ORIGINAL
Dayes

SDR # B02-031
Revision #: 0
Date Initiated: 11/15/01

# SAMPLE DISPOSITION RECORD

SAF: B01-103
OU: N/A
Project ID: 200 Area GW
Task ID: 1
Sampling Event: 200 Area Groundwater Well Drilling Waste Designation

0056916

Laboratory: TMA/RECRA

Task Manager: R. L. Jackson

Sampling Information:
Number of Samples: 13
ID Numbers: B12D77, B12D78, B12MB7, B12MB8, B12MK9, B12ML0, B12V25, B12V26, B135C3, B139C4, B139C5, B139C6, B139D1
Matrix: Soil
Collection Date: 07/17/01 – 10/19/01

RECEIVED
APR 16 2002
EDMC

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Addition of Analyses

Description: Addition of Analysis of Arsenic By Toxic Characteristic Leach Procedure

Disposition:

Description: The Groundwater/Vadose Zone Integration Project requested that analysis of arsenic by the Toxic Characteristic Leach Procedure (TCLP) be added to the analytical request for the listed samples. The request was made after the samples had been analyzed for other TCLP constituents.

Justification: Arsenic TCLP data are needed by the project to complete the designation of waste generated during groundwater well drilling and installation.

Approval Signatures:

S. J. Trent Steve J Trent 12/19/01
Project Coordinator (Print/Sign Name) Date

R. L. Jackson Ronald L Jackson 12/19/01
Task Manager (Print/Sign Name) Date

ORIGINAL
Dayes

SDR # B02-029
Revision #: 0
Date Initiated: 11/28/01

# SAMPLE DISPOSITION RECORD

**SAF: B01-103**
**OU: N/A**
**Project ID: 200 Area GW**
**Task ID: 1**
**Sampling Event: 200 Area Groundwater Well Drilling Waste Designation**

**Laboratory: TMA/RECRA**

**Task Manager: R. L. Jackson**

**Sampling Information:**
**Number of Samples: 6**
**ID Numbers: B12D78, B12FY3, B12MB8, B12ML0, B12V26, B12XJ8**
**Matrix: Soil**
**Collection Date: 07/17/01 – 09/19/01**

**Issue Background:**

**Class:** ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

**Type: Other**

**Description: Reissue Final Data Package Reports**

**Disposition:**

**Description: The final data packages for the listed samples identify the compound '3 + 4 Methylphenol' only as '4-Methylphenol'. The laboratory was requested to reissue the final data package reports for the listed samples with the '3 + 4 Methylphenol' composite compound name in place of '4-Methylphenol'.**

**Justification: Because 3-MethylPhenol and 4-Methylphenol are indistinguishable using method 8270, the final data package report needs to identify this composite compound as '3 + 4 Methylphenol'.**

**Approval Signatures:**

S. J. Trent — 12/5/01
Project Coordinator (Print/Sign Name) — Date

R. L. Jackson Ronald L. Jackson — 12/10/01
Task Manager (Print/Sign Name) Ronald L. Jackson — Date

H1461



## 1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1461 was composed of two solid (soil) samples designated under SAF No. B01-103 with a Project Designation of: 200 Area RCRA Drilling Waste Designation.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on November 3, 2001.

## 2.0 ANALYSIS NOTES

### 2.1 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

### 2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

### 2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

### 2.4 Americium-241 Analyses

No problems were encountered during the course of the analyses.

### 2.5 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

### 2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

### 2.7 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

### 2.8 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

### 2.9 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

### 2.10 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

### 2.11 Tritium Analyses

The H3 matrix spike percent recovery (83%) was below the 3σ limits (86 to 114%), but within the laboratory protocol limits (8σ to 120%). No other problems were encountered during the course of the analyses.

**Case Narrative Certification Statement**

**"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."**

Melissa Mannion

**Melissa C. Mannion**
**Program Manager**

11/9/01

**Date**

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

SDG 7054
Contact Melissa C. Mannion

## SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1461

| CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | LAB SAMPLE ID | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| B12MB7 | 200 East | SOLID | | R108081-01 | B01-103 | B01-103-05 | 08/13/01 11:10 |
| B12MB8 | 200 East | SOLID | | R108081-02 | B01-103 | B01-103-05 | 08/13/01 11:38 |
| Method Blank | | SOLID | | R108081-04 | B01-103 | | |
| Lab Control Sample | | SOLID | | R108081-03 | B01-103 | | |
| Duplicate (R108081-01) | 200 East | SOLID | | R108081-05 | B01-103 | | 08/13/01 11:10 |
| Spike (R108081-01) | 200 East | SOLID | | R108081-06 | B01-103 | | 08/13/01 11:10 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

SDG 7054
Contact Melissa C. Mannion

## QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1461

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 7054 | B01-103-05 | B12MB7 | SOLID | 99.4 | 1485 g | | 08/16/01 | 3 | R108081-01 | 7054-001 |
| | | B12MB8 | SOLID | 95.7 | 1443 g | | 08/16/01 | 3 | R108081-02 | 7054-002 |
| | | Method Blank | SOLID | | | | | | R108081-04 | 7054-004 |
| | | Lab Control Sample | SOLID | | | | | | R108081-03 | 7054-003 |
| | | Duplicate (R108081-01) | SOLID | 99.4 | 1485 g | | 08/16/01 | 3 | R108081-05 | 7054-005 |
| | | Spike (R108081-01) | SOLID | 99.4 | 1485 g | | 08/16/01 | 3 | R108081-06 | 7054-006 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

SDG 7054
Contact Melissa C. Mannion

## PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1461

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alpha Spectroscopy** | | | | | | | | | | | | |
| AM | SOLID | Americium 241 in Soil | 6994-192 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| NP | SOLID | Neptunium in Soil | 6994-192 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| PU | SOLID | Plutonium, Isotopic in Solids | 6994-192 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| TH | SOLID | Thorium, Isotopic in Soil | 6994-192 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| U | SOLID | Uranium, Isotopic in Soil | 6994-192 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Beta Counting** | | | | | | | | | | | | |
| SR | SOLID | Total Strontium in Soil | 6994-192 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| TC | SOLID | Technetium 99 in Soil | 6994-192 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Gamma Spectroscopy** | | | | | | | | | | | | |
| GAM | SOLID | Gamma Scan | 6994-192 | 15.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Liquid Scintillation Counting** | | | | | | | | | | | | |
| C | SOLID | Carbon 14 in Soil | 6994-192 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| H | SOLID | Tritium in Soil | 6994-192 | 10.0 | 2 | | | 1 | 1 | 1/1 | 1/1 | X |
| NI_L | SOLID | Nickel 63 in Soil | 6994-192 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

SDG 7054
Contact Melissa C. Mannion

## WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1461

| CLIENT SAMPLE ID / LOCATION / CUSTODY | SAF No | MATRIX | LAB SAMPLE ID / COLLECTED / RECEIVED | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| B12MB7 | | | R108081-01 | 7054-001 | AM | | 09/25/01 | 11/03/01 | MCM | Americium 241 in Soil |
| 200 East | | SOLID | 08/13/01 | 7054-001 | C | | 09/21/01 | 11/03/01 | MCM | Carbon 14 in Soil |
| B01-103-05 | B01-103 | | 08/16/01 | 7054-001 | GAM | | 09/18/01 | 11/03/01 | MCM | Gamma Scan |
| | | | | 7054-001 | H | | 09/21/01 | 11/03/01 | MCM | Tritium in Soil |
| | | | | 7054-001 | NI_L | | 09/18/01 | 11/03/01 | MCM | Nickel 63 in Soil |
| | | | | 7054-001 | NP | | 09/27/01 | 11/03/01 | MCM | Neptunium in Soil |
| | | | | 7054-001 | PU | | 09/26/01 | 11/03/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7054-001 | SR | | 09/17/01 | 11/03/01 | MCM | Total Strontium in Soil |
| | | | | 7054-001 | TC | | 09/26/01 | 11/03/01 | MCM | Technetium 99 in Soil |
| | | | | 7054-001 | TH | | 09/18/01 | 11/03/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7054-001 | U | | 10/18/01 | 11/03/01 | MCM | Uranium, Isotopic in Soil |
| B12MB8 | | | R108081-02 | 7054-002 | AM | | 09/25/01 | 11/03/01 | MCM | Americium 241 in Soil |
| 200 East | | SOLID | 08/13/01 | 7054-002 | C | | 09/21/01 | 11/03/01 | MCM | Carbon 14 in Soil |
| B01-103-05 | B01-103 | | 08/16/01 | 7054-002 | GAM | | 09/18/01 | 11/03/01 | MCM | Gamma Scan |
| | | | | 7054-002 | H | | 09/21/01 | 11/03/01 | MCM | Tritium in Soil |
| | | | | 7054-002 | NI_L | | 09/18/01 | 11/03/01 | MCM | Nickel 63 in Soil |
| | | | | 7054-002 | NP | | 09/27/01 | 11/03/01 | MCM | Neptunium in Soil |
| | | | | 7054-002 | PU | | 09/26/01 | 11/03/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7054-002 | SR | | 09/17/01 | 11/03/01 | MCM | Total Strontium in Soil |
| | | | | 7054-002 | TC | | 10/02/01 | 11/03/01 | MCM | Technetium 99 in Soil |
| | | | | 7054-002 | TH | | 09/18/01 | 11/03/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7054-002 | U | | 10/23/01 | 11/03/01 | MCM | Uranium, Isotopic in Soil |
| Method Blank | | | R108081-04 | 7054-004 | AM | | 09/25/01 | 11/03/01 | MCM | Americium 241 in Soil |
| | | SOLID | | 7054-004 | C | | 09/20/01 | 11/03/01 | MCM | Carbon 14 in Soil |
| | B01-103 | | | 7054-004 | GAM | | 09/18/01 | 11/03/01 | MCM | Gamma Scan |
| | | | | 7054-004 | H | | 09/21/01 | 11/03/01 | MCM | Tritium in Soil |
| | | | | 7054-004 | NI_L | | 09/18/01 | 11/03/01 | MCM | Nickel 63 in Soil |
| | | | | 7054-004 | NP | | 09/27/01 | 11/03/01 | MCM | Neptunium in Soil |
| | | | | 7054-004 | PU | | 09/26/01 | 11/03/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7054-004 | SR | | 09/17/01 | 11/03/01 | MCM | Total Strontium in Soil |
| | | | | 7054-004 | TC | | 09/25/01 | 11/03/01 | MCM | Technetium 99 in Soil |
| | | | | 7054-004 | TH | | 09/18/01 | 11/03/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7054-004 | U | | 10/19/01 | 11/03/01 | MCM | Uranium, Isotopic in Soil |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

SDG 7054
Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1461

| CLIENT SAMPLE ID / LOCATION / CUSTODY | SAF No | MATRIX | LAB SAMPLE ID / COLLECTED / RECEIVED | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| Lab Control Sample | | | R108081-03 | 7054-003 | AM | | 10/18/01 | 11/03/01 | MCM | Americium 241 in Soil |
| | | SOLID | | 7054-003 | C | | 09/21/01 | 11/03/01 | MCM | Carbon 14 in Soil |
| | B01-103 | | | 7054-003 | GAM | | 10/26/01 | 11/03/01 | MCM | Gamma Scan |
| | | | | 7054-003 | H | | 09/21/01 | 11/03/01 | MCM | Tritium in Soil |
| | | | | 7054-003 | NI_L | | 09/18/01 | 11/03/01 | MCM | Nickel 63 in Soil |
| | | | | 7054-003 | NP | | 09/27/01 | 11/03/01 | MCM | Neptunium in Soil |
| | | | | 7054-003 | PU | | 09/26/01 | 11/03/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7054-003 | SR | | 09/17/01 | 11/03/01 | MCM | Total Strontium in Soil |
| | | | | 7054-003 | TC | | 09/25/01 | 11/03/01 | MCM | Technetium 99 in Soil |
| | | | | 7054-003 | TH | | 09/18/01 | 11/03/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7054-003 | U | | 10/19/01 | 11/03/01 | MCM | Uranium, Isotopic in Soil |
| Duplicate (R108081-01) | | | R108081-05 | 7054-005 | AM | | 09/25/01 | 11/03/01 | MCM | Americium 241 in Soil |
| 200 East | | SOLID | 08/13/01 | 7054-005 | C | | 09/21/01 | 11/03/01 | MCM | Carbon 14 in Soil |
| | B01-103 | | 08/16/01 | 7054-005 | GAM | | 10/30/01 | 11/03/01 | MCM | Gamma Scan |
| | | | | 7054-005 | H | | 09/21/01 | 11/03/01 | MCM | Tritium in Soil |
| | | | | 7054-005 | NI_L | | 09/18/01 | 11/03/01 | MCM | Nickel 63 in Soil |
| | | | | 7054-005 | NP | | 09/27/01 | 11/03/01 | MCM | Neptunium in Soil |
| | | | | 7054-005 | PU | | 09/26/01 | 11/03/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7054-005 | SR | | 09/17/01 | 11/03/01 | MCM | Total Strontium in Soil |
| | | | | 7054-005 | TC | | 09/25/01 | 11/03/01 | MCM | Technetium 99 in Soil |
| | | | | 7054-005 | TH | | 09/20/01 | 11/03/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7054-005 | U | | 09/18/01 | 11/03/01 | MCM | Uranium, Isotopic in Soil |
| Spike (R108081-01) | | | R108081-06 | 7054-006 | H | | 09/21/01 | 11/03/01 | MCM | Tritium in Soil |
| 200 East | | SOLID | 08/13/01 | | | | | | | |
| | B01-103 | | 08/16/01 | | | | | | | |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

