

1R - 480

**GENERAL  
CORRESPONDENCE**

**YEAR(S):**  
2007

**RICE** Operating Company  
JUNCTION BOX FINAL REPORT

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	NEW BOX DIMENSIONS - FEET		
EME	B-8	B	8	20S	37E	Lea	Length	Width	Depth
							moved 20 ft north west		

LAND TYPE: BLM \_\_\_\_\_ STATE \_\_\_\_\_ FEE LANDOWNER Jimmie T. Cooper etux. Betty B.J.T. OTHER \_\_\_\_\_

Depth to Groundwater 40 feet NMOC SITE ASSESSMENT RANKING SCORE: 20

Date Started 7/18/2007 Date Completed 7/30/2007 NMOC Witness no

Soil Excavated 222 cubic yards Excavation Length 25 Width 20 Depth 12 feet

Soil Disposed 0 cubic yards Offsite Facility n/a Location n/a

FINAL ANALYTICAL RESULTS: Sample Date 7/18/07, 7/19/07, 7/23/07, 7/24/07 Sample Depth 12 ft.

5-point composite sample of bottom and 4-point composite sample of excavation sidewalls. TPH and chloride laboratory test results completed by using an approved laboratory and testing procedures pursuant to NMOC guidelines.

CHLORIDE FIELD TESTS

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	1.1	<10.0	<10.0	128
BOTTOM COMP.	3.7	<10.0	<10.0	288
BACKFILL	1.8	<10.0	<10.0	160

LOCATION	DEPTH (ft)	ppm
4-wall comp.	n/a	128
bottom comp.	12	288
backfill comp.	n/a	160

General Description of Remedial Action:

A new watertight junction box was built 20'  
north west (eliminating junction box) during the pipeline replacement/upgrade project. A backhoe  
was used to collect samples for field analysis at regular intervals of breadth and depth. Site was  
excavated to a 25 ft. X 20 ft. X 12 ft. Field composites of the walls, bottom, were low in chlorides  
and organic vapors were low. Compsites of the walls, bottom, and blended backfill were sent to a  
commercial laboratory for analysis which laboratory confirmed site was low in chloride concentration  
and organics. On 7/27/07 site was backfilled with soil blended on site and site was seeded on  
7/30/07 with a blend of native grass seed. Site should return to a productive capacity at a normal  
rate.

enclosures: photos, lab results, PID field screenings.

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE  
AND BELIEF.

SITE SUPERVISOR Larry Bruce Baker Jr.

COMPANY RICE Operating Company

REPORT ASSEMBLED BY Larry Bruce Baker Jr.

SIGNATURE \_\_\_\_\_

DATE 5/27/2008

TITLE Environmental Tech.

**Hansen, Edward J., EMNRD**

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**From:** Caperton, Patricia, EMNRD  
**Sent:** Friday, December 08, 2006 1:05 PM  
**To:** Hansen, Edward J., EMNRD  
**Subject:** RE: 1R1134

Thanks

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**From:** Hansen, Edward J., EMNRD  
**Sent:** Friday, December 08, 2006 1:03 PM  
**To:** Gilbert Van Deventer  
**Cc:** Caperton, Patricia, EMNRD  
**Subject:** RE: 1R1134

Gil,

The OCD has received the ICP for case #1R1134 (Rice EME B-8 Release Site). However, the OCD Santa Fe Office will now take over the review of that site. Therefore, please use the "new" OCD case # 1R0480 in future correspondence.

Let me know if you have any questions regarding this matter. Also, please send any future correspondence regarding the above case to me. Thank you.

Edward J. Hansen  
505-476-3489

P.S.: Pat, Wayne asked me to cc you on this message so you can make any necessary record changes on your end - thanks.



