1R - 425-84

REPORTS

DATE:

5-31-13

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

CERTIFIED MAIL
RETURN RECEIPT NO. 7011 2000 0002 0285 5131

May 31st, 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: **Investigation and Characterization Plan (ICP) Report and Request for Further Delineation**
Rice Operating Company – Vacuum SWD System
Vacuum Jct. C-31 (1R425-84): UL/C sec. 31 T17S R35E

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 abandoned Vacuum Salt Water Disposal (SWD) system. ROC is the service provider (agent) for the Vacuum 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 0.5 miles southwest of Buckeye, New Mexico in Unit C, Section 31, T17S, R35E as shown on the Site Location Map (Figure 1). Soil bore installation at the site indicates that groundwater is likely to be encountered at 100 ft bgs.

In 2009, ROC initiated work on the former Vacuum Jct. C-31 junction boxes. The site was delineated using a backhoe to collect soil samples at regular intervals, creating a 30 x 20 x 12-ft deep excavation. Soil samples were field tested for chlorides and hydrocarbons and resulted in elevated chloride concentrations. Representative samples were taken to a commercial laboratory for analysis. Laboratory analysis of the four-wall composite resulted in a chloride concentration of 2,400 mg/kg, a gasoline range organics (GRO) concentration of 69.1 mg/kg and a diesel range organics (DRO) concentration of 1,110 mg/kg. BTEX analysis of the four-wall composite resulted in benzene and toluene concentrations of non-detect, an ethyl benzene concentration of 0.363 mg/kg and a total xylenes concentration of 1.48 mg/kg. Laboratory analysis of the bottom composite resulted in a chloride concentration of 944 mg/kg, a GRO concentration of 158 mg/kg and a DRO concentration of 1,590 mg/kg. BTEX analysis of the bottom composite resulted in benzene, toluene, and ethyl benzene concentrations of non-detect and a total xylenes concentration of 2.77 mg/kg.

The excavated soil was blended on site and a representative composite sample was sent to a commercial laboratory for analysis of chlorides and TPH. The laboratory analysis resulted in a chloride concentration of 1,200 mg/kg, a GRO concentration of 10.4 mg/kg and a DRO concentration of 1,130 mg/kg. The blended backfill was returned to the excavation to 5 ft below ground surface (bgs) and a geo-synthetic and plastic liner were installed and properly seated into the excavation. The remaining backfill was blended with clean, imported soil and analyzed by a commercial laboratory for chlorides and TPH. Laboratory analysis of the blended backfill II resulted in a chloride concentration of 400 mg/kg, a GRO concentration of non-detect and a DRO concentration of 312 mg/kg. The blended backfill II was returned to the excavation to ground surface and was used to contour the site to the surrounding area. On June 8th, 2009, the site was seeded with a blend of native vegetation.

NMOCD was notified of potential groundwater impact on March 12th, 2010, and a junction box disclosure report was submitted to NMOCD with all the 2009 junction box closures and disclosures.

On February 8th, 2013, ROC submitted an Investigation and Characterization Plan (ICP), which was approved on March 4th, 2013. As part of the ICP, RECS personnel were on site April 11th and 12th, 2013 to install soil bores (Figure 2). A total of six soil bores were drilled at the site and as they were advanced, soil samples were taken at regular intervals. The samples were field tested for chlorides and hydrocarbons and representative samples were taken to a commercial laboratory for analysis. Laboratory analysis of SB-1 returned chlorides results of 2,210 mg/kg at 30 ft bgs and decreased to 256 mg/kg at 75 ft bgs. GRO and DRO analyses showed non-detect in all samples except for at 30 ft bgs where the DRO reading was 14.4 mg/kg. In SB-2, laboratory chloride readings returned results of 3,960 mg/kg at 40 ft bgs and decreased to 1,710 mg/kg at 90 ft bgs. GRO and DRO analyses returned results of non-detect. In SB-3, laboratory chloride readings returned results of 4,000 mg/kg at 40 ft bgs and decreased to 928 mg/kg at 90 ft bgs. GRO and DRO analyses returned non-detect for all samples except for at 40 ft bgs where the DRO reading was 20.7 mg/kg. In SB-4, laboratory chloride readings returned 5,920 mg/kg at the surface, 4,880 mg/kg at 10 ft bgs and 1,150 mg/kg at 90 ft bgs. GRO and DRO analyses returned results of non-detect except at the surface where the DRO reading was 45.9 mg/kg. In SB-5, the laboratory chloride readings returned results of 4,160 mg/kg at the surface, 2,600 mg/kg at 50 ft bgs and decreased to 240 mg/kg at 85 ft bgs. GRO and DRO analyses returned results of non-detect except at the surface where the DRO reading was 11.3 mg/kg. In SB-6, the laboratory chloride readings returned results of 3,280 mg/kg at 40 ft bgs and decreased to 656 mg/kg at 90 ft bgs. GRO and DRO readings returned results of non-detect.

Request for Further Delineation

Soil borings completed thus far resulted in elevated chloride concentrations; however, the lateral extent of the contamination in the vadose zone has yet to be determined. RECS recommends that ROC continue to investigate the site to determine the lateral extent of

the chloride contamination. ROC will also review historical photos and, if warranted, install a near-source monitoring well. Additional monitoring wells may be required to fully delineate groundwater quality. All monitoring wells will be installed and sampled according to NMOCD and industry standards.

Once further sampling is conducted at the site and the data is evaluated, RECS will submit a Corrective Action Plan (CAP) that will suggest a vadose zone remedy and, if warranted, a groundwater investigation plan.

