

1R - 425-85

REPORTS

DATE:

8-8-11

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

Texerra

627 Forest View Way Monument, Colorado 80132
Tel: 719-339-6791 E-mail: lpg@texerra.com

August 8th, 2011

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

AUG 15 2011

RE: **INVESTIGATION & CHARACTERIZATION PLAN (ICP) REPORT**
Rice Operating Company – Vacuum SWD System
Vacuum N-28 Vent: UL/N, Sec. 28, T17S, R35E
NMOCD Case Number: 1R425-85

Oil Conservation Division
1208 St. Francis Drive
Santa Fe, NM 87505

Sent via Certified U.S. Mail w/ Return Receipt No. 7008 1830 0004 2694 4293

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 work to date completed per the OCD-approved Investigation and Characterization Plan of May 2nd, 2011 for this site.

The location of the Vacuum N-28 Vent site is given in Figure 1. A summary of soil boring analyses from samples taken in June and July 2011 are given in Figure 2. Representative photographs of this work are given in the Appendix, as are copies of laboratory analyses.

Residual soil chlorides were found in all of the soil borings near the surface and at depth in some of them. However, soil chloride concentrations dropped to below 250 mg/kg at 12 ft below ground surface (bgs) in SB-3, 40 ft bgs in SB-2, SB-5, and SB-6, and 55 ft bgs in SB-4. The depth to groundwater at this site is approximately 68 ft bgs. Residual soil petroleum hydrocarbons were low (PID readings < 100 ppm) in all soil borings except SB-1 and SB-6 where PID were detected only in the surface layers.

Taken together, these data indicate that residual chlorides and petroleum hydrocarbons are concentrated in the near-surface and at moderate depths across the site and groundwater has not been impacted. Nevertheless, to minimize the potential for future groundwater impacts we will propose to continue delineating soil surrounding the former junction box to determine possible liner dimensions. Once soil delineation is complete, a Corrective Action Plan (CAP) will be submitted to the NMOCD with recommendations.

Vacuum N-28 Vent ICP Report

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. Please do not hesitate to contact either Katie Jones of Rice Operating Company or myself if you have any questions or need additional information.

Sincerely,

A handwritten signature in black ink, appearing to be 'L. Peter Galusky, Jr.', written in a cursive style.