CERTIFIED MAIL  
RETURN RECIEPT NO. 7099 3400 0017 1737 2282

November 30, 2006

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

RE: **INVESTIGATION & CHARACTERIZATION PLAN**  
**EME B-8 Release Site**  
**T20S-R37E-Section 8, Unit Letter B**  
**NMOCD Case No.: 1RP # 1134**

Mr. Price:

RICE Operating Company (ROC) has retained Trident Environmental to address potential environmental concerns at the above-referenced site. ROC is the service provider (agent) for the Eunice -Monument- Eumont (EME) 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 Partners, who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner AFE approval and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is requested.

For all environmental projects, ROC will choose a path forward that:

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall have three submissions or a combination of:

1. This Investigation and Characterization Plan (ICP) is a proposal for data gathering and site characterization and assessment.
2. Upon evaluating the data and results from this ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP).
3. Finally, after implementing the remedy, a closure report with final documentation will be submitted.

## BACKGROUND

The B-8 Release site is located at township 20 south, range 37 east, section 8, unit letter B approximately 2 miles south-southwest of Monument, NM as shown on the attached Site Location Map (Figure 1). According to the Lea County Tax Assessor's Office, the land is owned by Jimmie T. Cooper. Land in the site area is utilized for crude oil production and cattle ranching. Area crude oil production is primarily operated by Arch Petroleum Inc., Plantation Operating LLC, and Gruy Petroleum Management Corp., and Apache Corp.

## PREVIOUS WORK

On June 1, 2005, ROC was notified of an accidental discharge of approximately 430 barrels of produced water from an 8-inch A/C pipeline at a point located approximately 564 feet southeast of the C-8 junction box. Approximately 400 barrels of produced water were recovered and disposed to the EME SWD facility. The 8-inch A/C pipeline was replaced with a 40-foot length of 8-inch PVC pipe. The initial C-141 report (attached) was submitted by ROC on June 3, 2005, and approved by the NMOCD Hobbs District 1 office on June 10, 2005.

Initial sampling activities with a hand auger conducted on June 3 and June 6, 2005, indicated approximately 8,144 square feet of surface was impacted by the release based on chloride field tests and visual observations. Hydrocarbon impacts to the soil were evaluated using a Mini Rae Plus Photoionization Gas Detector (PID) calibrated to isobutylene. The results identified a maximum surface concentration of 15 ppm, decreasing to <10 ppm at a depth of 4 ft below ground surface. On July 15, 2005, a backhoe was used to collect samples at five sampling points confirming chloride impact to a depth of 15 ft below ground surface. A site map showing the field sampling results is shown in Figure 2.

Groundwater in the site area occurs within the High Plains aquifer under water table (unconfined) conditions (Hart & McAda, 1985). The saturated portion of the High Plains aquifer is estimated to be approximately 25 ft thick in the site area (Nicholson and Clebsch, 1961). Depth to groundwater in the site area is estimated at approximately 30 feet below ground surface (bgs) based on nearby monitoring well data in adjacent sections.

## RECOMMENDATION FOR FURTHER ACTIONS

The repair of the pipeline has minimized the threat of additional impact from the vadose zone and sufficient horizontal delineation has been conducted. As discussed above, existing site data suggest a potential for impairment of groundwater quality. Therefore, the work elements described below are designed to assist ROC in selecting the appropriate vadose zone remedy, and, if necessary, a groundwater remedy.

### *Task 1            Evaluate Concentrations of Constituents of Concern in the Vadose Zone*

Subsurface soil samples will be collected from one soil boring for characterization of the vertical extent of hydrocarbon- and chloride-impacted soil. A soil boring will be placed immediately adjacent to the source of the release and soil samples will be collected in accordance with the procedures explained in QP-02, QP-03, and QP-07 (attached). Soil lithology and the presence of any observed staining or odor will be recorded.

Soil samples will be collected at one to five-foot sampling intervals and field-tested for chloride content using the titration method. Soil samples will also be collected for headspace analysis using a PID, which will be calibrated to assume a benzene response factor. Samples with headspace readings above 100 ppm shall be analyzed for gas and diesel range organics (GRO and DRO) using EPA Method 8015 and for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. If chloride concentrations do not decrease sufficiently with depth the soil boring will be converted into a monitoring well.

