1R - 426-286

WORKPLANS

Date:
3-19-12

Rice Environmental Consulting & Safety
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

CERTIFIED MAIL
RETURN RECEIPT NO. 7011 2000 0002 0285 5087

March 19th, 2012

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: **Report of Further Investigation and Corrective Action Plan (CAP)**
Rice Operating Company – BD SWD System
BD jct. G-23 (1R426-286): UL/G sec. 23 T22S R37E

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

Background and Previous Work

The site is located approximately 4 miles south-east of Eunice, New Mexico at UL/G sec. 23 T22S R37E as shown on the Site Map (Figure 1). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 59 +/- feet.

In 2010, ROC initiated work on the former BD G-23 junction box. The site was delineated using a backhoe to form a 30 ft x 30 ft x 12 ft deep excavation and soil samples were screened at regular intervals for both hydrocarbons and chlorides. From the excavation, the four-wall composite and the bottom composite were taken to a commercial laboratory for analysis. Laboratory tests of the four-wall composite showed a chloride reading of 432 mg/kg and a gasoline range organics (GRO) reading and diesel range organics (DRO) reading of non-detect. The bottom composite showed a chloride laboratory reading of 1,790 mg/kg and GRO and DRO readings of non-detect. The excavated soil was blended on site and a sample was taken to a commercial laboratory for analysis. The soil showed a chloride reading of 672 mg/kg and GRO and DRO readings of non-detect. The blended backfill was returned to the excavation to 6 ft below ground surface (bgs). At 6-5 ft bgs, a 1 ft clay layer was installed to inhibit downward migration of chlorides to groundwater. A clay compaction test was conducted on March 1st, 2010. 156 yards of the excavated material was transported to a NMOCD approved facility for

disposal. Clean soil was imported to the site and blended with the remaining backfill from the excavation. Laboratory analysis of the blended backfill with imported clean soil showed a chloride reading of 480 mg/kg. The excavation was backfilled with the blended backfill to ground surface. The area was contoured to the surrounding landscape, seeded, and an identification plate was placed on the surface of the site to mark its location for future environmental considerations. NMOCD was notified of potential groundwater impact on February 21st, 2011 and a junction box disclosure report was submitted to NMOCD with all the 2010 junction box closures and disclosures.

As part of the Investigation and Characterization Plan approved by NMOCD on June 9th, 2011, three soil bores were advanced through the former junction box site on July 12th, 2011 (Figure 2). ROC personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector (PID) for hydrocarbons. Representative samples from the bores were taken to a commercial laboratory for confirmation of field numbers (Appendix A). In all three soil bores, the laboratory chloride values decreased as the bores were advanced to values below 250 mg/kg before reaching the capillary fringe. In SB-1, the laboratory chloride readings were 1,220 mg/kg at the surface and decreased to 32 mg/kg at 50 ft bgs. In SB-2, the chloride readings were 1,040 mg/kg at 20 ft bgs and decreased to 128 mg/kg at 50 ft bgs. In SB-3, the chloride readings were 2,080 mg/kg at the surface, 880 mg/kg at 15 ft bgs, and 160 mg/kg at 30 ft bgs. In all three bores at all depths, GRO and DRO values were non-detect.

On August 8th, 2011, an ICP Report was submitted to NMOCD that was subsequently approved on September 21st, 2011. The report recommended that ROC continue to delineate the soils surrounding the former junction box site. On February 1st, 2012, two additional soil bores were installed at the site (Figure 2). Representative samples from the bores were taken to a commercial laboratory for confirmation of field numbers (Appendix A). Both bores showed chloride values that decreased to below 250 mg/kg as the bores were advanced. SB-4 resulted in laboratory chloride readings of 672 mg/kg at 15 ft bgs and decreased to 48 mg/kg at 30 ft bgs. SB-5 resulted in laboratory chloride readings of 272 mg/kg at 20 ft bgs that decreased to 48 mg/kg at 30 ft bgs.

Corrective Action Plan

Based on the delineation of the soils surrounding the former junction box, the site will not contribute to the degradation of groundwater. The site has an existing 30 ft x 30 ft clay layer installed at 6 ft bgs that will impede migration of residual chlorides and hydrocarbons. RECS recommends that ROC scrape the site to approximately 6 inches to 1 foot to remove all rock and break up the soil for seeding. The site will then be backfilled with clean soil to ground surface and contoured to the surrounding area. Soil amendments will be added as needed to promote vegetative growth and the site will be seeded with native vegetation. The site will be expected to return to normal vegetative capacity. Vegetation will act as an evapo-transpiration barrier that will also inhibit the downward migration of chlorides and hydrocarbons. Plants capture water through their roots and so reduce the amount of water infiltrating below the root zone.