SDG 7054
Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1461

### COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP | SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | B01-103 | Americium 241 in Soil | AMCMISO_IE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| C | B01-103 | Carbon 14 in Soil | C14_COX_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| GAM | B01-103 | Gamma Scan | GAMMA_GS | 2 | | | 1 | 1 | 1 | | 5 |
| H | B01-103 | Tritium in Soil | 906.0_H3_LSC | 2 | | | 1 | 1 | 1 | 1 | 6 |
| NI_L | B01-103 | Nickel 63 in Soil | NI63_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| NP | B01-103 | Neptunium in Soil | NP237_LLE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| PU | B01-103 | Plutonium, Isotopic in Solids | PUISO_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| SR | B01-103 | Total Strontium in Soil | SRTOT_SEP_PRECIP_GPC | 2 | | | 1 | 1 | 1 | | 5 |
| TC | B01-103 | Technetium 99 in Soil | TC99_TR_SEP_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| TH | B01-103 | Thorium, Isotopic in Soil | THISO_IE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| U | B01-103 | Uranium, Isotopic in Soil | UISO_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| TOTALS | | | | 22 | | | 11 | 11 | 11 | 1 | 56 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

R108081-04 Method Blank

## METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7054 | Client/Case no | Hanford | SDG H1461 | |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R108081-04 | Client sample id | Method Blank | | |
| Dept sample id | 7054-004 | Material/Matrix | | SOLID | |
| | | SAF No | B01-103 | | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | -0.180 | 0.19 | 0.33 | 400 | U | H |
| Carbon 14 | 14762-75-5 | -3.51 | 2.5 | 4.3 | 50 | U | C |
| Nickel 63 | 13981-37-8 | -0.105 | 1.1 | 1.9 | 30 | U | NI_L |
| Total Strontium | SR-RAD | -0.101 | 0.088 | 0.17 | 1.0 | U | SR |
| Americium 241 | 14596-10-2 | 0 | 0.13 | 0.31 | 1.0 | U | AM |
| Technetium 99 | 14133-76-7 | 0.048 | 0.24 | 0.55 | 15 | U | TC |
| Thorium 228 | 14274-82-9 | -0.099 | 0.20 | 0.44 | | U | TH |
| Thorium 230 | 14269-63-7 | -0.165 | 0.20 | 0.44 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 0.066 | 0.13 | 0.25 | 1.0 | U | TH |
| Uranium 233 | U-233/234 | -0.018 | 0.036 | 0.14 | 1.0 | U | U |
| Uranium 235 | 15117-96-1 | 0.022 | 0.044 | 0.17 | 1.0 | U | U |
| Uranium 238 | U-238 | 0.018 | 0.036 | 0.14 | 1.0 | U | U |
| Neptunium 237 | 13994-20-2 | -0.008 | 0.008 | 0.036 | 1.0 | U | NP |
| Plutonium 238 | 13981-16-3 | 0 | 0.051 | 0.19 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.025 | 0.051 | 0.19 | 1.0 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 0.49 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.019 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.018 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.035 | 0.10 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.072 | 0.20 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.041 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.051 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.034 | 0.10 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.022 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.072 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.061 | | U | GAM |
| Uranium 238 | U-238 | U | | 2.1 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.017 | | U | GAM |

200 Area RCRA Drilling Waste Desig.



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 11/03/01 |

# B L A N K ,  c o n t .

| | | | | |
|---|---|---|---|---|
| SDG | 7054 | Client/Case no | Hanford | SDG H1461 |
| Contact | Melissa C. Mannion | Contract | No. 630 | |
| Lab sample id | R108081-04 | Client sample id | Method Blank | |
| Dept sample id | 7054-004 | Material/Matrix | | SOLID |
| | | SAF No | B01-103 | |

QC-BLANK 39637



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 11/03/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

R108081-03

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7054
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1461
Case no No. 630

Lab sample id R108081-03
Dept sample id 7054-003

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-103

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 24.8 | 0.66 | 0.34 | 400 | J | H | 24.7 | 0.99 | 100 | 83-117 | 80-120 |
| Carbon 14 | 9690 | 190 | 24 | 50 | | C | 11300 | 450 | 86 | 86-114 | 80-120 |
| Nickel 63 | 249 | 4.3 | 1.9 | 30 | | NI_L | 264 | 11 | 94 | 84-116 | 80-120 |
| Total Strontium | 24.2 | 0.92 | 0.26 | 1.0 | | SR | 23.0 | 0.92 | 105 | 82-118 | 80-120 |
| Americium 241 | 21.7 | 1.9 | 0.16 | 1.0 | | AM | 21.0 | 0.84 | 103 | 83-117 | 80-120 |
| Technetium 99 | 132 | 2.6 | 0.70 | 15 | | TC | 131 | 5.2 | 101 | 83-117 | 80-120 |
| Thorium 230 | 47.1 | 3.8 | 0.52 | 1.0 | | TH | 44.8 | 1.8 | 105 | 84-116 | 80-120 |
| Uranium 233 | 18.0 | 1.5 | 0.70 | 1.0 | | U | 18.6 | 0.74 | 97 | 85-115 | 80-120 |
| Uranium 235 | 13.5 | 1.3 | 0.15 | 1.0 | | U | 15.1 | 0.60 | 89 | 84-116 | 80-120 |
| Uranium 238 | 19.8 | 1.6 | 0.67 | 1.0 | | U | 20.2 | 0.81 | 98 | 85-115 | 80-120 |
| Neptunium 237 | 23.0 | 1.4 | 0.042 | 1.0 | | NP | 23.8 | 0.95 | 97 | 87-113 | 80-120 |
| Plutonium 238 | 23.9 | 2.1 | 0.17 | 1.0 | | PU | 27.2 | 1.1 | 88 | 85-115 | 80-120 |
| Plutonium 239/240 | 26.7 | 2.3 | 0.17 | 1.0 | | PU | 29.0 | 1.2 | 92 | 85-115 | 80-120 |
| Cobalt 60 | 1.25 | 0.060 | 0.030 | 0.050 | | GAM | 1.15 | 0.046 | 109 | 74-126 | 80-120 |
| Cesium 137 | 1.52 | 0.054 | 0.031 | 0.10 | | GAM | 1.33 | 0.053 | 114 | 73-127 | 80-120 |

200 Area RCRA Drilling Waste Desig.

QC-LCS 39636

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

R108081-05 B12MB7

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7054 | | | Client/Case no | Hanford SDG H1461 |
| Contact | Melissa C. Mannion | | | Case no | No. 630 |
| | *DUPLICATE* | | *ORIGINAL* | | |
| Lab sample id | R108081-05 | Lab sample id | R108081-01 | Client sample id | B12MB7 |
| Dept sample id | 7054-005 | Dept sample id | 7054-001 | Location/Matrix | 200 East SOLID |
| | | Received | 08/16/01 | Collected/Weight | 08/13/01 11:10 1485 g |
| % solids | 99.4 | % solids | 99.4 | Custody/SAF No | B01-103-05 B01-103 |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ PROT TOT LIMIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | -0.019 | 0.052 | 0.091 | 400 | U | H | -0.015 | 0.053 | 0.091 | U | - | |
| Carbon 14 | -2.13 | 2.3 | 3.9 | 50 | U | C | -1.43 | 2.3 | 3.9 | U | - | |
| Nickel 63 | -0.129 | 1.4 | 2.3 | 30 | U | NI_L | 0.536 | 1.2 | 2.0 | U | - | |
| Total Strontium | 0.029 | 0.12 | 0.22 | 1.0 | U | SR | -0.019 | 0.088 | 0.18 | U | - | |
| Americium 241 | 0.330 | 0.24 | 0.29 | 1.0 | J | AM | -0.028 | 0.056 | 0.22 | U | 200 | 207 |
| Technetium 99 | -0.197 | 0.21 | 0.59 | 15 | U | TC | -0.027 | 0.082 | 0.38 | U | - | |
| Thorium 228 | 0.656 | 0.21 | 0.24 | | | TH | 0.438 | 0.35 | 0.54 | U | 40 | 112 |
| Thorium 230 | 0.215 | 0.20 | 0.34 | 1.0 | U | TH | 0.438 | 0.35 | 0.42 | J | 68 | 186 |
| Thorium 232 | 0.603 | 0.16 | 0.11 | 1.0 | J | TH | 0.657 | 0.35 | 0.34 | J | 9 | 92 |
| Uranium 233 | 0.304 | 0.26 | 0.42 | 1.0 | U | U | 0.420 | 0.083 | 0.029 | J | 32 | 114 |
| Uranium 235 | 0 | 0.11 | 0.40 | 1.0 | U | U | 0.027 | 0.027 | 0.035 | U | - | |
| Uranium 238 | 0.130 | 0.17 | 0.33 | 1.0 | U | U | 0.393 | 0.076 | 0.029 | J | 101 | 107 |
| Neptunium 237 | 0.003 | 0.014 | 0.032 | 1.0 | U | NP | 0.046 | 0.031 | 0.037 | J | 176 | 209 |
| Plutonium 238 | 0 | 0.045 | 0.17 | 1.0 | U | PU | 0 | 0.047 | 0.18 | U | - | |
| Plutonium 239/240 | 0.023 | 0.045 | 0.17 | 1.0 | U | PU | 0 | 0.047 | 0.18 | U | - | |
| Potassium 40 | 14.3 | 0.71 | 0.29 | | | GAM | 15.1 | 0.78 | 0.28 | | 5 | 34 |
| Cobalt 60 | U | | 0.033 | 0.050 | U | GAM | U | | 0.041 | U | - | |
| Cesium 137 | U | | 0.030 | 0.10 | U | GAM | U | | 0.031 | U | - | |
| Radium 226 | 0.454 | 0.060 | 0.058 | 0.10 | | GAM | 0.450 | 0.064 | 0.060 | | 1 | 43 |
| Radium 228 | 0.578 | 0.14 | 0.14 | 0.20 | | GAM | 0.785 | 0.14 | 0.14 | | 30 | 54 |
| Europium 152 | U | | 0.067 | 0.10 | U | GAM | U | | 0.083 | U | - | |
| Europium 154 | U | | 0.11 | 0.10 | U | GAM | U | | 0.11 | U | - | |
| Europium 155 | U | | 0.098 | 0.10 | U | GAM | U | | 0.11 | U | - | |
| Thorium 228 | 0.590 | 0.037 | 0.037 | | | GAM | 0.568 | 0.040 | 0.040 | | 4 | 35 |
| Thorium 232 | 0.578 | 0.14 | 0.14 | | | GAM | 0.785 | 0.14 | 0.14 | | 30 | 54 |
| Uranium 235 | U | | 0.10 | | U | GAM | U | | 0.15 | U | - | |
| Uranium 238 | U | | 3.8 | | U | GAM | U | | 4.1 | U | - | |
| Americium 241 | U | | 0.21 | | U | GAM | U | | 0.27 | U | - | |

