**Department of Energy**
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

SEP 19 1990

SEP 1990 RECEIVED HAZARDOUS WASTE PROGRAM

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Kathleen Sisneros, Director
Hazardous Waste Bureau
New Mexico Environmental Improvement Division
Harold Runnels Building
1190 St. Francis Dr.
Santa Fe, NM 87503

Dear Ms. Sisneros:

This letter transmits the closure documentation for the Technical Area (TA) 16 Surface Impoundment.

Los Alamos National Laboratory (LANL) received an approved Resource Conservation and Recovery Act (RCRA) closure plan for the TA-16 Surface Impoundment on February 12, 1990. Upon the receipt of this document, LANL proceeded with the closure of this unit. This closure was completed on June 12, 1990. Enclosure 1 and 1a are the Closure Certifications. All closure activities were completed within the Closure Schedule time frame listed in Section 5.1.9 of the closure plan.

LANL's Analytical Chemistry Group (HSE-9) performed the analytical tests for this closure. International Technology Analytical Services was used for duplicate analyses. All analyses, quality assurance, and quality control follow methods defined in the Environmental Protection Agency methods described in document number SW-846. A summary of the analyses and the Laboratory reports are Enclosures 2 and 3 respectively. Tetrachloroethylene was identified by both laboratories in one of the samples. The Environmental Improvement Division determined that, based on the levels of this contaminant found (29 parts per billion), the contamination could be left in place and a clean closure status could still be obtained. (See Enclosure 4.) A map of the sample locations is included as Enclosure 5.

David McInroy, with the Laboratory's Environmental Protection Group (HSE-8), was responsible for the oversight and the quality of the performance of this closure. His Quality Assurance/Quality Control (QA/QC) statement is Enclosure 6.

5913

All supporting documentation pertaining to this closure is currently on file with HSE-8. At some point in the future, these files will be permanently transferred to the Environmental Restoration Program Office of the Health, Safety and Environment Division Office HSE-DO/ER.

A certification of accuracy can be found in Enclosure 7. The Enclosure is a Certificate of Disposal for the waste generated during closure.

Should you require further information, please contact Dr. Paul Schumann of my staff at 665-5027.

Sincerely,

for Harry T. Season, Jr.
Acting Area Manager

LESH:2DG-458-9

Enclosures

cc:
A. Tiedman, ADO, LANL, MS-A120
Steve Slaten, EPA, Region 6
J. Themelis, Director, EPD/AL

TA-16

LIBRARY COPY

# CLOSURE REPORT

## TECHNICAL AREA 16
## SURFACE IMPOUNDMENT

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

# Attachment 1 and 1a

# Certifications of Closure

Attachment 1

**CERTIFICATION OF CLOSURE**

I certify that the Surface Impoundment [SWMU number 16-0008 (b)] at Technical Area (TA) 16 has been closed in accordance with the specifications in the approved closure plan. The closure was performed under my direction in accordance with a system designed to assure that qualified personnel properly conduct closure activities. To the best of my knowledge and belief, based on my inquiry of the person or persons who manage the system, or those persons directly responsible for closure activities, the closure was conducted as specified. I am aware that there are significant penalties for submitting false information, including the possibility of fines or imprisonment for knowing violations.

LAGritzo for
Allen J. Tiedman
Associate Director for Operations
Los Alamos National Laboratory
Operator

18 Sept 1990
Date Signed

for Harry T. Season, Jr.
Area Manager
Los Alamos Area Office
U. S. Department of Energy
Albuquerque Operations
Owner

9/19/90
Date Signed

Attachment 1a

# Santa Fe Engineering, Ltd.

POST OFFICE BOX 1764 SANTA FE, NEW MEXICO 87504-1764 TEL (505) 988-7438 FAX (505) 983-5608

September 10, 1990

Mr. David McInroy
Environmental Protection
Los Alamos National Laboratory
P.O. Box 1663 MS K490
Los Alamos, New Mexico 87545

Dear Mr. McInroy:

I have reviewed the closure plan and analytical data resulting from sampling specific areas of the TA-16 Surface Impoundment. I have visited the site during various stages of closure. Based upon my observations, it is my opinion that closure was performed in accordance with the elements of the closure plan.

Sincerely,

Lauren B. Ames

Lauren B. Ames, PE
President

LAUREN B. AMES
NEW MEXICO
10254
REGISTERED PROFESSIONAL ENGINEER

# Attachment 2

# Summary of Analyses

Attachment 2

## SUMMARY OF ANALYSES[1]

| Sample Location | Metals (EP Toxicity) | Volatile Organics (8260) | Semi Volatile Organics (8270) |
|---|---|---|---|
| 1 | ND | ND | ND |
| 2 | ND | ND | ND |
| 3 | ND | ND | ND |
| 4 | ND | ND | ND |
| 5 | ND | ND | ND |
| 6 | ND | ND | ND |
| 7 | ND | ND | ND |
| 8 | ND | ND | ND |
| 9 | ND | ND | ND |
| 10 | ND | ND | ND |
| 11 | ND | ND | ND |
| 12 | ND | 29 ppb, 16 ppb[2] | ND |

**ND** Not detected above the limits of quantitation.

*1* Detection limits and Analytical precision data are provided in Attachment 3.

*2* Sample Results from duplicate sent to IT Analytical Services.

April 2, 1990

Dave,

Attached you will find the **final** report for the soil samples you submitted for VOA analysis under the request #10158. Sample #'s 90.11347 thru 90.11357 did not contain any detectable volatile target components above the Limit of Quantitation (LOQ). Sample #90.11358 did contain Tetrachloroethene at a concentration of 29 ug/kg (ppb). This component was not detected in the laboratory blank. No non-target volatile components were detected in any of the samples at any significant levels. If you have any questions regarding these results, please do not hesitate to contact me at 5-4792 or stop by my office (TA-59, OH-1, Room 115).

Thank you for your continued support of our VOA analysis program.

Chuck Rzeszutko

Organic Section Leader

HSE-9

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-1,13,25 | 90.11347 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-1,13,25 | 90.11347 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-1,13,25 | 90.11347 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-1,13,25 | 90.11347 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-1,13,25 | 90.11347 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-1,13,25 | 90.11347 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-1,13,25 | 90.11347 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-1,13,25 | 90.11347 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-1,13,25 | 90.11347 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-1,13,25 | 90.11347 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-1,13,25 | 90.11347 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-1,13,25 | 90.11347 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-1,13,25 | 90.11347 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-1,13,25 | 90.11347 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-1,13,25 | 90.11347 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-1,13,25 | 90.11347 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-1,13,25 | 90.11347 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-1,13,25 | 90.11347 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-1,13,25 | 90.11347 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-1,13,25 | 90.11347 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-1,13,25 | 90.11347 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-1,13,25 | 90.11347 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-1,13,25 | 90.11347 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-1,13,25 | 90.11347 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-1,13,25 | 90.11347 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-1,13,25 | 90.11347 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-1,13,25 | 90.11347 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-1,13,25 | 90.11347 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-1,13,25 | 90.11347 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-1,13,25 | 90.11347 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-1,13,25 | 90.11347 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-1,13,25 | 90.11347 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-1,13,25 | 90.11347 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-1,13,25 | 90.11347 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-1,13,25 | 90.11347 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-1,13,25 | 90.11347 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-1,13,25 | 90.11347 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-1,13,25 | 90.11347 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-1,13,25 | 90.11347 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-1,13,25 | 90.11347 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-1,13,25 | 90.11347 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-1,13,25 | 90.11347 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-1,13,25 | 90.11347 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-1,13,25 | 90.11347 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-1,13,25 | 90.11347 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-1,13,25 | 90.11347 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-1,13,25 | 90.11347 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-1,13,25 | 90.11347 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-1,13,25 | 90.11347 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-1,13,25 | 90.11347 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-1,13,25 | 90.11347 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-1,13,25 | 90.11347 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-1,13,25 | 90.11347 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-1,13,25 | 90.11347 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-1,13,25 | 90.11347 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-1,13,25 | 90.11347 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-1,13,25 | 90.11347 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-1,13,25 | 90.11347 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-1,13,25 | 90.11347 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-1,13,25 | 90.11347 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-1,13,25 | 90.11347 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-1,13,25 | 90.11347 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-2,14,26 | 90.11348 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-2,14,26 | 90.11348 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-2,14,26 | 90.11348 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-2,14,26 | 90.11348 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-2,14,26 | 90.11348 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-2,14,26 | 90.11348 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-2,14,26 | 90.11348 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-2,14,26 | 90.11348 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-2,14,26 | 90.11348 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-2,14,26 | 90.11348 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-2,14,26 | 90.11348 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-2,14,26 | 90.11348 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-2,14,26 | 90.11348 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-2,14,26 | 90.11348 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-2,14,26 | 90.11348 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-2,14,26 | 90.11348 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-2,14,26 | 90.11348 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-2,14,26 | 90.11348 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-2,14,26 | 90.11348 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-2,14,26 | 90.11348 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-2,14,26 | 90.11348 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-2,14,26 | 90.11348 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-2,14,26 | 90.11348 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-2,14,26 | 90.11348 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| [illegible] | 90.11348 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-2,14,26 | 90.11348 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-2,14,26 | 90.11348 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-2,14,26 | 90.11348 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-2,14,26 | 90.11348 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-2,14,26 | 90.11348 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-2,14,26 | 90.11348 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-2,14,26 | 90.11348 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-2,14,26 | 90.11348 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-2,14,26 | 90.11348 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-2,14,26 | 90.11348 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-2,14,26 | 90.11348 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-2,14,26 | 90.11348 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-2,14,26 | 90.11348 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-2,14,26 | 90.11348 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-2,14,26 | 90.11348 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-2,14,26 | 90.11348 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-2,14,26 | 90.11348 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-2,14,26 | 90.11348 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-2,14,26 | 90.11348 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-2,14,26 | 90.11348 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-2,14,26 | 90.11348 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-2,14,26 | 90.11348 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-2,14,26 | 90.11348 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-2,14,26 | 90.11348 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-2,14,26 | 90.11348 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-2,14,26 | 90.11348 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-2,14,26 | 90.11348 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-2,14,26 | 90.11348 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-2,14,26 | 90.11348 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-2,14,26 | 90.11348 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-2,14,26 | 90.11348 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-2,14,26 | 90.11348 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-2,14,26 | 90.11348 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-2,14,26 | 90.11348 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-2,14,26 | 90.11348 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-2,14,26 | 90.11348 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-2,14,26 | 90.11348 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-2,14,26 | 90.11348 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-2,14,26 | 90.11348 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-3,15,27 | 90.11349 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-3,15,27 | 90.11349 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-3,15,27 | 90.11349 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-3,15,27 | 90.11349 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-3,15,27 | 90.11349 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-3,15,27 | 90.11349 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-3,15,27 | 90.11349 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-3,15,27 | 90.11349 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-3,15,27 | 90.11349 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-3,15,27 | 90.11349 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-3,15,27 | 90.11349 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-3,15,27 | 90.11349 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-3,15,27 | 90.11349 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-3,15,27 | 90.11349 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-3,15,27 | 90.11349 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-3,15,27 | 90.11349 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-3,15,27 | 90.11349 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-3,15,27 | 90.11349 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-3,15,27 | 90.11349 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-3,15,27 | 90.11349 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-3,15,27 | 90.11349 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-3,15,27 | 90.11349 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-3,15,27 | 90.11349 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-3,15,27 | 90.11349 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-3,15,27 | 90.11349 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

Xcpt to: J. White A.I. ASE-8 due 11/18/88

DISPOSITION JPB 10/6

NEW MEXICO
HEALTH AND ENVIRONMENT
DEPARTMENT

Post Office Box 968
Santa Fe, New Mexico 87504-0968

HAZARDOUD WASTE BUREAU

GARREY CARRUTHERS
Governor

CARLA L. MUTH
Secretary

MICHAEL J. BURKHART
Deputy Secretary

Bodley cy 10/11/88

AU 10/7 10/5/88

September 30, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

CERTIFIED
P 456 379 867
MAIL

Mr. Harold E. Valencia
Area Manager
U.S. D.O.E. Area Office
Los Alamos, New Mexico 87544

RE: NM 0890010515
TA-16 Surface Impoundment Closure

Dear Mr. Valencia:

Enclosed for your information are a public notice and fact sheet concerning the closure of the TA-16 Surface Impoundment. The public notice will be published on or about October 16, 1988. The closure plan administrative record will be available at the Santa Fe office of the Hazardous Waste Section and the Espanola public library for public review.

As part of the review and approval process, you are requested to comment on the following specific items concerning the plan as submitted. Your responses will be considered in the decision to approve or disapparove the plan. Please provide your comments by the end of the public comment period, **December 9, 1988.**

1. Paragraph 5.1.4.1 describes soil borings through the liner. Two samples are not statistically sufficient to establish that the liner has not leaked. Please provide a more adequate sampling plan. Similarly, two samples are not adequate for background determination.

2. Paragraph 5.1.4.1 proposes that organic constituents may not be present. This is invalidated by DOE letter of July 30, 1987. Please provide a more adequate analysis plan.

3. Paragraph 5.1.6 proposes that the laboratory will prepare a risk assessment for EID approval and/or negotiation. HWMR-4, Section 206. C.6.f.1. address clean closure by removal of wastes and residues. Please provide any data accumulated to date to establish that no wastes or residues will remain in the soil or groundwater. Such data should include, but is not limited to, the following:



EQUAL OPPORTUNITY EMPLOYER

Mr. Harold E. Valencia
U.S. D.O.E. Area Manager
September 30, 1988

a. Complete logs of any wells or borings.

b. An accurate map showing the locations of any wells or borings and the impoundment.

c. Complete field testing data.

d. Any interpretative data or opinion, identified by author.

e. An accurate drawing showing the as-built plumbing to the wastewater treatment unit and isolation of the surface impoundment.

f. A description of the waste removal and disposition.

g. Risk assessment calculations based, at a minimum, on a 95% confidence level. See 52FR8704 (March 19, 1987) for guidance. All media, soil, air and water, should be addressed.

4. Paragraphs 5.1.2.4. and 5.1.7. decontamination efforts must be better detailed to establish adequacy. Where will individual equipment be decontaminated and how decontamination materials will be controlled should be detailed.

5. We are concerned that LANL intends to resume use of this impoundment after closure. Please describe what changes have been or will be made to ensure that hazardous wastes will not re-enter the unit; or if they will, what mangement will occur so that the appropriate regulations will be observed.

If you have any questions please call me at 827-2923.

Sincerely,

C Kelley Crossman

C. Kelley Crossman
Permitting Supervisor

CKC:to

cc: Janie Hernandez
US EPA (6H-HS) w/encl.

LEGAL NOTICE

NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION
HAZARDOUS WASTE BUREAU
Santa Fe, New Mexico 87503

PUBLIC NOTICE NO. 26 October 16, 1988

NOTICE OF INTENT TO TERMINATE, BY PERMIT DENIAL, THE INTERIM STATUS OF A HAZARDOUS WASTE TREATMENT UNIT

The State of New Mexico is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of the Resource Conservation and Recovery Act (RCRA) in effect prior to the enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA). The HSWA impose additional requirements on hazardous waste management facilities which will be administered and enforced by the U.S. Environmental Protection Agency (EPA) until the State of New Mexico receives additional authorization for these requirements.

Under authority of the New Mexico Hazardous Waste Act (§ 74-4-1 *et. seq.* NMSA 1978, as amended, 1987) and the New Mexico Hazardous Waste Management Regulations, the New Mexico Environmental Improvement Division (NMEID) of the State Health and Environment Department can approve or deny closure plans submitted by Los Alamos National Laboratory, Los Alamos, NM. NMEID invites the public to review and comment on the closure plan submitted by LANL for a Technical Area 16 Surface Impoundment used to treat hazardous wastes by evaporation and precipitation. This unit is presently under interim status under RCRA.

LANL has engaged in explosives research and used this impoundment to treat effluent in lieu of discharge under the Clean Water Act (CWA). The impoundment was installed in 1985 to capture the discharge formerly made under the CWA and was removed from service in 1987 when a treatment unit under the CWA was installed.

The proposed closure plan documents that hazardous wastes and/or hazardous constituents may not remain in the closed unit upon completion of closure. The unit is presently under interim status, and because of that status, must have an operating permit for continued use. However, LANL has elected to close in lieu of seeking an operating permit for this unit. The NMEID has accepted this decision and is hereby formally proposing to terminate the unit's interim status by denying a permit. The proposed permit denial is not premised upon, nor does it indicate any wrongdoing on the part of the facility. Upon completion of the closure activities, the interim status of this unit will be terminated. This will have no effect on the status of the remainder of LANL for which an operating permit will be issued. A post-closure care permit for this closed unit may be required at a later date if hazardous wastes or hazardous constituents remain in place.

Any person who wishes to comment upon the proposed plans or to request a public hearing, should submit written comments and requests, along with the commentor's name and address, to the New Mexico Environmental Improvement Division, Hazardous Waste Bureau, 1190 St. Francis Drive, Santa Fe, New Mexico 87503, ATTENTION: Mr. C. Kelley Crossman. Requests for a public hearing shall state the nature of the issues proposed to be raised in the hearing. Only comments and/or requests received by December 9, 1988 will be considered.

The administrative record for this decision consists of a fact sheet, the closure plan and related correspondence. The administrative record may be reviewed at either the NMEID Hazardous Waste Section, Harold Runnels Building, 1190 St. Francis Drive, Sante Fe, New Mexico or the Espanola public library, 314A Onate NW, Espanola, New Mexico. To obtain a copy of the administrative record or any part thereof, at 35 cents per page, please contact Mr. Crossman at the above address, or call (505) 827-2923.

All written comments submitted on the proposed plan or permit will be considered in formulating a final decision. Under the Hazardous Waste Management Regulations the EID may either approve the plan or disapprove the plan and require LANL to submit a revised plan. If the revised plan in not acceptable the EID may direct closure activities by publishing a rewritten plan. The EID will notify LANL, and each person who submitted a written comment during the public comment period, of the final decision or of any public hearing which may be scheduled.

If, after consideration of all written comments, these proposed actions become EID's final decisions, EID will issue to LANL final approval for the proposed closure plan. The final approval will require that the closure activities be performed in conformity with applicable State and Federal law, as well as within the terms of the closure plan. Upon completion of closure the interim status will be terminated by permit denial.

# FACT SHEET

Intent to Terminate, by Permit Denial, the Interim Status
of Hazardous Waste Units
Under the
New Mexico Hazardous Waste Act

**Activities:** Termination of the interim status of a surface impoundment; closure of the unit.

**Facility Name:** Los Alamos National Laboratory

**EPA I.D. Number:** NM 0890010515

**Location :** Los Alamos, N.M.

**Landowner:** United States Department of Energy

**Facility Operator:** University of California

**Interim-status Activities:** The interim-status activity conducted at this facility was the fabrication and testing of explosives and the treatment of the resulting hazardous wastes in a surface impoundment.

**Closure of the Unit:** The unit is presently under interim status and, therefore, the operator must seek an operating permit for it or close it. The proposed closure plan documents that hazardous wastes and/or hazardous constituents may or may not remain upon completion of closure. The plan specifies that the remaining wastes and any contaminated soil will be removed and the liner will be decontaminated by washing until the washwater tests clean. The operator has elected to close in lieu of seeking an operating permit for this unit. The NMEID has accepted this decision and is hereby formally proposing to terminate this units' interim status by denying a permit. The proposed permit denial is not premised upon, nor does it indicate any wrongdoing on the part of the owner or operator. The interim status of this unit will be terminated upon completion of these closure activities, but this will have no effect on the status under the hazardous waste regulations of the remainder of LANL. The impoundment was used by LANL under the hazardous waste laws and this cell was removed from service in 1987. Since that time it has been unused. The wastes previously treated in this unit are now treated under the Clean Water Act and are subject to the provisions of Section 402 of the CWA.

INTERIM STATUS CLOSURE PLAN
TECHNICAL AREA (TA) 16 SURFACE IMPOUNDMENT

Los Alamos National Laboratory
Los Alamos, New Mexico 87545
NM 0890010515

November 18, 1988

Response Comments to the Hazardous Waste Section, New Mexico Environmental Improvement Division, Request for Additional Information, Dated September 30, 1988

1. Paragraph 5.1.4.1

No soil borings have, or will, be made through the impoundment liner. More than two water and soil sample analyses have been obtained in order to describe contaminant concentration levels in and below the surface impoundment. Additional water and soil analyses for metals using the Extraction Procedure (EP) toxicity method, and selected organic contaminants, have been proposed. A more detailed description of the sampling plan, including all work completed to date, is outlined in the attached report.

2. Paragraph 5.1.4.1

This section suggests that if no organics are found in the surface impoundment, analyses for organics in the soil will not be performed. As this closure plan was prepared prior to receiving analytical results indicating the presence of organics, an alternative was provided. This alternative requires organic analyses of the soil if organic constituents are detected in the surface impoundment. Organic constituent analyses have been performed on surface impoundment fluid samples. Based on these analytical results, final contaminant sampling indicator parameters will be established. Preliminary surface impoundment fluid and soil samples recovered below the liner have already been tested for metals using the EP toxicity method, and for those volatile and semi-volatile organic constituents shown in the attached report. Results of these analyses are also listed in this report. Additional sampling and detailed analyses will be conducted as described in the attached report.

3. Paragraph 5.1.6

The proposal to conduct a risk assessment was erroneously included in this closure plan. Upon completion of the sampling survey described in Section 5.1.4, and further clarified in the attached report, Los Alamos National Laboratory (LANL) will not prepare a risk assessment for this surface impoundment. Analyses of soil samples recovered from beneath the surface impoundment liner will determine if a release has occurred, and if so, the extent of such contamination. It is the intent of LANL to document the full extent of any potential environmental contamination associated with this surface impoundment; to remove all contaminated fluids, residue, and soils; and completely fulfill the clean closure requirement outlined in New Mexico Hazardous Waste

Management Regulations (NMHWMR) 206.C.6.f.1. and 2. [40 Code of Federal Regulations (CFR) 265.228(a)(1)].

The request to provide all data accumulated to date is hereby acknowledged. These data are summarized in the attached report.

4. Paragraphs 5.1.2.4 and 5.1.7

Decontamination procedures have been detailed in the attached report.

5. NMEID Comments

LANL has no intention of using the surface impoundment for continued disposal operations after final closure. Current plans indicate that after closure certification, the area will be filled in with clean crushed tuff and topsoil, recontoured to its approximate original undisturbed configuration, and reseeded with native grasses. These planned post-closure efforts are not required under NMHWMR 206.C (40 CFR 265) following clean closure, and will be subject to budgetary constraints. A remote possibility exists that potential future unrelated disposal operations may become necessary at this location. However, if this situation arises, LANL will seek appropriate future permit approval for any new site if it is required.

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-3,15,27 | 90.11349 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-3,15,27 | 90.11349 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-3,15,27 | 90.11349 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-3,15,27 | 90.11349 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-3,15,27 | 90.11349 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-3,15,27 | 90.11349 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-3,15,27 | 90.11349 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-3,15,27 | 90.11349 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-3,15,27 | 90.11349 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-3,15,27 | 90.11349 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-3,15,27 | 90.11349 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-3,15,27 | 90.11349 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-3,15,27 | 90.11349 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-3,15,27 | 90.11349 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-3,15,27 | 90.11349 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-3,15,27 | 90.11349 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-3,15,27 | 90.11349 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-3,15,27 | 90.11349 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-3,15,27 | 90.11349 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-3,15,27 | 90.11349 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-3,15,27 | 90.11349 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-3,15,27 | 90.11349 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-3,15,27 | 90.11349 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-3,15,27 | 90.11349 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-3,15,27 | 90.11349 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-3,15,27 | 90.11349 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-3,15,27 | 90.11349 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-3,15,27 | 90.11349 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-3,15,27 | 90.11349 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-3,15,27 | 90.11349 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-3,15,27 | 90.11349 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-3,15,27 | 90.11349 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-3,15,27 | 90.11349 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-3,15,27 | 90.11349 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-3,15,27 | 90.11349 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-3,15,27 | 90.11349 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-3,15,27 | 90.11349 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-3,15,27 | 90.11349 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-3,15,27 | 90.11349 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-4,16,28 | 90.11350 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-4,16,28 | 90.11350 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-4,16,28 | 90.11350 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-4,16,28 | 90.11350 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-4,16,28 | 90.11350 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-4,16,28 | 90.11350 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-4,16,28 | 90.11350 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-4,16,28 | 90.11350 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-4,16,28 | 90.11350 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-4,16,28 | 90.11350 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-4,16,28 | 90.11350 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-4,16,28 | 90.11350 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-4,16,28 | 90.11350 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-4,16,28 | 90.11350 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-4,16,28 | 90.11350 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-4,16,28 | 90.11350 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-4,16,28 | 90.11350 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-4,16,28 | 90.11350 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-4,16,28 | 90.11350 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-4,16,28 | 90.11350 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-4,16,28 | 90.11350 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-4,16,28 | 90.11350 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-4,16,28 | 90.11350 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-4,16,28 | 90.11350 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-4,16,28 | 90.11350 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-4,16,28 | 90.11350 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-4,16,28 | 90.11350 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-4,16,28 | 90.11350 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-4,16,28 | 90.11350 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-4,16,28 | 90.11350 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-4,16,28 | 90.11350 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-4,16,28 | 90.11350 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-4,16,28 | 90.11350 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-4,16,28 | 90.11350 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-4,16,28 | 90.11350 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-4,16,28 | 90.11350 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-4,16,28 | 90.11350 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-4,16,28 | 90.11350 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-4,16,28 | 90.11350 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-4,16,28 | 90.11350 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-4,16,28 | 90.11350 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-4,16,28 | 90.11350 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-4,16,28 | 90.11350 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-4,16,28 | 90.11350 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-4,16,28 | 90.11350 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-4,16,28 | 90.11350 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-4,16,28 | 90.11350 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-4,16,28 | 90.11350 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-4,16,28 | 90.11350 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-4,16,28 | 90.11350 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-4,16,28 | 90.11350 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-4,16,28 | 90.11350 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-4,16,28 | 90.11350 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-4,16,28 | 90.11350 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-4,16,28 | 90.11350 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-4,16,28 | 90.11350 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-4,16,28 | 90.11350 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-4,16,28 | 90.11350 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-4,16,28 | 90.11350 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-4,16,28 | 90.11350 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-4,16,28 | 90.11350 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-4,16,28 | 90.11350 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-4,16,28 | 90.11350 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-4,16,28 | 90.11350 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-5,17,29 | 90.11351 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-5,17,29 | 90.11351 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-5,17,29 | 90.11351 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-5,17,29 | 90.11351 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-5,17,29 | 90.11351 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-5,17,29 | 90.11351 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-5,17,29 | 90.11351 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-5,17,29 | 90.11351 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-5,17,29 | 90.11351 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-5,17,29 | 90.11351 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-5,17,29 | 90.11351 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-5,17,29 | 90.11351 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-5,17,29 | 90.11351 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-5,17,29 | 90.11351 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-5,17,29 | 90.11351 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-5,17,29 | 90.11351 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-5,17,29 | 90.11351 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-5,17,29 | 90.11351 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-5,17,29 | 90.11351 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-5,17,29 | 90.11351 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-5,17,29 | 90.11351 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-5,17,29 | 90.11351 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-5,17,29 | 90.11351 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-5,17,29 | 90.11351 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-5,17,29 | 90.11351 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-5,17,29 | 90.11351 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-5,17,29 | 90.11351 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-5,17,29 | 90.11351 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-5,17,29 | 90.11351 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-5,17,29 | 90.11351 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-5,17,29 | 90.11351 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-5,17,29 | 90.11351 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-5,17,29 | 90.11351 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-5,17,29 | 90.11351 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-5,17,29 | 90.11351 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-5,17,29 | 90.11351 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-5,17,29 | 90.11351 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-5,17,29 | 90.11351 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-5,17,29 | 90.11351 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-5,17,29 | 90.11351 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-5,17,29 | 90.11351 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-5,17,29 | 90.11351 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-5,17,29 | 90.11351 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-5,17,29 | 90.11351 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-5,17,29 | 90.11351 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-5,17,29 | 90.11351 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-5,17,29 | 90.11351 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-5,17,29 | 90.11351 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-5,17,29 | 90.11351 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-5,17,29 | 90.11351 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-5,17,29 | 90.11351 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-5,17,29 | 90.11351 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-5,17,29 | 90.11351 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-5,17,29 | 90.11351 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-5,17,29 | 90.11351 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-5,17,29 | 90.11351 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-5,17,29 | 90.11351 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-5,17,29 | 90.11351 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-5,17,29 | 90.11351 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-5,17,29 | 90.11351 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-5,17,29 | 90.11351 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-5,17,29 | 90.11351 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-5,17,29 | 90.11351 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-5,17,29 | 90.11351 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-6,18,30 | 90.11352 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-6,18,30 | 90.11352 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-6,18,30 | 90.11352 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-6,18,30 | 90.11352 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-6,18,30 | 90.11352 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-6,18,30 | 90.11352 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-6,18,30 | 90.11352 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-6,18,30 | 90.11352 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-6,18,30 | 90.11352 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-6,18,30 | 90.11352 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-6,18,30 | 90.11352 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-6,18,30 | 90.11352 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-6,18,30 | 90.11352 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-6,18,30 | 90.11352 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-6,18,30 | 90.11352 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-6,18,30 | 90.11352 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-6,18,30 | 90.11352 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-6,18,30 | 90.11352 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-6,18,30 | 90.11352 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-6,18,30 | 90.11352 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-6,18,30 | 90.11352 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-6,18,30 | 90.11352 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-6,18,30 | 90.11352 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-6,18,30 | 90.11352 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-6,18,30 | 90.11352 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-6,18,30 | 90.11352 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-6,18,30 | 90.11352 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-6,18,30 | 90.11352 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-6,18,30 | 90.11352 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-6,18,30 | 90.11352 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-6,18,30 | 90.11352 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-6,18,30 | 90.11352 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-6,18,30 | 90.11352 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-6,18,30 | 90.11352 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-6,18,30 | 90.11352 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-6,18,30 | 90.11352 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-6,18,30 | 90.11352 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-6,18,30 | 90.11352 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-6,18,30 | 90.11352 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-6,18,30 | 90.11352 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-6,18,30 | 90.11352 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-6,18,30 | 90.11352 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-6,18,30 | 90.11352 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-6,18,30 | 90.11352 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-6,18,30 | 90.11352 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-6,18,30 | 90.11352 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-6,18,30 | 90.11352 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-6,18,30 | 90.11352 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-6,18,30 | 90.11352 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-6,18,30 | 90.11352 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-6,18,30 | 90.11352 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-6,18,30 | 90.11352 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-6,18,30 | 90.11352 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-6,18,30 | 90.11352 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-6,18,30 | 90.11352 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-6,18,30 | 90.11352 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-6,18,30 | 90.11352 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-6,18,30 | 90.11352 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-6,18,30 | 90.11352 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-6,18,30 | 90.11352 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-6,18,30 | 90.11352 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-6,18,30 | 90.11352 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-6,18,30 | 90.11352 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-6,18,30 | 90.11352 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-7,19,31 | 90.11353 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-7,19,31 | 90.11353 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-7,19,31 | 90.11353 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-7,19,31 | 90.11353 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-7,19,31 | 90.11353 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-7,19,31 | 90.11353 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-7,19,31 | 90.11353 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-7,19,31 | 90.11353 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-7,19,31 | 90.11353 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-7,19,31 | 90.11353 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-7,19,31 | 90.11353 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-7,19,31 | 90.11353 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-7,19,31 | 90.11353 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-7,19,31 | 90.11353 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-7,19,31 | 90.11353 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-7,19,31 | 90.11353 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-7,19,31 | 90.11353 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-7,19,31 | 90.11353 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-7,19,31 | 90.11353 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-7,19,31 | 90.11353 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-7,19,31 | 90.11353 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-7,19,31 | 90.11353 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-7,19,31 | 90.11353 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-7,19,31 | 90.11353 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| [illegible],19,31 | 90.11353 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-7,19,31 | 90.11353 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-7,19,31 | 90.11353 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-7,19,31 | 90.11353 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-7,19,31 | 90.11353 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-7,19,31 | 90.11353 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-7,19,31 | 90.11353 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-7,19,31 | 90.11353 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-7,19,31 | 90.11353 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-7,19,31 | 90.11353 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-7,19,31 | 90.11353 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-7,19,31 | 90.11353 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-7,19,31 | 90.11353 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-7,19,31 | 90.11353 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-7,19,31 | 90.11353 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-7,19,31 | 90.11353 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-7,19,31 | 90.11353 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-7,19,31 | 90.11353 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-7,19,31 | 90.11353 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-7,19,31 | 90.11353 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-7,19,31 | 90.11353 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-7,19,31 | 90.11353 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-7,19,31 | 90.11353 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-7,19,31 | 90.11353 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-7,19,31 | 90.11353 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-7,19,31 | 90.11353 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-7,19,31 | 90.11353 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-7,19,31 | 90.11353 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-7,19,31 | 90.11353 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-7,19,31 | 90.11353 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-7,19,31 | 90.11353 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-7,19,31 | 90.11353 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-7,19,31 | 90.11353 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-7,19,31 | 90.11353 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-7,19,31 | 90.11353 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-7,19,31 | 90.11353 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-7,19,31 | 90.11353 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-7,19,31 | 90.11353 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-7,19,31 | 90.11353 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-7,19,31 | 90.11353 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-8,20,32 | 90.11354 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-8,20,32 | 90.11354 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-8,20,32 | 90.11354 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-8,20,32 | 90.11354 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-8,20,32 | 90.11354 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-8,20,32 | 90.11354 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-8,20,32 | 90.11354 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-8,20,32 | 90.11354 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-8,20,32 | 90.11354 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-8,20,32 | 90.11354 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-8,20,32 | 90.11354 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-8,20,32 | 90.11354 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-8,20,32 | 90.11354 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-8,20,32 | 90.11354 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-8,20,32 | 90.11354 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-8,20,32 | 90.11354 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-8,20,32 | 90.11354 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-8,20,32 | 90.11354 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-8,20,32 | 90.11354 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-8,20,32 | 90.11354 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-8,20,32 | 90.11354 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-8,20,32 | 90.11354 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-8,20,32 | 90.11354 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-8,20,32 | 90.11354 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-8,20,32 | 90.11354 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-8,20,32 | 90.11354 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-8,20,32 | 90.11354 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-8,20,32 | 90.11354 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-8,20,32 | 90.11354 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-8,20,32 | 90.11354 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-8,20,32 | 90.11354 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-8,20,32 | 90.11354 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-8,20,32 | 90.11354 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-8,20,32 | 90.11354 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-8,20,32 | 90.11354 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-8,20,32 | 90.11354 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-8,20,32 | 90.11354 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-8,20,32 | 90.11354 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-8,20,32 | 90.11354 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-8,20,32 | 90.11354 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-8,20,32 | 90.11354 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-8,20,32 | 90.11354 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-8,20,32 | 90.11354 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-8,20,32 | 90.11354 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-8,20,32 | 90.11354 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-8,20,32 | 90.11354 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-8,20,32 | 90.11354 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-8,20,32 | 90.11354 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-8,20,32 | 90.11354 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-8,20,32 | 90.11354 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-8,20,32 | 90.11354 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-8,20,32 | 90.11354 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-8,20,32 | 90.11354 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-8,20,32 | 90.11354 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-8,20,32 | 90.11354 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-8,20,32 | 90.11354 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-8,20,32 | 90.11354 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-8,20,32 | 90.11354 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-8,20,32 | 90.11354 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-8,20,32 | 90.11354 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-8,20,32 | 90.11354 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-8,20,32 | 90.11354 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-8,20,32 | 90.11354 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-8,20,32 | 90.11354 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

Raw Laboratory Chemical Data Used in Table C-1.

