2' (H302017-09)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**80.0**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	**15.6**	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*87.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*91.2 %*	*63.6-154*

Sample ID: SB 5 @ 4' (H302017-10)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	191	95.7	200	3.91	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	186	93.0	200	5.56	

Surrogate: 1-Chlorooctane	*91.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*95.9 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 6 @ 2' (H302017-11)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1800**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*97.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*102 %*	*63.6-154*

Sample ID: SB 6 @ 10' (H302017-12)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	08/26/2013	ND	416	104	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*89.3 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*96.3 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 7 @ SURFACE (H302017-13)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1060**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	**89.1**	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*95.6 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*105 %*	*63.6-154*

Sample ID: SB 7 @ 2' (H302017-14)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**816**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*102 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*105 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 7 @ 8' (H302017-15)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*94.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*98.4 %*	*63.6-154*

Sample ID: SB 8 @ 2' (H302017-16)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2480**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*98.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*101 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 8 @ 12' (H302017-17)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**992**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*102 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*107 %*	*63.6-154*

Sample ID: SB 9 @ 2' (H302017-18)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1500**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*103 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*101 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 9 @ 6' (H302017-19)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2040**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*91.6 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*96.5 %*	*63.6-154*

Sample ID: SB 9 @ 8' (H302017-20)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2160**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*97.6 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*102 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/22/2013	Sampling Date:	08/21/2013
Reported:	08/28/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	19S / 36E		

Sample ID: SB 10 @ 8' (H302017-21)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2200**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*95.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.8 %*	*63.6-154*

Sample ID: SB 10 @ 12' (H302017-22)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**560**	16.0	08/27/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/27/2013	ND	188	93.9	200	5.96	
DRO >C10-C28	<10.0	10.0	08/27/2013	ND	178	89.2	200	8.76	

Surrogate: 1-Chlorooctane	*98.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*101 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

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

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

Company Name: Rice	BILL TO	P.O. #:	
Project Manager: Hack Conder		Company:	
Address:		Attn:	
City: Hobbs	State: NM	Zip: 88240	Address:
Phone #:	Fax #:		City:
Project #:	Project Owner:		State: Zip:
Project Name:			Phone #:
Project Location: EME L-25 19S, 36E.			Fax #:
Sampler Name: Kyle Norman			

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D. H302017-	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS					
01	SB2 @ surface	G	1			✓					✓		8-21-13	8:00	✓	✓									
02	SB2 @ 4'	G	1			✓					✓		"	8:10	✓	✓									
03	SB2 @ 10'	G	1			✓					✓		"	8:30	✓	✓									
04	SB3 @ 4'	G	1			✓					✓		"	8:45	✓	✓									
05	SB3 @ 8'	G	1			✓					✓		"	8:55	✓	✓									
06	SB4 @ 2'	G	1			✓					✓		"	9:25	✓	✓									
07	SB4 @ 12'	G	1			✓					✓		"	9:45	✓	✓									
08	SB5 @ Surface	G	1			✓					✓		"	10:00	✓	✓									
09	SB5 @ 2'	G	1			✓					✓		"	10:30	✓	✓									
10	SB5 @ 4'	G	1			✓					✓		"	11:00	✓	✓									

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 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 service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Kyle Norma	Date: 8-22-13	Received By: Cindy Keene	Phone Result: ☐ Yes ☑ No Add'l Phone #:
	Time: 1:55		Fax Result: ☐ Yes ☑ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: email results: zconder@rice-ecs.com Knorman@rice-ecs.com; lpena@riceswd.com Kjones@riceswd.com; Bbaker@rice-ecs.com; hconder@rice-ecs.com; Lweinheimer@rice-ecs.com
	Time:		

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: -15.2°C

Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No

CHECKED BY: (Initials) CDL

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

#54

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

		BILL TO	
Company Name:	Rice	P.O. #:	
Project Manager:	Hack Conder	Company:	
Address:		Attn:	
City: Hobbs	State: NM Zip: 88240	Address:	
Phone #:	Fax #:	City:	
Project #:	Project Owner:	State: Zip:	
Project Name:		Phone #:	
Project Location:	EME L-25 19S. 36E.	Fax #:	
Sampler Name:	Kyle Norman		