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

Sincerely,

Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

Attachments:

Figure 1 – Site Location Map
Figure 2 – Soil Bore Installation Map
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

Vacuum Jct. C-31

UL/ C, Section 31,
T17S, R35E
Lea County, NM

NMOCD Case #: 1R425-84

Figure 1

N
W E
S

0 0.05 0.1 0.2 Miles

Drawing date: 2-8-13

Soil Bore Installation

SB-1

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	1158	0.1			
5'	370	1.3			
10'	443	2.4			
15'	335	3.9			
20'	682	2.2			
25'	1425	1.2			
30'	2216	0.6	2210	<10.0	14.4
35'	1724	0.8			
40'	2026	0.8			
45'	1545	0.9			
50'	949	0.7			
55'	903	0.7			
60'	996	0.5			
65'	534	1.2			
70'	302	1.1			
75'	242	0.8	256	<10.0	<10.0

SB-2

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	771	0.7			
5'	600	1.2			
10'	677	10.3			
15'	173	5.7			
20'	1264	3.6			
25'	1096	3.1			
30'	2099	3.8			
35'	3385	3.7			
40'	3619	3.7	3960	<10.0	<10.0
45'	1841	2.2			
50'	1696	1.8			
55'	1788	2.5			
60'	1076	3.8			
65'	1296	3			
70'	591	2.8			
75'	1813	4.6			
80'	2014	3.6			
85'	1400	3.3			
90'	1693	3.4	1710	<10.0	<10.0

SB-3

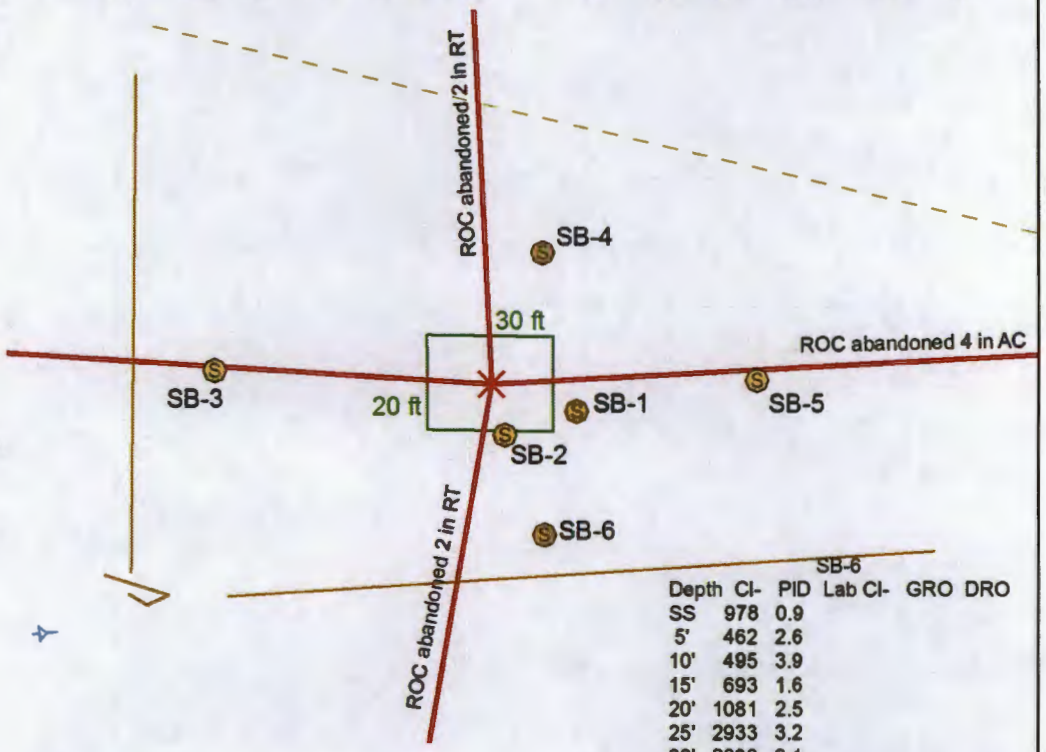
Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	641	0.7			
5'	508	1.2			
10'	1767	96.8			
15'	3905	22.1			
20'	2982	24.5			
25'	3179	4.5			
30'	3531	4.9			
35'	2476	3.1			
40'	4242	3.3	4000	<10	20.7
45'	3402	2.5			
50'	3722	2.7			
55'	3284	4.1			
60'	1544	2.5			
65'	2194	3			
70'	1431	1.5			
75'	753	1.9			
80'	841	2.3			
85'	707	3.3			
90'	892	4.2	928	<10	<10

SB-4

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	4425	1	5920	<10.0	45.9
5'	1092	1.4			
10'	3520	2.1	4880	<10.0	<10.0
15'	1926	2			
20'	743	2			
25'	2271	0.9			
30'	1545	1.7			
35'	997	1.8			
40'	826	1.8			
45'	1072	2.1			
50'	1481	2.6			
55'	1794	2.3			
60'	1749	2.7			
65'	1002	2.6			
70'	796	1.5			
75'	858	1.9			
80'	1097	2.3			
85'	701	2.1			
90'	1053	0.9	1150	<10.0	<10.0

