

1R - 425-27

**GENERAL  
CORRESPONDENCE**

**YEAR(S):**

**2007**

---

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

April 13, 2007

Mr. Wayne Price  
New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

1R425-27  
**RECEIVED**

APR 24 2007

RE: Investigation Characterization Plan:  
Jct. F-31-1 Junction, Vacuum Salt Water Disposal System

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

Dear Mr. Price:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is pleased to submit this Investigation Characterization Plan (ICP) for above- referenced site within the Vacuum Salt Water Disposal System. Plate 1 is a map showing the site relative to major roads in the area, nearby ROC sites and nearby USGS monitoring wells. GPS coordinates for this site are 32° 47.636 N, 103° 29.938 W. This site had a junction box that that was addressed as part of Vacuum System abandonment and excavated to 10L x 10W x 12D feet and backfilled with blended dirt to 6' below ground surface, capped with a one foot clay barrier, backfilled to the surface with blended soil and topped with 12 yards of clean top soil contoured to shed precipitation. NMOCD was notified that this site is a source of potential ground water impact on 4-17-06.

The work elements proposed to characterize this site sufficiently to develop an appropriate corrective action are presented below.

1. ROC will identify and document the location of all current and historic equipment and pipelines associated with the site.
2. ROC and Hicks Consultants will use a backhoe, with a 12-foot vertical reach to install a series of sampling trenches in order to recover soil samples and delineate the lateral extent (and potentially the vertical extent) of impacted soil.
3. Soil samples employed for delineation will be obtained from regular intervals below ground surface in each trench.
4. A representative number of the soil samples will be sent to a laboratory to allow for verification of the field results.
5. General soil texture descriptions will be provided for each sample trench.
6. The criteria to delineate the extent of impact is 5 point chloride decline vs. depth or:
  - a. 250 ppm chloride using field analyses (see attached ROC Quality Procedure in Appendix A), whichever occurs first.
  - b. 100 ppm total hydrocarbon vapors using the headspace method analysis (Appendix A).
  - c. Soil boring to ground water depth should neither (a) or (b) apply
  - d. Monitoring well installation if warranted to asses ground water quality at the site.

Following the site characterization described above, we will submit the data and analysis with a Corrective Action Plan that outlines the procedures for closure of the site.

Rice Operating Company (ROC) is the service provider (agent) for the Vacuum Saltwater Disposal System and has no ownership of any portion of pipeline, well, or facility. A consortium of oil producers who own the Hobbs System (System Partners); provide all operating capital on a percentage ownership/usage basis. Major projects require System Partner authorization for expenditures (AFE) approval and work begins as funds are received. We will implement the work

April 13, 2007

Page 2

outlined herein after NMOCD approval and subsequent authorization from the System Partners. The Hobbs SWD system is in abandonment.

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

1. Protects public health.
2. Provides the greatest net environmental benefit.
3. Complies with NMOCD Rules.
4. Is supported by good science.

The last criteria employed when evaluating any proposed remedy or investigative work is confirming that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

Each site shall have three submissions or a combination of:

1. This Investigation and Characterization Plan (ICP), which is a proposal for data gathering, and site characterization and assessment (this submission).
2. Upon evaluation of the data and results from the 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.

