1R425-81

CAP

Approved
January 2015

From: Lowe, Leonard, EMNRD
To: "Lara Weinheimer"
Cc: "Hack Conder"; "Katie Jones"; "Sarah Edwards"
Subject: Approved Corrective Action Plan for ROC"s Vacuum Jct. D-31 (1R425-81)
Date: Tuesday, January 13, 2015 4:08:00 PM
Importance: High

Laura Weinheimer
Project Scientists
Rice Environmental Consulting & Safety

OCD has reviewed the submitted CAP for **Vacuum Jct. D – 31 (1R – 425 – 81)**, dated March 24, 2014 and approves the submitted Corrective Action Plan.

Please be advised that OCD approval of this plan does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

Leonard Lowe
Environmental Engineer
[Environmental Bureau]
Oil **C**onservation **D**ivision
Energy **M**inerals and **N**atural **R**esources **D**epartment
1220 South St. Frances
Santa Fe, New Mexico 87004
Office: 505-476-3492
Fax: 505-476-3462
E-mail: leonard.lowe@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/

From: Lara Weinheimer [mailto:lweinheimer@rice-ecs.com]
Sent: Monday, March 24, 2014 1:34 PM
To: Lowe, Leonard, EMNRD; VonGonten, Glenn, EMNRD
Cc: 'Hack Conder'; 'Katie Jones'; 'Sarah Edwards'
Subject: Corrective Action Plan for ROC's Vacuum Jct. D-31 (1R425-81)

Attached you will find the Corrective Action Plan (CAP) for ROC's Vacuum Jct. D-31 (1R425-81).

If you have any questions regarding this submission, don't hesitate to contact Hack Conder (1-575-631-6432) or myself at (1-575-441-0431).

Thank you,

Lara

Lara Weinheimer
Rice Environmental Consulting & Safety
Project Scientist
419 West Cain
Hobbs, NM 88240
(575) 441-0431

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

March 24th, 2014

Mr. Leonard Lowe
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: **Corrective Action Plan (CAP)**
Rice Operating Company – Vacuum SWD System
Vacuum Jct. D-31 (1R425-81): UL/D sec. 31 T17S R35E

Mr. Lowe:

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 0.3 miles south of Buckeye, New Mexico in Unit D, Section 31, T17S, R35E as shown on the Site Location Map (Figure 1). Soil bore installation shows depth to groundwater at 118 ft bgs.

In 2009, ROC initiated work on the former Vacuum Jct. D-31 junction box. The site was delineated using a backhoe to collect soil samples at regular intervals, creating a 10 x 30 x 12-ft deep excavation. The samples were field tested for chlorides, which evidenced elevated chloride concentrations. The samples were also tested for organic vapors using a PID, which resulted in varied readings. Representative composite samples were sent to a commercial laboratory for analysis of chloride and TPH. Laboratory analysis of the four-wall composite resulted in a chloride concentration of 3,320 mg/kg, a gasoline range organics (GRO) concentration of non-detect and a diesel range organics (DRO) concentration of 966 mg/kg. Laboratory analysis of the bottom composite resulted in a chloride concentration of 2,840 mg/kg, a GRO concentration of non-detect and a DRO concentration of 1,130 mg/kg. The excavated soil was blended on site and a sample of the blended soil returned a laboratory chloride concentration of 1,070 mg/kg, a GRO concentration of non-detect and a DRO concentration of 1,180 mg/kg. The blended backfill was returned to the excavation up to 5 ft below ground surface (bgs). At 5-4 ft bgs, a 1-ft thick clay liner was installed and a clay compaction test performed on April 17th, 2009. Clean, imported soil was used to backfill the excavation to ground surface and 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 November 11th, 2009, 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) to NMOCD which was approved on March 4th, 2013. As part of the ICP, RECS personnel were on site April 9th through 11th to conduct soil bore installations. Six soil bores were installed and as the bores were advanced, samples were field tested for chlorides and hydrocarbons. Representative samples from each bore were taken to a commercial laboratory for analysis. In all six soil bores, the chloride values decreased as the bores were advanced, except in SB-3 where the laboratory chloride value at the surface was 320 mg/kg, at 15 ft bgs the value was 624 mg/kg and at 20 ft bgs the value was 128 mg/kg. At 85 ft bgs, all the bores had laboratory chloride readings above regulatory standards, except for SB-3, which achieved a laboratory chloride reading below 250 mg/kg at 20 ft bgs. GRO and DRO in all bores at all depths were non-detect.

On May 31st, 2011, an Investigation and Characterization Plan (ICP) Report and Request for Further Investigation was submitted to NMOCD and approved on July 25th, 2013. The ICP Report and Request for Further Investigation asked NMOCD permission to continue to investigate the site to determine the lateral extent of the chloride contamination. As part of this report, RECS personnel were on site December 13th and 19th to install an additional four soil bores (Figure 2). As SB 7-10 were installed, soil samples were taken at regular intervals and field tested for chlorides and hydrocarbons. Representative samples were taken to a commercial laboratory for confirmatory analysis (Appendix A). SB-7 returned a laboratory chloride result of 640 mg/kg at 60 ft bgs and 336 mg/kg at 80 ft bgs. SB-8 returned a laboratory chloride result of 5,440 mg/kg at 15 ft bgs and 2,600 mg/kg at 80 ft bgs. SB-9 returned a laboratory chloride result of 1,360 mg/kg at 40 ft bgs and 2,920 mg/kg at 80 ft bgs. SB-10 returned a laboratory chloride result of 176 mg/kg at 5 ft bgs and 128 mg/kg at 20 ft bgs. A 38 ft north surface sample was taken to a commercial laboratory and returned a chloride result of non-detect. GRO and DRO results at all depths in all bores were non-detect.