Upon the completion of the CAP work elements, we anticipate that ROC will submit a written report which will include a request for 'remediation termination' of the regulatory file.

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

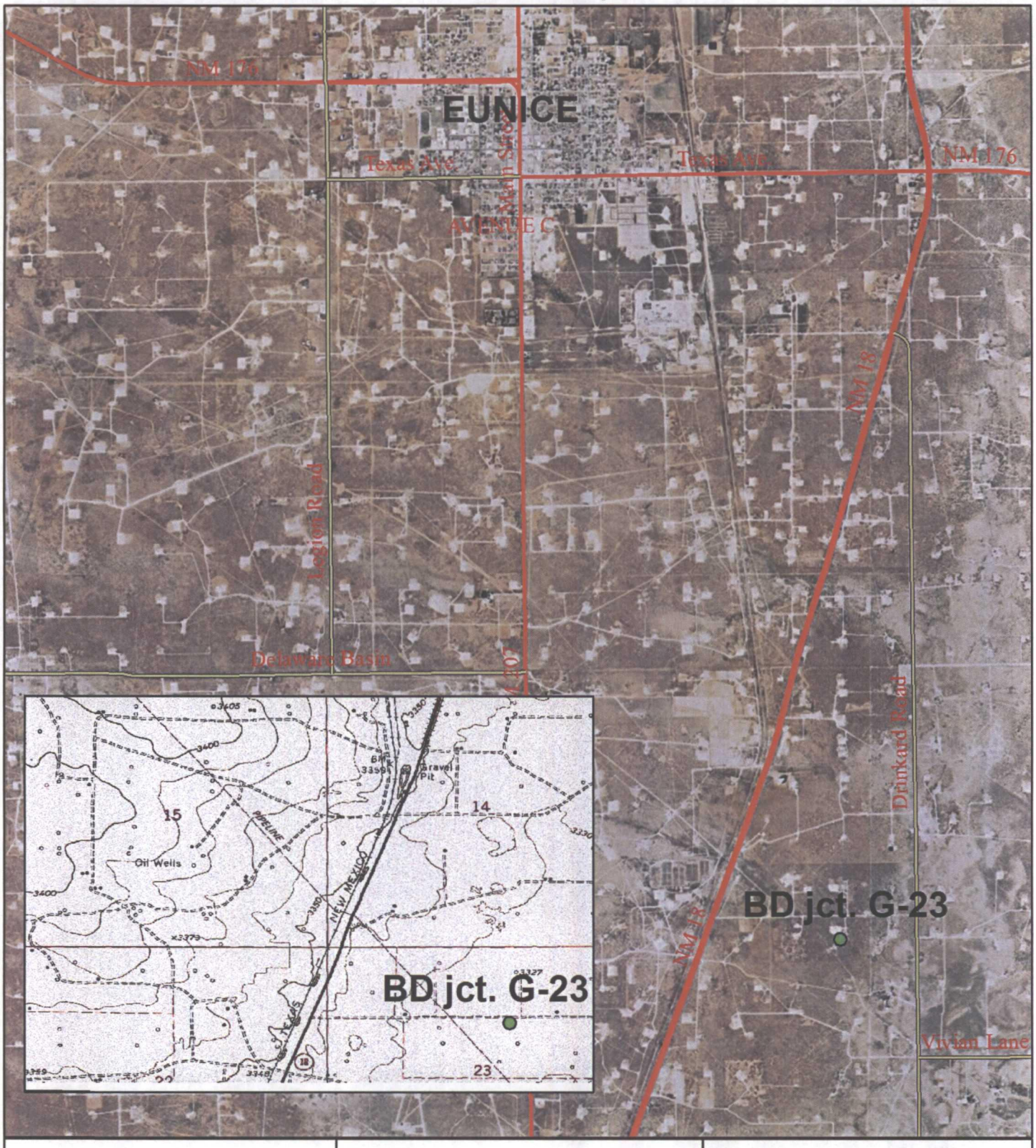
Attachments:

- Figure 1 – Site Map
- Figure 2 – Soil Bore Installation Map
- Appendix A – Soil Bore Installation Logs and Labs