200 Area RCRA Drilling Waste Desig.

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 11/03/01 |

# DUPLICATE, cont.

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7054 | | | Client/Case no | Hanford SDG H1461 |
| Contact | Melissa C. Mannion | | | Case no | No. 630 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R108081-05 | Lab sample id | R108081-01 | Client sample id | B12MB7 |
| Dept sample id | 7054-005 | Dept sample id | 7054-001 | Location/Matrix | 200 East SOLID |
| | | Received | 08/16/01 | Collected/Weight | 08/13/01 11:10 1485 g |
| % solids | 99.4 | % solids | 99.4 | Custody/SAF No | B01-103-05 B01-103 |

QC-DUP#1 39638

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 11/03/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

R108081-06 B12MB7

## MATRIX SPIKE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7054 | | | Client/Case no | Hanford SDG H1461 |
| Contact | Melissa C. Mannion | | | Case no | No. 630 |
| | MATRIX SPIKE | | ORIGINAL | | |
| Lab sample id | R108081-06 | Lab sample id | R108081-01 | Client sample id | B12MB7 |
| Dept sample id | 7054-006 | Dept sample id | 7054-001 | Location/Matrix | 200 East SOLID |
| | | Received | 08/16/01 | Collected/Weight | 08/13/01 11:10 1485 g |
| % solids | 99.4 | % solids | 99.4 | Custody/SAF No | B01-103-05 B01-103 |

| ANALYTE | SPIKE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | ORIGINAL pCi/g | 2σ ERR (COUNT) | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 43.5 | 0.44 | 0.094 | 400 | JX | H | 52.7 | 2.1 | -0.015 | 0.053 | 83 | 86-114 | 60-140 |

200 Area RCRA Drilling Waste Desig.

QC-MS#1 39639

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-MS |
| Version | 3.06 |
| Report date | 11/03/01 |

# EBERLINE SERVICES/RICHMOND

**SAMPLE DELIVERY GROUP H1461**

**R108081-01** **B12MB7**

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7054 | Client/Case no | Hanford | SDG H1461 | |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R108081-01 | Client sample id | B12MB7 | | |
| Dept sample id | 7054-001 | Location/Matrix | 200 East | SOLID | |
| Received | 08/16/01 | Collected/Weight | 08/13/01 11:10 | 1485 g | |
| % solids | 99.4 | Custody/SAF No | B01-103-05 | B01-103 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | -0.015 | 0.053 | 0.091 | 400 | U | H |
| Carbon 14 | 14762-75-5 | -1.43 | 2.3 | 3.9 | 50 | U | C |
| Nickel 63 | 13981-37-8 | 0.536 | 1.2 | 2.0 | 30 | U | NI_L |
| Total Strontium | SR-RAD | -0.019 | 0.088 | 0.18 | 1.0 | U | SR |
| Americium 241 | 14596-10-2 | -0.028 | 0.056 | 0.22 | 1.0 | U | AM |
| Technetium 99 | 14133-76-7 | -0.027 | 0.082 | 0.38 | 15 | U | TC |
| Thorium 228 | 14274-82-9 | 0.438 | 0.35 | 0.54 | | U | TH |
| Thorium 230 | 14269-63-7 | 0.438 | 0.35 | 0.42 | 1.0 | J | TH |
| Thorium 232 | TH-232 | 0.657 | 0.35 | 0.34 | 1.0 | J | TH |
| Uranium 233 | U-233/234 | 0.420 | 0.083 | 0.029 | 1.0 | J | U |
| Uranium 235 | 15117-96-1 | 0.027 | 0.027 | 0.035 | 1.0 | U | U |
| Uranium 238 | U-238 | 0.393 | 0.076 | 0.029 | 1.0 | J | U |
| Neptunium 237 | 13994-20-2 | 0.046 | 0.031 | 0.037 | 1.0 | J | NP |
| Plutonium 238 | 13981-16-3 | 0 | 0.047 | 0.18 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0 | 0.047 | 0.18 | 1.0 | U | PU |
| Potassium 40 | 13966-00-2 | 15.1 | 0.78 | 0.28 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.041 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.031 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | 0.450 | 0.064 | 0.060 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.785 | 0.14 | 0.14 | 0.20 | | GAM |
| Europium 152 | 14683-23-9 | U | | 0.083 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.11 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.11 | 0.10 | U | GAM |
| Thorium 228 | 14274-82-9 | 0.568 | 0.040 | 0.040 | | | GAM |
| Thorium 232 | TH-232 | 0.785 | 0.14 | 0.14 | | | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.15 | | U | GAM |
| Uranium 238 | U-238 | U | | 4.1 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.27 | | U | GAM |

200 Area RCRA Drilling Waste Desig.

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 11/03/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

R108081-02 B12MB8

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7054 | Client/Case no | Hanford | SDG H1461 | |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R108081-02 | Client sample id | B12MB8 | | |
| Dept sample id | 7054-002 | Location/Matrix | 200 East | SOLID | |
| Received | 08/16/01 | Collected/Weight | 08/13/01 11:38 | 1443 g | |
| % solids | 95.7 | Custody/SAF No | B01-103-05 | B01-103 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | 0.053 | 0.059 | 0.097 | 400 | U | H |
| Carbon 14 | 14762-75-5 | 1.24 | 2.1 | 3.5 | 50 | U | C |
| Nickel 63 | 13981-37-8 | -0.187 | 1.2 | 2.0 | 30 | U | NI_L |
| Total Strontium | SR-RAD | 1.17 | 0.22 | 0.24 | 1.0 | | SR |
| Americium 241 | 14596-10-2 | -0.023 | 0.046 | 0.18 | 1.0 | U | AM |
| Technetium 99 | 14133-76-7 | -0.029 | 0.075 | 0.29 | 15 | U | TC |
| Thorium 228 | 14274-82-9 | 0.128 | 0.26 | 0.47 | | U | TH |
| Thorium 230 | 14269-63-7 | 0 | 0.26 | 0.41 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 0.384 | 0.26 | 0.33 | 1.0 | J | TH |
| Uranium 233 | U-233/234 | 0.410 | 0.13 | 0.083 | 1.0 | J | U |
| Uranium 235 | 15117-96-1 | 0.026 | 0.052 | 0.10 | 1.0 | U | U |
| Uranium 238 | U-238 | 0.399 | 0.13 | 0.083 | 1.0 | J | U |
| Neptunium 237 | 13994-20-2 | 0.009 | 0.017 | 0.042 | 1.0 | U | NP |
| Plutonium 238 | 13981-16-3 | 0 | 0.045 | 0.17 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0 | 0.045 | 0.17 | 1.0 | U | PU |
| Potassium 40 | 13966-00-2 | 13.7 | 0.91 | 0.32 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.030 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.028 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.097 | 0.10 | U | GAM |
| Radium 228 | 15262-20-1 | 0.671 | 0.14 | 0.14 | 0.20 | | GAM |
| Europium 152 | 14683-23-9 | U | | 0.067 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.11 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.067 | 0.10 | U | GAM |
| Thorium 228 | 14274-82-9 | 0.614 | 0.037 | 0.032 | | | GAM |
| Thorium 232 | TH-232 | 0.671 | 0.14 | 0.14 | | | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.11 | | U | GAM |
| Uranium 238 | U-238 | U | | 3.8 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.037 | | U | GAM |

200 Area RCRA Drilling Waste Desig.

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 11/03/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test AM Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Americium 241 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | ok | J |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | |
| *200 Area RCRA Drilling Waste Desig.* | | | | | | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | 2σ prep error 5.0 % | | | | Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.22 | 0.500 | | | 70 | | 120 | | | 43 | 09/24/01 | 09/25 | SS-049 |
| B12MB8 | R108081-02 | | | 0.18 | 0.500 | | | 81 | | 121 | | | 43 | 09/24/01 | 09/25 | SS-050 |
| BLK (QC ID=39637) | R108081-04 | | | 0.31 | 0.500 | | | 80 | | 121 | | | | 09/24/01 | 09/25 | SS-021 |
| LCS (QC ID=39636) | R108081-03 | | | 0.16 | 0.500 | | | 74 | | 156 | | | | 09/24/01 | 10/18 | SS-012 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.29 | 0.500 | | | 84 | | 121 | | | 43 | 09/24/01 | 09/25 | SS-024 |
| Nominal values and limits from method | | | | 1.0 | 0.500 | | | 20-105 | | 100 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | AMCMISO_IE_PLATE_AEA |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-940 | Plutonium Separation and Purification, rev 3 |
| | CP-960 | Americium-Curium Purification, Large Aliquot, rev 4 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.23 ± 0.13
YIELD 78 ± 11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test NP Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Neptunium 237 |
|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | 0.046 J |
| B12MB8 | R108081-02 | | | 7054-002 | U |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | ok U |
| Nominal values and limits from method 200 Area RCRA Drilling Waste Desig. | | | | RDLs (pCi/g) | 1.0 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 2σ prep error 5.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.037 | 0.500 | | | 55 | | 1090 | | | 45 | 09/20/01 | 09/27 | SS-043 |
| B12MB8 | R108081-02 | | | 0.042 | 0.500 | | | 47 | | 1091 | | | 45 | 09/20/01 | 09/27 | SS-044 |
| BLK (QC ID=39637) | R108081-04 | | | 0.036 | 0.500 | | | 56 | | 1090 | | | | 09/20/01 | 09/27 | SS-047 |
| LCS (QC ID=39636) | R108081-03 | | | 0.042 | 0.500 | | | 56 | | 1061 | | | | 09/20/01 | 09/27 | SS-046 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.032 | 0.500 | | | 62 | | 1091 | | | 45 | 09/20/01 | 09/27 | SS-048 |
| Nominal values and limits from method | | | | 1.0 | 0.500 | | | 20-105 | | 100 | | | 180 | | | |

| PROCEDURES | REFERENCE | NP237_LLE_PLATE_AEA |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-934 | Neptunium from Solids and Water by Extraction Chromatography, rev 2 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| MDA | 0.038 | ± | 0.009 |
| YIELD | 55 | ± | 11 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

| | |
|---|---|
| Test PU | Matrix SOLID |
| SDG 7054 | |
| Contact Melissa C. Mannion | |

## METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract No. 630 | |
| Contract SDG H1461 | |

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Plutonium 238 | | Plutonium 239/240 | |
|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - | U | - | U |
| Nominal values and limits from method 200 Area RCRA Drilling Waste Desig. | | | | RDLs (pCi/g) | 1.0 | | 1.0 | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | 2σ prep error 5.0 % | | | | Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.18 | 0.500 | | | 83 | | 118 | | | 44 | 09/14/01 | 09/26 | SS-043 |
| B12MB8 | R108081-02 | | | 0.17 | 0.500 | | | 83 | | 119 | | | 44 | 09/14/01 | 09/26 | SS-044 |
| BLK (QC ID=39637) | R108081-04 | | | 0.19 | 0.500 | | | 76 | | 119 | | | | 09/14/01 | 09/26 | SS-047 |
| LCS (QC ID=39636) | R108081-03 | | | 0.17 | 0.500 | | | 87 | | 119 | | | | 09/14/01 | 09/26 | SS-046 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.17 | 0.500 | | | 84 | | 119 | | | 44 | 09/14/01 | 09/26 | SS-048 |
| Nominal values and limits from method | | | | 1.0 | 0.500 | | | 20-105 | | 100 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | |
|---|---|---|
| | PUISO_PLATE_AEA | |
| | CP-060 | Soil Preparation, rev 3 |
| | CP-940 | Plutonium Separation and Purification, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| MDA | 0.18 | ± | 0.018 |
| YIELD | 83 | ± | 8 |