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS					
H302017-																									
11	SB6 @ 2'	G	1			✓					✓		8-21-13	11:30	✓	✓									
12	SB6 @ 10'	G	1			✓					✓		"	11:45	✓	✓									
13	SB7 @ surface	G	1			✓					✓		"	12:45	✓	✓									
14	SB7 @ 2'	G	1			✓					✓		"	1:00	✓	✓									
15	SB7 @ 8'	G	1			✓					✓		"	1:15	✓	✓									
16	SB8 @ 2'	G	1			✓					✓		"	1:30	✓	✓									
17	SB8 @ 12'	G	1			✓					✓		"	2:00	✓	✓									
18	SB9 @ 2'	G	1			✓					✓		"	2:30	✓	✓									
19	SB9 @ 6'	G	1			✓					✓		"	3:00	✓	✓									
20	SB9 @ 8'	G	1			✓					✓		"	3:15	✓	✓									

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 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 service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Kyle Norman	Date: 8-22-13 Time: 1:55	Received By: Cindy Keene	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other: -15.2°	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) CK	

Phone Result: ☐ Yes ☑ No Add'l Phone #:
Fax Result: ☐ Yes ☑ No Add'l Fax #:
REMARKS:

email results
Knorman@rice-ecs.com
Kjones@riceswd.com; jkamplain@rice-ecs.com
hconder@rice-ecs.com; Lweinheimer@rice-ecs.com

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

#54

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:	Rice	BILL TO	
Project Manager:	Hack Conder	P.O. #:	
Address:		Company:	
City: Hobbs	State: NM Zip: 88240	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location:	EME #25 T9S, R36E	Phone #:	
Sampler Name:	Kyle Norman	Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
H302017-21	SB 10 @ 8'	G	1			✓					✓		8-21-13	3:30	✓	✓				
22	SB 10 @ 12'	G	1			✓					✓		8-21-13	3:45	✓	✓				

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 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 service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Kyle N.	Date: 8-22-13 Time: 7:55	Received By: Cindy Keene	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	-15.2°C	Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No	CHECKED BY: (Initials)

Phone Result: ☐ Yes ☑ No Add'l Phone #:
Fax Result: ☐ Yes ☑ No Add'l Fax #:
REMARKS:

email results
Knorman@rice-ecs.com
Kjones@riceswd.com; jkamplain@rice-ecs.com
hconder@rice-ecs.com; Lweinheimer@rice-ecs.com

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

#54

CARDINAL Laboratories

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

September 03, 2013

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME L-25

Enclosed are the results of analyses for samples received by the laboratory on 08/23/13 17:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated 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 (V1, 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/23/2013	Sampling Date:	08/22/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	19S / 36E		

Sample ID: SB 11 @ 2' (H302044-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2720**	16.0	08/30/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/30/2013	ND	209	105	200	2.74	
DRO >C10-C28	<10.0	10.0	08/30/2013	ND	209	104	200	4.45	

Surrogate: 1-Chlorooctane	*94.6 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.7 %*	*63.6-154*

Sample ID: SB 11 @ 12' (H302044-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1490**	16.0	08/30/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/30/2013	ND	210	105	200	4.91	
DRO >C10-C28	<10.0	10.0	08/30/2013	ND	205	102	200	5.30	

Surrogate: 1-Chlorooctane	*94.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.9 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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

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

Company Name: ROC		BILL TO	
Project Manager: Kyle Norman		P.O. #:	
Address:		Company:	
City: Hobbs	State: NM Zip: 88240	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location: EME L-25		Phone #:	
Sampler Name: Kyle Schnaidt		Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS					
H302044	11																								
1	SB 1 @ 2'	G	1			X					X		8-22-13	10:10	X	X									
2	SB 11 @ 12'	G	1			X					X		8-22-13	10:15	X	X									