Figures

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

Site Map



RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

BD jct. G-23

LEGALS: UL/G sec. 23
T22S R37E

NMOCD Case #: 1R426-286

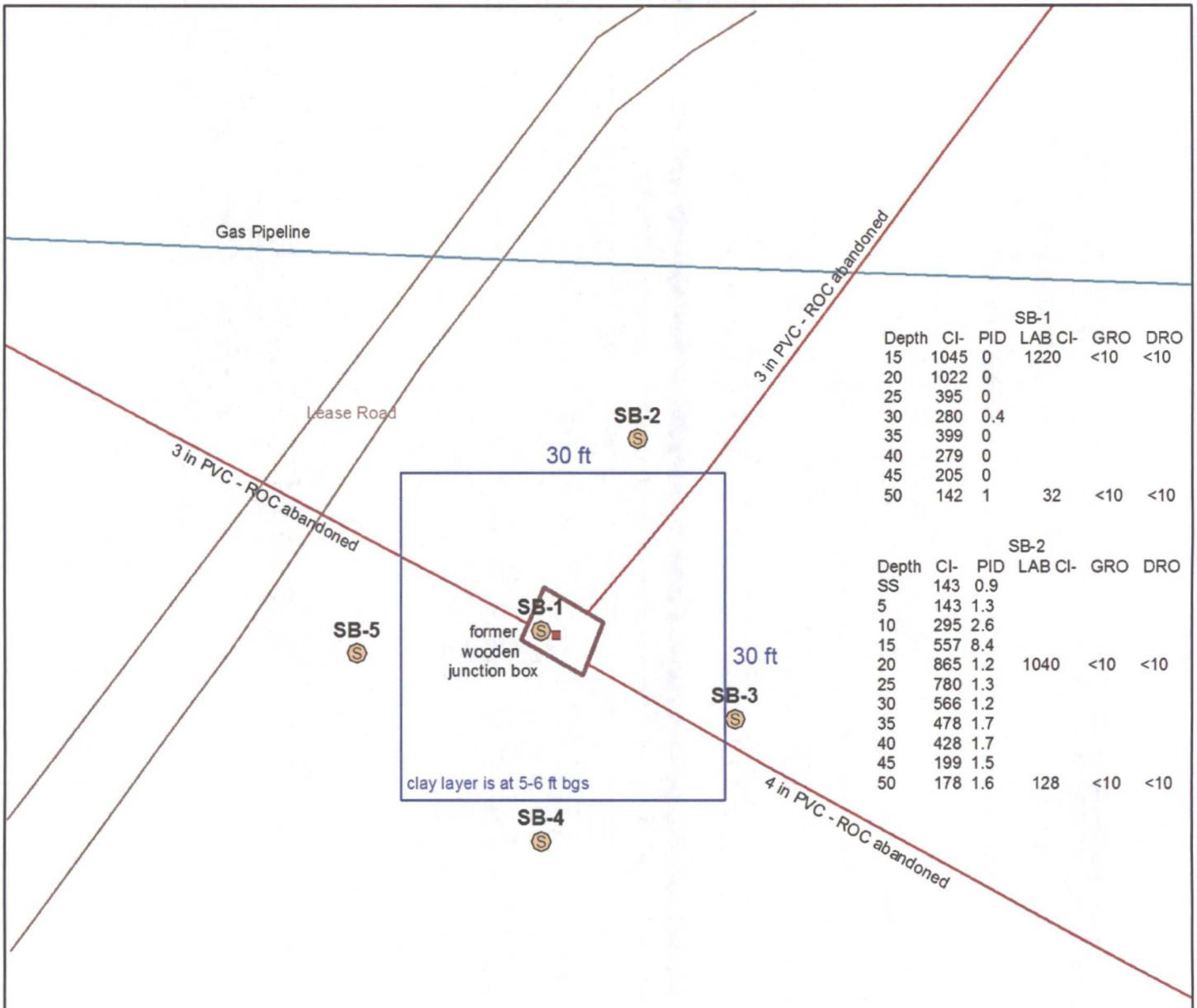
Figure 1

N
W E
S

0 1,750 3,500 7,000
Feet

Drawing date: 5-3-11
Drafted by: L. Weinheimer

Soil Bore Installation



SB-1

Depth	Cl-	PID	LAB Cl-	GRO	DRO
15	1045	0	1220	<10	<10
20	1022	0			
25	395	0			
30	280	0.4			
35	399	0			
40	279	0			
45	205	0			
50	142	1	32	<10	<10