As part of this ICP, the residual impact to vadose zone soils will be evaluated to determine what, if any remediation/isolation techniques will be required at the site.

*Task 2 Evaluate Concentrations of Constituents of Concern in the Groundwater (if necessary)*

If a monitoring well is installed under the conditions described above, and if groundwater impact is confirmed, one additional monitoring well will be installed upgradient and downgradient to determine the local groundwater gradient direction, the lateral extent of groundwater impact, and the potential for off site sources of impact. If groundwater monitoring wells are installed they will be constructed in accordance with EPA and industry standards and developed either by bailing with a rig or hand bailer, or pumping with an electric submersible pump to remove fine-grained sediment disturbed during drilling and to ensure collection of representative water samples. Groundwater samples will be collected in accordance with procedures explained in QP-04 and QP-05 (attached), and analyzed for BTEX, major ions, and total dissolved solids (TDS). Water removed from any monitoring well will be disposed of in the EME SWD System.

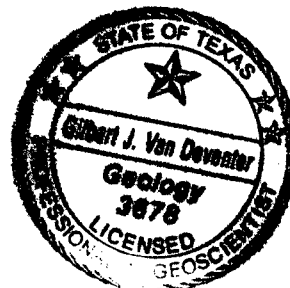
The information gathered from tasks 1 and 2 will be evaluated and utilized to design a soil and/or ground water remedy, if needed. The remedy that offers the greatest environmental benefit while causing the least environmental impairment will be selected. Such recommendations and findings will be presented to NMOCD in a subsequent Corrective Action Plan (CAP). When evaluating any proposed remedy or investigative work, ROC will confirm that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

Your approval to move forward with this work plan will facilitate approval of expenditures by the System Partners. We appreciate the opportunity to work with you on this project. Please feel free to call me at 432-638-8740 or Kristin Farris Pope at 505-393-9174, if you have any questions.