Information Source: Mike Barr, WR-3 ⇒ he got them from Roy Bohn 10/20/88

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 12/19/86

ORIGIN OF SAMPLE(S) 16 L401, 406 EPA OSA055

8,032 gals. ~~flow~~ total vol. estimated discharged 1400 hrs

DATE SAMPLED 12/19/86

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|
| pH | 9.5 | 12/19 | | RB |
| Temp | 5.8°C | 12/19 | | RB |
| COD | 0.44 ± 0.09 G/L | 12/30 | 410.4 | KS |
| TSS | 32 ± 32 mg/l | 12/23 | 160.1 | [illegible] |
| Ba (total) | 0.13 g/l ± .01 g/l | 1/9 | 208.1 | [illegible] |

| DESCRIPTION | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|
| SAMPLE #4 | | | |

| Test/Analysis | Result/Conc |
|---|---|
| | |

REMARKS: 2

APPROVED: [illegible] Chief Chemist DATE: 1-12-87 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 12/19/86

ORIGIN OF SAMPLE(S) TA-16-401,406

DATE SAMPLED 1100 hrs 12/19/86

DESCRIPTION: SAMPLE #3 DISCHARGE FROM TRUCK, through sand filters into "pond"

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.31 | 12/19 | | RB | | | | | |
| Temp | 10.9 °C | 12/19 | | RB | | | | | |
| C.O.D. | 187 ±37 mg/L | 12/30 | 410.4 | FS | | | | | |
| Barium | 2.1 ± .2 g/L | 1/9 | 208.1 | [illegible] | | | | | |

REMARKS: 86.75288

APPROVED: [illegible] Chief Chemist DATE: 1-12-87 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 12/19/86

ORIGIN OF SAMPLE(S) TA-16-401, 406

DATE SAMPLED 1100 hrs 12/19/86

DESCRIPTION: Sample #2 Discharge from truck into sand filters

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.16 | | | | | | | | |
| Temp | 11.6°C | | | | | | | | |
| Ra (Total) | 1.4 ± .2 g/L | 1/9 | 208.1 | [illegible] | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

REMARKS: X6.75021

APPROVED: [illegible] Chief Chemist DATE: 1-12-87 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 12/19/86

ORIGIN OF SAMPLE(S) TA-16 -401,406

DATE SAMPLED 12/19/86 1100

DESCRIPTION: SAMPLE #1 TAP WATER THROUGH SAND FILTERS

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.31 | 12/19 | | RB | | | | | |
| Temp | 11.3 °C | 12/19 | | RB | | | | | |
| C.O.D. | 35 ± 7 mg/L | 12/30 | 410.4 | KS | | | | | |
| Ba (total) | 16 ± 2 mg/L | 1/9 | 208.1 | [illegible] | | | | | |

REMARKS: 86.75286

APPROVED: [illegible] Chief Chemist DATE: 1-12-87 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Born DATE: 12/10/86

ORIGIN OF SAMPLE(S) EPA 05A 055

TA-16 401, 406

DATE SAMPLED 12/10/86

DESCRIPTION: Depth of water 36"

" " sample - TOP

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 9.39 | 12/10 | | RB | ALKALINITY | 126 ± 13 mg/L | 12/23 | 310.1 | KS |
| Temp | 3.7 °C | 12/11 | | RB | $NH_3$ (FREE) | 4.6 ± .46 mg/L | 1/27 | calc | mcw |
| Cl- | 0 | | | | Salinity | < 3 g/kg | 1/8/87 | 210.2 | Smit |
| HARDNESS | 33 ± 3 mg/l | 12/17 | 314A | mcw | Ba (TOTAL) | 53 ± 5 mg/L | 1/9/87 | 208.1 | [illegible] |
| CONDUCTIVITY | 385 ± 19 umHos/cm | 12/11 | 120.1 | g.f. | COD | .30 ± .06 g/L | 1/20 | 410.4 | [illegible] |
| | | | | | $NH_3$ | 4.5 ± .45 mg/L | 12/30 | 350.1 | [illegible] |

REMARKS: 86-75283

H7-LAB-35A APPROVED: mcw Chief Chemist DATE: 1-28-86 Lab Copy

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 11/20/86

ORIGIN OF SAMPLE(S) EPA 0SA055

TA-16-401,406

DATE SAMPLED 11/20/86

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | DESCRIPTION | | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Test/Analysis | Result/Conc | | | |
| pH | 8.0 | 11/20 | | RB | | | | | |
| COD | 126 ± 25 mg/L | 11/24 | 410.4 | KS | | | | | |
| Ba (TOTAL) | 59 ± 6 mg/L | 12/12 | 208.1 | MCW | | | | | |

REMARKS: 86-75272

APPROVED: _____ DATE: _____
Chief Chemist Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 11/10/86

ORIGIN OF SAMPLE(S) 16-401,406 EPA 05A055

"Pond" Level -26"

DATE SAMPLED 11/10/86

DESCRIPTION: SPECIAL TA16-401,406

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.21 | 11/10 | | RB | | | | | |
| COD | 135 ± 27 mg/L | 11/24 | 410.4 | KS | | | | | |
| Ba (TOTAL) | 60 ± 6 mg/L | 11/17 | 208.1 | Tmf | | | | | |

REMARKS:

86.75261

APPROVED: _____ Chief Chemist

DATE: _____ Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE SUBMITTED BY: | Roy Bohn | | | | | DATE: 10/27/86 | | | |
| ORIGIN OF SAMPLE(S) | TA-16-401, 406 "SPECIAL" | | | | | | | | |
| DATE SAMPLED 10/27/86 | | DATE BEGUN | METHOD | ANALYZED BY | DESCRIPTION | | DATE BEGUN | METHOD | ANALYZED BY |
| Test/Analysis | Result/Conc | | | | Test/Analysis | Result/Conc | | | |
| pH | 9.8 | 10/27 | | RB | | | | | |
| COD | 251 mg/L | 10/28 | | KS | | | | | |
| Ba (total) | 30 ± 3 mg/L | 11/17 | 208.1 | [illegible] | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

REMARKS:

H7-LAB-35A 86.75242

APPROVED: [illegible] Chief Chemist DATE: 11-18-86 Lab Copy

LABORATORY AI ES

SAMPLE SUBMITTED BY: Roy Rothn

DATE: 10/7/86

ORIGIN OF SAMPLE(S) TA-16-401,406

DATE SAMPLED 10/7/86

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|
| pH | 7.22 | 10/7 | | ~~RS~~ RB |
| TSS | 15 ± 1.5 mg/l | 10/8 | 160.1 | D.P. |
| COD | 214 ± 43 mg/L | 10/10 | 410.4 | KS |
| Ba (total) | 27 ± 3 mg/L | 11/17 | 208.1 | TMY |
| ALKALINITY (TOTAL) | 214 ± 42 mg/L | 10/9 | 310.1 | KS |

DESCRIPTION: OUTFALL 05A055 SPECIAL!

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|
| HARDNESS | 88 ± 9 mg/L | 11/6 | 3144 | mcw |
| CL⁻ | 31 ± 3.1 mg/L | 10/23 | 325.2 | emlt |
| CONDUCTIVITY | 490 ± 25 umhos/cm | 10/8 | 120.1 | D.P. |
| $NH_3$ | 14 ± 1.4 mg/L | 11/4 | 350.1 | gdm |

REMARKS:

86.75219

APPROVED: mcw Chief Chemist

DATE: 11-18-86 Lab Copy

H7-LAB-35A

LABORATC IALYSES

DATE: 9-17-86

SAMPLE SUBMITTED BY: CARLA

ORIGIN OF SAMPLE(S) TA-16-401,406 05A055

DATE SAMPLED 9-17-86

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|
| pH | 7.92 | | | |
| TSS | 4±1 mg/l | 9/18 | 160.1 | [illegible] |
| C.O.D. | 212± 42 mg/l | 9/29 | 410.4 | ICS |
| Ba | 30±3 mg/L | 9/30 | 202.1 | [illegible] |

DESCRIPTION: HE.

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|
| | | | | |

REMARKS: SAVE SAMPLES IF BARIUM is above EPA LIMIT
86 70522

APPROVED: [illegible] Chief Chemist

DATE: 10-1-86

Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

0945

SAMPLE SUBMITTED BY: Roy Rohn DATE: 7/14/86

ORIGIN OF SAMPLE(S) TA-16 401-406

DATE SAMPLED

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | DESCRIPTION | | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 7.19 | 7/14 | | RB | | | | | |
| COD | 97 ± 19 mg/L | 7/25 | | gdm | | | | | |
| TSS | 19 ± 1.9 mg/l | 7/15 | 160.1 | RL. | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

REMARKS:

86. 70519

APPROVED: [illegible] Chief Chemist DATE: 8-1-86 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: RWARD DATE: 7-7-86

ORIGIN OF SAMPLE(S) TA-16-401,406

DATE SAMPLED 7-7-86

DESCRIPTION: LAGOON SAMPLE

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| C.O.D. | 0.19 ± 0.04 g/l | 7/9 | 410.4 | KS | | | | | |
| Ba | 15 ± 2 mg/L | 7/25 | 208.1 | MCW | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

REMARKS: 86.75097

MISC

APPROVED: MCW Chief Chemist DATE: 7-25-86 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

| | | | |
|---|---|---|---|
| SAMPLE SUBMITTED BY: | Carla Jacquez | DATE: | 5/20/86 |
| ORIGIN OF SAMPLE(S) | TA 16-401-406 EPA SERIAL 05A055 | | |

FLOW: 0

DATE SAMPLED 5/20/86

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | DESCRIPTION / HIGH EXPLOSIVE | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|---|
| pH | 7.07 | | | | | TSS | 10 ± 1.0 mg/l | 5/22 | 2090 | J.J. |
| COD | .29 ± .06 g/L | 6/6 | 410.4 | gdm | | Ba(Total) | 22 ± 2 mg/L | 7/10 | 2081 | mcw |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

REMARKS: SPECIAL SAMPLE

H7-LAB-35A 86.70514

APPROVED: mcw Chief Chemist

DATE: 7-10-86 Lab Copy

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bohn DATE: 4/1/86

ORIGIN OF SAMPLE(S) TA-16- Burn site Pond

DATE SAMPLED

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | DESCRIPTION | | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| Ba | 0.14 mg/L | 4/2 | 2021 | mcw | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

REMARKS:

APPROVED: mcw Chief Chemist DATE: 4-2-86 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Ray Bahn DATE: 2/9/86

'GIN OF SAMPLE(S)

DATE SAMPLED

DESCRIPTION: TAIL Burnside (Pond (Sludge) → EPTOX + Corrosivity

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| pH | 6.47 | 3/4 | | HP | | | | | |
| corrosivity | 0.26 mmpy | 3/19 | | HP | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

REMARKS: 86.02401

APPROVED: mcw Chief Chemist DATE: 3-31-86 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: Roy Bahn DATE: 2/9/86

GIN OF SAMPLE(S)

DATE SAMPLED

DESCRIPTION: High explosives - LIQUID EPTOX + corrosive Ba only

| Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY | Test/Analysis | Result/Conc | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|
| Ba (total) | 178 mg/L | 3/5 | | mcw | | | | | |
| pH | 6.74 | 3/4 | | HP | | | | | |
| Corrosivity | 1.7 mmpy ⊛ | 3/14 | | HP | | | | | |

REMARKS: 86.02400

⊛ Corrosivity is much less than 6.35 mmpy (mm per year) per EPA requirements

APPROVED: mcw Chief Chemist DATE: 3-31-86 Lab Copy

H7-LAB-35A

LABORATORY ANALYSES

SAMPLE SUBMITTED BY: DATE: 1/29/86

ORIGIN OF SAMPLE(S): TA16 Burn site - Lagoon

DATE SAMPLED 1/29/86

| DESCRIPTION: FOR FLASH POINT | DATE BEGUN | METHOD | ANALYZED BY | DESCRIPTION | DATE BEGUN | METHOD | ANALYZED BY |
|---|---|---|---|---|---|---|---|
| Test/Analysis / Result/Conc | | | | Test/Analysis / Result/Conc | | | |
| E6.75020 F.P. > 160°F (LIQUID) | 2/25 | | HP | | | | |
| E6.75021 F.P > 160°F (LIQUID + SEDIMENT) | 2/25 | | HP | | | | |

REMARKS:

APPROVED: mcw Chief Chemist DATE: 2-25-86 Lab Copy

H7-LAB-35A

| SAMPLE NUM | ANALYTICAL OWNER | MATRIX | ANALYSIS | REQUEST NUM | REQUESTOR | REQUEST DATE | PROJECT NUM | ANALYST | TECHNIQUE | SYMBOL | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | STATUS | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86.02597 | CS | W | AG | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.5 | 0.5 | MG/L | 2/11/86 | R | |
| 86.02597 | CS | W | AS | 05047 | RB | 1/30/86 | W57J | RJS | ETVAA | < | 0.1 | 0.1 | MG/L | 2/13/86 | R | |
| 86.02597 | CS | W | BA | 05047 | RB | 1/30/86 | W57J | RJS | FAA | | 115.1 | 11.5 | MG/L | 2/13/86 | R | |
| 86.02597 | CS | W | CD | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.05 | 0.05 | MG/L | 2/13/86 | R | |
| 86.02597 | CS | W | CR | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.2 | 0.2 | MG/L | 2/13/86 | R | |
| 86.02597 | CS | W | HG | 05047 | RB | 1/30/86 | W57J | MB | CVAA | < | 0.01 | 0.01 | UG/L | 2/04/86 | R | |
| 86.02597 | CS | W | IGNIT | 05047 | RB | 1/30/86 | W57J | HP | MISC | < | 160. | 10. | DEG C | 4/01/86 | R | |
| 86.02597 | CS | W | PB | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.2 | 0.2 | MG/L | 2/13/86 | R | |
| 86.02597 | CS | W | PH | 05047 | RB | 1/30/86 | W57J | DK | ISE | | 7.1 | 0.1 | PH | 2/13/86 | R | |
| 86.02597 | CS | W | SE | 05047 | RB | 1/30/86 | W57J | RJS | ETVAA | | 0.02 | 0.02 | MG/L | 2/05/86 | R | |
| 86.02598 | CS | W | AG | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.5 | 0.5 | MG/L | 2/11/86 | R | |
| 86.02598 | CS | W | AS | 05047 | RB | 1/30/86 | W57J | RJS | ETVAA | < | 0.1 | 0.1 | MG/L | 2/13/86 | R | |
| 86.02598 | CS | W | BA | 05047 | RB | 1/30/86 | W57J | RJS | FAA | | 229.4 | 22.9 | MG/L | 2/13/86 | R | |
| 86.02598 | CS | W | CD | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.05 | 0.05 | MG/L | 2/13/86 | R | |
| 86.02598 | CS | W | CR | 05047 | RB | 1/30/86 | W57J | RJS | FAA | < | 0.2 | 0.2 | MG/L | 2/13/86 | R | |
| 86.02598 | CS | W | HG | 05047 | RB | 1/30/86 | W57J | MB | CVAA | < | 0.01 | 0.01 | UG/L | 2/04/86 | R | |
| 86.02598 | CS | W | IGNIT | 05047 | RB | 1/30/86 | W57J | HP | MISC | < | 160. | 10. | DEG C | 4/01/86 | R | |
| 86.02598 | CS | W | PB | 05047 | RB | 1/30/86 | W57J | RJS | FAA | | 0.5 | 0.2 | MG/L | 2/13/86 | R | |
| 86.02598 | CS | W | PH | 05047 | RB | 1/30/86 | W57J | DK | ISE | | 7. | 0.1 | PH | 2/13/86 | R | |
| 86.02598 | CS | W | SE | 05047 | RB | 1/30/86 | W57J | RJS | ETVAA | < | 0.02 | 0.02 | MG/L | 2/13/86 | R | |

86.02597 CS = liquid

86.02598 CS = sludge

HSE-9 ANALYTICAL RESULTS

REAC 12-May-1986 CSR

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 86.02552 | 05062 | 0.0000 | 0.0000 | | 5/12/86 | NEGATIVE |
| 86.02553 | 05062 | 0.0000 | 0.0000 | | 5/12/86 | NEGATIVE |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

5-13-86 D Kuab
SECTION LEADER

mag 5-13-86
QUALITY ASSURANCE OFFICER

Sampled 1/29/86 TA-16-401,406 pond

86.02552 liquid
86.02553 Sludge

TA-16-401,406 Sampling results

| Date ampled | Media | Depth (feet) | C.O.D. | Ba(TOTAL) | EP TOXIC Ba # | pH |
|---|---|---|---|---|---|---|
| 08/14/85 | liquid | | | | 36 | |
| 01/29/86 | sludge | | | | | |
| 01/29/86 | liquid | | | | | |
| 01/30/86 | sludge | | | | 229.4 | 7 |
| 01/30/86 | liquid | | | | 115.1 | 7.1 |
| 02/09/86 | sludge | | | | | 6.47 |
| 02/09/86 | liquid | | | 171 | | 6.74 |
| 04/01/86 | sludge | | | 0.14 | | |
| 05/20/86 | liquid | | 290 | 22 | | 7.07 |
| 07/07/86 | liquid | | 190 | 15 | | |
| 07/17/86 | liquid | | 97 | | | 7.19 |
| 09/17/86 | liquid | | 212 | 30 | | 7.92 |
| 10/07/86 | liquid | | 214 | 27 | | 7.2 |
| 10/27/86 | liquid | | 251 | 30 | | 9.8 |
| 11/10/86 | liquid | 2.2 | 135 | 60 | | 7.21 |
| 11/20/86 | liquid | 2.3 | 126 | 59 | | 8 |

TA-16-401,406 Sampling results

| Date sampled | Media | Depth (feet) | C.O.D. mg/l | Ba(TOTAL) | EP TOXIC Ba # | pH | |
|---|---|---|---|---|---|---|---|
| 8/14/85 | liquid | | | | 36 | | 0.05 |
| 01/29/86 | sludge } flash pt. | | | | | | 0.00 |
| 01/29/86 | liquid } | | | | | | |
| 01/30/86 | sludge } see summary list | | | | 229.4 | 7 | |
| 01/30/86 | liquid } | | | | 115.1 | 7.1 | |
| 02/09/86 | sludge ✓ | | | | | 6.47 | |
| 02/09/86 | liquid ✓ | | | 171 | | 6.74 | |
| 04/01/86 | sludge ✓ | | | 0.14 | | | |
| 05/20/86 | liquid ✓ | | 290 | 22 | | 7.07 | |
| 07/07/86 | liquid ✓ | | 190 | 15 | | | |
| 07/17/86 14 | liquid ✓ | | 97 | 19 ± 1.9 | | 7.19 | |
| 09/17/86 | liquid ✓ | | 212 | 30 | | 7.92 | |
| 10/07/86 | liquid ✓ outfall | | 214 ± 43 | 27 ± 3 | | 7.22 | |
| 10/27/86 | liquid ✓ outfall | | 251 | 30 ± 3 | | 9.8 | |

11/10/86

11/20/86

12/10/86

12/19/86

11/29/86

30/86

# HSE-9 ANALYTICAL RESULTS

AS [illegible] FE

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 87.02602 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 87.02603 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

SBr 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

HSE-9 ANALYTICAL RESULTS

| MPLE BER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 87.02602 | 05797 | 1.50 | 0.50 | MG/L | 2/02/87 | |
| 87.02603 | 05797 | 2.20 | 0.50 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

GSG 43

SECTION LEADER

mag 2/3/87

QUALITY ASSURANCE OFFICER

HSEP ANALYTICAL RESULTS

CP 2-FEB-1987 CL

| SMPLE NBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 37.02603 | 00787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |
| 37.02603 | 00787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSEP GROUP QUALITY ASSURANCE STANDARDS

GLR 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

HSE--9 ANALYTICAL RESULTS

CF 2-Feb-1987

| SAMPLE NUMBER | REG NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 87.02600 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 87.02603 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

GSG 2/3
SECTION HEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

# Attachment 8

# Certificate of Disposal for Liner Material

ROLLINS
ENVIRONMENTAL SERVICES (LA) INC.
P.O. Box 74137, Baton Rouge, LA 70874-4137, 504/778-1234 General Offices, 504/778-1242 Sales Office

# CERTIFICATE OF DISPOSAL

THIS CERTIFIES THAT ROLLINS ENVIRONMENTAL SERVICES (LA) INC. (RES) HAS PROPERLY DISPOSED OF WASTE COVERED UNDER BR 33400 ACCEPTED BY RES ON 4/30/90 BILL OF LADING NUMBER 889362 MANIFEST NUMBER LA 1178796 - 800, LA 1168473 & 475 TRAILER NUMBER Matlack 6345 IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, ORDINANCES AND REGULATIONS.

All drums on the above mentioned manifest were incinerated.

THIS CERTIFIES THAT THE ABOVE DESCRIBED WASTE WAS DISPOSED OF BY:

X INCINERATION

____ STABILIZATION/ENCAPSULATION

____ DIRECT LANDFILL

____ OTHER

ON 4/30/90 (DATE)

ROLLINS ENVIRONMENTAL SERVICES (LA) INC.
BATON ROUGE, LOUISIANA

LOS ALAMOS NATIONAL BANK
P. O. BOX 1663 MSI 593
Los Alamos, NM 87545

Attn: Pat Josey

NAME Bill Keslick

TITLE: CHEMPAK Q C SUPERVISOR

DATE 4/30/90

C-5

TABLE C-5
SEMIVOLATILE ORGANIC COMPOUND IDENTIFICATION LIST FOR SOIL ANALYSES
SOIL SAMPLES FROM BELOW THE TA-16 SURFACE IMPOUNDMENT LINER

| Compound Name | CAS Number | MDL[1] |
|---|---|---|
| Phenol | 108952 | 0.5 |
| bis-(2-Chloroethyl) Ether | 111444 | 0.5 |
| 2-Chlorophenol | 95578 | 0.5 |
| 1,3-Dichlorobenzene | 541731 | 1.5 |
| 1,4-Dichlorobenzene | 106467 | 3.3 |
| Benzyl Alcohol | 100516 | 0.5 |
| 1,2-Dichlorobenzene | 95501 | 3.3 |
| 2-Methylphenol | 95487 | 0.5 |
| bis-(2-Chloroisopropyl) Ether | 39638329 | 3.3 |
| 4-Methylphenol | 106445 | 0.5 |
| N-Nitroso-Dipropylamine[2] | 621647 | 1.5 |
| Hexachloroethane | 67721 | 0.5 |
| Nitrobenzene | 98953 | 0.5 |
| Isophorone | 78591 | 0.5 |
| 2-Nitrophenol | 88755 | 0.5 |
| 2,4-Dimethylphenol | 105679 | 0.5 |
| Benzoic Acid | 65850 | 0.5 |
| bis-(2-Chloroethyoxy) Methane | 111911 | 3.3 |
| 2,4-Dichlorophenol | 120832 | 0.5 |
| 1,2,4-Trichlorobenzene | 120821 | 0.5 |
| Naphthalene | 91203 | 0.5 |
| 4-Chloroaniline | 106478 | 0.5 |
| Hexachlorobutadiene | 87683 | 3.3 |
| 4-Chloro-3-Methylphenol | 59507 | 0.5 |
| 2-Methylnaphthalene | 91576 | 0.5 |
| Hexachlorocyclopentadiene | 77474 | 0.5 |
| 2,4,6-Trichlorophenol | 88062 | 0.5 |
| 2,4,5-Trichlorophenol | 95954 | 0.5 |
| 2-Chloronaphthalene | 91587 | 3.3 |
| 2-Nitroaniline | 88744 | 0.5 |
| Dimethylphthalate | 131113 | 1.5 |

All of the above compounds were below minimum detection limits, except as noted below. See Appendix E for raw laboratory data used in constructing this table. Sample numbers: 87.00262, 87.00263, 87.00264, 87.00265, 87.00266, 87.00267, and 87.00268; locations of these sample numbers are identical to sample numbers 87.00275, 87.00276, 87.00277, 87.00278, 87.00279, 87.00280, and 87.00281, respectively. See Table C-3-2 for sample numbers and location map.

MDL[1] = LANL HSE-9 Minimum Detection Limit (micrograms per gram, or ug/g), which is generally lower than the EPA specified minimum detection limit of 10.0 ug/g for these compounds.

[2]Detected in Sample Number 87.00267 at 8.3 ug/g, which is below the EPA specified Contract Laboratory Program (CLP) detection limit of 10 ug/g.

TABLE C-5 (Continued)
SEMIVOLATILE ORGANIC COMPOUND IDENTIFICATION LIST FOR SOIL ANALYSES
SOIL SAMPLES FROM BELOW THE TA-16 SURFACE IMPOUNDMENT LINER

| Compound Name | CAS Number | MDL[1] |
|---|---|---|
| Acenaphthylene | 208968 | 0.5 |
| 2,6-Dinitrotoluene | 606202 | 1.5 |
| 3-Nitroaniline | 99092 | 0.5 |
| Acenaphthene | 83329 | 0.5 |
| 2,4-Dinitrophenol | 51285 | 6.7 |
| 4-Nitrophenol | 100027 | 1.5 |
| Dibenzofuran | 132649 | 0.5 |
| 2,4-Dinitrotoluene | 121142 | 1.5 |
| Diethylphthalate | 84662 | 1.5 |
| 4-Chlorophenyl Phenyl Ether | 7005723 | 0.5 |
| Fluorene | 86737 | 0.5 |
| 4-Nitroaniline | 100016 | 1.5 |
| 4,6-Dinitro-2-Methylphenol | 534521 | 3.3 |
| N-Nitrosodiphenylamine | 86306 | 0.5 |
| 4-Bromomphenyl Phenyl Ether | 101553 | 1.5 |
| Hexachlorobenzene | 118741 | 0.5 |
| Pentachlorophenol | 87865 | 3.3 |
| Phenanthrene | 85018 | 0.5 |
| Anthracene | 120127 | 0.5 |
| Di-n-Butylphthalate | 84742 | 0.5 |
| Fluoranthene | 206440 | 0.5 |
| Pyrene | 129000 | 0.5 |
| Butyl Benzyl Phthalate | 85687 | 0.5 |
| 3,3'-Dichlorobenzidine | 91941 | NA[2] |
| Benzo-(a)-Anthracene | 56553 | 0.5 |
| Chrysene | 218019 | 0.5 |
| bis-(2-Ethylhexyl) Phthalate | 117817 | 1.5 |
| Di-n-Octyl Phthalate | 117840 | 0.5 |
| Benzo-(b)-Fluoranthene | 205992 | 0.5 |
| Benzo-(k)-Fluoranthene | 207089 | 0.5 |
| Benzo-(a)-Pyrene | 50328 | 0.5 |
| Indeno-(1,2,3-cd) Pyrene | 193295 | 0.5 |
| Dibenz-(a,h)-Anthracene | 53703 | NA[2] |
| Benzo-(g,h,i)-Perylene | 191242 | NA[2] |

All of the above compounds were below minimum detection limits, except as noted below. See Appendix E for raw laboratory data used in constructing this table. Sample numbers: 87.00262, 87.00263, 87.00264, 87.00265, 87.00266, 87.00267, and 87.00268; locations of these sample numbers are identical to sample numbers 87.00275, 87.00276, 87.00277, 87.00278, 87.00279, 87.00280, and 87.00281, respectively. See Table C-3-2 for sample numbers and location map.

MDL[1] = LANL HSE-9 Minimum Detection Limit (micrograms per gram, or ug/g), which is generally lower than the EPA specified minimum detection limit of 10.0 ug/g for these compounds.

NA[2] = Not Analyzed (instrument problem)

This page was intentionally left blank. It reflects corrections made to this document on February 6, 1989.

# APPENDIX D. Background Correspondence

**Department of Energy**
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

MAR 12 1987

FA: TG 3/13/87
CYS: Dry polcher
Nylander
White
Barr
Read File

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Michael Burkhart, Director
New Mexico Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504-0968

Dear Mr. Burkhart:

The Los Alamos National Laboratory maintains a surface impoundment at Technical Area 16 (TA-16) to collect effluent from pressure vessels used to filter high explosives waste. This effluent is then discharged through a permitted National Pollutant Discharge Elimination System (NPDES) outfall. Last summer, after we discovered high levels of barium had accumulated in the impoundment, the Laboratory treated the liquid to remove the barium and discharged the effluent under the permit.

Because the barium level exceeded the criteria for toxicity under the New Mexico Hazardous Waste Management Regulations (NMHWMR-3) (100mg/1), the Environmental Improvement Division (EID) determined the Laboratory had stored and treated a hazardous waste in the impoundment. Although neither the Department of Energy nor the University of California has acquiesced in EID's determination, we have since submitted a closure plan (November 13, 1986) and continue to analyze the contents of the impoundment to insure that high levels of barium are not accumulating. In addition, we have ordered a broad spectrum analysis of the effluent to determine whether other hazardous constituents are present.

Following two sampling events on November 10 and 20, 1986, the Environmental Surveillance Group, HSE-8, notified The Design Engineering (WX) Division, the organization responsible for maintaining the impoundment, that they could discharge its contents under the Laboratory's NPDES permit (pH:6-9, COD:2000 g/1 seven-day average, 1000 g/1 daily average, and TSS:90 mg/1 seven-day average, 60 mg/1 daily average). Group HSE-8 based its approval on parameters for the NPDES permit having been met (pH:7.21 and 8.0, COD:135 +/- 27g/1 and 126 +/- 25g/1) and on analytical results indicating barium levels of 60 and 59 mg/1 respectively - well below the criteria for toxicity defined in NMHWMR-3.

At this juncture, WX Division discharged additional wastewater through the pressure vessels into the impoundment on December 12, 1986, and then proceeded to discharge from the impoundment under the permit. Subsequent analysis of effluent samples taken during discharge from the impoundment indicate barium levels exceeding 100 mg/1 (specifically, 130 mg/1).

In response to this incident, the Laboratory sampled the soils below the discharge point and analyzed them for Extraction Process (EP) toxic levels of barium. We are currently awaiting these results and will submit them to EID following in-house review.

The Laboratory immediately initiated steps to preclude the recurrence of such an incident. Specifically, we have begun design work on an accumulation tank which would provide the ability to treat the effluent prior to its discharge under the permit. Because discharge under the permit is subject to Section 402 and 307(b) of the Clean Water Act, and because the treatment vessel will meet the definition of a wastewater treatment tank, the unit will not require a Resource Conservation and Recovery Act (RCRA) permit [40CFR264.1(g)(6) and NMHWMR-3 Section 206.A.4.f].

The Laboratory can feasibly have the accumulation tank in place and operational by August or September of this year because the tank will not require a permit for its installation and use. Meanwhile, we are treating potentially high barium liquid prior to transfer to the pressure vessels. This treatment will take place in sumps which meet the definition of wastewater treatment units. In addition, prior to any discharge of liquid from the impoundment, samples will be collected and analyzed to assure compliance with all regulatory requirements, specifically NMHWMR-3 and NPDES Permit limitations.

We hope our efforts to provide a solution to this problem meet with your approval. If you should have any questions regarding this matter, please call James Phoenix at 667-5288.

Sincerely,

Original Signed by
H. E. Valencia

Harold E. Valencia
Area Manager

6513A

bcc:
A. Tiedman, LANL, ADS, MS-A120
J. Aragon, LANL, HSE-DO, MS-K491
T. Gunderson (HSE8-87-186-1, 2-17), LANL, HSE-8, MS-K490

**Department of Energy**
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

JUN 05 1987

From: TC
cys: A. I File (Tim
R. File
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**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

Mr. Myron Knudson, Director
Water Management Division, 6W
U. S. EPA, Region VI
Allied Bank Tower at Fountain Place
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Mr. Knudson:

On April 7, 1987, I received a letter from the New Mexico Environmental Improvement Division (EID) regarding our National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for discharges from Los Alamos National Laboratory (LANL). The EID letter (Enclosure 1) indicated concerns regarding the discharge of barium from an NPDES Outfall at the Laboratory and included several Environmental Protection Agency (EPA) Region VI personnel on the distribution i.e., Roger Hartung, Jack Ferguson, and Susan Stark. In order to avoid any misunderstanding regarding the NPDES permit, I am writing this explanation and addressing EID's concerns by copy of this letter.

The subject of the EID letter is NPDES Outfall 055, which is a Category 05A High Explosives Outfall. During the early 1980's this Outfall experienced periodic noncompliance with NPDES effluent limitations, specifically chemical oxygen demand. As a result of this noncompliance, this Outfall was included in the first Federal Facility Compliance Agreement (FFCA) negotiated between EPA and the Department of Energy's (DOE), Los Alamos Area Office (LAAO), in March 1983. Remedial action taken to bring this Outfall into compliance with the NPDES permit included construction of a lined evaporation pond prior to 1985.

On December 1,1980, EPA placed DOE/LAAO on notice that a FFCA was to be negotiated and that the compliance agreement was to include a description of the violating discharges and the specific improvements planned to correct them (Enclosure 2). As part of the FFCA negotiations, EPA personnel (James Highland and Rick Amber) conducted site inspections on at least two occasions and inspected the noncompliant high explosive Outfalls, included Outfall 055. During Mr. Highland's site inspection on September 14-15, 1982, the proposed construction of the lined evaporation pond at Outfall 055 was discussed with regard to the wastewater characteristics, and the construction of the evaporation pond was encouraged in principle by EPA. When the FFCA was signed by DOE/LAAO and EPA it required installation of an evaporation pond at Outfall 055 and the EID reviewed and concurred with the content of the FFCA before it was executed (Enclosure 3).

The lined evaporation pond was used to collect wastewater drainage from sand filters. However, in order to fully understand the process, a brief explanation regarding the generation of this wastewater may be useful at this point. Throughout the Laboratory's Technical Area 16, many individual buildings have operations that involve the presence of high explosive materials. Each building that houses operations that process high explosives has a wastewater sump that is used to clarify wastewater prior to discharge pursuant to NPDES. Periodically, these sumps are vacuum cleaned and the materials discharged onto the sand filters that drain to the lined evaporation pond. After the solid materials trapped by the filter are dried, they are burned to eliminate the explosivity hazard and the resulting ash is handled as a hazardous waste.

Each of the high explosive Outfalls is permitted under NPDES, and the 1977 consolidated NPDES permit application indicated that many of the high explosive Outfalls contained barium in the effluent. Subsequent NPDES permit reapplications included previous wastewater characterization and information by reference. Barium is present due to the explosive industry's typical use of barium nitrate in explosives. Throughout the history of high explosive operations at the Laboratory, barium nitrate has been present. However, its usage has waxed and waned with peak usage occurring during the 1940s, 1950s, and mid-1970s to mid-1980s. Therefore, depending on the time period during which an NPDES high explosives Outfall was sampled, barium may or may not have been present. Typically, only de minimus quantities were anticipated in the effluents in the concentration range of a few parts per million.

From the time the lined evaporation pond went into service in January 1985, it did not discharge until mid-1986. Because of the residence time that wastewater had in the lined pond, certain chemical constituents had concentrated through evaporation unbeknown to the Laboratory. Barium, in particular, had concentrated to such a level that the level in the bottom sediments exceeded the criteria for Extraction Procedure (EP) toxicity under the New Mexico Hazardous Waste Management Regulations (NMHWMR-3). The EID then made a determination that the Laboratory had stored and treated a hazardous waste in the pond. (Although neither DOE nor the University of California has acquiesced in EID's determination, DOE/LAAO has since submitted a closure plan on November 13, 1986, for the pond and continued to analyze the contents of the pond to insure that high levels of barium are not accumulating).

For several months the Laboratory did not discharge from the pond following the above-mentioned discharge. The lined pond became quite full because of the accretion of excessive precipitation and was sampled on November 10 and 20, 1986, in preparation for discharge. The collected samples were analyzed for the NPDES parameters, as well as for barium. The results indicated that the potential discharge met the NPDES parameter limitations and that the barium was well below the NMHWMR-3 requirement for barium.

On December 12, 1986, additional influent was added to the lined pond and the pond was discharged. Subsequent analysis of effluent samples collected during discharge from the pond indicated barium concentrations exceeding 100 mg/l (specifically, 130 mg/l). It was later determined that the excessive barium levels were a result of additional influent. Realizing the import of this concentration regarding hazardous waste management and NPDES, the Laboratory immediately initiated steps to preclude the recurrence of such an incident. Specifically, the following steps have been taken:

1. An engineering design was initiated and completed to construct an accumulation tank which would provide treatment of the effluent prior to discharge pursuant to NPDES. This treatment system would include barium sulfate precipitation, clarification and activated carbon filtration of the effluent prior to discharge.

2. A composite sampling program was initiated on specific high explosive outfalls that contribute wastewater to the lined pond and that have the potential for contributing barium to the lined pond. Treatment for barium removal is being invoked at the building wastewater treatment sumps prior to effluent transfer to the lined pond, as necessary.

