1R-426-124

REPORTS

DATE:

-1-11

Rice Environmental Consulting & Safety

P.O. Box 5630 Hobbs, NM 88241 Phone 575.393.4411 Fax 575.393.0293

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CERTIFIED MAIL RETURN RECIEPT NO. 7007 2560 0003 0323 9193

August 1st, 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

RE: Corrective Action Plan Report on the Vadose Zone Remediation Rice Operating Company – BD SWD System BD jct. P-30 (1R426-124): UL/P sec. 30 T21S 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/usage basis.

Background and Previous Work

The site is located approximately 2 miles west-northwest of Eunice, New Mexico at UL/P, Sec. 30, T21S, R37E as shown on the Site Location Map (Figure 1).

In 2006, ROC initiated work on the former BD P-30 junction box prior to it being replaced by a new, watertight junction box at the site. The site was delineated using a backhoe and soil samples were screened at regular intervals for both hydrocarbons and chlorides. The excavation reached dimensions of $30 \times 30 \times 12$ feet bgs. Following the characterization of the soil, the excavated soil was blended and returned to the excavation up to a depth of 6 ft bgs. A 1 foot thick compacted clay layer was installed to prevent potential downward migration of any residual contaminants and the remaining soil was placed above the clay. The area was contoured to the surrounding landscape and an identification plate was placed on the surface of the site to mark its location for future environmental considerations.

Using an air rotary drilling rig, five soil borings were completed on June 4th, 2008, to delineate vadose zone conditions. On June 16th, 2009, one monitoring well (MW-1) was installed using an air rotary drilling rig to assess groundwater conditions. Soil samples were collected at five-foot

intervals for the soil borings and at ten-foot intervals for the monitoring well and field titrated to analyze for chloride content. Representative samples from the bore were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. Groundwater was encountered at approximately 95 feet below ground surface.

On December 21st, 2010, ROC submitted a Corrective Action Plan (CAP) to NMOCD and on January 31st, 2011, ROC submitted an Addendum to the CAP to NMOCD. The submissions were approved by NMOCD on February 1st, 2011. In the CAP and Addendum, ROC recommended a vadose zone remedy that incorporated the installation of a 20-mil reinforced poly liner at the site measuring 110' x 103' properly seated at a depth of approximately 4 ft bgs. Figure 2 depicts the approved liner and the area to be excavated. Soil with chloride concentrations no greater than 500 mg/kg and a PID reading below 100 ppm would be used to backfill over the liner. Any soil requiring disposal would be properly disposed of at a NMOCD approved facility. Soil amendments would be added to the site as needed and then the area would be seeded with native vegetative mix. Vegetation above the liner will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

The CAP also proposed to use the groundwater recovery system at a nearby site (BD O-23 vent) which utilizes a solar-powered submersible pump, for limited chloride mass removal to compensate for any potential downward migration of residual chlorides into the groundwater. Based on monitor well sampling data analysis, a chloride mass of 599 kg will need to be removed from the BD O-23 vent site. Removed groundwater will be utilized for pipeline and well maintenance. ROC will continue quarterly groundwater sampling at the monitoring well at the BD jct. P-30 site until the groundwater recovery program is completed.

Vadose Zone Restoration

On July 1st, 2011, ROC began the NMOCD approved CAP excavation at the BD jct. P-30 site. The site was excavated to 104 ft x 111 ft x 4.5 ft deep. The excavated soil was field tested for chlorides and hydrocarbons using a PID meter and soils that did not meet the requirement for backfill were taken to a NMOCD facility for disposal. A total of 936 yard of soil was taken to Sundance Facility for disposal. The remaining soil was blended on site and an eight point composite sample was taken and field tested for hydrocarbons using a PID meter. Field testing showed a PID reading of 22.5 ppm (Appendix A). The soil was then taken to a commercial laboratory for analysis on July 22nd, 2011. Laboratory chloride readings returned 480 mg/kg (Appendix B).

