

1R - 425-82

WORKPLANS

Date:

4-16-12

L. Peter Galusky, Jr. Ph.D., P.G.

Texerra LLC

20055 Laredo Lane Monument, CO 80132
Tel: 917-339-6791 E-mail: lpg@texerra.com

April 16th, 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

RECEIVED

APR 25 2012

RE: **ICP Report and Corrective Action Plan (CAP)**
Rice Operating Company – Vacuum SWD System
Vacuum Jct. F-31: UL/F, Sec. 31, T17S, R35E
NMOCD Case Number: 1R425-82

Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

Sent via U.S. Mail w/ Certified Receipt No. 7011 0110 0001 5863 4875

Mr. Hansen:

RICE Operating Company (ROC) has retained Texerra to address potential environmental concerns at the above-referenced site in the abandoned Vacuum Salt Water Disposal (SWD) system. This report summarizes additional soil characterization work completed to date per the OCD approved Investigation and Characterization Plan of May 3rd, 2011 and presents a Corrective Action Plan (CAP) for the protection of groundwater quality.

The location of the Vacuum Jct. F-31 site is given in Figure 1. The depth to groundwater at this site is estimated to be approximately 85 ft below ground surface (bgs).

Elevated residual soil chloride concentrations were found in the soil borings but decreased to below 250 mg/kg within 25 ft of the estimated water table surface throughout the sampled area. As part of the ICP, approved by OCD on June 9th, 2011, five soil bores (SB-1 through SB-5) were advanced through the former junction box site on February 28th and 29th, 2012 (Figure 2). ROC personnel field tested the soil for chlorides and each sample was field screened for hydrocarbons using a photo-ionization detector (PID). Representative samples from the bore were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers (Appendix). SB-1 chloride concentrations decreased from 4,560 mg/kg at 20 ft below ground surface (bgs) to 224 mg/kg at 35 ft bgs. SB-2 chloride concentrations were low throughout with 80 mg/kg at 15 ft bgs to 112 mg/kg at 30 ft. SB-3 chloride concentrations increased from 384 mg/kg at 20 ft bgs to 3,760 mg/kg at 45 ft bgs but exhibited a significant decline to 176 mg/kg at 65 ft bgs. SB-4 exhibited the same trend, 272 mg/kg at 35 ft bgs to 1,740 mg/kg at 45 ft bgs to 112 mg/kg at 65 ft bgs. SB-5 decreased from 4,240 mg/kg at 10 ft bgs to 64 mg/kg at 30 ft bgs.

Residual soil petroleum hydrocarbons were significant (PID readings > 100 ppm) in many of the soil borings but were insignificant within 50 ft of the estimated water table surface.

Vacuum Jct. F-31

In order to protect groundwater quality from the potential migration of residual soil chlorides, ROC proposes the following actions to serve as a Corrective Action Plan (CAP) for this project. ROC will:

Install a 20-mil Reinforced Sub-surface Infiltration Barrier and Restore the Ground Surface

- Excavate the area to dimensions of 18 ft by 52 ft (Figure 2) to a depth of approximately 3 ft bgs (limited by the presence of hard rock).
- Install an 18 by 52 ft 20-mil, reinforced poly liner over a 6 inch layer of clean blow sand and pad this with another 6 inch layer of the same.
- The soils placed above the liner will have a laboratory chloride reading no greater than 500 mg/kg and a field PID measurement below 100 ppm. Excavated soil will be evaluated for use as backfill, and any soil requiring disposal will be properly disposed of at a NMOCD approved facility.
- Restore the ground surface to natural contours and seed with a blend of native vegetation mix.

Report Course and Results of Work to NMOCD

- Provide a brief report with photographs summarizing the course of these corrective actions and a request for remediation termination.

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.

We appreciate your consideration of this ICP Report and Corrective Action Plan. Please call Hack Conder at (575) 393-9174 or myself if you have any questions or wish to discuss this project.

