1R - 427-95

# WORKPLANS

Date:

5-2-11

Rice Environmental Consulting & Safety
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293



CERTIFIED MAIL
RETURN RECIEPT NO. 7008 1140 0001 3070 5665

**May 2nd, 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: **INVESTIGATION & CHARACTERIZATION PLAN (ICP)**
**Rice Operating Company – EME SWD System**
**EME I-13 EOL (1R427-95): UL/I sec. 13 T19S R36E**
**(formerly EME P-13 EOL)**

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 EME Salt Water Disposal (SWD) system. The site was previously referred to as the EME P-13 EOL. However, the site name has changed to the EME I-13 EOL to match its geographical location. All future correspondence will reference EME I-13 EOL.

ROC is the service provider (agent) for the 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 Parties, who provide all operating capital on a percentage/usage basis. Environmental projects of this nature require System Party AFE approval prior to work commencing at the site. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission is greatly appreciated.

For all such environmental projects, ROC will choose the 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 generally have three submissions:

1. This Investigation and Characterization Plan (ICP) is proposed for gathering data and site characterization and assessment.

2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP) if warranted.

3. Finally, after implementing the remedy, a Termination Request with final documentation will be submitted.

## Background and Previous Work

The site is located approximately 3 miles north-west of Monument, New Mexico at UL/I sec. 13 T19S R36E as shown on the Site Location Map (Figure 1). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 53 +/- feet.

In 2002 ROC initiated work on the former EME I-13 EOL junction box. The site was delineated using a backhoe to form a 30 ft x 30 ft x 13 ft deep excavation and soil samples were screened at regular intervals for both hydrocarbons and chlorides. From the excavation, the four-wall composite, the bottom composite and the backfill were taken to a commercial laboratory for analysis. Laboratory tests of the four-wall composite showed a chloride reading of 1,360 mg/kg, a gasoline range organics (GRO) reading of 1,380 and a diesel range organics (DRO) reading of 2,130 mg/kg. The benzene reading for the four-wall composite was non-detect. The toluene reading was 0.248 mg/kg, the ethyl benzene reading was 0.153, and the total xylene reading was 1.161. The bottom composite showed a chloride laboratory reading of 1,740 mg/kg, a GRO reading of 632 mg/kg and a DRO reading of 64.6 mg/kg. The benzene reading of the bottom composite showed a reading of non-detect. The toluene reading was 0.0355, the ethyl benzene reading was 0.0978 mg/kg and the total xylene reading was 0.803. At the bottom of the excavation, a foot clay barrier was installed to impede vertical migration of chlorides. The soil taken from the excavation was blended and returned to the excavation. Laboratory analysis of the blended backfill showed a chloride reading of non-detect, a GRO reading on non-detect and a DRO reading of 354 mg/kg. BTEX readings of the backfill were non-detect for each constituent.

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. NMOCD was notified of potential groundwater impact on January 31st, 2003 and a junction box disclosure report (Appendix A) was submitted to NMOCD with all the 2002 junction box closures and disclosures.

ROC proposes additional investigative work at the site to determine if there is potential for groundwater degradation from residual chlorides and hydrocarbons at the site.

## Proposed Work Elements

1. Conduct vertical and lateral delineation of residual soil hydrocarbons and chlorides from samples taken using a drill rig, hand auger, and/or backhoe (see Appendix B for Quality Procedures).

a. Vertical sampling will be conducted until the following criteria are met in the field.
    i. Three samples in which the chloride concentration decreases and the third sample has a chloride concentration of ≤ 250 ppm; and,
    ii. Three samples in which PID readings decrease and the third sample has a PID reading of ≤ 100 ppm; or,
    iii. The sampling reaches the capillary fringe.
b. Lateral sampling will be conducted until the following criteria are met in the field.
    i. A decrease is observed in chloride concentrations between lateral bores at similar depths; and,
    ii. A chloride concentration of ≤ 250 ppm is observed in a lateral surface sample; or,
    iii. Safety concerns impede further lateral delineation.

2. If warranted, install a monitor well to provide direct measurement of the potential groundwater impact at the site. (All monitor wells will be installed by EPA, NMOCD, and industry standards.)
3. Evaluate the risk of groundwater impact based on the information obtained.

If the evaluation of the site shows no threat to groundwater from residual chlorides, then only a vadose zone remedy will be undertaken. However, if groundwater shows impact from residual chlorides, a CAP will be developed to address these concerns.