SB-5

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	2621	0.8	4160	<10.0	11.3
5'	780	4.2			
10'	1609	16.5			
15'	1479	8.4			
20'	600	40			
25'	334	8.1			
30'	657	5.3			
35'	1424	4.5			
40'	2096	4			
45'	1995	2.9			
50'	2440	3	2600	<10.0	<10.0
55'	1676	3.4			
60'	1420	3.6			
65'	385	4.2			
70'	556	4.3			
75'	497	1.3			
80'	277	1.6			
85'	248	2	240	<10.0	<10.0



SB-6

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	978	0.9			
5'	462	2.6			
10'	495	3.9			
15'	693	1.6			
20'	1081	2.5			
25'	2933	3.2			
30'	2838	3.1			
35'	2825	2.6			
40'	2963	2.4	3280	<10.0	<10.0
45'	1762	2.4			
50'	2678	2.1			
55'	2198	1.9			
60'	2046	1.8			
65'	1908	1.7			
70'	1053	1.8			
75'	1092	2.3			
80'	1049	3.4			
85'	581	3.1			
90'	717	2.2	656	<10.0	<10.0

Legend

- VACUUM SOIL BORES
- DEADMAN
- NON ROC BURIED PIPELINE
- NON ROC SURFACE LINES
- VACUUM REMOVED BOX
- VACUUM ABANDONED LINE
- GEOSYNTHETIC LINER COVERED BY A PLASTIC LINER @ 5 ft

DGW: 100 ft.

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

Vacuum Jct. C-31

UL/ C, Section 31,
T17S, R35E
Lea County, NM

NMOCD Case #: 1R425-84

Figure 2

N W E S

0 10 20 40 Feet

GPS DATE: 4/9/13 TG
Drawing date: 5/17/13
Drafted by: LS

Appendix A

Soil Bore Installation Documentation

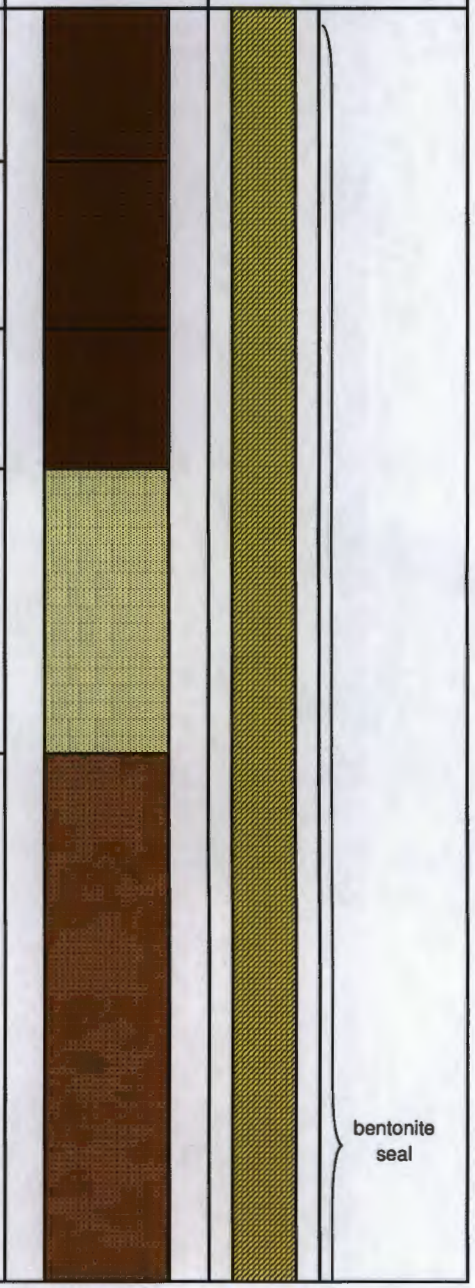
RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

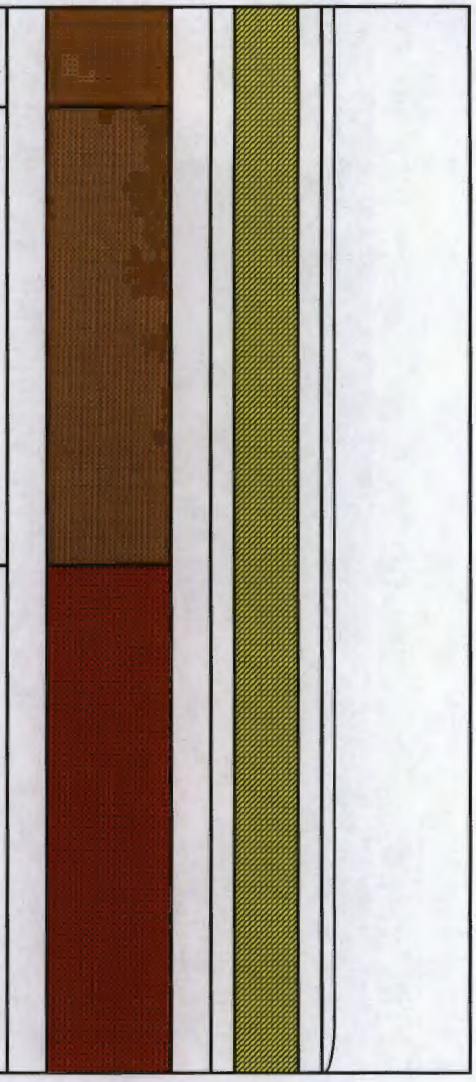
Logger:	Kyle Norman		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air Rotary		**Project Name:** Vacuum Jct. C-31 **Well ID:** SB-1
Start Date:	4/11/2013		
End Date:	4/11/2013		**Project Consultant:** RECS