On February 10th, 2014, SB-11 was installed at the site to determine depth to groundwater at the site. Groundwater was determined to be located at a depth of 118 ft bgs. The soil bore was plugged in entirety with bentonite.

Corrective Action Plan

Based on the data from SB-11, it is evident that groundwater exists beneath the site at a depth of 118 ft bgs. However, all soil bore installations conducted at the site did not extend vertically to the edge of the capillary fringe; instead, they were installed to a depth no greater than 85 ft bgs. Therefore, further soil bore installation activities need to be conducted below 85 ft bgs to determine if the residual chloride concentrations in the vadose zone could potentially affect groundwater. If the additional soil bore installation activities indicate that groundwater may have been affected by the residual chlorides in vadose zone, a near-source monitor well will be installed, after the vadose zone

remediation is complete. The monitor well will be installed per EPA and NMOCD standards. The monitor well will be sampled quarterly and once appropriate groundwater analysis data has been obtained, a remedy for groundwater will be proposed to NMOCD. Additional monitoring wells may be required to fully delineate groundwater quality.

In order to protect groundwater quality from potential chloride migration, RECS recommends the installation of a 20-mil, reinforced liner. The site will be excavated 50 ft x 90 ft to a depth of 3 ft bgs, due to the presence of hard rock in the area (Figure 2). The excavation will cover the 38 ft North Surface Sample and will extend 5 ft beyond the 5 ft south vertical taken during the junction box delineation phase. To the west, the edge of the excavation is located 5 ft beyond SB-7. To the east, the edge of the excavation is located half way between SB-9 and SB-10. The soils placed above the liner will have a laboratory chloride reading no greater than 500 mg/kg and a field PID reading below 100 ppm. Excavated soil will be evaluated for use as backfill and any soils requiring disposal will be properly disposed of at a NMOCD approved facility. At the base of the excavation, a 20-mil reinforced poly liner will be installed and properly seated. The liner will overlay the previously installed 30 ft x 10 ft clay liner at 5 – 4 ft bgs. The poly liner will provide a barrier that will inhibit the downward migration of chlorides to groundwater.

Upon completion of backfilling, the site will be seeded with a native vegetative mix and soil amendments will be added as necessary. Vegetation provides 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 the additional vertical soil delineation indicates that groundwater has not been affected, then a request for 'remediation termination' and site closure will be submitted after the vadose zone remediation is completed.

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

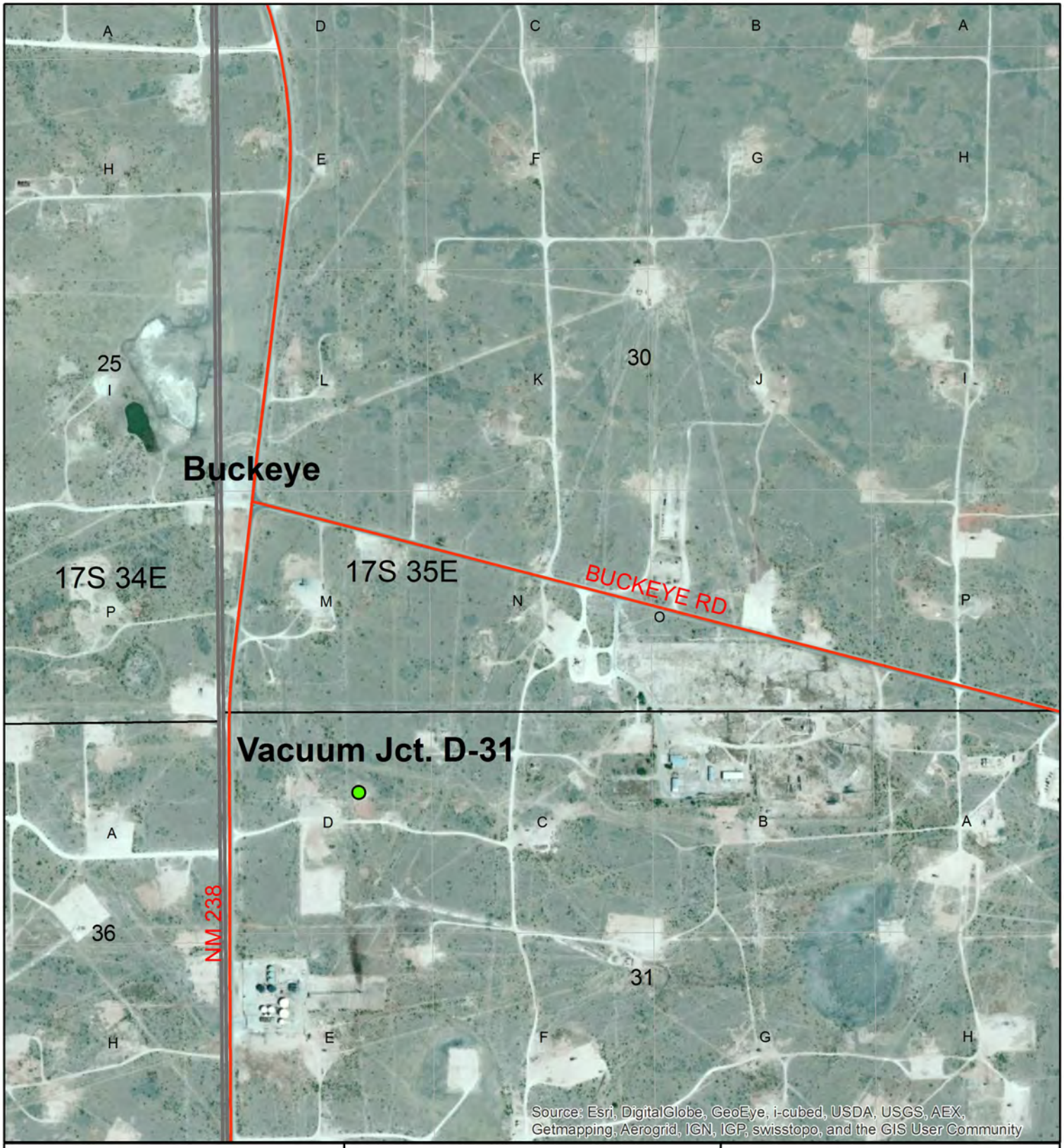
Attachments:

Figure 1 – Site Location Map
Figure 2 – SB Installation, Proposed Liner and MW Installations
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. D-31

Legals: UL/D, Section 31
T17S, R35E
Lea County, NM

NMOCD Case #: 1R425-81

Figure 1

N
W E
S

0 0.125 0.25
Miles

Drawing date: 2-8-13

SB Installation, Proposed Liner and MW Installations

SB-1

Depth	Cl-	PID	Lab Cl-	GRO	DRO
15'	954	2.1			
20'	1936	0.6			
25'	2517	2.1			
30'	2398	1.7			
35'	2478	1.3			
40'	2302	1.4			
45'	1986	0.8			
50'	2699	0.1	3200	<10.0	17.5
55'	1865	0.2			
60'	2392	0.4			
65'	1628	0.4			
70'	970	0.3			
75'	1046	0.2			
80'	1271	0.2			
85'	961	0.8	1020	<10.0	14.9

SB-3

Depth	Cl-	PID	Lab Cl-	GRO	DRO
SS	281	0.6	320	<10.0	<10.0
5'	294	1.4			
10'	407	1.8			
15'	481	2.5	624	<10.0	<10.0
20'	144	1.9	128	<10.0	<10.0

5' South Vertical

Depth	Cl-	PID
1'	150	62.8
2'	252	60.5
3'	257	57.3
4'	256	128
5'	258	89
6'	153	63
7'	178	127
8'	198	93.8
9'	346	78.3
10'	309	43.5
11'	174	46
12'	165	27

SB-7

Depth	Cl-	PID	Lab CL-	GRO	DRO
SS	85	1.9			
5'	113	1.6			
10'	303	2.8			
15'	604	2.4			
20'	286	3.9			
25'	421	1.4			
30'	351	1.9			
35'	310	1.4			
40'	254	1.2			
45'	258	1			
50'	280	1.3			
55'	298	2.1			
60'	611	2.3	640	<10.0	<10.0
65'	502	3.1			
70'	379	0.9			
75'	300	0.7			
80'	290	1.4	336	<10.0	<10.0

SB-8

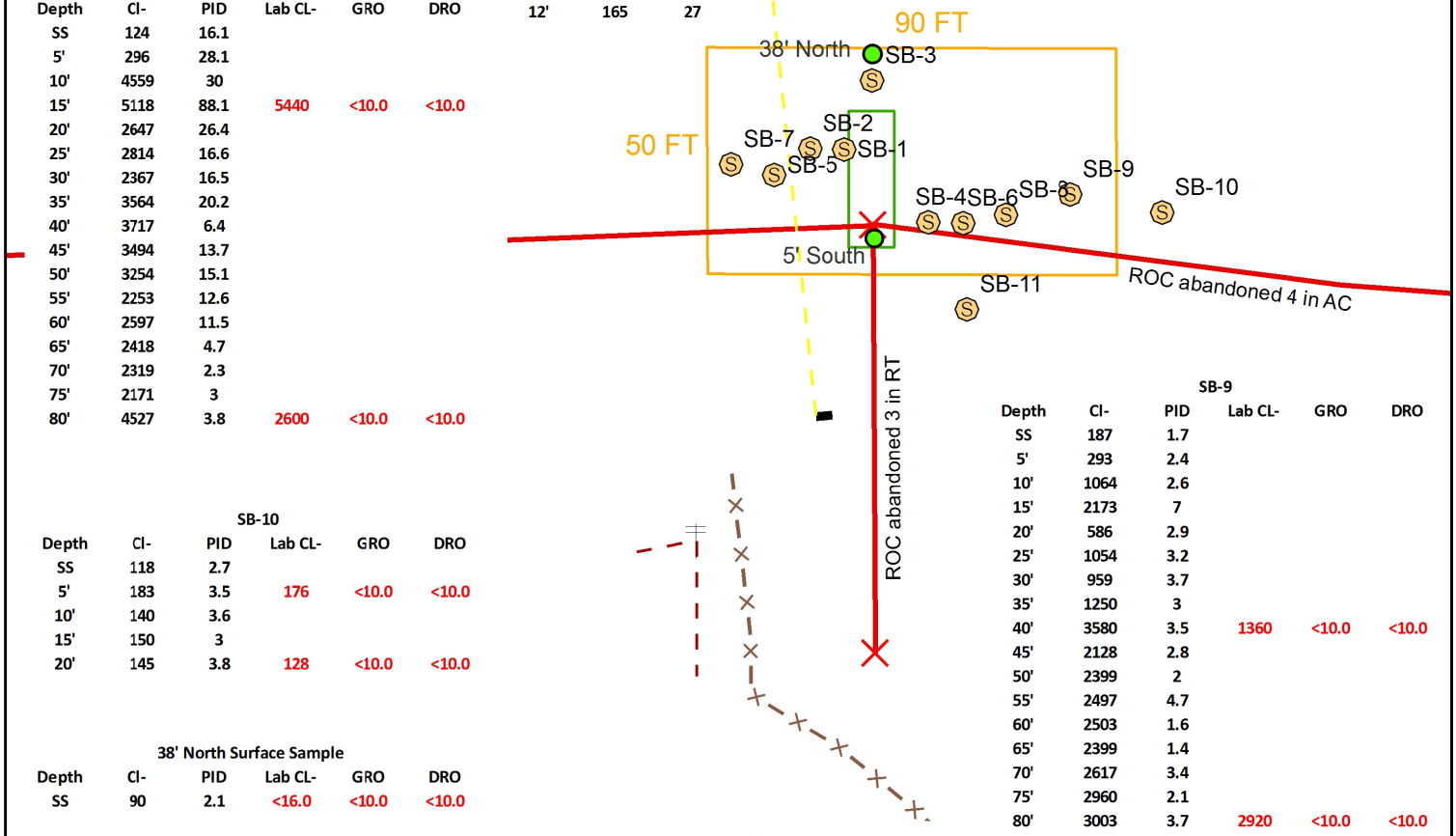
Depth	Cl-	PID	Lab CL-	GRO	DRO
SS	124	16.1			
5'	296	28.1			
10'	4559	30			
15'	5118	88.1	5440	<10.0	<10.0
20'	2647	26.4			
25'	2814	16.6			
30'	2367	16.5			
35'	3564	20.2			
40'	3717	6.4			
45'	3494	13.7			
50'	3254	15.1			
55'	2253	12.6			
60'	2597	11.5			
65'	2418	4.7			
70'	2319	2.3			
75'	2171	3			
80'	4527	3.8	2600	<10.0	<10.0