40 CFR 122.41(1)(8) states: "Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information." Since barium was presumed to be present in only de minimus concentrations, and was not analytically shown to be a constituent of the high explosive wastewater Outfall sampled as representative of the high explosive effluent category (for the NPDES permit application submitted March 1986), the Laboratory did not expect high concentrations of barium in Outfall 055. As previously stated, the presence of high concentrations of barium in Outfall 055 was first thought to be due to evaporative concentration effects in the lined pond. As soon as it was apparent that barium was being added to the pond via influent that contained more than de minimus concentrations, the Laboratory undertook swift remedial actions.

Should further monitoring of other high explosive Outfalls disclose barium as a wastewater constituent exceeding the reported levels characterizing the Outfalls in the 1986 permit reapplication, such information will be transmitted immediately to EPA and EID. Furthermore, as soon as the detail design is available for the new treatment system proposed for Outfall 055 (or for any other high explosive Outfalls, as dictated by the monitoring program), such information will be transmitted to EPA and EID.

On April 23 and 24, 1986, an EPA NPDES Compliance Evaluation Inspection was conducted at the Laboratory by Ms. Delia Oteiza. During the inspection and pursuant to her request, Ms. Oteiza was taken on a tour of the lined pond and Outfall 055 and typically high explosive wastewater sumps and Outfalls. The history and unforeseen presence of barium in Outfall 055 and the interrelationship of the NPDES and Resource Conservation and Recovery Act (RCRA) requirements were discussed. After touring the high explosive Outfalls and specifically Outfall 055, Ms. Oteiza should be able to corroborate the above-mentioned explanation and assist in clarifying any further misunderstanding regarding Outfall 055.

I trust that the foregoing discussion for the benefit of all parties concerned will shed light on any misunderstandings regarding Outfall 055 and our NPDES permit. Please be assured that we are aware of the requirements associated with our NPDES permit and that we apologize for any failure in reporting. Both DOE/LAAO and the Laboratory are diligently making every effort to maintain compliance with the permit. Should you have any questions concerning this letter or our NPDES permit, please feel free to contact James Phoenix (FTS) 843-5288 of my staff.

Sincerely,

Original signed by
Harold E. Valencia

Harold E. Valencia
Area Manager

3 Enclosures

cc:
Michael Burkhart, Director, NMEID, Santa Fe, NM
Kathleen Sisneros, NMEID, Santa Fe, NM
James Highland, USEPA, Dallas

bcc:
A. Tiedman, ADS, LANL, MS A120
J. Aragon, HSE-DO, LANL, MS K491
T. Gunderson (HSE8-87-573, AI#48, 5/26), LANL, MS K490

LTP:JAP:0688

**Department of Energy**
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

JUL 3 0 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Myron Knudson, Director
Water Management Division, 6W
US EPA, Region VI
Allied Bank Tower/Fountain Pl.
1445 Ross Avenue
Dallas, TX 75202-2733

Dear Mr. Knudson:

Pursuant to our March 12, 1987 letter to you, enclosed are results of soil sampling performed by the Los Alamos National Laboratory (the Laboratory) after a discharge from a surface impoundment in Technical Area (TA) 16. The discharge contained barium above the Extraction Procedure (EP) toxicity criteria of 100 mg/l. The Laboratory sampled downgradient from the discharge into the ephemeral channel to determine if barium levels indicating a Resource Conservation and Recovery Act (RCRA) hazardous waste (i.e., above 100 mg/l) were in the soil.

The analytical results indicate that measured levels (26.0 mg/l) somewhat above background (0.8 mg/l), although well below the EP toxic criteria (100.0 mg/l), exist within 3 feet of the discharge point. These levels quickly decrease to near background concentrations in samples taken 10 feet and 40 feet from the discharge (6.6 mg/l and 2.7 mg/l, respectively). Due to these low levels, we do not see the need for further evaluation related to this discharge.

Pursuant to our June 5, 1987 letter to you, enclosed are results of recent wastewater sampling for barium on other high explosive Outfalls, specifically, Outfalls 056 and 058. As stated in the June 5, 1987 letter, a composite sampling program was begun on other specific high explosive Outfalls, and as the data became available it would be transmitted to EPA and EID. Sampling from other high explosive Outfalls is continuing.

Our letter of March 12, 1987 stated we were planning to install a treatment system to ensure that future discharges of relatively elevated levels of barium would not occur. We proposed to install this treatment system and have it operational by September, 1987. We have since chosen to eliminate barium in our processes rather than treat barium as originally proposed. We anticipate elimination of barium in our processes to occur by September 1988.

*Celebrating the U.S. Constitution Bicentennial — 1787-1987*

We are currently developing a substitute composition to replace barium in our explosive manufacturing processes. Although this development is proceeding, our use of barium-containing compositions must continue in a very limited capacity until another composition can be proven effective. We are treating all barium-containing sludge and effluent in sumps prior to collection for disposal/burning at the pressure vessels. This treatment renders the barium insoluble prior to effluent discharge through permitted Outfall Number 055.

Generally, the treatment procedure for the sludge and effluent in the sumps is: 1) the sump that will receive barium-containing waste is emptied, 2) machining or cleaning waste effluent is discharged into the sump until an indicator light shows the discharge portion of the sump to be two-thirds full, 3) cleaning or machining operations then cease until the sump's contents have been treated and emptied, 4) prior to emptying, contents of the sump are sampled and the appropriate amount of chemicals (hydrochloric acid and sodium sulfate) to adequately fix the barium in a nonsoluble form is determined, 5) diluted hydrocholoric acid and sodium sulfate are then added to the sump, mixed, and allowed to settle, and 6) contents of the sump are removed by vacuum truck and drained through a cloth filter onto the pressure vessels for burning. This ensures that the eventual effluent from the pressure vessels into the surface impoundment does not contain elevated levels of barium.

We have expanded our Standard Operating Procedures (SOP) to include significant changes in process. These changes include reducing the amount of water associated with manufacturing barium-containing explosives and inert products and, consequently, reducing the amount dissolved in the washdown water; isolating activities that have potential to empty barium-containing wastewater into the collection sumps; and treating barium in the sumps prior to disposal. These SOPs have been included as enclosures.

Also in the March 12, 1987 letter, we committed to analyze influent entering the surface impoundment for a broad spectrum of other potential contaminants (specifically, volatiles, semi-volatiles and nitroaromatics). Results from these analyses are enclosed and indicate a need for treating organic constituents. We are changing our treatment system design to address removal of organics by filtering the effluent through an activated carbon adsorption tank. A copy of the treatment system design is enclosed.

This treatment system will be operational by mid-September, 1987. Once it is on-line, we will remove the remaining liquid from the surface impoundment. Before removal, the liquid will be sampled and analyzed for elevated levels of barium from discharges prior to our treatment in sumps. If only de minimus levels exist, we will discharge the fluid through the carbon treatment system to ensure removal of organic compounds. If higher

concentrations of barium are evident, we will pump the fluid into a stock tank for treatment similar to that performed in the sumps. The treated fluid will then be discharged through the cloth filter, pressure vessels, and carbon treatment system.

Eliminating barium from our manufacturing processes and removing organic compounds from our effluents are waste minimization steps in our continued efforts to maintain environmental compliance.

If this approach does not meet with your approval, please contact Mr. James Phoenix of my staff at 667-5288.

Sincerely,

Harold E. Valencia
Area Manager

7229A

Enclosure:
As stated

cc:
A. Tiedman, LANL, ADS, MS A120
J. Aragon, LANL, HSE-DO, MS K491
T. Gunderson (HSE8-87-730, 7-14), LANL, HSE-8, MS K490
A. Drypolcher, LANL, HSE-8, MS K490

EW MEXICO
EALTH AND ENVIRONMENT
DEPARTMENT

**ENVIRONMENTAL IMPROVEMENT DIVISION**
**Harold Runnels Bldg.-1190 St. Francis Drive**
**Santa Fe, New Mexico 87503**

GARREY CARRUTHERS
Governor
CARLA L. MUTH
Secretary
MICHAEL J. BURKHART
Deputy Secretary

Richard Mitzelfelt
Director

Fold at line over top of envelope to the right of the return address
CERTIFIED
P 965 484 183
MAIL

January 5, 1989

Certified Mail P 965 484 183
Return Receipt Requested

Mr. Harold E. Valencia
U.S. Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

**RE: NM0890010515**
**TA-16 SURFACE IMPOUNDMENT CLOSURE**

Dear Mr. Valencia:

After reviewing the materials submitted with your letter of December 7, 1988, providing comments on the closure plan for the surface impoundment at Technical Area 16, we must disapprove the plan as written. You are required, in accordance with HWMR-5, Part VI, Section 265.112(d)(4), to respond within 30 days of receipt of this letter with a revised closure plan addressing the issues delineated below.

1. The surface impoundment has been partially closed; emptied of liquids and the sludge and liner removed. The plan was not modified in accordance with HWMR-5, Part VI, Section 265.112(c)(1) to reflect the partial closure actions and the proposed actions remaining to complete closure. The numerous conditional actions in the original plan need to be deleted or revised to reflect the current proposed actions.

2. The original plan states that the maximum capacity of the impoundment is 18,610 gallons. The partial closure actions taken in September 1987 removed 100,000 gallons of contaminated fluids. This variance must be explained.

3. The plan does not reflect the totally enclosed treatment unit (TETU) which was installed to enable closure of this impoundment. This TETU is an integral part of the closure as it is one of the actions taken to preclude future release of hazardous waste or hazardous constituents.

4. The original plan states that the impoundment will be reused. The December 7, 1988 letter states that the impoundment will be filled with soil, regraded and replanted, subject to budgetary constraints.

The current proposal needs to be clearly stated and the plan modified accordingly. Plant species and soil preparation should be addressed.

5. Original plan paragraph 5.1.4.2. indicates three boreholes to a depth of 120 feet will be drilled. This may not adequately monitor groundwater which is approximately 1000 feet below the impoundment. If groundwater is not monitored an alternative monitoring plan must be detailed.

6. The closure schedule in the original plan does not reflect the current state of the impoundment. Neither does it provide adequate detail to demonstrate that the schedule is reflective of the contingencies discussed in the plan.

7. The original plan (page 11) states that a closure sampling field log book will be kept. Supplemental Report Section 3 indicates that this was not done during the partial closure. Failure to follow the closure plan will preclude obtaining proper certification of closure. The plan must reflect actual actions which will be taken.

8. Paragraph 3.2 of the Supplemental Report enclosed with your December 7, 1988 letter states that the liner will be burned. Open burning of hazardous wastes is prohibited by HWMR-5, Part VI, Section 265.382 unless the waste is explosive. The liner should be decontaminated by some means other than open burning. If LANL plans to burn the liner as ordinary waste, after decontamination, the plan must contain documentation that the proper air quality permits are or will be available.

9. Supplemental Report paragraph 3.3 refers to two additional boreholes to be made in the bottom of the impoundment. These boreholes are not adequately described. Because Table C-3-2 has identified hazardous constituents in the soil, adequate sampling must be performed to determine the extent of the contamination.

10. Supplemental Report Appendix C Table C-3-2 indicates elevated levels of cadmium in sample 0278. The source of this hazardous constituent should be explained and its removal addressed if clean-closure continues to be proposed.

11. The laboratory analysis request sheets in Appendix E of the Supplemental Report indicate that only barium analysis was requested, yet paragraph 2.1.1 states that the impoundment never exceeded E.P. Toxicity levels of any other metal. Upon what is this statement based?

12. The Appendix E data sheets refer to sample identification numbers different than those discussed in Appendix C. Provide identification in a common nomenclature so that all documentation associated with a sample may be identified.

The revised plan should clearly reflect what actions have been taken and what remain to be taken. The later should be detailed sufficiently to establish what resources will be required, what time may be needed to accomplish each of the remaining actions, what sampling and analysis data will be gathered and what records will be kept.

To establish that clean closure has been achieved, the final sampling and analysis must be fully documented. A table summarizing the sampling results and the laboratory analysis sheets supporting the summary table should be included. This should be reflected in a final report, documenting the following:

1. Sample results summarized in tabular form.

2. An as-built block diagram showing the essential elements of the TETU installed to replace the impoundment. This diagram need not be to scale but must show permanent piping connected to the filter cones and the discharge point.

3. Disposition of sludges removed from the impoundment.

4. Disposition of all decontamination wash waters.

If you have any questions please all Mr. C. Kelley Crossman at 827-2923.

Sincerely,

Jack Ellvinger

Jack Ellvinger, Chief
Hazardous Waste Bureau

JE/pv

cc: Janie Hernandez, EPA (6H-HS)

**Department of Energy**
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

FEB 09 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jack Ellvinger, Chief
Hazardous Waste Bureau
Environmental Improvement Division
1190 St. Francis Drive
Harold Runnels Bldg.
Santa Fe, NM 87503

Dear Mr. Ellvinger:

As result of the disapproval of the TA-16 Surface Impoundment Closure Plan by the Environmental Improvement Division (EID), the Department of Energy is submitting responses to specific items cited in your letter. These responses are enclosed, and are numbered to correspond to the numbering system used in your January 5, 1989 letter.

In addition, the original closure plan submitted to EID on November 13, 1986, should be discarded. A revised closure plan for the TA-16 surface impoundment is enclosed, as required under New Mexico Hazardous Waste Management Regulations (HWMR-5), Part VI, Section 265.112(d)(4). Furthermore, it is our intention that a corrected version of the Supplemental Report for the Interim Status Closure Plan at the TA-16 Surface Impoundment, previously submitted to the EID on December 7, 1988, and dated November 18, 1988, be a part of the revised closure plan. Minor corrections to this later document are also enclosed.

If you have any questions, please call Donna Lacombe at 667-5288.

Sincerely,

Harold E. V
Area Manage

not in 2/9/89 response in Vol. II

1DML-170

2 Enclosures

cc:
A. Davis, EPA, Dallas, w/o encls.
J. Themelis, Director, EHD, AL, w/encls.
A. Tiedman, ADS, LANL, MS A120, w/o encls.

ATTACHMENT I
INTERIM STATUS CLOSURE PLAN
TECHNICAL AREA (TA) 16 SURFACE IMPOUNDMENT

Los Alamos National Laboratory
Los Alamos, New Mexico 87545
NM 0890010515

February 6, 1989

Response Comments to the Hazardous Waste Bureau, New Mexico Environmental Improvement Division, Disapproval of Closure Plan Dated January 5, 1989

1. Responses to this New Mexico Environmental Improvement Division (NMEID) comment are contained in the revised closure plan document dated February 1989 and entitled, Interim Status Closure Plan, Tech Area 16 Surface Impoundment, prepared by International Technology, Inc. (IT, Inc., 1989) for the Los Alamos National Laboratory (LANL), and attached herein. This IT, Inc. (1989) report is hereafter referred to as the revised plan; it has been labeled as Volume I of II. A corrected version of the Supplemental Report for the Interim Status Closure Plan at the TA-16 Surface Impoundment, originally submitted to the NMEID on December 7, 1988, and dated November 18, 1988, forms an integral part of the revised plan. This modified document is hereafter referred to as the Supplemental Report; it has been labeled as Volume II of II. Modifications to the Supplemental Report are inclosed herein. The original closure plan document, prepared by IT, Inc. for LANL and submitted to the NMEID in November 1986, should be discarded.

2. The original closure plan document dated November 1986, and prepared by IT, Inc., was distributed for internal LANL review before final submittal to NMEID. The final draft version of this document was not marked as a draft copy, and has remained at LANL as a work document. This unmarked draft document was inadvertently referenced in the Supplemental Report. Hence, the TA-16 surface impoundment was incorrectly reported to have "approximately 100,000 gallons" on page 5 of the old Supplemental Report. The correct volume for the TA-16 impoundment is 18,610 gallons, as originally stated in the final IT, Inc. document dated November 1986, and submitted to the NMEID. Modifications to the Supplemental Report are enclosed that rectify this oversight.

3. There was never any RCRA defined totally enclosed treatment unit installed in conjunction with the interim status closure plan at the TA-16 impoundment. A wastewater treatment unit, as defined in NMHWMR-5, Part I, Section 260.10, was installed because of NPDES discharge requirements under NPDES Permit Numbers NM0028355 and NM0028576 at NPDES Outfall Number 05A-055. Discharges from this outfall are subject to Section 402 and 307(b) of the Clean Water Act; furthermore, this

wastewater treatment unit meets the definition of a wastewater treatment tank. Thus this unit does not require a RCRA permit under NMHWMR-5, Part V, Section 264.1(g)(6), or under NMHWMR-5, Part VI, Section 265.1(c)(10). However a complete description of this wastewater treatment unit has been included in the revised closure plan document (IT, Inc., 1989) inclosed herein.

4. Responses to this NMEID comment are contained in the revised closure plan document (IT, Inc., 1989) inclosed herein.

5. No additional boreholes will be located and drilled at the TA-16 impoundment. No monitoring of the uppermost aquifer, located approximately 1,230 feet beneath the TA-16 impoundment, is anticipated. Supporting documentation for a ground-water monitoring waiver at the TA-16 surface impoundment, as required under NMHWMR-5, Part VI, Section 265.90(c), is on file at LANL's Environmental Surveillance Group (HSE-8) office. This demonstration is in writing, and has been certified by both a qualified geotechnical engineer and a qualified geologist.

6. Responses to this NMEID comment are contained in the revised closure plan document (IT, Inc., 1989) inclosed herein.

7. Responses to this NMEID comment are contained in the revised closure plan document (IT, Inc., 1989), inclosed herein; and in the modified Supplemental Report. Since the NMEID has already received the original Supplemental Report, only modifications to it have been enclosed herein.

8. Personnel in the WX-12 Group at LANL will sample the liner for potentially explosive residue. Personnel from HSE-8 will simultaneously sample the liner for hazardous wastes. Sampling procedures and contaminant indicator parameters are described in the revised closure plan (IT, Inc., 1989). If WX-12 determines that the liner is still contaminated with explosives, then WX-3 and HSE-8 will provide the NMEID with adequate documentation of all contamination, including analytical test data and a photographic record of field testing activities. The liner will then be removed for thermal treatment at TA-16 in accordance with NMHWMR-5, Part VI, Section 265.382.

   If WX-3 certifies in writing that the liner is not contaminated with explosive residue, then the liner will be considered by LANL as equipment contaminated by hazardous wastes. If the HSE-8 analyses demonstrate that the liner was successfully decontaminated of all hazardous wastes before its

removal from the impoundment, then it will be reclaimed for subsequent utilization in other LANL activities, or will be disposed of as solid waste. If the HSE-8 analyses demonstrate that the liner is still contaminated with hazardous wastes, then it will be disposed of as a hazardous waste. In this later event, additional soil sampling will be conducted at those areas where the liner is presently stored, and appropriate actions will be taken (i.e., determination of the extent of potentially contaminated soils, soil removal, etc.). Detailed procedures that will be followed in the final liner disposition are contained in the revised closure plan document (IT, Inc. , 1989).

9. No additional boreholes will be drilled in the bottom of the impoundment. However, additional soil sampling in the impoundment excavation is described in the revised closure plan (IT, Inc., 1989). Furthermore, soil sampling below the present liner storage location will also be conducted if it is determined that the liner is still contaminated with hazardous wastes. These sampling procedures and contaminant indicator parameters are fully described in the revised closure plan (IT, Inc., 1989). If contamination is identified below the former impoundment excavation, or in soils below the current liner storage location, then appropriate remedial actions will be taken. These LANL responses to contamination are described in the revised closure plan (IT, Inc., 1989).

10. Soil sample 87.0278 indicated a cadmium concentration of 0.18 mg/l below the impoundment bottom, with an analytical uncertainty of 0.02 mg/l (see pgs. 81 and 172, Supplemental Report). Of the five soil samples recovered from below the impoundment liner and two background samples recovered adjacent to the impoundment (see pgs. 81 and 165-180, Supplemental Report), only soil sample 87.0278 indicated cadmium above detection limits. These same analyses also indicated that all other EP toxicity metals were at or below detection limits for all seven soil samples. Both impoundment sludge sample 86.02598 and impoundment water sample 86.02597 indicated cadmium concentrations of less than 0.05 mg/l, with an analytical uncertainty of 0.05 mg/l (see pgs. 73 and 124, Supplemental Report). Furthermore, impoundment water samples numbered 87.02602 and 87.02603 (see pgs. 76 and 130, Supplemental Report) also indicated cadmium levels at or below detection limits. Except for barium and lead, these same samples also indicated that all other EP toxicity metals were at or below detection limits. Sludge sample 86.02598 had a lead concentration of 0.50 mg/l with a detection limit of 0.20 mg/l; barium was detected above 100 mg/l in multiple impoundment samples. These data clearly indicate that no

cadmium contamination has occurred below the impoundment liner because no cadmium above its detection limit was ever observed in either the impoundment sludge or fluid. This observation is further supported by elevated barium concentrations (i.e., greater than 100 mg/l) in impoundment fluids that were recorded on multiple occasions (see pgs. 73-77, Supplemental Report); however, no barium concentrations above detection limits were recorded in any of the five soil samples recovered below the impoundment liner (see pgs. 73 and 76, and pg. 81 and 176, Supplemental Report).

Two conclusions can be drawn from this information. First, it is unlikely that the contents of the impoundment could have contaminated sub-base soils with cadmium to concentration levels above recorded levels in the impoundment. This statement is supported by the number of cadmium-free samples taken from the wastes in the impoundment compared to the one sub-base soil sample showing 0.18 mg/l cadmium. Second, it is even more unlikely that cadmium would be released from the impoundment wastes and into the sub-base soils below the liner, and that barium was not. Barium and lead were the only metals characteristic of EP toxicity that were detected in the impoundment wastes. If a release had occurred, then barium would have been found with cadmium beneath the impoundment. In conclusion, this information indicates that no contaminated fluids ever leaked from the impoundment at TA-16, and that the 0.18 mg/l cadmium level in sample 87.0278 is naturally occurring.

This conclusion is further supported by historical studies (i.e., 1979-1982) conducted on Sigma Mesa near TA-3 at LANL which are unrelated to activities at the TA-16 impoundment. These studies clearly indicate that trace levels of cadmium are a common natural constituent of various soil types in Los Alamos County. These data are currently being prepared for a LANL publication; however, these data have been included with the modifications to the Supplemental Report (i.e., added as Appendix F). Analyses of these data indicate that the mean background cadmium level in 36 soil samples is about 0.170 mg/l, with a 95% confidence interval of 0.138 to 0.201 mg/l (see pgs. 3-4, Supplemental Report). Clearly the recorded cadmium concentration level of 0.18 mg/l in sample 87.0278 falls between these confidence limits, and is indicative of background levels.

11. All metals characteristic of EP toxicity were tested on multiple occasions and with multiple samples; these results are contained in the Supplemental Report (see Appendices C and E). Samples were collected from impoundment sludges and

fluids, soils from below the impoundment liner, and soils below the NPDES outfall. As a convenience to the reader, the tables contained in Appendix C have been modified to reference actual sample numbers. The analytical results corresponding to these sample numbers are contained in Appendix E.

12. See comment (11) above.

END OF RESPONSE COMMENTS TO NMEID LETTER DATED JANUARY 5, 1989

# APPENDIX E. Raw Laboratory Chemical Data

E-1

WELL COMPLETION DIAGRAM

P-87-14
(ALUMINUM)

```
                T|  |<--------- 0
                T|  | TOP SOIL
                T|  |<--------- 4
                T|  |
                T|  | TUFF (3d)
                T|  |
                T|  |<--------- 30
                T|  |
                T|  |
                T|  |
                T|  | TUFF (3c)
                T|  |
                T|  |
                T|  |
79 --------->T|  |<--------- 75
                |X| TUFF (3b)
                |X|
                 - <--------- 85
```

| | |
|---|---|
| SCREEN | = |
| CAVED-IN | X |
| BACKFILLED TUFF | T |
| CEMENT | C |
| BENTONITE | B |
| SILICA SAND | S |

(NOT TO SCALE)

BOREHOLE: P-87-15
GEOLOGIST: Fred Brown
DATE DRILLED: 27 AUGUST 1987
ELEVATION: 7413 ft
LOCATION: 475803, 1763520
TOTAL DEPTH: 70 ft
DISPOSITION: Uncased

| DEPTH | DESCRIPTION |
|---|---|
| 0-1 | El Cajete Pumice |
| 1-3 | Pumice/Top Soil (sandy loam) |
| 3-4 | Dark yellowish brown clay |
| 4-40 | Unit 3c. Dark yellowish brown tuff<br>Moderately welded<br>Rare rhyolite lithic fragments<br>Common red-grey pumice lapilli |
| 40-50 | Unit 3c. Pale yellowish brown tuff<br>Slightly welded<br>Rare rhyolite lithic fragments<br>Rare pumice lapilli |
| 50-55 | Unit 3c. Dark yellowish brown tuff<br>Moderately welded<br>Rare rhyolite lithic fragments<br>Common red-grey pumice lapilli |
| 55-70 | Unit 3b. Dark yellowish brown tuff<br>Densely welded<br>Rare rhyolite lithic fragments<br>Rare pumice lapilli |

BOREHOLE: P-87-16A
GEOLOGIST: Fred Brown
DATE DRILLED: 4 SEPTEMBER 1987
ELEVATION: 7452 ft
LOCATION: 475550, 1764200
TOTAL DEPTH: 105 ft
DISPOSITION: Aluminum Casing

| DEPTH | DESCRIPTION |
|---|---|
| 0-5 | Fill/Dark Brown Clay |
| 5-7 | Top Soil (sandy loam) |
| 7-15 | Unit 3d. Pale yellowish brown tuff<br>Slightly welded<br>Rare rhyolite lithic fragments<br>Rare pumice lapilli<br>Vertical fracture at 9-12 ft |
| 15-26 | Unit 3d. Greyish orange pink tuff<br>Moderately welded<br>Rare rhyolite lithic fragments<br>Oxidation halo surrounds rhyolite lithic fragments<br>Rare brown pumice lapilli<br>Vertical fracture 19-22 ft |
| 26-31 | Extensive clay-filled vertical fractures |
| 31-42 | Unit 3d. Greyish orange pink tuff<br>Moderately welded<br>Common oxidized rhyolite lithic fragments<br>Common grey pumice lapilli |
| 42-46 | Unit 3c. Pale red tuff<br>Welded<br>Common oxidized rhyolite lithic fragments<br>Common grey pumice lapilli<br>Clay-filled vertical fracture (width to .5 in) |
| 46-50 | Unit 3c. Pale yellowish brown tuff<br>Welded<br>Common oxidized rhyolite lithic fragments<br>Common grey pumice lapilli |
| 50-60 | Densly welded, no core recovered |
| 60-68 | Unit 3c. Greyish red tuff<br>Welded<br>Rare rhyolite lithic fragments<br>Common large (to 2 in) pumice lapilli |

| | |
|---|---|
| 68-74 | Unit 3c. Pale brown tuff<br>Moderately welded<br>Rare rhyolite lithic fragments<br>Rare clayey pumice lapilli |
| 74-81 | Unit 3c. Pale yellowish brown tuff<br>Moderately welded<br>Rare rhyolite lithic fragments<br>Rare pumice lapilli<br>Clay-filled vertical fracture (width to .75 in) |
| 81-87 | Unit 3c. Pale yellowish brown tuff<br>Welded<br>Rare rhyolite lithic fragments<br>Rare pumice lapilli |
| 87-105 | Unit 3b. Densly welded, no core recovered |

WELL COMPLETION DIAGRAM

P-87-16A
(ALUMINUM)

```
                T| |<--------- 0
                T| | TOP SOIL
                T| |<--------- 7
                T| |
                T| | TUFF (3d)
                T| |
                T| |
                T| |<-------- 42
                T| |
                T| |
                T| | TUFF (3c)
                T| |
                T| |
                T| |<--------- 87
8 --------->T| |
                |X| TUFF (3b)
                |X|
                 - <--------- 105
```

| | |
|---|---|
| SCREEN | = |
| CAVED-IN | X |
| BACKFILLED TUFF | T |
| CEMENT | C |
| BENTONITE | B |
| SILICA SAND | S |

(NOT TO SCALE)

## IV. REFERENCES


Abeele, W.V., Wheeler, M.L., Burton, B.W. (1981): Geohydrology of Bandelier Tuff. LA-8962-MS. Los Alamos National Laboratory, Los Alamos, New Mexico.

Abrahams J.H. (1963): Physical properties of and movement of water in the Bandelier Tuff, Los Alamos and Santa Fe Counties, New Mexico. U.S.G.S. Open File Report, Santa Fe, New Mexico.

Bailey, R.A., Smith, R.L., Ross C.S. (1969): Stratigraphic nomenclature of the volcanic rocks of the Jemez Mountains, New Mexico. U.S.G.S. Bulletin 1274-P, Santa Fe, New Mexico.

Brown, F. (1987): Test Hole P-87-00, TA-16, Area P. LANL Memorandum dated July 29, 1987. Los Alamos, New Mexico.

Brown, F., Purtymun, W., Stoker, A., Barr, A. (1987): Geology and hydrology of Technical Area 16 Area P. In press. Los Alamos National Laboratory, Los Alamos, New Mexico.

Dransfield, B.J., Gardner, J.N. (1985): Subsurface geology of the Pajarito Plateau, Espanola Basin, New Mexico. LA-10455-MS. Los Alamos National Laboratory, Los Alamos, New Mexico.

Everett L.G., Wilson L.G., Holyman E.W. (1984): Vadose zone monitoring for hazardous waste sites. Noyes Data Corporation, Park Ridge, New Jersey.

Gardner J.N, Goff F. (1986): Stratigraphic relations and lithologic variations in the Jemez Volcanic Field, New Mexico. Journal of Geophysical Research, v.91, p.1763-1778.

Goddard E.N., Trask P.D., De Ford R.K., and others (1984): Rock Color Chart. Geological Society of America, Boulder, Colorado.

Griggs R.L. (1964): Geology and groundwater resources in the Los Alamos area. U.S.G.S. Water Supply Paper 1753, Santa Fe, New Mexico.

Kearl M.P., Dexter J.J, Kautsky, M. (1986): Vadose zone characterization of Technical Area 54, Waste Disposal Areas G and L. Report 3: Preliminary assessment of the hydrologic system. Bendix Field Engineering, Grand Junction, Colorado.

Purtymun W. (1968): Geology of the microseismic station at S-Site, Los Alamos County, Los Alamos. U.S.G.S. Administrative Report, Santa Fe, New Mexico.

Purtymun, W. (1974): General geohydrology of the Pajarito Plateau, in New Mexico Geologic Society Guidebook, 25th Field Conference. Socorro, New Mexico.

Purtymun, W. (1984): Hydrological characteristics of the main aquifer in the Los Alamos area. LA-9957-MS. Los Alamos National Laboratory, Los Alamos, New Mexico.

Smith, R.L., Bailey, R.A. (1966): The Bandelier Tuff - a study of ash-flow eruption cycles from zoned magma chambers. Bulletin Volcanologique v.29, p.83-104.

# APPENDIX B. Neutron Moisture Access Well Data Summary

Neutron moisture data will be collected from boreholes that are completed with two inch diameter aluminum casing. After the neutron probe has been calibrated, and all calibration and field data have been quality control checked, they will be made available to the NMEID.