SB-2

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	143	0.9			
5	143	1.3			
10	295	2.6			
15	557	8.4			
20	865	1.2	1040	<10	<10
25	780	1.3			
30	566	1.2			
35	478	1.7			
40	428	1.7			
45	199	1.5			
50	178	1.6	128	<10	<10

SB-3

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	1475	0.1	2080	<10	<10
5	148	0.3			
10	353	0.2			
15	732	0.2	880	<10	<10
20	510	0			
25	224	0			
30	203	0	160	<10	<10

SB-4

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	150	0.4			
5	173	0.5			
10	494	0.5			
15	690	0.3	672	<10	<10
20	339	0.3			
25	201	0.2			
30	145	0.5	48	<10	<10

SB-5

Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	149	0.5			
5	119	0.6			
10	167	0.6			
15	241	0.4			
20	301	0.6	272	<10	<10
25	204	0.3			
30	115	0.4	48	<10	<10

DGW = 59 ft

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

BD jct. G-23

NMOCD Case #: 1R426-286

LEGALS: UL/G sec. 23
T22S R37E

Figure 2

N W E S

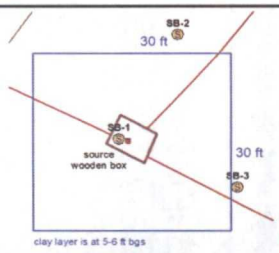
0 5 10 20 Feet

Drawing date: 2-14-12
Drafted by: L. Weinheimer

Appendix A

Soil Bore Installation Logs and Labs

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

Logger:	Jordan Woodfin		RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotay		**Project Name:** BD jct. G-23 **Well ID:** SB-1
Start Date:	7/12/2011		**Project Consultant:** RECS
End Date:	7/12/2011		

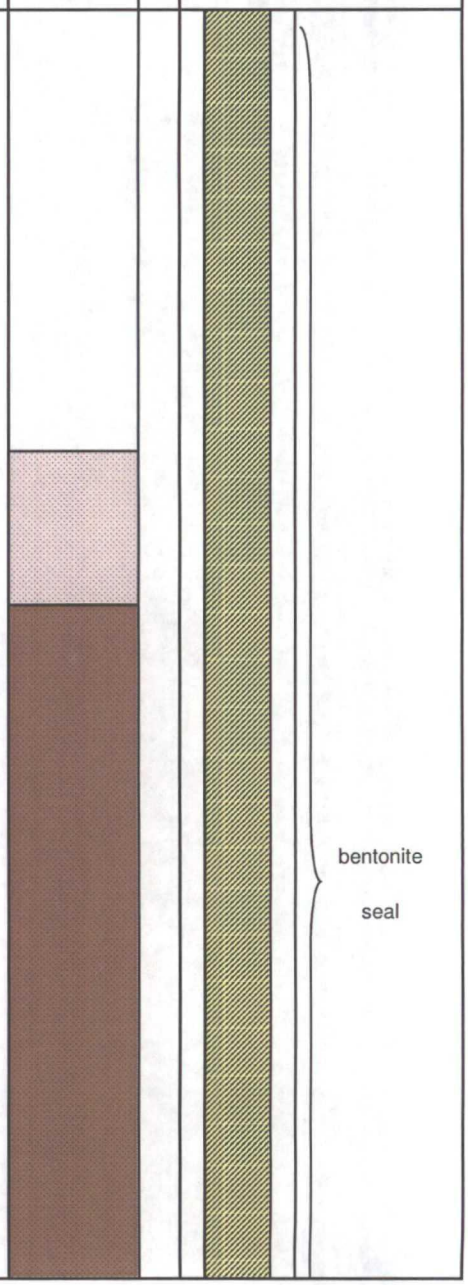
Comments: Located at the source of the former junction box site.
All samples were taken from cuttings.
DRAFTED BY: L. Weinheimer

