

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

1220 S. 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

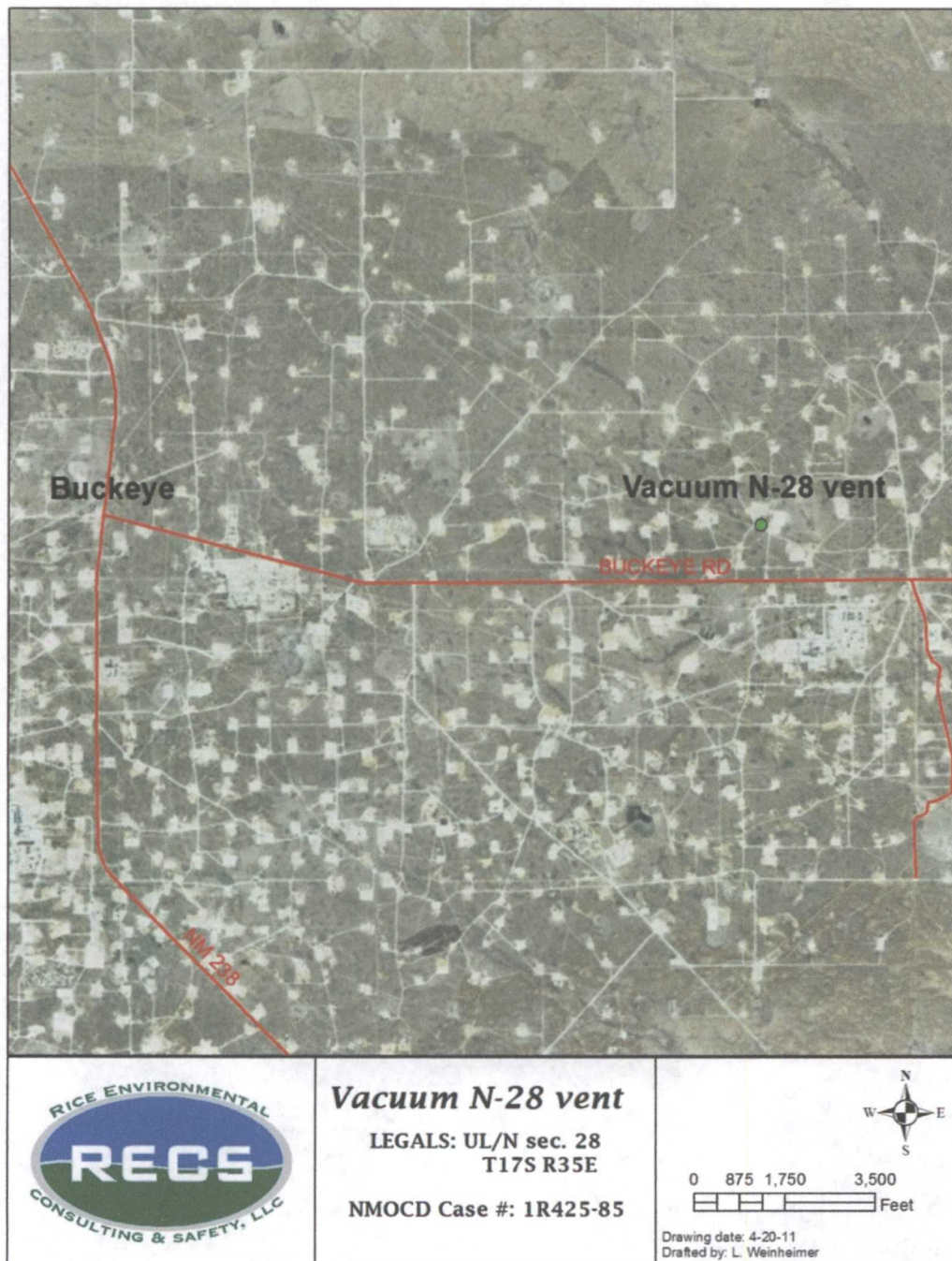


Figure 1 – Vacuum N-28 vent location.