L. Peter Galusky, Jr. Ph.D.

Copy: Rice Operating Company

Vacuum N-28 Vent ICP Report

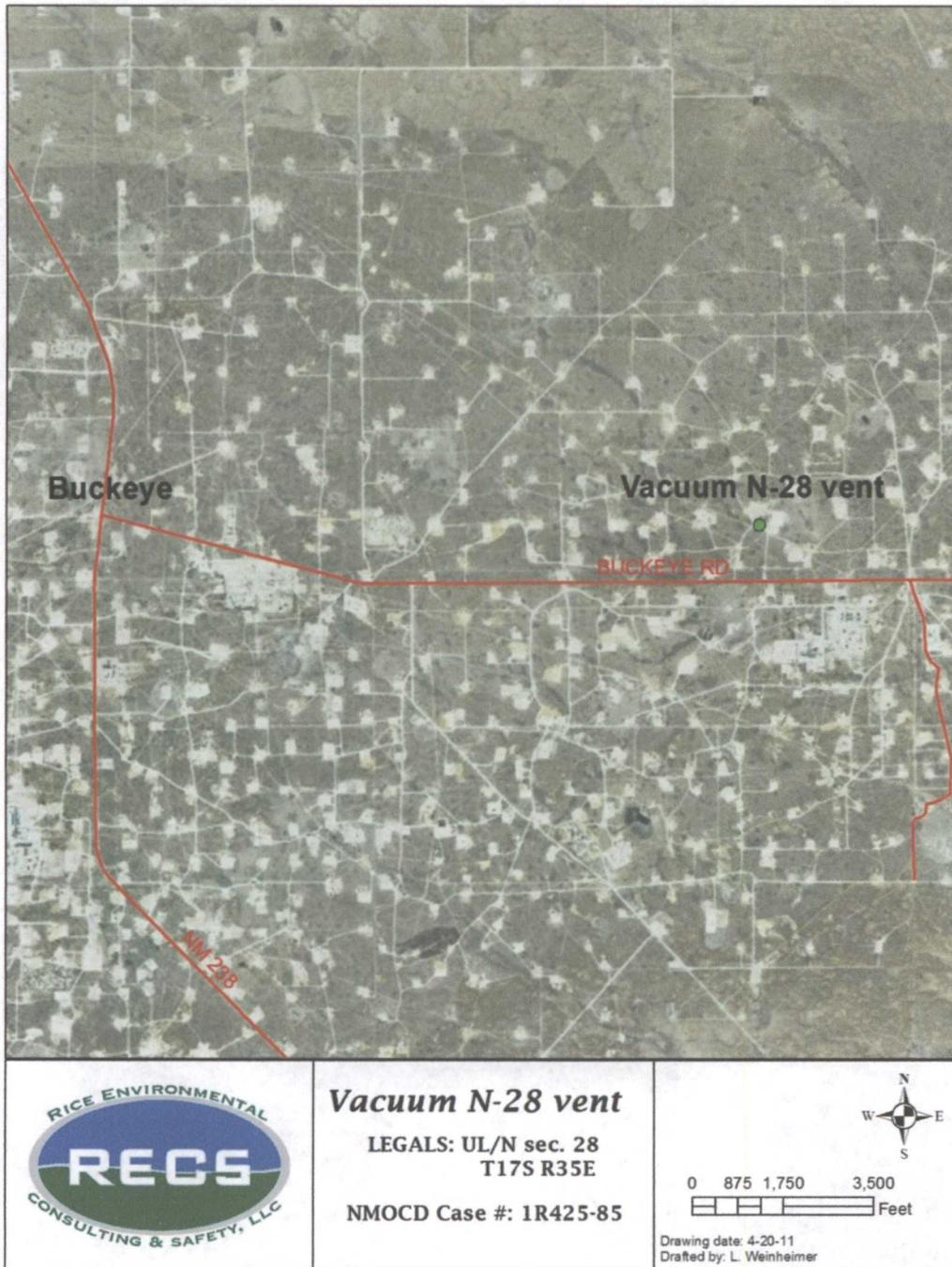


Figure 1 – Vacuum N-28 vent location.