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 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 service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Kyle Schnaidt	Date: 8/23/13 Time: 5:30	Received By: Jodi Henson	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials)	

Phone Result: ☐ Yes ☑ No Add'l Phone #:
Fax Result: ☐ Yes ☑ No Add'l Fax #:
REMARKS:

kschnaidt@rice-ecs.com
Knorman@rice-ecs.com
Kjones@riceswd.com; jkamplain@rice-ecs.com
hconder@rice-ecs.com; Lweinheimer@rice-ecs.com

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

54

CARDINAL Laboratories

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

September 03, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME L-25

Enclosed are the results of analyses for samples received by the laboratory on 08/23/13 16:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated 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 (V1, 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/23/2013	Sampling Date:	08/23/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	19S / 36E		

Sample ID: SB #12 4' (H302040-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1180**	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/29/2013	ND	179	89.5	200	2.67	
DRO >C10-C28	<10.0	10.0	08/29/2013	ND	193	96.4	200	3.95	

Surrogate: 1-Chlorooctane	*105 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*108 %*	*63.6-154*

Sample ID: SB #12 12' (H302040-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**352**	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/29/2013	ND	179	89.5	200	2.67	
DRO >C10-C28	<10.0	10.0	08/29/2013	ND	193	96.4	200	3.95	

Surrogate: 1-Chlorooctane	*104 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*108 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/23/2013	Sampling Date:	08/23/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	19S / 36E		

Sample ID: SB #13 4' (H302040-03)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**784**	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/29/2013	ND	179	89.5	200	2.67	
DRO >C10-C28	<10.0	10.0	08/29/2013	ND	193	96.4	200	3.95	

Surrogate: 1-Chlorooctane	*113 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*117 %*	*63.6-154*

Sample ID: SB #13 12' (H302040-04)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**320**	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/29/2013	ND	209	105	200	2.74	
DRO >C10-C28	<10.0	10.0	08/29/2013	ND	209	104	200	4.45	

Surrogate: 1-Chlorooctane	*93.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.3 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/23/2013	Sampling Date:	08/23/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	19S / 36E		

Sample ID: SB #14 SURFACE (H302040-05)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	08/29/2013	ND	209	105	200	2.74	
DRO >C10-C28	<50.0	50.0	08/29/2013	ND	209	104	200	4.45	

Surrogate: 1-Chlorooctane	*91.3 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*107 %*	*63.6-154*

Sample ID: SB #14 2' (H302040-06)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/29/2013	ND	209	105	200	2.74	
DRO >C10-C28	<10.0	10.0	08/29/2013	ND	209	104	200	4.45	

Surrogate: 1-Chlorooctane	*98.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*105 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/23/2013	Sampling Date:	08/23/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	19S / 36E		

Sample ID: SB #14 4' (H302040-07)

Chloride, SM4500Cl-B mg/kg **Analyzed By: DW**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/29/2013	ND	432	108	400	0.00	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	08/29/2013	ND	209	105	200	2.74	
DRO >C10-C28	**96.7**	50.0	08/29/2013	ND	209	104	200	4.45	

Surrogate: 1-Chlorooctane	*97.2 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*120 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

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

Celey D. Keene, Lab Director/Quality Manager

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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: RICE Operating	**BILL TO**
Project Manager: Katie Jones	**P.O. #:**
Address: 112 W. Taylor	**Company:**
City: Hobbs **State:** NM **Zip:** 88240	**Attn:**
Phone #: **Fax #:**	**Address:**
Project #: **Project Owner:**	**City:**
Project Name:	**State:** **Zip:**
Project Location: EME L-25 T-19-S/R-36-E	**Phone #:**
Sampler Name: Edward Cesareo	**Fax #:**

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS					
H302040	EME L-25																								
1	SB# 12 4'	G	1			✓					✓		8-23-13	2:35	✓	✓									
2	SB# 12 12'	G	1			✓					✓			2:40	✓	✓									
3	SB# 13 4'	G	1			✓					✓			2:40	✓	✓									
4	SB# 13 12'	G	1			✓					✓			2:45	✓	✓									
5	SB# 14 Surface	G	1			✓					✓			3:10	✓	✓									
6	SB# 14 2'	G	1			✓					✓			3:15	✓	✓									
7	SB# 14 4'	G	1			✓					✓			3:20	✓	✓									