C-1

## APPENDIX C. Sample Analyses Data Summary


| | |
|---|---|
| Table C-1 | NPDES Outfall 055 and Surface Impoundment Samples Chemical Quality and Characteristics Data Summary |
| Table C-2 | Surface Impoundment Fluid Samples Semi-Volatile Organic Compound Analyses |
| Table C-3-1 | Soils Below NPDES Outfall 055 with a Location Map |
| Table C-3-2 | Soils Below Impoundment Liner with a Location Map |
| Table C-4 | Volatile Organic Compound Identification List Soil Analyses Below the Surface Impoundment Liner |
| Table C-5 | Semi-Volatile Organic Compound Identification List Soil Analyses Below the Surface Impoundment Liner |

TABLE C-1. CHEMICAL QUALITY AND CHARACTERISTICS DATA SUMMARY
LOS ALAMOS NATIONAL LABORATORY
NPDES OUTFALL NO. EPA 05A-055 WATER QUALITY DATA SUMMARY
TECHNICAL AREA 16 SURFACE IMPOUNDMENT FLUIDS AND SLUDGES
SEE APPENDIX E FOR RAW DATA



| SAMPLE NO. : | NPDES | 86.75020 | 86.75021 | 86.02552 | 86.02553 |
|---|---|---|---|---|---|
| SAMPLE TYPE : | WATER | WATER | SLUDGE | WATER | SLUDGE |
| LOCATION : | OUTFALL | POND | POND | POND | POND |
| COLLECTED BY: | HSE-8 | HSE-8 | HSE-8 | HSE-8 | HSE-8 |
| ANALYSIS BY : | HSE-9 | HSE-9 | HSE-9 | HSE-9 | HSE-9 |
| DATE : | 8-14-85 | 1-29-86 | 1-29-86 | 1-29-86 | 1-29-86 |
| PARAMETER | UNITS | VALUES ==> | | | |
| pH | STD | | | | |
| TEMP | C | | | | |
| COD | mg/l | | | | |
| TSS | mg/l | | | | |
| EC | umho | | | | |
| HARDNESS | mg/l | | | | |
| ALKALINITY | mg/l | | | | |
| SALINITY | g/kg | | | | |
| CHLORIDE | mg/l | | | | |
| NITRATE | mg/l | | | | |
| FLASH PT | F | | > 160 | > 160 | |
| IGNITABLTY | | | | | |
| CORROSIVE | mm/y | | | | |
| REACTIVITY | | | | .00 | .00 |
| ARSENIC | mg/l | | | | |
| BARIUM | mg/l | 36.00 | | | |
| CADIUM | mg/l | | | | |
| CHROMIUM | mg/l | | | | |
| LEAD | mg/l | | | | |
| MERCURY | mg/l | | | | |
| SELENIUM | mg/l | | | | |
| SILVER | mg/l | | | | |

THE FOLLOWING VOLATILE ORGANIC COMPOUNDS ARE REPORTED IN ug/l
NOTE: ug/l = micrograms per liter

1,1,1-TRICHLOROETHANE (CAS #71556)
TOLUENE (CAS #108883)

TABLE C-1. CHEMICAL QUALITY AND CHARACTERISTICS DATA SUMMARY
LOS ALAMOS NATIONAL LABORATORY
NPDES OUTFALL NO. EPA 05A-055 WATER QUALITY DATA SUMMARY
TECHNICAL AREA 16 SURFACE IMPOUNDMENT FLUIDS AND SLUDGES
SEE APPENDIX E FOR RAW DATA



| SAMPLE NO. : | | 86.02597 | 86.02598 | 86.02400 | 86.02401 | NONE |
|---|---|---|---|---|---|---|
| SAMPLE TYPE : | | WATER | SLUDGE | WATER | SLUDGE | WATER |
| LOCATION : | | POND | POND | POND | POND | POND |
| COLLECTED BY: | | HSE-8 | HSE-8 | HSE-8 | HSE-8 | HSE-8 |
| ANALYSIS BY : | | HSE-9 | HSE-9 | HSE-9 | HSE-9 | HSE-9 |
| DATE : | | 1-30-86 | 1-30-86 | 2-09-86 | 2-09-86 | 4-01-86 |
| PARAMETER | UNITS | | | | | |
| pH | STD | 7.10 | 7.00 | 6.74 | 6.47 | |
| TEMP | C | | | | | |
| COD | mg/l | | | | | |
| TSS | mg/l | | | | | |
| EC | umho | | | | | |
| HARDNESS | mg/l | | | | | |
| ALKALINITY | mg/l | | | | | |
| SALINITY | g/kg | | | | | |
| CHLORIDE | mg/l | | | | | |
| NITRATE | mg/l | | | | | |
| FLASH PT | F | | | | | |
| IGNITABLTY | | .00 | .00 | | | |
| CORROSIVE | mm/y | .00 | .00 | 1.70 | .26 | |
| REACTIVITY | | .00 | .00 | | | |
| ARSENIC | mg/l | .10 | .10 | | | |
| BARIUM | mg/l | 115.10 | 229.40 | 171.00 | | .14 |
| CADIUM | mg/l | .05 | .05 | | | |
| CHROMIUM | mg/l | .20 | .20 | | | |
| LEAD | mg/l | .20 | .50 | | | |
| MERCURY | mg/l | .01 | .01 | | | |
| SELENIUM | mg/l | .02 | .02 | | | |
| SILVER | mg/l | .50 | .50 | | | |

THE FOLLOWING VOLATILE ORGANIC COMPOUNDS ARE REPORTED IN ug/l
NOTE: ug/l = micrograms per liter

1,1,1-TRICHLOROETHANE (CAS #71556)
TOLUENE (CAS #108883)

TABLE C-1. CHEMICAL QUALITY AND CHARACTERISTICS DATA SUMMARY
LOS ALAMOS NATIONAL LABORATORY
NPDES OUTFALL NO. EPA 05A-055 WATER QUALITY DATA SUMMARY
TECHNICAL AREA 16 SURFACE IMPOUNDMENT FLUIDS AND SLUDGES
SEE APPENDIX E FOR RAW DATA



| | | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE NO. : | | 86.70514 | 86.75097 | 86.70519 | 86.70522 | 86.75219 |
| SAMPLE TYPE : | | WATER | WATER | WATER | WATER | WATER |
| LOCATION : | | POND | POND | POND | POND | POND |
| COLLECTED BY: | | HSE-8 | HSE-8 | HSE-8 | HSE-8 | HSE-8 |
| ANALYSIS BY : | | HSE-9 | HSE-9 | HSE-9 | HSE-9 | HSE-9 |
| DATE : | | 5-20-86 | 7-07-86 | 7-14-86 | 9-17-86 | 10-07-86 |
| PARAMETER | UNITS | | | | | |
| pH | STD | 7.07 | | 7.19 | 7.92 | 7.22 |
| TEMP | C | | | | | |
| COD | mg/l | 290.00 | 190.00 | 97.00 | 212.00 | 214.00 |
| TSS | mg/l | 10.00 | | 19.00 | 4.00 | 15.00 |
| EC | umho | | | | | 490.00 |
| HARDNESS | mg/l | | | | | 88.00 |
| ALKALINITY | mg/l | | | | | 214.00 |
| SALINITY | g/kg | | | | | |
| CHLORIDE | mg/l | | | | | 31.00 |
| NITRATE | mg/l | | | | | 14.00 |
| FLASH PT | F | | | | | |
| IGNITABLTY | | | | | | |
| CORROSIVE | mm/y | | | | | |
| REACTIVITY | | | | | | |
| ARSENIC | mg/l | | | | | |
| BARIUM | mg/l | 22.00 | 15.00 | | 30.00 | 27.00 |
| CADIUM | mg/l | | | | | |
| CHROMIUM | mg/l | | | | | |
| LEAD | mg/l | | | | | |
| MERCURY | mg/l | | | | | |
| SELENIUM | mg/l | | | | | |
| SILVER | mg/l | | | | | |

THE FOLLOWING VOLATILE ORGANIC COMPOUNDS ARE REPORTED IN ug/l
NOTE: ug/l = micrograms per liter

1,1,1-TRICHLOROETHANE (CAS #71556)
TOLUENE (CAS #108883)

TABLE C-1. CHEMICAL QUALITY AND CHARACTERISTICS DATA SUMMARY
LOS ALAMOS NATIONAL LABORATORY
NPDES OUTFALL NO. EPA 05A-055 WATER QUALITY DATA SUMMARY
TECHNICAL AREA 16 SURFACE IMPOUNDMENT FLUIDS AND SLUDGES
SEE APPENDIX E FOR RAW DATA



| SAMPLE NO. : | | 86.75242 | 86.75261 | 86.75272 | 86.75283 | SAMPLE 4 |
|---|---|---|---|---|---|---|
| SAMPLE TYPE : | | WATER | WATER | WATER | WATER | WATER |
| LOCATION : | | POND | POND | POND | POND | POND |
| COLLECTED BY: | | HSE-8 | HSE-8 | HSE-8 | HSE-8 | HSE-8 |
| ANALYSIS BY : | | HSE-9 | HSE-9 | HSE-9 | HSE-9 | HSE-9 |
| DATE : | | 10-27-86 | 11-10-86 | 11-20-86 | 12-10-86 | 12-19-86 |
| PARAMETER | UNITS | | | | | |
| pH | STD | 9.80 | 7.21 | 8.00 | 9.39 | 9.50 |
| TEMP | C | | | | 3.70 | 5.80 |
| COD | mg/l | 251.00 | 135.00 | 126.00 | 300.00 | 440.00 |
| TSS | mg/l | | | | | 32.00 |
| EC | umho | | | | 385.00 | |
| HARDNESS | mg/l | | | | 33.00 | |
| ALKALINITY | mg/l | | | | 126.00 | |
| SALINITY | g/kg | | | | < 3.00 | |
| CHLORIDE | mg/l | | | | .00 | |
| NITRATE | mg/l | | | | 4.50 | |
| FLASH PT | F | | | | | |
| IGNITABLTY | | | | | | |
| CORROSIVE | mm/y | | | | | |
| REACTIVITY | | | | | | |
| ARSENIC | mg/l | | | | | |
| BARIUM | mg/l | 30.00 | 60.00 | 59.00 | 53.00 | 130.00 |
| CADIUM | mg/l | | | | | |
| CHROMIUM | mg/l | | | | | |
| LEAD | mg/l | | | | | |
| MERCURY | mg/l | | | | | |
| SELENIUM | mg/l | | | | | |
| SILVER | mg/l | | | | | |

THE FOLLOWING VOLATILE ORGANIC COMPOUNDS ARE REPORTED IN ug/l
NOTE: ug/l = micrograms per liter

1,1,1-TRICHLOROETHANE (CAS #71556)
TOLUENE (CAS #108883)

TABLE C-1. CHEMICAL QUALITY AND CHARACTERISTICS DATA SUMMARY
LOS ALAMOS NATIONAL LABORATORY
NPDES OUTFALL NO. EPA 05A-055 WATER QUALITY DATA SUMMARY
TECHNICAL AREA 16 SURFACE IMPOUNDMENT FLUIDS AND SLUDGES
SEE APPENDIX E FOR RAW DATA



| | | | | | | |
|---|---|---|---|---|---|---|
| SAMPLE NO. | : | 86.75288 | 87.02602 | 87.02603 | 87.02600 | 87.02601 |
| SAMPLE TYPE | : | WATER | WATER | WATER | WATER | WATER |
| LOCATION | : | POND | POND | POND | POND | POND |
| COLLECTED BY | : | HSE-8 | HSE-8 | HSE-8 | HSE-8 | HSE-8 |
| ANALYSIS BY | : | HSE-9 | HSE-9 | HSE-9 | HSE-9 | HSE-9 |
| DATE | : | 12-19-96 | 2-02-87 | 2-02-87 | 1-26-87 | 1-26-87 |
| PARAMETER | UNITS | | | | | |
| pH | STD | 7.31 | | | | |
| TEMP | C | 10.90 | | | | |
| COD | mg/l | 187.00 | | | | |
| TSS | mg/l | | | | | |
| EC | umho | | | | | |
| HARDNESS | mg/l | | | | | |
| ALKALINITY | mg/l | | | | | |
| SALINITY | g/kg | | | | | |
| CHLORIDE | mg/l | | | | | |
| NITRATE | mg/l | | | | | |
| FLASH PT | F | | | | | |
| IGNITABLTY | | | | | | |
| CORROSIVE | mm/y | | | | | |
| REACTIVITY | | | | | | |
| ARSENIC | mg/l | | .03 | .05 | | |
| BARIUM | mg/l | 210.00 | 1.50 | 2.20 | | |
| CADIUM | mg/l | | .01 | .01 | | |
| CHROMIUM | mg/l | | .05 | .05 | | |
| LEAD | mg/l | | .05 | .05 | | |
| MERCURY | mg/l | | .002 | .002 | | |
| SELENIUM | mg/l | | .01 | .01 | | |
| SILVER | mg/l | | .05 | .05 | | |

THE FOLLOWING VOLATILE ORGANIC COMPOUNDS ARE REPORTED IN ug/l
NOTE: ug/l = micrograms per liter

| | | |
|---|---|---|
| 1,1,1-TRICHLOROETHANE (CAS #71556) | 501.70 | 654.30 |
| TOLUENE (CAS #108883) | 342.70 | 452.80 |

C-2

TABLE C-2
SEMI-VOLATILE ORGANIC COMPOUND IDENTIFICATION LIST FOR FLUID AND WATER SAMPLES FROM THE TA-16 SURFACE IMPOUNDMENT

| Compound Name | CAS Number | MDL[1] |
|---|---|---|
| Phenol | 108952 | 200 |
| bis-(2-Chloroethyl) Ether | 111444 | 200 |
| 2-Chlorophenol | 95578 | 200 |
| 1,3-Dichlorobenzene | 541731 | 200 |
| 1,4-Dichlorobenzene | 106467 | 200 |
| 1,2-Dichlorobenzene | 75501 | 200 |
| bis-(2-Chloroisopropyl) Ether | 108601 | 200 |
| N-Nitroso-Dipropylamine | 621647 | 200 |
| Hexachloroethane | 67721 | 200 |
| Nitrobenzene | 98953 | 200 |
| Isophorone | 78591 | 200 |
| 2-Nitrophenol | 88755 | 200 |
| 2,4-Dimethylphenol | 105679 | 200 |
| bis-(2-Chloroethoxy) Methane | 111911 | 200 |
| 2,4-Dichlorophenol | 120832 | 200 |
| 1,2,4-Trichlorobenzene | 120821 | 200 |
| Naphthalene | 91203 | 200 |
| Hexachlorobutadiene | 87683 | 200 |
| 4-Chloro-3-Methylphenol | 59507 | 200 |
| Hexachlorocyclopentadiene | 77474 | 200 |
| 2,4,6-Trichlorophenol | 88062 | 200 |
| 2-Chloronaphthalene | 91587 | 200 |
| Dimethylphthalate | 131113 | 200 |
| Acenaphthylene | 208968 | 200 |
| 2,6-Dinitrotoluene | 606202 | 200 |
| Acenaphthene | 83329 | 200 |
| 2,4-Dinitrophenol | 51285 | 1000 |
| 4-Nitrophenol | 100027 | 1000 |
| 2,4-Dinitrotoluene | 121142 | 200 |

All of the above compounds were below minimum detection limits. See Appendix E for raw laboratory data used in constructing this table (i.e., Rocky Mountain Analytical Laboratory). Sample numbers: 87.02604, 87.02605, and 87.02606; dated 1/26/87.

MDL[1] = Minimum Detection Limit (micrograms per liter)

TABLE C-2 (Continued)
SEMI-VOLATILE ORGANIC COMPOUND IDENTIFICATION LIST FOR FLUID AND WATER SAMPLES FROM THE TA-16 SURFACE IMPOUNDMENT

| Compound Name | CAS Number | MDL[1] |
|---|---|---|
| Diethylphthalate | 84662 | 200 |
| 4-Chlorophenyl Phenyl Ether | 7005723 | 200 |
| Fluorene | 86737 | 200 |
| 4,6-Dinitro-2-Methylphenol | 534521 | 1000 |
| N-Nitrosodiphenylamine | 86306 | 200 |
| 4-Bromomphenyl Phenyl Ether | 101553 | 200 |
| Hexachlorobenzene | 118741 | 200 |
| Pentachlorophenol | 87865 | 1000 |
| Phenanthrene | 85018 | 200 |
| Anthracene | 120127 | 200 |
| Di-n-Butylphthalate | 84742 | 200 |
| Fluoranthene | 206440 | 200 |
| Pyrene | 129000 | 200 |
| Butyl Benzyl Phthalate | 85687 | 200 |
| 3,3'-Dichlorobenzidine | 91941 | 400 |
| Benzo-(a)-Anthracene | 56553 | 400 |
| Chrysene | 218019 | 200 |
| bis-(2-Ethylhexyl) Phthalate | 117817 | 200 |
| Di-n-Octyl Phthalate | 117840 | 200 |
| Benzo-(b)-Fluoranthene | 205992 | 200 |
| Benzo-(k)-Fluoranthene | 207089 | 200 |
| Benzo-(a)-Pyrene | 50328 | 200 |
| Indeno-(1,2,3-c,d) Pyrene | 193395 | 200 |
| Dibenzo-(a,h)-Anthracene | 53703 | 200 |
| Benzo-(g,h,i)-Perylene | 191242 | 100 |
| Benzidine | 92875 | 400 |
| 1,2-Diphenylhydrazine | 122394 | 200 |
| N-Nitrosodimethylamine as diphenylamine | 62759 | 200 |

All of the above compounds were below minimum detection limits. See Appendix E for raw laboratory data used in constructing this table (i.e., Rocky Mountain Analytical Laboratory). Sample numbers: 87.02604, 87.02605, and 87.02606; dated 1/26/87.

MDL[1] = Minimum Detection Limit (micrograms per liter)

C-3

TABLE C-3-1. SOIL ANALYSES BELOW NPDES OUTFALL 055
LOS ALAMOS NATIONAL LABORATORY; NPDES OUTFALL NO. EPA 05A055
SEE ATTACHED MAP FOR SAMPLE LOCATIONS
SEE APPENDIX E FOR RAW DATA



STATION ID : TA-16 - NPDES OUTFALL 05A055
SAMPLE TYPE: CHANNEL SEDIMENTS & SOIL SAMPLES
ANALYSES : EP TOXICITY PROCEDURE
SAMPLE DATE: FEBRUARY 11, 1987
LABORATORY : LANL HSE-9 LABORATORY (ANALYSES DATED ON 3-3-87)

| PARAMETER | UNITS | DETECTION LIMIT | SAMPLE NUMBER ===> 87.02608 | 87.02609 | 87.02610 | 87.02611 |
|---|---|---|---|---|---|---|
| REACTIVITY | SENS | .00 | .00 | .00 | .00 | .00 |
| ARSENIC | mg/l | .05 | .05 | .05 | .05 | .05 |
| BARIUM | mg/l | .50 | .80 | 26.00 | 6.60 | 2.70 |
| CADIUM | mg/l | .01 | .01 | .01 | .01 | .01 |
| CHROMIUM | mg/l | .05 | .05 | .05 | .05 | .07 |
| LEAD | mg/l | .05 | .05 | .05 | .05 | .05 |
| MERCURY | mg/l | .005 | .005 | .005 | .005 | .005 |
| SELENIUM | mg/l | .01 | .01 | .01 | .01 | .01 |
| SILVER | mg/l | .05 | .05 | .05 | .05 | .05 |

| SAMPLE NO. | SAMPLE DESCRIPTION ==> |
|---|---|
| 87.02608 | BACKGROUND BETWEEN SURFACE IMPOUNDMENT AND OUTFALL |
| 87.02609 | THREE FT DOWNSTREAM OF OUTFALL IN EROSION CHANNEL |
| 87.02610 | TEN FT DOWNSTREAM OF OUTFALL IN EROSION CHANNEL |
| 87.02611 | FORTY FT DOWNSTREAM OF OUTFALL IN EROSION CHANNEL |

NOTES
1. ALL SAMPLES EXCEPT 87.02608 WERE TAKEN IN THE STREAM-BED DRAINING NPDES OUTFALL NO. EPA 05A055.
2. EACH SAMPLE CONSISTED OF A 3.5 in. DIAMETER BY 4.0 in. LONG SURFACE SOIL CORE PLUG.
3. ALL SAMPLES WERE SEPARATELY LABELED AND SEALED IN ZIPLOCK PLASTIC BAGS.
4. DETECTION LIMITS VARY BY METAL & CONCENTRATIONS

TABLE C-3-2. SOIL ANALYSES BELOW SURFACE IMPOUNDMENT
LOS ALAMOS NATIONAL LABORATORY; TA-16 SURFACE IMPOUNDMENT
SEE ATTACHED MAP FOR SAMPLE LOCATIONS
SEE APPENDIX E FOR RAW DATA



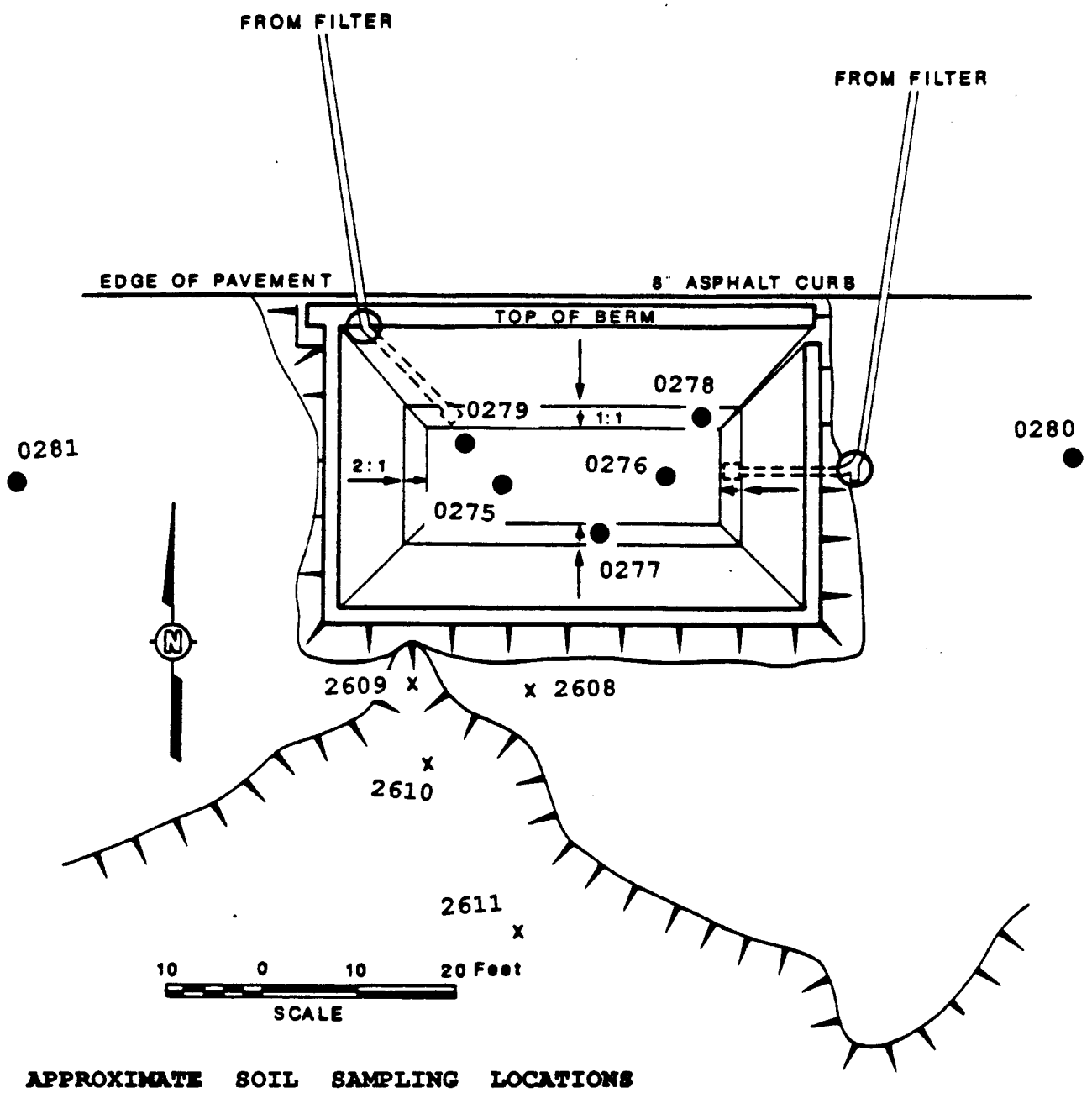
STATION ID : TA-16 - SURFACE IMPOUNDMENT
SAMPLE TYPE: SOIL SAMPLES BELOW PLASTIC LINER
ANALYSES : EP TOXICITY PROCEDURE
SAMPLE DATE: NOVEMBER 2, 1987
LABORATORY : LANL HSE-9 LABORATORY (ANALYSES REPORTED ON 12-8-87)

| PARAMETER | UNITS | DETECTION LIMIT | SAMPLE NUMBER ===> 00275 | 00276 | 00277 | 00278 | 00279 | 00280 | 00281 |
|---|---|---|---|---|---|---|---|---|---|
| REACTIVITY | SENS | .00 | NS | NS | NS | NS | NS | NS | NS |
| ARSENIC | mg/l | .05 | .05 | .05 | .05 | .05 | .05 | .05 | .05 |
| BARIUM | mg/l | .50 | .50 | .50 | .50 | .50 | .50 | .50 | .50 |
| CADIUM | mg/l | .01 | .01 | .01 | .01 | .18 | .01 | .01 | .01 |
| CHROMIUM | mg/l | .05 | .05 | .05 | .05 | .05 | .05 | .05 | .05 |
| LEAD | mg/l | .05 | .05 | .05 | .05 | .05 | .05 | .05 | .05 |
| MERCURY | mg/l | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 |
| SELENIUM | mg/l | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| SILVER | mg/l | .05 | .05 | .05 | .05 | .05 | .05 | .05 | .05 |

| SAMPLE NO. | SAMPLE DESCRIPTION ==> |
|---|---|
| 87.00275 | SOIL IMMEDIATELY BELOW LINER - SEE LOCATION MAP |
| 87.00276 | SOIL IMMEDIATELY BELOW LINER - SEE LOCATION MAP |
| 87.00277 | SOIL IMMEDIATELY BELOW LINER - SEE LOCATION MAP |
| 87.00278 | SOIL IMMEDIATELY BELOW LINER - SEE LOCATION MAP |
| 87.00279 | SOIL IMMEDIATELY BELOW LINER - SEE LOCATION MAP |
| 87.00280 | BACKGROUND SURFACE SOIL 500 FT TO EAST OF POND |
| 87.00281 | BACKGROUND SURFACE SOIL 500 FT TO WEST OF POND |

NS = NOT SAMPLED

DETECTION LIMITS VARY BY METAL & CONCENTRATIONS FOUND.




**APPROXIMATE SOIL SAMPLING LOCATIONS**

LEGEND

● POND BOTTOM SOIL SAMPLES

X NPDES OUTFALL SOIL SAMPLES

TA-16
SURFACE IMPOUNDMENT

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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... Creating a Safer Tomorrow

Do Not Scale This Drawing

C-4

TABLE C-4
VOLATILE ORGANIC COMPOUND IDENTIFICATION LIST FOR SOIL ANALYSES
SOIL SAMPLES FROM BELOW THE TA-16 SURFACE IMPOUNDMENT LINER

| Compound Name | CAS Number |
|---|---|
| Chloromethane (methyl chloride) | 74873 |
| Bromomethane (methyl bromide) | 73839 |
| Vinyl Chloride (chloroethene) | 75014 |
| Chloroethane | 75003 |
| Methylene Chloride | 75092 |
| Acetone | 67641 |
| Carbon Disulfide | 75150 |
| 1,1-Dichloroethene | 75354 |
| 1,1-Dichloroethane | 75343 |
| 1,2-Dichloroethene (total) | 540590 |
| Chloroform | 67663 |
| 1,2-Dichloroethane | 107062 |
| 2-Butanone (methyl ethyl ketone) | 78933 |
| 1,1,1-Trichloroethane (methyl chloroform) | 71556 |
| Carbon Tetrachloride | 56235 |
| Vinyl Acetate | 108054 |
| Bromodichloromethane | 75274 |
| 1,2-Dichloropropane (propylene dichloride) | 78875 |
| cis-1,3-Dichloropropene | 10061015 |
| Trichloroethene | 79016 |
| Dibromochloromethane | 124481 |
| 1,1,2-Trichloroethane | 79005 |
| Benzene | 71432 |
| trans-1,3-Dichloropropene | 10061026 |
| Bromoform | 75252 |
| 4-Methyl-2-Pentanone | 108101 |
| 2-Hexanone | 591786 |
| Tetrachloroethene | 127184 |
| 1,1,2,2-Tetrachloroethane | 79345 |
| Toluene | 108883 |
| Chlorobenzene | 108907 |
| Ethyl Benzene | 100414 |
| Styrene | 100425 |
| Xylene (total) | 133027 |

All of the above compounds were below minimum detection limits. See Appendix E for raw laboratory data used in constructing this table. Sample numbers: 87.00262, 87.00263, 87.00264, 87.00265, 87.00266, 87.00267, and 87.00268; locations of these sample numbers are identical to sample numbers 87.00275, 87.00276, 87.00277, 87.00278, 87.00279, 87.00280, and 87.00281, respectively. See Table C-3-2 for sample numbers and location map.

See the note concerning instrument detection limits on the last page of this table.

TABLE C-4 (Continued)
VOLATILE ORGANIC COMPOUND IDENTIFICATION LIST FOR SOIL ANALYSES
SOIL SAMPLES FROM BELOW THE TA-16 SURFACE IMPOUNDMENT LINER

| Compound Name | CAS Number |
|---|---|
| Trichlorofluoromethane | 75694 |
| 1,2-Dichlorobenzene | 95501 |
| 1,3-Dichlorobenzene | 541731 |
| 1,4-Dichlorobenzene | 106467 |
| Naphthalene | 91203 |
| n-Buthylbenzene | 104518 |
| Bromobenzene | 108861 |
| 2-Chlorotoluene | 95498 |
| 4-Chlorotoluene | 106434 |
| Dibromomethane | 74953 |
| 1,3-Dichloropropane | 142289 |
| 2,2-Dichloropropane | 590207 |
| Hexachlorobutadiene | 87683 |
| n-Propylbenzene | 103651 |
| 1,1,1,2-Tetrachloroethane | 630206 |
| 1,2,4-Trichlorobenzene | 120821 |
| 1,2,3-Trichloropropane | 96184 |
| 1,2,4-Trimethylbenzene | 95636 |

All of the above compounds were below minimum detection limits. See Appendix E for raw laboratory data used in constructing this table. Sample numbers: 87.00262, 87.00263, 87.00264, 87.00265, 87.00266, 87.00267, and 87.00268; locations of these sample numbers are identical to sample numbers 87.00275, 87.00276, 87.00277, 87.00278, 87.00279, 87.00280, and 87.00281, respectively. See Table C-3-2 for sample numbers and location map.

All of the above analyses were performed by the HSE-9 laboratory. The HSE-9 analytical system has been shown to be capable of detecting all of the above compounds. The estimated minimum detection limit for these compounds is 2.50 ppb. The linear range of the detector is 1 to 200 ppb in 5 ml of water. In those samples with analyte concentrations greater than 200 ppb, dilutions are made. As a contaminant value approaches the limit of detection, the uncertainty associated with that value increases. For concentrations in the 1 to 5 ppb range, this uncertainty is 50.0% of the reported value for that compound. For concentrations in the 5 to 200 ppb range, the uncertainty is 10.0% of the reported value.

HSE-9 ANALYTICAL RESULTS

AS 2-FEB-1987 FH

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 87.02603 | 00767 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 87.02604 | 00767 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

SECTION LEADER 2/3

QUALITY ASSURANCE OFFICER mag 2/3/87

HSE-9 ANALYTICAL RESULTS

AG 2-Feb-1987 DA

| MPLE UMBER | REQ NUM | | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| 00.96481 | 09999 | | 0.2400 | 0.0300 | MG/L | 8/18/86 | |
| 00.96481 | 09999 | | 0.2700 | 0.0300 | MG/L | 9/22/86 | |
| 00.96481 | 09999 | | 0.2800 | 0.0300 | MG/L | 9/22/86 | |
| 00.96481 | 09999 | | 0.2700 | 0.0300 | MG/L | 11/18/86 | |
| 00.96481 | 09999 | | 0.2700 | 0.0300 | MG/L | 11/18/86 | |
| 00.96481 | 09999 | | 0.2600 | 0.0300 | MG/L | 9/22/86 | |
| 00.96481 | 09999 | | 0.2900 | 0.0300 | MG/L | 9/22/86 | |
| 00.96481 | 09999 | | 0.2600 | 0.0300 | MG/L | 9/03/86 | |
| 00.96481 | 09999 | | 0.2500 | 0.0300 | MG/L | 9/03/86 | |
| 00.96481 | 09999 | | 0.2800 | 0.0300 | MG/L | 9/22/86 | |
| 00.96481 | 09999 | | 0.2600 | 0.0300 | MG/L | 8/18/86 | |
| 00.96481 | 09999 | | 0.2400 | 0.0200 | MG/L | 11/26/86 | |
| 00.96481 | 09999 | | 0.2700 | 0.0300 | MG/L | 11/26/86 | |
| 00.96481 | 09999 | | 0.2700 | 0.0300 | MG/L | 11/26/86 | |
| 00.96481 | 09999 | | 0.3000 | 0.0300 | MG/L | 9/03/86 | |
| 00.96481 | 09999 | | 0.2400 | 0.0300 | MG/L | 9/03/86 | |
| 00.96481 | 09999 | | 0.2800 | 0.0300 | MG/L | 2/02/87 | |
| 00.97263 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97264 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97265 | 05787 | | 0.2700 | 0.0300 | MG/L | 2/02/87 | |
| 00.97266 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

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SE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

CSG 2/3 — SECTION LEADER

mag 2/3/87 — QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE | K |
|---|---|---|---|---|---|---|
| 00.96481 | AG | 0.25 | 0.03 | MG/L | 86GAU | 02 |

QC data

HSE-9 ANALYTICAL RESULTS

AS 2-FEB-1987 DA

| SAMPLE NUMBER | REQ NUM | | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| 0.96478 | 09999 | | 460.0000 | 50.0000 | UG/L | 11/18/86 | |
| 0.96478 | 09999 | | 472.0000 | 47.2000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | | 0.4900 | 0.0490 | MG/L | 2/02/87 | |
| 0.96478 | 09999 | | 0.4790 | 0.0480 | MG/L | 2/02/87 | |
| 0.96478 | 09999 | | 470.0000 | 50.0000 | UG/L | 11/18/86 | |
| 0.96478 | 09999 | | 433.0000 | 43.3000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | | 430.0000 | 48.0000 | UG/L | 11/26/86 | |
| 0.96479 | 09999 | | 0.2900 | 0.0300 | MG/L | 9/22/86 | |
| 0.96479 | 09999 | | 0.3000 | 0.0300 | MG/L | 9/22/86 | |
| 0.96479 | 09999 | | 0.2900 | 0.0300 | MG/L | 9/22/86 | |
| 0.96479 | 09999 | | 0.3000 | 0.0300 | MG/L | 9/03/86 | |
| 0.96479 | 09999 | | 0.2800 | 0.0300 | MG/L | 9/22/86 | |
| 0.96479 | 09999 | | 0.3000 | 0.0300 | MG/L | 11/18/86 | |
| 0.96479 | 09999 | | 0.2850 | 0.0300 | MG/L | 11/18/86 | |
| 0.96479 | 09999 | | 0.2900 | 0.0300 | MG/L | 9/22/86 | |
| 0.96479 | 09999 | | 0.2500 | 0.0200 | MG/L | 11/26/86 | |
| 0.96479 | 09999 | | 0.2600 | 0.0300 | MG/L | 8/18/86 | |
| 0.96479 | 09999 | | 0.3400 | 0.0500 | MG/L | 9/03/86 | |
| 0.96479 | 09999 | | 0.3000 | 0.0300 | MG/L | 9/03/86 | |
| 0.96479 | 09999 | | 0.2700 | 0.0300 | MG/L | 9/03/86 | |
| 0.96479 | 09999 | | 0.3200 | 0.0000 | MG/L | 8/18/86 | |
| 0.96479 | 09999 | | 0.2500 | 0.0300 | MG/L | 11/26/86 | |
| 96479 | 09999 | | 0.2600 | 0.0300 | MG/L | 8/18/86 | |
| 6479 | 09999 | | 0.3000 | 0.0300 | MG/L | 11/26/86 | |
| 97263 | 05787 | | 0.2100 | 0.0200 | MG/L | 2/02/87 | |
| 0.97264 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 0.97265 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 0.97266 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

ESG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE | N |
|---|---|---|---|---|---|---|
| 0.96478 | AS | 470. | 52. | UG/L | 86GAU | 02 |
| 0.96479 | AS | 0.25 | 0.03 | MG/L | 86GAU | 02 |

HSE-9 CHEMICAL RESULTS

BY 2-FEB-1987 ON

| SAMPLE NUMBER | REQ NUM | | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| 00.96480 | 09999 | | 4.6000 | 0.5000 | MG/L | 8/18/86 | |
| 00.96480 | 09999 | | 5.0000 | 0.5000 | MG/L | 9/22/86 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 11/18/86 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 11/26/86 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 11/18/86 | |
| 00.96480 | 09999 | | 5.6000 | 0.5000 | MG/L | 9/22/86 | |
| 00.96480 | 09999 | | 5.9000 | 0.6000 | MG/L | 9/22/86 | |
| 00.96480 | 09999 | | 5.1000 | 0.5000 | MG/L | 9/03/86 | |
| 00.96480 | 09999 | | 5.2000 | 0.5000 | MG/L | 9/03/86 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 9/03/86 | |
| 00.96480 | 09999 | | 4.8000 | 0.5000 | MG/L | 8/18/86 | |
| 00.96480 | 09999 | | 4.7000 | 0.5000 | MG/L | 11/26/86 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 2/02/87 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 11/26/86 | |
| 00.96480 | 09999 | | 5.3000 | 0.5000 | MG/L | 8/18/86 | |
| 00.96480 | 09999 | | 5.4000 | 0.5000 | MG/L | 9/03/86 | |
| 00.97263 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97264 | 05787 | | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97265 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97266 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

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SSE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

LSG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE | N |
|---|---|---|---|---|---|---|
| 00.96480 | BA | 5.0 | 0.5 | MG/L | BESAU | 02 |
| .97264 | | 0.5 | 0.05 | mg/L | | |

HSE-9 ANALYTICAL RESULTS

CD [illegible] 1987 DC

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 0.96478 | 09999 | 81.0000 | 8.0000 | UG/L | 11/18/86 | |
| 0.96478 | 09999 | 0.0810 | 0.0080 | MG/L | 2/02/87 | |
| 0.96478 | 09999 | 0.0830 | 0.0080 | MG/L | 2/02/87 | |
| 0.96478 | 09999 | 81.0000 | 8.1000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | 68.0000 | 6.8000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | 0.0810 | 0.0080 | MG/L | 1/21/87 | |
| 0.96478 | 09999 | 70.0000 | 10.0000 | UG/L | 11/18/86 | |
| 0.96478 | 09999 | 76.0000 | 7.6000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | 67.0000 | 6.7000 | UG/L | 11/26/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 2/02/87 | |
| 0.96480 | 09999 | 0.0600 | 0.0100 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | 0.0440 | 0.0040 | MG/L | 1/21/87 | |
| 0.96480 | 09999 | 0.0600 | 0.0100 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 11/26/86 | |
| 0.96480 | 09999 | 0.0490 | 0.0050 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | 0.0540 | 0.0100 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 11/26/86 | |
| 0.96480 | 09999 | 0.0600 | 0.0100 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | 0.0600 | 0.0100 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | 0.0600 | 0.0100 | MG/L | 11/18/86 | |
| 0.96480 | 09999 | 0.0600 | 0.0100 | MG/L | 11/18/86 | |
| 6480 | 09999 | 0.0500 | 0.0100 | MG/L | 11/26/86 | |
| .6480 | 09999 | 0.0500 | 0.0100 | MG/L | 8/18/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 8/18/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0050 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | 0.0500 | 0.0100 | MG/L | 8/18/86 | |
| 0.96481 | 09999 | 0.3100 | 0.0300 | MG/L | 8/18/86 | |
| 0.97263 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |
| 0.97264 | 05787 | 0.0500 | 0.0100 | MG/L | 2/02/87 | |
| 0.97265 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |
| 0.97266 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

GG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE K |
|---|---|---|---|---|---|
| 0.96478 | CD | 76. | 6. | UG/L | 86GAU 02 |
| 0.96480 | CD | 0.05 | 0.01 | MG/L | 86GAU 02 |
| 64 | | 0.06 | 0.01 | mG/L | |