Sincerely,



Gilbert J. Van Deventer, REM, PG  
Trident Environmental - Project Manager



cc: Larry Johnson, NMOCD District 1 (Hobbs NM)  
CDH, KFP, file

*enclosures: maps, C-141 Form, photos, and sampling procedures*





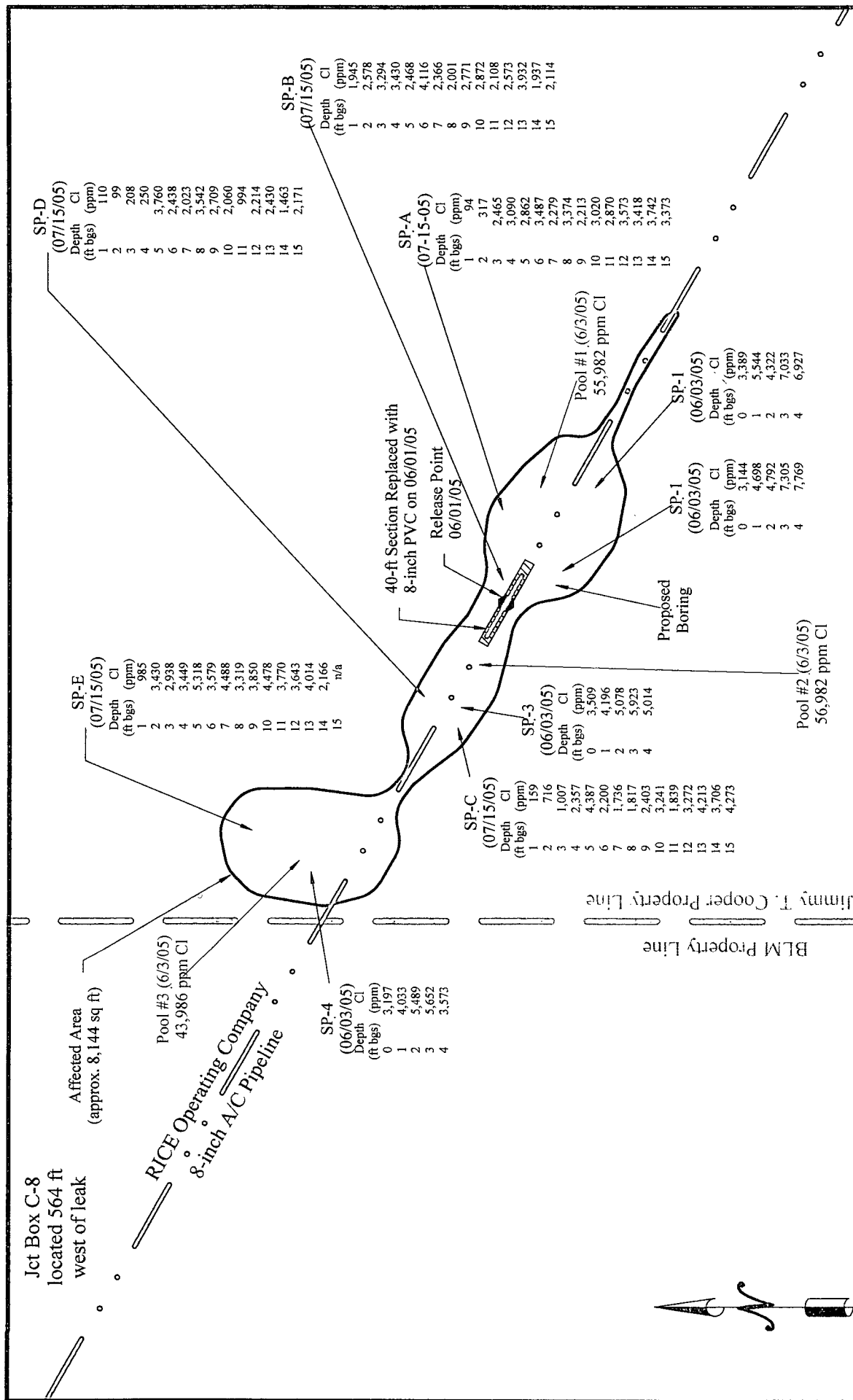
EME B-8  
RELEASE SITE



SITE NAME: EME B-8 LINE LEAK
DATE: JULY 20, 2005
DRAWN BY: D. LITTLEJOHN
APPROXIMATE SCALE: 1 INCH = 1000 FT

FIGURE 1  
EME B-8 LEAK SITE  
LOCATION MAP





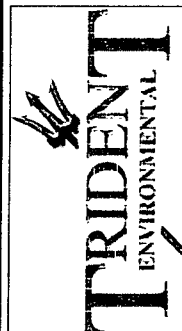
**FIGURE 2**  
**EME B-8 SITE MAP**  
**FIELD SAMPLE RESULTS**

SITE NAME: EME B-8 LINE LEAK

DATE: JUNE 3 & JULY 15, 2005

DRAWN BY: D. LITTLEJOHN

APPROXIMATE SCALE: 1 INCH = 60 FT





District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Branz Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-141  
Revised October 10, 2003

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

**Release Notification and Corrective Action**

**OPERATOR**

☒ Initial Report ☐ Final Report


Name of Company: Rice Operating	Contact: Jennifer Johnson	
Address: 122 W. Taylor Hobbs, New Mexico	Telephone No.: 505-393-9174	
Facility Name: EME	Facility Type: SWD Gathering Line	
Surface Owner: Jimmy Cooper	Mineral Owner	Lease No.

**LOCATION OF RELEASE**

Unit Letter B	Section 8	Township 20S	Range 37E	Feet from the	North/South Line	Feet from the	East/West Line	County LEA
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Latitude: 32°35.528 N Longitude: 103°16.398 W