Sincerely,



L. Peter Galusky, Jr. Ph.D., P.G.

Copy: Rice Operating Company
Attachments: Site location map, Soil boring locations and Proposed Liner Dimensions plat,
Laboratory results of soil analysis

Vacuum Jct. F-31

Attachments: Figures and Laboratory Analyses Reports

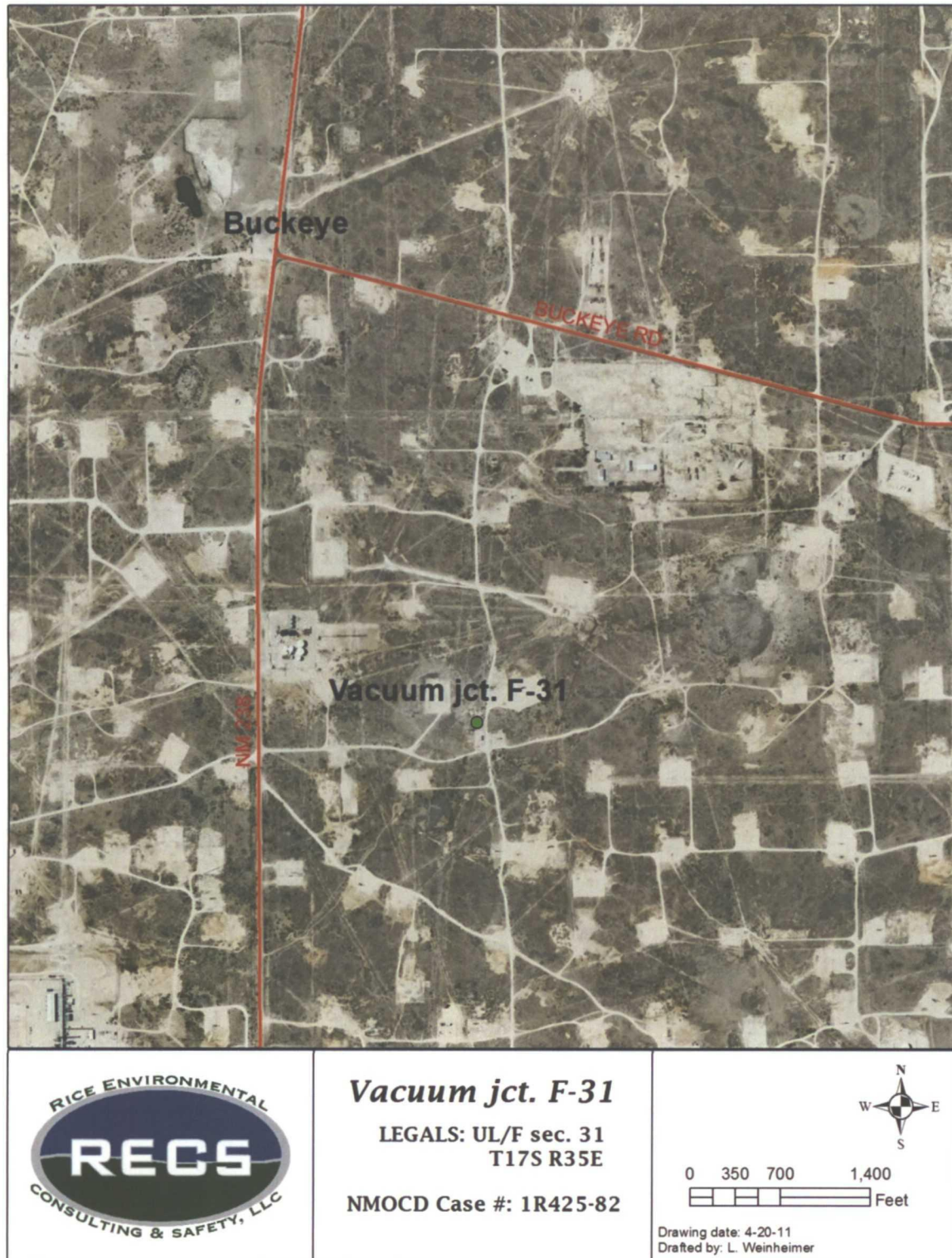


Figure 1 – Site location map.