# HSE-9 ANALYTICAL RESULTS

CR 2-Feb-1987 DA

| MPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 00.96478 | 09999 | 527.0000 | 53.0000 | UG/L | 11/18/86 | |
| 00.96478 | 09999 | 0.5190 | 0.0520 | MG/L | 2/02/87 | |
| 00.96478 | 09999 | 0.5190 | 0.0520 | MG/L | 2/02/87 | |
| 00.96478 | 09999 | 522.0000 | 52.2000 | UG/L | 11/26/86 | |
| 00.96478 | 09999 | 552.0000 | 52.2000 | UG/L | 11/26/86 | |
| 00.96478 | 09999 | 507.0000 | 50.2000 | UG/L | 11/26/86 | |
| 00.96479 | 09999 | 0.2300 | 0.0300 | MG/L | 9/22/86 | |
| 00.96479 | 09999 | 0.2900 | 0.0300 | MG/L | 9/22/86 | |
| 00.96479 | 09999 | 0.2800 | 0.0300 | MG/L | 9/22/86 | |
| 00.96479 | 09999 | 0.2500 | 0.0300 | MG/L | 9/03/86 | |
| 00.96479 | 09999 | 0.2600 | 0.0300 | MG/L | 9/22/86 | |
| 00.96479 | 09999 | 0.3300 | 0.0500 | MG/L | 8/18/86 | |
| 00.96479 | 09999 | 0.2800 | 0.0300 | MG/L | 11/26/86 | |
| 00.96479 | 09999 | 0.2600 | 0.0300 | MG/L | 11/26/86 | |
| 00.96479 | 09999 | 0.2800 | 0.0300 | MG/L | 11/18/86 | |
| 00.96479 | 09999 | 0.3000 | 0.0300 | MG/L | 8/26/86 | |
| 00.96479 | 09999 | 0.2300 | 0.0300 | MG/L | 9/03/86 | |
| 00.96479 | 09999 | 0.2800 | 0.0300 | MG/L | 9/03/86 | |
| 00.96479 | 09999 | 0.2600 | 0.0300 | MG/L | 9/03/86 | |
| 00.96479 | 09999 | 0.2500 | 0.0300 | MG/L | 8/18/86 | |
| 00.96479 | 09999 | 0.2500 | 0.0300 | MG/L | 2/02/87 | |
| 00.96479 | 09999 | 0.2600 | 0.0300 | MG/L | 8/18/86 | |
| 97263 | 05787 | 0.2300 | 0.0200 | MG/L | 2/02/87 | |
| 97264 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97265 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 00.97266 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

BG 2/3
SECTION LEADER

2/3/87
QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE K |
|---|---|---|---|---|---|
| 00.96478 | CR | 522. | 48. | UG/L | 86GAU 02 |
| 00.96479 | CR | 0.25 | 0.03 | MG/L | 86GAU 02 |
| 5.97263 | | 0.25 | 0.03 | | |

# HSE-9 ANALYTICAL RESULTS

SE 3-Feb-1987 Da

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 0.96478 | 09999 | 100.0000 | 10.0000 | UG/L | 11/18/86 | |
| 0.96478 | 09999 | 0.0950 | 0.0140 | MG/L | 2/02/87 | |
| 0.96479 | 09999 | 0.0890 | 0.0140 | MG/L | 2/03/87 | |
| 0.96478 | 09999 | 107.0000 | 10.7000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | 103.0000 | 10.3000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | 103.0000 | 10.3000 | UG/L | 11/26/86 | |
| 0.96479 | 09999 | 0.0500 | 0.0100 | MG/L | 8/18/86 | |
| 0.96479 | 09999 | 0.0400 | 0.0100 | MG/L | 11/26/86 | |
| 0.96479 | 09999 | 0.0430 | 0.0070 | MG/L | 2/02/87 | |
| 0.96479 | 09999 | 0.0700 | 0.0100 | MG/L | 9/03/86 | |
| 0.96479 | 09999 | 0.0600 | 0.0100 | MG/L | 11/18/86 | |
| 0.97263 | 05787 | 0.0400 | 0.0100 | MG/L | 2/02/87 | |
| 0.97264 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |
| 0.97265 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |
| 0.97266 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

SLG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE | N |
|---|---|---|---|---|---|---|
| .96478 | SE | 100.4 | 10. | UG/L | 86GAU | 02 |
| 0.96479 | SE | 0.05 | 0.01 | MG/L | 86GAU | 02 |
| 0.97263 | | 0.05 | 0.01 | | | |

# HSE-9 ANALYTICAL RESULTS

FROM 2-FEB-1987 TO

| SAMPLE NUMBER | REQ NUM | | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| 0.96478 | 09999 | | 870.0000 | 70.0000 | UG/L | 11/18/86 | |
| 0.96478 | 09999 | | 0.9340 | 0.0930 | MG/L | 2/02/87 | |
| 0.96478 | 09999 | | 859.0000 | 85.9000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | | 0.9000 | 0.0900 | MG/L | 1/21/87 | |
| 0.96478 | 09999 | | 0.8890 | 0.0890 | MG/L | 2/02/87 | |
| 0.96478 | 09999 | | 853.0000 | 85.3000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | | 915.0000 | 91.5000 | UG/L | 11/26/86 | |
| 0.96478 | 09999 | | 864.0000 | 86.4000 | UG/L | 11/26/86 | |
| 0.96480 | 09999 | | 0.2600 | 0.0300 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | | 0.2500 | 0.0300 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | | 0.2800 | 0.0300 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | | 0.2800 | 0.0300 | MG/L | 2/02/87 | |
| 0.96480 | 09999 | | 0.2700 | 0.0300 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | | 0.2800 | 0.0300 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | | 0.2300 | 0.0300 | MG/L | 11/18/86 | |
| 0.96480 | 09999 | | 0.2600 | 0.0300 | MG/L | 11/18/86 | |
| 0.96480 | 09999 | | 0.2400 | 0.0300 | MG/L | 9/22/86 | |
| 0.96480 | 09999 | | 0.2400 | 0.0300 | MG/L | 11/18/86 | |
| 0.96480 | 09999 | | 0.2500 | 0.0300 | MG/L | 8/18/86 | |
| 0.96480 | 09999 | | 0.2500 | 0.0200 | MG/L | 11/26/86 | |
| 0.96480 | 09999 | | 0.2900 | 0.0300 | MG/L | 1/21/87 | |
| 0.96480 | 09999 | | 0.2500 | 0.0300 | MG/L | 8/18/86 | |
| 0.96480 | 09999 | | 0.2600 | 0.0300 | MG/L | 8/18/86 | |
| 0.96480 | 09999 | | 0.2700 | 0.0300 | MG/L | 9/03/86 | |
| 0.96480 | 09999 | | 0.2600 | 0.0300 | MG/L | 8/26/86 | |
| 0.97263 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 0.97264 | 05787 | | 0.2700 | 0.0300 | MG/L | 2/02/87 | |
| 0.97265 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 0.97266 | 05787 | < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

BBG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

| SAMPLE NUMBER | CERTIFIED VALUE NAME | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | CERTIFIED VALUE UNITS | CODE | N |
|---|---|---|---|---|---|---|
| 0.96478 | FB | 870. | 60. | UG/L | BeGAU | 02 |
| 0.96480 | FB | 0.25 | 0.03 | MG/L | BeGAU | 02 |
| 0.97264 | | 0.25 | 0.03 | | | |

ANALYSIS DATA SHEET # 5589

Post Sampling Conference Completed With _____ and Samples Submitted On _____ Time _____

Due _____ Project # _____ Estimate of Time Involved _____ Actual Time 3 days

Analytical Results and Remarks Recovery of surrogate spikes: 108.2% (σ = 3.7) on 87.02600 and 106.5% (σ = 46) on 87.02601. Analyzed by PT6CMS. 5ml each. Total of 5 runs per sample

QC Cross Reference: Notebook R6981 p7

If Chain of Custody, Seal(s) Intact: Yes ___ No X Seal(s) Broken By: _____ Date _____

Printed Data Output Attached: Yes ___ No ___ Other Sheets Attached: Yes ___ No ___ (DE=Date Extracted, DA=Date Analyzed)

| Sample Number | DE/DA | Compound | CAS # | Analytical Result (Units) | Analytical Uncertainty | MDL | Comments | |
|---|---|---|---|---|---|---|---|---|
| 87.02600 | | 111 Trichloroethane | 71556 | 501.7 ug/L | 79.2 | | | |
| | | Toluene | 108883 | 342.7 | 52.4 | | | |
| | | | | | | | | |
| 87.02601 | | 111 Trichloroethane | 71556 | 654.3 | 64.2 | | | |
| | | Toluene | 108883 | 452.8 | 43.6 | | Added | % Rec |
| 0.97246 | | CHCl3 | 67663 | 63.9 ppb (ug/L) | 6.4 ppb | | 82.8 | 77 |
| | | CCl4 | 56235 | 63.9 | 6.4 | | 106.4 | 60 |
| | | BDCM | 75274 | 63.0 | 6.3 | | 76.8 | 82 |
| 0.97247 | | 111 TCE | 71556 | 48.7 | 4.9 | | 67.9 | 72 |
| | | CDBM | 124481 | 71.8 | 7.2 | | 85.05 | 84 |
| | | Ethylbenzene | 100414 | 38.7 | 3.9 | | 54.9 | 70 |

Approved By: Analyst [signature] Notebook R698 Page 23 Date 2-3-87 QC Coordinator mag 2/3/87

Section Leader [signature] Date 2-3-87 Computer Entry _____ Date _____

0112S (002S)

REQUESTOR DATA SHEET # 5589

Log Book _____ Page _____

Sampled by Roy Bohn / Ralph Ward Collection Date 1/26/87 Time 1400 Weather clear Witness _____

Presampling Conference Completed With S. Bell On 1/26/87 Send Report To R. Bohn MS K-490

Phone 5-0452 Source of Sample: TA-16 - 401, 406 Reason for Sampling _____

Group HSE-8 Site 16 Building 401, 406 Room No. OUTSIDE

Priority Assigned: 1. Emergency; 2. Recognized Danger; 3. Imminent Deadline; 4. Special Survey; 5. Routine;

(Circle One) Priority Approval: _____ (1. GL or DGL; 2. or 3. AGL; 4. or 5. SL).

Method of Analysis Complies With: _____

Background Information Useful to Analyst (Contamination Levels, Hazards, Etc.) _____

Chain of Custody: Yes _____ (See Attached Form) No _____ Other Information _____

All Samples Submitted to HSE-9 Must Be Screened For Radioactivity. Samples Containing Greater Than 20 dpm Total Alpha or 100 dpm Combined Gamma/Beta Contamination Cannot Be Handled At TA-59.

144

| Sample Number | Other I.D. | Sampling Location | Analysis Requested | Sampling Method | Sample Type | Preservative Utilized | Radioactivity Scan (dpm) Alpha | Radioactivity Scan (dpm) Beta/Gamma | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| ~~86~~ | | | | | | | | | |
| 87,02600 | #1 | 16-401,406 | Volatiles | grab | liquid | none | NA | NA | |
| 87,02601 | #2 | 16-401,406 | " | grab | liquid | none | ↓ | ↓ | |
| | | | | | | | | | |
| 0.97246 | } | Quality Control | | (Blind) | | | | | |
| 0.97247 | } | | | | | | | | |
| | | | | | | | | | |

Sampling Method: 24FC=24 Hour Flow-Weighted Composite; 24TC=24 Hour Time-Weighted Composite; G=Grab; B=Ball; D=Drill; C=Core; P=Pump; O=Other (Please Specify)

Sample Type: E=Effluent; SL=Sludge: SO=Soil; SC-Soil Core; WW-Well Water; SW=Surface Water; O=Other

Preservative: F=Filtered; NF=Non-filtered; NA=Non Acidified; A-$H_2SO_4$(2 ml/l); A-$HNO_3$(5 ml/l); A-$HNO_3$(5 ml/l); A $H_3PO_4$ & $CuSO_4$; A-Other; I=Iced; P-NaOH.

Semivolatiles + [illegible] Mercury

E-2

**Raw Laboratory Chemical Data Used in Table C-2.**

HSE-9 Analytical Chemistry Request

Sample Sheet No.: 5385

'ıestor: R. Bohn

Date Submitted: 01/27/87

| ɔample No. | Contractor | Other ID No. | Analyses Desired |
|---|---|---|---|
| 00.97262 | Rocky Mtn. Anal. | 87.02606 | Semi-Volatiles |
| 87.02604 | Rocky Mtn. Anal. | | Semi-Volatiles |
| 87.02605 | Rocky Mtn. Anal. | | Semi-Volatiles |

Total Number of Samples: 3

Roy,

There were 18 compounds spiked into a QC sample send along with your two samples.

RMA found 12 of these 18 compounds, and of those 12 they reported analytical values that represent an average recovery of 66.7%.

Note, though that the ones they did not find were spiked at levels near their reported limits of detection.

QC data for SS# 5385

| Amt. Found | Amt. Spiked | % Recovery |
|---|---|---|
| 11 | 17 | 64.7 |
| 12 | 24 | 50.0 |
| 27 | 37 | 73.0 |
| 15 | 20 | 75.0 |
| 23 | 30 | 76.7 |
| 23 | 37 | 62.2 |
| 12 | 23 | 52.2 |
| 16 | 24 | 66.7 |
| 17 | 24 | 70.8 |
| 14 | 26 | 53.8 |
| 29 | 37 | 78.4 |
| 30 | 38 | 78.9 |

Average % Recovery 66.9

For 12 Samples with reported values.

| Amt. Found | Amt. Spiked | % Recovery |
|---|---|---|
| ND | 12 | 0 |
| ND | 12 | 0 |
| ND | 12 | 0 |
| ND | 12 | 0 |
| ND | 17 | 0 |
| ND | 12 | 0 |

Number of Compounds not detected 6

## Analytical Report

Date: 02/20/87

To: R. Bohn
MS - K-490
Tel. (505)-665-0453

From: Larry R. Field
HSE-9 / Contracting
MS - K484
Tel. (505)-667-5889

Source of Samples: ——> TA - 16, Discharge, Structures 401, 406

Sample Sheet # 5385

| Sample No. | Other ID No. | Analysis Type | Cas. Number | Analytical Result | Amt. Spiked | Units | Uncertainty +/- |
|---|---|---|---|---|---|---|---|
| /262 | 87.02606 | 4-Nitrophenol | 100027 | < 50 | | UG/L | 5 |
| QC Sample | | 4-Bromophenyl phenyl ether | 101553 | < 10 | | UG/L | 1 |
| | | 2,4-Dimethylphenol | 105679 | < 10 | | UG/L | 1 |
| | | 1,4-Dichlorobenzene | 106467 | < 10 | | UG/L | 1 |
| | | bis(2-Chloroisopropylether | 108601 | < 10 | | UG/L | 1 |
| | | Phenol | 108952 | < 10 | | UG/L | 1 |
| | | bis(2-Chloroethyl)ether | 111444 | 17 | 24 | UG/L | 1.7 |
| | | bis(2-Chloroethoxy)methane | 111911 | 16 | 24 | UG/L | 1.6 |
| | | bis(2-Ethylhexyl)phthalate | 117817 | < 10 | | UG/L | 1 |
| | | Di-n-octyl phthalate | 117840 | < 10 | 22 | UG/L | 1 |
| | | Hexachlorobenzene | 118741 | 11 | 17 | UG/L | 1.1 |
| | | Anthracene | 120127 | < 10 | | UG/L | 1 |
| | | 1,2,4-Trichlorobenzene | 120821 | < 10 | 12 | UG/L | 1 |
| | | 2,4-Dichlorophenol | 120832 | < 10 | | UG/L | 1 |
| | | 2,4-Dinitrotoluene | 121142 | 29 | 37 | UG/L | 2.9 |
| | | 1,2-Diphenylhydrazine * | 122394 | < 10 | | UG/L | 1 |
| | | Pyrene | 129000 | 23 | 30 | UG/L | 2.3 |
| | | Dimethyl phthalate | 131113 | < 10 | | UG/L | 1 |
| | | Benzo(g,h,i)perylene | 191242 | < 5 | | UG/L | 0.5 |
| | | Indeno(1,2,3-c,d)pyrene | 193395 | < 10 | | UG/L | 1 |
| | | Benzo(b)fluoranthene | 205992 | < 10 | | UG/L | 1 |
| | | Fluoranthene | 206440 | < 10 | | UG/L | 1 |
| | | Benzo(k)fluoranthene | 207089 | 12 | 23 | UG/L | 1.2 |
| | | Acenaphthylene | 208968 | < 10 | | UG/L | 1 |
| | | Chrysene | 218019 | < 10 | | UG/L | 1 |
| | | Benzo(a)pyrene | 50328 | < 10 | | UG/L | 1 |
| | | 2,4-Dinitrophenol | 51285 | < 50 | | UG/L | 5 |
| | | 4,6-Dinitro-2-methylphenol | 534521 | < 50 | | UG/L | 5 |
| | | Dibenzo(a,h)anthracene | 53703 | < 10 | | UG/L | 1 |
| | | 1,3-Dichlorobenzene | 541731 | 14 | 26 | UG/L | 1.4 |
| | | Benzo(a)anthracene | 56553 | 23 | 37 | UG/L | 2.3 |
| | | 4-Chloro-3-methylphenol | 59507 | < 10 | | UG/L | 1 |

| Sample No. | Other ID No. | Analysis Type | Cas. Number | Analytical Result | Units | Uncertainty +/- |
|---|---|---|---|---|---|---|
| | | 2,6-Dinitrotoluene | 606202 | 30 38 | UG/L | 3 |
| | | N-Nitroso-dipropylamine | 621647 | < 10 17 | UG/L | 1 |
| | | N-Nitrosodimethylamine | 62759 | < 10 | UG/L | 1 |
| | | Hexachloroethane | 67721 | < 10 | UG/L | 1 |
| | | 4-Chlorophenyl phenylether | 7005723 | < 10 | UG/L | 1 |
| | | 1,2-Dichlorobenzene | 75501 | < 10 12 | UG/L | 1 |
| | | Hexachlorocyclopentadiene | 77474 | < 10 | UG/L | 1 |
| | | Isophorone | 78591 | 27 38 | UG/L | 2.7 |
| | | Acenaphthene | 83329 | < 10 | UG/L | 1 |
| | | Diethyl phthalate | 84662 | < 10 12 | UG/L | 1 |
| | | Di-n-butyl pthalate | 84742 | < 10 12 | UG/L | 1 |
| | | Phenanthrene | 85018 | 15 20 | UG/L | 1.5 |
| | | Butyl benzyl phthalate | 85687 | < 10 | UG/L | 1 |
| | | N-Nitrosodiphenylamine * | 86306 | < 10 | UG/L | 1 |
| | | Fluorene | 86737 | < 10 | UG/L | 1 |
| | | Hexachlorobutadiene | 87683 | 12 24 | UG/L | 1.2 |
| | | Pentachlorophenol | 87865 | < 50 | UG/L | 5 |
| | | 2,4,6-Trichlorophenol | 88062 | < 10 | UG/L | 1 |
| | | 2-Nitrophenol | 88755 | < 10 | UG/L | 1 |
| | | Naphthalene | 91203 | < 10 | UG/L | 1 |
| | | 2-Chloronaphthalene | 91587 | < 10 12 | UG/L | 1 |
| | | 3,3'-Dichlorobenzidine | 91941 | < 20 | UG/L | 2 |
| | | Benzidine | 92875 | < 20 | UG/L | 2 |
| | | 2-Chlorophenol | 95578 | < 10 | UG/L | 1 |
| | | Nitrobenzene | 98953 | < 10 | UG/L | 1 |
| 7.02604 | | 4-Nitrophenol | 100027 | < 1000 | UG/L | 100 |
| | | 4-Bromophenyl phenyl ether | 101553 | < 200 | UG/L | 20 |
| | | 2,4-Dimethylphenol | 105679 | < 200 | UG/L | 20 |
| | | 1,4-Dichlorobenzene | 106467 | < 200 | UG/L | 20 |
| | | bis(2-Chloroisopropylether | 108601 | < 200 | UG/L | 20 |
| | | Phenol | 108952 | < 200 | UG/L | 20 |
| | | bis(2-Chloroethyl)ether | 111444 | < 200 | UG/L | 20 |
| | | bis(2-Chloroethoxy)methane | 111911 | < 200 | UG/L | 20 |
| | | bis(2-Ethylhexyl)phthalate | 117817 | < 200 | UG/L | 20 |
| | | Di-n-octyl phthalate | 117840 | < 200 | UG/L | 20 |
| | | Hexachlorobenzene | 118741 | < 200 | UG/L | 20 |
| | | Anthracene | 120127 | < 200 | UG/L | 20 |
| | | 1,2,4-Trichlorobenzene | 120821 | < 200 | UG/L | 20 |
| | | 2,4-Dichlorophenol | 120832 | < 200 | UG/L | 20 |
| | | 2,4-Dinitrotoluene | 121142 | < 200 | UG/L | 20 |
| | | 1,2-Diphenylhydrazine * | 122394 | < 200 | UG/L | 20 |
| | | Pyrene | 129000 | < 200 | UG/L | 20 |
| | | Dimethyl phthalate | 131113 | < 200 | UG/L | 20 |
| | | Benzo(g,h,i)perylene | 191242 | < 100 | UG/L | 10 |
| | | Indeno(1,2,3-c,d)pyrene | 193395 | < 200 | UG/L | 20 |
| | | Benzo(b)fluoranthene | 205992 | < 200 | UG/L | 20 |
| | | Fluoranthene | 206440 | < 200 | UG/L | 20 |
| | | Benzo(k)fluoranthene | 207089 | < 200 | UG/L | 20 |
| | | Acenaphthylene | 208968 | < 200 | UG/L | 20 |
| | | Chrysene | 218019 | < 200 | UG/L | 20 |
| | | Benzo(a)pyrene | 50328 | < 200 | UG/L | 20 |
| | | 2,4-Dinitrophenol | 51285 | < 1000 | UG/L | 100 |
| | | 4,6-Dinitro-2-methylphenol | 534521 | < 1000 | UG/L | 100 |
| | | Dibenzo(a,h)anthracene | 53703 | < 200 | UG/L | 20 |
| | | 1,3-Dichlorobenzene | 541731 | < 200 | UG/L | 20 |
| | | Benzo(a)anthracene | 56553 | < 200 | UG/L | 20 |
| | | 4-Chloro-3-methylphenol | 59507 | < 200 | UG/L | 20 |
| | | 2,6-Dinitrotoluene | 606202 | < 200 | UG/L | 20 |
| | | N-Nitroso-dipropylamine | 621647 | < 200 | UG/L | 20 |
| | | N-Nitrosodimethylamine | 62759 | < 200 | UG/L | 20 |

| Sample No. | Other ID No. | Analysis Type | Cas. Number | Analytical Result | Units | Uncertainty +/- |
|---|---|---|---|---|---|---|
| | | Hexachloroethane | 67721 | < 200 | UG/L | 20 |
| | | 4-Chlorophenyl phenylether | 7005723 | < 200 | UG/L | 20 |
| | | 1,2-Dichlorobenzene | 75501 | < 200 | UG/L | 20 |
| | | Hexachlorocyclopentadiene | 77474 | < 200 | UG/L | 20 |
| | | Isophorone | 78591 | < 200 | UG/L | 20 |
| | | Acenaphthene | 83329 | < 200 | UG/L | 20 |
| | | Diethyl phthalate | 84662 | < 200 | UG/L | 20 |
| | | Di-n-butyl pthalate | 84742 | < 200 | UG/L | 20 |
| | | Phenanthrene | 85018 | < 200 | UG/L | 20 |
| | | Butyl benzyl phthalate | 85687 | < 200 | UG/L | 20 |
| | | N-Nitrosodiphenylamine * | 86306 | < 200 | UG/L | 20 |
| | | Fluorene | 86737 | < 200 | UG/L | 20 |
| | | Hexachlorobutadiene | 87683 | < 200 | UG/L | 20 |
| | | Pentachlorophenol | 87865 | < 1000 | UG/L | 100 |
| | | 2,4,6-Trichlorophenol | 88062 | < 200 | UG/L | 20 |
| | | 2-Nitrophenol | 88755 | < 200 | UG/L | 20 |
| | | Naphthalene | 91203 | < 200 | UG/L | 20 |
| | | 2-Chloronaphthalene | 91587 | < 200 | UG/L | 20 |
| | | 3,3'-Dichlorobenzidine | 91941 | < 400 | UG/L | 40 |
| | | Benzidine | 92875 | < 400 | UG/L | 40 |
| | | 2-Chlorophenol | 95578 | < 200 | UG/L | 20 |
| | | Nitrobenzene | 98953 | < 200 | UG/L | 20 |
| 37.02605 | | 4-Nitrophenol | 100027 | < 1000 | UG/L | 100 |
| | | 4-Bromophenyl phenyl ether | 101553 | < 200 | UG/L | 20 |
| | | 2,4-Dimethylphenol | 105679 | < 200 | UG/L | 20 |
| | | 1,4-Dichlorobenzene | 106467 | < 200 | UG/L | 20 |
| | | bis(2-Chloroisopropylether | 108601 | < 200 | UG/L | 20 |
| | | Phenol | 108952 | < 200 | UG/L | 20 |
| | | bis(2-Chloroethyl)ether | 111444 | < 200 | UG/L | 20 |
| | | bis(2-Chloroethoxy)methane | 111911 | < 200 | UG/L | 20 |
| | | bis(2-Ethylhexyl)phthalate | 117817 | < 200 | UG/L | 20 |
| | | Di-n-octyl phthalate | 117840 | < 200 | UG/L | 20 |
| | | Hexachlorobenzene | 118741 | < 200 | UG/L | 20 |
| | | Anthracene | 120127 | < 200 | UG/L | 20 |
| | | 1,2,4-Trichlorobenzene | 120821 | < 200 | UG/L | 20 |
| | | 2,4-Dichlorophenol | 120832 | < 200 | UG/L | 20 |
| | | 2,4-Dinitrotoluene | 121142 | < 200 | UG/L | 20 |
| | | 1,2-Diphenylhydrazine * | 122394 | < 200 | UG/L | 20 |
| | | Pyrene | 129000 | < 200 | UG/L | 20 |
| | | Dimethyl phthalate | 131113 | < 200 | UG/L | 20 |
| | | Benzo(g,h,i)perylene | 191242 | < 100 | UG/L | 10 |
| | | Indeno(1,2,3-c,d)pyrene | 193395 | < 200 | UG/L | 20 |
| | | Benzo(b)fluoranthene | 205992 | < 200 | UG/L | 20 |
| | | Fluoranthene | 206440 | < 200 | UG/L | 20 |
| | | Benzo(k)fluoranthene | 207089 | < 200 | UG/L | 20 |
| | | Acenaphthylene | 208968 | < 200 | UG/L | 20 |
| | | Chrysene | 218019 | < 200 | UG/L | 20 |
| | | Benzo(a)pyrene | 50328 | < 200 | UG/L | 20 |
| | | 2,4-Dinitrophenol | 51285 | < 1000 | UG/L | 100 |
| | | 4,6-Dinitro-2-methylphenol | 534521 | < 1000 | UG/L | 100 |
| | | Dibenzo(a,h)anthracene | 53703 | < 200 | UG/L | 20 |
| | | 1,3-Dichlorobenzene | 541731 | < 200 | UG/L | 20 |
| | | Benzo(a)anthracene | 56553 | < 200 | UG/L | 20 |
| | | 4-Chloro-3-methylphenol | 59507 | < 200 | UG/L | 20 |
| | | 2,6-Dinitrotoluene | 606202 | < 200 | UG/L | 20 |
| | | N-Nitroso-dipropylamine | 621647 | < 200 | UG/L | 20 |
| | | N-Nitrosodimethylamine | 62759 | < 200 | UG/L | 20 |
| | | Hexachloroethane | 67721 | < 200 | UG/L | 20 |
| | | 4-Chlorophenyl phenylether | 7005723 | < 200 | UG/L | 20 |
| | | 1,2-Dichlorobenzene | 75501 | < 200 | UG/L | 20 |

| Sample No. | Other ID No. | Analysis Type | Cas. Number | Analytical Result | Units | Uncertainty +/- |
|---|---|---|---|---|---|---|
| | | Hexachlorocyclopentadiene | 77474 | < 200 | UG/L | 20 |
| | | Isophorone | 78591 | < 200 | UG/L | 20 |
| | | Acenaphthene | 83329 | < 200 | UG/L | 20 |
| | | Diethyl phthalate | 84662 | < 200 | UG/L | 20 |
| | | Di-n-butyl pthalate | 84742 | < 200 | UG/L | 20 |
| | | Phenanthrene | 85018 | < 200 | UG/L | 20 |
| | | Butyl benzyl phthalate | 85687 | < 200 | UG/L | 20 |
| | | N-Nitrosodiphenylamine * | 86306 | < 200 | UG/L | 20 |
| | | Fluorene | 86737 | < 200 | UG/L | 20 |
| | | Hexachlorobutadiene | 87683 | < 200 | UG/L | 20 |
| | | Pentachlorophenol | 87865 | < 1000 | UG/L | 100 |
| | | 2,4,6-Trichlorophenol | 88062 | < 200 | UG/L | 20 |
| | | 2-Nitrophenol | 88755 | < 200 | UG/L | 20 |
| | | Naphthalene | 91203 | < 200 | UG/L | 20 |
| | | 2-Chloronaphthalene | 91587 | < 200 | UG/L | 20 |
| | | 3,3'-Dichlorobenzidine | 91941 | < 400 | UG/L | 40 |
| | | Benzidine | 92875 | < 400 | UG/L | 40 |
| | | 2-Chlorophenol | 95578 | < 200 | UG/L | 20 |
| | | Nitrobenzene | 98953 | < 200 | UG/L | 20 |

Date: 2/20/87

Approved, Contracting

mag Date: 2/20/87

Approved, Quality Control

**Rocky Mountain Analytical Laboratory**
4955 Yarrow Street, Arvada, CO 80002 (303) 421-6611

A DIVISION OF
ENSECO
INCORPORATED

February 10, 1987

Dr. Larry Field
University of California
Los Alamos National Laboratory
HSE-8, Mail Stop K490
Los Alamos, NM 87545

Dear Larry:

Enclosed please find the results for three water samples received in our laboratory on January 28, 1987. In addition to the priority pollutant semivolatiles reported in the accompanying report, the following approximate concentrations of tentatively identified compounds were also found:

| | |
|---|---|
| 62716-01 | TNT, (2-methyl-1,3,5-trinitrobenzene) approx. 1200 ug/L<br>2-chloroethanol phosphate, approx. 400 ug/L |
| 62716-02 | TNT (2-Methyl-1,3,5-trinitrobenzene) approx. 1000 ug/L<br>2-chloroethanol phosphate, approx. 380 ug/L |

As a result of the rather high levels of these two tentatively identified compounds, the detection limits reported for samples 1 and 2 are somewhat higher than normal.

Please note that the original request, both from yourself, as well as Suzanne Bell and Elizabeth Affeldt, requested priority pollutant semivolatiles. However, the sample tag note sent to us with the company chain of custody mentions HSL semivolatiles. As you can see, we reported the priority pollutant list.

Please feel free to contact me should any questions arise with regard to these data.

Best Regards,

Owen Callaway

Owen Callaway
Technical Director

Reviewed by:

Michael P. Phillips

Michael P. Phillips
Director
Mass Spectrometry

JOC/MPP/bjb
Enclosures

RMAL # 62716

# SAMPLE DESCRIPTION INFORMATION

for

Los Alamos National Laboratory

| RMA Sample No. | Sample Description | Sample Type | Date Sampled | Date Received |
|---|---|---|---|---|
| 62716-01 | 87.02604 | Water | 01/26/87 | 01/28/87 |
| 62716-02 | 87.02605 | Water | 01/26/87 | 01/28/87 |
| 62716-03 | 87.02606 | Water | -- | 01/28/87 |

February 10, 1987

# ANALYTICAL RESULTS

For

Los Alamos National Laboratory

## PRIORITY POLLUTANT SEMIVOLATILES, METHOS 625 (CONT.)

| Parameter | Units | 62716-01 | | 62716-02 | | 62716-03 | | |
|---|---|---|---|---|---|---|---|---|
| Fluoranthene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Fluorene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Hexachlorobenzene | ug/L | ND | (200) | ND | (200) | 11 | (10) | 17 |
| Hexachlorobutadiene | ug/L | ND | (200) | ND | (200) | 12 | (10) | 24 |
| Hexachlorocyclopentadiene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Hexachloroethane | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Indeno(1,2,3-c,d)pyrene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Isophorone | ug/L | ND | (200) | ND | (200) | 27 | (10) | 38 |
| Naphthalene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Nitrobenzene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| N-Nitrosodimethylamine | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| N-Nitroso-dipropylamine | ug/L | ND | (200) | ND | (200) | ND | (10) | 17 |
| N-Nitrosodiphenylamine* | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Phenanthrene | ug/L | ND | (200) | ND | (200) | 15 | (10) | 20 |
| Pyrene | ug/L | ND | (200) | ND | (200) | 23 | (10) | 50 |
| 1,2,4-Trichlorobenzene | ug/L | ND | (200) | ND | (200) | ND | (10) | 12 |
| 2-Chlorophenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 2,4-Dichlorophenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 2,4-Dimethylphenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 4,6-Dinitro-2-methylphenol | ug/L | ND | (1000) | ND | (1000) | ND | (50) | |
| 2,4-Dinitrophenol | ug/L | ND | (1000) | ND | (1000) | ND | (50) | |
| 2-Nitrophenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 4-Nitrophenol | ug/L | ND | (1000) | ND | (1000) | ND | (50) | |
| 4-Chloro-3-methylphenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Pentachlorophenol | ug/L | ND | (1000) | ND | (1000) | ND | (50) | |
| Phenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 2,4,6-Trichlorophenol | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| SS Nitrobenzene-D5 | % | 54 | (-) | 46 | (-) | 83 | (-) | |
| SS 2-Fluorobiphenyl | % | 60 | (-) | 50 | (-) | 81 | (-) | |
| SS Terphenyl-D14 | % | 22 | (-) | 15 | (-) | 95 | (-) | |
| SS Phenol-D5 | % | 11 | (-) | 11 | (-) | 47 | (-) | |
| SS 2-Fluorophenol | % | 19 | (-) | 14 | (-) | 47 | (-) | |
| SS 2,4,6-Tribromophenol | % | 32 | (-) | 23 | (-) | 61 | (-) | |

ND = Not Detected. Detection limits in parentheses. SS = Surrogate Spikes. * = Analyzed as diphenylamine

# ANALYTICAL RESULTS

For

Los Alamos National Laboratory

## PRIORITY POLLUTANT SEMIVOLATILES, METHOD 625

| Parameter | Units | 62716-01 | | 62716-02 | | 62716-03 | | |
|---|---|---|---|---|---|---|---|---|
| Acenaphthene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Acenaphthylene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Anthracene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Benzidine | ug/L | ND | (400) | ND | (400) | ND | (20) | |
| Benzo(a)anthracene | ug/L | ND | (200) | ND | (200) | 23 | (10) | 37 |
| Benzo(a)pyrene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Benzo(b)fluoranthene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Benzo(g,h,i)perylene | ug/L | ND | (100) | ND | (100) | ND | (5) | |
| Benzo(k)fluoranthene | ug/L | ND | (200) | ND | (200) | 12 | (10) | 23 |
| bis(2-Chloroethoxy)methane | ug/L | ND | (200) | ND | (200) | 16 | (10) | 24 |
| bis(2-Chloroethyl)ether | ug/L | ND | (200) | ND | (200) | 17 | (10) | 24 |
| bis(2-Chloroisopropyl)ether | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| bis(2-Ethylhexyl)phthalate | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 4-Bromophenyl phenyl ether | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Butyl benzyl phthalate | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 2-Chloronaphthalene | ug/L | ND | (200) | ND | (200) | ND | (10) | 12 |
| 4-Chlorophenyl phenyl ether | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Chrysene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Dibenzo(a,h)anthracene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 1,2-Dichlorobenzene | ug/L | ND | (200) | ND | (200) | ND | (10) | 12 |
| 1,3-Dichlorobenzene | ug/L | ND | (200) | ND | (200) | 14 | (10) | 26 |
| 1,4-Dichlorobenzene | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| 3,3'-Dichlorobenzidine | ug/L | ND | (400) | ND | (400) | ND | (20) | |
| Diethyl phthalate | ug/L | ND | (200) | ND | (200) | ND | (10) | 12 |
| Dimethyl phthalate | ug/L | ND | (200) | ND | (200) | ND | (10) | |
| Di-n-butyl phthalate | ug/L | ND | (200) | ND | (200) | ND | (10) | 12 |
| 2,4-Dinitrotoluene | ug/L | ND | (200) | ND | (200) | 29 | (10) | 37 |
| 2,6-Dinitrotoluene | ug/L | ND | (200) | ND | (200) | 30 | (10) | 38 |
| Di-n-octyl phthalate | ug/L | ND | (200) | ND | (200) | ND | (10) | 22 |
| 1,2-Diphenylhydrazine* | ug/L | ND | (200) | ND | (200) | ND | (10) | |

ND = Not Detected. Detection limits in parentheses. * = Analyzed as azobenzene.

