# 1R - 427 - 47

# REPORTS

# DATE:

# 2-19-2004

EME K-18
IRO 427-47

# FINAL

# REPORT

# RICE OPERATING COMPANY
## JUNCTION BOX FINAL REPORT

BOX LOCATION

| SWD SYSTEM | JUNCTION | UNIT | SECTION | TOWNSHIP | RANGE | COUNTY | BOX DIMENSIONS - FEET | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Length | Width | Depth |
| EME | K-18 | K | 18 | 19S | 37E | Lea | Eliminated | | |

LAND TYPE: BLM _____ STATE X FEE LANDOWNER _____ OTHER _____

Depth to Groundwater 52 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 12/1/2003 Date Completed 12/12/2003 OCD Witness No

Soil Excavated 178 cubic yards Excavation Length 20 Width 20 Depth 12 feet

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

## FINAL ANALYTICAL RESULTS: **Sample Date** 12/3/2003 **Sample Depth** 12 ft 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 | PID ppm | GRO mg/kg | DRO mg/kg | Chloride mg/kg |
|---|---|---|---|---|
| SIDEWALLS | 0.0 | <10.0 | <10.0 | 320 |
| BOTTOM | 0.0 | <10.0 | <10.0 | 528 |
| REMEDIATED | 433.0 | <10.0 | 95.7 | 464 |
| SOIL BORE @ 26 ft | XXX | XXX | XXX | 352 |

General Description of Remedial Action: This site was delineated with a backhoe producing a 20 x 20 x 12-ft-deep excavation. Although chloride concentrations declined with depth, a slight increase that occurred at 14 ft caused concern. TPH concentrations were below NMOCD guidelines. On 1/2/2004, a soil bore was initiated to confirm the decline and the extent of chloride impact was found at 26 ft bgs. At this depth, very hard caliche was encountered and the bore machine could not advance any deeper. Field tests of split spoon samples to 26 ft create a conclusive declination trend of chloride concentrations (see graph). The excavation was backfilled to 6 ft bgs. At 6 ft, a 1.5 compacted clay barrier was installed to inhibit further chloride migration (see diagram). The remaining soil was backfilled on top of the clay and the surface was contoured.

enclosures: chloride graph, photos, lab results, PID readings, bore log, diagram, clay compaction test

CHLORIDE FIELD TESTS

| LOCATION | DEPTH (ft) | ppm |
|---|---|---|
| Vertical | 7 | 1305 |
| | 8 | 1272 |
| | 9 | 1154 |
| | 10 | 1272 |
| | 11 | 1251 |
| | 12 | 1117 |
| | 13 | 754 |
| | 14 | 922 |
| soil bore | 15 | 473 |
| | 20 | 300 |
| | 25 | 250 |
| | 26 | 296 |
| 4-wall comp. | n/a | 327 |
| bottom comp. | 12 | 504 |
| remed. comp. | na | 419 |