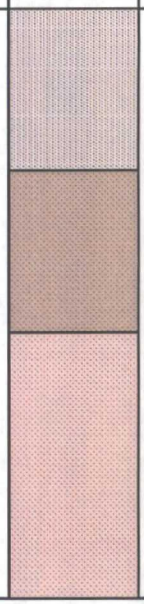
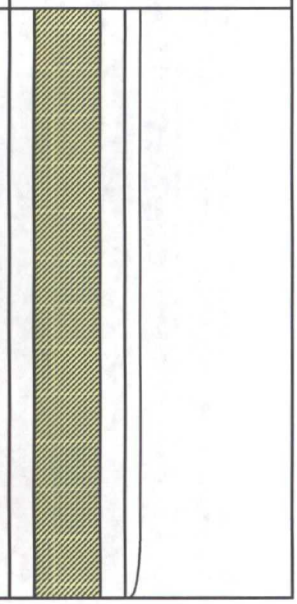
TD = 50 ft GW = 59 ft

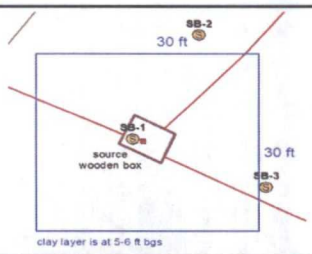
Location: UL/G sec. 23 T22S R37E

Lat: 32°22'44.805"N **County**: Lea
Long: 103°7'55.434"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Regolith
Surface Sample				
5 ft				
10 ft				
				Tan very fine sand
15 ft	1045	Cl- 1220	0	
		GRO <10		Light brown to tan medium to fine sand with small caliche fragments
		DRO <10		
20 ft	1022		0	
25 ft	395		0	
30 ft	280		0.4	
35 ft	399		0	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Tan caliche with some fine sand		
40 ft	279		0			
				Tan medium sand		
45 ft	205		0			
				Light red fine sand with some small caliche fragments		
50 ft	142	Cl-32	1.0			
		GRO <10				
		DRO <10				

Logger:	Jordan Woodfin		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotay		**Project Name:** BD jct. G-23 **Well ID:** SB-2
Start Date:	7/12/2011		**Project Consultant:** RECS
End Date:	7/12/2011		

Comments: Located 19 ft NNE of the former junction box site.
All samples were taken from cuttings.
DRAFTED BY: L. Weinheimer

TD = 50 ft GW = 59 ft

Location: UL/G sec. 23 T22S R37E

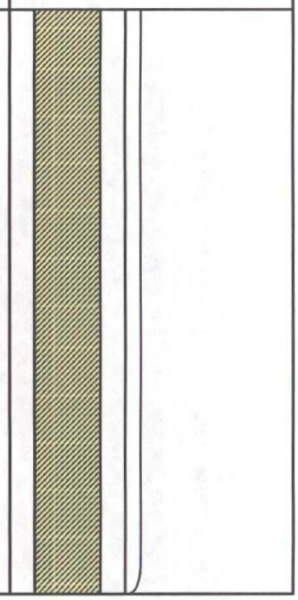
Lat: 32°22'44.978"N **County**: Lea
Long: 103°7'55.325"W **State**: NM

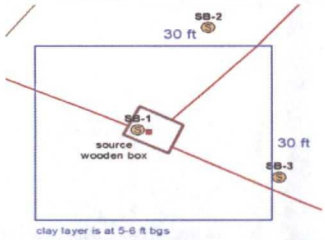
Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown very fine sand
Surface Sample	143		0.9	
				Tan medium sand with very small caliche fragments
5 ft	143		1.3	
10 ft	295		2.6	
				Tan very fine sand with caliche fragments
15 ft	557		8.4	
20 ft	865	CI- 1040	1.2	
		GRO <10		
		DRO <10		
25 ft	780		1.3	
30 ft	566		1.2	
35 ft	478		1.7	

Lithology

Well Construction

bentonite seal

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Tan caliche with some fine sand		
40 ft	428		1.7			
				Light brown to red very fine sand with very small caliche fragments		
45 ft	199		1.5			
50 ft	178	Cl-128	1.6			
		GRO <10				
		DRO <10				

Logger:	Jordan Woodfin		**Project Name:** BD jct. G-23 **Well ID:** SB-3
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotay		
Start Date:	7/12/2011		
End Date:	7/12/2011		