Relinquished By: Steve Caraway	**Date:** 8-23-13 **Time:** 4:10	**Received By:** Jodie Henson	**Phone Result:** ☐ Yes ☑ No **Add'l Phone #:**
Relinquished By:	**Date:** **Time:**	**Received By:**	**Fax Result:** ☐ Yes ☑ No **Add'l Fax #:**
			REMARKS: email results hconder@rice-ecs.com; Lweinheimer@rice-ecs.com; kjones@riceswd.com; Lpena@riceswd.com; knorman@rice-ecs.com; ecesareo@rice-ecs.com
Delivered By: (Circle One) Sampler - UPS - Bus - Other: 4.7°c	**Sample Condition** Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	**CHECKED BY: (Initials)**	

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

#54

CARDINAL Laboratories

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

September 03, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME SYSTEM/ L-25

Enclosed are the results of analyses for samples received by the laboratory on 08/27/13 10:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated 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 (V1, 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/27/2013	Sampling Date:	08/26/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME SYSTEM/ L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #15 SURFACE (H302062-01)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/30/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/31/2013	ND	195	97.4	200	0.475	
DRO >C10-C28	<10.0	10.0	08/31/2013	ND	192	96.0	200	0.588	

Surrogate: 1-Chlorooctane	*107 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*110 %*	*63.6-154*

Sample ID: SB #15 2' (H302062-02)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/30/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/31/2013	ND	195	97.4	200	0.475	
DRO >C10-C28	<10.0	10.0	08/31/2013	ND	192	96.0	200	0.588	

Surrogate: 1-Chlorooctane	*104 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*108 %*	*63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	08/27/2013	Sampling Date:	08/26/2013
Reported:	09/03/2013	Sampling Type:	Soil
Project Name:	EME SYSTEM/ L-25	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #15 4' (H302062-03)

Chloride, SM4500Cl-B mg/kg **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/30/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/31/2013	ND	195	97.4	200	0.475	
DRO >C10-C28	<10.0	10.0	08/31/2013	ND	192	96.0	200	0.588	

Surrogate: 1-Chlorooctane	*94.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.2 %*	*63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
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

Celey D. Keene, Lab Director/Quality Manager

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: RICE Operating	**BILL TO**
Project Manager: Katie Jones	**P.O. #:**
Address: 112 W. Taylor	**Company:**
City: Hobbs **State:** NM **Zip:** 88240	**Attn:**
Phone #: **Fax #:**	**Address:**
Project #: **Project Owner:**	**City:**
Project Name:	**State:** **Zip:**
Project Location: EME SYSTEM / L-25 T-19-S/R-36-E	**Phone #:**
Sampler Name: Edward Cesareo	**Fax #:**

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST											
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS						
H302062	EME L-25																								
1	SB#15 Surface	C	1			✓					✓		8-26-13	8:35	✓	✓										
2	SB#15 2'	C	1			✓					✓		"	8:40	✓	✓										
3	SB#15 4'	C	1			✓					✓		"	8:45	✓	✓										

Relinquished By: Edward Cesareo	**Date:** 8-26-13 **Time:** 10:20	**Received By:** Jodi Henson	**Phone Result:** ☐ Yes ☑ No **Add'l Phone #:**
Relinquished By:	**Date:** **Time:**	**Received By:**	**Fax Result:** ☐ Yes ☑ No **Add'l Fax #:**
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	**Sample Condition** Cool ☑ Yes ☐ No Intact ☑ Yes ☐ No	**CHECKED BY:** (Initials)	**REMARKS:** email results hconder@rice-ecs.com; Lweinheimer@rice-ecs.com; kjones@riceswd.com; Lpena@riceswd.com; knorman@rice-ecs.com; ecesareo@rice-ecs.com

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

#54