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-CMS |
| Version | 3.06 |
| Report date | 11/03/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test TH Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Thorium 228 | Thorium 230 | Thorium 232 |
|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | 0.438 J | 0.657 J |
| B12MB8 | R108081-02 | | | 7054-002 | U | U | 0.384 J |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | U | U |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | ok | ok U | ok J |
| Nominal values and limits from method 200 Area RCRA Drilling Waste Desig. | | | | RDLs (pCi/g) | | 1.0 | 1.0 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 2σ prep error 5.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.42 | 0.250 | | | 92 | | 155 | | | 36 | 09/17/01 | 09/18 | SS-021 |
| B12MB8 | R108081-02 | | | 0.41 | 0.250 | | | 93 | | 155 | | | 36 | 09/17/01 | 09/18 | SS-024 |
| BLK (QC ID=39637) | R108081-04 | | | 0.44 | 0.250 | | | 80 | | 233 | | | | 09/17/01 | 09/18 | SS-024 |
| LCS (QC ID=39636) | R108081-03 | | | 0.52 | 0.250 | | | 75 | | 232 | | | | 09/17/01 | 09/18 | SS-021 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.34 | 0.250 | | | 87 | | 707 | | | 38 | 09/17/01 | 09/20 | SS-021 |
| Nominal values and limits from method | | | | 1.0 | 0.250 | | | 20-105 | | 150 | | | 180 | | | |

| PROCEDURES | REFERENCE | THISO_IE_PLATE_AEA |
|---|---|---|
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-905 | Thorium in Water and Dissolved Solid Sample Using TRU and AG 1x8 Resin, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.43 ± 0.13
YIELD 85 ± 16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test U Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | 1: Uranium 233 | 2: Uranium 235 | 3: Uranium 238 | RESULT RATIOS (%) 1÷3 | 2σ | 2÷3 | 2σ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | 0.420 J | U | 0.393 J | 107 | 30 | 7 | 7 |
| B12MB8 | R108081-02 | | | 7054-002 | 0.410 J | U | 0.399 J | 103 | 47 | 7 | 13 |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | U | U | | | | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | ok | ok | | | | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | ok U | - U | ok U | | | | |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | 1.0 | 1.0 | 100 | | 4 | |
| 200 Area RCRA Drilling Waste Desig. | | | | | | | | Averages 105 | | 7 | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 2σ prep error 5.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.035 | 0.500 | | | 101 | | 615 | | | 66 | 09/13/01 | 10/18 | SS-043 |
| B12MB8 | R108081-02 | | | 0.10 | 0.500 | | | 105 | | 221 | | | 71 | 09/13/01 | 10/23 | SS-031 |
| BLK (QC ID=39637) | R108081-04 | | | 0.17 | 0.500 | | | 93 | | 139 | | | | 09/13/01 | 10/19 | SS-042 |
| LCS (QC ID=39636) | R108081-03 | | | 0.70 | 0.500 | | | 106 | | 139 | | | | 09/13/01 | 10/19 | SS-041 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.42 | 0.500 | | | 62 | | 116 | | | 36 | 09/13/01 | 09/18 | SS-019 |
| Nominal values and limits from method | | | | 1.0 | 0.500 | | | 20-105 | | 100 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | UISO_PLATE_AEA |
|---|---|---|
| | CP-911 | Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.28 ± 0.55
YIELD 93 ± 37

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test SR Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Total Strontium |
|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U |
| B12MB8 | R108081-02 | | | 7054-002 | 1.17 |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - U |
| Nominal values and limits from method 200 Area RCRA Drilling Waste Desig. | | | | RDLs (pCi/g) | 1.0 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.18 | 1.00 | | | 95 | | 100 | | | 35 | 09/17/01 | 09/17 | GRB-201 |
| B12MB8 | R108081-02 | | | 0.24 | 1.00 | | | 98 | | 100 | | | 35 | 09/17/01 | 09/17 | GRB-208 |
| BLK (QC ID=39637) | R108081-04 | | | 0.17 | 1.00 | | | 89 | | 200 | | | | 09/17/01 | 09/17 | GRB-222 |
| LCS (QC ID=39636) | R108081-03 | | | 0.26 | 1.00 | | | 88 | | 100 | | | | 09/17/01 | 09/17 | GRB-230 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.22 | 1.00 | | | 96 | | 200 | | | 35 | 09/17/01 | 09/17 | GRB-205 |
| Nominal values and limits from method | | | | 1.0 | 1.00 | | | 30-105 | | 100 | | | 180 | | | |

| PROCEDURES | REFERENCE | SRTOT_SEP_PRECIP_GPC |
|---|---|---|
| | CP-502 | Strontium in Solids, rev 4 |
| | CP-519 | Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 0.21 | ± | 0.077 |
| | YIELD | 93 | ± | 9 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test TC Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Technetium 99 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 15 | |
| 200 Area RCRA Drilling Waste Desig. | | | | | | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.38 | 1.03 | | | 87 | | 100 | | | 44 | 09/21/01 | 09/26 | GRB-224 |
| B12MB8 | R108081-02 | | | 0.29 | 1.04 | | | 84 | | 200 | | | 50 | 09/21/01 | 10/02 | GRB-201 |
| BLK (QC ID=39637) | R108081-04 | | | 0.55 | 1.00 | | | 98 | | 50 | | | | 09/21/01 | 09/25 | GRB-221 |
| LCS (QC ID=39636) | R108081-03 | | | 0.70 | 1.00 | | | 72 | | 50 | | | | 09/21/01 | 09/25 | GRB-224 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.59 | 1.03 | | | 88 | | 50 | | | 43 | 09/21/01 | 09/25 | GRB-221 |
| Nominal values and limits from method | | | | 15 | 1.00 | | | 20-105 | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | TC99_TR_SEP_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-021 | Preparation of Tc-99m Tracer, rev 1 |
| | CP-002 | Q.C. Preparation, rev 3 |
| | CP-003 | Tracing, rev 3 |
| | CP-542 | Technetium-99 Purification (Soil) by Extraction Chromatography, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 0.50 | ± | 0.33 |
| | YIELD | 86 | ± | 19 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test GAM Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Cobalt 60 | | Cesium 137 | |
|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - | U | - | U |
| Nominal values and limits from method 200 Area RCRA Drilling Waste Desig. | | | | RDLs (pCi/g) | 0.050 | | 0.10 | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | 2σ prep error 15.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.10 | 872 | | | | | 103 | | | 36 | 09/14/01 | 09/18 | MB,05,00 |
| B12MB8 | R108081-02 | | | 0.076 | 743 | | | | | 117 | | | 36 | 09/14/01 | 09/18 | MB,07,00 |
| BLK (QC ID=39637) | R108081-04 | | | 0.035 | 743 | | | | | 123 | | | | 09/14/01 | 09/18 | MB,07,00 |
| LCS (QC ID=39636) | R108081-03 | | | 0.030 | 743 | | | | | 131 | | | | 09/14/01 | 10/26 | MB,07,00 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.098 | 872 | | | | | 131 | | | 78 | 09/14/01 | 10/30 | MB,05,00 |
| Nominal values and limits from method | | | | 0.050 | 743 | | | | | 100 | | | 180 | | | |

| PROCEDURES | REFERENCE | GAMMA_GS |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-100 | Ge(Li) Preparation for Commercial Samples, rev 3 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.068 ± 0.067
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test C Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

CARBON 14 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Carbon 14 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - | U |

Nominal values and limits from method RDLs (pCi/g) 50
200 Area RCRA Drilling Waste Desig.

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 3.9 | 0.230 | | | 100 | | 100 | | | 39 | 09/20/01 | 09/21 | LSC-005 |
| B12MB8 | R108081-02 | | | 3.5 | 0.242 | | | 100 | | 100 | | | 39 | 09/20/01 | 09/21 | LSC-005 |
| BLK (QC ID=39637) | R108081-04 | | | 4.3 | 0.200 | | | 100 | | 100 | | | | 09/20/01 | 09/20 | LSC-005 |
| LCS (QC ID=39636) | R108081-03 | | | 24 | 0.200 | | | 100 | | 3 | | | | 09/20/01 | 09/21 | LSC-005 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 3.9 | 0.220 | | | 100 | | 100 | | | 39 | 09/20/01 | 09/21 | LSC-005 |
| Nominal values and limits from method | | | | 50 | 0.200 | | | | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | C14_COX_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-251 | Tritium/Carbon-14 Oxidation, rev 3 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 7.9 ± 18
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test H Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Tritium | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | J |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - | U |
| Spike (R108081-01) | R108081-06 | | | 7054-006 | LOW | JX |

Nominal values and limits from method RDLs (pCi/g) 400
200 Area RCRA Drilling Waste Desig.

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 0.091 | 23.5 | | | 100 | | 100 | | | 39 | 09/17/01 | 09/21 | LSC-005 |
| B12MB8 | R108081-02 | | | 0.097 | 23.9 | | | 91 | | 100 | | | 39 | 09/17/01 | 09/21 | LSC-005 |
| BLK (QC ID=39637) | R108081-04 | | | 0.33 | 20.0 | | | 33 | | 100 | | | | 09/17/01 | 09/21 | LSC-005 |
| LCS (QC ID=39636) | R108081-03 | | | 0.34 | 20.0 | | | 33 | | 100 | | | | 09/17/01 | 09/21 | LSC-005 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 0.091 | 23.6 | | | 100 | | 100 | | | 39 | 09/17/01 | 09/21 | LSC-005 |
| Spike (R108081-01) (QC ID=39639) | R108081-06 | | | 0.094 | 21.8 | | | 100 | | 100 | | | 39 | 09/17/01 | 09/21 | LSC-005 |
| Nominal values and limits from method | | | | 400 | 20.0 | | | | | 25 | | | 180 | | | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | 906.0_H3_LSC |
| | CP-060 | Soil Preparation, rev 3 |
| | CP-216 | Tritium in Solid Samples by Azeotropic Distillation, rev 4 |

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.17 ± 0.25
YIELD 76 ± 67

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1461

Test NI L Matrix SOLID
SDG 7054
Contact Melissa C. Mannion

## METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1461

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Nickel 63 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | | | | | | |
| B12MB7 | R108081-01 | | | 7054-001 | U | |
| B12MB8 | R108081-02 | | | 7054-002 | U | |
| BLK (QC ID=39637) | R108081-04 | | | 7054-004 | U | |
| LCS (QC ID=39636) | R108081-03 | | | 7054-003 | ok | |
| Duplicate (R108081-01) | R108081-05 | | | 7054-005 | - | U |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 30 | |
| 200 Area RCRA Drilling Waste Desig. | | | | | | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-192 | 2σ prep error 10.0 % | | | | Reference Lab Notebook 6994 pg. 192 | | | | | | | | | | | |
| B12MB7 | R108081-01 | | | 2.0 | 0.500 | | | 89 | | 100 | | | 36 | 09/14/01 | 09/18 | LSC-007 |
| B12MB8 | R108081-02 | | | 2.0 | 0.500 | | | 88 | | 100 | | | 36 | 09/14/01 | 09/18 | LSC-007 |
| BLK (QC ID=39637) | R108081-04 | | | 1.9 | 0.500 | | | 93 | | 100 | | | | 09/14/01 | 09/18 | LSC-007 |
| LCS (QC ID=39636) | R108081-03 | | | 1.9 | 0.500 | | | 94 | | 100 | | | | 09/14/01 | 09/18 | LSC-007 |
| Duplicate (R108081-01) (QC ID=39638) | R108081-05 | | | 2.3 | 0.500 | | | 78 | | 100 | | | 36 | 09/14/01 | 09/18 | LSC-007 |
| Nominal values and limits from method | | | | 30 | 0.500 | | | 30-105 | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | NI63_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-431 | Nickel-63 Purification, rev 4 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 2.0 ± 0.33
YIELD 88 ± 13

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/03/01

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: R Fahlberg | Company Contact: D Weekes — Telephone No.: 372-9130 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area RCRA Drilling Waste Designation | Sampling Location: 200 East H1461 (7054) | SAF No.: B01-103 | Air Quality ☐ |
| Ice Chest No.: ERC 99.063 | Field Logbook No.: EL 1517-2 — COA JRCRA14114 ~~XL1013GHGR~~ RF 8-13-01 | Method of Shipment: Fed EX | |
| Shipped To: (TMA/RECRA) EBERline | Offsite Property No.: A010351 | Bill of Lading/Air Bill No.: 4238795 4 6477 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. RF | See item (2) in Special Instructions. 8-13-01 | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) RF 8-13-01 | See item (4) in Special Instructions. | See item (5) in Special Instructions. RF | PCBs - 8082 8-13-01 | See item (6) in Special Instructions. | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ B12MB7 | SOIL | 8-13-01 | 1110 | | | | | | | X | B12MB9 |
| ✓ B12MB8 | SOIL | 8-13-01 | 1138 | | | | | | | X | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Samples stored in Ref.# 2B at the 3728 Shipping Facility on 8/13/01. Collector not available to relinquish samples on 8/15/01 for shipment. RT 8-15-01