On July 25th, 2011, a 20-mil reinforced poly liner was installed at the bottom of the excavation at 4.5 ft bgs. Since the site contained primarily sandy/silty soils without appreciable rock, it was not necessary to pad either the top or bottom of the liner. The blended soil and imported soil were used to backfill the excavation to ground surface. A total of 936 yards of imported, clean soil was used to bring the excavation up to ground surface. An 8 point composite sample of the imported soil was field tested for hydrocarbons using a PID. Field testing showed a PID reading of 18.4 ppm (Appendix A). The samples was prepared and taken to a commercial laboratory for analysis. The imported soil returned with a laboratory chloride reading of non-detect (Appendix

C). The area was contoured to the surrounding landscape and compost and peat moss were added to the soil to promote vegetative growth. On July 30^{th} , 2011, the site was seeded with 35 lbs of native vegetative mix and the site is expected to return to normal vegetative capacity (Appendix D). Silt net fencing was installed around the excavation to help keep the seed in place. Photo documentation of these activities will be found in Appendix E.

The corrective actions on the vadose zone are complete. Once the corrective actions on the groundwater are complete, a final CAP Report will be submitted to the NMOCD with a termination request of the regulatory file and plugging of the monitoring well using cement grout with 1% to 3% bentonite.

ROC 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.

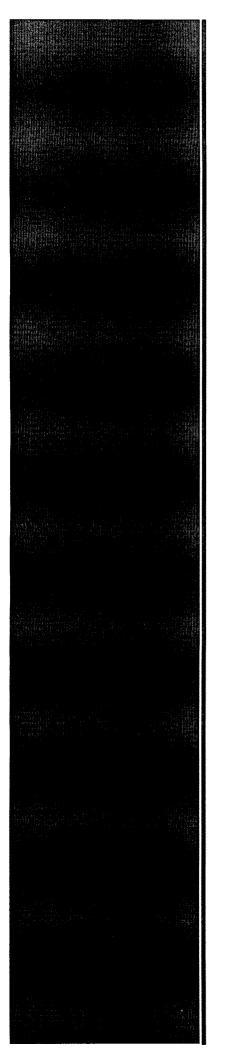
Sincerely,

Lara Weinheimer Project Scientist RECS (575) 441-0431

Attachments:

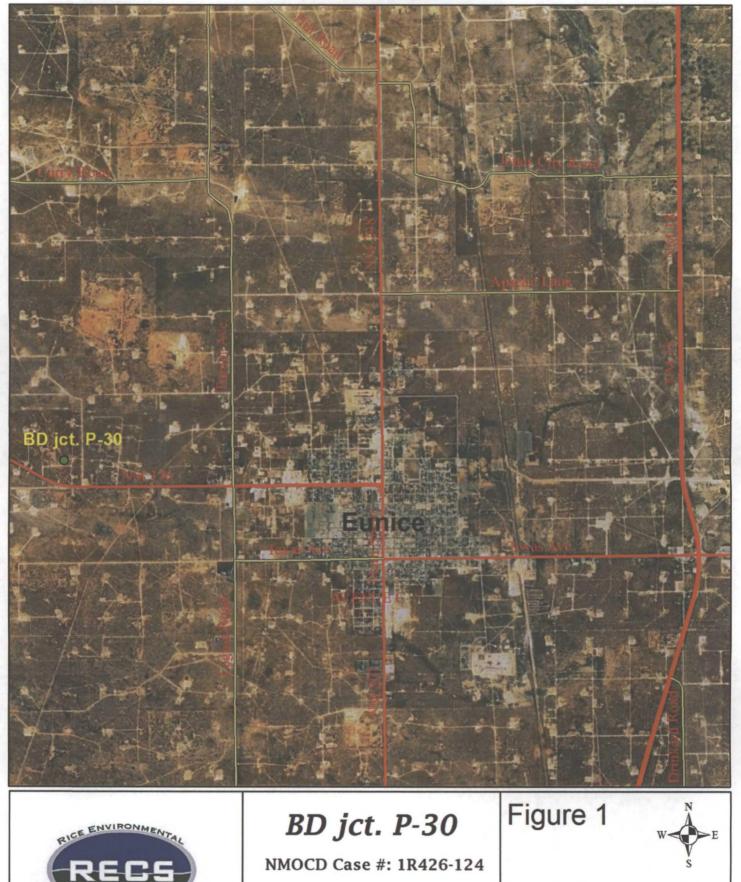
Figure 1 – Site Location Map Figure 2 – Approved Liner Installation Plat Appendix A – PID sheets Appendix B – Blended Backfill Laboratory Confirmation Appendix C – Imported Soil Laboratory Confirmation Appendix D – RECS Re-vegetation Form Appendix E – Excavation Photo Documentation