SB-10

Depth	Cl-	PID	Lab CL-	GRO	DRO
SS	118	2.7			
5'	183	3.5	176	<10.0	<10.0
10'	140	3.6			
15'	150	3			
20'	145	3.8	128	<10.0	<10.0

38' North Surface Sample

Depth	Cl-	PID	Lab CL-	GRO	DRO
SS	90	2.1	<16.0	<10.0	<10.0



SB-9

Depth	Cl-	PID	Lab CL-	GRO	DRO
SS	187	1.7			
5'	293	2.4			
10'	1064	2.6			
15'	2173	7			
20'	586	2.9			
25'	1054	3.2			
30'	959	3.7			
35'	1250	3			
40'	3580	3.5	1360	<10.0	<10.0
45'	2128	2.8			
50'	2399	2			
55'	2497	4.7			
60'	2503	1.6			
65'	2399	1.4			
70'	2617	3.4			
75'	2960	2.1			
80'	3003	3.7	2920	<10.0	<10.0

Legend

- VACUUM SOIL BORES
- ELECTRIC POLE
- VACUUM REMOVED BOX
- NON-ROC BURIED PIPLINE
- FENCE
- OVERHEAD ELECTRIC LINE
- DEAD STEEL RISER
- VACUUM ABANDONED LINE
- PROPOSED 20-MIL REINFORCED LINER AT 3 FT BGS
- 30 FT x 10 FT CLAY LAYER AT 5-4 ft BGS

DGW: 118 ft

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS

Vacuum Jct. D-31

UL/D sec. 31
T17S, R35E
LEA COUNTY, NM

NMOCD Case#: 1R425-81

Figure 2

N W E S

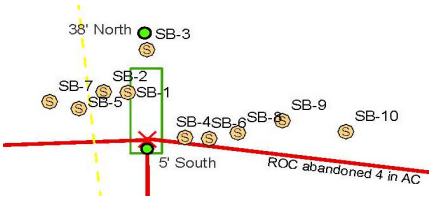
0 30 60 Feet

Drawing date: 1/7/14
Drafted by: L. Weinheimer

Appendix A

Soil Bore Installation Documentation

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

Logger:	Edward Cesareo		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air-Rotary		**Project Name:** Vacuum Jct. D-31 **Well ID:** SB-7
Start Date:	12/13/2013		
End Date:	12/13/2013		

Comments: SB-7 is located 34 ft northwest of the former junction box site. All samples were from cuttings.