**NATURE OF RELEASE**

Type of Release: Produced Water	Volume of Release: 430 bbls	Volume Recovered: 400 bbls
Source of Release: Pipeline	Date and Hour of Occurrence: 6/01/05 n/a	Date and Hour of Discovery: 6/01/05 12:43 pm.
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Paul Shreeley	
By Whom? Jennifer Johnson	Date and Hour: 6/01/05 3:55pm	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully. N/A		
Describe Cause of Problem and Remedial Action Taken.* 8 inch AC pipeline cracked, replaced by 40ft of 8 inch PVC line		
Describe Area Affected and Cleanup Action Taken.* 8144sq ft affected, delineation results to follow.		
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.		
Signature: 		<b>OIL CONSERVATION DIVISION</b>
Printed Name: Jennifer Johnson		Approved by District Supervisor:
Title: Environmental Technician	Approval Date:	Expiration Date:
E-mail Address: jjriceoswd@leaco.net	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 6/03/05 Phone: 505-393-9174		

\* Attach Additional Sheets If Necessary



EME B-8 Release Site  
October 25, 2006



View of site on date of release discovery (06-01-2005).



View of site on date of release discovery (06-01-2005).





View of site the day after removal and disposal of 400 bbls of released fluids (06-02-2005).



View of site the day after repair of the 8-inch pipeline with PVC (06-02-2005).

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**Rice Operating Company**

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**Quality Procedure**

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**Procedure for Obtaining  
Soil Samples for Transportation to a Laboratory**

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**1.0 Purpose**

This procedure outlines the methods to be employed when obtaining soil samples to be taken to a laboratory for analysis.

**2.0 Scope**

This procedure is to be used when collecting soil samples intended for ultimate transfer to a testing laboratory.

**3.0 Preliminary**

- 3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the soil. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.
- 3.2 If collecting TPH, BTEX, RCRA 8 metals, cation /anions or O&G, the sample jar may be a clear 4 oz. container with Teflon lid. If collecting PAH's, use an amber 4 oz. container.

**4.0 Chain of Custody**

- 4.1 Prepare a Sample Plan. The plan will list the number, location and designation of each planned sample and the individual tests to be performed on the sample. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.
- 4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.
- 4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label.) Affix the labels to the jars.

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**5.0 Sampling Procedure**

- 5.1. Do not touch the soil with your bare hands. Use new latex gloves with each sample to help minimize any cross-contamination.
- 5.2. Go to the sampling point with the sample container. If not analyzing for ions or metals, use a trowel to obtain the soil.
- 5.3. Pack the soil tightly into the container leaving the top slightly domed. Screw the lid down tightly. Enter the time of collection onto the sample collection jar label.
- 5.4. Place the sample directly on ice for transport to the laboratory if required.
- 5.5. Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

**6.0 Documentation**

- 6.1 The testing laboratory shall provide the following minimum information:
  - a. Project and sample name.
  - b. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
  - c. Results of the requested analyses
  - d. Test Methods employed
  - e. Quality Control methods and results



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**Rice Operating Company**

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**QUALITY PROCEDURE**

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**Sampling and Testing Protocol  
Chloride Titration Using .282 Normal  
Silver Nitrate Solution**

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**1.0 Purpose**

This procedure is to be used to determine the concentration of chloride in soil.

**2.0 Scope**

This procedure is to be used as the standard field measurement for soil chloride concentrations.

**3.0 Sample Collection and Preparation**

- 3.1 Collect at least 80 grams of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample for soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).
- 3.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag. Care should be taken to insure that no cross-contamination occurs between the soil sample and the collection tools or sample processing equipment.
- 3.3 The sealed sample bag should be massaged to break up any clods.

**4.0 Sample Preparation**

- 4.1 Tare a clean glass vial having a minimum 40 ml capacity. Add at least 10 grams of the soil sample and record the weight.
- 4.2 Add at least 10 grams of reverse osmosis water to the soil sample and shake for 20 seconds.
- 4.3 Allow the sample to set for a period of 5 minutes or until the separation of soil and water.
- 4.4 Carefully pour the free liquid extract from the sample through a paper filter into a clean plastic cup if necessary.