Vacuum N-28 Vent ICP Report

Soil bore installation

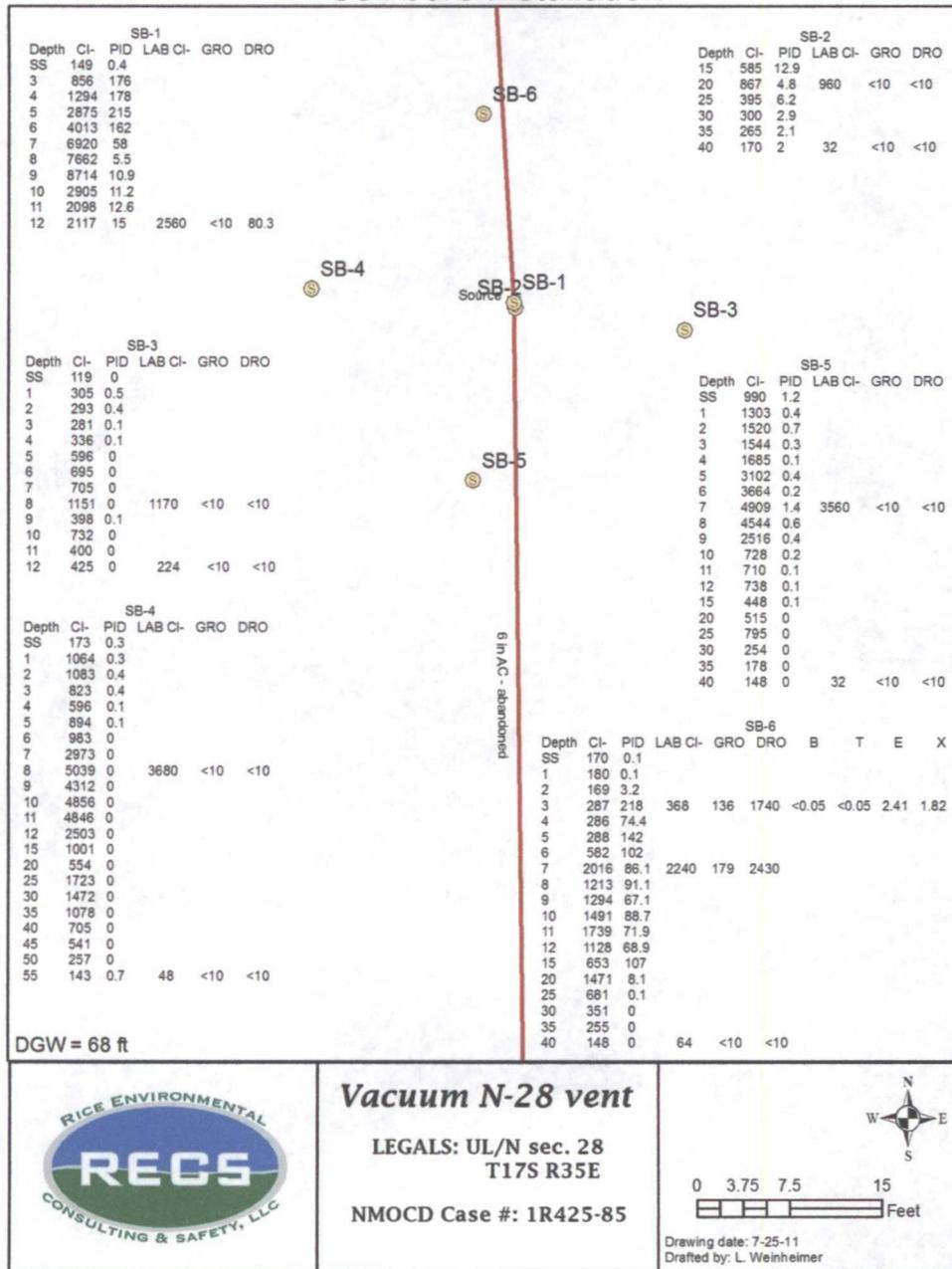


Figure 2 – Summary of soil chloride and petroleum hydrocarbon concentrations from samples taken in June and July 2011.

Vacuum N-28 Vent ICP Report

Appendix – Photographs & Laboratory Reports

Vacuum N-28 vent
Unit N, Section 28, T17S, R35E



drilling SB-2, facing north



plugging SB-2 with bentonite, facing east



drilling SB-3, facing southeast



plugging SB-3 with bentonite, facing east



drilling SB-4, facing south



plugging SB-4 with bentonite, facing south

Vacuum N-28 Vent ICP Report



plugging SB-5 with bentonite, facing south



drilling SB-6, facing east



plugging SB-6 with bentonite, facing east



June 20, 2011

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

RE: VACUUM N-28 VENT

Enclosed are the results of analyses for samples received by the laboratory on 06/10/11 16:20.