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

DATE 2/19/2004 PRINTED NAME Kristin Farris

SIGNATURE Kristin Farris TITLE Project Scientist

# EME jct. K-18

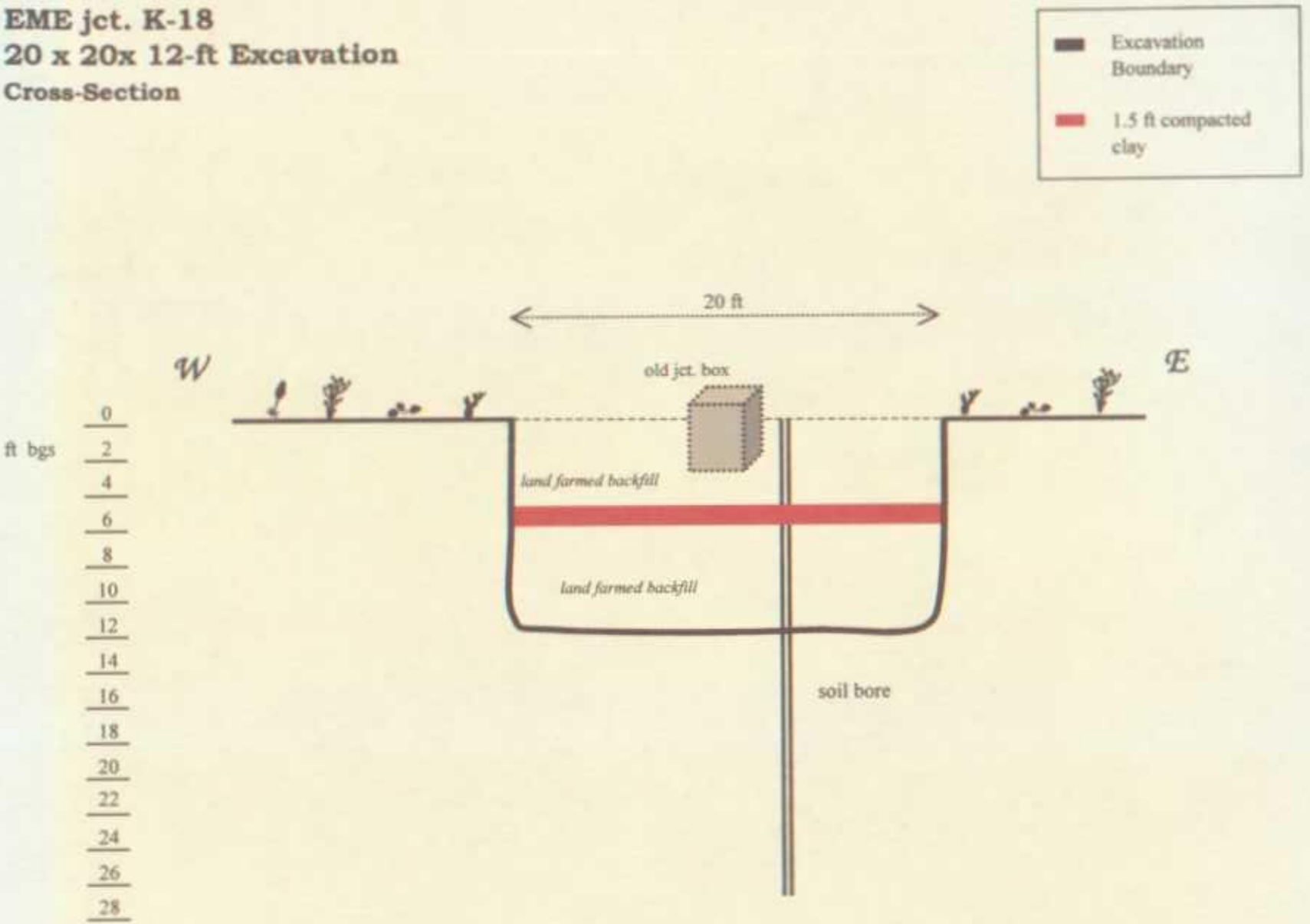
Undisturbed Junction Box 10/2/2003

Compacted Clay Barrier Installed at 6 ft bgs

Backfilled Site

Soil Bore Delineation 1/2/2004

**EME jct. K-18**
**20 x 20x 12-ft Excavation**
**Cross-Section**



# EME jct. K-18

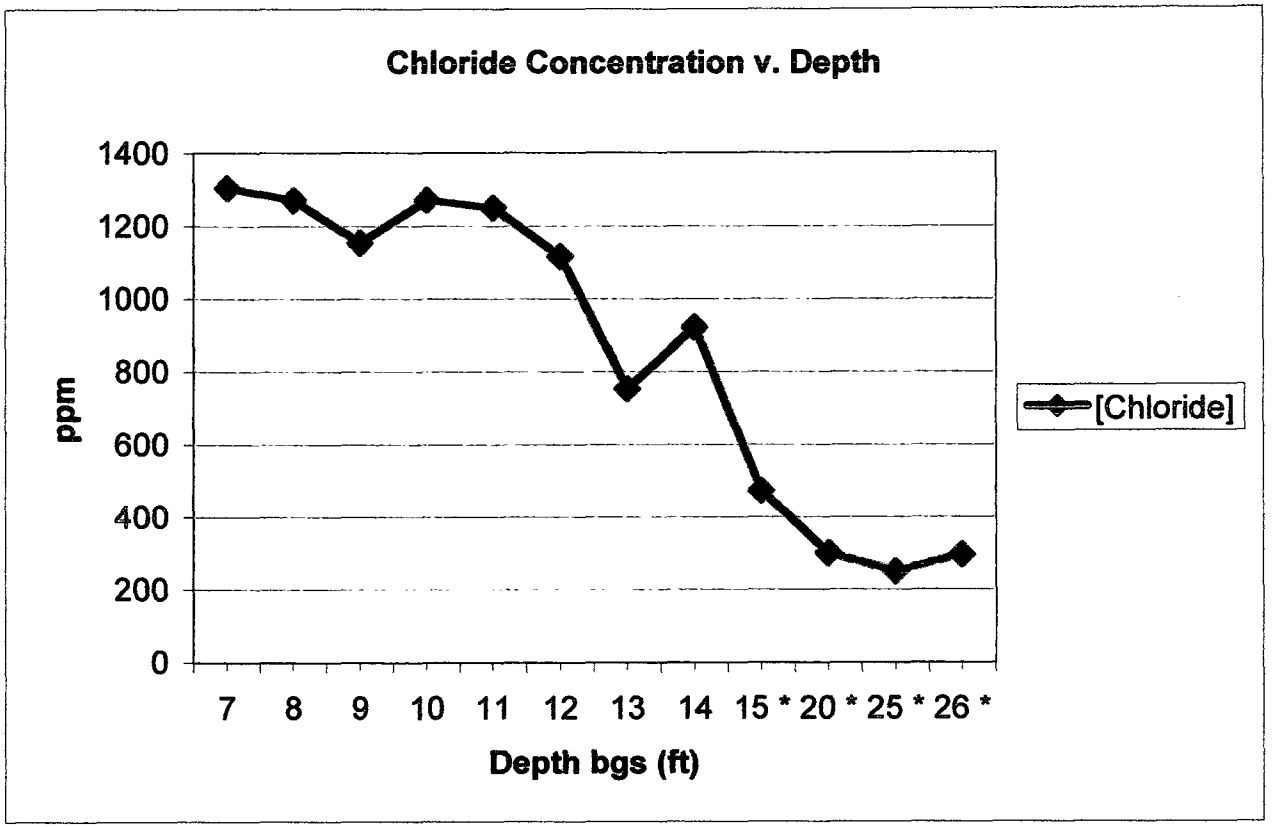
T19S, R37E

*Vertical Delineation at Source*

| Depth bgs (ft) | [Cl⁻] ppm |
|---|---|
| 7 | 1305 |
| 8 | 1272 |
| 9 | 1154 |
| 10 | 1272 |
| 11 | 1251 |
| 12 | 1117 |
| 13 | 754 |
| 14 | 922 |
| 15 * | 473 |
| 20 * | 300 |
| 25 * | 250 |
| 26 * | 296 |

Groundwater = 52 ft

* Soil bore samples



| | | | |
|---|---|---|---|
| **Logger:** | Joe Gatts; Mort Bates | **Client:** | **Well ID:** |
| **Driller:** | Atkins Engineering Associates, Inc. | RICE Operating Company | |
| **Drilling Method:** | Hollow Stem Auger | **Project Name:** | |
| **Start Date:** | 1/2/2004 | jct. K-18 | |
| **End Date:** | 1/2/2004 | **Location:** | **SB-1** |
| **Notes:** | Backfilled with drill cuttings; TD = 27 ft; Groundwater = 52 ft | EME SWD System | |
| | | Sec. 18, T19S, R37E | |
| | | Lea County, NM | |

| Depth (feet) | Split Spoon chloride | Split Spoon PID | Description | Lithology | Additional Notes |
|---|---|---|---|---|---|