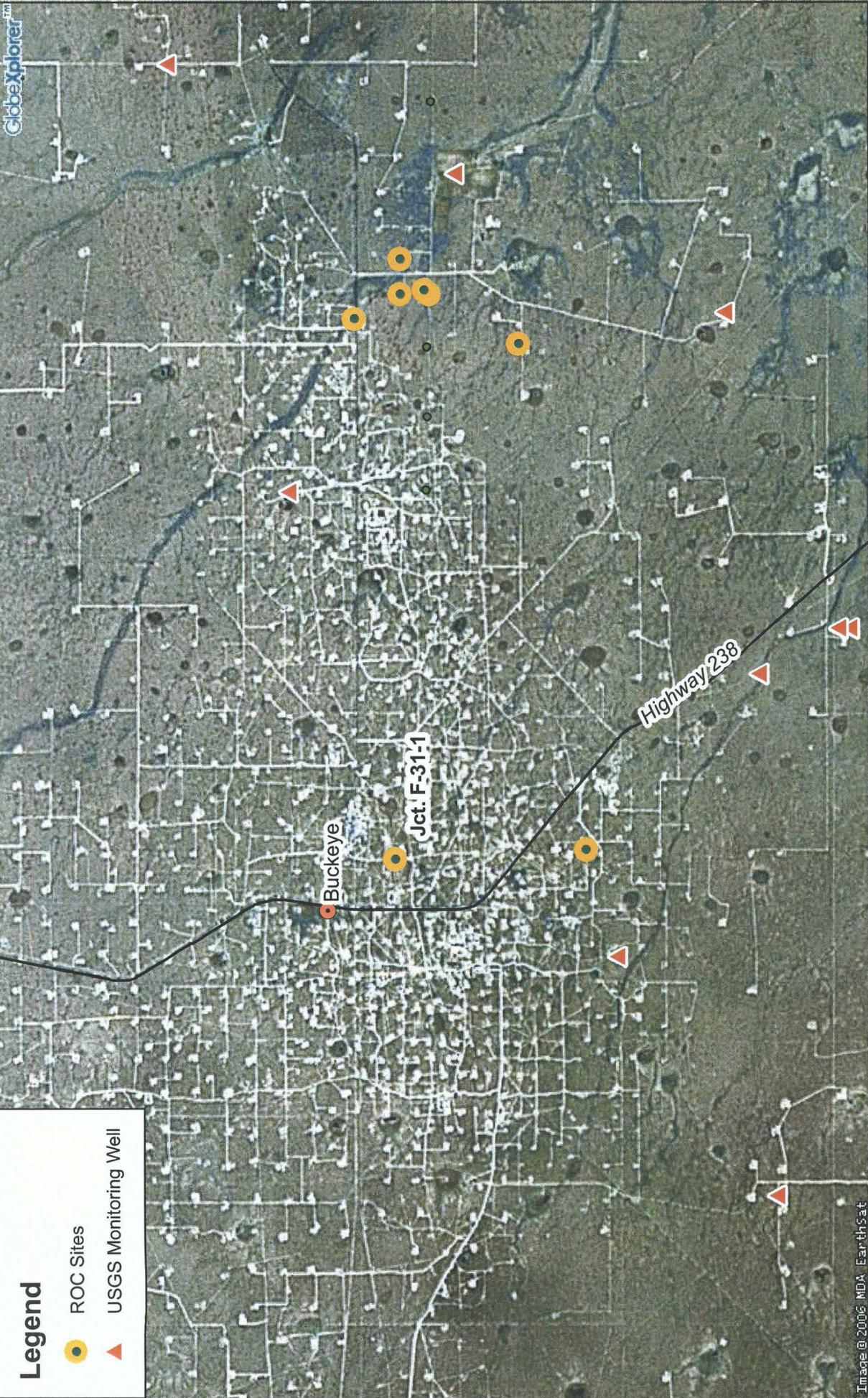
If you have any questions or comments regarding this ICP, please contact Kristin Pope of Rice Operating Company as she has reviewed and approved this submission.

Sincerely,  
R.T. Hicks Consultants, Ltd.



Randall T. Hicks  
Principal

Copy: Rice Operating Company



**Legend**

- ROC Sites
- ▲ USGS Monitoring Well



<b>R.T. Hicks Consultants, Ltd</b> 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location of Jct. F-31-1 relative to Buckeye, New Mexico  Rice Operating Company: Vacuum SWD System	Plate 1  April 2007
---	--	---------------------------

CibbeXplorer™

Image © 2006 MDA EarthSat

**RICE OPERATING COMPANY  
JUNCTION BOX DISCLOSURE REPORT**

BOX LOCATION							BOX DIMENSIONS - FEET		
SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	Length	Width	Depth
Vacuum	jct. F-31-1	F	31	17S	35E	Lea			
							box eliminated - System Abandonment		

LAND TYPE: BLM \_\_\_\_\_ STATE X FEE LANDOWNER \_\_\_\_\_ OTHER \_\_\_\_\_

Depth to Groundwater: 117 feet NMOCD SITE ASSESSMENT RANKING SCORE: 0

Date Started 7/19/2005 Date Completed 2/17/2006 NMOCD Witness no

Soil Excavated 44 cubic yards Excavation Length 10 Width 10 Depth 12 feet

Soil Disposed 24 cubic yards Offsite Facility Sundance/Parabo Location Eunice, NM

FINAL ANALYTICAL RESULTS: Sample Date 7/21/2005 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 NMOCD guidelines.

**CHLORIDE FIELD TESTS**

Sample Location	PID ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	XXX	<10.0	<10.0	4990
BOTTOM COMP.	1.5	<10.0	<10.0	6170
BACKFILL COMP.	4.6	<10.0	<10.0	3570

LOCATION	DEPTH (ft)	ppm	
vertical delineation trench at junction	3	873	
	4	1481	
	5	231	
	6	198	
	7	458	
	8	1891	
	9	2993	
	10	4112	
	11	4731	
	12	6073	
	4-wall comp.	n/a	4867
	bottom comp.	12	7947
backfill comp.	n/a	3467	

**General Description of Remedial Action:**

This junction box was addressed as part of the Vacuum SWD System abandonment. After removing the box materials, delineation trenches were excavated at the site using a tracked white soil samples were collected at regular intervals. Chloride field tests and PID screenings were conducted on each sample. Chloride concentrations were high at 12 ft while PID concentrations were relatively low throughout. After composite samples from the 10 x 10 x 12-ft excavation were collected for laboratory analysis, the excavation was backfilled with the excavated soil to 6 ft BGS. At 6 ft BGS, a 1-ft-thick compacted clay barrier was installed in the excavation. The remaining excavated soil was backfilled on top of the clay. Additional topsoil was imported and backfilled on top of the area. The disturbed surface has been seeded with a blend of native vegetation and will be monitored for growth. An identification plate was placed on the surface of this site to mark the former junction box location for future environmental considerations. NMOCD has been notified of potential groundwater impact at this site. A replacement junction box is not required because the Vacuum SWD System has been abandoned.

