

1R - 426-99

# REPORTS

DATE:

7-20-12

**Texerra LLC**

20055 Laredo Lane Monument, CO 80132  
Tel: 719-339-6791 E-mail: [lpg@texerra.com](mailto:lpg@texerra.com)

July 20th, 2012

**Mr. Edward Hansen**

New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau  
1220 S. St. Francis Drive  
Santa Fe, New Mexico 87504

**RECEIVED**

JUL 24 2012

RE: Rice Operating Company – BD SWD System  
**BD O-23 Vent**  
**CAP Report for Groundwater and Request for Remediation Termination**  
UL O, Sect 23, Township 21S, Range 37E  
NMOCD Case Number 1R426-99

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

Sent via E-mail and U.S. Certified Mail Return Receipt No. 7011 0110 0002 5197 1303

**Mr. Hansen:**

This letter is to confirm and provide documentation that Rice Operating Company (ROC) has completed the soil and groundwater remediation requirements for the BD O-23 Vent (location given in Figure 1) specified in Corrective Action Plan (CAP), submitted to NMOCD on December 21<sup>st</sup>, 2010, and CAP Addendum, submitted to NMOCD on February 2<sup>nd</sup>, 2011, and approved by NMOCD on February 2<sup>nd</sup>, 2011, as summarized, below:

- The excavation of chloride impacted soils across a 70 by 90 ft area and the installation of a subsurface synthetic infiltration barrier to protect groundwater from the downward migration of residual soil chlorides. Between February and April 2011, chloride impacted soils were removed to a depth of 5 ft across the affected area. Six inches of clean blow sand (padding) were added to the bottom of the excavation and a 70 by 90 ft, 20 mil synthetic liner was installed. An additional six inches of clean blow sand were carefully added above the liner and excavated soils were backfilled into the excavation. Clean imported topsoil, amended with peanut hay, was spread over the work area and the lease roads were repaired. The site was subsequently seeded with native vegetation mix. A CAP Progress Report was submitted to NMOCD on February 2<sup>nd</sup>, 2012 and NMOCD subsequently granted remediation termination status for the unsaturated zone on February 16<sup>th</sup>, 2012.
- The removal of 8,893 lbs or 4,033 kg of groundwater chloride from a recovery well at this location and the adjacent BD O-23-1 vent location to compensate for legacy groundwater impacts (Figure 2). Groundwater recovery began at BD O-23 vent site on March 27<sup>th</sup>, 2012. From BD O-23 vent RW-1, a total of 1,790 barrels was extracted from the aquifer. Given that the BD O-23 vent RW-1 had a chloride concentration of 6,900 mg/L, a total of 1,963 kg of chloride (4,327 lbs of affected groundwater) was removed. From BD O-23 vent RW-2, a total of 1,067 barrels was extracted. Given that BD O-23 vent RW-2 had a chloride

**Rice Operating Company – BD O-23 vent**

concentration of 10,300 mg/L, a total of 1,747 kg of chloride (3,851 lbs of affected groundwater) was removed (Appendix A). Groundwater recovery began at BD O-23-1 vent site for BD O-23 vent on June 28<sup>th</sup>, 2012. From the BD O-23-1 vent RW-1, a total of 305 barrels was extracted. Given that the BD O-23-1 RW-1 had a chloride concentration of 4,400 mg/L, a total of 213 kg of chloride (469 lbs of affected groundwater) was removed. From the BD O-23-1 vent RW-2, a total of 305 barrels was extracted. Given that the BD O-23-1 vent RW-2 had a chloride concentration of 5,050 mg/L, a total of 244 kg of chloride (537 lbs of affected groundwater) was removed (Appendix B). Groundwater recovery was completed at both BD O-23 vent and BD O-23-1 vent on July 11<sup>th</sup>, 2012. All combined, a total of 4,167 kg of chloride (or 9,186 lbs of affected groundwater) have been recovered and used for SWD line maintenance purposes. The groundwater remediation requirements have thus been met for the BD O-23 vent location.

We therefore submit that the work items specified in the Corrective Action Plan for this project have been completed, and therefore respectfully request remediation termination or similar regulatory closure status for this project.

Please be advised that we wish to continue operation of the groundwater recovery well at this location for other groundwater remediation projects within the BD SWD system. We therefore propose to keep this well operational until further notice with approval from NMOCD.

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.

Thank you for your consideration.

Sincerely



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

Attachments: Site location maps, recovery well groundwater chloride lab reports.