E-3

Raw Laboratory Chemical Data Used in Table C-3-1.

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

LOS ALAMOS NATIONAL LAB.

* Possibly due to lab contamination butylbenzylphthalate was detected in lab blanks at this same approximate level.

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

IV. Methodology
Requested analyses were performed according to the following methods.

TEST NAME **HAZARDOUS SUBSTANCE VOLS** TEST CODE **8240**

| | |
|---|---|
| Hazardous Substance List Volatiles | EPA 8240-Test Methods for Evaluating Solid Wastes, 3rd Edition, November 1986. GC/MS Purge and Trap analysis |

TEST NAME **ABN HSL GC/MS EXTRACTABLES** TEST CODE **8270**

| | |
|---|---|
| Hazardous Substance List Extractables | EPA 8270-Test Methods for Evaluating Solid Waste,3rd Edition, November 1986. Acid/Base-Neutral Extraction followed by GC/MS analysis. |

TEST NAME **SILVER** **EP TOX** TEST CODE **AG_EPT**

| | |
|---|---|
| Silver-EPTox | EPA 7760-Test Methods for Evaluating Solid Wastes,3rd Edition, November 1986. Silver is analyzed using flame atomic absorption on an EP toxicity leachate. |

TEST NAME **ARSENIC** **EP TOX** TEST CODE **AS_EPT**

| | |
|---|---|
| Arsenic-EPToxicity | EPA 7060-Test Methods for Evaluating Solid Wastes,3rd Edition, November 1986. Arsenic is determined using graphite furnace atomic absorption on EP TOX leachates. |

TEST NAME **BARIUM** **EP TOX** TEST CODE **BA_EPT**

| | |
|---|---|
| Barium-EP Toxicity | EPA 7080-Test Methods for Evaluating Solid Wastes,3rd Edition, November 1986. Barium is analyzed using flame atomic absorption on an EP Toxicity leachate. |

TEST NAME **CADMIUM** **EP TOX** TEST CODE **CD_EPT**

| | |
|---|---|
| Cadmium-EPTox | EPA7130-Test Methods for Evaluating Solid Wastes,3rd Edition, November 1986. Cadmium is analyzed using |

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME **CADMIUM** **EP TOX** TEST CODE **CD_EPT**

flame atomic absorption on an EP Toxicity leachate.

TEST NAME **CHROMIUM** **EP TOX** TEST CODE **CR_EPT**

Chromium-EP TOX — Method 7190-Test Methods for Evaluating Solid Wastes, 3rd Edition, November 1986. Atomic Absorption Analysis.

TEST NAME **MERCURY** **EP TOX** TEST CODE **HG_EPT**

Mercury-EP TOX — Method 7471-Test Methods for Evaluating Solid Wastes, 3rd Edition, November 1986. Cold vapor atomic absorption.

TEST NAME **NICKEL** **EP TOX** TEST CODE **NI_EPT**

Nickel-EP TOX — Method 7520-Test Methods for Evaluating Solid Wastes, 3rd Edition, November 1986. Flame atomic absorption analysis.

TEST NAME **LEAD** **EP TOX** TEST CODE **PB_EPT**

Lead-EP TOX — Method 7420-Test Methods for Evaluating Solid Wastes 3rd Edition, November 1986. Flame atomic absorption analysis.

TEST NAME **SELENIUM** **EP TOX** TEST CODE **SE_EPT**

Selenium-EP TOX — Method 7740-Test Methods for Evaluating Solid Wastes, 3rd Edition, November 1986. Graphite furnace atomic absorption.

# Attachment 4

## Letter from Environmental Improvement Division

Attachment 4

New Mexico Health and Environment Department

MARALYN BUCKS
Acting Secretary

CARLA L. MOTT
Deputy Secretary

MICHAEL J. BURKHARDT
Deputy Secretary

RICHARD MITZELFELT
Director

May 15, 1990

Dr. Paul Schumann
U.S. Department of Energy
Los Alamos Area Office
528 35th Street
Los Alamos, NM 87544

Dear Dr. Schumann:

This letter is to confirm our conversations regarding the closure at TA-16.

Based on the sampling data faxed to the Environmental Improvement Division (EID) on Tuesday, May 8, 1990, the EID conducted a risk assessment for tetrachloroethylene. The calculations are attached. The acceptable range of risk, as designated by the Environmental Protection Agency, runs from $10^{-4}$ to $10^{-7}$ which corresponds to one death from cancer per 10,000-10,000,000 exposed persons. The incremental risk derived from 29 ppb of tetrachloroethylene was $2.96 \times 10^{-8}$ which indicates that this amount of tetrachloroethylene is a couple of orders of magnitude less than the level of concern. Consequently, the EID has determined that the residues of tetrachloroethylene found in sample 12 do not present a threat to the environment or human health and you may proceed with closure without further excavation.

I would like to iterate our concern over the rate of spike recovery that accompanied sample 12. The one spike that was recovered at a very low rate was the tetrachloroethylene spike. If the calculations had indicated a possible level of concern, we would have had to require that you resample that area.

If you have any questions, please contact me at (505) 827-2934.

Yours truly,

A. Elizabeth Gordon, Ph.D.

A. Elizabeth Gordon, Ph.D.
Permitting Supervisor

AEG/aeg

cc: John Krueger, LANL
Marc Sides, EPA-Region 6

— ENVIRONMENTAL IMPROVEMENT DIVISION —
Harold Runnels Building
1190 St. Francis Dr.
Santa Fe, New Mexico 87503

REPORT NUMBER: 6024 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: J.D. MONTOYA on 20-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|---|
| 00.20193 | 00.20193 | 9.8 | 0.98 | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 9.7 | 0.97 | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 9.8 | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20331 | 00.20331 | 10. | 1. | MG/L | 11. | 1. | 3/20/90 | UNDER CONTROL |

| Analyst | Section Leader | QA Officer |
|---|---|---|
| JD Montoya | [illegible] | mag |
| 3-20 90 | 3-20-90 | 3-21-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

**********

REPORT NUMBER: 6023 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: J.D. MONTOYA on 20-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|---|
| 00.20193 | 00.20193 | 10. | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10. | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10.4 | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20331 | 00.20331 | 14. | 1.4 | MG/L | 14. | 1. | 3/20/90 | UNDER CONTROL |

| Analyst | Section Leader | QA Officer |
|---|---|---|
| 3-20-90 | 3-20-90 | 3-21-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

**********

REPORT NUMBER: 6022 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: J.D. MONTOYA on 20-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|---|
| 00.20193 | 00.20193 | 9.8 | 0.98 | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10. | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10.1 | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20331 | 00.20331 | 11. | 1.1 | MG/L | 12. | 1. | 3/20/90 | UNDER CONTROL |

| Analyst | Section Leader | QA Officer |
|---|---|---|
| JD Montoya | [illegible] | mag |
| 3-20-90 | 3-20-90 | 3-21-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

**********

REPORT NUMBER: 6021 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: J.D. MONTOYA on 20-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|---|
| 00.20193 | 00.20193 | 9.8 | 0.98 | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10. | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10.3 | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20331 | 00.20331 | 16. | 1.6 | MG/L | 15. | 2. | 3/20/90 | UNDER CONTROL |

| Analyst | Section Leader | QA Officer |
|---|---|---|
| 3-20-90 | 3-20-90 | 3-21-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

**********

INTERNATIONAL TECHNOLOGY CORPORATION

March 07, 1990

DAVE McINROY, HSE-8
LOS ALAMOS NATIONAL LAB.
P O BOX 1663 M.S. K490
LOS ALAMOS NM 87545

Re: TA-16 SURFACE IMPOUND.CLOSURE

Dear DAVE McINROY, HSE-8:

On March 07, 1990, the following samples were received at the ITAS Austin laboratory:

TA-16-12 TA-16-4

They were checked into our sample tracking system as work order number B0-03-066 and assigned testing for the following parameters:

| | | | |
|---|---|---|---|
| HAZARDOUS SUBSTANCE VOLS | | ABN HSL GC/MS | EXTRACTABLES |
| EP TOX PREPARATION | | MERCURY | EP TOX |
| SILVER | EP TOX | BARIUM | EP TOX |
| CADMIUM | EP TOX | CHROMIUM | EP TOX |
| NICKEL | EP TOX | LEAD | EP TOX |
| ARSENIC | EP TOX | SELENIUM | EP TOX |
| ABN Prep - Soil (Sonicate) | | | |

When the above analyses are completed, your report will be issued to the address shown above. If you need to arrange for other reporting, please contact me.

We appreciate the opportunity to participate in this program of analytical work, and look forward to working with you in the future. Again, please contact me if you have any questions or special requirements.

Sincerely,

Cindy Quy

Cindy Quy
Customer Services Representative

Regional Office
5307 Industrial Oaks Boulevard • Suite 160 • Austin, Texas 78735 • 512-892-6684

IT Corporation is a wholly owned subsidiary of International Technology Corporation

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYTICAL SERVICES

## CERTIFICATE OF ANALYSIS

Date: 03/30/90

LOS ALAMOS NATIONAL LAB.
P O BOX 1663 M.S. K490
LOS ALAMOS NM 87545
DAVE McINROY, HSE-8

Work Order: BO-03-066

This is the Certificate of Analysis for the following samples:

Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE
Date Received: 03/07/90
Number of Samples: 2
Sample Type: SOIL

I. Introduction

Samples were labeled as follows:

| SAMPLE IDENTIFICATION | LABORATORY # |
|---|---|
| TA-16-4 | BO-03-066-01 |
| TA-16-12 | BO-03-066-02 |

II. QA/QC
The results presented in this report meet the statement of work requirements in accordance with Quality Control and Quality Assurance protocol.
III. Analytical Data
The following page(s) supply results for requested analyses performed on the samples listed above.

Reviewed and Approved:

Diane M. Nichols
Laboratory Manager

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

| SAMPLE ID | TA-16-4 | TA-16-12 | |
|---|---|---|---|
| SAMPLED | 03/05/90 | 03/05/90 | |
| TEST | | | UNITS |
| EP TOX PREPARATION | 03/14/90 | 03/14/90 | date |
| MERCURY EP TOX | ND [ 0.00020] | ND [ 0.00020] | mg/L |
| SILVER EP TOX | ND [ 0.010] | ND [ 0.010] | mg/L |
| BARIUM EP TOX | 0.36 [ 0.030] | 0.56 [ 0.030] | mg/L |
| CADMIUM EP TOX | ND [ 0.010] | ND [ 0.010] | mg/L |
| CHROMIUM EP TOX | ND [ 0.010] | ND [ 0.010] | mg/L |
| NICKEL EP TOX | 0.034 [ 0.030] | 0.041 [ 0.030] | mg/L |
| LEAD EP TOX | ND [ 0.10] | ND [ 0.10] | mg/L |
| ARSENIC EP TOX | 0.003 [ 0.0020] | ND [ 0.0020] | mg/L |
| SELENIUM EP TOX | ND [ 0.0050] | ND [ 0.0050] | mg/L |

ND indicates the parameter was not detected.
Detection limits are specified in [].

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME: HAZARDOUS SUBSTANCE VOLS

SAMPLE ID: TA-16-4
SAMPLE DATE: 03/05/90
ANALYSIS DATE: 03/20/90

Results in ug/kg:

| | | Detection Limit | | | Detection Limit |
|---|---|---|---|---|---|
| Methyl chloride | ND | 10 | 1,2-Dichloropropane | ND | 5.0 |
| Methyl bromide | ND | 5.0 | trans-1,3-Dichloropropene | ND | 5.0 |
| Vinyl chloride | ND | 10 | Trichloroethylene | ND | 5.0 |
| Chloroethane | ND | 10 | Chlorodibromomethane | ND | 5.0 |
| Methylene chloride | ND | 5.0 | 1,1,2-Trichloroethane | ND | 5.0 |
| Acetone | ND | 100 | Benzene | ND | 5.0 |
| Carbon disulfide | ND | 5.0 | cis-1,3-Dichloropropene | ND | 5.0 |
| 1,1-Dichloroethylene | ND | 5.0 | 2-Chloroethylvinyl ether | ND | 10 |
| 1,1-Dichloroethane | ND | 5.0 | Bromoform | ND | 5.0 |
| trans-1,2-Dichloroethylene | ND | 5.0 | 2-Hexanone | ND | 50 |
| Chloroform | ND | 5.0 | 4-Methyl-2-pentanone | ND | 50 |
| 1,2-Dichloroethane | ND | 5.0 | Tetrachloroethylene | ND | 5.0 |
| 2-Butanone | ND | 100 | 1,1,2,2-Tetrachloroethane | ND | 5.0 |
| 1,1,1-Trichloroethane | ND | 5.0 | Toluene | ND | 5.0 |
| Carbon tetrachloride | ND | 5.0 | Chlorobenzene | ND | 5.0 |
| Vinyl acetate | ND | 50 | Ethylbenzene | ND | 5.0 |
| Dichlorobromomethane | ND | 5.0 | Styrene | ND | 5.0 |
| | | | Xylenes, total | ND | 5.0 |

| Surrogates | % Recovery |
|---|---|
| Toluene-D8 | 107 |
| Bromofluorobenzene | 90 |
| 1,2-Dichloroethane-D4 | 101 |

Comments: 'ND' or '<' indicates that the compound is not detected at the specified limit.

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME: ABN HSL GC/MS EXTRACTABLES

SAMPLE ID: TA-16-4
SAMPLE DATE: 03/05/90
EXTRACTION DATE: 03/06/90
ANALYSIS DATE: 03/23/90

Results in mg/kg:

| | | Detection Limit | | | Detection Limit |
|---|---|---|---|---|---|
| Phenol | ND | 0.33 | 2,6-Dinitrotoluene | ND | 0.33 |
| bis(2-Chloroethyl)ether | ND | 0.33 | 3-Nitroaniline | ND | 1.7 |
| 2-Chlorophenol | ND | 0.33 | Acenaphthene | ND | 0.33 |
| 1,3-Dichlorobenzene | ND | 0.33 | 2,4-Dinitrophenol | ND | 1.7 |
| 1,4-Dichlorobenzene | ND | 0.33 | 4-Nitrophenol | ND | 1.7 |
| Benzyl alcohol | ND | 0.66 | Dibenzofuran | ND | 0.33 |
| 1,2-Dichlorobenzene | ND | 0.33 | 2,4-Dinitrotoluene | ND | 0.33 |
| 2-Methylphenol | ND | 0.33 | Diethylphthalate | ND | 0.33 |
| bis(2-Chloroisopropyl)ether | ND | 0.33 | 4-Chlorophenyl-phenylether | ND | 0.33 |
| 4-Methylphenol | ND | 0.33 | Fluorene | ND | 0.33 |
| N-Nitroso-di-n-propylamine | ND | 0.33 | 4-Nitroaniline | ND | 1.7 |
| Hexachloroethane | ND | 0.33 | 4,6-Dinitro-2-methylphenol | ND | 1.7 |
| Nitrobenzene | ND | 0.33 | N-Nitrosodiphenylamine | ND | 0.33 |
| Isophorone | ND | 0.33 | 4-Bromophenyl-phenylether | ND | 0.33 |
| 2-Nitrophenol | ND | 0.33 | Hexachlorobenzene | ND | 0.33 |
| 2,4-Dimethylphenol | ND | 0.33 | Pentachlorophenol | ND | 1.7 |
| Benzoic Acid | ND | 1.7 | Phenanthrene | ND | 0.33 |
| bis(2-Chloroethoxy)methane | ND | 0.33 | Anthracene | ND | 0.33 |
| 2,4-Dichlorophenol | ND | 0.33 | Di-n-butylphthalate | ND | 0.33 |
| 1,2,4-Trichlorobenzene | ND | 0.33 | Fluoranthene | ND | 0.33 |
| Naphthalene | ND | 0.33 | Pyrene | ND | 0.33 |
| 4-Chloroaniline | ND | 0.66 | Butylbenzylphthalate | 1.4 * | 0.33 |
| Hexachlorobutadiene | ND | 0.33 | 3,3'-Dichlorobenzidine | ND | 0.66 |
| 4-Chloro-3-methylphenol | ND | 0.66 | Benzo(a)anthracene | ND | 0.33 |
| 2-Methylnaphthalene | ND | 0.33 | Chrysene | ND | 0.33 |
| Hexachlorocyclopentadiene | ND | 0.33 | bis(2-Ethylhexyl)phthalate | ND | 0.33 |
| 2,4,6-Trichlorophenol | ND | 0.33 | Di-n-octylphthalate | ND | 0.33 |
| 2,4,5-Trichlorophenol | ND | 0.33 | Benzo(b)fluoranthene | ND | 0.33 |
| 2-Chloronaphthalene | ND | 0.33 | Benzo(k)fluoranthene | ND | 0.33 |
| 2-Nitroaniline | ND | 1.7 | Benzo(a)pyrene | ND | 0.33 |
| Dimethylphthalate | ND | 0.33 | Indeno(1,2,3-cd)pyrene | ND | 0.33 |
| Acenaphthylene | ND | 0.33 | Dibenzo(a,h)anthracene | ND | 0.33 |
| | | | Benzo(g,h,i)perylene | ND | 0.33 |

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME: ABN HSL GC/MS EXTRACTABLES

SAMPLE ID: TA-16-4
SAMPLE DATE: 03/05/90

| Surrogates | % Recovery |
|---|---|
| Nitrobenzene-D5 | 55 |
| 2-Fluorobiphenyl | 63 |
| Terphenyl-D14 | 75 |
| Phenol-D6 | 49 |
| 2-Fluorophenol | 38 |
| 2,4,6-Tribromophenol | 76 |

Comments: 'ND' or '<' indicates that the compound is not detected at the specified limit.

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME: HAZARDOUS SUBSTANCE VOLS

SAMPLE ID: TA-16-12
SAMPLE DATE: 03/05/90
ANALYSIS DATE: 03/20/90

Results in ug/kg:

| | | Detection Limit | | | Detection Limit |
|---|---|---|---|---|---|
| Methyl chloride | ND | 10 | 1,2-Dichloropropane | ND | 5.( |
| Methyl bromide | ND | 5.0 | trans-1,3-Dichloropropene | ND | 5.( |
| Vinyl chloride | ND | 10 | Trichloroethylene | ND | 5.( |
| Chloroethane | ND | 10 | Chlorodibromomethane | ND | 5.( |
| Methylene chloride | ND | 5.0 | 1,1,2-Trichloroethane | ND | 5.( |
| Acetone | ND | 100 | Benzene | ND | 5.( |
| Carbon disulfide | ND | 5.0 | cis-1,3-Dichloropropene | ND | 5.( |
| 1,1-Dichloroethylene | ND | 5.0 | 2-Chloroethylvinyl ether | ND | 1 |
| 1,1-Dichloroethane | ND | 5.0 | Bromoform | ND | 5.( |
| trans-1,2-Dichloroethylene | ND | 5.0 | 2-Hexanone | ND | 5( |
| Chloroform | ND | 5.0 | 4-Methyl-2-pentanone | ND | 5( |
| 1,2-Dichloroethane | ND | 5.0 | **Tetrachloroethylene** | 16 | 5.( |
| 2-Butanone | ND | 100 | 1,1,2,2-Tetrachloroethane | ND | 5.( |
| 1,1,1-Trichloroethane | ND | 5.0 | Toluene | ND | 5.( |
| Carbon tetrachloride | ND | 5.0 | Chlorobenzene | ND | 5.( |
| Vinyl acetate | ND | 50 | Ethylbenzene | ND | 5.( |
| Dichlorobromomethane | ND | 5.0 | Styrene | ND | 5.( |
| | | | Xylenes, total | ND | 5.( |

| Surrogates | % Recovery |
|---|---|
| Toluene-D8 | 106 |
| Bromofluorobenzene | 97 |
| 1,2-Dichloroethane-D4 | 103 |

Comments: 'ND' or '<' indicates that the compound is not detected at the specified limit.

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME: ABN HSL GC/MS EXTRACTABLES

SAMPLE ID: TA-16-12
SAMPLE DATE: 03/05/90
EXTRACTION DATE: 03/06/90
ANALYSIS DATE: 03/23/90

Results in mg/kg:

| | | Detection Limit | | | Detection Limit |
|---|---|---|---|---|---|
| Phenol | ND | 3.3 | 2,6-Dinitrotoluene | ND | 3. |
| bis(2-Chloroethyl)ether | ND | 3.3 | 3-Nitroaniline | ND | 1 |
| 2-Chlorophenol | ND | 3.3 | Acenaphthene | ND | 3. |
| 1,3-Dichlorobenzene | ND | 3.3 | 2,4-Dinitrophenol | ND | 1 |
| 1,4-Dichlorobenzene | ND | 3.3 | 4-Nitrophenol | ND | 1 |
| Benzyl alcohol | ND | 6.6 | Dibenzofuran | ND | 3. |
| 1,2-Dichlorobenzene | ND | 3.3 | 2,4-Dinitrotoluene | ND | 3. |
| 2-Methylphenol | ND | 3.3 | Diethylphthalate | ND | 3. |
| bis(2-Chloroisopropyl)ether | ND | 3.3 | 4-Chlorophenyl-phenylether | ND | 3. |
| 4-Methylphenol | ND | 3.3 | Fluorene | ND | 3. |
| N-Nitroso-di-n-propylamine | ND | 3.3 | 4-Nitroaniline | ND | 1 |
| Hexachloroethane | ND | 3.3 | 4,6-Dinitro-2-methylphenol | ND | 1 |
| Nitrobenzene | ND | 3.3 | N-Nitrosodiphenylamine | ND | 3. |
| Isophorone | ND | 3.3 | 4-Bromophenyl-phenylether | ND | 3. |
| 2-Nitrophenol | ND | 3.3 | Hexachlorobenzene | ND | 3. |
| 2,4-Dimethylphenol | ND | 3.3 | Pentachlorophenol | ND | 1 |
| Benzoic Acid | ND | 17 | Phenanthrene | ND | 3. |
| bis(2-Chloroethoxy)methane | ND | 3.3 | Anthracene | ND | 3. |
| 2,4-Dichlorophenol | ND | 3.3 | Di-n-butylphthalate | ND | 3. |
| 1,2,4-Trichlorobenzene | ND | 3.3 | Fluoranthene | ND | 3. |
| Naphthalene | ND | 3.3 | Pyrene | ND | 3. |
| 4-Chloroaniline | ND | 6.6 | Butylbenzylphthalate | ND | 3. |
| Hexachlorobutadiene | ND | 3.3 | 3,3'-Dichlorobenzidine | ND | 6. |
| 4-Chloro-3-methylphenol | ND | 6.6 | Benzo(a)anthracene | ND | 3. |
| 2-Methylnaphthalene | ND | 3.3 | Chrysene | ND | 3. |
| Hexachlorocyclopentadiene | ND | 3.3 | bis(2-Ethylhexyl)phthalate | ND | 3. |
| 2,4,6-Trichlorophenol | ND | 3.3 | Di-n-octylphthalate | ND | 3. |
| 2,4,5-Trichlorophenol | ND | 3.3 | Benzo(b)fluoranthene | ND | 3. |
| 2-Chloronaphthalene | ND | 3.3 | Benzo(k)fluoranthene | ND | 3. |
| 2-Nitroaniline | ND | 17 | Benzo(a)pyrene | ND | 3. |
| Dimethylphthalate | ND | 3.3 | Indeno(1,2,3-cd)pyrene | ND | 3. |
| Acenaphthylene | ND | 3.3 | Dibenzo(a,h)anthracene | ND | 3. |
| | | | Benzo(g,h,i)perylene | ND | 3. |

Company: LOS ALAMOS NATIONAL LAB.
Date: 03/30/90
Client Work ID: TA-16 SURFACE IMPOUND.CLOSURE

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684

Work Order: B0-03-066

TEST NAME: ABN HSL GC/MS EXTRACTABLES

SAMPLE ID: TA-16-12
SAMPLE DATE: 03/05/90

| Surrogates | % Recovery |
|---|---|
| Nitrobenzene-D5 | 52 |
| 2-Fluorobiphenyl | 71 |
| Terphenyl-D14 | 79 |
| Phenol-D6 | 57 |
| 2-Fluorophenol | 40 |
| 2,4,6-Tribromophenol | 60 |

Comments: 'ND' or '<' indicates that the compound is not detected at the specified limit.

| | | | | |
|---|---|---|---|---|
| TA16-6,18,30 | 90.11352 | AG | < 10. | UG/L | 3/16/90 |
| TA16-6,18,30 | 90.11352 | AG | < 10. | UG/L | 3/16/90 |
| TA16-6,18,30 | 90.11352 | AS | < 2. | UG/L | 3/16/90 |
| TA16-6,18,30 | 90.11352 | AS | < 2. | UG/L | 3/16/90 |
| TA16-6,18,30 | 90.11352 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-6,18,30 | 90.11352 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-6,18,30 | 90.11352 | SE | < 1. | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | AG | < 10. | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | AG | < 10. | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | AS | < 2. | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | AS | < 2. | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | SE | < 1. | UG/L | 3/16/90 |
| TA16-7,19,31 | 90.11353 | SE | < 1. | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | AG | < 10. | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | AG | < 10. | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | AS | < 2. | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | AS | < 2. | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | SE | < 1. | UG/L | 3/16/90 |
| TA16-8,20,32 | 90.11354 | SE | < 1. | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | AG | < 10. | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | AG | < 10. | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | AS | < 2. | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | AS | < 2. | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | HG | < 0.2 | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | SE | < 1. | UG/L | 3/16/90 |
| TA16-9,21,33 | 90.11355 | SE | < 1. | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | AG | < 10. | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | AG | < 10. | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | AS | < 2. | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | AS | < 2. | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | HG | < 0.2 | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | HG | < 0.2 | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | SE | < 1. | UG/L | 3/16/90 |
| TA1610,22,34 | 90.11356 | SE | < 1. | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | AG | < 10. | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | AG | < 10. | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | AS | < 2. | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | AS | < 2. | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | HG | < 0.2 | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | HG | < 0.2 | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | SE | < 1. | UG/L | 3/16/90 |
| TA1611,23,35 | 90.11357 | SE | < 1. | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | AG | < 10. | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | AG | < 10. | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | AS | < 2. | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | AS | < 2. | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | HG | < 0.2 | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | HG | < 0.2 | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | SE | < 1. | UG/L | 3/16/90 |
| TA1612,24,36 | 90.11358 | SE | < 1. | UG/L | 3/16/90 |

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REPORT NUMBER: 6021

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: J.D. MONTOYA on 20-Mar-1990

ANALYSIS: BA REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE : 6010

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | 0.5 | 0.05 | MG/L | 3/19/90 | 3010 |
| TA16-2,14,26 | 90.11348 | 0.65 | 0.07 | MG/L | 3/19/90 | 3010 |
| TA16-3,15,27 | 90.11349 | 0.7 | 0.07 | MG/L | 3/19/90 | 3010 |
| TA16-4,16,28 | 90.11350 | 1.3 | 0.13 | MG/L | 3/19/90 | 3010 |
| TA16-5,17,29 | 90.11351 | 0.67 | 0.07 | MG/L | 3/19/90 | 3010 |
| TA16-6,18,30 | 90.11352 | 0.58 | 0.06 | MG/L | 3/19/90 | 3010 |
| TA16-7,19,31 | 90.11353 | 1.6 | 0.16 | MG/L | 3/19/90 | 3010 |
| TA16-8,20,32 | 90.11354 | 0.64 | 0.06 | MG/L | 3/19/90 | 3010 |
| TA16-9,21,33 | 90.11355 | 1.1 | 0.11 | MG/L | 3/19/90 | 3010 |
| TA1610,22,34 | 90.11356 | 0.56 | 0.06 | MG/L | 3/19/90 | 3010 |
| TA1611,23,35 | 90.11357 | 0.7 | 0.07 | MG/L | 3/19/90 | 3010 |
| TA1612,24,36 | 90.11358 | 1.3 | 0.13 | MG/L | 3/19/90 | 3010 |

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REPORT NUMBER: 6022

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: J.D. MONTOYA on 20-Mar-1990

ANALYSIS: CD REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE : 6010

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | < 0.008 | | MG/L | 3/19/90 | 3010 |
| TA16-2,14,26 | 90.11348 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-3,15,27 | 90.11349 | 0.02 | 0.008 | MG/L | 3/19/90 | 3010 |
| TA16-4,16,28 | 90.11350 | 0.01 | 0.008 | MG/L | 3/19/90 | 3010 |
| TA16-5,17,29 | 90.11351 | 0.03 | 0.03 | MG/L | 3/19/90 | 3010 |
| TA16-6,18,30 | 90.11352 | 0.03 | 0.03 | MG/L | 3/19/90 | 3010 |
| TA16-7,19,31 | 90.11353 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-8,20,32 | 90.11354 | 0.03 | 0.008 | MG/L | 3/19/90 | 3010 |
| TA16-9,21,33 | 90.11355 | < 0.008 | | MG/L | 3/19/90 | 3010 |
| TA1610,22,34 | 90.11356 | 0.026 | 0.008 | MG/L | 3/19/90 | 3010 |
| TA1611,23,35 | 90.11357 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA1612,24,36 | 90.11358 | < 0.03 | | MG/L | 3/19/90 | 3010 |

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REPORT NUMBER: 6023

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: J.D. MONTOYA on 20-Mar-1990

ANALYSIS: CR REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE : 6010

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-2,14,26 | 90.11348 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-3,15,27 | 90.11349 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-4,16,28 | 90.11350 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-5,17,29 | 90.11351 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-6,18,30 | 90.11352 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-7,19,31 | 90.11353 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-8,20,32 | 90.11354 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA16-9,21,33 | 90.11355 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA1610,22,34 | 90.11356 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA1611,23,35 | 90.11357 | < 0.025 | | MG/L | 3/19/90 | 3010 |
| TA1612,24,36 | 90.11358 | < 0.025 | | MG/L | 3/19/90 | 3010 |

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REPORT NUMBER: 6024

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: J.D. MONTOYA on 20-Mar-1990

ANALYSIS: PB REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE : 6010

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-2,14,26 | 90.11348 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-3,15,27 | 90.11349 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-4,16,28 | 90.11350 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-5,17,29 | 90.11351 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-6,18,30 | 90.11352 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-7,19,31 | 90.11353 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA16-8,20,32 | 90.11354 | 0.24 | 0.15 | MG/L | 3/19/90 | 3010 |
| TA16-9,21,33 | 90.11355 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA1610,22,34 | 90.11356 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA1611,23,35 | 90.11357 | < 0.15 | | MG/L | 3/19/90 | 3010 |
| TA1612,24,36 | 90.11358 | < 0.15 | | MG/L | 3/19/90 | 3010 |

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REPORT NUMBER: 6025

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: J.D. MONTOYA on 20-Mar-1990

ANALYSIS: NI REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

ANALYTICAL TECHNIQUE: ICPES ANALYTICAL PROCEDURE : 6010

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-2,14,26 | 90.11348 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-3,15,27 | 90.11349 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-4,16,28 | 90.11350 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-5,17,29 | 90.11351 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-6,18,30 | 90.11352 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-7,19,31 | 90.11353 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-8,20,32 | 90.11354 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA16-9,21,33 | 90.11355 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA1610,22,34 | 90.11356 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA1611,23,35 | 90.11357 | < 0.03 | | MG/L | 3/19/90 | 3010 |
| TA1612,24,36 | 90.11358 | < 0.03 | | MG/L | 3/19/90 | 3010 |

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REPORT NUMBER: 5995 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: TMF on 19-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Trudi Foreman PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | ANALYSIS | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE |
|---|---|---|---|---|---|---|---|---|
| 00.01010 | 00.01010 | AS | 31. | 6. | UG/L | 27. | 3. | 3/19/90 UNDER CONTROL |
| 00.01010 | 00.01010 | AS | 30.7 | 6. | UG/L | 27. | 3. | 3/19/90 UNDER CONTROL |
| 00.01010 | 00.01010 | SE | 11.5 | 2. | UG/L | 11. | 2. | 3/19/90 UNDER CONTROL |
| 00.01010 | 00.01010 | SE | 11.2 | 2. | UG/L | 11. | 2. | 3/19/90 UNDER CONTROL |
| 00.20210 | 00.20210 | HG | 2.3 | 0.2 | UG/L | 2. | 0.2 | 3/19/90 UNDER CONTROL |
| 00.20210 | 00.20210 | HG | 2.3 | 0.2 | UG/L | 2. | 0.2 | 3/19/90 UNDER CONTROL |
| 00.98805 | 00.98805 | AG | 0.504 | 0.05 | MG/L | 0.5 | 0.05 | 3/19/90 UNDER CONTROL |
| 00.98805 | 00.98805 | AG | 0.508 | 0.051 | MG/L | 0.5 | 0.05 | 3/19/90 UNDER CONTROL |

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

| SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| 90.10636 | 3.9 | 0.4 | UG/L | 4. | 0.4 | 3/16/90 | UNDER CONTROL |
| 90.10779 | 280. | 30. | UG/L | 700. | 70. | 3/16/90 | OUT OF CONTROL |
| 90.10779 | 56. | 10. | UG/L | 50. | 5. | 3/16/90 | UNDER CONTROL |
| 90.10779 | 21. | 4. | UG/L | 20. | 2. | 3/16/90 | UNDER CONTROL |

| SAMPLE NUM | ANALYSIS | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|---|
| 90.10636 | HG | 3.9 | 0.4 | UG/L | 4. | 0.4 | 3/16/90 | UNDER CONTROL |
| 90.10779 | AG | 280. | 30. | UG/L | 700. | 70. | 3/16/90 | OUT OF CONTROL |
| 90.10779 | AS | 56. | 10. | UG/L | 50. | 5. | 3/16/90 | UNDER CONTROL |
| 90.10779 | SE | 21. | 4. | UG/L | 20. | 2. | 3/16/90 | UNDER CONTROL |

| | | |
|---|---|---|
| [illegible] | [illegible] | mag |
| Analyst | Section Leader | QA Officer |
| [illegible] | [illegible] | 3-23-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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REPORT NUMBER: 6025 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT *********

Prepared by: J.D. MONTOYA on 20-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Charles T. Apel PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|---|
| 00.20193 | 00.20193 | 10. | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10.4 | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20193 | 00.20193 | 10.4 | 1. | MG/L | 10. | 1. | 3/19/90 | UNDER CONTROL |
| 00.20417 | 00.20417 | 4.2 | 0.42 | MG/L | 4. | 0.4 | 3/20/90 | UNDER CONTROL |

| Analyst | Section Leader | QA Officer |
|---|---|---|
| | | mag |
| 3-20-90 | 3-20-90 | 3-21-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 90.11363 | 87616 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2,3-Trichlorobenzene |
| 90.11363 | 79005 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,1,2-Trichloroethane |
| 90.11363 | 71556 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,1,1-Trichloroethane |
| 90.11363 | 79016 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Trichloroethene |
| 90.11363 | 75694 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Trichlorofluoromethane |
| 90.11363 | 96184 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2,3-Trichloropropane |
| 90.11363 | 95636 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2,4-Trimethylbenzene |
| 90.11363 | 108678 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,3,5-Trimethylbenzene |
| 90.11363 | 108054 | 31.3 | 9.4 | UG/KG | 110. | 11. | 3/21/90 | OUT OF CONTROL | Vinyl acetate |
| 90.11363 | 75014 | < 10. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Vinyl chloride |
| 90.11363 | 95476 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | o-Xylene |
| 90.11363 | 1330207 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Mixed-Xylenes (m ± p) |

**SURROGATE RESULTS FOR EPA VOLATILES**

Surrogate 1 = 1,2-Dichloroethane d4 (CAS # = 17060070)
Surrogate 2 = Toluene d8 (CAS # = 2037265)
Surrogate 3 = 4-Bromofluorobenzene (CAS # = 460004)

| SAMPLE NUMBER | UNITS | Surrogate 1 | Surrogate 2 | Surrogate 3 | COMPLETION DATE |
|---|---|---|---|---|---|
| 90.11347 | % | 114. | 88.7 | 111. | 21-Mar-1990 |
| 90.11348 | % | 116. | 87.7 | 103. | 21-Mar-1990 |
| 90.11349 | % | 112. | 79. | 96.9 | 21-Mar-1990 |
| 90.11350 | % | 109. | 93.7 | 88. | 21-Mar-1990 |
| 90.11351 | % | 85.7 | 109. | 94.8 | 21-Mar-1990 |
| 90.11352 | % | 130. | 89.1 | 103. | 21-Mar-1990 |
| 90.11353 | % | 117. | 93.7 | 112. | 21-Mar-1990 |
| 90.11354 | % | 108. | 78.2 | 94.7 | 21-Mar-1990 |
| 90.11355 | % | 114. | 89.6 | 108. | 21-Mar-1990 |
| 90.11356 | % | 124. | 115. | 112. | 21-Mar-1990 |
| 90.11357 | % | 120. | 95.7 | 108. | 21-Mar-1990 |
| 90.11358 | % | 111. | 79.6 | 79.1 | 21-Mar-1990 |
| 90.11363 | % | 136. | 91.5 | 93.4 | 21-Mar-1990 |

EPA Limits:

| | | | | |
|---|---|---|---|---|
| Water | % | 76 - 114 | 88 - 110 | 86 - 115 |
| Soil | % | 70 - 121 | 81 - 117 | 74 - 121 |

Analyst Section Leader QA Officer

| | | |
|---|---|---|
| 3/28/90 | 3/28/90 | 3-28-90 |
| Date | Date | Date |

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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## Summary of Request 90.10158

The following soil samples were analyzed for Volatile Organic Components (VOC's) using a modified SW 846 Purge & Trap(P/T) GC/MS method of analysis:

| | | |
|---|---|---|
| 90.11347 | 90.11348 | 90.11349 |
| 90.11350 | 90.11351 | 90.11352 |
| 90.11353 | 90.11354 | 90.11355 |
| 90.11356 | 90.11357 | 90.11358 |

A 5 gram sample aliquot was used for the analysis. Sample 90.11359 was not analyzed since a separate sample container for the volatile analysis was not available, and the integrity of the sample was questionable at the time of the analysis. Since the final results are not blank subtracted, a copy of the associated method blanks have been included in the report.