3 | Page



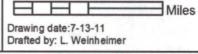
Figures

Site Map



Legals: UL/P sec. 30 T21S R37E

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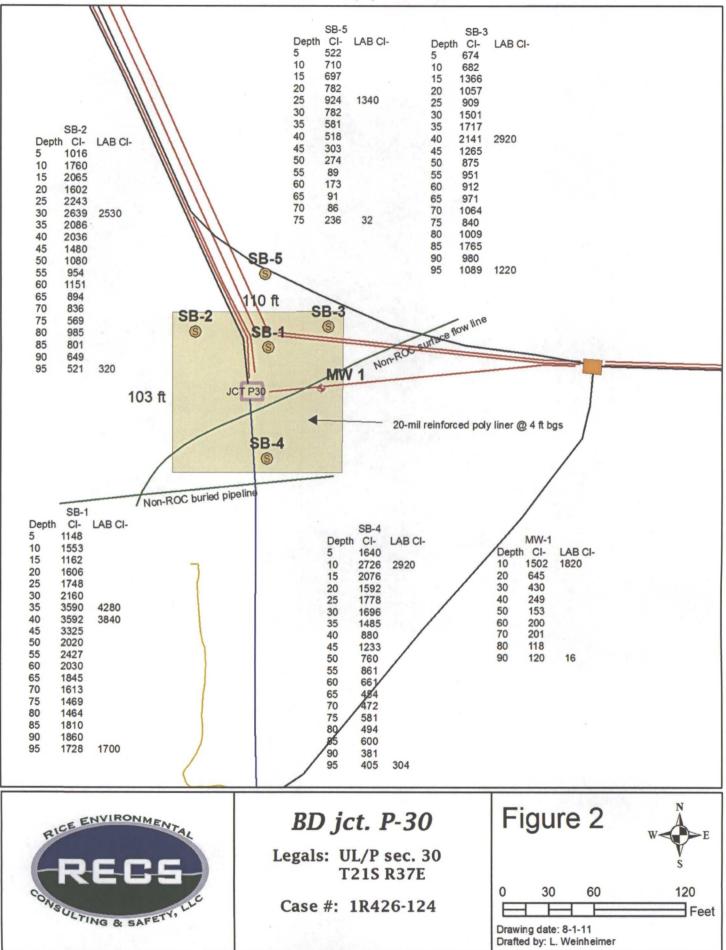
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NMOCD Approved Liner



Appendix A PID sheets

RICE ENVIRONMENTAL CONSULTING & SAFETY

122-West Taylor Hobbs, NM 88240 PHONE: (305) 393-9174 11/32: (305) 397-1471 PHONE: CALIBRATION & FIELD REPORT FORM

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MODEL: PGM 7300 MODEL: PGM 7300 MODEL: PGM 7320 MODEL: PGM 7320 SERIAL NO: 590-000508 SERIAL NO: 590-000504 SERIAL NO: 592-903318 SERIAL NO: 590-000183

GAS COMPOSITION: ISOBULYLENE 100PPM / AIR: BALANCE

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RICE ENVIRONMENTAL CONSULTING & SAFETY

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Appendix B Blended Backfill Laboratory Confirmation



July 22, 2011

Hack Conder Rice Operating Company

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112 W. Taylor

Hobbs, NM 88240

RE: BD P-30 JCT

Enclosed are the results of analyses for samples received by the laboratory on 07/22/11 12:03.

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. Keine

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:	07/22/2011	Sampling Date:	07/22/2011
Reported:	07/22/2011	Sampling Type:	Soil
Project Name:	BD P-30 JCT	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: BLENDED 8 PT COMP (H101526-01)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	480	16.0	07/22/2011	ND	416	104	400	3.77	

Cardinal Laboratories

*=Accredited Analyte

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 client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by claimal, within thirty (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 the services hereunder by Cardinal, regardless of whether such chain is based unoor and the above stated reasons or otherwise. Results relate only to the samples identified above. This reproduced exception influid writime approad of Cardinal Laboratories.