| 0.0 | | | Silty Sand mixed with Broken Caliche: loose, tan, dry | Hydrated Bentonite Seal 3-9 ft | Blended backfill from backhoe excavation |
| 1.0 | | | | | |
| 2.0 | | | | | |
| 3.0 | | | | | |
| 4.0 | | | | | |
| 5.0 | | | | | |
| 6.0 | | | | | |
| 7.0 | | | | | |
| 8.0 | | | | | |
| 9.0 | | | | | |
| 10.0 | | | | | |
| 11.0 | | | | | |
| 12.0 | | | Caliche: firm, light gray, dry | | |
| 13.0 | | | | | |
| 14.0 | | | | | |
| 15.0 | 473 | no odor | | | |
| 16.0 | | | | | |
| 17.0 | | | | | |
| 18.0 | | | Silty Sand: loose, tan, dry | | |
| 19.0 | | | | | |
| 20.0 | 300 | no odor | | | |
| 21.0 | | | Caliche: hard, light tan, dry | | |
| 22.0 | | | | | |
| 23.0 | | | | | |
| 24.0 | | | | | |
| 25.0 | 250 | no odor | | | |
| 26.0 | 296 | no odor | | | lab = 352 ppm $Cl^-$ |
| 27.0 | | | | | |

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: KRISTIN FARRIS
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (505) 397-1471

Receiving Date: 01/05/04
Reporting Date: 01/06/04
Project Number: NOT GIVEN
Project Name: K-18
Project Location: EME

Analysis Date: 01/06/04
Sampling Date: 01/02/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

| LAB NUMBER | SAMPLE ID | $Cl^-$ (mg/Kg) |
|---|---|---|
| H8320-1 | SOIL BORE 26' BGS | 352 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Quality Control | | 1010 |
| True Value QC | | 1000 |
| % Recovery | | 101 |
| Relative Percent Difference | | 7.0 |

| METHOD: Standard Methods | 4500-$Cl^-$B |
|---|---|

Note: Analysis performed on a 1:4 w:v aqueous extract.