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From: R. Fahlberg R. Fahlberg — Date/Time: 8-13-01 1300 | Received By/Stored In: RF 2-B — Date/Time: 8-13-01 1300 | |
| Relinquished By/Removed From: RF 2B 3728 — Date/Time: 8-15-01 0900 | Received By/Stored In: R Thoren — Date/Time: 8-15-01 0900 | |
| Relinquished By/Removed From: R Thoren — Date/Time: 8-15-01 0900 | Received By/Stored In: FEDEX — Date/Time: 8-15-01 | |
| Relinquished By/Removed From: Fed EX — Date/Time: 8-16-01 1000 | Received By/Stored In: J Lind — Date/Time: 8-16-01 1000 | |
| Relinquished By/Removed From: — Date/Time: | Received By/Stored In: — Date/Time: | |
| Relinquished By/Removed From: — Date/Time: | Received By/Stored In: — Date/Time: | |

SPECIAL INSTRUCTIONS

~~(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}~~

(2) ~~Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470~~

(3) ~~IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030~~

(4) ~~Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene; Normal paraffin hydrocarbons (petroleum)}~~

(5) ~~Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) {Tributyl phosphate}~~

(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 – Total Sr; Technetium-99; Isotopic Uranium; Tritium - H3

RF 8-16-01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

ThermoRetec
Richmond Laboratory

Analytical Services

## SAMPLE RECEIPT CHECKLIST

### SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 8-16-2001 1000

CoC No. B01-103-05

Container I.D. No. ERC-99-063 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

### INSPECTION

1. Custody seals on shipping container intact? Yes [ ] No [ ] N/A [✓]
2. Custody seals on shipping container dated & signed? Yes [ ] No [ ] N/A [✓]
3. Custody seals on sample containers intact? Yes [ ] No [ ] N/A [✓]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 2 ~~9~~
7. Number of containers per sample: 1 (Or see CoC _____ )
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by James Lind Date: 8-16-01 Time: 1000

| Customer Sample No. | cpm | mr/hr | Customer Sample No. | Cpm | mr/hr |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B12MB7 | | | | | | |
| TCLP | 001 | S | 01LTO104 | 08/13/01 | 08/28/01 | 08/29/01 |
| ALUMINUM, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| ALUMINUM, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| ALUMINUM, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| BISMUTH, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| CALCIUM, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| CALCIUM, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| CALCIUM, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| COPPER, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| COPPER, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| COPPER, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| IRON, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| IRON, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| IRON, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| POTASSIUM, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| POTASSIUM, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| POTASSIUM, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MAGNESIUM, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MAGNESIUM, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MAGNESIUM, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MANGANESE, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MANGANESE, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MANGANESE, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MOLYBDENUM, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MOLYBDENUM, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MOLYBDENUM, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| SODIUM, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| SODIUM, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| SODIUM, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| TIN, TOTAL | 001 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| TIN, TOTAL | 001 REP | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| TIN, TOTAL | 001 MS | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| B12MB8 | | | | | | |
| TCLP | 002 | S | 01LTO104 | 08/13/01 | 08/28/01 | 08/29/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| ALUMINUM, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| BISMUTH, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| CALCIUM, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| COPPER, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| IRON, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| POTASSIUM, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MAGNESIUM, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MANGANESE, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| MOLYBDENUM, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| SODIUM, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| TIN, TOTAL | 002 | S | 01L0562 | 08/13/01 | 09/08/01 | 09/11/01 |
| B12MB7 | | | | | | |
| SILVER, TCLP LEACHAT | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| SILVER, TCLP LEACHAT | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| SILVER, TCLP LEACHAT | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| MERCURY, TCLP LEACHA | 003 | W | 01C0271 | 08/29/01 | 09/05/01 | 09/06/01 |
| NICKEL, TCLP LEACHAT | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| NICKEL, TCLP LEACHAT | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| NICKEL, TCLP LEACHAT | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ANTIMONY, TCLP LEACH | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ANTIMONY, TCLP LEACH | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| ANTIMONY, TCLP LEACH | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | 003 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | 003 REP | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | 003 MS | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| B12MB8 | | | | | | |
| SILVER, TCLP LEACHAT | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| MERCURY, TCLP LEACHA | 004 | W | 01C0271 | 08/29/01 | 09/05/01 | 09/06/01 |
| MERCURY, TCLP LEACHA | 004 REP | W | 01C0271 | 08/29/01 | 09/05/01 | 09/06/01 |
| MERCURY, TCLP LEACHA | 004 MS | W | 01C0271 | 08/29/01 | 09/05/01 | 09/06/01 |
| NICKEL, TCLP LEACHAT | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ANTIMONY, TCLP LEACH | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | 004 | W | 01L0544 | 08/29/01 | 08/30/01 | 08/30/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| ALUMINUM LABORTORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| ALUMINUM, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| BISMUTH, LCS | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| BISMUTH, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| CALCIUM LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| CALCIUM, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| COPPER LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| COPPER, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| IRON LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| IRON, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| POTASSIUM LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| POTASSIUM, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| MAGNESIUM LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| MAGNESIUM, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| MANGANESE LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| MANGANESE, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| MOLYBDENUM LABORATOR | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| MOLYBDENUM, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| SODIUM LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| SODIUM, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| TIN LABORATORY | LC1 BS | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| TIN, TOTAL | MB1 | S | 01L0562 | N/A | 09/08/01 | 09/11/01 |
| SILVER LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SILVER, TCLP LEACHAT | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SILVER, TCLP LEACHAT | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SILVER, TCLP LEACHAT | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BARIUM LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BARIUM, TCLP LEACHAT | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BERYLLIUM LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| BERYLLIUM, TCLP LEAC | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CADMIUM LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CADMIUM, TCLP LEACHA | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CHROMIUM LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| CHROMIUM, TCLP LEACH | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| MERCURY LABORATORY | LC1 BS | W | 01C0271 | N/A | 09/05/01 | 09/06/01 |
| MERCURY, TOTAL | MB1 | W | 01C0271 | N/A | 09/05/01 | 09/06/01 |
| MERCURY, TCLP LEACHA | MB2 | W | 01C0271 | N/A | 09/05/01 | 09/06/01 |
| MERCURY, TCLP LEACHA | MB3 | W | 01C0271 | N/A | 09/05/01 | 09/06/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| NICKEL LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| NICKEL, TCLP LEACHAT | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| NICKEL, TCLP LEACHAT | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| NICKEL, TCLP LEACHAT | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| LEAD LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| LEAD, TCLP LEACHATE | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ANTIMONY LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ANTIMONY, TCLP LEACH | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ANTIMONY, TCLP LEACH | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ANTIMONY, TCLP LEACH | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SELENIUM LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| SELENIUM, TCLP LEACH | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| VANADIUM LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| VANADIUM, TCLP LEACH | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ZINC LABORATORY | LC1 BS | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | MB1 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | MB2 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |
| ZINC, TCLP LEACHATE | MB3 | W | 01L0544 | N/A | 08/30/01 | 08/30/01 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client:** TNU-HANFORD B01-103
**LVL#:** 0108L587
**SDG/SAF#:** H1461/B01-103

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 08-16-01

## METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 soil samples and 2 TCLP leachate samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All TCLP leachate samples were reported with a six fold dilution for ICP analytes due to sample matrix.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The soil MB, 01L0562, result for Tin was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples for Tin read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.

Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| B12MB7 | Aluminum | 20,000 | 99.5 |
| | Iron | 20,000 | 106.9 |

12. The TCLP leachate duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. The TCLP extract from sample B12MB7 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

14. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

09-24-01
Date

gmb/m08-587

LVLI
LIONVILLE LABORATORY INC

# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 01081587

Leaching Procedure: __1310 ✓1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A ✓3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

## Metals Analysis Methods

| | SW846 | | EPA | | STD MTD | EPA OSWR | USATHAMA |
|---|---|---|---|---|---|---|---|
| Aluminum | ✓6010B | | __200.7 | | | | __99 |
| Antimony | ✓6010B | __7041 [5] | __200.7 | __204.2 | | | __99 |
| Arsenic | __6010B | __7060A [5] | __200.7 | __206.2 | __3113B | | __99 |
| Barium | ✓6010B | | __200.7 | | | | __99 |
| Beryllium | ✓6010B | | __200.7 | | | | __99 |
| Bismuth | ✓6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Boron | __6010B | | __200.7 | | | | __99 |
| Cadmium | ✓6010B | __7131A [5] | __200.7 | __213.2 | | | __99 |
| Calcium | ✓6010B | | __200.7 | | | | __99 |
| Chromium | ✓6010B | __7191 [5] | __200.7 | __218.2 | | | __SS17 |
| Cobalt | __6010B | | __200.7 | | | | __99 |
| Copper | ✓6010B | __7211 [5] | __200.7 | __220.2 | | | __99 |
| Iron | ✓6010B | | __200.7 | | | | __99 |
| Lead | ✓6010B | __7421 [5] | __200.7 | __239.2 | __3113B | | __99 |
| Lithium | __6010B | __7430 [4] | __200.7 | | | __1620 | __99 |
| Magnesium | ✓6010B | | __200.7 | | | | __99 |
| Manganese | ✓6010B | | __200.7 | | | | __99 |
| Mercury | ✓7470A [3] | __7471A [3] | __245.1 [2] | __245.5 [2] | | | __99 |
| Molybdenum | ✓6010B | | __200.7 | | | | __99 |
| Nickel | ✓6010B | | __200.7 | | | | __99 |
| Potassium | ✓6010B | __7610 [4] | __200.7 | __258.1 [4] | | | __99 |
| Rare Earths | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Selenium | ✓6010B | __7740 [5] | __200.7 | __270.2 | __3113B | | __99 |
| Silicon | __6010B [1] | | __200.7 | | | __1620 | __99 |
| Silica | __6010B | | __200.7 | | | __1620 | __99 |
| Silver | ✓6010B | __7761 [5] | __200.7 | __272.2 | | | __99 |
| Sodium | ✓6010B | __7770 [4] | __200.7 | __273.1 [4] | | | __99 |
| Strontium | __6010B | | __200.7 | | | | __99 |
| Thallium | __6010B | __7841 [5] | __200.7 | __279.2__200.9 | | | __99 |
| Tin | ✓6010B | | __200.7 | | | | __99 |
| Titanium | __6010B | | __200.7 | | | | __99 |
| Uranium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Vanadium | ✓6010B | | __200.7 | | | | __99 |
| Zinc | ✓6010B | | __200.7 | | | | __99 |
| Zirconium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |

08

Other:_____ Method:_____

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B12MB7 | Aluminum, Total | 7200 | MG/KG | 1.6 | 1.0 |
| | | Bismuth, Total | 0.31 u | MG/KG | 0.31 | 1.0 |
| | | Calcium, Total | 6680 | MG/KG | 0.78 | 1.0 |
| | | Copper, Total | 12.1 | MG/KG | 0.05 | 1.0 |
| | | Iron, Total | 19500 | MG/KG | 1.6 | 1.0 |
| | | Potassium, Total | 1230 | MG/KG | 1.1 | 1.0 |
| | | Magnesium, Total | 4840 | MG/KG | 0.80 | 1.0 |
| | | Manganese, Total | 285 | MG/KG | 0.01 | 1.0 |
| | | Molybdenum, Total | 1.0 | MG/KG | 0.10 | 1.0 |
| | | Sodium, Total | 428 | MG/KG | 0.16 | 1.0 |
| | | Tin, Total | 1.8 | MG/KG | 0.39 | 1.0 |
| -002 | B12MB8 | Aluminum, Total | 5210 | MG/KG | 1.6 | 1.0 |
| | | Bismuth, Total | 0.32 u | MG/KG | 0.32 | 1.0 |
| | | Calcium, Total | 4470 | MG/KG | 0.80 | 1.0 |
| | | Copper, Total | 12.7 | MG/KG | 0.05 | 1.0 |
| | | Iron, Total | 16200 | MG/KG | 1.6 | 1.0 |
| | | Potassium, Total | 643 | MG/KG | 1.1 | 1.0 |
| | | Magnesium, Total | 2720 | MG/KG | 0.82 | 1.0 |
| | | Manganese, Total | 213 | MG/KG | 0.01 | 1.0 |
| | | Molybdenum, Total | 1.5 | MG/KG | 0.10 | 1.0 |
| | | Sodium, Total | 526 | MG/KG | 0.16 | 1.0 |
| | | Tin, Total | 3.5 | MG/KG | 0.40 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -003 | B12MB7 | Silver, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Barium, TCLP Leachate | 599 | | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Mercury, TCLP Leachate | 0.10 | u | UG/L | 0.10 | 1.0 |
| | | Nickel, TCLP Leachate | 17.8 | | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 | u | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 13.8 | u | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 21.5 | | UG/L | 2.4 | 6.0 |
| -004 | B12MB8 | Silver, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Barium, TCLP Leachate | 289 | | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Mercury, TCLP Leachate | 0.10 | u | UG/L | 0.10 | 1.0 |
| | | Nickel, TCLP Leachate | 10.2 | u | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 20.0 | | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 16.9 | | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 2240 | | UG/L | 2.4 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/17/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK1 | 01L0562-MB1 | Aluminum, Total | 2.1 | | MG/KG | 1.6 | 1.0 |
| | | Bismuth, Total | 0.31 | u | MG/KG | 0.31 | 1.0 |
| | | Calcium, Total | 3.0 | | MG/KG | 0.78 | 1.0 |
| | | Copper, Total | 0.05 | | MG/KG | 0.05 | 1.0 |
| | | Iron, Total | 6.3 | | MG/KG | 1.6 | 1.0 |
| | | Potassium, Total | 2.2 | | MG/KG | 1.1 | 1.0 |
| | | Magnesium, Total | 0.95 | | MG/KG | 0.80 | 1.0 |
| | | Manganese, Total | 0.02 | | MG/KG | 0.01 | 1.0 |
| | | Molybdenum, Total | 0.10 | u | MG/KG | 0.10 | 1.0 |
| | | Sodium, Total | 9.7 | | MG/KG | 0.16 | 1.0 |
| | | Tin, Total | 1.4 | | MG/KG | 0.39 | 1.0 |
| BLANK1 | 01L0544-MB1 | Silver, TCLP Leachate | 0.50 | u | UG/L | 0.50 | 1.0 |
| | | Barium, TCLP Leachate | 0.49 | | UG/L | 0.10 | 1.0 |
| | | Beryllium,TCLP Leachate | 0.20 | u | UG/L | 0.20 | 1.0 |
| | | Cadmium, TCLP Leachate | 0.30 | u | UG/L | 0.30 | 1.0 |
| | | Chromium, TCLP Leachate | 1.4 | u | UG/L | 1.4 | 1.0 |
| | | Nickel, TCLP Leachate | 1.7 | u | UG/L | 1.7 | 1.0 |
| | | Lead, TCLP Leachate | 2.4 | u | UG/L | 2.4 | 1.0 |
| | | Antimony, TCLP Leachate | 2.3 | u | UG/L | 2.3 | 1.0 |
| | | Selenium, TCLP Leachate | 3.2 | | UG/L | 3.2 | 1.0 |
| | | Vanadium, TCLP Leachate | 0.50 | u | UG/L | 0.50 | 1.0 |
| | | Zinc, TCLP Leachate | 2.7 | | UG/L | 0.40 | 1.0 |
| BLANK2 | 01L0544-MB2 | Silver, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Barium, TCLP Leachate | 1.4 | | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Nickel, TCLP Leachate | 10.2 | u | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 | u | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 13.8 | u | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 6.0 | | UG/L | 2.4 | 6.0 |
| BLANK3 | 01L0544-MB3 | Silver, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Barium, TCLP Leachate | 1.7 | | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |

Lionville Laboratory, Inc.

*INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/17/01*

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK3 | 01L0544-MB3 | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Nickel, TCLP Leachate | 10.2 | u | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 | u | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 13.8 | u | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 5.8 | | UG/L | 2.4 | 6.0 |
| BLANK1 | 01C0271-MB1 | Mercury, Total | 0.10 | u | UG/L | 0.10 | 1.0 |
| BLANK2 | 01C0271-MB2 | Mercury, TCLP Leachate | 0.10 | u | UG/L | 0.10 | 1.0 |
| BLANK3 | 01C0271-MB3 | Mercury, TCLP Leachate | 1.3 | | UG/L | 0.10 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/17/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B12MB7 | Aluminum, Total | 7730 | 7200 | 201 | 263.7* | 1.0 |
| | | Calcium, Total | 9380 | 6680 | 2510 | 107.4 | 1.0 |
| | | Copper, Total | 33.3 | 12.1 | 25.1 | 84.5 | 1.0 |
| | | Iron, Total | 18500 | 19500 | 100 | -1100. * | 1.0 |
| | | Potassium, Total | 3770 | 1230 | 2510 | 100.9 | 1.0 |
| | | Magnesium, Total | 7190 | 4840 | 2510 | 93.4 | 1.0 |
| | | Manganese, Total | 329 | 285 | 50.2 | 88.2* | 1.0 |
| | | Molybdenum, Total | 91.9 | 1.0 | 100 | 90.4 | 1.0 |
| | | Sodium, Total | 2880 | 428 | 2510 | 97.4 | 1.0 |
| | | Tin, Total | 92.6 | 1.8 | 100 | 90.3 | 1.0 |
| -003 | B12MB7 | Silver, TCLP Leachate | 4660 | 3.0 u | 5000 | 93.2 | 6.0 |
| | | Barium, TCLP Leachate | 97100 | 599 | 100000 | 96.5 | 6.0 |
| | | Beryllium, TCLP Leacha | 1020 | 1.2 u | 1000 | 102.4 | 6.0 |
| | | Cadmium, TCLP Leachate | 998 | 1.8 u | 1000 | 99.8 | 6.0 |
| | | Chromium, TCLP Leachat | 5020 | 8.4 u | 5000 | 100.3 | 6.0 |
| | | Nickel, TCLP Leachate | 1040 | 17.8 | 1000 | 102.0 | 6.0 |
| | | Lead, TCLP Leachate | 4960 | 14.4 u | 5000 | 99.2 | 6.0 |
| | | Antimony, TCLP Leachat | 1030 | 13.8 u | 1000 | 103.2 | 6.0 |
| | | Selenium, TCLP Leachat | 1020 | 19.2 u | 1000 | 102.2 | 6.0 |
| | | Vanadium, TCLP Leachat | 1010 | 3.0 u | 1000 | 101.4 | 6.0 |
| | | Zinc, TCLP Leachate | 1060 | 21.5 | 1000 | 103.5 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/17/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108LS87

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -004 | B12MB8 | Mercury, TCLP Leachate | 148 | 0.10u | 200 | 74.0 | 50.0 |

Lionville Laboratory, Inc.

*INORGANICS PRECISION REPORT 09/17/01*

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B12MB7 | Aluminum, Total | 7200 | 7220 | 0.35 | 1.0 |
| | | Calcium, Total | 6680 | 6860 | 2.6 | 1.0 |
| | | Copper, Total | 12.1 | 11.2 | 7.7 | 1.0 |
| | | Iron, Total | 19500 | 18700 | 4.4 | 1.0 |
| | | Potassium, Total | 1230 | 1320 | 6.4 | 1.0 |
| | | Magnesium, Total | 4840 | 4820 | 0.45 | 1.0 |
| | | Manganese, Total | 285 | 283 | 0.70 | 1.0 |
| | | Molybdenum, Total | 1.0 | 0.85 | 15.8 | 1.0 |
| | | Sodium, Total | 428 | 425 | 0.89 | 1.0 |
| | | Tin, Total | 1.8 | 1.6 | 11.8 | 1.0 |
| -003REP | B12MB7 | Silver, TCLP Leachate | 3.0 u | 3.0 u | NC | 6.0 |
| | | Barium, TCLP Leachate | 599 | 602 | 0.53 | 6.0 |
| | | Beryllium TCLP Leachate | 1.2 u | 1.2 u | NC | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 u | 1.8 u | NC | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 u | 8.4 u | NC | 6.0 |
| | | Nickel, Leachate | 17.8 | 25.9 | 37.1 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 u | 14.4 u | NC | 6.0 |
| | | Antimony, Leachate | 13.8 u | 13.8 u | NC | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 u | 19.2 u | NC | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 u | 3.0 u | NC | 6.0 |
| | | Zinc, Leachate | 21.5 | 16.7 | 25.1 | 6.0 |

Lionville Laboratory, Inc.

*INORGANICS PRECISION REPORT 09/17/01*

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -004REP | B12MB8 | Mercury, TCLP Leachate | 0.10u | 0.10u | NC | 1.0 |

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/17/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 01L0562-LC1 | Aluminum, LCS | 496 | 500 | MG/KG | 99.1 |
| | | Bismuth, LCS | 484 | 500 | MG/KG | 96.9 |
| | | Calcium, LCS | 2430 | 2500 | MG/KG | 97.1 |
| | | Copper, LCS | 123 | 125 | MG/KG | 98.1 |
| | | Iron, LCS | 493 | 500 | MG/KG | 98.6 |
| | | Potassium, LCS | 2520 | 2500 | MG/KG | 100.8 |
| | | Magnesium, LCS | 2500 | 2500 | MG/KG | 99.8 |
| | | Manganese, LCS | 75.5 | 75.0 | MG/KG | 100.7 |
| | | Molybdenum, LCS | 494 | 500 | MG/KG | 98.8 |
| | | Sodium, LCS | 2450 | 2500 | MG/KG | 98.0 |
| | | Tin, LCS | 489 | 500 | MG/KG | 97.8 |
| LCS1 | 01L0544-LC1 | Silver, LCS | 497 | 500 | UG/L | 99.4 |
| | | Barium, LCS | 4910 | 5000 | UG/L | 98.1 |
| | | Beryllium, LCS | 252 | 250 | UG/L | 100.9 |
| | | Cadmium, LCS | 249 | 250 | UG/L | 99.6 |
| | | Chromium, LCS | 509 | 500 | UG/L | 101.9 |
| | | Nickel, LCS | 2000 | 2000 | UG/L | 100.0 |
| | | Lead, LCS | 2440 | 2500 | UG/L | 97.7 |
| | | Antimony, LCS | 2980 | 3000 | UG/L | 99.3 |
| | | Selenium, LCS | 9410 | 10000 | UG/L | 94.1 |
| | | Vanadium, LCS | 2580 | 2500 | UG/L | 103.2 |
| | | Zinc, LCS | 1000 | 1000 | UG/L | 100.2 |
| LCS1 | 01C0271-LC1 | Mercury, LCS | 4.9 | 5.0 | UG/L | 98.3 |

Lionville Laboratory Use Only
0108L587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TRU-Hanford Bol-103
Est. Final Proj. Sampling Date:
Project #: 11343-6000.001.9999.00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day

Date Rec'd: 8-16-01 Date Due: 9-15-01

| | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container (Solid) | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume (Solid) | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 50 | |
| Preservatives | - | - | - | | - | | - | - | | - | - | | | - | |
| ANALYSES REQUESTED | VOA | BNA | Pest/PCB | Herb | TIC Gen Chem | | TCLP Met | Metal | CN | | IC | | | TCO | |
| | ORGANIC | | | | | | | INORG | | | | | | | |
| Lionville Laboratory Use Only | OLC24H | OLC25X | OPCB | | ODPO OGPO | | ITCLP | Met(1) | | ICPO | Inorg(1) | | | Met(2) | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | OLC24H | OLC25X | OPCB | | ODPO OGPO | | ITCLP | Met(1) | | ICPO | Inorg(1) | | | Met(2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish | 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| | 002 | 1 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| | 003 | 1 7 tclp of 001 | | | L | 1 | 1 | | | | | | | | | | | | | | ✓ |
| | 004 | 1 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ |

Special Instructions: Sof Bol-103
Run Matrix QC
* See lab chron

DATE/REVISIONS:
Met(1) 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg(1) 2. TCNO2, TCNO3, TDH3N, TCNTO, TPH,
1 3. TSED
Met(2) 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | [illegible] | 8-17-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE | | ORIGINAL | |

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # SEE below
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 4.4° °C