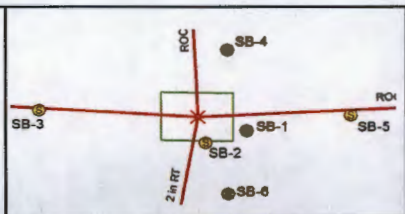
Comments: SB-1 is at the source of the former junction box site.
All samples were from cuttings.
DRAFTED BY: T. Jennings
TD = 75 ft GW = 100 ft

Location: UL/C, Sec. 31, T17S, R35E
Lat: 32°79'72.61N **Long:103°49'90.11W**
County: Lea **State:**NM

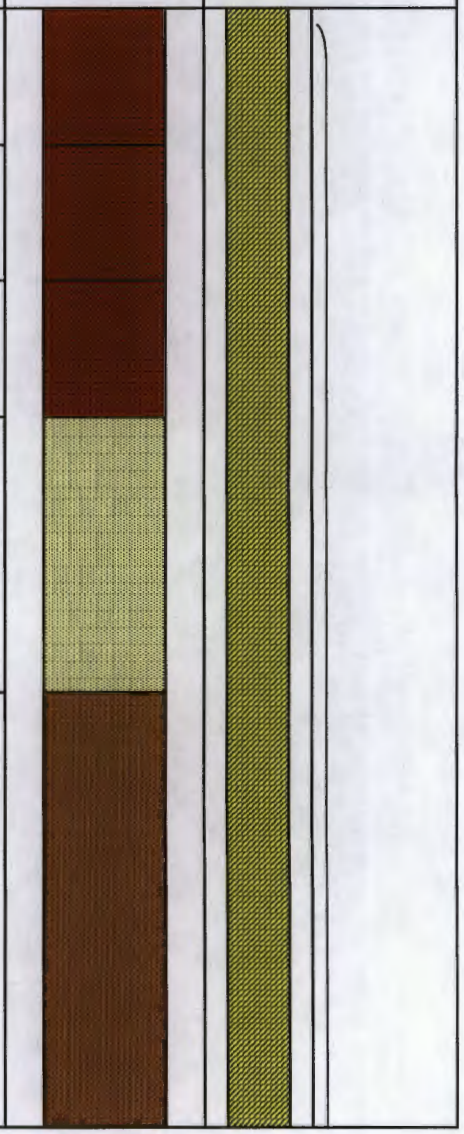
Depth	Field Cl⁻ (mg/kg)	LAB Cl⁻ (mg/kg)	LAB TPH (mg/kg)	PID (ppm)	Description
SS	1,158			0.1	Brown Sand Regolith
5 ft	370			1.3	Brown Sand Regolith (plastic liner)
10 ft	443			2.4	Brown Sand Regolith
15 ft	335			3.9	Caliche/Sandstone
20 ft	682			2.2	
25 ft	1,425			1.2	Tan Sand
30 ft	2,216	2,210	GRO <10 DRO 14.4	0.6	
35 ft	1,724			0.8	
40 ft	2,026			0.8	



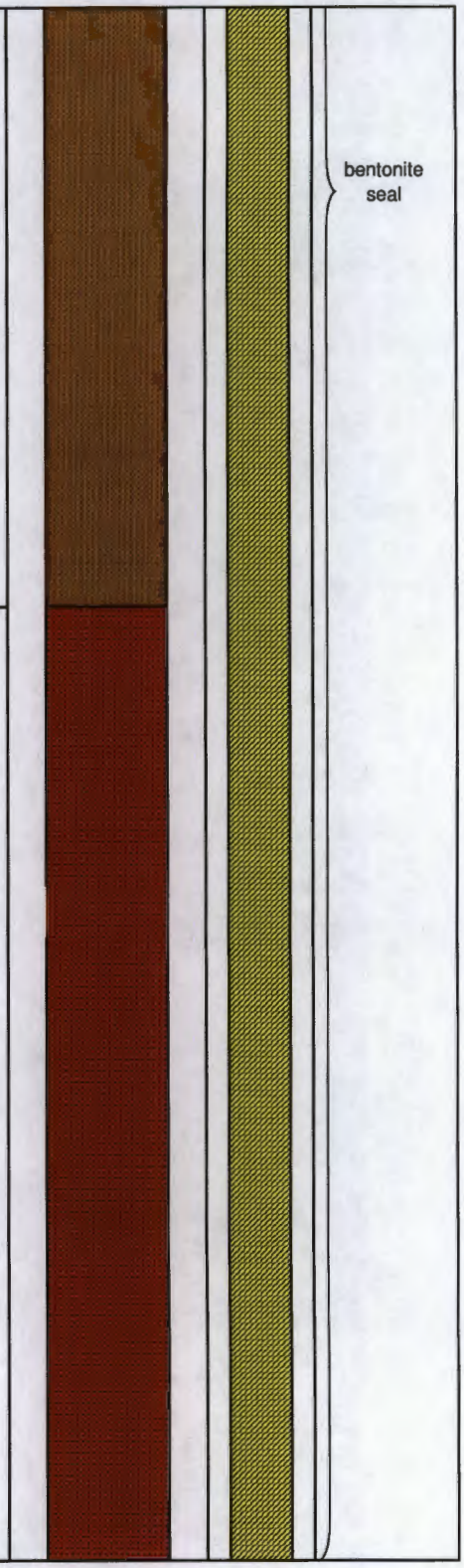
					Tan Sand	
45 ft	1,545			0.9		
50 ft	949			0.7		
					Tan Sand/Caliche	
55 ft	903			0.7		
60 ft	996			0.5		
65 ft	534			1.2		
					Moist Red Sand	
70 ft	302			1.1		
75 ft	242	256	GRO <10 DRO <10	0.8		