**RESULTS:**

It was determine that the analyses of samples 90.11347 - 90.11357 did not detect the volatile organic target components at or above the limit of quantitation (LOQ). Samples 90.11347 - 90.11358 did not contain any non-target volatile organic component at a significant level. **The analysis of sample 90.11358 did detect Tetrachloroethene at a concentration of 29 ug/kg.** A second analysis of sample 90.11358 confirmed the detection of Tetrachloroethene. Anomalies observed in this request group would include slightly low surrogate recoveries of Toluene-d8 and 4-Bromofluorobenzene in sample 90.11358 and Toluene-d8 in sample 90.11354. The low recoveries of Toluene-d8 and 4-Bromofluorobenzene should not compromise the data. All samples associated with this request group were clean with the exception of sample 90.11358.

## QC Summary for Request 90.10158

Sample 90.11352 was used as the matrix spike media by adding 10 uL of the matrix spike mix to two separate 5 gram aliquots. The two aliquots served as the matrix spike (MS) and the matrix spike duplicate (MSD). The results are as follows:

90.11352MS

| SURROGATE | CONC. | RECOVERED | %RECOVERY |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.0 | 54.8 | 110% |
| Toluene-d8 | 50.0 | 41.4 | 82.8 |
| 4-Bromofluorobenzene | 50.0 | 47.1 | 94.3% |

| Component | Conc. Added, ug/kg | RECOVERED ug/kg | RECOVERED % |
|---|---|---|---|
| 1,1-Dichloroethene | 50.0 | 27.2 | 54.4% |
| Benzene | 50.0 | 41.4 | 82.7% |
| Trichloroethene | 50.0 | 34.5 | 69.0% |
| Toluene | 50.0 | 36.4 | 72.9% |
| Chlorobenzene | 50.0 | 41.1 | 82.2% |

90.11352MSD

| SURROGATE | CONC. | RECOVERED | %RECOVERY |
|---|---|---|---|
| 1,2-Dichloroethane-d4 | 50.0 | 55.7 | 111% |
| Toluene-d8 | 50.0 | 48.9 | 97.9% |
| 4-Bromofluorobenzene | 50.0 | 49.3 | 98.7% |

| Component | Conc. Added, ug/kg | RECOVERED ug/kg | RECOVERED % |
|---|---|---|---|
| 1,1-Dichloroethane | 50.0 | 33.1 | 66.3% |
| Benzene | 50.0 | 47.5 | 94.9% |
| Trichloroethene | 50.0 | 41.0 | 82.0% |
| Toluene | 50.0 | 45.6 | 91.1% |
| Chlorobenzene | 50.0 | 52.5 | 105% |

| Component | Precision | QC LIMITS Precision | QC LIMITS Recovery |
|---|---|---|---|
| 1,1-Dichloroethene | 20 | 22 | 59-172 |
| Benzene | 14 | 24 | 62-137 |
| Trichloroethene | 17 | 21 | 66-142 |
| Toluene | 22* | 21 | 59-139 |
| Chlorobenzene | 24* | 21 | 60-133 |

The accuracy of the spike components was within the CLP control limits for both spiked aliquots. The precision for Toluene and Chlorobenzene was above the control limit. The surrogate recoveries for the spiked aliquots were within the CLP control limits.

Sample 90.11363 was received from the Quality Assurance group to be analyzed with this request group. Sample 90.11363 was a "blind sample"; therefore, the amount spike was unavailable at this time. The results are as follows:

90.11363

| COMPONENT | Amt. Recovered, ug/kg |
|---|---|
| *Acetone | 1400 |
| Carbon disulfide | 22.2 |
| 1,1-Dichloroethane | 49.4 |
| 1,2-Dichloroethane | 66.3 |
| Vinyl Acetate | 31.3 |
| 2-Butanone | 143 |
| t-1,3-Dichloropropene | 24.2 |
| c-1,3-Dichloropropene | 20.4 |
| Tetrachloroethene | 41.2 |
| Chlorodibromomethane | 44.9 |
| 2-Hexanone | 37.8 |
| Chlorobenzene | 43.0 |
| Ethylbenzene | 49.4 |

*It should be noted that the method blank analyzed with the blind sample appeared to be free of any target VOC's at or above the limit of quantitation. Therefore, the high concentration of Acetone detected in the blind sample is most likely attributed to QC lab contamination during the preparation of the "blind" sample rather than the analysis.

REPORT NUMBER: 5995

# EP TOX METALS

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: TMF on 19-Mar-1990

REQUEST NUMBER: 10150 MATRIX: S ANALYST: Trudi Foreman PROGRAM CODE: M292

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID: AL-LA-RC-1

| CUSTOMER NUM | SAMPLE NUM | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| TA16-1,13,25 | 90.11347 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-1,13,25 | 90.11347 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-2,14,26 | 90.11348 | SE | 1. | 1. | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | SE | 1. | 1. | UG/L | 3/16/90 | |
| TA16-3,15,27 | 90.11349 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-4,16,28 | 90.11350 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | AG | < 10. | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | AS | < 2. | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | HG | < 0.2 | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | SE | < 1. | | UG/L | 3/16/90 | |
| TA16-5,17,29 | 90.11351 | SE | < 1. | | UG/L | 3/16/90 | |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA1611,23,35 | 90.11357 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA1611,23,35 | 90.11357 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA1611,23,35 | 90.11357 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA1611,23,35 | 90.11357 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA1611,23,35 | 90.11357 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA1611,23,35 | 90.11357 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA1611,23,35 | 90.11357 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA1611,23,35 | 90.11357 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA1611,23,35 | 90.11357 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA1611,23,35 | 90.11357 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA1611,23,35 | 90.11357 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA1611,23,35 | 90.11357 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA1611,23,35 | 90.11357 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA1611,23,35 | 90.11357 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA1611,23,35 | 90.11357 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA1611,23,35 | 90.11357 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA1611,23,35 | 90.11357 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA1611,23,35 | 90.11357 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA1611,23,35 | 90.11357 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA1611,23,35 | 90.11357 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA1611,23,35 | 90.11357 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA1611,23,35 | 90.11357 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA1611,23,35 | 90.11357 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA1611,23,35 | 90.11357 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA1611,23,35 | 90.11357 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA1611,23,35 | 90.11357 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA1611,23,35 | 90.11357 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA1611,23,35 | 90.11357 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA1611,23,35 | 90.11357 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA1611,23,35 | 90.11357 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA1611,23,35 | 90.11357 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA1611,23,35 | 90.11357 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA1611,23,35 | 90.11357 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA1611,23,35 | 90.11357 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA1611,23,35 | 90.11357 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA1611,23,35 | 90.11357 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA1611,23,35 | 90.11357 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA1611,23,35 | 90.11357 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA1611,23,35 | 90.11357 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA1611,23,35 | 90.11357 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA1611,23,35 | 90.11357 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA1611,23,35 | 90.11357 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA1611,23,35 | 90.11357 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA1611,23,35 | 90.11357 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA1611,23,35 | 90.11357 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA1611,23,35 | 90.11357 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA1611,23,35 | 90.11357 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA1611,23,35 | 90.11357 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA1611,23,35 | 90.11357 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA1611,23,35 | 90.11357 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA1611,23,35 | 90.11357 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA1611,23,35 | 90.11357 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA1611,23,35 | 90.11357 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA1611,23,35 | 90.11357 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA1611,23,35 | 90.11357 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA1611,23,35 | 90.11357 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA1611,23,35 | 90.11357 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA1611,23,35 | 90.11357 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA1611,23,35 | 90.11357 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA1611,23,35 | 90.11357 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA1611,23,35 | 90.11357 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA1611,23,35 | 90.11357 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA1611,23,35 | 90.11357 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA1611,23,35 | 90.11357 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA1612,24,36 | 90.11358 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA1612,24,36 | 90.11358 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA1612,24,36 | 90.11358 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA1612,24,36 | 90.11358 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA1612,24,36 | 90.11358 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA1612,24,36 | 90.11358 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA1612,24,36 | 90.11358 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA1612,24,36 | 90.11358 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA1612,24,36 | 90.11358 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA1612,24,36 | 90.11358 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA1612,24,36 | 90.11358 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA1612,24,36 | 90.11358 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA1612,24,36 | 90.11358 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA1612,24,36 | 90.11358 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA1612,24,36 | 90.11358 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA1612,24,36 | 90.11358 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA1612,24,36 | 90.11358 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA1612,24,36 | 90.11358 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA1612,24,36 | 90.11358 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA1612,24,36 | 90.11358 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA1612,24,36 | 90.11358 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA1612,24,36 | 90.11358 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA1612,24,36 | 90.11358 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA1612,24,36 | 90.11358 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| [illegible],24,36 | 90.11358 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| TA1612,24,36 | 90.11358 | 106467 | < 5. | | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA1612,24,36 | 90.11358 | 75343 | < 5. | | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA1612,24,36 | 90.11358 | 107062 | < 5. | | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA1612,24,36 | 90.11358 | 156605 | < 5. | | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA1612,24,36 | 90.11358 | 75354 | < 5. | | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA1612,24,36 | 90.11358 | 156592 | < 5. | | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA1612,24,36 | 90.11358 | 142289 | < 5. | | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA1612,24,36 | 90.11358 | 78875 | < 5. | | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA1612,24,36 | 90.11358 | 594207 | < 5. | | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA1612,24,36 | 90.11358 | 563586 | < 5. | | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA1612,24,36 | 90.11358 | 10061015 | < 5. | | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA1612,24,36 | 90.11358 | 10061026 | < 5. | | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA1612,24,36 | 90.11358 | 100414 | < 5. | | UG/KG | 3/21/90 | Ethylbenzene |
| TA1612,24,36 | 90.11358 | 87683 | < 5. | | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA1612,24,36 | 90.11358 | 591786 | < 20. | | UG/KG | 3/21/90 | 2-Hexanone |
| TA1612,24,36 | 90.11358 | 98828 | < 5. | | UG/KG | 3/21/90 | Isopropylbenzene |
| TA1612,24,36 | 90.11358 | 99876 | < 5. | | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA1612,24,36 | 90.11358 | 108101 | < 20. | | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA1612,24,36 | 90.11358 | 75092 | < 5. | | UG/KG | 3/21/90 | Methylene chloride |
| TA1612,24,36 | 90.11358 | 91203 | < 5. | | UG/KG | 3/21/90 | Naphthalene |
| TA1612,24,36 | 90.11358 | 103651 | < 5. | | UG/KG | 3/21/90 | Propylbenzene |
| TA1612,24,36 | 90.11358 | 100425 | < 5. | | UG/KG | 3/21/90 | Styrene |
| TA1612,24,36 | 90.11358 | 79345 | < 5. | | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA1612,24,36 | 90.11358 | 630206 | < 5. | | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA1612,24,36 | 90.11358 | 127184 | 29. | 8.7 | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA1612,24,36 | 90.11358 | 108883 | < 5. | | UG/KG | 3/21/90 | Toluene |
| TA1612,24,36 | 90.11358 | 87616 | < 5. | | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA1612,24,36 | 90.11358 | 120821 | < 5. | | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA1612,24,36 | 90.11358 | 79005 | < 5. | | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA1612,24,36 | 90.11358 | 71556 | < 5. | | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA1612,24,36 | 90.11358 | 79016 | < 5. | | UG/KG | 3/21/90 | Trichloroethene |
| TA1612,24,36 | 90.11358 | 75694 | < 5. | | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA1612,24,36 | 90.11358 | 96184 | < 5. | | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA1612,24,36 | 90.11358 | 95636 | < 5. | | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA1612,24,36 | 90.11358 | 108678 | < 5. | | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA1612,24,36 | 90.11358 | 108054 | < 10. | | UG/KG | 3/21/90 | Vinyl acetate |
| TA1612,24,36 | 90.11358 | 75014 | < 10. | | UG/KG | 3/21/90 | Vinyl chloride |
| TA1612,24,36 | 90.11358 | 95476 | < 5. | | UG/KG | 3/21/90 | o-Xylene |
| TA1612,24,36 | 90.11358 | 1330207 | < 5. | | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

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REPORT NUMBER: 6085 (continued)

********** HSE-9 QUALITY ASSURANCE REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ No QC samples run with this sample batch.

____ No QC samples for this constituent and matrix type available within HSE-9

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

| SAMPLE NUM | ANALYSIS | RESULT | UNCERTAINTY | UNITS | CERTIFIED VALUE | CERTIFIED VALUE UNCERTAINTY | COMPLETION DATE | COMMENT | COMPOUND-NAME |
|---|---|---|---|---|---|---|---|---|---|
| 90.11363 | 67641 | 1400. | 420. | UG/KG | | | 3/21/90 | OUT OF CONTROL | Acetone |
| 90.11363 | 71432 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Benzene |
| 90.11363 | 108861 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Bromobenzene |
| 90.11363 | 74975 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Bromochloromethane |
| 90.11363 | 75274 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Bromodichloromethane |
| 90.11363 | 75252 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Bromoform |
| 90.11363 | 74839 | < 10. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Bromomethane |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 90.11363 | 78933 | 143. | 42.9 | UG/KG | 120. | 12. | 3/21/90 | UNDER CONTROL | 2-Butanone |
| 90.11363 | 135988 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | sec-Butylbenzene |
| 90.11363 | 98066 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | tert-Butylbenzene |
| 90.11363 | 104518 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | n-Butylbenzene |
| 90.11363 | 75150 | 22.2 | 6.7 | UG/KG | 120. | 12. | 3/21/90 | OUT OF CONTROL | Carbon disulfide |
| 90.11363 | 56235 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Carbon tetrachloride |
| 90.11363 | 108907 | 43. | 12.9 | UG/KG | 110. | 11. | 3/21/90 | OUT OF CONTROL | Chlorobenzene |
| 90.11363 | 124481 | 44.9 | 13.5 | UG/KG | 110. | 11. | 3/21/90 | OUT OF CONTROL | Chlorodibromomethane |
| 90.11363 | 75003 | < 10. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Chloroethane |
| 90.11363 | 67663 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Chloroform |
| 90.11363 | 74873 | < 10. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Chloromethane |
| 90.11363 | 106434 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | p-Chlorotoluene |
| 90.11363 | 95498 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | o-Chlorotoluene |
| 90.11363 | 96128 | < 10. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2-Dibromo-3-chloropropane |
| 90.11363 | 106934 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2-Dibromoethane |
| 90.11363 | 74953 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Dibromomethane |
| 90.11363 | 95501 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | o-Dichlorobenzene (1,2) |
| 90.11363 | 541731 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | m-Dichlorobenzene (1,3) |
| 90.11363 | 106467 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | p-Dichlorobenzene (1,4) |
| 90.11363 | 107062 | 66.3 | 19.9 | UG/KG | 120. | 12. | 3/21/90 | WARNING 2-3 SIG | 1,2-Dichloroethane |
| 90.11363 | 75343 | 49.4 | 14.8 | UG/KG | 110. | 11. | 3/21/90 | OUT OF CONTROL | 1,1-Dichloroethane |
| 90.11363 | 156605 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | trans-1,2-Dichloroethene |
| 90.11363 | 75354 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,1-Dichloroethene |
| 90.11363 | 156592 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | cis-1,2-Dichloroethylene |
| 90.11363 | 142289 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,3-Dichloropropane |
| 90.11363 | 594207 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 2,2-Dichloropropane |
| 90.11363 | 78875 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2-Dichloropropane |
| 90.11363 | 563586 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,1-Dichloropropene |
| 90.11363 | 10061026 | 24.2 | 7.3 | UG/KG | 34. | 3. | 3/21/90 | UNDER CONTROL | trans-1,3-Dichloropropene |
| 90.11363 | 10061015 | 20.4 | 6.1 | UG/KG | 81. | 8. | 3/21/90 | OUT OF CONTROL | cis-1,3-Dichloropropene |
| 90.11363 | 100414 | 49.4 | 14.8 | UG/KG | 120. | 12. | 3/21/90 | OUT OF CONTROL | Ethylbenzene |
| 90.11363 | 87683 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Hexachlorobutadiene |
| 90.11363 | 591786 | 37.8 | 11.3 | UG/KG | | | 3/21/90 | OUT OF CONTROL | 2-Hexanone |
| 90.11363 | 98828 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Isopropylbenzene |
| 90.11363 | 99876 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 4-Isopropyltoluene |
| 90.11363 | 108101 | < 20. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 4-Methyl-2-pentanone |
| 90.11363 | 75092 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Methylene chloride |
| 90.11363 | 91203 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Naphthalene |
| 90.11363 | 103651 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Propylbenzene |
| 90.11363 | 100425 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Styrene |
| 90.11363 | 79345 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,1,2,2-Tetrachloroethane |
| 90.11363 | 630206 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,1,1,2-Tetrachloroethane |
| 90.11363 | 127184 | 41.2 | 12.4 | UG/KG | 140. | 14. | 3/21/90 | OUT OF CONTROL | Tetrachloroethylene |
| 90.11363 | 108883 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | Toluene |
| 90.11363 | 120821 | < 5. | | UG/KG | | | 3/21/90 | UNDER CONTROL | 1,2,4-Trichlorobenzene |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

| | |
|---|---|
| REQUEST NUMBER: 10158 | DATE EXTRACTED: 3/8/90 |
| SAMPLE NUMBER: 90.11356 | AMOUNT EXTRACTED: 29.20 g |
| DATA FILE ID: >S3R22 | DATE ANALYZED: 3/29/90 |
| MATRIX: Soil | SUMMARY DATE: 4/11/90 |

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1700.0 |
| Aniline | 62-53-3 | <LOQ | 1700.0 |
| Phenol | 108-95-2 | <LOQ | 1700.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1700.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1700.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1700.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1700.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1700.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1700.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1700.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1700.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1700.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1700.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1700.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1700.0 |
| Isophorone | 78-59-1 | <LOQ | 1700.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1700.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1700.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1700.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1700.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1700.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1700.0 |
| Naphthalene | 91-20-3 | <LOQ | 1700.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1700.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1700.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1700.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1700.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1700.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1700.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1700.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1700.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11356
DATA FILE NAME: >S3R22

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1700.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1700.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1700.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1700.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1700.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1700.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1700.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1700.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1700.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1700.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1700.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1700.0 |
| Fluorene | 86-73-7 | <LOQ | 1700.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1700.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1700.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1700.0 |
| Azobenzene | 103-33-3 | <LOQ | 1700.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1700.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1700.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1700.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1700.0 |
| Anthracene | 120-12-7 | <LOQ | 1700.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1700.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1700.0 |
| Benzidine | 92-87-5 | <LOQ | 1700.0 |
| Pyrene | 129-00-0 | <LOQ | 1700.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1700.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1700.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1700.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1700.0 |
| Chrysene | 218-01-9 | <LOQ | 1700.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1700.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1700.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1700.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1700.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1700.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1700.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1700.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11357
DATA FILE ID: >S3R23
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 28.20 g
DATE ANALYZED: 3/29/90
SUMMARY DATE: 4/11/90

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1800.0 |
| Aniline | 62-53-3 | <LOQ | 1800.0 |
| Phenol | 108-95-2 | <LOQ | 1800.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1800.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1800.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1800.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1800.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1800.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1800.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1800.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1800.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1800.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1800.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1800.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1800.0 |
| Isophorone | 78-59-1 | <LOQ | 1800.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1800.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1800.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1800.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1800.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1800.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1800.0 |
| Naphthalene | 91-20-3 | <LOQ | 1800.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1800.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1800.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1800.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1800.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1800.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1800.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1800.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1800.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11357
DATA FILE NAME: >S3R23

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1800.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1800.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1800.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1800.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1800.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1800.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1800.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1800.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1800.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1800.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1800.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1800.0 |
| Fluorene | 86-73-7 | <LOQ | 1800.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1800.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1800.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1800.0 |
| Azobenzene | 103-33-3 | <LOQ | 1800.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1800.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1800.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1800.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1800.0 |
| Anthracene | 120-12-7 | <LOQ | 1800.0 |
| Di-n-Butyl[illegible]ate | 87-74-2 | <LOQ | 1800.0 |
| Fluoranth[illegible] | 206-44-0 | <LOQ | 1800.0 |
| Benzidine | 92-87-5 | <LOQ | 1800.0 |
| Pyrene | 129-00-0 | <LOQ | 1800.0 |
| Butylbenzy[illegible]thalate | 85-68-7 | <LOQ | 1800.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1800.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1800.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1800.0 |
| Chrysene | 218-01-9 | <LOQ | 1800.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1800.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1800.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1800.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1800.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1800.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1800.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1800.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

## SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

| | |
|---|---|
| REQUEST NUMBER: 10158 | DATE EXTRACTED: 3/8/90 |
| SAMPLE NUMBER: 90.11358 | AMOUNT EXTRACTED: 29.62 g |
| DATA FILE ID: >S3R24 | DATE ANALYZED: 3/29/90 |
| MATRIX: Soil | SUMMARY DATE: 4/11/90 |

### TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1700.0 |
| Aniline | 62-53-3 | <LOQ | 1700.0 |
| Phenol | 108-95-2 | <LOQ | 1700.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1700.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1700.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1700.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1700.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1700.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1700.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1700.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1700.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1700.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1700.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1700.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1700.0 |
| Isophorone | 78-59-1 | <LOQ | 1700.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1700.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1700.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1700.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1700.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1700.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1700.0 |
| Naphthalene | 91-20-3 | <LOQ | 1700.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1700.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1700.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1700.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1700.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1700.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1700.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1700.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1700.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11358
DATA FILE NAME: >S3R24

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1700.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1700.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1700.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1700.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1700.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1700.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1700.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1700.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1700.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1700.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1700.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1700.0 |
| Fluorene | 86-73-7 | <LOQ | 1700.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1700.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1700.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1700.0 |
| Azobenzene | 103-33-3 | <LOQ | 1700.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1700.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1700.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1700.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1700.0 |
| Anthracene | 120-12-7 | <LOQ | 1700.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1700.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1700.0 |
| Benzidine | 92-87-5 | <LOQ | 1700.0 |
| Pyrene | 129-00-0 | <LOQ | 1700.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1700.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1700.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1700.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1700.0 |
| Chrysene | 218-01-9 | <LOQ | 1700.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1700.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1700.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1700.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1700.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1700.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1700.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1700.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

## SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

| | |
|---|---|
| REQUEST NUMBER: 10158 | DATE EXTRACTED: 3/8/90 |
| SAMPLE NUMBER: 90.11359 | AMOUNT EXTRACTED: 29.75 g |
| DATA FILE ID: >S3R25 | DATE ANALYZED: 3/29/90 |
| MATRIX: Soil | SUMMARY DATE: 4/11/90 |

### TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (mg/Kg) | LOQ** (mg/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 84.0 |
| Aniline | 62-53-3 | <LOQ | 84.0 |
| Phenol | 108-95-2 | <LOQ | 84.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 84.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 84.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 84.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 84.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 84.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 84.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 84.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 84.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 84.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 84.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 84.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 84.0 |
| Isophorone | 78-59-1 | <LOQ | 84.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 84.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 84.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 84.0 |
| bis(-2-Chl[illegible]thoxy)Methane | 111-91-1 | <LOQ | 84.0 |
| 2,4-Dichl[illegible]nol | 120-83-2 | <LOQ | 84.0 |
| 1,2,4-Tric[illegible]obenzene | 120-82-1 | <LOQ | 84.0 |
| Naphthal[illegible] | 91-20-3 | <LOQ | 84.0 |
| 4-Chloroanilin[illegible] | 106-47-8 | <LOQ | 84.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 84.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 84.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 84.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 84.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 84.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 84.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 84.0 |

**LOQ = Limit Of Quantitation

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA16-9,21,33 | 90.11355 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA16-9,21,33 | 90.11355 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA16-9,21,33 | 90.11355 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA16-9,21,33 | 90.11355 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA16-9,21,33 | 90.11355 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA16-9,21,33 | 90.11355 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA16-9,21,33 | 90.11355 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA16-9,21,33 | 90.11355 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA16-9,21,33 | 90.11355 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA16-9,21,33 | 90.11355 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA16-9,21,33 | 90.11355 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA16-9,21,33 | 90.11355 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA16-9,21,33 | 90.11355 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA16-9,21,33 | 90.11355 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA16-9,21,33 | 90.11355 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA16-9,21,33 | 90.11355 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA16-9,21,33 | 90.11355 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA16-9,21,33 | 90.11355 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA16-9,21,33 | 90.11355 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA16-9,21,33 | 90.11355 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA16-9,21,33 | 90.11355 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA16-9,21,33 | 90.11355 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA16-9,21,33 | 90.11355 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA16-9,21,33 | 90.11355 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA16-9,21,33 | 90.11355 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA16-9,21,33 | 90.11355 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA16-9,21,33 | 90.11355 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA16-9,21,33 | 90.11355 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA16-9,21,33 | 90.11355 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA16-9,21,33 | 90.11355 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA16-9,21,33 | 90.11355 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA16-9,21,33 | 90.11355 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA16-9,21,33 | 90.11355 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA16-9,21,33 | 90.11355 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA16-9,21,33 | 90.11355 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA16-9,21,33 | 90.11355 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA16-9,21,33 | 90.11355 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA16-9,21,33 | 90.11355 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA16-9,21,33 | 90.11355 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA16-9,21,33 | 90.11355 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA16-9,21,33 | 90.11355 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA16-9,21,33 | 90.11355 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA16-9,21,33 | 90.11355 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA16-9,21,33 | 90.11355 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA16-9,21,33 | 90.11355 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA16-9,21,33 | 90.11355 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA16-9,21,33 | 90.11355 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA16-9,21,33 | 90.11355 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA16-9,21,33 | 90.11355 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA16-9,21,33 | 90.11355 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA16-9,21,33 | 90.11355 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA16-9,21,33 | 90.11355 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA16-9,21,33 | 90.11355 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA16-9,21,33 | 90.11355 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA16-9,21,33 | 90.11355 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA16-9,21,33 | 90.11355 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA16-9,21,33 | 90.11355 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA16-9,21,33 | 90.11355 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA16-9,21,33 | 90.11355 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA16-9,21,33 | 90.11355 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA16-9,21,33 | 90.11355 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA16-9,21,33 | 90.11355 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA16-9,21,33 | 90.11355 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA16-9,21,33 | 90.11355 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

REPORT NUMBER: 6085

********** HSE-9 ANALYTICAL REPORT **********

Prepared by: CPR on 26-Mar-1990

EPA VOLATILES

REQUEST NUMBER: 10158 MATRIX: S ANALYST: Laura Tsiagkouris PROGRAM CODE: WA56

OWNER: Dave McInroy GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0819 TASK-ID:

| CUSTOMER NUMBER | SAMPLE NUMBER | ANALYSIS | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT | COMPOUND NAME |
|---|---|---|---|---|---|---|---|---|
| TA1610,22,34 | 90.11356 | 67641 | < 20. | | UG/KG | 3/21/90 | | Acetone |
| TA1610,22,34 | 90.11356 | 71432 | < 5. | | UG/KG | 3/21/90 | | Benzene |
| TA1610,22,34 | 90.11356 | 108861 | < 5. | | UG/KG | 3/21/90 | | Bromobenzene |
| TA1610,22,34 | 90.11356 | 74975 | < 5. | | UG/KG | 3/21/90 | | Bromochloromethane |
| TA1610,22,34 | 90.11356 | 75274 | < 5. | | UG/KG | 3/21/90 | | Bromodichloromethane |
| TA1610,22,34 | 90.11356 | 75252 | < 5. | | UG/KG | 3/21/90 | | Bromoform |
| TA1610,22,34 | 90.11356 | 74839 | < 10. | | UG/KG | 3/21/90 | | Bromomethane |
| TA1610,22,34 | 90.11356 | 78933 | < 20. | | UG/KG | 3/21/90 | | 2-Butanone |
| TA1610,22,34 | 90.11356 | 135988 | < 5. | | UG/KG | 3/21/90 | | sec-Butylbenzene |
| TA1610,22,34 | 90.11356 | 98066 | < 5. | | UG/KG | 3/21/90 | | tert-Butylbenzene |
| TA1610,22,34 | 90.11356 | 104518 | < 5. | | UG/KG | 3/21/90 | | n-Butylbenzene |
| TA1610,22,34 | 90.11356 | 75150 | < 5. | | UG/KG | 3/21/90 | | Carbon disulfide |
| TA1610,22,34 | 90.11356 | 56235 | < 5. | | UG/KG | 3/21/90 | | Carbon tetrachloride |
| TA1610,22,34 | 90.11356 | 108907 | < 5. | | UG/KG | 3/21/90 | | Chlorobenzene |
| TA1610,22,34 | 90.11356 | 124481 | < 5. | | UG/KG | 3/21/90 | | Chlorodibromomethane |
| TA1610,22,34 | 90.11356 | 75003 | < 10. | | UG/KG | 3/21/90 | | Chloroethane |
| TA1610,22,34 | 90.11356 | 67663 | < 5. | | UG/KG | 3/21/90 | | Chloroform |
| TA1610,22,34 | 90.11356 | 74873 | < 10. | | UG/KG | 3/21/90 | | Chloromethane |
| TA1610,22,34 | 90.11356 | 95498 | < 5. | | UG/KG | 3/21/90 | | o-Chlorotoluene |
| TA1610,22,34 | 90.11356 | 106434 | < 5. | | UG/KG | 3/21/90 | | p-Chlorotoluene |
| TA1610,22,34 | 90.11356 | 96128 | < 10. | | UG/KG | 3/21/90 | | 1,2-Dibromo-3-chloropropane |
| TA1610,22,34 | 90.11356 | 106934 | < 5. | | UG/KG | 3/21/90 | | 1,2-Dibromoethane |
| TA1610,22,34 | 90.11356 | 74953 | < 5. | | UG/KG | 3/21/90 | | Dibromomethane |
| TA1610,22,34 | 90.11356 | 95501 | < 5. | | UG/KG | 3/21/90 | | o-Dichlorobenzene (1,2) |
| TA1610,22,34 | 90.11356 | 541731 | < 5. | | UG/KG | 3/21/90 | | m-Dichlorobenzene (1,3) |

| | | | | | | |
|---|---|---|---|---|---|---|
| TA1610,22,34 | 90.11356 | 106467 | < 5. | UG/KG | 3/21/90 | p-Dichlorobenzene (1,4) |
| TA1610,22,34 | 90.11356 | 75343 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethane |
| TA1610,22,34 | 90.11356 | 107062 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloroethane |
| TA1610,22,34 | 90.11356 | 156605 | < 5. | UG/KG | 3/21/90 | trans-1,2-Dichloroethene |
| TA1610,22,34 | 90.11356 | 75354 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloroethene |
| TA1610,22,34 | 90.11356 | 156592 | < 5. | UG/KG | 3/21/90 | cis-1,2-Dichloroethylene |
| TA1610,22,34 | 90.11356 | 594207 | < 5. | UG/KG | 3/21/90 | 2,2-Dichloropropane |
| TA1610,22,34 | 90.11356 | 142289 | < 5. | UG/KG | 3/21/90 | 1,3-Dichloropropane |
| TA1610,22,34 | 90.11356 | 78875 | < 5. | UG/KG | 3/21/90 | 1,2-Dichloropropane |
| TA1610,22,34 | 90.11356 | 563586 | < 5. | UG/KG | 3/21/90 | 1,1-Dichloropropene |
| TA1610,22,34 | 90.11356 | 10061015 | < 5. | UG/KG | 3/21/90 | cis-1,3-Dichloropropene |
| TA1610,22,34 | 90.11356 | 10061026 | < 5. | UG/KG | 3/21/90 | trans-1,3-Dichloropropene |
| TA1610,22,34 | 90.11356 | 100414 | < 5. | UG/KG | 3/21/90 | Ethylbenzene |
| TA1610,22,34 | 90.11356 | 87683 | < 5. | UG/KG | 3/21/90 | Hexachlorobutadiene |
| TA1610,22,34 | 90.11356 | 591786 | < 20. | UG/KG | 3/21/90 | 2-Hexanone |
| TA1610,22,34 | 90.11356 | 98828 | < 5. | UG/KG | 3/21/90 | Isopropylbenzene |
| TA1610,22,34 | 90.11356 | 99876 | < 5. | UG/KG | 3/21/90 | 4-Isopropyltoluene |
| TA1610,22,34 | 90.11356 | 108101 | < 20. | UG/KG | 3/21/90 | 4-Methyl-2-pentanone |
| TA1610,22,34 | 90.11356 | 75092 | < 5. | UG/KG | 3/21/90 | Methylene chloride |
| TA1610,22,34 | 90.11356 | 91203 | < 5. | UG/KG | 3/21/90 | Naphthalene |
| TA1610,22,34 | 90.11356 | 103651 | < 5. | UG/KG | 3/21/90 | Propylbenzene |
| TA1610,22,34 | 90.11356 | 100425 | < 5. | UG/KG | 3/21/90 | Styrene |
| TA1610,22,34 | 90.11356 | 630206 | < 5. | UG/KG | 3/21/90 | 1,1,1,2-Tetrachloroethane |
| TA1610,22,34 | 90.11356 | 79345 | < 5. | UG/KG | 3/21/90 | 1,1,2,2-Tetrachloroethane |
| TA1610,22,34 | 90.11356 | 127184 | < 5. | UG/KG | 3/21/90 | Tetrachloroethylene |
| TA1610,22,34 | 90.11356 | 108883 | < 5. | UG/KG | 3/21/90 | Toluene |
| TA1610,22,34 | 90.11356 | 87616 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichlorobenzene |
| TA1610,22,34 | 90.11356 | 120821 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trichlorobenzene |
| TA1610,22,34 | 90.11356 | 79005 | < 5. | UG/KG | 3/21/90 | 1,1,2-Trichloroethane |
| TA1610,22,34 | 90.11356 | 71556 | < 5. | UG/KG | 3/21/90 | 1,1,1-Trichloroethane |
| TA1610,22,34 | 90.11356 | 79016 | < 5. | UG/KG | 3/21/90 | Trichloroethene |
| TA1610,22,34 | 90.11356 | 75694 | < 5. | UG/KG | 3/21/90 | Trichlorofluoromethane |
| TA1610,22,34 | 90.11356 | 96184 | < 5. | UG/KG | 3/21/90 | 1,2,3-Trichloropropane |
| TA1610,22,34 | 90.11356 | 108678 | < 5. | UG/KG | 3/21/90 | 1,3,5-Trimethylbenzene |
| TA1610,22,34 | 90.11356 | 95636 | < 5. | UG/KG | 3/21/90 | 1,2,4-Trimethylbenzene |
| TA1610,22,34 | 90.11356 | 108054 | < 10. | UG/KG | 3/21/90 | Vinyl acetate |
| TA1610,22,34 | 90.11356 | 75014 | < 10. | UG/KG | 3/21/90 | Vinyl chloride |
| TA1610,22,34 | 90.11356 | 95476 | < 5. | UG/KG | 3/21/90 | o-Xylene |
| TA1610,22,34 | 90.11356 | 1330207 | < 5. | UG/KG | 3/21/90 | Mixed-Xylenes (m ± p) |