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,

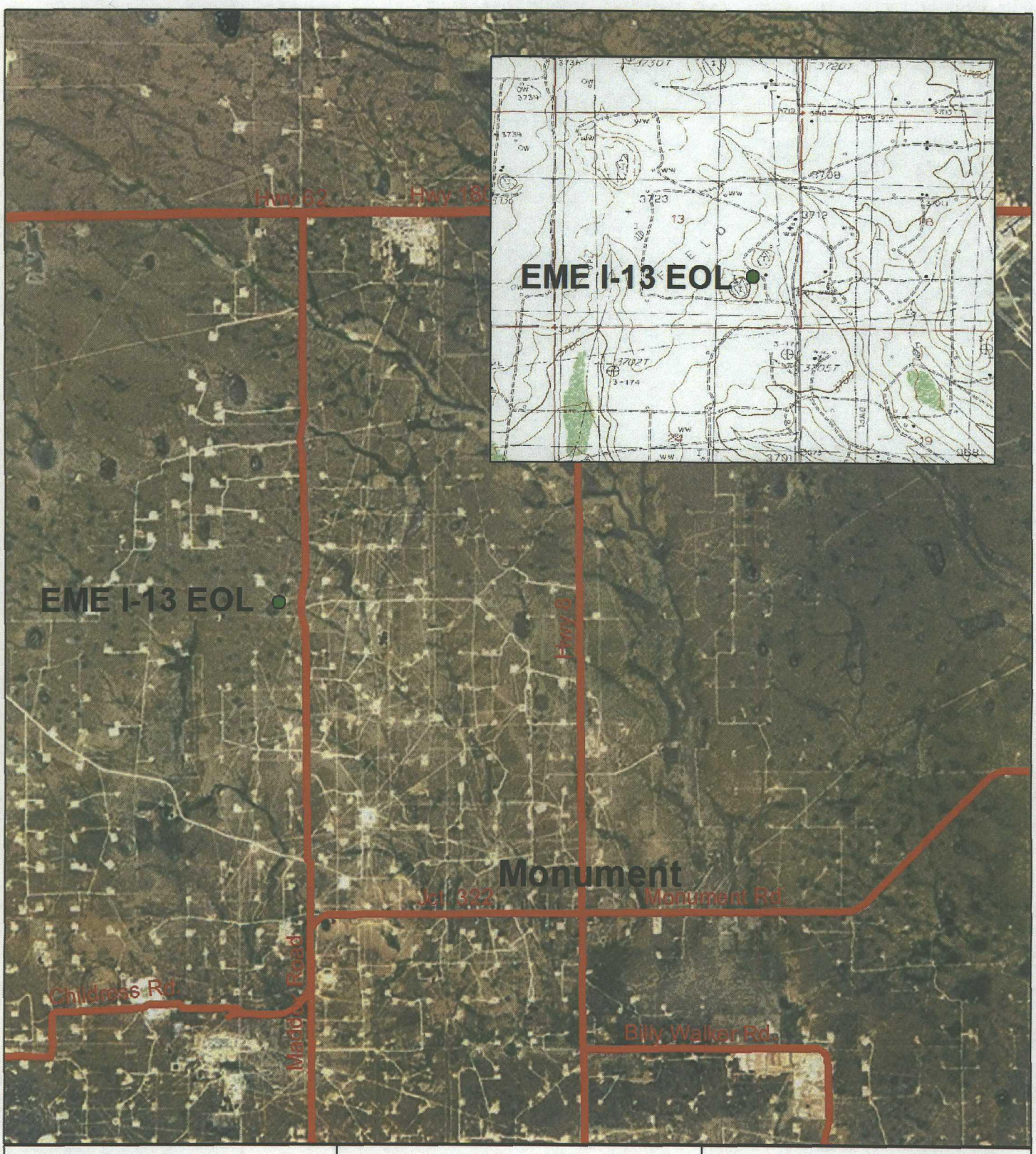
Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

Attachments:

Figures – Site location map
Appendix A – Junction Box Disclosure Report
Appendix B – Quality Procedures

# Figures

**RICE Environmental Consulting and Safety (RECS)**
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293




RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

RECS

# *EME I-13 EOL*

**LEGALS: UL/I sec. 13**
**T19S R36E**

**NMOCD Case #: 1R427-95**

Figure 1

N
W E
S

0 2,300 4,600 9,200
Feet

Drawing date: 4-15-11
Drafted by: L. Weinheimer

# Appendix A

## Junction Box Disclosure Report

**RICE Environmental Consulting and Safety (RECS)**
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

# RICE OPERATING COMPANY
## JUNCTION BOX DISCLOSURE REPORT

### BOX LOCATION

| SWD SYSTEM | JUNCTION | UNIT | SECTION | TOWNSHIP | RANGE | COUNTY | BOX DIMENSIONS - FEET | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Length | Width | Depth |
| EME | P-13 EOL | P | 13 | 19 S | 36 E | Lea | Moved 200' east | | |