Celey D.Kune

Celey D. Keene, Lab Director/Quality Manager

Page 2 of 4

CARDINAL Laboratories

Notes and Definitions

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

Cardinal Laboratories

*=Accredited Analyte

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Celey D Keene ٩

Celey D. Keene, Lab Director/Quality Manager

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Appendix C Imported Soil Laboratory Confirmation



July 28, 2011

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD P-30 JCT

Enclosed are the results of analyses for samples received by the laboratory on 07/27/11 16:25.

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.

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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. Kune

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

Sample ID: IMPORTED TOPSOIL 8 PT. COMP (H101562-01)

Chloride, SM4500CI-B	mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	07/28/2011	ND	464	116	400	3.51	

Cardinal Laboratories

*=Accredited Analyte

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Celey D.Kune

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
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***	Insufficient time to reach temperature.
-	Chloride by SM4500CI-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 $\begin{tabular}{c} & & \\ & & & \\ & & & \\ & & \\ & & & \\ & & \\ & &$

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Celey D.Kune

Celey D. Keene, Lab Director/Quality Manager

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kjones@riceswd.com *Knorman@rue-ecs.*com; Zconder@rice-ecs.com; Bbaker@rice-ecs.com;

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Page 4 of 4

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Appendix D RECS Re-vegetation Form



PO Box 5630 Hobbs, NM 88241 Phone: (575) 393-4411 Fax: (575) 393-0293

REVEGETATION FORM

1. General Informati	oń						
Site name:	BD jct. P-	30	0				
U/L	Section	Township	Range	County	Latitude	Longi	
Р	30	21	37	Lea	32°26'42.093"N	103°11'45.409	"W
Contact Name:	Hack Co	onder			• •		
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HConder@riceswd.com	<u></u>						
Site size:29,181'		square feet	Map de	tail of site at	Itached .	د د. بو معدههی در د	·· •··· •···
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2. Soils *Do		i	1	- ita	······································		· ·
Salvaged from site	not rip calici Bioremedi		Imported X		ace by ripping shall be ded 🔀 🛛 🗍 I	removea. Depth (in): 4 ft	
Texture: Sandy		oil & subsoil:		ly topsoil	the second se	20pul (m). 4 It	
		Depth(in):	Disc	and the second s		rpack	
Date completed:		Depui(iii).		<u> </u>			
7/30/11							
			•••••••				4
3. Bioremediation							
Fertilizer			Hay [her 🛛	
Туре:					De		ost 19 bags
Lbs/acre:						Peatim	loss 10 bags
4. Seeding *Att	ach seed bag	lags to this form	Seed bag tag	s shall contain	the site name and S-T	- <i>Ŕ</i> :	
	Prescribed n		mix name:		Scason Mix S	ending date	07 / 30 /11
Broadcast 🛛							i i
Method: broadcasting see							
Soil conditions during se	eding: D	Dry 🛛 Dar	np 🗌 Wet		-		_
Photos attached 🛛	Observa	tions:			• · · · · · · · · · · · · · · · · · · ·		-
Number of photos:							
the same the second							. * :
5 Certification the	hu cortify that	the information in	this form and a	tachmente ic to	e and complete to the bes	t of my knowledge of	d balief

Name: Signature:

1 .

Appendix E Excavation Photo Documentation

BD jct. P-30 Unit P, Section 30, T-21-S, R-37-E



Site prior to excavation, facing north 7/1/11



Exporting soil to Sundance, facing northwest 7/12/11



Excavation complete, facing north

7/20/11



Excavating site, facing west





Blending spoil pile, facing west

7/12/11



Liner installed, facing southwest

7/25/11



Backfilling site, facing north

7/26/11



Spreading soil amendments, facing northwest 7/30/11



Disking the site for seed, facing west 7/30/11



Unloading topsoil at site, facing west 7/27/11



Seeding the site, facing south

7/30/11



Excavation complete, facing northwest 7/31/11