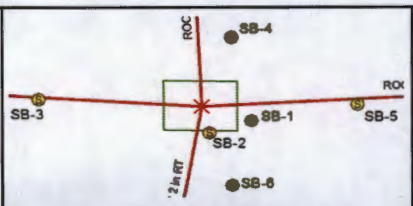
Logger:	Kyle Norman		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		**Project Name:** Vacuum Jct. C-31 **Well ID:** SB-2
Drilling Method:	Air Rotary		**Project Consultant:** RECS
Start Date:	4/11/2013		
End Date:	4/11/2013		
Comments: SB-2 is located 10 ft. west of the former junction box site. All samples were from cuttings. **DRAFTED BY: T. Jennings** TD = 90 ft GW = 100 ft			**Location: UL/C, Sec. 31, T17S, R35E** **Lat: 32°47'50.028"N** **Long: 103°29'55.966"W** **County**:Lea **State**: NM

Depth	Field Cl⁻ (mg/kg)	LAB Cl⁻ (mg/kg)	LAB TPH (mg/kg)	PID (ppm)	Description
SS	771			0.7	Brown Sand Regolith
5 ft	600			1.2	Brown Sand Regolith (plastic Liner)
10 ft	677			10.3	Brown Sand Regolith
15 ft	173			5.7	Caliche/Sandstone
20 ft	1,264			3.6	
25 ft	1,096			3.1	Tan Sand
30 ft	2,099			3.8	
35 ft	3,385			3.7	



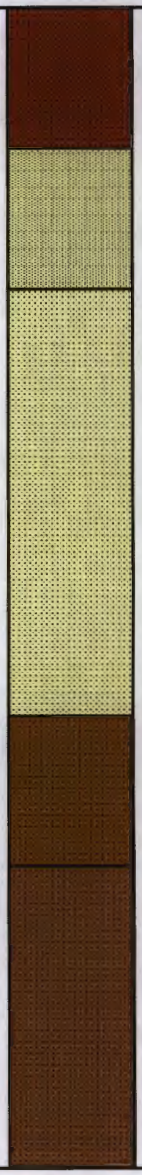
40 ft	3,619	3,960	GRO <10 DRO <10	3.7	Tan Sand
45 ft	1,841			2.2	
50 ft	1,696			1.8	
55 ft	1,788			2.5	
60 ft	1,076			3.8	Moist Red Sand
65 ft	1,296			3	
70 ft	591			2.8	
75 ft	1,813			4.6	
80 ft	2,014			3.6	
85 ft	1,400			3.3	
90 ft	1,693	1,710	GRO <10 DRO <10	3.4	



Logger:	Kyle Norman		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		**Project Name:** Vacuum Jct. C-31 **Well ID:** SB-3
Drilling Method:	Air Rotary		**Project Consultant:** RECS
Start Date:	4/12/2013		**Location: UL/C, Sec. 31, T17S, R35E**
End Date:	4/12/2013		**Lat: 32°47'50.066"N** **County:** Lea
Comments: SB-3 is located 25 ft west of the former junction box site. All samples were from cuttings. **DRAFTED BY: T. Jennings** TD = 90 ft GW = 100 ft			**Long: 103°29'56.487"W** **State:** NM

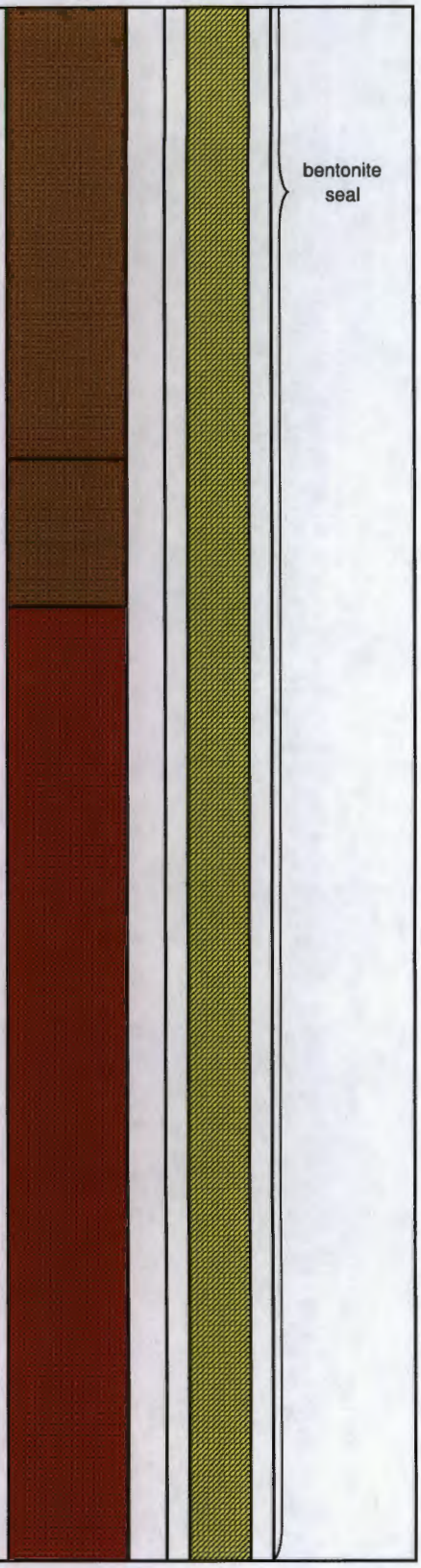
Depth	Field Cl⁻ (mg/kg)	LAB Cl⁻ (mg/kg)	LAB TPH (mg/kg)	PID (ppm)	Description
SS	641			0.7	6" Brown Sand Top Soil
5 ft	508			1.2	Caliche/Sandstone (Hydrocarbon Smell)
10 ft	1,767			96.8	Caliche (Hydrocarbon Smell)
15 ft	3,905			22.1	
20 ft	2,982			24.5	
25 ft	3,179			4.5	Caliche/Tan Sand Mix (Hydrocarbon Smell)
30 ft	3,531			4.9	Tan Sand (Slight Hydro Carbine Smell)
35 ft	2,476			3.1	