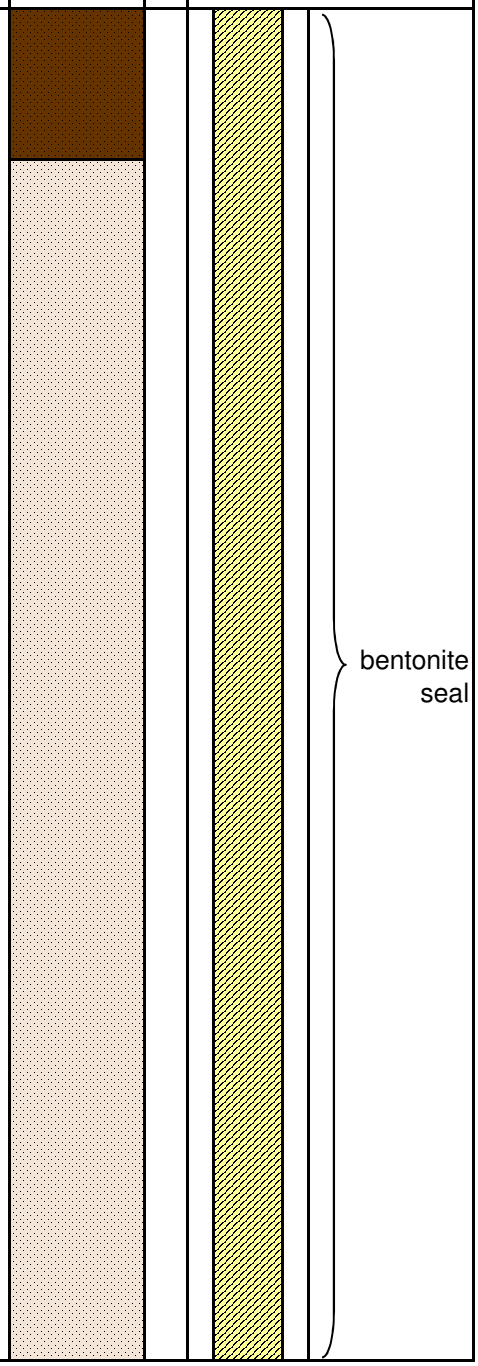
DRAFTED BY: L. Flores

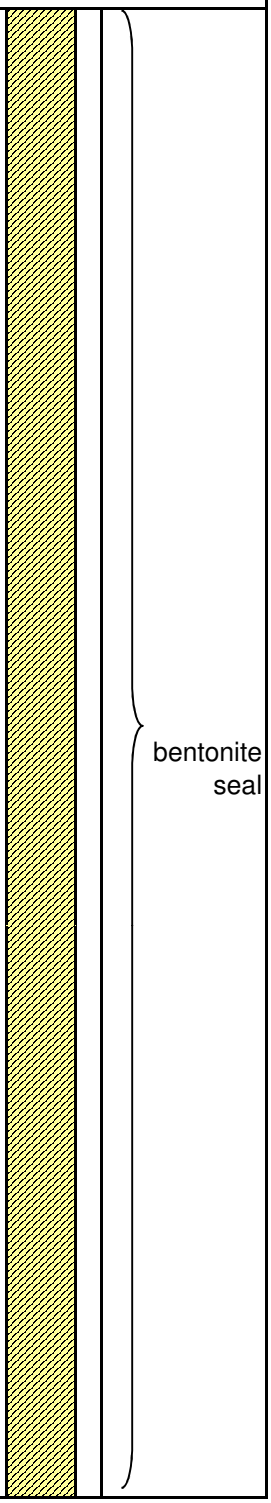
TD = 80 ft GW = 118 ft

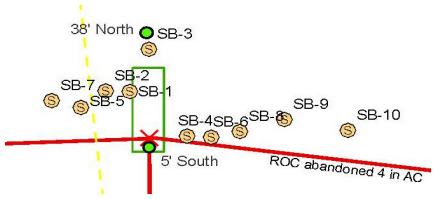
Location: UL D, Sec. 31, T17S, R35E

Lat: 32°47'51.259"N **Long:** 103°30'10.399"W **County**: Lea **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				DARK BROWN SAND
SS	85		1.9	
				TAN SAND
5 ft	113		1.6	
10 ft	303		2.8	
15 ft	604		2.4	
20 ft	286		3.9	
25 ft	421		1.4	
30 ft	351		1.9	
35 ft	310		1.4	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
40 ft	254		1.2	TAN SAND		bentonite seal
45 ft	258		1			
50 ft	280		1.3			
55 ft	298		2.1			
60 ft	611	Cl- 640	2.3			
		GRO <10.0				
		DRO <10.0				
65 ft	502		3.1			
70 ft	379		0.9			
75 ft	300		0.7			
80 ft	290	Cl- 336	1.4			
		GRO <10.0				
		DRO <10.0				

Logger:	Edward Cesareo		**Project Name:** Vacuum Jct. D-31
Driller:	Harrison & Cooper, Inc.		**Well ID:** SB-8
Drilling Method:	Air-Rotary		
Start Date:	12/13/2013		
End Date:	12/13/2013		

Comments: SB-8 is 30 ft east of the former junction box site.
All samples were from cuttings.
DRAFTED BY: L. Flores