Copy: Rice Operating Company

### Site Location Map

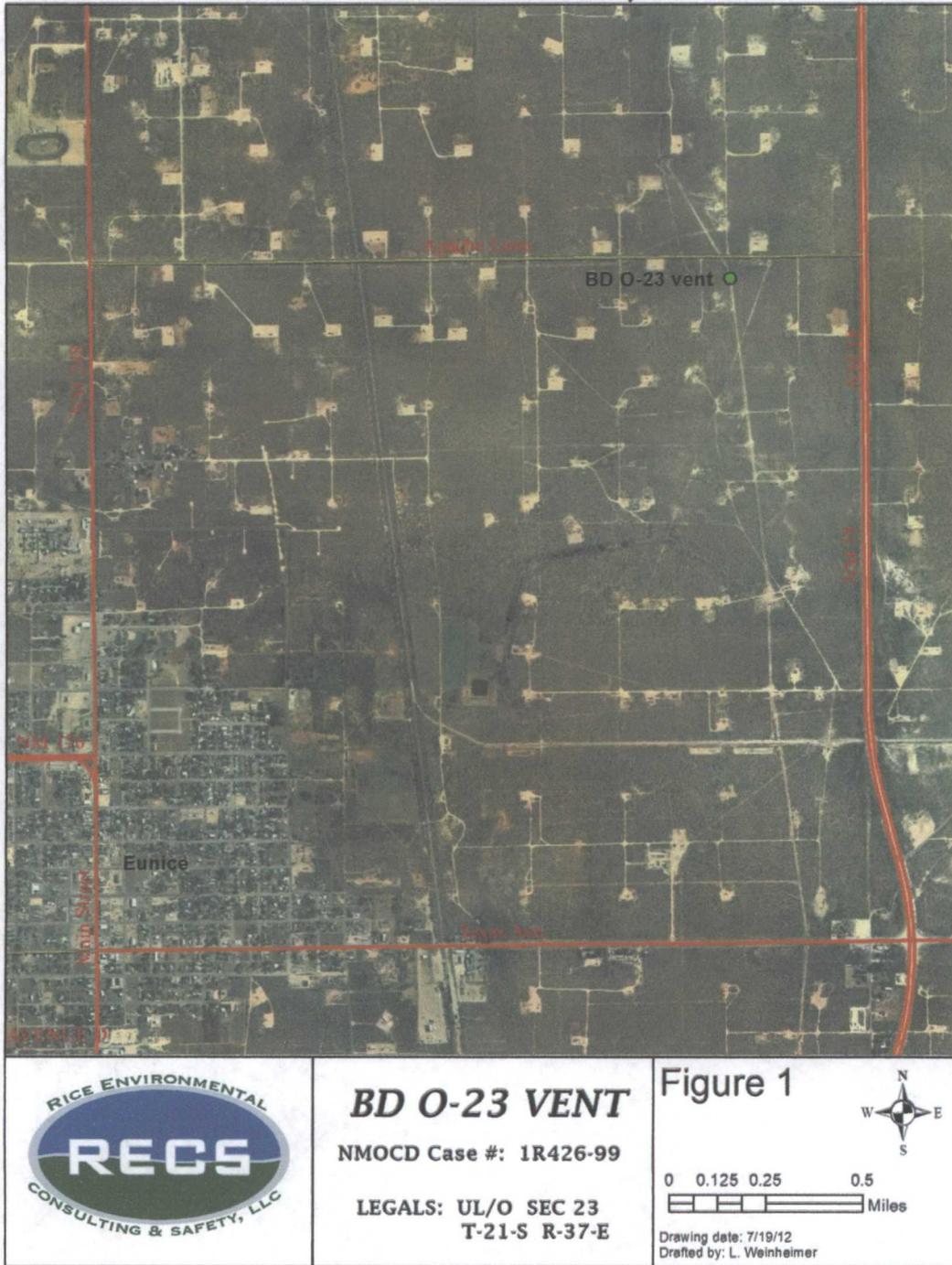


Figure 1 – BD O-23 Vent site location map.