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### 5.0 Titration Procedure

- 5.1 Using a graduated pipette, remove 10 ml extract and dispense into a clean plastic cup.
- 5.2 Add 2-3 drops potassium chromate ( $K_2CrO_4$ ) to mixture.
- 5.3 If the sample contains any sulfides (hydrogen or iron sulfides are common to oilfield soil samples) add 2-3 drops of hydrogen peroxide ( $H_2O_2$ ) to mixture.
- 5.4 Using a 1 ml pipette, carefully add .282 normal silver nitrate (one drop at a time) to the sample while constantly agitating it. Stop adding silver nitrate when the solution begins to change from yellow to red. Be consistent with endpoint recognition.
- 5.5 Record the ml of silver nitrate used.

### 6.0 Calculation

To obtain the chloride concentration, insert measured data into the following formula:

$$\frac{.282 \times 35.450 \times \text{ml AgNO}_3}{\text{ml water extract}} \times \frac{\text{grams of water in mixture}}{\text{grams of soil in mixture}}$$

Using Step 5.0, determine the chloride concentration of the RO water used to mix with the soil sample. Record this concentration and subtract it from the formula results to find the net chloride in the soil sample.

Record all results on the delineation form.

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**Rice Operating Company**

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**Quality Procedure**  
**Development of Cased Water-Monitoring Wells**

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**1.0 Purpose**

This procedure outlines the methods to be employed to develop cased monitoring wells.

**2.0 Scope**

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

**3.0 Sample Collection and Preparation**

- 3.1 Prior to development, the static water level and height of the water column within the well casing will be measured with the use of an electric D.C. probe or a steel engineer's tape and water sensitive paste.
- 3.2 All measurements will be recorded within a field log notebook.
- 3.3 All equipment used to measure the static water level will be decontaminated after each use by means of Liquinox, a phosphate free laboratory detergent, and water to reduce the possibility of cross-contamination. The volume of water in each well casing will be calculated.

**4.0 Purging**

- 4.1 Wells will be purged by using a 2" decontaminated submersible pump or dedicated one liter Teflon bailer. Wells should be purged until the pH and conductivity are stabilized and the turbidity has been reduced to the greatest extent possible.
- 4.2 If a submersible is used the pump will be decontaminated prior to use by scrubbing the outside surface of tubing and wiring with a Liquinox water mixture, pumping a Liquinox-water mixture through the pump, and a final flush with fresh water.

**5.0 Water Disposal**

- 5.1 All purge and decontamination water will be temporarily stored within a portable tank to be later disposed of in an appropriate manner.

**6.0 Records**

- 6.1 Rice Operating Company will record the amount of water removed from the well during development procedures. The purge volume will be reported to the appropriate regulatory authority when filing the closure report.

## Rice Operating Company

### Quality Procedure

#### Procedure for Obtaining Water Samples (Cased Wells) Using One Liter Bailer

#### 1.0 Purpose

This procedure outlines the methods to be employed in obtaining water samples from cased monitoring wells.

#### 2.0 Scope

This procedure shall be used for developed, cased water monitoring wells. It is not to be used for standing water samples such as ponds or streams.

#### 3.0 Preliminary

3.1 Obtain sterile sampling containers from the testing laboratory designated to conduct analyses of the water. The shipment should include a Certificate of Compliance from the manufacturer of the collection bottle or vial and a Serial Number for the lot of containers. Retain this Certificate for future documentation purposes.

3.2 The following table shall be used to select the appropriate sampling container, preservative method and holding times for the various elements and compounds to be analyzed.

Compound to be Analyzed	Sample Container Size	Sample Container Description	Cap Requirements	Preservative	Maximum Hold Time
BTEX	40 ml	VOA Container	Teflon Lined	HCl	7 days
TPH	1 liter	clear glass	Teflon Lined	HCl	28 days
PAH	1 liter	amber glass	Teflon Lined	Ice	7 days
Cation/Anion	1 liter	clear glass	Teflon Lined	None	48 Hrs
Metals	1 liter	HD polyethylene	Any Plastic	Ice/HNO <sub>3</sub>	28 Days
TDS	300 ml	clear glass	Any Plastic	Ice	7 Days

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#### **4.0 Chain of Custody**

- 4.1 Prepare a Sample Plan. The plan will list the well identification and the individual tests to be performed at that location. The sampler will check the list against the available inventory of appropriate sample collection bottles to insure against shortage.
- 4.2 Transfer the data to the Laboratory Chain of Custody Form. Complete all sections of the form except those that relate to the time of delivery of the samples to the laboratory.
- 4.3 Pre-label the sample collection jars. Include all requested information except time of collection. (Use a fine point Sharpie to insure that the ink remains on the label). Affix the labels to the jars.