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>R Fahlberg | Company Contact<br>D Weekes | Telephone No.<br>372-9130 | Project Coordinator<br>TRENT, SJ | Price Code 8N<br>Air Quality ☐ | Data Turnaround<br>45 Days |
| Project Designation<br>200 Area RCRA Drilling Waste Designation | Sampling Location<br>200 East | | SAF No.<br>B01-103 | | |
| Ice Chest No. ERC 96-036 | Field Logbook No.<br>EL 1517-2 | COA JRCRA14114<br>~~XL1013GHGR~~ RF 8-13-01 | Method of Shipment<br>Fed EX | | |
| Shipped To<br>TMA/RECRA | Offsite Property No. A010323 | | Bill of Lading/Air Bill No. 42357954 - 6461 | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref. ZB at the 3728 Shipping Facility on 8/13/01. Collector not available to relinquish samples on 8/15/01 for shipment. RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RT 8-15-01 | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| B12MB7 | SOIL | 8-13-01 | 1110 | X | X | X | X | X | X | X | X | | B12MB9 |
| B12MB8 | SOIL | 8-13-01 | 1138 | X | X | X | X | X | X | X | X | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R.Fahlberg / R.Fahlberg | 8-13-01 1300 | RAF 2B | 8-13-01 1300 |
| RAF 2B | 8-15-01 0900 | R Thore | 8-15-01 0900 |
| R Thore | 8-15-01 0900 | FEDEX | |
| FEDEX | 8-16-01 9:40 | Carlos Ramos | 8-16-01 9:40 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total-U; Technetium-99; Isotopic Uranium; Tritium-H3~~ RT 8-15-01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B12MB7 | 001 | S | 01LE0967 | 08/13/01 | 08/17/01 | 08/28/01 |
| B12MB8 | 002 | S | 01LE0967 | 08/13/01 | 08/17/01 | 08/28/01 |
| B12MB8 | 002 MS | S | 01LE0967 | 08/13/01 | 08/17/01 | 08/28/01 |
| B12MB8 | 002 MSD | S | 01LE0967 | 08/13/01 | 08/17/01 | 08/28/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SBLKDY | MB1 | S | 01LE0967 | N/A | 08/17/01 | 08/28/01 |
| SBLKDY | MB1 BS | S | 01LE0967 | N/A | 08/17/01 | 08/28/01 |

LIONVILLE LABORATORY INC.

**Client:** TNU-HANFORD B01-103
**LVL #:** 0108L587
**SDG/SAF #:** H1461/B01-103

**W.O. #:** 11343-606-001-9999-00
**Date Received:** 08-16-2001

**SEMIVOLATILE**

Two (2) soil samples were collected on 08-13-2001.

The samples and their associated QC samples were extracted on 08-17-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 08-28-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The samples were extracted and analyzed within required holding times.

3. Non-target compounds were detected in these samples.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.

7. Internal standard area and retention time criteria were met.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
President
Lionville Laboratory Incorporated

9/13/01
Date

pef\gorup\data\bna\tnu-hanford-0108-587.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.



208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

## GLOSSARY OF BNA DATA

### DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture. |
| J | = | Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| D | = | Identifies all compounds identified in an analysis at a secondary dilution factor. |
| I | = | Interference. |
| NQ | = | Result qualitatively confirmed but not able to quantify. |
| A | = | Indicates that a TIC is a suspected aldol-condensation product. |
| N | = | Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used. |
| X | = | This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard). |
| Y | = | Additional qualifiers used as required are explained in the case narrative. |

## GLOSSARY OF BNA DATA

### ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

LEONVILLE LABORATORY INC

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

**MP** - Missed Peak: manually added peak not found by automatic quantitation program.

**PA** - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

**RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

**SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

**CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

**PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.
Semivolatiles by GC/MS, Special List

RFW Batch Number: 0108L587 Client: THUHANFORD B01-103 H1461 Work Order: 11343606001 Report Date: 12/12/01 07:33 Page: 1a

| | Cust ID: | B12MB7 | | B12MB8 | | B12MB8 | | B12MB8 | | SBLKDY | | SBLKDY BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 002 | | 002 MS | | 002 MSD | | 01LK0967-MB1 | | 01LK0967-MB1 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | |
| Surrogate Recovery | Nitrobenzene-d5 | 63 | % | 76 | % | 64 | % | 60 | % | 84 | % | 87 | % |
| | 2-Fluorobiphenyl | 73 | % | 76 | % | 66 | % | 62 | % | 88 | % | 92 | % |
| | p-Terphenyl-d14 | 93 | % | 98 | % | 89 | % | 87 | % | 107 | % | 102 | % |
| | Phenol-d5 | 59 | % | 68 | % | 61 | % | 52 | % | 77 | % | 78 | % |
| | 2-Fluorophenol | 55 | % | 70 | % | 59 | % | 50 | % | 75 | % | 77 | % |
| | 2,4,6-Tribromophenol | 81 | % | 80 | % | 72 | % | 78 | % | 89 | % | 94 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Phenol | | 340 | U | 350 | U | 58 | % | 50 | % | 330 | U | 77 | % |
| bis(2-Chloroethyl)ether | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Chlorophenol | | 340 | U | 350 | U | 58 | % | 52 | % | 330 | U | 80 | % |
| 1,3-Dichlorobenzene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 1,4-Dichlorobenzene | | 340 | U | 350 | U | 54 | % | 47 | % | 330 | U | 80 | % |
| 1,2-Dichlorobenzene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Methylphenol | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,2'-oxybis(1-Chloropropane) | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 3- and/or 4-Methylphenol | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| N-Nitroso-Di-n-propylamine | | 340 | U | 350 | U | 64 | % | 57 | % | 330 | U | 83 | % |
| Hexachloroethane | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Nitrobenzene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Isophorone | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Nitrophenol | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dimethylphenol | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| bis(2-Chloroethoxy)methane | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dichlorophenol | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 1,2,4-Trichlorobenzene | | 340 | U | 350 | U | 59 | % | 53 | % | 330 | U | 86 | % |
| Naphthalene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Chloroaniline | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorobutadiene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Chloro-3-methylphenol | | 340 | U | 350 | U | 62 | % | 60 | % | 330 | U | 84 | % |
| 2-Methylnaphthalene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorocyclopentadiene | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4,6-Trichlorophenol | | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4,5-Trichlorophenol | | 840 | U | 870 | U | 870 | U | 870 | U | 830 | U | 830 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0108L587 Client: TNUHANFORD S01-103 H1461 Work Order: 11343606001 Page: 1b

| Cust ID: | B12MB7 | | B12MB8 | | B12MB8 | | B12MB8 | | SBLKDY | | SBLKDY BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 001 | | 002 | | 002 MS | | 002 MSD | | 01LE0967-MB1 | | 01LE0967-MB1 | |
| 2-Chloronaphthalene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Nitroaniline | 840 | U | 870 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| Dimethylphthalate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Acenaphthylene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,6-Dinitrotoluene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 3-Nitroaniline | 840 | U | 870 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| Acenaphthene | 340 | U | 350 | U | 67 | % | 63 | % | 330 | U | 88 | % |
| 2,4-Dinitrophenol | 840 | U | 870 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| 4-Nitrophenol | 840 | U | 870 | U | 57 | % | 65 | % | 830 | U | 72 | % |
| Dibenzofuran | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dinitrotoluene | 340 | U | 350 | U | 71 | % | 73 | % | 330 | U | 90 * | % |
| Diethylphthalate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Chlorophenyl-phenylether | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Fluorene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Nitroaniline | 840 | U | 870 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| 4,6-Dinitro-2-methylphenol | 840 | U | 870 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| N-Nitrosodiphenylamine (1) | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Bromophenyl-phenylether | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorobenzene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Pentachlorophenol | 840 | U | 870 | U | 56 | % | 69 | % | 830 | U | 81 | % |
| Phenanthrene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Anthracene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Carbazole | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Di-n-Butylphthalate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Fluoranthene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Pyrene | 340 | U | 350 | U | 75 | % | 74 | % | 330 | U | 90 | % |
| Butylbenzylphthalate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 3,3'-Dichlorobenzidine | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(a)anthracene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Chrysene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| bis(2-Ethylhexyl)phthalate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Di-n-Octyl phthalate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(b)fluoranthene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(k)fluoranthene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(a)pyrene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Indeno(1,2,3-cd)pyrene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Dibenzo(a,h)anthracene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(g,h,i)perylene | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Tributylphosphate | 340 | U | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B12MB7

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-103 H1461

Matrix: (soil/water) SOIL

Lab Sample ID: 0108L587-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: C082810

Level: (low/med) LOW

Date Received: 08/16/01

% Moisture: 1 decanted: (Y/N)__

Date Extracted: 08/17/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/28/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 7.593 | 100 | J |
| 2. | ALKANE | 9.622 | 100 | J |
| 3. | UNKNOWN | 25.942 | 100 | J |

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B12MB8

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-103 H1461

Matrix: (soil/water) SOIL

Lab Sample ID: 0108L587-002

Sample wt/vol: 30.1 (g/mL) G

Lab File ID: C082811

Level: (low/med) LOW

Date Received: 08/16/01

% Moisture: 4 decanted: (Y/N)__

Date Extracted: 08/17/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/28/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 7.59 | 100 | J |

FORM 1 SV-TIC 3/90

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKDY

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-103 H1461

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE0967-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: C082808

Level: (low/med) LOW

Date Received: 08/17/01

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 08/17/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/28/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: _____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

Lionville Laboratory Use Only: 0108L587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI — Lionville Laboratory Inc.

Client: TNU- Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-6006-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | 2 | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | 0 | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 5 | |
| Preservatives | | - | - | - | | - | | - | - | | - | - | | | 0 | |
| ANALYSES REQUESTED | | ORGANIC: VOA | BNA | Pest/PCB | Herb | Alc. Ext. | | TCLP Met. | INORG: Metal | CN | | HC | | | ICP Met. | |

Lionville Laboratory Use Only

| MATRIX CODES | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | OLA24H | OLA25X | OPCB | | ODRO OGRO | | ITCLP | Met① | | ICPA0 | Inorg① | | | Met② |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil | 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| SE - Sediment | 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| SO - Solid | 003 | 7 tclp of 001 | | | L | * | | | | | | | | | | | | | | | ✓ |
| SL - Sludge | 004 | 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ |
| W - Water | | | | | | | | | | | | | | | | | | | | | |
| O - Oil | | | | | | | | | | | | | | | | | | | | | |
| A - Air | | | | | | | | | | | | | | | | | | | | | |
| DS - Drum Solids | | | | | | | | | | | | | | | | | | | | | |
| DL - Drum Liquids | | | | | | | | | | | | | | | | | | | | | |
| L - EP/TCLP Leachate | | | | | | | | | | | | | | | | | | | | | |
| Wi - Wipe | | | | | | | | | | | | | | | | | | | | | |
| X - Other | | | | | | | | | | | | | | | | | | | | | |
| F - Fish | | | | | | | | | | | | | | | | | | | | | |

Special Instructions: Saf B01-103
Run Matrix QC
* See lab chron

DATE/REVISIONS:
Met① 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg① 2. ICNO2, ICNO3, INH3N, ICNTO, IPH,
1 3. ISED
Met② 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # SEE below
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hunt | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL DOWNITTER | | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 5461

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 2 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: R Fahlberg | Company Contact: D Weekes — Telephone No.: 372-9130 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area RCRA Drilling Waste Designation | Sampling Location: 200 East | SAF No.: B01-103 | Air Quality ☐ |
| Ice Chest No.: ERC 96-036 | Field Logbook No.: EL 1517-2 — COA JRCRA14114 ~~XL1013GHGR~~ RF 8-13-01 | Method of Shipment: Fed EX | |
| Shipped To: TMA/RECRA | Offsite Property No.: A010323 | Bill of Lading/Air Bill No.: 4235 7954 — 6461 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref. #2B at the 3728 Shipping Facility on 8/13/01. Collector not available to relinquish samples on 8/15/01 for shipment. RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RF 8-13-01 | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| B12MB7 | SOIL | 8-13-01 | 1110 | X | X | X | X | X | X | X | X | | B12MB9 |
| B12MB8 | SOIL | 8-13-01 | 1138 | X | X | X | X | X | X | X | X | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg / R. Fahlberg | 8-13-01 1300 | RaF 2-B | 8-13-01 1300 |
| RF 2B | 8-15-01 0900 | R Thore | 8-15-01 0900 |
| R Thore | 8-15-01 0900 | FEDEX | |
| FEDEX | 8-16-01 9:40 | Carla Bonny | 8-16-01 9:40 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec -- Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241, Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Isotopic Uranium, Tritium-H3~~ 8-15-01 RT

**Matrix ***
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

LIONVILLE LABORATORY INC.