Laboratory Name: LANL-USEG

Case No: 10158

Sample Number: 90113149

## Organics Analysis Data Sheet

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. 51 | UNKNOWN Alcohol | BNA | 10.63 | 34000 |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
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| 29. | | | | |
| 30. | | | | |

Form 1, Part B



Revision 0
Date September 1986

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11350
DATA FILE ID: >S3R14
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 24.7g
DATE ANALYZED: 3/29/90
SUMMARY DATE: 4/18/90

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 2000.0 |
| Aniline | 62-53-3 | <LOQ | 2000.0 |
| Phenol | 108-95-2 | <LOQ | 2000.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 2000.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 2000.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 2000.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 2000.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 2000.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 2000.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 2000.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 2000.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 2000.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 2000.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 2000.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 2000.0 |
| Isophorone | 78-59-1 | <LOQ | 2000.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 2000.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 2000.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 2000.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 2000.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 2000.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 2000.0 |
| Naphthalene | 91-20-3 | <LOQ | 2000.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 2000.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 2000.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 2000.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 2000.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 2000.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 2000.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 2000.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 2000.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11350
DATA FILE NAME: >S3R14

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 2000.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 2000.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 2000.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 2000.0 |
| Acenaphthene | 83-32-9 | <LOQ | 2000.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 2000.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 2000.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 2000.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 2000.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 2000.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 2000.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 2000.0 |
| Fluorene | 86-73-7 | <LOQ | 2000.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 2000.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 2000.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 2000.0 |
| Azobenzene | 103-33-3 | <LOQ | 2000.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 2000.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 2000.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 2000.0 |
| Phenanthrene | 85-01-8 | <LOQ | 2000.0 |
| Anthracene | 120-12-7 | <LOQ | 2000.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 2000.0 |
| Fluoranthene | 206-44-0 | <LOQ | 2000.0 |
| Benzidine | 92-87-5 | <LOQ | 2000.0 |
| Pyrene | 129-00-0 | <LOQ | 2000.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 2000.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 2000.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 2000.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 2000.0 |
| Chrysene | 218-01-9 | <LOQ | 2000.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 2000.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 2000.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 2000.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 2000.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 2000.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 2000.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 2000.0 |

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HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

| | |
|---|---|
| REQUEST NUMBER: 10158 | DATE EXTRACTED: 3/8/90 |
| SAMPLE NUMBER: 90.11351 | AMOUNT EXTRACTED: 29.0g |
| DATA FILE ID: >S3R15 | DATE ANALYZED: 3/29/90 |
| MATRIX: Soil | SUMMARY DATE: 4/18/90 |

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1700.0 |
| Aniline | 62-53-3 | <LOQ | 1700.0 |
| Phenol | 108-95-2 | <LOQ | 1700.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1700.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1700.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1700.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1700.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1700.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1700.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1700.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1700.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1700.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1700.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1700.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1700.0 |
| Isophorone | 78-59-1 | <LOQ | 1700.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1700.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1700.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1700.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1700.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1700.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1700.0 |
| Naphthalene | 91-20-3 | <LOQ | 1700.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1700.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1700.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1700.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1700.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1700.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1700.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1700.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1700.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11351
DATA FILE NAME: >S3R15

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1700.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1700.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1700.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1700.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1700.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1700.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1700.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1700.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1700.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1700.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1700.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1700.0 |
| Fluorene | 86-73-7 | <LOQ | 1700.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1700.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1700.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1700.0 |
| Azobenzene | 103-33-3 | <LOQ | 1700.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1700.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1700.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1700.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1700.0 |
| Anthracene | 120-12-7 | <LOQ | 1700.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1700.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1700.0 |
| Benzidine | 92-87-5 | <LOQ | 1700.0 |
| Pyrene | 129-00-0 | <LOQ | 1700.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1700.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1700.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1700.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1700.0 |
| Chrysene | 218-01-9 | <LOQ | 1700.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1700.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1700.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1700.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1700.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1700.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1700.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1700.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11352
DATA FILE ID: >S3R19
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 28.99 g
DATE ANALYZED: 3/29/90
SUMMARY DATE: 4/11/90

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1700.0 |
| Aniline | 62-53-3 | <LOQ | 1700.0 |
| Phenol | 108-95-2 | <LOQ | 1700.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1700.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1700.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1700.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1700.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1700.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1700.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1700.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1700.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1700.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1700.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1700.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1700.0 |
| Isophorone | 78-59-1 | <LOQ | 1700.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1700.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1700.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1700.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1700.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1700.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1700.0 |
| Naphthalene | 91-20-3 | <LOQ | 1700.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1700.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1700.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1700.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1700.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1700.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1700.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1700.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1700.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11352
DATA FILE NAME: >S3R19

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1700.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1700.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1700.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1700.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1700.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1700.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1700.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1700.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1700.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1700.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1700.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1700.0 |
| Fluorene | 86-73-7 | <LOQ | 1700.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1700.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1700.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1700.0 |
| Azobenzene | 103-33-3 | <LOQ | 1700.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1700.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1700.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1700.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1700.0 |
| Anthracene | 120-12-7 | <LOQ | 1700.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1700.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1700.0 |
| Benzidine | 92-87-5 | <LOQ | 1700.0 |
| Pyrene | 129-00-0 | <LOQ | 1700.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1700.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1700.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1700.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1700.0 |
| Chrysene | 218-01-9 | <LOQ | 1700.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1700.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1700.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1700.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1700.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1700.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1700.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1700.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11353
DATA FILE ID: >S3R20
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 26.10 g
DATE ANALYZED: 3/29/90
SUMMARY DATE: 4/11/90

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1900.0 |
| Aniline | 62-53-3 | <LOQ | 1900.0 |
| Phenol | 108-95-2 | <LOQ | 1900.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1900.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1900.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1900.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1900.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1900.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1900.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1900.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1900.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1900.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1900.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1900.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1900.0 |
| Isophorone | 78-59-1 | <LOQ | 1900.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1900.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1900.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1900.0 |
| bis(-2-Chl[illegible]thoxy)Methane | 111-91-1 | <LOQ | 1900.0 |
| 2,4-Dichlo[illegible]enol | 120-83-2 | <LOQ | 1900.0 |
| 1,2,4-Tric[illegible]robenzene | 120-82-1 | <LOQ | 1900.0 |
| Naphthalene | 91-20-3 | <LOQ | 1900.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1900.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1900.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1900.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1900.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1900.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1900.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1900.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1900.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11353
DATA FILE NAME: >S3R20

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1900.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1900.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1900.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1900.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1900.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1900.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1900.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1900.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1900.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1900.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1900.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1900.0 |
| Fluorene | 86-73-7 | <LOQ | 1900.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1900.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1900.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1900.0 |
| Azobenzene | 103-33-3 | <LOQ | 1900.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1900.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1900.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1900.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1900.0 |
| Anthracene | 120-12-7 | <LOQ | 1900.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1900.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1900.0 |
| Benzidine | 92-87-5 | <LOQ | 1900.0 |
| Pyrene | 129-00-0 | <LOQ | 1900.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1900.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1900.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1900.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1900.0 |
| Chrysene | 218-01-9 | <LOQ | 1900.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1900.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1900.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1900.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1900.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1900.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1900.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1900.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY. AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

| | |
|---|---|
| REQUEST NUMBER: 10158 | DATE EXTRACTED: 3/8/90 |
| SAMPLE NUMBER: 90.11354 | AMOUNT EXTRACTED: 29.53 g |
| DATA FILE ID: >S3R21 | DATE ANALYZED: 3/29/90 |
| MATRIX: Soil | SUMMARY DATE: 4/11/90 |

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1700.0 |
| Aniline | 62-53-3 | <LOQ | 1700.0 |
| Phenol | 108-95-2 | <LOQ | 1700.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1700.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1700.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1700.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1700.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1700.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1700.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1700.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1700.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1700.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1700.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1700.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1700.0 |
| Isophorone | 78-59-1 | <LOQ | 1700.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1700.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1700.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1700.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1700.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1700.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1700.0 |
| Naphthalene | 91-20-3 | <LOQ | 1700.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1700.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1700.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1700.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1700.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1700.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1700.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1700.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1700.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11354
DATA FILE NAME: >S3R21

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1700.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1700.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1700.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1700.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1700.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1700.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1700.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1700.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1700.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1700.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1700.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1700.0 |
| Fluorene | 86-73-7 | <LOQ | 1700.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1700.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1700.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1700.0 |
| Azobenzene | 103-33-3 | <LOQ | 1700.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1700.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1700.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1700.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1700.0 |
| Anthracene | 120-12-7 | <LOQ | 1700.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1700.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1700.0 |
| Benzidine | 92-87-5 | <LOQ | 1700.0 |
| Pyrene | 129-00-0 | <LOQ | 1700.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1700.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1700.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1700.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1700.0 |
| Chrysene | 218-01-9 | <LOQ | 1700.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1700.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1700.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1700.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1700.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1700.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1700.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1700.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11355
DATA FILE ID: >S3R10
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 28.50 g
DATE ANALYZED: 3/28/90
SUMMARY DATE: 4/11/90

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 330.0 |
| Aniline | 62-53-3 | <LOQ | 330.0 |
| Phenol | 108-95-2 | <LOQ | 330.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 330.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 330.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 330.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 330.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 330.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 330.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 330.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 330.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 330.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 330.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 330.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 330.0 |
| Isophorone | 78-59-1 | <LOQ | 330.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 330.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 330.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 330.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 330.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 330.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 330.0 |
| Naphthalene | 91-20-3 | <LOQ | 330.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 330.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 330.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 330.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 330.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 330.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 330.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 330.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 330.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10153
SAMPLE NUMBER: [illegible]
DATA FILE NAME: [illegible]

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 330.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 330.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 330.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 330.0 |
| Acenaphthene | 83-32-9 | <LOQ | 330.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 330.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 330.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 330.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 330.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 330.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 330.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 330.0 |
| Fluorene | 86-73-7 | <LOQ | 330.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 330.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 330.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 330.0 |
| Azobenzene | 103-33-3 | <LOQ | 330.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 330.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 330.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 330.0 |
| Phenanthrene | 85-01-8 | <LOQ | 330.0 |
| Anthracene | 120-12-7 | <LOQ | 330.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 330.0 |
| Fluoranthene | 206-44-0 | <LOQ | 330.0 |
| Benzidine | 92-87-5 | <LOQ | 330.0 |
| Pyrene | 129-00-0 | <LOQ | 330.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 330.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 330.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 330.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 330.0 |
| Chrysene | 218-01-9 | <LOQ | 330.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 330.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 330.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 330.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 330.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 330.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 330.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 330.0 |

SEMIVOLATILE ORGANIC ANALYSIS
SURROGATE RECOVERY SUMMARY

REQUEST NUMBER: 10159
MATRIX: SOIL

| SURROGATE ID | QC LIMITS (%) | AMOUNT ADDED |
|---|---|---|
| S1 = 2-Fluorophenol | 25 - 121 | 100 ug/ml |
| S2 = d5-Phenol | 24 - 113 | 100 ug/ml |
| S3 = d5-Nitrobenzene | 23 - 120 | 50 ug/ml |
| S4 = 2-Fluorobiphenyl | 30 - 115 | 50 ug/ml |
| S5 = 2,4,6-Tribromophenol | 19 - 122 | 100 ug/ml |
| S6 = d14-Terphenyl | 18 - 137 | 50 ug/ml |

| SAMPLE ID | PERCENT RECOVERY | | | | | |
|---|---|---|---|---|---|---|
| | S1 | S2 | S3 | S4 | S5 | S6 |
| BLANK 3/8 | 63 | 72 | 71 | 75 | 76 | 91 |
| 90.11347 | 99 | 112 | 93 | 101 | 97 | 99 |
| 90.11348 | 79 | 87 | 84 | 98 | 88 | 92 |
| 90.11349 | 80 | 92 | 88 | 97 | 94 | 91 |
| 90.11350 | 84 | 91 | 87 | 99 | 92 | 106 |
| 90.11351 | 78 | 88 | 88 | 99 | 87 | 101 |
| 90.11352 | 81 | 90 | 86 | 98 | 81 | 87 |
| 90.11353 | 84 | 94 | 91 | 97 | 88 | 81 |
| 90.11354 | 76 | 85 | 81 | 95 | 87 | 85 |
| 90.11355 | 55 | 64 | 64 | 71 | 82 | 83 |
| 90.11356 | 78 | 87 | 86 | 97 | 81 | 86 |
| 90.11357 | 83 | 94 | 89 | 99 | 80 | 91 |
| 90.11358 | 80 | 89 | 88 | 98 | 76 | 96 |
| 90.11359 | D | D | D | D | D | D |

* Values outside of QC limits

D Surrogates diluted below LOQ

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

## SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

| | |
|---|---|
| REQUEST NUMBER: 10158 | DATE EXTRACTED: 3/8/90 |
| SAMPLE NUMBER: Blank 3/8 | AMOUNT EXTRACTED: 60.38 g |
| DATA FILE ID: >S3R08 | DATE ANALYZED: 3/28/90 |
| MATRIX: Sodium Sulfate Blank | SUMMARY DATE: 4/11/90 |

### TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 330.0 |
| Aniline | 62-53-3 | <LOQ | 330.0 |
| Phenol | 108-95-2 | <LOQ | 330.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 330.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 330.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 330.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 330.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 330.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 330.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 330.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 330.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 330.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 330.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 330.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 330.0 |
| Isophorone | 78-59-1 | <LOQ | 330.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 330.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 330.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 330.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 330.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 330.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 330.0 |
| Naphthalene | 91-20-3 | <LOQ | 330.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 330.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 330.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 330.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 330.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 330.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 330.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 330.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 330.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: Blank 3/8
DATA FILE NAME: >S3R08

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 330.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 330.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 330.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 330.0 |
| Acenaphthene | 83-32-9 | <LOQ | 330.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 330.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 330.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 330.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 330.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 330.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 330.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 330.0 |
| Fluorene | 86-73-7 | <LOQ | 330.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 330.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 330.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 330.0 |
| Azobenzene | 103-33-3 | <LOQ | 330.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 330.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 330.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 330.0 |
| Phenanthrene | 85-01-8 | <LOQ | 330.0 |
| Anthracene | 120-12-7 | <LOQ | 330.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 330.0 |
| Fluoranthene | 206-44-0 | <LOQ | 330.0 |
| Benzidine | 92-87-5 | <LOQ | 330.0 |
| Pyrene | 129-00-0 | <LOQ | 330.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 330.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 330.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 330.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 330.0 |
| Chrysene | 218-01-9 | <LOQ | 330.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 330.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 330.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 330.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 330.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 330.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 330.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 330.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11347
DATA FILE ID: >S3R11
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 28.70 g
DATE ANALYZED: 3/28/90
SUMMARY DATE: 4/11/90

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1700.0 |
| Aniline | 62-53-3 | <LOQ | 1700.0 |
| Phenol | 108-95-2 | <LOQ | 1700.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1700.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1700.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1700.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1700.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1700.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1700.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1700.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1700.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1700.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1700.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1700.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1700.0 |
| Isophorone | 78-59-1 | <LOQ | 1700.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1700.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1700.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1700.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1700.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 1700.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 1700.0 |
| Naphthalene | 91-20-3 | <LOQ | 1700.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 1700.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1700.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1700.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1700.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1700.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1700.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1700.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1700.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11347
DATA FILE NAME: >S3R11

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1700.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1700.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1700.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1700.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1700.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1700.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1700.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1700.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1700.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1700.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1700.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1700.0 |
| Fluorene | 86-73-7 | <LOQ | 1700.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1700.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1700.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1700.0 |
| Azobenzene | 103-33-3 | <LOQ | 1700.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1700.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1700.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1700.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1700.0 |
| Anthracene | 120-12-7 | <LOQ | 1700.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1700.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1700.0 |
| Benzidine | 92-87-5 | <LOQ | 1700.0 |
| Pyrene | 129-00-0 | <LOQ | 1700.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1700.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1700.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1700.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1700.0 |
| Chrysene | 218-01-9 | <LOQ | 1700.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1700.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1700.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1700.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1700.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1700.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1700.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1700.0 |

Laboratory Name: LANL-HSE9

Case No: RN 10158

Sample Number: 90.11347

## Organics Analysis Data Sheet

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. 51 | UNKNOWN Alcohol | BNA | 7.78 | * |
| 2. 51 | UNKNOWN ALCOHOL | " | 11.03 | 60000 |
| 3. 100 | Unknown | " | 26.18 | 9700 |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | * UNABLE TO QUANT DUE TO POOR | | | |
| 9. | CHROMATOGRAPHY | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |
| 13. | | | | |
| 14. | | | | |
| 15. | | | | |
| 16. | | | | |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |

Form 1, Part B



Revision 0
Date September 1986

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

# SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11348
DATA FILE ID: >S3R12
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 27.6g
DATE ANALYZED: 3/28/90
SUMMARY DATE: 4/18/90

## TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 1800.0 |
| Aniline | 62-53-3 | <LOQ | 1800.0 |
| Phenol | 108-95-2 | <LOQ | 1800.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 1800.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 1800.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 1800.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 1800.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 1800.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 1800.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 1800.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 1800.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 1800.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 1800.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 1800.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 1800.0 |
| Isophorone | 78-59-1 | <LOQ | 1800.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 1800.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 1800.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 1800.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 1800.0 |
| 2,4-Dichlo[illegible]nol | 120-83-2 | <LOQ | 1800.0 |
| 1,2,4-Tric[illegible]benzene | 120-82-1 | <LOQ | 1800.0 |
| Naphthalen[illegible] | 91-20-3 | <LOQ | 1800.0 |
| 4-Chloroan[illegible] | 106-47-8 | <LOQ | 1800.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 1800.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 1800.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 1800.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 1800.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 1800.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 1800.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 1800.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11348
DATA FILE NAME: >S3R12

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 1800.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 1800.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 1800.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 1800.0 |
| Acenaphthene | 83-32-9 | <LOQ | 1800.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 1800.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 1800.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 1800.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 1800.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 1800.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 1800.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 1800.0 |
| Fluorene | 86-73-7 | <LOQ | 1800.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 1800.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 1800.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 1800.0 |
| Azobenzene | 103-33-3 | <LOQ | 1800.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 1800.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 1800.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 1800.0 |
| Phenanthrene | 85-01-8 | <LOQ | 1800.0 |
| Anthracene | 120-12-7 | <LOQ | 1800.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 1800.0 |
| Fluoranthene | 206-44-0 | <LOQ | 1800.0 |
| Benzidine | 92-87-5 | <LOQ | 1800.0 |
| Pyrene | 129-00-0 | <LOQ | 1800.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 1800.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 1800.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 1800.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 1800.0 |
| Chrysene | 218-01-9 | <LOQ | 1800.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 1800.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 1800.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 1800.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 1800.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 1800.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 1800.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 1800.0 |

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11349
DATA FILE ID: >S3R13
MATRIX: Soil

DATE EXTRACTED: 3/8/90
AMOUNT EXTRACTED: 25.2g
DATE ANALYZED: 3/28/90
SUMMARY DATE: 4/18/90

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| N-Nitrosodimethylamine | 62-75-9 | <LOQ | 2000.0 |
| Aniline | 62-53-3 | <LOQ | 2000.0 |
| Phenol | 108-95-2 | <LOQ | 2000.0 |
| bis(-2-Chloroethyl)Ether | 111-44-4 | <LOQ | 2000.0 |
| 2-Chlorophenol | 95-57-8 | <LOQ | 2000.0 |
| 1,3 Dichlorobenzene | 541-73-1 | <LOQ | 2000.0 |
| 1,4 Dichlorobenzene | 106-46-7 | <LOQ | 2000.0 |
| Benzyl Alcohol | 100-51-6 | <LOQ | 2000.0 |
| 1,2-Dichlorobenzene | 95-50-1 | <LOQ | 2000.0 |
| 2-Methylphenol | 95-48-7 | <LOQ | 2000.0 |
| bis(2-Chloroisopropyl)Ether | 108-60-1 | <LOQ | 2000.0 |
| 4-Methylphenol | 106-44-5 | <LOQ | 2000.0 |
| N-Nitroso-Di-n-propylamine | 621-64-7 | <LOQ | 2000.0 |
| Hexachloroethane | 67-72-1 | <LOQ | 2000.0 |
| Nitrobenzene | 98-95-3 | <LOQ | 2000.0 |
| Isophorone | 78-59-1 | <LOQ | 2000.0 |
| 2-Nitrophenol | 88-75-5 | <LOQ | 2000.0 |
| 2,4-Dimethylphenol | 105-67-9 | <LOQ | 2000.0 |
| Benzoic Acid | 65-85-0 | <LOQ | 2000.0 |
| bis(-2-Chloroethoxy)Methane | 111-91-1 | <LOQ | 2000.0 |
| 2,4-Dichlorophenol | 120-83-2 | <LOQ | 2000.0 |
| 1,2,4-Trichlorobenzene | 120-82-1 | <LOQ | 2000.0 |
| Naphthalene | 91-20-3 | <LOQ | 2000.0 |
| 4-Chloroaniline | 106-47-8 | <LOQ | 2000.0 |
| Hexachlorobutadiene | 87-68-3 | <LOQ | 2000.0 |
| 4-Chloro-3-methylphenol | 59-50-7 | <LOQ | 2000.0 |
| 2-Methylnaphthalene | 91-57-6 | <LOQ | 2000.0 |
| Hexachlorocyclopentadiene | 77-47-4 | <LOQ | 2000.0 |
| 2,4,6-Trichlorophenol | 88-06-2 | <LOQ | 2000.0 |
| 2,4,5-Trichlorophenol | 95-95-4 | <LOQ | 2000.0 |
| 2-Chloronaphthalene | 91-58-7 | <LOQ | 2000.0 |

**LOQ = Limit Of Quantitation

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11349
DATA FILE NAME: >S3R13

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (ug/Kg) | LOQ** (ug/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 2000.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 2000.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 2000.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 2000.0 |
| Acenaphthene | 83-32-9 | <LOQ | 2000.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 2000.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 2000.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 2000.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 2000.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 2000.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 2000.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 2000.0 |
| Fluorene | 86-73-7 | <LOQ | 2000.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 2000.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 2000.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 2000.0 |
| Azobenzene | 103-33-3 | <LOQ | 2000.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 2000.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 2000.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 2000.0 |
| Phenanthrene | 85-01-8 | <LOQ | 2000.0 |
| Anthracene | 120-12-7 | <LOQ | 2000.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 2000.0 |
| Fluoranthene | 206-44-0 | <LOQ | 2000.0 |
| Benzidine | 92-87-5 | <LOQ | 2000.0 |
| Pyrene | 129-00-0 | <LOQ | 2000.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 2000.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 2000.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 2000.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 2000.0 |
| Chrysene | 218-01-9 | <LOQ | 2000.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 2000.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 2000.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 2000.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 2000.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 2000.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 2000.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 2000.0 |

HSE-9 ANALYTICAL RESULTS

FB 25-Feb-1987 FR

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 87.02602 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/02/87 | |
| 87.02603 | 05787 < | 0.0500 | 0.0500 | MG/L | 2/03/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

GG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

HSE-9 ANALYTICAL RESULTS

| MPLE NBER | REQ NUM | | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|---|
| 37.02602 | 05787 | < | 0.0020 | 0.0020 | MG/L | 2/02/87 | |
| 37.02603 | 05787 | < | 0.0020 | 0.0020 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

GLG 2/3
SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

HSE-9 ANALYTICAL RESULTS

SF 2-Feb-1987 FE

| SAMPLE NUMBER | REQ NUM | RESULT | UNCERTAINTY | UNITS | COMPLETION DATE | COMMENT |
|---|---|---|---|---|---|---|
| 37.02603 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |
| 37.02603 | 05787 < | 0.0100 | 0.0100 | MG/L | 2/02/87 | |

THESE DATA MEET ESTABLISHED HSE9 GROUP QUALITY ASSURANCE STANDARDS

SECTION LEADER

mag 2/3/87
QUALITY ASSURANCE OFFICER

# Attachment 3

# Laboratory Reports

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY, AND ENVIRONMENT DIVISION
HEALTH AND ENVIRONMENTAL CHEMISTRY GROUP HSE-9
ORGANIC ANALYSIS SECTION

SEMIVOLATILE ORGANICS ANALYTICAL RESULTS

REQUEST NUMBER: 10158
SAMPLE NUMBER: 90.11359
DATA FILE NAME: >S3R25

TARGET COMPOUNDS

| COMPOUND | CAS # | CONCENTRATION (mg/Kg) | LOQ** (mg/Kg) |
|---|---|---|---|
| 2-Nitroaniline | 88-74-4 | <LOQ | 84.0 |
| Dimethylphthalate | 131-11-3 | <LOQ | 84.0 |
| Acenaphthylene | 208-96-8 | <LOQ | 84.0 |
| 3-Nitroaniline | 99-09-2 | <LOQ | 84.0 |
| Acenaphthene | 83-32-9 | <LOQ | 84.0 |
| 2,4-Dinitrophenol | 51-28-5 | <LOQ | 84.0 |
| 4-Nitrophenol | 100-02-7 | <LOQ | 84.0 |
| Dibenzofuran | 132-64-9 | <LOQ | 84.0 |
| 2,4-Dinitrotoluene | 121-14-2 | <LOQ | 84.0 |
| 2,6-Dinitrotoluene | 606-20-2 | <LOQ | 84.0 |
| Diethylphthalate | 84-66-2 | <LOQ | 84.0 |
| 4-Chlorophenyl-phenylether | 7005-72-3 | <LOQ | 84.0 |
| Fluorene | 86-73-7 | <LOQ | 84.0 |
| 4-Nitroaniline | 100-01-6 | <LOQ | 84.0 |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | <LOQ | 84.0 |
| N-Nitrosodiphenylamine | 86-30-6 | <LOQ | 84.0 |
| Azobenzene | 103-33-3 | <LOQ | 84.0 |
| 4-Bromophenyl-phenylether | 101-55-3 | <LOQ | 84.0 |
| Hexachlorobenzene | 118-74-1 | <LOQ | 84.0 |
| Pentachlorophenol | 87-86-5 | <LOQ | 84.0 |
| Phenanthrene | 85-01-8 | <LOQ | 84.0 |
| Anthracene | 120-12-7 | <LOQ | 84.0 |
| Di-n-Butylphthalate | 87-74-2 | <LOQ | 84.0 |
| Fluoranthene | 206-44-0 | <LOQ | 84.0 |
| Benzidine | 92-87-5 | <LOQ | 84.0 |
| Pyrene | 129-00-0 | <LOQ | 84.0 |
| Butylbenzylphthalate | 85-68-7 | <LOQ | 84.0 |
| 3,3'-Dichlorobenzidine | 91-94-1 | <LOQ | 84.0 |
| Benzo(a)Anthracene | 56-55-3 | <LOQ | 84.0 |
| Bis(2-Ethylhexyl)Phthalate | 117-81-7 | <LOQ | 84.0 |
| Chrysene | 218-01-9 | <LOQ | 84.0 |
| Di-n-octyl phthalate | 117-84-0 | <LOQ | 84.0 |
| Benzo(b)fluoranthene | 205-99-2 | <LOQ | 84.0 |
| Benzo(k)fluoranthene | 207-08-9 | <LOQ | 84.0 |
| Benzo(a)Pyrene | 50-32-8 | <LOQ | 84.0 |
| Indeno(1,2,3-cd)Pyrene | 193-39-5 | <LOQ | 84.0 |
| Dibenzo(a,h)Anthracene | 53-70-3 | <LOQ | 84.0 |
| Benzo(g,h,i)Perylene | 191-24-2 | <LOQ | 84.0 |

# HSE-9 SEMIVOLATILE ORGANIC ANALYSIS
## SUMMARY OF ANALYTICAL RESULTS

To: Dave McInroy
From: Martin Koby

MM Koby 4/18/90

Reviewed CNS 4/19/90

Request Number: 10158
Matrix: Soil
Summary Date: 4/18/90

| Sample ID | Target Compounds Found | Amount (ug/Kg) | F.V. (ml) | LOQ (ug/Kg) |
|---|---|---|---|---|
| Blank 3/8 | NONE | NA | 1.0 | 330.0 |
| 90.11347 (TICs) | NONE | NA | 5.0 | 1700.0 |
| 90.11348 | NONE | NA | 5.0 | 1800.0 |
| 90.11349 (TICs) | NONE | NA | 5.0 | 2000.0 |
| 90.11350 | NONE | NA | 5.0 | 2000.0 |
| 90.11351 | NONE | NA | 5.0 | 1700.0 |
| 90.11352 | NONE | NA | 5.0 | 1700.0 |
| 90.11353 | NONE | NA | 5.0 | 1900.0 |
| 90.11354 | NONE | NA | 5.0 | 1700.0 |
| 90.11355 | NONE | NA | 1.0 | 330.0 |
| 90.11356 | NONE | NA | 5.0 | 1700.0 |
| 90.11357 | NONE | NA | 5.0 | 1800.0 |
| 90.11358 | NONE | NA | 5.0 | 1700.0 |
| 90.11359 | NONE | NA | 25.0 | 84000.0 |

F.V. = Final Volume
LOQ = Limit of Quantitation

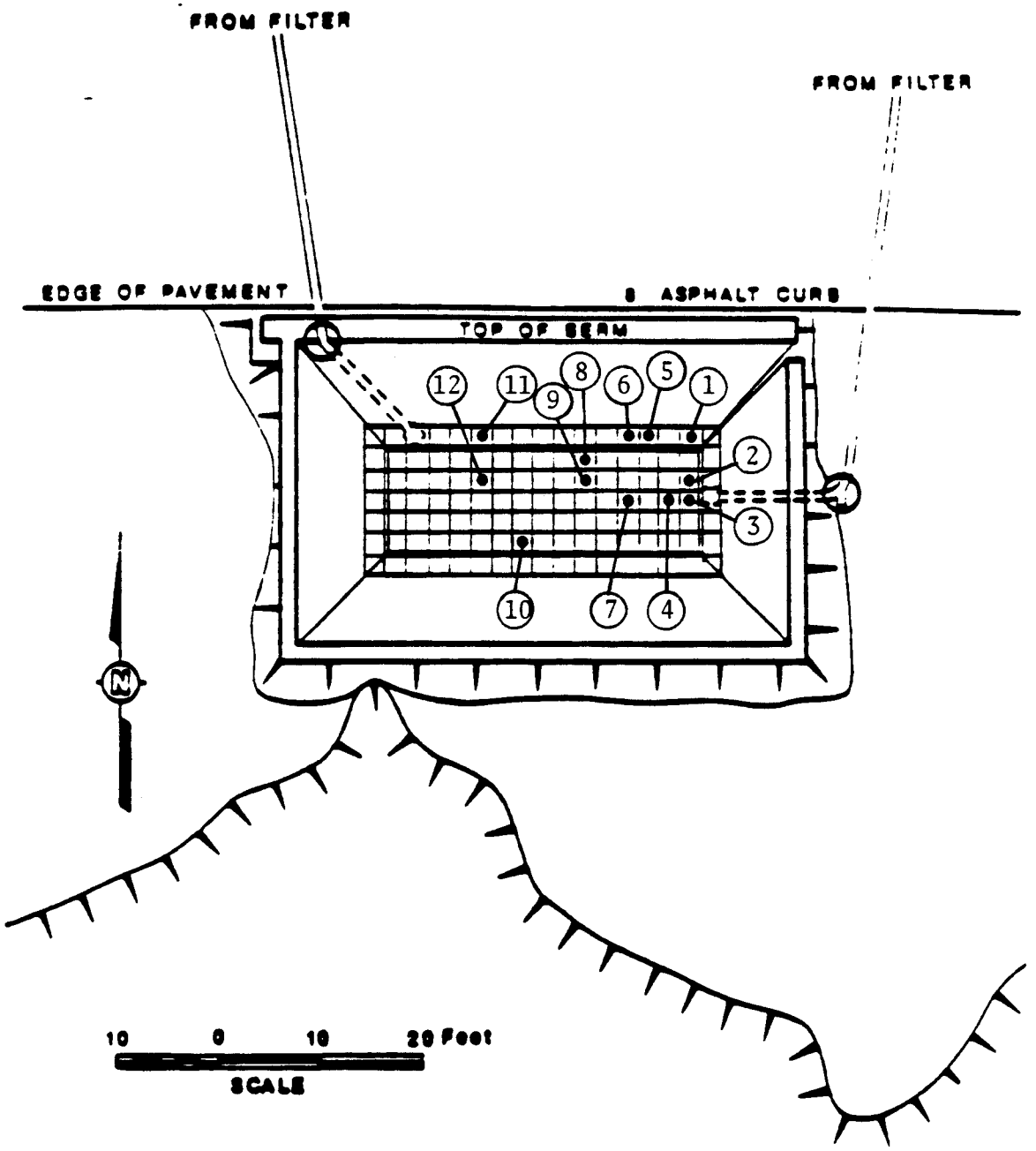
The samples were prepped by mixing approximately 30 g of [illegible] with 60 g sodium sulfate and soxhlet extracting with methylene chloride for 18 hours. Appropriate surrogate standards were added prior to extraction as a check of method efficiency. Initial extracts were concentrated to an appropriate final volume by Kuderna-Danish and nitrogen evaporation techniques. Analysis was performed by capillary column GC/MS methods. These methods are consistent with EPA SW-846 protocol.

With the exception of a QC generated matrix spike, no target compounds were detected above reportable limits. The majority of extracts contained significant amounts of coextracted humic or hydrocarbon material, thus the greater Limits of Quantitation. Sample 90.11359 was representative of the asphalt present at the sight.

Several of the extracts contained non-target compounds tentatively identified by mass spectral library searches. Identification was limited to compound class at best as reliable matches were not achieved.

# Attachment 5

# Map of Sample Locations




DRAWN BY LLF 2/3/88
CHECKED BY
APPROVED BY
DRAWING NUMBER 301215 02 12 A2

FIGURE 5-18

• SOIL SAMPLING LOCATIONS

TA-16 ADDITIONAL
SOIL SAMPLING LOCATIONS

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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INTERNATIONAL TECHNOLOGY CORPORATION

# Attachment 6

# QA/QC Statement

Attachment 6

**STATEMENT OF ADEQUACY**
**OF THE ANALYSES AND DECONTAMINATION**

Based on my oversight of the Technical Area (TA) 16 Surface Impoundment closure, I believe that the quality of the performance on all key activities pertaining to this closure were done in such a manner to ensure that a clean closure of this unit has been achieved. I have reviewed all analytical and QA/QC reports and have determined that the data is accurate and adequate. All procedures described in the approved closure plan were followed with the exception of Section 5.1.3 Liner Decontamination Procedures. It was jointly decided by staff within the Health, Safety, and Environment Division and the State Environmental Improvement Division, that it would be a more conservative approach and more cost effective to have the liner incinerated/disposed of as hazardous waste. Attachment 8 is the Certificate of Disposal for the liner material.

David J. McInroy
Environmental Protection Group
Los Alamos National Laboratory

Sept. 17, 1990
Date Signed

# Attachment 7

# Certification of Accuracy

Attachment 7

**CERTIFICATION OF ACCURACY**

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

LAGritzo for

Allen J. Tiedman
Associate Director for Operations
Los Alamos National Laboratory
Operator

18 Sept 1990
Date Signed

for Harry T. Season, Jr.
Area Manager
Los Alamos Area Office
U. S. Department of Energy
Albuquerque Operations
Owner

9/19/90
Date Signed