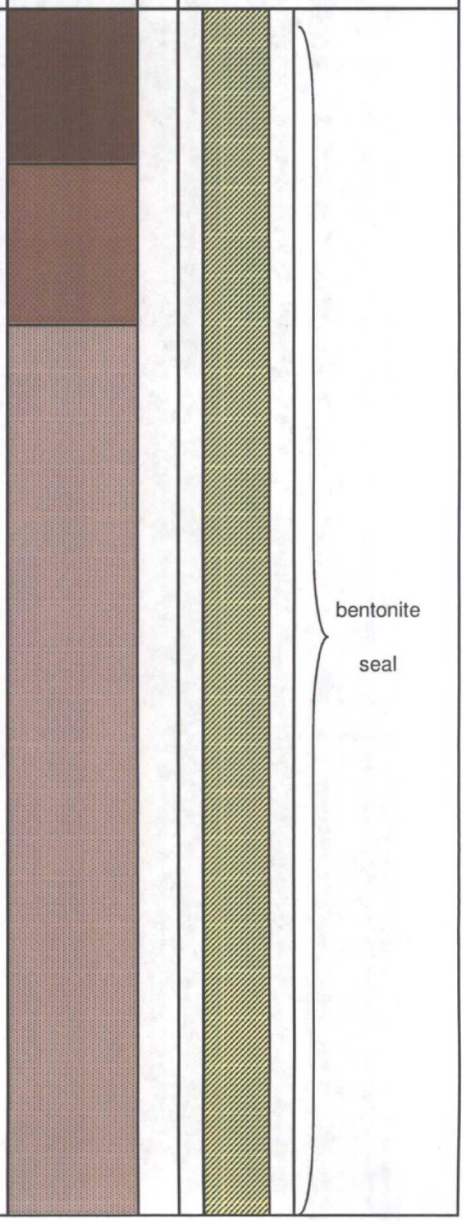
Comments: Located 18 ft SE of the former junction box site.
All samples were taken from cuttings.
DRAFTED BY: L. Weinheimer

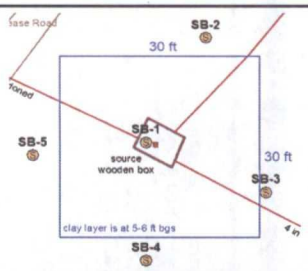
TD = 30 ft GW = 59 ft

Location: UL/G sec. 23 T22S R37E

Lat: 32°22'44.722"N **County**: Lea
Long: 103°7'55.223"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown very fine sand and caliche
Surface Sample	1475	Cl- 2080	0.1	
		GRO <10		Light brown very fine silty sand
		DRO <10		
5 ft	148		0.3	
				Tan to light brown very fine small with small caliche fragments
10 ft	353		0.2	
15 ft	732	Cl- 880	0.2	
		GRO <10		
		DRO <10		
20 ft	510		0	
25 ft	224		0	
30 ft	203	Cl- 160	0	
		GRO <10		
		DRO <10		



Logger:	Kyle Norman		**Project Name:** BD jct. G-23 **Well ID:** SB-4
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		**Location:** UL/G sec. 23 T22S R37E
Start Date:	2/1/2012		**Lat:** 32°22'44.613"N **Long:** 103°7'55.441"W **County:** Lea **State:** NM
End Date:	2/1/2012		

Comments: Located 14 ft south of the former junction box site. All samples were from cuttings.

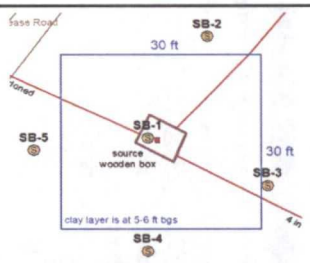
DRAFTED BY: L. Weinheimer

TD = 30 ft GW = 59 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	150		0.4	
				Tan Sand
5 ft	173		0.5	
10 ft	494		0.5	
15 ft	690	Cl- 672	0.3	
		GRO <10		
		DRO <10		
20 ft	339		0.3	
				Red Sand
25 ft	201		0.2	
30 ft	145	Cl- 48	0.5	
		GRO <10		
		DRO <10		

Lithology

Well Construction: bentonite seal

Logger:	Kyle Norman		**Project Name:** BD jct. G-23 **Well ID:** SB-5
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	2/1/2012		
End Date:	2/1/2012		

Comments: Located 19 ft west of the former junction box site. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