**ADDITIONAL EVALUATION IS LOW PRIORITY**

enclosures: chloride graph, photos, lab results, PID field screenings, clay test, clay diagram

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

SITE SUPERVISOR Israel Juarez SIGNATURE [Signature] COMPANY RICE Operating Company

REPORT ASSEMBLED BY Kristin Harris Pope SIGNATURE [Signature]

DATE 4/17/2006 TITLE Project Scientist

\* This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.

## **Appendix A**

### **Rice Operating Company**

#### **QUALITY PROCEDURE - 03**

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

##### **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 large 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.

##### **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<sub>2</sub>O<sub>2</sub>) to mixture.

5.4 Using a 10 ml pipette, carefully add 0.282 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:

$$\frac{0.282 \times 35,450 \times \text{ml AgNO}_3}{\text{ml water extract}} \times \frac{\text{grams of water in mixture}}{\text{grams of soil in mixture}}$$

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.

## **Rice Operating Company**

### **QUALITY PROCEDURE -07** Sampling and Testing Protocol for VOC in Soil

#### **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 prototype 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-O2 and QP-O6. 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.**

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

April 13, 2007

Mr. Wayne Price  
New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

RE: Investigation Characterization Plan: T18S R38E  
Jct. E-4  
Jct. N-4 Vent  
Jct. M-4 Vent  
Hobbs Salt Water Disposal System

Dear Mr. Price:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is pleased to submit this Investigation Characterization Plan (ICP) for the three (3) junction box sites referenced above within the Hobbs Salt Water Disposal System. Plate 1 is a map showing the location of these three sites relative to major roads in the area and other relevant sites.

The work elements proposed to characterize these sites sufficiently to develop an appropriate corrective action are presented below.

1. ROC will identify and document the location of all current and historic equipment and pipelines associated with each site.
2. ROC and Hicks Consultants will use a backhoe, with a 12-foot vertical reach to install a series of sampling trenches in order to recover soil samples and delineate the lateral extent (and potentially the vertical extent) of impacted soil.
3. Soil samples employed for delineation will be obtained from regular intervals below ground surface in each trench.
4. Representative soil samples will be sent to a laboratory to allow for verification of the field results.
5. General soil texture descriptions will be provided for each sample trench.
6. The criteria to delineate the extent of impact is 5 point chloride decline vs. depth, or:
  - a. 250 ppm chloride using field analyses (see attached ROC Quality Procedure in Appendix A) whichever occurs first,
  - b. 100 ppm total hydrocarbon vapors using the headspace method analysis (Appendix A).
  - c. Soil boring to ground water depth should neither (a) nor (b) apply,
  - d. Monitoring well installation if warranted to assess ground water at the site.

Following the site characterization described above, we will submit the data and analysis with a Corrective Action Plan that outlines the procedures for closure of the site.

Rice Operating Company (ROC) is the service provider (agent) for the Hobbs Saltwater Disposal System and has no ownership of any portion of pipeline, well, or facility. A consortium of oil producers who own the Hobbs System (System Partners); provide all operating capital on a percentage ownership/usage basis. Major projects require System Partner authorization for expenditures (AFE) approval and work begins as funds are received. The Hobbs SWD System has been abandoned.

April 13, 2007

Page 2

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

1. Protects public health.
2. Provides the greatest net environmental benefit.
3. Complies with NMOCD Rules.
4. Is supported by good science.

The last criteria employed when evaluating any proposed remedy or investigative work is confirming that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

Each site shall have three submissions or a combination of:

1. This Investigation and Characterization Plan (ICP), which is a proposal for data gathering, and site characterization and assessment (this submission).
2. Upon evaluation of the data and results from the 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.