Vacuum N-28 Vent ICP Report

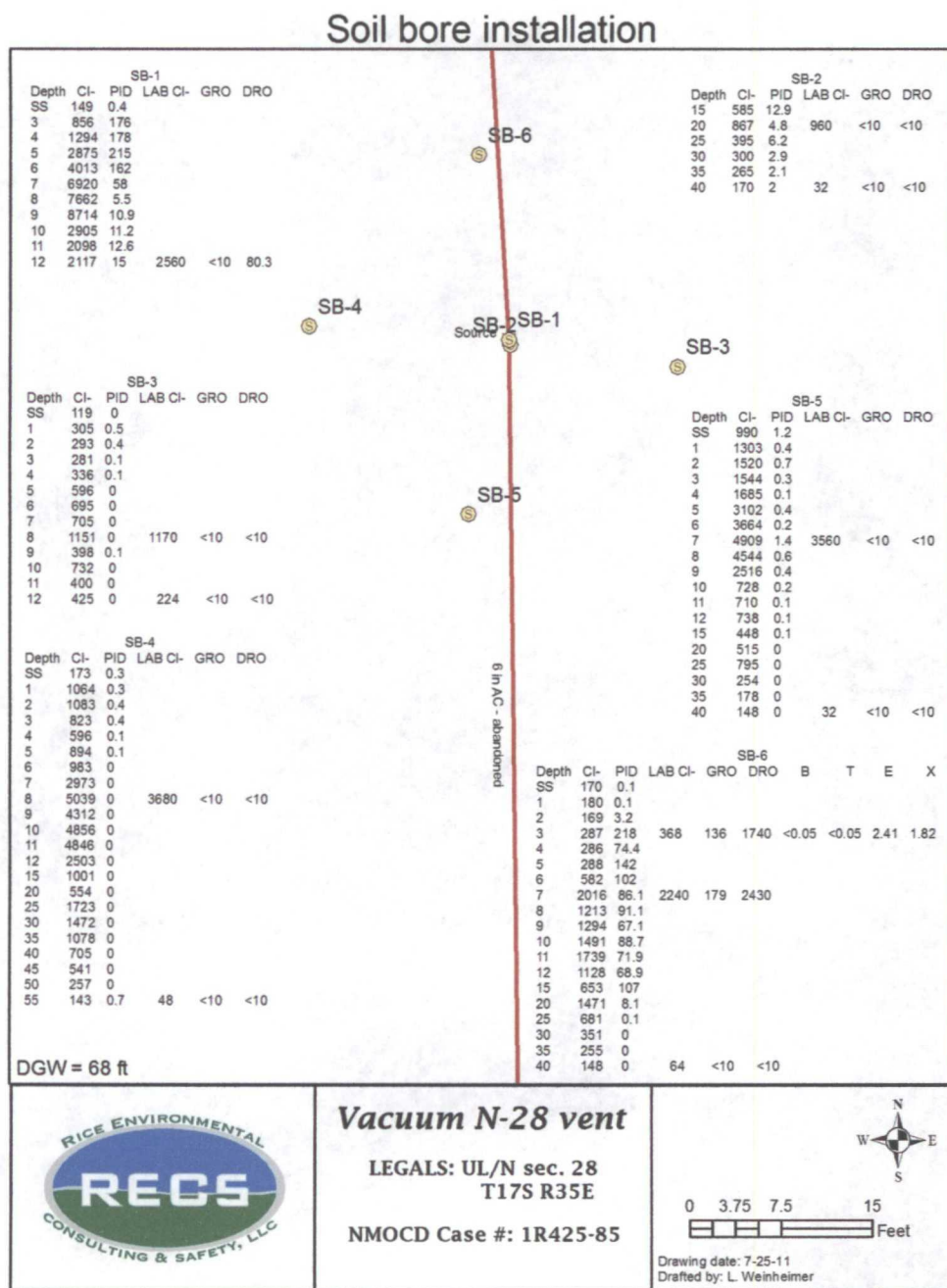


Figure 2 – Summary of soil chloride and petroleum hydrocarbon concentrations from samples taken in June and July 2011.