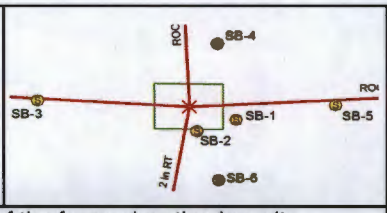
Lithology



Well Construction

40 ft	4,242	4,000	GRO <10 DRO 20.7	3.3	Tan Sand (Slight Hydro Carbine Smell)	
45 ft	3,402			2.5		
50 ft	3,722			2.7		
55 ft	3,284			4.1	Damp Tan Sand with some Sandstone	
60 ft	1,544			2.5	Moist Red Sand	
65 ft	2,194			3		
70 ft	1,431			1.5		
75 ft	753			1.9		
80 ft	841			2.3		
85 ft	707			3.3		
90 ft	892	928	GRO <10 DRO <10	4.2		



Logger:	Kyle Norman		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		**Project Name:** Vacuum Jct. C-31 **Well ID:** SB-4
Drilling Method:	Air Rotary		**Project Consultant:** RECS
Start Date:	4/12/2013		**Location: UL/C, Sec. 31, T17S, R35E**
End Date:	4/12/2013		**Lat: 32°47'50.252"N** **County:**Lea **Long: 103°29'55.88"W** **State:**NM

Comments: SB-4 is located 20 north of the former junction box site. All samples were from cuttings.

DRAFTED BY: T. Jennings

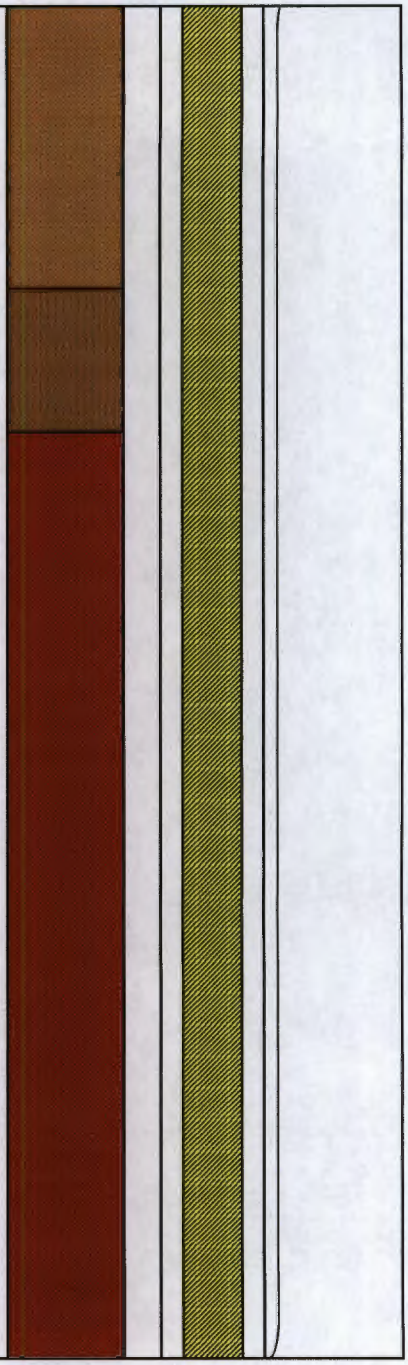
TD = 90 ft GW = 100 ft

Depth	Field Cl^- (mg/kg)	LAB Cl^- (mg/kg)	LAB TPH (mg/kg)	PID (ppm)	Description
SS	4,425	5,920	GRO <10 DRO 45.9	1.0	6" Brown Sand Top Soil
5 ft	1,092			1.4	Caliche/Sandstone
10 ft	3,520	4,880	GRO <10 DRO <10	2.1	Caliche
15 ft	1,926			2.0	Caliche/Sandstone
20 ft	743			2.0	
25 ft	2,271			0.9	Tan Sand
30 ft	1,545			1.7	
35 ft	997			1.8	
40 ft	826			1.8	

Lithology

Well Construction

bentonite seal

45 ft	1,072			2.1	Tan Sand	
50 ft	1,481			2.6		
55 ft	1,794			2.3	Damp Tan Sand With Some Sandstone	
60 ft	1,749			2.7	Moist Red Sand	
65 ft	1,002			2.6		
70 ft	796			1.5		
75 ft	858			1.9		
80 ft	1,097			2.3		
85 ft	701			2.1		
90 ft	1,053	1,150	GRO <10 DRO <10	0.9		

Logger:	Kyle Norman		**Project Name:** Vacuum Jct. C-31 **Well ID:** SB-5
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air Rotary		**Location: UL/C, Sec. 31, T17S, R35E**
Start Date:	4/12/2013		**Lat: 32°47'50.044"N** **County:**Lea
End Date:	4/12/2013		**Long: 103°29'55.484"W** **State:**NM