Chemist

1/6/04
Date

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h8320

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST


**CARDINAL LABORATORIES, INC.**

2111 Beechwood, Abilene, TX 79603 (915) 673-7001 Fax (915) 673-7020

101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476


Page ____ of ____

| | |
|---|---|
| Company Name: RICE Operating | BILL TO |
| Project Manager: Kristin Farris | P.O. #: |
| Address: 122 W Taylor | Company: RICE |
| City: Hobbs State: NM Zip: 88240 | Attn: |
| Phone #: 393-9174 Fax #: 397-1471 | Address: |
| Project #: Project Owner: | City: |
| Project Name: K-18 | State: Zip: |
| Project Location: EME | Phone #: |
| Sampler Name: J. Watts | Fax #: |

ANALYSIS REQUEST: Chloride

| FOR LAB USE ONLY Lab I.D. | Sample I.D. | (G)RAB OR (C)OMP. | # CONTAINERS | MATRIX: GROUNDWATER | WASTEWATER | SOIL | CRUDE OIL | SLUDGE | OTHER: | PRESERV: ACID/BASE: | ICE / COOL | OTHER: | SAMPLING: DATE | TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H8520-1 | Soil Bore 26'bgs | 6 | 1 | | | x | | | | | x | | 1/2/04 | 1030 |

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| | | | |
|---|---|---|---|
| Sampler Relinquished: J. Watts | Date: 1/5/04 Time: 930 | Received By: | Phone Result: ☐ Yes ☐ No Add'l Phone #: |
| Relinquished By: | Date: 1/5/04 Time: 10:30 | Received By: (Lab Staff) | Fax Result: ☒ Yes ☐ No Add'l Fax #: |
| | | | REMARKS: Fax to RICE |
| Delivered By: (Circle One) Sampler - UPS - Bus - Other: | Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No | CHECKED BY: (Initials) | |

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.

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PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: KRISTIN FARRIS
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (505) 397-1471

Receiving Date: 12/03/03
Reporting Date: 12/04/03
Project Number: NOT GIVEN
Project Name: EME K-18
Project Location: LEA CO., NM

Sampling Date: 12/03/03
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: BC/AH

| LAB NUMBER | SAMPLE ID | GRO ($C_6$-$C_{10}$) (mg/Kg) | DRO (>$C_{10}$-$C_{28}$) (mg/Kg) | Cl* (mg/Kg) |
|---|---|---|---|---|
| ANALYSIS DATE | | 12/03/03 | 12/03/03 | 12/04/03 |
| H8218-1 | BOTTOM 12' | <10.0 | <10.0 | 528 |
| H8218-2 | 4 WALL COMP. | <10.0 | <10.0 | 320 |
| H8218-3 | REMEDIATED BACKFILL | <10.0 | 95.7 | 464 |
| | | | | |
| | | | | |
| Quality Control | | 764 | 779 | 1010 |
| True Value QC | | 800 | 800 | 1000 |
| % Recovery | | 95.5 | 97.4 | 101 |
| Relative Percent Difference | | 0.8 | 0.5 | 1.0 |

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; $Cl^-$: Std. Methods 4500-$Cl^-$B
*Analyses performed on 1:4 w:v aqueous extracts.