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



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

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



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: 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							

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

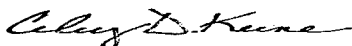
Notes and Definitions

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

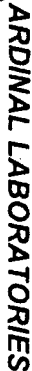
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Celey D. Keene, Lab Director/Quality Manager



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

[illegible]

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

NEED SAMPLES BACK, PLEASE



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

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.

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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
 Reported: 07/28/2011
 Project Name: VACUUM N-28 VENT
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 07/13/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

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

Chloride, SM4500Cl-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)

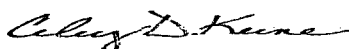
Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	224	16.0	07/15/2011	ND	416	104	400	3.77	
TPH 8015M			mg/kg		Analyzed By: ab				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	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
Reported: 07/28/2011
Project Name: VACUUM N-28 VENT
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 07/14/2011
Sampling Type: Soil
Sampling Condition: Cool & Intact
Sample Received By: Jodi Henson

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		
Surrogate: 1-Chlorooctane	103 %	70-130								
Surrogate: 1-Chlorooctadecane	117 %	70-130								

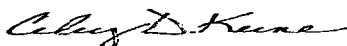
Sample ID: SB 4 @ 55' (H101462-04)

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		
Surrogate: 1-Chlorooctane	114 %	70-130								
Surrogate: 1-Chlorooctadecane	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
 Reported: 07/28/2011
 Project Name: VACUUM N-28 VENT
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 07/14/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

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		

Surrogate: 1-Chlorooctane 104 % 70-130
 Surrogate: 1-Chlorooctadecane 113 % 70-130

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

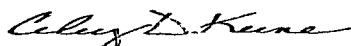
Chloride, SM4500CI-B			mg/kg							Analyzed By: HM
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	07/15/2011	ND	416	104	400	3.77		
TPH 8015M			mg/kg							Analyzed By: ab
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	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		

Surrogate: 1-Chlorooctane 110 % 70-130
 Surrogate: 1-Chlorooctadecane 121 % 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
 Reported: 07/28/2011
 Project Name: VACUUM N-28 VENT
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 07/14/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

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	

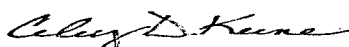
Surrogate: 1-Chlorooctane 120 % 70-130

Surrogate: 1-Chlorooctadecane 119 % 70-130

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* = 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
 Reported: 07/28/2011
 Project Name: VACUUM N-28 VENT
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 07/14/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

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

Chloride, SM4500Cl-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)

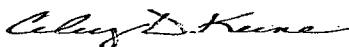
Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	07/15/2011	ND	416	104	400	3.77	
TPH 8015M			mg/kg		Analyzed By: ab				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	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

Cardinal Laboratories

*=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.

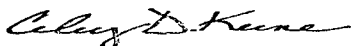
*** Insufficient time to reach temperature.

- 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

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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 (326) 673-7001 FAX (326) 673-7020

CHAIN-OF-CUSTODY AND 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 Name: Vacuum N-28 Vent Project Location: Vacuum N-28 Vent Sampler Name: Jordan Woodfin		P.O. #: Company: Attn: Address: City: State: Zip: Phone #: Fax #:	
Lab I.D. Sample I.D. H1D1402		Matrix (G)RAB OR (C)OMP. # CONTAINERS GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER: ACID/BASE: ICE / COOL OTHER:	
DATE 7/13/11 TIME 3:00		ANALYSIS REQUEST Chlorides TPH 8015 M BTEX Texas TPH Complete Cations/Anions TPH 8015 M Extended Thru C40	
Relinquished By: Jordan Woodfin Date: 7/13/11 Time: 8:01 Received By: [Signature] Relinquished By: [Signature]		Phone Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Add'l Phone #: Fax Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Add'l Fax #: REMARKS: email results	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool <input checked="" type="checkbox"/> Intact <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input checked="" type="checkbox"/> CHECKED BY: [Signature]	

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

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NEED SAMPLES BACK, PLEASE