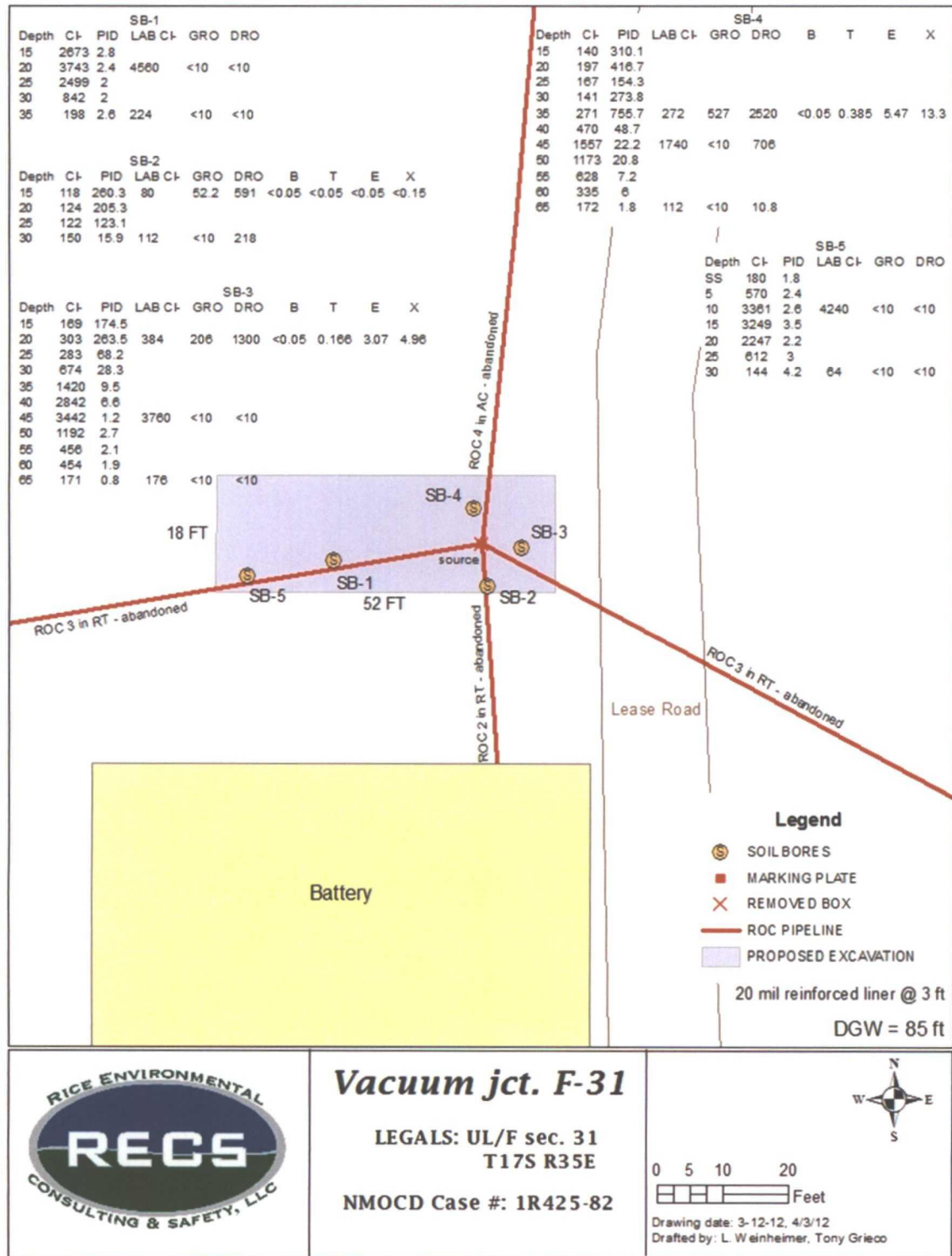


Figure 2 – Soil boring locations and analysis summary and surface footprint of proposed excavation and sub-surface synthetic infiltration barrier.