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 Hydrocarbons

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

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 (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

Analytical Results For:

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

 Received: 06/10/2011
 Reported: 06/20/2011
 Project Name: VACUUM N-28 VENT
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 06/10/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB 2 @ 20' (H101215-01)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	960	16.0	06/15/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/18/2011	ND	199	99.3	200	3.48		
DRO >C10-C28	<10.0	10.0	06/18/2011	ND	189	94.7	200	3.43		
Surrogate: 1-Chlorooctane	98.0 %	70-130								
Surrogate: 1-Chlorooctadecane	119 %	70-130								

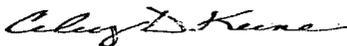
Sample ID: SB 2 @ 40' (H101215-02)

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	06/15/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: CK						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/18/2011	ND	199	99.3	200	3.48		
DRO >C10-C28	<10.0	10.0	06/18/2011	ND	189	94.7	200	3.43		
Surrogate: 1-Chlorooctane	74.8 %	70-130								
Surrogate: 1-Chlorooctadecane	83.4 %	70-130								

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*=Accredited Analyte

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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

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*=Accredited Analyte

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager



July 28, 2011

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

RE: VACUUM N-28 VENT

Enclosed are the results of analyses for samples received by the laboratory on 07/15/11 8:01.

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 Hydrocarbons

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

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 (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

Analytical Results For:

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

Received:	07/15/2011	Sampling Date:	07/13/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 3 @ 8' (H101462-01)

Chloride, SM4500C-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1170	16.0	07/15/2011	ND	416	104	400	3.77		
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	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		

Surrogate: 1-Chlorooctane 111 % 70-130
 Surrogate: 1-Chlorooctadecane 123 % 70-130

Sample ID: SB 3 @ 12' (H101462-02)

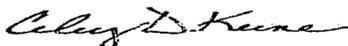
Chloride, SM4500C-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	224	16.0	07/15/2011	ND	416	104	400	3.77		
TPH 8015M		mg/kg		Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		

Surrogate: 1-Chlorooctane 109 % 70-130
 Surrogate: 1-Chlorooctadecane 120 % 70-130

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* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 4 @ 8' (H101462-03)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	3680	16.0	07/15/2011	ND	416	104	400	3.77		
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	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		
<i>Surrogate: 1-Chlorooctane</i>		103 %	70-130							
<i>Surrogate: 1-Chlorooctadecane</i>		117 %	70-130							

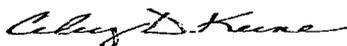
Sample ID: SB 4 @ 55' (H101462-04)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	07/15/2011	ND	416	104	400	3.77		
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	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		
<i>Surrogate: 1-Chlorooctane</i>		114 %	70-130							
<i>Surrogate: 1-Chlorooctadecane</i>		124 %	70-130							

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 5 @ 7' (H101462-05)

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	3560	16.0	07/15/2011	ND	416	104	400	3.77		
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	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		
<i>Surrogate: 1-Chlorooctane</i>		104 %	70-130							
<i>Surrogate: 1-Chlorooctadecane</i>		113 %	70-130							

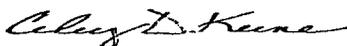
Sample ID: SB 5 @ 40' (H101462-06)

Chloride, SM4500CI-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	07/15/2011	ND	416	104	400	3.77		
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	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		
<i>Surrogate: 1-Chlorooctane</i>		110 %	70-130							
<i>Surrogate: 1-Chlorooctadecane</i>		121 %	70-130							

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 6 @ 3' (H101462-07)

BTEX 8021B		mg/kg		Analyzed By: CMS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/21/2011	ND	1.51	75.7	2.00	29.5	
Toluene*	<0.050	0.050	07/21/2011	ND	1.63	81.5	2.00	28.3	
Ethylbenzene*	2.41	0.050	07/21/2011	ND	1.73	86.7	2.00	29.0	
Total Xylenes*	1.82	0.150	07/21/2011	ND	5.21	86.9	6.00	27.7	

Surrogate: 4-Bromofluorobenzene (PIL) 143 % 70-130

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	368	16.0	07/15/2011	ND	416	104	400	3.77	

TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	136	50.0	07/18/2011	ND	201	101	200	3.59	
DRO >C10-C28	1740	50.0	07/18/2011	ND	170	85.1	200	0.0329	