LAND TYPE: BLM _____ STATE _____ FEE LANDOWNER El Paso Natural Gas OTHER _____

Depth to Groundwater 53 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 4/8/2002 Date Completed 4/16/2003 OCD Witness No

Soil Excavated 433 cubic yards Excavation Length 30 Width 30 Depth 13 feet

Soil Disposed 36 cubic yards Offsite Facility South Monument Location Monument, NM

## FINAL ANALYTICAL RESULTS: **Sample Date** 4/10/2003 **Sample Depth** 13' bgs

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH, BTEX and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

| Sample Location | Benzene mg/kg | Toluene mg/kg | Ethyl Benzene mg/kg | Total Xylenes mg/kg | GRO mg/kg | DRO mg/kg | Chlorides mg/kg |
|---|---|---|---|---|---|---|---|
| SIDEWALLS | <0.025 | 0.248 | 0.153 | 1.161 | 1380 | 2130 | 1360 |
| BOTTOM | <0.025 | 0.0355 | 0.0978 | 0.803 | 632 | 64.6 | 1740 |
| REMEDIATED | <0.025 | <0.025 | <0.025 | <0.025 | <10.0 | 354 | <20.0 |

General Description of Remedial Action: A 30' x 30' x 13' excavation exhibited relatively consistent chloride impact vertically and TPH concentrations did not meet NMOCD guidelines so a compacted clay barrier was installed at the bottom of the excavation and the soil was blended and backfilled. Because the concentrations did not meet guidelines, this site is reported as a disclosure.

cc: lab results, photos, disposal tickets

CHLORIDE FIELD TESTS

| LOCATION | DEPTH (ft) | ppm |
|---|---|---|
| Vertical | 5 | 200 |
| | 9 | 2100 |
| | 13 | 2800 |
| btm. comp. | 13 | 1900 |
| wall comp. | n/a | 1800 |
| | | |
| | | |
| | | |
| | | |
| | | |

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

DATE 3-27-03 PRINTED NAME Donnie Anderson

SIGNATURE _____ TITLE Environmental Projects Leader

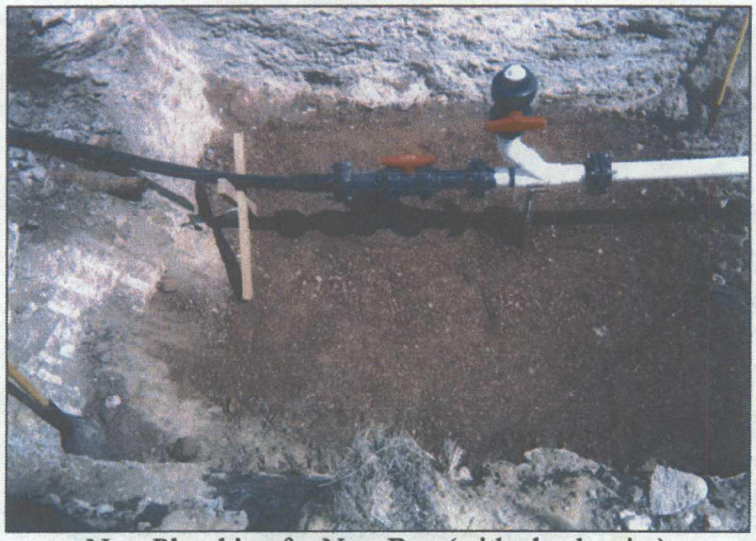
# EME P-13 EOL

Old Junction Box

NORM Removal With Old Plumbing

Impact Excavation with Clay Barrier


Backfilled



New Plumbing for New Box (with clay barrier)

New Junction Box (200' east)

# ANALYTICAL REPORT

## Prepared for:

**DEREK ROBINSON**
**RE ENVIRONMENTAL**
**P.O. BOX 13418**
**ODESSA, TX 79768**

P-13
Monstate

| | |
|---|---|
| **Project:** | Rice Operating |
| **Order#:** | G0203050 |
| **Report Date:** | 04/17/2002 |

**Certificates**
**US EPA Laboratory Code TX00158**

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

RE ENVIRONMENTAL
P.O. BOX 13418
ODESSA, TX 79768
366-0804

Order#: G0203050
Project:
Project Name: Rice Operating
Location: Amerada Monstate