#### **5.0 Bailing Procedure**

- 5.1 Identify the well from the sites schematics. Place pre-labeled jar(s) next to the well. Remove the plastic cap from the well bore by first lifting the metal lever and then unscrewing the entire assembly.
- 5.2 Using a dedicated one liter Teflon bailer, purge a minimum of three well volumes. Place the water in storage container for transport to a ROC disposal facility.
- 5.3 Take care to insure that the bailing device and string do not become cross-contaminated. A clean pair of rubber gloves should be used when handling either the retrieval string or bailer. The retrieval string should not be allowed to come into contact with the ground.

#### **6.0 Sampling Procedure**

- 6.1 Once the well has been bailed in accordance with 5.2 of this procedure, a sample may be decanted into the appropriate sample collection jar directly from the bailer. The collection jar should be filled to the brim. Once the jar is sealed, turn the jar over to detect any bubbles that may be present. Add additional water to remove all bubbles from the sample container.
- 6.2 Note the time of collection on the sample jar with a fine Sharpie.



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6.3 Place the sample directly on ice for transport to the laboratory. The preceding table shows the maximum hold times between collection and testing for the various analyses.

6.4 Complete the Chain of Custody form to include the collection times for each sample. Deliver all samples to the laboratory.

### 7.0 Documentation

7.1 The testing laboratory shall provide the following minimum information:

- A. Project and sample name.
- B. Signed copy of the original Chain of Custody Form including the time the sample was received by the lab.
- C. Results of the requested analyses
- D. Test Methods employed
- E. Quality Control methods and results

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### Calculation for Determining the Minimum Bailing Volume for Monitor Wells

$$\text{Formula } V = (\pi r^2 h)$$

$$2'' \text{ well } [V/231 = \text{gal}] \times 3 = \text{Purge Volume}$$

V=Volume

$\pi = \text{pi}$

r=inside radius of the well bore

h=maximum height of well bore in water table

Example:

$\pi$	$r^2$	h(in)	V(cu.in)	V(gal)	X 3 Volumes	Actual
3.1416	1	180	565.488	2.448	7.34 gal	>10 gal

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## Rice Operating Company

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### Quality Procedure Composite Sampling of Excavation Sidewalls and Bottoms For TPH and Chloride Analysis

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#### 1.0 Purpose

This procedure outlines the methods to be employed when obtaining final composite soil samples for TPH and Chloride analysis.

#### 2.0 Scope

This procedure is to be used in conjunction with *Quality Procedure – 02: Soil Samples for Transportation to a Laboratory* and will be inserted at subparagraph 5.2 of Section 5.0: Sampling Procedure.

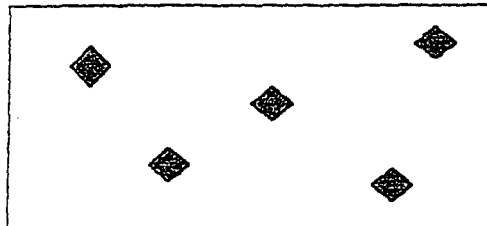
#### 3.0 Sampling Procedure

Follow *Quality Procedure – 02: Soil Samples for Transportation to a Laboratory* for all Sections and subparagraphs until subparagraph 5.2 of Section 5.0: Sampling Procedure. Instead of 5.2 instructions, perform the composite sample collection procedure as follows:

- 3.1 Go to the excavation with a clean large blending bowl or new plastic baggie. If not analyzing for ions or metals, use a trowel to obtain the soil. If the excavation is deeper than 6' BGS, do not enter the pit, but use a backhoe to assist in procurement of the sample. (If a backhoe is used, the backhoe will obtain an amount of soil from each composite point, bring the purchase to the surface staging area where a sample-portion of soil will be extracted from the backhoe purchase. The remainder of the backhoe purchase will be staged on the surface with other staged soils.)