Surrogate: 1-Chlorooctane 120 % 70-130

Surrogate: 1-Chlorooctadecane 119 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

Received:	07/15/2011	Sampling Date:	07/14/2011
Reported:	07/28/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 6 @ 7' (H101462-08)

Chloride, SM4500CI-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2240	16.0	07/15/2011	ND	416	104	400	3.77		
TPH 8015M		mg/kg		Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	179	50.0	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	2430	50.0	07/18/2011	ND	170	85.1	200	0.0329		

Surrogate: 1-Chlorooctane 128 % 70-130
 Surrogate: 1-Chlorooctadecane 124 % 70-130

Sample ID: SB 6 @ 40' (H101462-09)

Chloride, SM4500CI-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	07/15/2011	ND	416	104	400	3.77		
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	07/18/2011	ND	201	101	200	3.59		
DRO >C10-C28	<10.0	10.0	07/18/2011	ND	170	85.1	200	0.0329		

Surrogate: 1-Chlorooctane 114 % 70-130
 Surrogate: 1-Chlorooctadecane 122 % 70-130

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* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

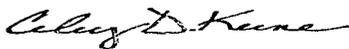
Notes and Definitions

- A-01 BFB surrogate failed due to objective matrix interference. Reanalysis not necessary.
- 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

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Celey D. Keene, Lab Director/Quality Manager



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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

BILL TO

ANALYSIS REQUEST

Company Name: Rice Operating Company
 Project Manager: Hack Conder
 Address: 122 West Taylor
 City: Hobbs State: NM Zip: 88240
 Phone #: 575-393-9174 Fax #: 575-397-1471
 Project #: Project Owner:
 Project Name: Vacuum N-28 Vent
 Project Location: Vacuum N-28 Vent
 Sampler Name: Jordan Woodfin
 FOR LAB USE ONLY

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	ANALYSIS REQUEST								
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:			ACID/BASE:	ICE / COOL	OTHER:	PRESERV	SAMPLING	Chlorides	TPH 8015 M	BTEX	Texas TPH
1	SB 3 @ 8'		1	<input checked="" type="checkbox"/>	7/13/11	3:00	<input checked="" type="checkbox"/>													
2	SB 3 @ 12'		1	<input checked="" type="checkbox"/>	7/13/11	3:15	<input checked="" type="checkbox"/>													
3	SB 4 @ 8'		1	<input checked="" type="checkbox"/>	7/14/11	10:00	<input checked="" type="checkbox"/>													
4	SB 4 @ 55'		1	<input checked="" type="checkbox"/>	7/14/11	10:45	<input checked="" type="checkbox"/>													
5	SB 5 @ 7'		1	<input checked="" type="checkbox"/>	7/14/11	11:30	<input checked="" type="checkbox"/>													
6	SB 5 @ 40'		1	<input checked="" type="checkbox"/>	7/14/11	12:10	<input checked="" type="checkbox"/>													
7	SB 6 @ 3'		1	<input checked="" type="checkbox"/>	7/14/11	3:00	<input checked="" type="checkbox"/>													
8	SB 6 @ 7'		1	<input checked="" type="checkbox"/>	7/14/11	3:10	<input checked="" type="checkbox"/>													
9	SB 6 @ 40'		1	<input checked="" type="checkbox"/>	7/14/11	3:40	<input checked="" type="checkbox"/>													

Reinforced By: Jordan Woodfin
 Date: 8-01
 Received By: [Signature]
 Date: [Signature]
 Sample Condition: Cool Intact
 Checked By: [Signature]

Phone Request: Yes No
 Fax Request: Yes No
 Add'l Phone #:
 Add'l Fax #:
 REMARKS: email results

Delivered By: (Circle One)
 Sampler - UPS - Bus - Other:
 #26

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

NEED SAMPLES BACK, PLEASE