Comments: SB-5 is 30 ft east of the former junction box site.
All samples were from cuttings.
DRAFTED BY: T. Jennings
TD = 85 ft GW = 100 ft

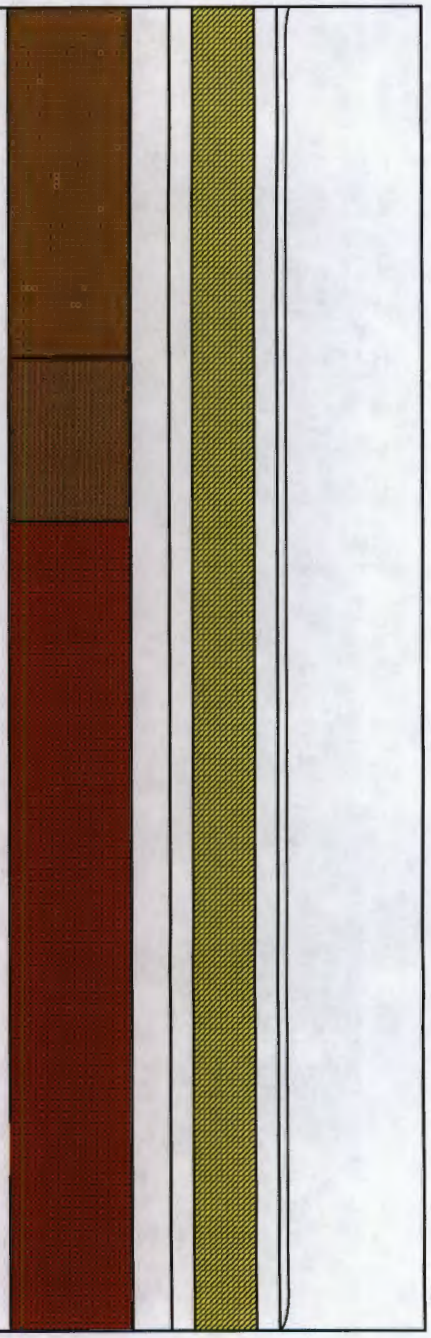
Depth	Field Cl⁻ (mg/kg)	LAB Cl⁻ (mg/kg)	LAB TPH (mg/kg)	PID (ppm)	Description
SS	2,621	4,160	GRO <10 DRO 11.3	0.8	6" Brown Sand Top Soil
5 ft	780			4.2	Caliche/Sandstone
10 ft	1,609			16.5	Caliche/Sandstone (Hydrocarbon Smell)
15 ft	1,479			8.4	
20 ft	600			40.0	
25 ft	334			8.1	
30 ft	657			5.3	Tan Sand
35 ft	1,424			4.5	
40 ft	2,096			4.0	

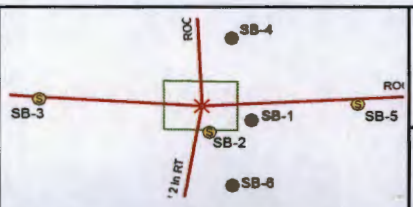
Lithology

Well Construction

bentonite seal

45 ft	1,995			2.9		
					Tan Sand	
50 ft	2,440	2,600	GRO <10 DRO <10	3.0		
55 ft	1,676			3.4		
					Damp Tan Sand With Some Sandstone	
60 ft	1,420			3.6		
65 ft	385			4.2		
70 ft	556			4.3		
					Moist Red Sand	
75 ft	497			1.3		
80 ft	277			1.6		
85 ft	248	240	GRO <10 DRO <10	2.0		



Logger:	Kyle Norman		**Project Name:** Vacuum Jct. C-31 **Well ID:** SB-6
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air Rotary		**Location: UL/C, Sec. 31, T17S, R35E**
Start Date:	4/12/2013		**Lat: 32°47'49.816"N** **County:**Lea
End Date:	4/12/2013		**Long: 103°29'55.887"W** **State:**NM

Comments: SB-6 is located 25 ft. south of the former junction box site. All samples were from cuttings.

DRAFTED BY: T. Jennings

TD = 90 ft GW = 100 ft

Depth	Field Cl⁻ (mg/kg)	LAB Cl⁻ (mg/kg)	LAB TPH (mg/kg)	PID (ppm)	Description	Lithology	Well Construction
SS	978			0.9	6" Brown Sand Top Soil		
5 ft	462			2.6	Caliche/Sandstone		
10 ft	495			3.9			
15 ft	693			1.6			
20 ft	1,081			2.5	Caliche		
25 ft	2,933			3.2	Tan Sand		
30 ft	2,838			3.1			
35 ft	2,825			2.6			
40 ft	2,963	3,280	GRO <10 DRO <10	2.4			

45 ft	1,762			2.4	Tan Sand	
50 ft	2,678			2.1		
55 ft	2,198			1.9		
60 ft	2,046			1.8	Moist Red Sand	
65 ft	1,908			1.7		
70 ft	1,053			1.8		
75 ft	1,092			2.3		
80 ft	1,049			3.4		
85 ft	581			3.1		
90 ft	717	656	GRO <10 DRO <10	2.2		

CARDINAL Laboratories

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

April 16, 2013

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM JCT C-31 17S-35E

Enclosed are the results of analyses for samples received by the laboratory on 04/11/13 16:25.