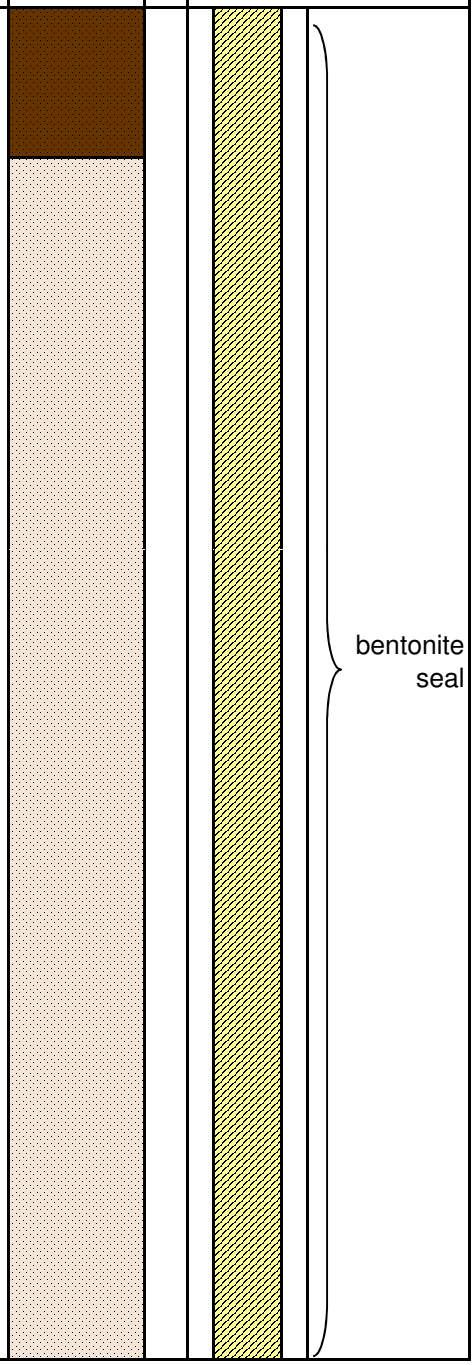
TD = 80 ft GW = 118 ft

Location: UL D, Sec. 31, T17S, R35E

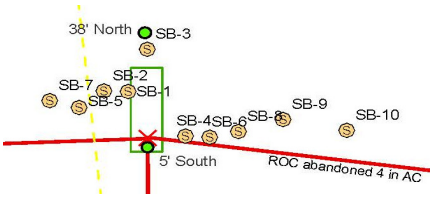
Lat: 32°47'51.133"N **Long:** 103°30'9.693"W

County: Lea **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				DARK BROWN SAND
SS	124		16.1	
				TAN SAND
5 ft	296		28.1	
10 ft	4559		30	
15 ft	5118	Cl- 5440	88.1	
		GRO <10.0		
		DRO <10.0		
20 ft	2647		26.4	
25 ft	2814		16.6	
30 ft	2367		16.5	
35 ft	3564		20.2	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
40 ft	3717		6.4	TAN SAND		bentonite seal
45 ft	3494		13.7			
50 ft	3254		15.1			
55 ft	2253		12.6			
60 ft	2597		11.5			
65 ft	2418		4.7			
70 ft	2319		2.3			
75 ft	2171		3			
80 ft	4527	Cl- 2600	3.8			
		GRO <10.0				
		DRO <10.0				

Logger:	Edward Cesareo		**Project Name:** Vacuum Jct. D-31
Driller:	Harrison & Cooper, Inc.		**Well ID:** SB-9
Drilling Method:	Air-Rotary		
Start Date:	12/13/2013		
End Date:	12/13/2013		

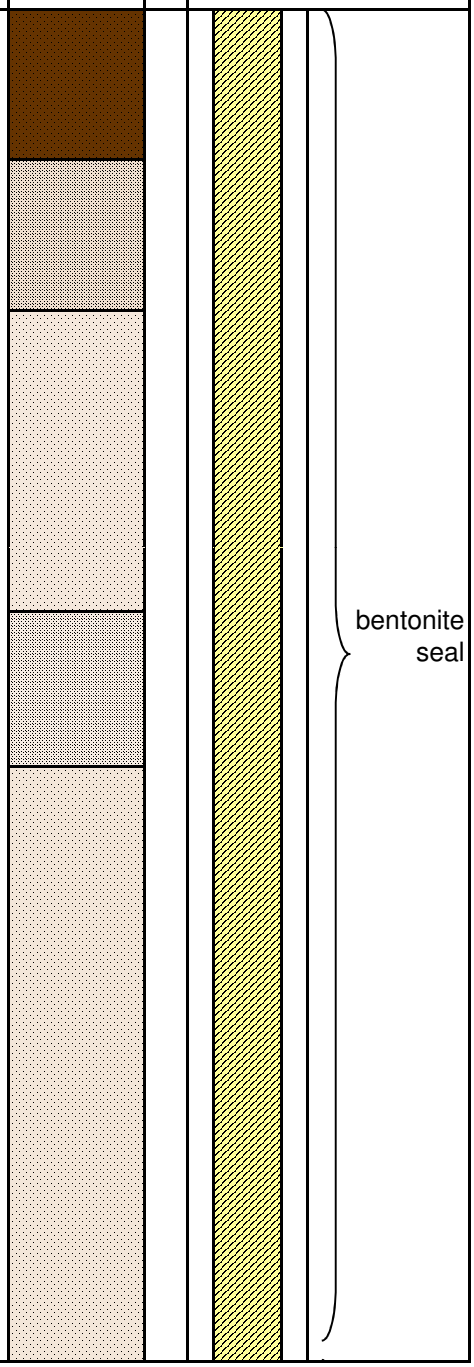
Comments: SB-9 is 44 ft east of the former junction box site.
All samples were from cuttings.
DRAFTED BY: L. Flores