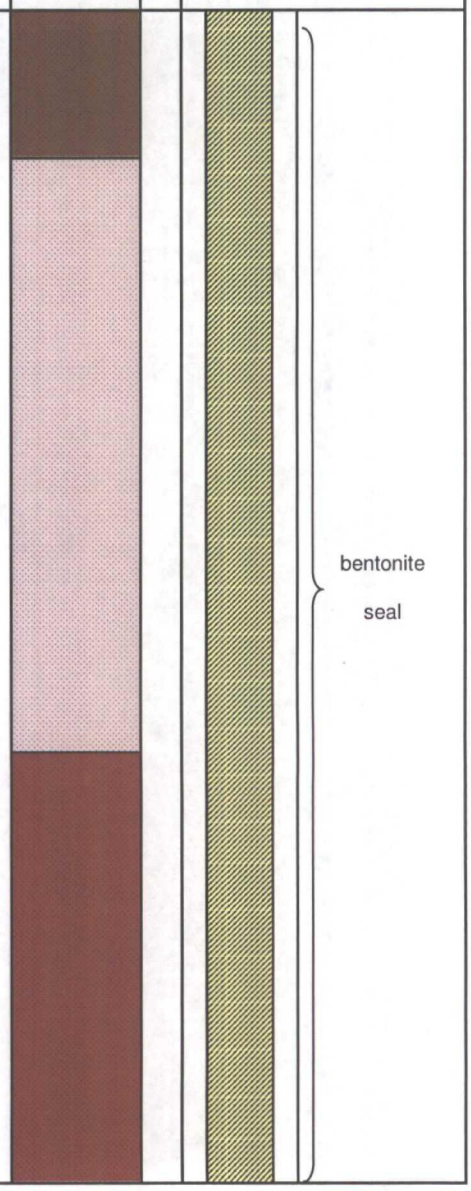
TD = 30 ft GW = 59 ft

Location: UL/G sec. 23 T22S R37E

Lat: 32°22'44.785"N **County**: Lea

Long: 103°7'55.641"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				Brown Sand
SS	149		0.5	
				Tan Sand
5 ft	119		0.6	
10 ft	167		0.6	
15 ft	241		0.4	
20 ft	301	Cl- 272	0.6	
		GRO <10		Red Sand
		DRO <10		
25 ft	204		0.3	
30 ft	115	Cl- 48	0.4	
		GRO <10		
		DRO <10		



CARDINAL Laboratories

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

July 18, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD JCT G-23

Enclosed are the results of analyses for samples received by the laboratory on 07/13/11 7:54.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

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 (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:	07/13/2011	Sampling Date:	07/12/2011
Reported:	07/18/2011	Sampling Type:	Soil
Project Name:	BD JCT G-23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NOT GIVEN		

Sample ID: SB 1 @ 15' (H101438-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1220**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*107 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*116 %*	*70-130*

Sample ID: SB 1 @ 50' (H101438-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*103 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*111 %*	*70-130*

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:	07/13/2011	Sampling Date:	07/12/2011
Reported:	07/18/2011	Sampling Type:	Soil
Project Name:	BD JCT G-23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NOT GIVEN		

Sample ID: SB 2 @ 20' (H101438-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1040**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*100 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*110 %*	*70-130*

Sample ID: SB 2 @ 50' (H101438-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*105 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*112 %*	*70-130*

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:	07/13/2011	Sampling Date:	07/12/2011
Reported:	07/18/2011	Sampling Type:	Soil
Project Name:	BD JCT G-23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NOT GIVEN		

Sample ID: SB 3 SURFACE SAMPLE (H101438-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2080**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*109 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*117 %*	*70-130*

Sample ID: SB 3 @ 15' (H101438-06)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**880**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*108 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*117 %*	*70-130*

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:	07/13/2011	Sampling Date:	07/12/2011
Reported:	07/18/2011	Sampling Type:	Soil
Project Name:	BD JCT G-23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Celey D. Keene
Project Location:	NOT GIVEN		

Sample ID: SB 3 @ 30' (H101438-07)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**160**	16.0	07/14/2011	ND	432	108	400	0.00	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/15/2011	ND	204	102	200	0.0358	
DRO >C10-C28	<10.0	10.0	07/15/2011	ND	181	90.4	200	2.80	

Surrogate: 1-Chlorooctane	*105 %*	*70-130*
Surrogate: 1-Chlorooctadecane	*116 %*	*70-130*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