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:	04/11/2013	Sampling Date:	04/11/2013
Reported:	04/16/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB - 1 @ 30' (H300870-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2210**	16.0	04/12/2013	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	04/15/2013	ND	195	97.6	200	3.04	
DRO >C10-C28	**14.4**	10.0	04/15/2013	ND	195	97.3	200	3.66	

Surrogate: 1-Chlorooctane	*85.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.7 %*	*63.6-154*

Sample ID: SB - 1 @ 75' (H300870-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**256**	16.0	04/12/2013	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	04/15/2013	ND	195	97.6	200	3.04	
DRO >C10-C28	<10.0	10.0	04/15/2013	ND	195	97.3	200	3.66	

Surrogate: 1-Chlorooctane	*81.1 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*98.6 %*	*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:	04/11/2013	Sampling Date:	04/11/2013
Reported:	04/16/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB - 2 @ 40' (H300870-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3960**	16.0	04/12/2013	ND	416	104	400	3.77	

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	04/15/2013	ND	195	97.6	200	3.04	
DRO >C10-C28	<10.0	10.0	04/15/2013	ND	195	97.3	200	3.66	

Surrogate: 1-Chlorooctane	*79.7 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.0 %*	*63.6-154*

Sample ID: SB - 2 @ 90' (H300870-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1710**	16.0	04/12/2013	ND	416	104	400	3.77	

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	04/15/2013	ND	195	97.6	200	3.04	
DRO >C10-C28	<10.0	10.0	04/15/2013	ND	195	97.3	200	3.66	

Surrogate: 1-Chlorooctane	*79.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*94.6 %*	*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

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

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: Vacuum Jct, C-31 17S-35E	**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
H300670																				
1	SB-1 @ 30'	G	1			✓					✓		4-11-13	10:30	✓	✓				
2	SB-1 @ 75'	G	1			✓					✓		"	12:00	✓	✓				
3	SB-2 @ 40'	G	1			✓					✓		"	1:30	✓	✓				
4	SB-2 @ 90'	G	1			✓					✓		"	3:00	✓	✓				

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 N	**Date:** 4-11-13 **Time:** 4:25	**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:

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

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

#26

CARDINAL Laboratories

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

April 19, 2013

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM JCT C-31 17S-35E

Enclosed are the results of analyses for samples received by the laboratory on 04/12/13 16:00.

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:	04/12/2013	Sampling Date:	04/12/2013
Reported:	04/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 3 @ 40' (H300891-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4000**	16.0	04/16/2013	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	04/15/2013	ND	195	97.6	200	3.04	
DRO >C10-C28	**20.7**	10.0	04/15/2013	ND	195	97.3	200	3.66	

Surrogate: 1-Chlorooctane	*67.1 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.8 %*	*63.6-154*

Sample ID: SB 3 @ 90' (H300891-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**928**	16.0	04/16/2013	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	04/16/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/16/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*92.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*112 %*	*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:	04/12/2013	Sampling Date:	04/12/2013
Reported:	04/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 4 @ SURFACE (H300891-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**5920**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	**45.9**	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*91.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*114 %*	*63.6-154*

Sample ID: SB 4 @ 10' (H300891-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4880**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*94.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*113 %*	*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:	04/12/2013	Sampling Date:	04/12/2013
Reported:	04/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 4 @ 90' (H300891-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1150**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*86.2 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*106 %*	*63.6-154*

Sample ID: SB 5 @ SURFACE (H300891-06)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4160**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	**11.3**	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*94.3 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*115 %*	*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:	04/12/2013	Sampling Date:	04/12/2013
Reported:	04/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 5 @ 50' (H300891-07)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2600**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*92.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*113 %*	*63.6-154*

Sample ID: SB 5 @ 85' (H300891-08)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**240**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*92.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*113 %*	*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:	04/12/2013	Sampling Date:	04/12/2013
Reported:	04/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT C-31 17S-35E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 6 @ 40' (H300891-09)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3280**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*91.7 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*111 %*	*63.6-154*

Sample ID: SB 6 @ 90' (H300891-10)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**656**	16.0	04/16/2013	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	04/17/2013	ND	214	107	200	1.59	
DRO >C10-C28	<10.0	10.0	04/17/2013	ND	231	116	200	8.38	

Surrogate: 1-Chlorooctane	*86.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*107 %*	*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

Cardinal Laboratories

*=Accredited Analyte

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		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: Vacuum Jct C-31 17S-35E		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
H3008866																				
1	SB 3 @ 40'	G	1			✓					✓		4-12-13	8:30	✓	✓				
2	SB 3 @ 90'	G	1			✓					✓		"	9:25	✓	✓				
3	SB 4 @ Surface	G	1			✓					✓		"	9:40	✓	✓				
4	SB 4 @ 10'	G	1			✓					✓		"	10:30	✓	✓				
5	SB 4 @ 90'	G	1			✓					✓		"	11:00	✓	✓				
6	SB 5 @ Surface	G	1			✓					✓		"	11:20	✓	✓				
7	SB 5 @ 50'	G	1			✓					✓		"	12:30	✓	✓				
8	SB 5 @ 85'	G	1			✓					✓		"	1:00	✓	✓				
9	SB 6 @ 40'	G	1			✓					✓		"	2:30	✓	✓				
10	SB 6 @ 90'	G	1			✓					✓		"	3:30	✓	✓				

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Relinquished By: Kyle	Date: 4-12-13 Time: 4:00	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:	4°C	Sample Condition Cool ☐ Yes ☐ No Intact ☐ Yes ☐ No	CHECKED BY: (Initials)

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

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

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