APPENDIX: Laboratory results of soil analysis



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

March 14, 2012

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

RE: VACUUM F-31 JCT (17S/35E)

Enclosed are the results of analyses for samples received by the laboratory on 02/28/12 15:40.

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

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (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,

A handwritten signature in black ink that reads "Celey D. Keene".

Celey D. Keene
Lab Director/Quality Manager



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: 02/28/2012
Reported: 03/14/2012
Project Name: VACUUM F-31 JCT (17S/3SE)
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 02/28/2012
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Jodi Henson

Sample ID: SB 1 @ 20' (H200526-01)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	4560	16.0	02/29/2012	ND	400	100	400	7.69	
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	03/02/2012	ND	202	101	200	9.46	
DRO >C10-C28	<10.0	10.0	03/02/2012	ND	201	101	200	9.60	

Surrogate: 1-Chlorooctane 82.2 % 55.5-154

Surrogate: 1-Chlorodecane 93.4 % 57.6-158

Sample ID: SB 1 @ 35' (H200526-02)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	224	16.0	02/29/2012	ND	400	100	400	7.69	
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	03/02/2012	ND	202	101	200	9.46	
DRO >C10-C28	<10.0	10.0	03/02/2012	ND	201	101	200	9.60	

Surrogate: 1-Chlorooctane 89.8 % 55.5-154

Surrogate: 1-Chlorodecane 93.1 % 57.6-158

Cardinal Laboratories

**Accredited Analyte

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Celeste D. Keene, Lab Director/Quality Manager

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Analytical Results For:

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

Received: 02/28/2012
Reported: 03/14/2012
Project Name: VACUUM F-31 JCT (17S/35E)
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 02/28/2012
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Jodi Henson

Sample ID: SB 2 @ 15" (H200526-03)

BTX 80218		mg/kg	Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/12/2012	ND	1.84	92.1	2.00	5.25	
Toluene*	<0.050	0.050	03/12/2012	ND	1.98	99.0	2.00	4.49	
Ethylbenzene*	<0.050	0.050	03/12/2012	ND	2.03	102	2.00	3.36	
Total Xylenes*	<0.150	0.150	03/12/2012	ND	6.30	105	6.00	3.47	

Surrogate: 4-Bromofluorobenzene (PIL) 118% 64.4-134

Chloride, SM4500Cl-B		mg/kg	Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	80.0	16.0	02/29/2012	ND	400	100	400	7.69	

TPH 8015M		mg/kg	Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	52.2	10.0	03/02/2012	ND	202	101	200	9.46	
DRO >C10-C28	591	10.0	03/02/2012	ND	201	101	200	9.80	

Surrogate: 1-Chlorooctane 102% 55.5-154

Surrogate: 1-Chlorooctadecane 97.3% 57.6-156

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Catelyn D. Keene, Lab Director/Quality Manager

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Analytical Results For:

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

Received: 02/28/2012
 Reported: 03/14/2012
 Project Name: VACUUM F-31 JCT (17S/35E)
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 02/28/2012
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB 2 @ 30' (H200526-04)

Chloride, SP4450001-8		mg/kg	Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	112	16.0	02/29/2012	ND	400	100	400	7.69	
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	03/02/2012	ND	202	101	200	9.46	
DRO >C10-C28	218	10.0	03/02/2012	ND	201	101	200	9.80	
Surrogate: 1-Chloroanthracene	88.6%	55.5-154							
Surrogate: 1-Chloroanthracene	96.6%	37.6-158							

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* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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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 SM4500-Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celley D. Keene

Celley D. Keene, Lab Director/Quality Manager

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 6 of 6

[illegible][illegible]