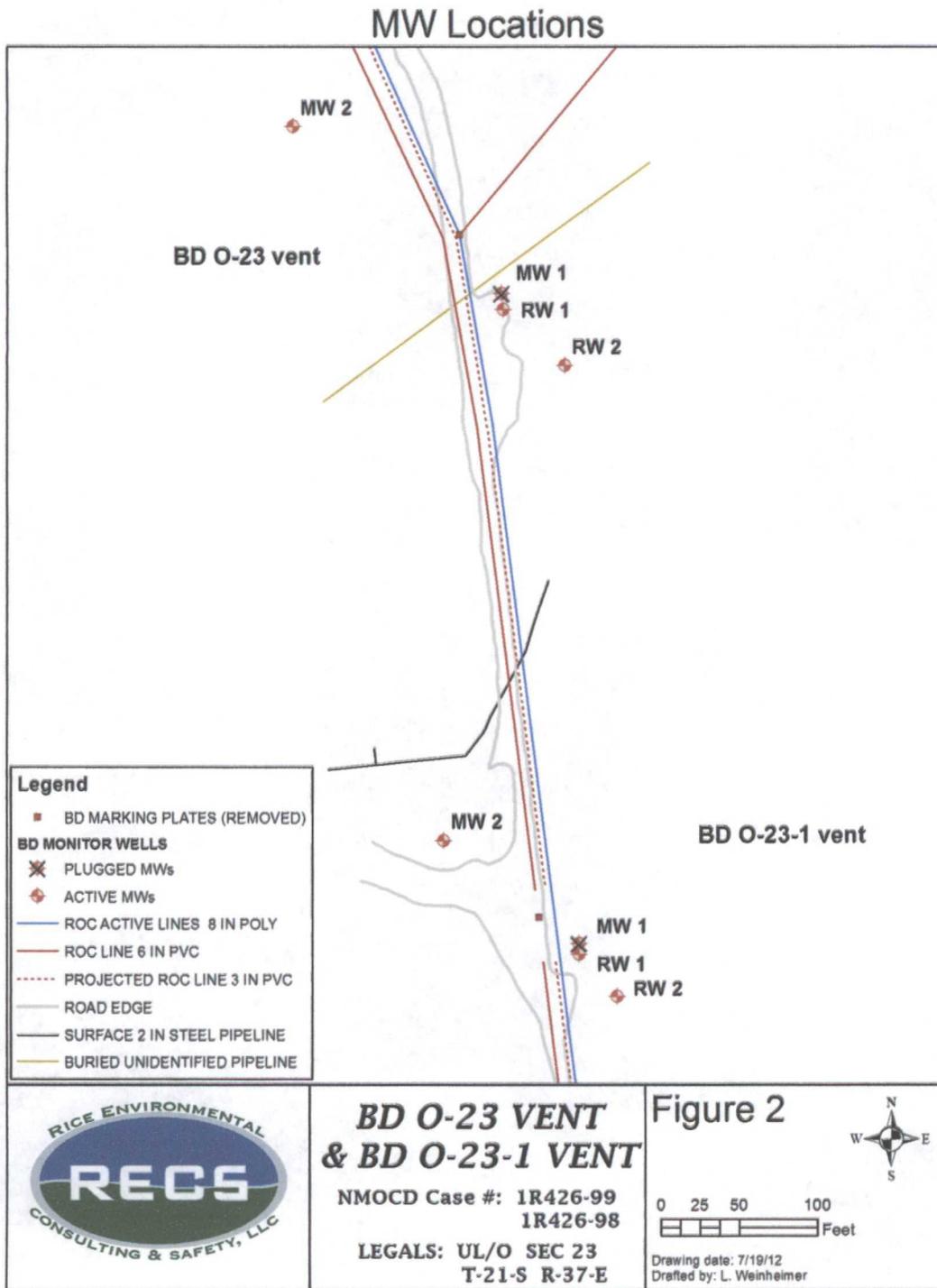


Figure 2 – BD O-23 Vent groundwater monitor and recovery well locations.

**Rice Operating Company – BD O-23 vent**

General Equation

Total mass (kg) of groundwater chlorides removed =

bbbls groundwater removed \* 42 gallons/bbl \* 3.785 kg/bbl

\* groundwater Cl- conc (mg/kg) / 1,000,000 mg/kg

Computation of Groundwater Chlorides Removed at BD O-23 Vent RW-1

1,790 bbls \* 42 gallons/bbl \* 3.785 kg/bbl \* 6,900 mg/kg/1,000,000 mg/kg = 1,963 kg

Computation of Groundwater Chlorides Removed at BD O-23 Vent RW-2

1,067 bbls \* 42 gallons/bbl \* 3.785 kg/bbl \* 10,300 mg/kg/1,000,000 mg/kg = 1,747 kg

Computation of Groundwater Chlorides Removed at BD O-23-1 Vent RW-1

305 bbls \* 42 gallons/bbl \* 3.785 kg/bbl \* 4,400 mg/kg/1,000,000 mg/kg = 213 kg