**The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas.**

| Lab ID: | Sample : | Matrix: | Date / Time Collected | Date / Time Received | Container | Preservative |
|---|---|---|---|---|---|---|
| **0203050-01** | 4 PT Wall Comp @ 11' | SOIL | 4/10/02 10:00 | 4/11/02 8:30 | 4 oz Glass | ice |
| | ***Lab Testing:*** | **Rejected:** No | | **Temp:** 12C | | |
| | 8015M<br>8021B/5030 BTEX<br>Chloride | | | | | |
| **0203050-02** | 5Pt Bottom Comp @13' | SOIL | 4/10/02 14:00 | 4/11/02 8:30 | 4 oz Glass | ice |
| | ***Lab Testing:*** | **Rejected:** No | | **Temp:** 12C | | |
| | 8015M<br>8021B/5030 BTEX<br>Chloride | | | | | |

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

| | | | |
|---|---|---|---|
| DEREK ROBINSON | | Order#: | G0203050 |
| RE ENVIRONMENTAL | | Project: | |
| P.O. BOX 13418 | | Project Name: | Rice Operating |
| ODESSA, TX 79768 | | Location: | Amerada Monstate |

Lab ID: 0203050-01
Sample ID: 4 PT Wall Comp @ 11'

### *8015M*

| Method Blank | Date Prepared | Date Analyzed | Sample Amount | Dilution Factor | Analyst | Method |
|---|---|---|---|---|---|---|
| | | 4/11/02 | 1 | 1 | CK | 8015M |

| Parameter | Result mg/kg | RL |
|---|---|---|
| DRO, >C12-C35 | 2130 | 10.0 |
| GRO, C6-C12 | 1380 | 10.0 |
| TOTAL, C6-C35 | 3510 | 10.0 |

### *8021B/5030 BTEX*

| Method Blank | Date Prepared | Date Analyzed | Sample Amount | Dilution Factor | Analyst | Method |
|---|---|---|---|---|---|---|
| 0001183-02 | | 4/10/02 21:57 | 1 | 25 | CK | 8021B |

| Parameter | Result µg/kg | RL |
|---|---|---|
| Benzene | 25.0 | 25.0 |
| Ethylbenzene | 153 | 25.0 |
| Toluene | 248 | 25.0 |
| p/m-Xylene | 912 | 25.0 |
| o-Xylene | 249 | 25.0 |

Lab ID: 0203050-02
Sample ID: 5Pt Bottom Comp @13'

### *8015M*

| Method Blank | Date Prepared | Date Analyzed | Sample Amount | Dilution Factor | Analyst | Method |
|---|---|---|---|---|---|---|
| | | 4/11/02 | 1 | 1 | CK | 8015M |

| Parameter | Result mg/kg | RL |
|---|---|---|
| DRO, >C12-C35 | 64.6 | 10.0 |
| GRO, C6-C12 | 632 | 10.0 |
| TOTAL, C6-C35 | 697 | 10.0 |

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

DEREK ROBINSON
RE ENVIRONMENTAL
P.O. BOX 13418
ODESSA, TX 79768

Order#: G0203050
Project:
Project Name: Rice Operating
Location: Amerada Monstate

Lab ID: 0203050-02
Sample ID: 5Pt Bottom Comp @13'

### *8021B/5030 BTEX*

| Method Blank | Date Prepared | Date Analyzed | Sample Amount | Dilution Factor | Analyst | Method |
|---|---|---|---|---|---|---|
| 0001183-02 | | 4/10/02 22:19 | 1 | 25 | CK | 8021B |

| Parameter | Result µg/kg | RL |
|---|---|---|
| Benzene | <25.0 | 25.0 |
| Ethylbenzene | 97.8 | 25.0 |
| Toluene | 35.5 | 25.0 |
| p/m-Xylene | 629 | 25.0 |
| o-Xylene | 174 | 25.0 |

Approval: Celey D. Keene 4/19/02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

| | | | |
|---|---|---|---|
| DEREK ROBINSON | | Order#: | G0203050 |
| RE ENVIRONMENTAL | | Project: | |
| P.O. BOX 13418 | | Project Name: | Rice Operating |
| ODESSA, TX 79768 | | Location: | Amerada Monstate |

Lab ID: 0203050-01
Sample ID: 4 PT Wall Comp @ 11'

*Test Parameters*

| Parameter | Result | Units | Dilution Factor | RL | Method | Date Analyzed | Analyst |
|---|---|---|---|---|---|---|---|
| Chloride | 1360 | mg/kg | 1 | 5.00 | 9253 | 4/11/02 | SB |

Lab ID: 0203050-02
Sample ID: 5Pt Bottom Comp @13'