TD = 80 ft GW = 118 ft

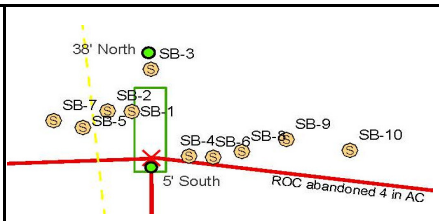
Location: UL D, Sec. 31, T17S, R35E

Lat: 32°47'51.183"N **County**: Lea
Long: 103°30'9.527"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				DARK BROWN SAND
SS	187		1.7	
				TAN SAND WITH ROCK
5 ft	293		2.4	
				TAN SILTY SAND
10 ft	1064		2.6	
15 ft	2173		7	
				TAN SAND WITH GRAVEL
20 ft	586		2.9	
				TAN SAND
25 ft	1054		3.2	
30 ft	959		3.7	
35 ft	1250		3	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
40 ft	3580	Cl- 1360	3.5	TAN SAND		bentonite seal
		GRO <10.0				
		DRO <10.0				
45 ft	2128		2.8			
50 ft	2399		2			
55 ft	2497		4.7			
60 ft	2503		1.6			
65 ft	2399		1.4			
70 ft	2617		3.4			
75 ft	2960		2.1			
80 ft	3003	Cl- 2920	3.7			
		GRO <10.0				
		DRO <10.0				

Logger:	Edward Cesareo		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air-Rotary		**Project Name:** Vacuum Jct. D-31 **Well ID:** SB-10
Start Date:	12/19/2013		
End Date:	12/19/2013		

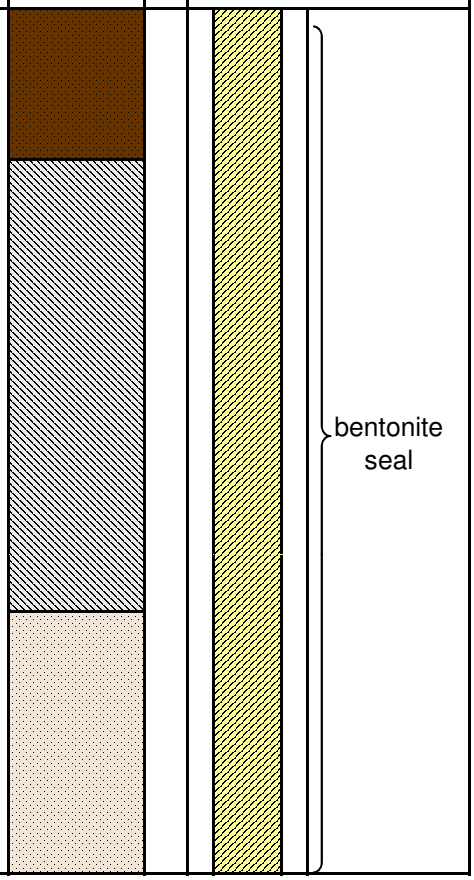
Comments: SB-10 is 64 ft east of the former junction box site.
All samples were from cuttings.
DRAFTED BY: L. Flores

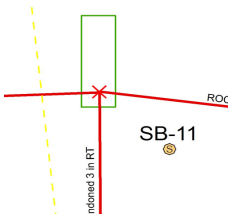
TD = 20 ft GW = 118 ft

Location: UL D, Sec. 31, T17S, R35E

Lat: 32°47'51.15"N **Long:** 103°30'9.277"W **County**: Lea **State**: NM

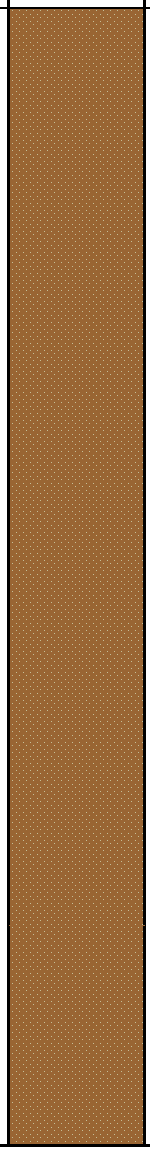
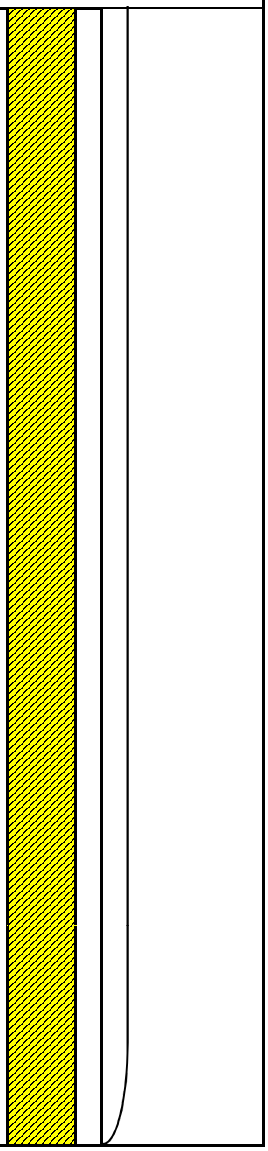
Depth (feet)	Chloride field tests	LAB	PID	Description
				DARK BROWN SAND
SS	118		2.7	
				CALICHE / SANDSTONE
5 ft	183	Cl- 176	3.5	
		GRO <10.0		
		DRO <10.0		
10 ft	140		3.6	
15 ft	150		3	
				TAN SAND
20 ft	145	Cl- 128	3.8	
		GRO <10.0		
		DRO <10.0		



Logger:	Edward Cesareo		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison&Cooper Inc.		
Drilling Method:	Air Rotary		**Project Name:** Vacuum Jct. D-31 **Well ID:** SB-11
Start Date:	2/10/2014		
End Date:	2/10/2014		**Project Consultant:** RECS
Comments: No sampling conducted on SB.			**Location:** UL/D Sec. 31 T-17-S R-35-E
DRAFTED BY: C. Ursanic			**Lat:** 32°47'50.931"N **County**:Lea
TD = 110'	GW = 118'		**Long:** 103°30'9.791"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN SAND		
SS						
				SANDSTONE CALICHE		
5 ft						
				CALICHE		
10 ft						
15 ft						
20 ft						
				TAN SAND		
25 ft						
30 ft						
35 ft						
40 ft						
45 ft						
50 ft						
				BROWN SAND		
55 ft						
60 ft						