Computation of Groundwater Chlorides Removed at BD O-23-1 Vent RW-2

305 bbls \* 42 gallons/bbl \* 3.785 kg/bbl \* 5,050 mg/kg/1,000,000 mg/kg = 244 kg

Total Groundwater Chlorides Removed

BD O-23 vent RW-1	1,963 kg
BD O-23 vent RW-2	1,747 kg
BD O-23-1 vent RW-1	213 kg
<u>BD O-23-1 vent RW-2</u>	<u>244 kg</u>
Total	4,167 kg

**Table 1** – Groundwater chloride mass removal calculations

# Rice Operating Company – BD O-23 vent

## Appendix A: BD O-23 vent most recent lab result



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

June 26, 2012

Hack Conder

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD O-23 VENT

Enclosed are the results of analyses for samples received by the laboratory on 06/21/12 15:45.

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](http://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 529.2	Total Trihalomethanes (TTHM)
Method EPA 529.4	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 cursive script that reads "Coley D. Keene".

Coley D. Keene

Lab Director/Quality Manager

Page 1 of 4

Rice Operating Company – BD O-23 vent



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:	06/21/2012	Sampling Date:	06/21/2012
Reported:	06/26/2012	Sampling Type:	Water
Project Name:	BD O-23 VENT	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E SEC23 O-LEA CTY., NM		

**Sample ID: MONITOR WELL 1-R (H201420-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	6900	4.00	06/26/2012	ND	100	100	100	0.00		

**Sample ID: RECOVERY WELL 2 (H201420-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	10300	4.00	06/26/2012	ND	100	100	100	0.00		

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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\*=Accredited Analyte

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



Appendix B: BD O-23-1 vent most recent lab result



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

June 26, 2012

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

RE: BD O-23-1

Enclosed are the results of analyses for samples received by the laboratory on 06/21/12 15:45.

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](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

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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 "Caley D. Keene".

Caley D. Keene  
Lab Director/Quality Manager

Rice Operating Company – BD O-23 vent



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:	06/21/2012	Sampling Date:	06/21/2012
Reported:	06/26/2012	Sampling Type:	Water
Project Name:	BD O-23-1	Sampling Condition:	** (See Notes)
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E SEC23 O-LEA CTY., NM		

**Sample ID: MW 1-R (H201421-01)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	4400	4.00	06/26/2012	ND	100	100	100	0.00		

**Sample ID: RW-2 (H201421-02)**

Chloride, SM4500Cl-B		mg/L		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride*	5050	4.00	06/26/2012	ND	100	100	100	0.00		

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

# Rice Operating Company – BD O-23 vent



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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 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

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**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: <u>Rice</u>		<b>BILL TO</b>										<b>ANALYSIS REQUEST</b>																			
Project Manager: <u>Hack Conder</u>		P.O. #:										Chlorides TPH 8015 M BTEX Texas TPH Complete Cations/Anions TDS																			
Address:		Company:																													
City: <u>Hobbs</u> State: <u>NM</u> Zip: <u>88240</u>		Attn:																													
Phone #: Fax #:		Address:																													
Project #: Project Owner:		City:																													
Project Name:		State: Zip:																													
Project Location: <u>BD 0-23-1</u>		Phone #:																													
Sampler Name: <u>Kyle Norman</u>		Fax #:																													
FOR LAB USE ONLY																															
Lab I.D.	Sample I.D.	(Q)RAB OR (C)OMP.	# CONTAINERS	MATRIX				PRESERV.		SAMPLING																					
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACIDBASE:	ICE/COOL:	OTHER:	DATE	TIME																	
<u>H2D1421</u>													<u>6/21/12</u>	<u>2:15</u>	<input checked="" type="checkbox"/>																
	<u>MW 1R</u>	<input checked="" type="checkbox"/>	<u>1</u>										<u>6/21/12</u>	<u>2:19</u>	<input checked="" type="checkbox"/>																
	<u>RW-2</u>	<input checked="" type="checkbox"/>	<u>1</u>																												

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Relinquished By: <u>[Signature]</u>	Date: <u>6-21-12</u>	Received By: <u>Jodi Benson</u>	Phone Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Add'l Phone #:
Relinquished By:	Time: <u>3:45</u>	Received By:	Fax Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	CHECKED BY: <u>[Signature]</u>	REMARKS: email results: zconder@rice-ecs.com Knorman@rice-ecs.com; lpena@riceswd.com Kjones@riceswd.com; Bbaker@rice-ecs.com; hconder@rice-ecs.com; Lweinheimer@rice-ecs.com	

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