Burgess J. A. Cooke
Chemist

12/4/03
Date

H8218.XLS

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# CHAIN OF CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES, INC.
2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

Page ____ of ____

| | | | |
|---|---|---|---|
| Company Name: | RICE Operating Company | BILL TO | |
| Project Manager: | Kristin Farris | P.O. #: | |
| Address: | 122 W. Taylor | Company: | RICE |
| City: | Hobbs, | State: NM Zip: 88240 | Attn: |
| Phone #: | 393-9174 | Fax #: 397-1471 | Address: |
| Project #: | | Project Owner: | City: |
| Project Name: | EME 15-18 | | State: Zip: |
| Project Location: | Lea | | Phone #: |
| Sampler Name: | Gary Stark | | Fax #: |

ANALYSIS REQUEST: TPH 8015 | Chlorides

| FOR LAB USE ONLY | | | | MATRIX | | | | | | | PRESERV | | | SAMPLING | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab I.D. | Sample I.D. | (G)RAB OR (C)OMP. | # CONTAINERS | GROUNDWATER | WASTEWATER | SOIL | CRUDE OIL | SLUDGE | OTHER: | ACID/BASE: | ICE / COOL | OTHER: | DATE | TIME | | |
| H8218-1 | Bottom 12' | C | G | | | X | | | | | X | | 12/3 | 12:41 | X | X |
| -2 | 4 Wall comp | C | G | | | X | | | | | X | | 12/3 | 12:54 | X | X |
| -3 | Remediated Backfill | C | G | | | X | | | | | X | | 12/3 | 12:30 | X | X |

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Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collection, including attorney's fees.

| | | | | | |
|---|---|---|---|---|---|
| Sampler Relinquished: | Date: | Received By: | Phone Result: | ☐ Yes | ☐ No |
| | Time: | | Fax Result: | ☐ Yes | ☐ No |
| Relinquished By: | Date: 12/3/23 | Received By: (Lab Staff) | REMARKS: Fax price & copy | | |
| Gary Stark | Time: 4:08 PM | | | | |
| Delivered By: (Circle One) | Sample Condition: Cool: ☐ Yes ☐ No; Intact: ☑ Yes ☐ No | CHECKED BY: (Initials) | | | |
| Sampler - UPS - Bus - Other: | | | | | |

Add'l Phone #:
Add'l Fax #:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.

# ENVIRONMENTAL TECHNOLOGY GROUP, INC.

2540 WEST MARLAND
HOBBS, NEW MEXICO 88240
PHONE: (505) 397-4882 FAX: (505) 397-4701

## VOC FIELD TEST REPORT FORM

MINI RAE PLUS CLASSIC PHOTOIONIZATION GAS DETECTOR

MODEL NO: PGM 761S
SERIAL NO: 103999
CALIBRATION GAS
GAS COMPOSITION: ISOBUTYLENE
100 PPM
AIR
BALANCE
LOT NO: 67401
FILL DATE: 12-3-03
EXP. DATE: 11/04
ACCURACY: 100ppm ± 2%
METER READING
ACCURACY: 99.4

| SYSTEM | JUNCTION | UNIT | SECTION | TOWNSHIP | RANGE |
|---|---|---|---|---|---|
| EME | K-18 | K | 18 | T19S | R37E |

| SAMPLE | PID RESULT | SAMPLE | PID RESULT |
|---|---|---|---|
| Composite | | 4 Wall | 0.0 |
| Samples | | | |
| | | Remediated | |
| 10' North | 0.0 | backfill | 433 |
| | | | |
| 10' South | 0.0 | | |
| | | | |
| 10' west | 0.0 | | |
| | | | |
| 10' East | 0.0 | | |
| | | | |
| Bottom 12' | 0.0 | | |
| | | | |

I certify that I have calibrated the above instrument in accordance to the manufacture operation manual.

Signature | Field Tech (Title) | 12-3-03 (Date)

LABORATORY TEST REPORT
PETTIGREW and ASSOCIATES, P.A.
1110 N. GRIMES
HOBBS, NM 88240
(505) 393-9827

AASHTO R18

DEBRA P. HICKS, P.E./L.S.I.
WILLIAM M. HICKS, III, P.E./P.S.

RECEIVED
DEC 1 8 2003
RICE OPERATING
HOBBS, NM

**To:** Rice Operating Corporation
Attn: Carolyn Haynes
122 W. Taylor
Hobbs, NM 88240

**Material:** Red Clay

**Test Method:** ASTM: D 2922

**Project:** EME K-18

**Date of Test:** December 12, 2003

**Depth:** Finished Subgrade

| Test No. | Location | Dry Density % Maximum | % Moisture | Depth |
|---|---|---|---|---|
| SG-1 | Pit - 10' S. & 3' E. of the NW Corner | 95.0 | 20.9 | |

**Control Density:** 104.2
ASTM: D 698

**Optimum Moisture:** 21.4%

**Required Compaction:** 95%

**Lab No.:** 03 7641-7642

**Copies To:** Rice Operating

**PETTIGREW and ASSOCIATES**

BY: _____ S.E./T.