Bentonite Seal

Depth (feet)	Chloride field tests	LAB	PID	Description		Lithology		Well Construction
				BROWN SAND				
65 ft								
70 ft								
75 ft								
80 ft								
85 ft								
90 ft								
95 ft								
100 ft								
105 ft								
110 ft								

CARDINAL Laboratories

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

December 19, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM JCT D-31

Enclosed are the results of analyses for samples received by the laboratory on 12/13/13 15:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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:	12/13/2013	Sampling Date:	12/13/2013
Reported:	12/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT D-31	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	17S/35E		

Sample ID: SB #7 60' (H303030-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**640**	16.0	12/18/2013	ND	416	104	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	12/18/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/18/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*84.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*84.0 %*	*63.6-154*

Sample ID: SB #7 80' (H303030-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**336**	16.0	12/18/2013	ND	416	104	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	12/18/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/18/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*85.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*81.5 %*	*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:	12/13/2013	Sampling Date:	12/13/2013
Reported:	12/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT D-31	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	17S/35E		

Sample ID: SB #8 15' (H303030-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**5440**	16.0	12/18/2013	ND	416	104	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	12/18/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/18/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*82.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*83.0 %*	*63.6-154*

Sample ID: SB #8 80' (H303030-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2600**	16.0	12/18/2013	ND	416	104	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	12/18/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/18/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*89.8 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*87.2 %*	*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:	12/13/2013	Sampling Date:	12/13/2013
Reported:	12/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT D-31	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	17S/35E		

Sample ID: SB #9 40' (H303030-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1360**	16.0	12/18/2013	ND	416	104	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	12/18/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/18/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*81.6 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*77.4 %*	*63.6-154*

Sample ID: SB #9 80' (H303030-06)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2920**	16.0	12/18/2013	ND	416	104	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	12/19/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/19/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*86.1 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*81.4 %*	*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:	12/13/2013	Sampling Date:	12/13/2013
Reported:	12/19/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT D-31	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	17S/35E		

Sample ID: PT 10 SURFACE (H303030-07)

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	12/18/2013	ND	416	104	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	12/19/2013	ND	192	95.8	200	0.0892	
DRO >C10-C28	<10.0	10.0	12/19/2013	ND	181	90.5	200	1.64	

Surrogate: 1-Chlorooctane	*81.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*80.4 %*	*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

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: Vacuum Jct D-31 17-S/35-E	Phone #:
Sampler Name: Edward Cesareo	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	ANALYSIS REQUEST: Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
H303030																				
1	SB # 7 60'	G	1			✓					✓		12-13-13	10:00	✓	✓				
2	SB # 7 80'	G	1			✓					✓			10:05	✓	✓				
3	SB # 8 15'	G	1			✓					✓			11:30	✓	✓				
4	SB # 8 80'	G	1			✓					✓			11:55	✓	✓				
5	SB # 9 40'	G	1			✓					✓			1:40	✓	✓				
6	SB # 9 80'	G	1			✓					✓			1:45	✓	✓				
7	Pit 10 Surface	G	1			✓					✓			9:30	✓	✓				

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:	Date: 12-13-13	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Time: 3:10 pm	Received By:	Fax Result: ☐ Yes ☑ No Add'l Fax #:
	Date:		REMARKS: email results hconder@rice-ecs.com; Lweinheimer@rice-ecs.com; kjones@riceswd.com; Lpena@riceswd.com; Hnorman@rice-ecs.com, ecesareo@rice-ecs.com
	Time:		
Delivered By: (Circle One) Sampler - UPS - Bus - Other: 3.0 C #54	Sample Condition Cool: ☐ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials)	

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

CARDINAL Laboratories

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

December 27, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: VACUUM JCT D-31

Enclosed are the results of analyses for samples received by the laboratory on 12/19/13 16:35.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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:	12/19/2013	Sampling Date:	12/19/2013
Reported:	12/27/2013	Sampling Type:	Soil
Project Name:	VACUUM JCT D-31	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	17S/35E		

Sample ID: SB #10 5' (H303091-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**176**	16.0	12/26/2013	ND	432	108	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	12/26/2013	ND	199	99.7	200	6.31	
DRO >C10-C28	<10.0	10.0	12/26/2013	ND	203	102	200	8.57	

Surrogate: 1-Chlorooctane	*99.4 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*100 %*	*63.6-154*

Sample ID: SB #10 20' (H303091-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	12/26/2013	ND	432	108	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	12/26/2013	ND	199	99.7	200	6.31	
DRO >C10-C28	<10.0	10.0	12/26/2013	ND	203	102	200	8.57	

Surrogate: 1-Chlorooctane	*98.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*95.8 %*	*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

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: Vacuum JCT. D-31 17-5/35-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					
H303091																									
1	SB# 10 5'	G	1			✓					✓		12-19-13	9:25	✓	✓									
2	SB# 10 20'	G	1			✓					✓		12-19-13	9:30	✓	✓									

Relinquished By: Edward Cesareo	**Date:** 12-19-13 **Time:** 4:35	**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: 3.6°C	**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; kkorman@rice-ecs.com, ecesareo@rice-ecs.com

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

#54