*Test Parameters*

| Parameter | Result | Units | Dilution Factor | RL | Method | Date Analyzed | Analyst |
|---|---|---|---|---|---|---|---|
| Chloride | 1740 | mg/kg | 1 | 5.00 | 9253 | 4/11/02 | SB |

Approval: Celey D. Keene 4/19/02
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable



*ENVIRONMENTAL LAB OF TEXAS I, LTD.* 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### 8015M

**Order#: G0203050**

| *BLANK* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
|---|---|---|---|---|---|---|
| TOTAL, C6-C35-mg/kg | 0001182-02 | | | <10.0 | | |
| *CONTROL* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| TOTAL, C6-C35-mg/kg | 0001182-03 | | 1000 | 780 | 78.% | |
| *CONTROL DUP* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| TOTAL, C6-C35-mg/kg | 0001182-04 | | 1000 | 790 | 79.% | 1.3% |
| *SRM* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| TOTAL, C6-C35-mg/kg | 0001182-05 | | 1000 | 940 | 94.% | |

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

## 8021B/5030 BTEX

**Order#: G0203050**

| *BLANK* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
|---|---|---|---|---|---|---|
| Benzene-µg/kg | 0001183-02 | | | <25.0 | | |
| Ethylbenzene-µg/kg | 0001183-02 | | | <25.0 | | |
| Toluene-µg/kg | 0001183-02 | | | <25.0 | | |
| p/m-Xylene-µg/kg | 0001183-02 | | | <25.0 | | |
| o-Xylene-µg/kg | 0001183-02 | | | <25.0 | | |
| *CONTROL* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| Benzene-µg/kg | 0001183-03 | | 100 | 113 | 113.% | |
| Ethylbenzene-µg/kg | 0001183-03 | | 100 | 102 | 102.% | |
| Toluene-µg/kg | 0001183-03 | | 100 | 100 | 100.% | |
| p/m-Xylene-µg/kg | 0001183-03 | | 200 | 220 | 110.% | |
| o-Xylene-µg/kg | 0001183-03 | | 100 | 102 | 102.% | |
| *CONTROL DUP* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| Benzene-µg/kg | 0001183-04 | | 100 | 111 | 111.% | 1.8% |
| Ethylbenzene-µg/kg | 0001183-04 | | 100 | 96 | 96.% | 6.1% |
| Toluene-µg/kg | 0001183-04 | | 100 | 110 | 110.% | 9.5% |
| p/m-Xylene-µg/kg | 0001183-04 | | 200 | 200 | 100.% | 9.5% |
| o-Xylene-µg/kg | 0001183-04 | | 100 | 101 | 101.% | 1.% |
| *SRM* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| Benzene-µg/kg | 0001183-05 | | 100 | 115 | 115.% | |
| Ethylbenzene-µg/kg | 0001183-05 | | 100 | 109 | 109.% | |
| Toluene-µg/kg | 0001183-05 | | 100 | 114 | 114.% | |
| p/m-Xylene-µg/kg | 0001183-05 | | 200 | 230 | 115.% | |
| o-Xylene-µg/kg | 0001183-05 | | 100 | 107 | 107.% | |

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### Test Parameters

Order#: G0203050

| *BLANK* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
|---|---|---|---|---|---|---|
| Chloride-mg/kg | 0001250-01 | | | <5.00 | | |
| *MS* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| Chloride-mg/kg | 0203042-12 | 23000 | 50000 | 72700 | 99.4% | |
| *MSD* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| Chloride-mg/kg | 0203042-12 | 23000 | 50000 | 73600 | 101.2% | 1.2% |
| *SRM* SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
| Chloride-mg/kg | 0001250-04 | | 5000 | 5050 | 101.% | |

# Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax: 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Derek Robinson
Company Name: R.E. Environmental
Company Address:
City/State/Zip:
Telephone No: Fax No:
Sampler Signature: Derek Robinson

Project Name: Rice Operating
Project #:
Project Loc: Amerada Monstate
PO #:

| LAB # (lab use only) | FIELD CODE | Date Sampled | Time Sampled | No. of Containers | Preservative: Ice | Preservative: $HNO_3$ | Preservative: HCl | Preservative: NaOH | Preservative: $H_2SO_4$ | Preservative: None | Preservative: Other (Specify) | Matrix: Water | Matrix: Sludge | Matrix: Soil | Matrix: Other (specify) | Analyze For: TCLP: TOTAL: TDS / SAR / EC | TPH 418.1 | TPH TX 1005/1006 | TPH 8015M GRO/DRO | Metals: As Ag Ba Cd Cr Pb Hg Se | Volatiles | Semivolatiles | BTEX 8021B/5030 | RUSH TAT (Pre-Schedule) | Standard TAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3050-01 | 4 PT wall Comp @ 11' | 4-10-02 | 10:00 am | 1 | ✓ | | | | | | | | | ✓ | | ✓ | | | ✓ | | | | ✓ | | |
| -02 | 5 PT Bottom Comp @ 13' | 4-10-02 | 2:00 pm | 1 | ✓ | | | | | | | | | ✓ | | ✓ | | | ✓ | | | | ✓ | | |