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

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 Company	**BILL TO**	
Project Manager:	Hack Conder	**P.O. #:**	
Address:	122 West Taylor	**Company:**	
City:	Hobbs **State:** NM **Zip:** 88240	**Attn:**	
Phone #:	575-393-9174 **Fax #:** 575-397-1471	**Address:**	
Project #:	**Project Owner:**	**City:**	
Project Name:	BD JCT G-23	**State:** **Zip:**	
Project Location:	BD JCT G-23	**Phone #:**	
Sampler Name:	Jordan Woodfin	**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	TPH 8015 M Extended Thru C40						
H1D1438	** SB1																								
- 1	~~SB 2~~ @ 15'	G	1			✓					✓		7/12/11	11:00	✓	✓									
-2 *	SB ~~2~~ 1 @ ~~20~~ 50'	G	1			✓					✓		"	11:45	✓	✓									
3	SB 3 @ 20'	G	1			✓					✓		"	12:30	✓	✓									
4	SB 3 @ 50'	G	1			✓					✓		"	01:30	✓	✓									
5	SB ~~2~~ 3 SURFACE SAMPLE	G	1			✓					✓		"	02:00	✓	✓									
6	SB ~~2~~ 3 @ 15'	G	1			✓					✓		"	02:15	✓	✓									
7	SB ~~2~~ 3 @ 30'	G	1			✓					✓		"	02:45	✓	✓									

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: Jordan Woodfin	**Date:** 7/12/11 **Time:** 7:30	**Received By:**	
Relinquished By:	**Date:** 7/12/11 **Time:** 7:54	**Received By:**	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		**Sample Condition** Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	**CHECKED BY: (Initials)** CESH

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

REMARKS:
email results
** Sample Bore # changed as per Lara. CH 7/14/11
Hconder@riceswd.com; jwoodfin@rice-ecs.com;
Lweinheimer@rice-ecs.com kjones@riceswd.com

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

#26

1/13/11 NEED SAMPLES BACK, PLEASE
* sample ID changed as Per Jordan

CARDINAL Laboratories

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

March 07, 2012

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD G-23 JCT 22S/37E

Enclosed are the results of analyses for samples received by the laboratory on 02/01/12 16:47.

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:	02/01/2012	Sampling Date:	02/01/2012
Reported:	03/07/2012	Sampling Type:	Soil
Project Name:	BD G-23 JCT 22S/37E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 4 @ 15' (H200254-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**672**	16.0	02/03/2012	ND	464	116	400	10.9	

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	02/03/2012	ND	203	101	200	19.7	
DRO >C10-C28	<10.0	10.0	02/03/2012	ND	244	122	200	24.4	

Surrogate: 1-Chlorooctane	*78.2 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*94.1 %*	*57.6-158*

Sample ID: SB 4 @ 30' (H200254-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	02/03/2012	ND	464	116	400	10.9	

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	02/03/2012	ND	203	101	200	19.7	
DRO >C10-C28	<10.0	10.0	02/03/2012	ND	244	122	200	24.4	

Surrogate: 1-Chlorooctane	*101 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*117 %*	*57.6-158*

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:	02/01/2012	Sampling Date:	02/01/2012
Reported:	03/07/2012	Sampling Type:	Soil
Project Name:	BD G-23 JCT 22S/37E	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 5 @ 20' (H200254-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**272**	16.0	02/03/2012	ND	464	116	400	10.9	

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	02/03/2012	ND	203	101	200	19.7	
DRO >C10-C28	<10.0	10.0	02/03/2012	ND	244	122	200	24.4	

Surrogate: 1-Chlorooctane	*97.2 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*110 %*	*57.6-158*

Sample ID: SB 5 @ 30' (H200254-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	02/03/2012	ND	464	116	400	10.9	

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	02/03/2012	ND	203	101	200	19.7	
DRO >C10-C28	<10.0	10.0	02/03/2012	ND	244	122	200	24.4	

Surrogate: 1-Chlorooctane	*101 %*	*55.5-154*
Surrogate: 1-Chlorooctadecane	*112 %*	*57.6-158*

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

QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
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

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	
Project Manager: Hack Conder		P.O. #:	
Address:		Company:	
City:	State: NM Zip:	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location: BD G-23 Jct 22S-37E		Phone #:	
Sampler Name: Kyle Norman		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					
H2DD254																									
1	SB 4 @ 15'	G	1				✓				-		2-1-12	9:00	✓	✓									
2	SB 4 @ 30'	G	1				✓				1		2-1-12	9:15	✓	✓									
3	SB 5 @ 20'	G	1				✓				1		2-1-12	9:30	✓	✓									
4	SB5 @ 30'	G	1				✓				1		2-1-12	9:45	✓	✓									

Relinquished By: Kyle	Date: 2-1-12 Time: 4:47	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
kjones@riceswd.com; knorman@rice-ecs.com;
Zconder@rice-ecs.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