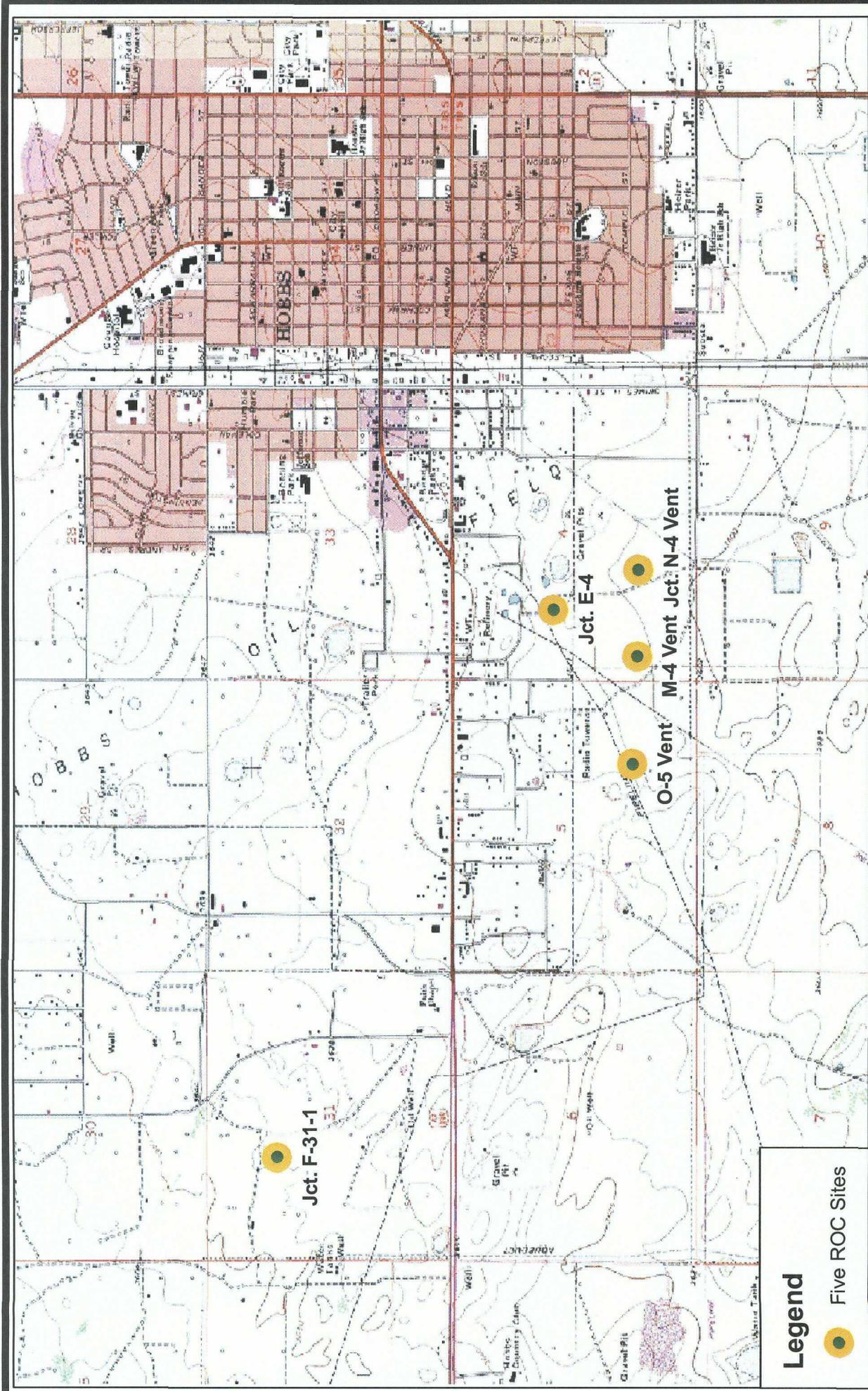
If you have any questions or comments regarding this ICP, please contact Kristin Pope of Rice Operating Company as she has reviewed and approved this submission.

Sincerely,  
R.T. Hicks Consultants, Ltd.



Randall T. Hicks  
Principal

Copy: Rice Operating Company



**Legend**

 Five ROC Sites



<p><b>R.T. Hicks Consultants, Ltd</b>          901 Rio Grande Blvd NW Suite F-142          Albuquerque, NM 87104          Ph: 505.266.5004</p>	<p>Five New Sites Relative to Hobbs, New Mexico</p>	<p>Plate 1</p>
	<p>Rice Operating Company</p>	<p>April 2007</p>

## **Appendix A**

### **Rice Operating Company**

#### **QUALITY PROCEDURE - 03**

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

##### **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 large 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.

##### **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<sub>2</sub>O<sub>2</sub>) to mixture.

5.4 Using a 10 ml pipette, carefully add 0.282 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:

$$\frac{0.282 \times 35,450 \times \text{ml AgNO}_3}{\text{ml water extract}} \times \frac{\text{grams of water in mixture}}{\text{grams of soil in mixture}}$$

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.

## Rice Operating Company

### QUALITY PROCEDURE -07 Sampling and Testing Protocol for VOC in Soil

#### 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 prototype 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-O2 and QP-O6. 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.