Special Instructions:

Sample Containers Intact? Y N
Temperature Upon Receipt: 1.2°C
Laboratory Comments:

| Relinquished by: | Date | Time | Received by: | Date | Time |
|---|---|---|---|---|---|
| | 4-11-01 | 9:00 AM | | | |
| Relinquished by: | Date | Time | Received by ELOT: | Date | Time |
| | | | Ray Brazzell | 4/11/02 | 8:32 AM |

# ANALYTICAL REPORT

## Prepared for:

**Kristin Farris**
**Rice Operating**
**122 W. Taylor**
**Hobbs, NM 88240**

| | |
|---|---|
| **Project:** | P-13 EOL |
| **PO#:** | 757 |
| **Order#:** | G0306057 |
| **Report Date:** | 03/27/2003 |

**Certificates**
**US EPA Laboratory Code TX00158**

# ENVIRONMENTAL LAB OF TEXAS

## SAMPLE WORK LIST

Rice Operating
122 W. Taylor
Hobbs, NM 88240
505-397-1471

Order#: G0306057
Project:
Project Name: P-13 EOL
Location: EME

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

| Lab ID: | Sample : | Matrix: | Date / Time Collected | Date / Time Received | Container | Preservative |
|---|---|---|---|---|---|---|
| 0306057-01 | Remed. Comp. | SOIL | 3/21/03 | 3/24/03 19:30 | 4 oz glass | Ice |

***Lab Testing:***
8015M
8021B/5030 BTEX
Chloride

**Rejected:** No **Temp:** 1.5 C

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

Kristin Farris
Rice Operating
122 W. Taylor
Hobbs, NM 88240

Order#: G0306057
Project:
Project Name: P-13 EOL
Location: EME

Lab ID: 0306057-01
Sample ID: Remed. Comp.

### 8015M

| Method Blank | Date Prepared | Date Analyzed | Sample Amount | Dilution Factor | Analyst | Method |
|---|---|---|---|---|---|---|
| | | 3/26/03 | 1 | 1 | WL | 8015M |

| Parameter | Result mg/kg | RL |
|---|---|---|
| GRO, C6-C12 | <10.0 | 10.0 |
| DRO, >C12-C35 | 354 | 10.0 |
| TOTAL, C6-C35 | 354 | 10.0 |

| Surrogates | % Recovered | QC Limits (%) | |
|---|---|---|---|
| 1-Chlorooctane | 113% | 70 | 130 |
| 1-Chlorooctadecane | 103% | 70 | 130 |

### 8021B/5030 BTEX

| Method Blank | Date Prepared | Date Analyzed | Sample Amount | Dilution Factor | Analyst | Method |
|---|---|---|---|---|---|---|
| 0005052-02 | | 3/25/03 16:20 | 1 | 25 | CK | 8021B |

| Parameter | Result mg/kg | RL |
|---|---|---|
| Benzene | <0.025 | 0.025 |
| Toluene | <0.025 | 0.025 |
| Ethylbenzene | <0.025 | 0.025 |
| p/m-Xylene | <0.025 | 0.025 |
| o-Xylene | <0.025 | 0.025 |

| Surrogates | % Recovered | QC Limits (%) | |
|---|---|---|---|
| aaa-Toluene | 100% | 80 | 120 |
| Bromofluorobenzene | 92% | 80 | 120 |

Approval: Raland K Tuttle 3-26-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

# ENVIRONMENTAL LAB OF TEXAS

## ANALYTICAL REPORT

Kristin Farris
Rice Operating
122 W. Taylor
Hobbs, NM 88240

Order#: G0306057
Project:
Project Name: P-13 EOL
Location: EME

Lab ID: 0306057-01
Sample ID: Remed. Comp.

*Test Parameters*

| Parameter | Result | Units | Dilution Factor | RL | Method | Date Analyzed | Analyst |
|---|---|---|---|---|---|---|---|
| Chloride | <20.0 | mg/kg | 1 | 20 | 9253 | 3/25/03 | WL |

Approval: Raland K Tuttle 3-27-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.