Relinquished By:		Date:	Received By:	Phone Results:	☐ Yes ☐ No	Add'l Phone #:
[Signature]		Time:	[Signature]	Test Results:	☐ Yes ☐ No	Add'l Test #:
Relinquished By:		Date:	Received By:	REMARKS:		
		Time:		email results		
Delivered By: (Circle One)			Sample Condition	kjones@riceswd.com; knorman@rice-ecs.com;		
Sampler - UPS - Bus - Other:			Cool Intact	Zcorder@rice-ecs.com; Bbaker@rice-ecs.com;		
			☐ Yes ☐ No	hcoonder@rice-ecs.com; Lweinheimer@rice-ecs.com		
			☐ No ☐ No			
			3:54	CHECKED BY: [Signature]		

† Cardinal cannot accept verbal changes. Please fax written changes to 605-393-2476

#26



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

March 08, 2012

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

RE: VACUUM F-31 JCT (17S/35E)

Enclosed are the results of analyses for samples received by the laboratory on 02/29/12 16:55.

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

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

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (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
Lab Director/Quality Manager



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

Analytical Results For:

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

Received:	02/29/2012	Sampling Date:	02/29/2012
Reported:	03/08/2012	Sampling Type:	Soil
Project Name:	VACUUM F-31 JCT (17S/35E)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 3 @ 20' (H200542-01)

STEX 80218		mg/kg	Analyzed By: AP		S-04					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/07/2012	ND	1.85	92.4	2.00	13.7		
Toluene*	0.166	0.050	03/07/2012	ND	2.02	101	2.00	13.5		
Ethylbenzene*	3.07	0.050	03/07/2012	ND	2.07	103	2.00	13.1		
Total Xylenes*	4.96	0.150	03/07/2012	ND	6.52	109	6.00	12.4		

Surrogate: 4-Bromofluorobenzene (PIL) 162 % 64.4-134

Chloride, SM4500Cl-B		mg/kg	Analyzed By: NM							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	384	16.0	03/02/2012	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	206	50.0	03/03/2012	ND	192	96.2	200	3.12		
DRO >C10-C28	1300	50.0	03/03/2012	ND	157	78.5	200	2.75		

Surrogate: 1-Chlorooctane 113 % 55.3-154

Surrogate: 1-Chlorodecane 117 % 57.6-158

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* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

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

Received: 02/29/2012
 Reported: 03/08/2012
 Project Name: VACUUM F-31 JCT (17S/35E)
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 02/29/2012
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB 3 @ 45' (H200542-02)

Chloride, SM4300Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3760	16.0	03/02/2012	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	03/03/2012	ND	192	96.2	200	3.12	
DRO >C10-C28	<10.0	10.0	03/03/2012	ND	157	78.5	200	2.75	
Surrogate: 1-Chlorooctane		93.8 %	55.5-154						
Surrogate: 1-Chlorooctadecane		103 %	57.6-158						

Sample ID: SB 3 @ 65' (H200542-03)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	176	16.0	03/02/2012	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	03/03/2012	ND	192	96.2	200	3.12	
DRO >C10-C28	<10.0	10.0	03/03/2012	ND	157	78.5	200	2.75	
Surrogate: 1-Chlorooctane		99.4%	55.5-154						
Surrogate: 1-Chlorooctadecane		104%	57.6-158						

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Celey D. Keene, Lab Director/Quality Manager



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

Analytical Results For:

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

Received: 02/29/2012
 Reported: 03/08/2012
 Project Name: VACUUM F-31 JCT (17S/35E)
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 02/29/2012
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB 4 @ 35' (H200542-04)