#### 3.2 Sidewall samples

- 3.2.1 On each sidewall, procure a 5oz sample from each of five distinct points on the sidewall with distinct points resembling the "W" pattern:



- 3.2.2 Thoroughly blend these five samples in the blending bowl.
- 3.2.3 Pour blended sample into sifter and sift into labeled baggie.
- 3.2.4 Repeat steps 3.2.1 through 3.2.4 for each remaining sidewall, using a clean blending bowl for each sidewall.
- 3.2.5 From each labeled baggie, procure a 5 oz portion and pour into a baggie labeled "Sidewall Composite". Blend this soil mixture completely.
- 3.2.6 Obtain proper laboratory sample container for "Sidewall Composite" and continue with subparagraph 5.3 of QP - 02.

### 3.3 Bottom Sample

- 3.3.1 From bottom of excavation, procure a 5oz sample from each of five distinct points with distinct points resembling the "W" pattern as illustrated above.
- 3.3.2 Thoroughly blend these five samples in a clean blending bowl.
- 3.2.3 Pour blended sample into sifter and sift into baggie labeled "Bottom Composite".
- 3.2.6 Obtain proper laboratory sample container for "Bottom Composite" and continue with subparagraph 5.3 of QP - 02.

## Rice Operating Company

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### QUALITY PROCEDURE

#### Sampling and Testing Protocol for VOC in Soil

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#### 1.0 Purpose

This procedure is to be used to determine the concentrations of Volatile Organic Compounds in soils.

#### 2.0 Scope

This procedure is to be used as the standard field measurement for soil VOC concentrations. It is not to be used as a substitute for full spectrographic speciation of organic compounds.

#### 3.0 Procedure

##### 3.1 Sample Collection and Preparation

3.1.1 Collect at least 500 g. of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample of soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.1.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag and sealed. When sealed, the bag should contain a nearly equal space between the soil sample and trapped air. Record the sample name and the time that the sample was collected on the Field Analytical Report Form.

3.1.3 The sealed samples shall be allowed to set for a minimum of five minutes at a temperature of between 10-15 Celsius, (59-77°F). The sample temperatures may be adjusted by cooling the sample in ice, or by heating the sample within a generally controlled environment such as the inside of a vehicle. The samples should not be placed directly on heated surfaces or placed in direct heat sources such as lamps or heater vents.

3.1.4 The sealed sample bag should be massaged to break up any clods, and to provide the soil sample with as much exposed surface area as practically possible.

### 3.2 Sampling Procedure

- 3.2.1 The instrument to be used in conducting VOC concentration testing shall be an Environmental Instruments 13471 OVM / Datalogger or a similar PID-type instrument. (Device will be identified on VOC Field Test Report Form.) Prior to use, the instrument shall be zeroed-out in accordance with the appropriate maintenance and calibration procedure outlined in the instrument operation manual. The PID device will be calibrated each day it's used.
- 3.2.2 Carefully open one end of the collection bag and insert the probe tip into the bag taking care that the probe tip not touch the soil sample or the sidewalls of the bag.
- 3.2.3 Set the instrument to retain the highest result reading value. Record the reading onto the Field Test Report Form.
- 3.2.4 If the instrument provides a reading exceeding 100 ppm, proceed to conduct BTEX Speciation in accordance with QP-02 and QP-06. If the reading is 100 ppm or less, NMOCD BTEX guideline has been met and no further testing for BTEX is necessary. File the Field Test Report Form in the project file.

### 4.0 Clean-up

After testing, the soil samples shall be returned to the sampling location, and the bags collected for off-site disposal. **IN NO CASE SHALL THE SAME BAG BE USED TWICE. EACH SAMPLE CONTAINER MUST BE DISCARDED AFTER EACH USE.**