RL = Reporting Limit N/A = Not Applicable

# ENVIRONMENTAL LAB OF TEXAS

## QUALITY CONTROL REPORT

### 8015M

**Order#: G0306057**

| ***BLANK*** SOIL | LAB-ID # | Sample Concentr. | Spike Concentr. | QC Test Result | Pct (%) Recovery | RPD |
|---|---|---|---|---|---|---|
| TOTAL, C6-C35-mg/kg | 0005062-02 | | | <10.0 | | |
| ***MS*** SOIL | **LAB-ID #** | **Sample Concentr.** | **Spike Concentr.** | **QC Test Result** | **Pct (%) Recovery** | **RPD** |
| TOTAL, C6-C35-mg/kg | 0306058-02 | 50.4 | 952 | 782 | 76.8% | |
| ***MSD*** SOIL | **LAB-ID #** | **Sample Concentr.** | **Spike Concentr.** | **QC Test Result** | **Pct (%) Recovery** | **RPD** |
| TOTAL, C6-C35-mg/kg | 0306058-02 | 50.4 | 952 | 820 | 80.8% | 4.7% |
| ***SRM*** SOIL | **LAB-ID #** | **Sample Concentr.** | **Spike Concentr.** | **QC Test Result** | **Pct (%) Recovery** | **RPD** |
| TOTAL, C6-C35-mg/kg | 0005062-05 | | 1000 | 823 | 82.3% | |

# Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
Fax 915-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Farris
Company Name: RICE Operating
Company Address: 122 W. Taylor
City/State/Zip: Hobbs, NM 88240
Telephone No: (505) 393-9174 Fax No: (505) 397-1471
Sampler Signature: Joe Thatt

Project Name: P-13 EOL
Project #:
Project Loc: EME
PO #: 757

| LAB # (lab use only) | FIELD CODE | Date Sampled | Time Sampled | No. of Containers 4oz: 5/4oz | Preservative: Ice | HNO3 | HCl | NaOH | H2SO4 | None | Other (Specify) | Matrix: Water | Sludge | Soil | Other (specify): | Analyze For: TCLP: 8260 / CL Aromatics | TOTAL: TPH 418.1 | TPH TX 1005/1006 | TPH 8015M GRO/DRO | Metals: As Ag Ba Cd Cr Pb Hg Se | Volatiles | Semivolatiles | BTEX 8021B/5030 | RUSH TAT (Pre-Scheduled) | Standard TAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | Remed. Comp. | 032103 | — | 1 | X | | | | | | | | | X | | X | | | X | | | | X | | |

Special Instructions:
Fax Results.

| Relinquished by: | Date | Time | Received by: | Date | Time |
|---|---|---|---|---|---|
| [signature] | 1630 | | | | |
| Relinquished by: | Date | Time | Received by ELOT: | Date | Time |
| C Chapman | 3/24/03 | 19:30 | [signature] | 3-24-03 | 1930 |

Sample Containers Intact? Y N
Temperature Upon Receipt:
Laboratory Comments:
Ice 1.5°C

# Appendix B
Quality Procedures

**RICE Environmental Consulting and Safety (RECS)**
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

# Rice Environmental Consulting and Safety

## Quality Procedures

Table of Contents

# Rice Environmental Consulting and Safety

## Quality Procedure
## Soil Samples for Transportation to a Laboratory

**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.

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.

**5.0 Sampling Procedure**

5.1 Do not touch the soil with your bare hands. Use new nitrile gloves to help minimize any 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

# Rice Environmental Consulting and Safety

## QUALITY PROCEDURE
## Chloride Titration Using
## 0.282 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 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 20 grams of reverse osmosis water to the soil sample and shake well.

4.3 Allow the sample to set for a period of 5 minutes or until the separation of soil and water.

**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 if necessary.

5.3 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.

5.4 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.

# Rice Environmental Consulting and Safety

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

**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.

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 Environmental Consulting and Safety 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 Environmental Consulting and Safety

## Quality Procedure
## Sampling of Cased Water-Monitoring Well

### 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.

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 | 14 days |
| TPH (8015 Extended) | 40 ounces | (2) 40ml VOA vials | Teflon Lined | HCL and Ice | 14 days |
| PAH | 1 liter | amber glass | Teflon Lined | Ice | 7 days |
| Cation/Anion | 1 liter | HD polyethylene | Any Plastic | None | 48 Hrs |
| Metals | 1 liter | HD polyethylene | Any Plastic | Ice/$HNO_3$ | 28 Days |
| TDS | 300 ml | clear glass or 250 ml HD polyethylene | Any Plastic | Ice | 7 Days |
| Cl- | 500 ml | HD polyethylene | Any Plastic | None | 28 Days |

## 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 or submersible pump, purge a minimum of three well volumes. Place the water in storage container for transport to a ROC disposal facility.