STEX 60218		mg/kg		Analyzed By: AP				S-04	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/07/2012	ND	1.85	92.4	2.00	13.7	
Toluene*	0.385	0.050	03/07/2012	ND	2.02	101	2.00	13.5	
Ethylbenzene*	5.47	0.050	03/07/2012	ND	2.07	103	2.00	13.1	
Total Xylenes*	13.3	0.150	03/07/2012	ND	6.52	109	6.00	12.4	
Surrogate: 4-Bromofluorobenzene (PIL)									
	191 %	64.4-134							
Chloride, SP4500CI-8		mg/kg		Analyzed By: MM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	272	16.0	03/02/2012	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	527	50.0	03/03/2012	ND	192	96.2	200	3.12	
DRO >C10-C28	2520	50.0	03/03/2012	ND	157	78.5	200	2.75	
Surrogate: 1-Chloro-o-xylene									
	133 %	55.5-154							
Surrogate: 1-Chloro-p-xylene									
	127 %	57.6-158							

Cardinal Laboratories

* Accredited Analyte

PLEASE NOTE: Liability and Warranty: Cardinal's liability and warranty extends only to the analysis of the sample as received. All claims, including those for negligence and any other legal claims, shall be deemed waived unless made in writing and received by Cardinal within sixty (60) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruption, loss of use or loss of profits, regardless of whether, in substance, addition or otherwise, arising out of or related to the performance of the services furnished by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or other cause. Results relate only to the samples described above. This report shall not be reproduced except in full and with the approval of Cardinal Laboratories.

Catelyn D. Keene, Lab Director/Quality Manager

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

Analytical Results For:

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

Received: 02/29/2012
 Reported: 03/08/2012
 Project Name: VACUUM F-31 JCT (175/35E)
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 02/29/2012
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB 4 @ 45' (H200542-05)

Chloride, SM4500Cl-B

mg/kg

Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1740	16.0	03/02/2012	ND	416	104	400	0.00	

TPH B015M

mg/kg

Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GR0 C6-C10	<10.0	10.0	03/03/2012	ND	192	96.2	200	3.12	
DRO >C10-C28	706	10.0	03/03/2012	ND	157	78.5	200	2.75	

Surrogate: 1-Chlorooctane 98.6% 55.5-154

Surrogate: 1-Chlorooctadecane 109% 57.6-154

Sample ID: SB 4 @ 65' (H200542-06)

Chloride, SM4500Cl-B

mg/kg

Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	112	16.0	03/02/2012	ND	416	104	400	0.00	

TPH B015M

mg/kg

Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GR0 C6-C10	<10.0	10.0	03/03/2012	ND	192	96.2	200	3.12	
DRO >C10-C28	10.8	10.0	03/03/2012	ND	157	78.5	200	2.75	

Surrogate: 1-Chlorooctane 89.5% 55.5-154

Surrogate: 1-Chlorooctadecane 97.9% 57.6-154

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* = Accredited Analyte

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C. D. Keene, Lab Director/Quality Manager



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Analytical Results For:

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

Received: 02/29/2012
Reported: 03/08/2012
Project Name: VACUUM F-31 JCT (175/35E)
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 02/29/2012
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Jodi Henson

Sample ID: SB 5 @ 10' (H200542-07)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	4240	16.0	03/02/2012	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	03/03/2012	ND	192	96.2	200	3.12	
GRO >C10-C28	<10.0	10.0	03/03/2012	ND	157	78.5	200	2.75	
Surrogate: 1-Chlorooctane	94.3 %	55.5-154							
Surrogate: 1-Chlorodecane	101 %	57.6-158							

Sample ID: SB 5 @ 30' (H200542-08)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	03/02/2012	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	03/03/2012	ND	192	96.2	200	3.12	
GRO >C10-C28	<10.0	10.0	03/03/2012	ND	157	78.5	200	2.75	
Surrogate: 1-Chlorooctane	91.2 %	55.5-154							
Surrogate: 1-Chlorodecane	101 %	57.6-158							

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Cefey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

- S-HI High surrogate recovery was confirmed as a matrix effect by a second analysis.
- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPO Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by SM4500C-B does not require samples be received at or below 6°C
Samples reported on an as received basis (wet) unless otherwise noted on report

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A handwritten signature in black ink, appearing to read "C. D. Keene".

Cedey D. Keene, Lab Director/Quality Manager

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2876

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