5.3 If using a bailer, take care to insure that the bailing device and string does not become cross-contaminated. A clean pair of nitrile 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 or submersible pump.

6.2 Note the time of collection on the sample jar with a fine Sharpie.

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**
**Formula V= ($\pi r^2 h$)**
**2" well [V/231=gal] X 3 = Purge Volume**

**V**=Volume
**$\pi$**=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 |

# Rice Environmental Consulting and Safety

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

**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.

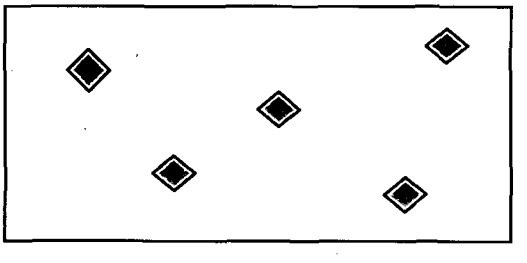
**3.0 Sampling Procedure**

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 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 a labeled baggie.
3.2.3 Repeat steps 3.2.1 through 3.2.4 for each remaining sidewall.
3.2.4 From each labeled baggie, procure a 5 oz portion and pour into a baggie labeled "Sidewall Composite". Blend this soil mixture completely.
3.2.5 Obtain proper laboratory sample container for "Sidewall Composite" and continue with subparagraph 5.3 of QP – 01.

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 baggie.
3.3.3 Obtain proper laboratory sample container for "Bottom Composite" and continue with subparagraph 5.3 of QP – 01.

# Rice Environmental Consulting and Safety

## QUALITY PROCEDURE
## 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 $^{0}$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 a RAE Systems Photoionization device. (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 QP-7. 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.**

# Rice Environmental Consulting and Safety

## Quality Procedure
## Composite Sampling of Excavation Sidewalls and Bottoms For BTEX

**1.0 Purpose**

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

**2.0 Scope**

This procedure is to be used when collecting soil samples intended for ultimate transfer to a testing laboratory for BTEX analysis. This procedure is to be used only when the PID field-test results for OVM exceeds 100 ppm.

**3.0 Preliminary**

3.1 Obtain sterile, clear, 2 oz. glass containers with Teflon lid from a laboratory supply company or the testing laboratory designated to conduct analyses of the soil.

**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.

**5.0 Sampling Procedure**

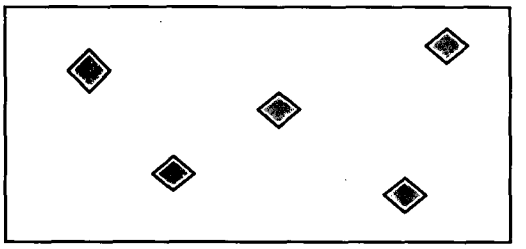
5.1. Do not touch the soil with your bare hands. Use new nitrile gloves to help minimize any cross-contamination.

5.2. If safe and within OSHA regulations, go to the sampling point with the sample container. 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.)

5.3. Sidewall Samples

5.3.1. On each sidewall, procure a 2oz sample from each of five distinct points on the sidewall with distinct points resembling the "W" pattern:



5.4. 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. Repeat for each sampling point.

5.5. Place the samples directly on ice for transport to the laboratory if required.

5.6. 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

# Rice Environmental Consulting and Safety

## Procedure for Plugging & Abandonment of Cased Water Monitoring Wells

**1.0 Purpose**

This procedure outlines the methods to be employed to plug and abandon cased monitoring wells.

**2.0 Scope**

This procedure shall be used for developed, cased water monitoring wells located in the State of New Mexico

**3.0 Preliminary**

**3.1** No well may be drilled, modified or plugged without NMOCD approval. Additional approvals may be required if the well is situated in a sensitive area, within municipal jurisdictions or on federal or tribal lands.

**4.0 Plugging**

**4.1** Each bore will be filled with a 1% - 3% bentonite/concrete slurry to three feet bgs. The remaining three feet will be capped with concrete only.

**4.2** All wellheads will be removed to below ground surface.

**5.0 Records**

**5.1** The company plugging the well shall prepare a report on their company letter head listing the site name and describing general well construction including total depth of the well, the diameter of casing, material used to plug the well (e.g. bentonite/cement slurry), and date of the plugging operation.

**5.2** It is recommended but not required that photographs of the final surface restoration be taken and included within the records.

**5.3** Copies of the plugging report shall be submitted to all appropriate agencies and retained by the well operator for a minimum period of ten years.