Analytical Report

**Client:** TNU-HANFORD B01-103
**LVL#:** 0108L587
**SDG/SAF#:** H1461/B01-103

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 08-16-01

****Revision****

## METALS CASE NARRATIVE

This report has been revised to include the addition of Arsenic.

1. This narrative covers the analyses of 2 soil samples and 2 TCLP leachate samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All TCLP leachate samples were reported with a six fold dilution for ICP analytes due to sample matrix.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The soil MB, 01L0562, result for Tin was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples for Tin read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

8. All ICP Interference Check Standards were within control limits.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.



208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| B12MB7 | Aluminum | 20,000 | 99.5 |
| | Iron | 20,000 | 106.9 |

12. The TCLP leachate duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. The TCLP extract from samples B12MB7 for ICP analytes and B12MB8 for Mercury were selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

14. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11-28-01
Date

gmb/m08-587r

LVLI
LIONVILLE LABORATORY INC.

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01PM 645

Initiator: C Johnson Batch: 01082587 Parameter: Metals
Date: 11/16/01 Samples: All Matrix: soil
Client: TNx Hanford H1461 Method: SW846/MCAWW/CLP/ Prep Batch: _____

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error ✓ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

**2. Known or Probable Causes(s)**

**3. Discussion and Proposed Action** Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Add Arsenic TCLP

**4. Project Manager Instructions**...signature/date: Frank Johnson 11/16/01

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

**5. Final Action**...signature/date: [illegible] 11/26/01 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative [illegible] 11/28/01
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

**When Final Action has been recorded, forward original to QA Specialist for distribution and filing.**

| Route | Distribution of Completed SDR | Route | Distribution of Completed SDR |
|---|---|---|---|
| __ | X Initiator | 2 | __ Metals: Beegle |
| __ | X Lab General Manager: M. Taylor | __ | __ Inorganic: Perrone |
| __ | X Project Mgr: Stone/Johnson/Haslett | __ | __ GC/LC: Kiger |
| __ | X Technical Mgr: Wesson/Daniels | __ | __ MS: Rychlak/Layman |
| __ | X QA (file): Alberts | 1 | ✓ Log-in: Keppel [illegible] |
| __ | __ Data Management: Feldman | __ | __ Admin: Soos |
| __ | __ Sample Prep: Beegle/Kiger | __ | __ Other: _____ |

# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0108L587

Leaching Procedure: __1310 ✓1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A ✓3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

## Metals Analysis Methods

| | SW846 | | EPA | | STD MTD | EPA OSWR | USATHAMA |
|---|---|---|---|---|---|---|---|
| Aluminum | ✓6010B | | __200.7 | | | | __99 |
| Antimony | ✓6010B | __7041 [5] | __200.7 | __204.2 | | | __99 |
| Arsenic | ✓6010B | __7060A [5] | __200.7 | __206.2 | __3113B | | __99 |
| Barium | ✓6010B | | __200.7 | | | | __99 |
| Beryllium | ✓6010B | | __200.7 | | | | __99 |
| Bismuth | ✓6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Boron | ✓6010B | | __200.7 | | | | __99 |
| Cadmium | ✓6010B | __7131A [5] | __200.7 | __213.2 | | | __99 |
| Calcium | ✓6010B | | __200.7 | | | | __99 |
| Chromium | ✓6010B | __7191 [5] | __200.7 | __218.2 | | | __SS17 |
| Cobalt | ✓6010B | | __200.7 | | | | __99 |
| Copper | ✓6010B | __7211 [5] | __200.7 | __220.2 | | | __99 |
| Iron | ✓6010B | | __200.7 | | | | __99 |
| Lead | ✓6010B | __7421 [5] | __200.7 | __239.2 | __3113B | | __99 |
| Lithium | ✓6010B | __7430 [4] | __200.7 | | | __1620 | __99 |
| Magnesium | ✓6010B | | __200.7 | | | | __99 |
| Manganese | ✓6010B | | __200.7 | | | | __99 |
| Mercury | ✓7470A [3] | __7471A [3] | __245.1 [2] | __245.5 [2] | | | __99 |
| Molybdenum | ✓6010B | | __200.7 | | | | __99 |
| Nickel | ✓6010B | | __200.7 | | | | __99 |
| Potassium | ✓6010B | __7610 [4] | __200.7 | __258.1 [4] | | | __99 |
| Rare Earths | ✓6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Selenium | ✓6010B | __7740 [5] | __200.7 | __270.2 | __3113B | | __99 |
| Silicon | __6010B [1] | | __200.7 | | | __1620 | __99 |
| Silica | __6010B | | __200.7 | | | __1620 | __99 |
| Silver | ✓6010B | __7761 [5] | __200.7 | __272.2 | | | __99 |
| Sodium | ✓6010B | __7770 [4] | __200.7 | __273.1 [4] | | | __99 |
| Strontium | __6010B | | __200.7 | | | | __99 |
| Thallium | ✓6010B | __7841 [5] | __200.7 | __279.2__200.9 | | | __99 |
| Tin | ✓6010B | | __200.7 | | | | __99 |
| Titanium | __6010B | | __200.7 | | | | __99 |
| Uranium | ✓6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| Vanadium | ✓6010B | | __200.7 | | | | __99 |
| Zinc | ✓6010B | | __200.7 | | | | __99 |
| Zirconium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |

Other:_____ Method:_____

L-W1-033/M-03/01

## METHOD REFERENCES AND DATA QUALIFIERS

### DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

### Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

### ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

### ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B12MB7 | Aluminum, Total | 7200 | MG/KG | 1.6 | 1.0 |
| | | Bismuth, Total | 0.31 u | MG/KG | 0.31 | 1.0 |
| | | Calcium, Total | 6680 | MG/KG | 0.78 | 1.0 |
| | | Copper, Total | 12.1 | MG/KG | 0.05 | 1.0 |
| | | Iron, Total | 19500 | MG/KG | 1.6 | 1.0 |
| | | Potassium, Total | 1230 | MG/KG | 1.1 | 1.0 |
| | | Magnesium, Total | 4840 | MG/KG | 0.80 | 1.0 |
| | | Manganese, Total | 285 | MG/KG | 0.01 | 1.0 |
| | | Molybdenum, Total | 1.0 | MG/KG | 0.10 | 1.0 |
| | | Sodium, Total | 428 | MG/KG | 0.16 | 1.0 |
| | | Tin, Total | 1.8 | MG/KG | 0.39 | 1.0 |
| -002 | B12MB8 | Aluminum, Total | 5210 | MG/KG | 1.6 | 1.0 |
| | | Bismuth, Total | 0.32 u | MG/KG | 0.32 | 1.0 |
| | | Calcium, Total | 4470 | MG/KG | 0.80 | 1.0 |
| | | Copper, Total | 12.7 | MG/KG | 0.05 | 1.0 |
| | | Iron, Total | 16200 | MG/KG | 1.6 | 1.0 |
| | | Potassium, Total | 643 | MG/KG | 1.1 | 1.0 |
| | | Magnesium, Total | 2720 | MG/KG | 0.82 | 1.0 |
| | | Manganese, Total | 213 | MG/KG | 0.01 | 1.0 |
| | | Molybdenum, Total | 1.5 | MG/KG | 0.10 | 1.0 |
| | | Sodium, Total | 526 | MG/KG | 0.16 | 1.0 |
| | | Tin, Total | 3.5 | MG/KG | 0.40 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -003 | B12MB7 | Silver, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Arsenic, TCLP Leachate | 23.4 | u | UG/L | 23.4 | 6.0 |
| | | Barium, TCLP Leachate | 599 | | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Mercury, TCLP Leachate | 0.10 | u | UG/L | 0.10 | 1.0 |
| | | Nickel, TCLP Leachate | 17.8 | | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 | u | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 13.8 | u | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 21.5 | | UG/L | 2.4 | 6.0 |
| -004 | B12MB8 | Silver, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Arsenic, TCLP Leachate | 23.4 | u | UG/L | 23.4 | 6.0 |
| | | Barium, TCLP Leachate | 289 | | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Mercury, TCLP Leachate | 0.10 | u | UG/L | 0.10 | 1.0 |
| | | Nickel, TCLP Leachate | 10.2 | u | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 20.0 | | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 16.9 | | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 2240 | | UG/L | 2.4 | 6.0 |

*Lionville Laboratory, Inc.*

*INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/28/01*

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| BLANK1 | 01L0562-MB1 | Aluminum, Total | 2.1 | MG/KG | 1.6 | 1.0 |
| | | Bismuth, Total | 0.31 u | MG/KG | 0.31 | 1.0 |
| | | Calcium, Total | 3.0 | MG/KG | 0.78 | 1.0 |
| | | Copper, Total | 0.05 | MG/KG | 0.05 | 1.0 |
| | | Iron, Total | 6.3 | MG/KG | 1.6 | 1.0 |
| | | Potassium, Total | 2.2 | MG/KG | 1.1 | 1.0 |
| | | Magnesium, Total | 0.95 | MG/KG | 0.80 | 1.0 |
| | | Manganese, Total | 0.02 | MG/KG | 0.01 | 1.0 |
| | | Molybdenum, Total | 0.10 u | MG/KG | 0.10 | 1.0 |
| | | Sodium, Total | 9.7 | MG/KG | 0.16 | 1.0 |
| | | Tin, Total | 1.4 | MG/KG | 0.39 | 1.0 |
| BLANK1 | 01L0544-MB1 | Silver, TCLP Leachate | 0.50 u | UG/L | 0.50 | 1.0 |
| | | Arsenic, TCLP Leachate | 3.9 u | UG/L | 3.9 | 1.0 |
| | | Barium, TCLP Leachate | 0.49 | UG/L | 0.10 | 1.0 |
| | | Beryllium,TCLP Leachate | 0.20 u | UG/L | 0.20 | 1.0 |
| | | Cadmium, TCLP Leachate | 0.30 u | UG/L | 0.30 | 1.0 |
| | | Chromium, TCLP Leachate | 1.4 u | UG/L | 1.4 | 1.0 |
| | | Nickel, TCLP Leachate | 1.7 u | UG/L | 1.7 | 1.0 |
| | | Lead, TCLP Leachate | 2.4 u | UG/L | 2.4 | 1.0 |
| | | Antimony, TCLP Leachate | 2.3 u | UG/L | 2.3 | 1.0 |
| | | Selenium, TCLP Leachate | 3.2 | UG/L | 3.2 | 1.0 |
| | | Vanadium, TCLP Leachate | 0.50 u | UG/L | 0.50 | 1.0 |
| | | Zinc, TCLP Leachate | 2.7 | UG/L | 0.40 | 1.0 |
| BLANK2 | 01L0544-MB2 | Silver, TCLP Leachate | 3.0 u | UG/L | 3.0 | 6.0 |
| | | Arsenic, TCLP Leachate | 23.4 u | UG/L | 23.4 | 6.0 |
| | | Barium, TCLP Leachate | 1.4 | UG/L | 0.60 | 6.0 |
| | | Beryllium,TCLP Leachate | 1.2 u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 u | UG/L | 8.4 | 6.0 |
| | | Nickel, TCLP Leachate | 10.2 u | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 u | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 13.8 u | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 6.0 | UG/L | 2.4 | 6.0 |
| BLANK3 | 01L0544-MB3 | Silver, TCLP Leachate | 3.0 u | UG/L | 3.0 | 6.0 |
| | | Arsenic, TCLP Leachate | 23.4 u | UG/L | 23.4 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK3 | 01L0544-MB3 | Barium, TCLP Leachate | 1.7 | | UG/L | 0.60 | 6.0 |
| | | Beryllium, TCLP Leachate | 1.2 | u | UG/L | 1.2 | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 | u | UG/L | 1.8 | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 | u | UG/L | 8.4 | 6.0 |
| | | Nickel, TCLP Leachate | 10.2 | u | UG/L | 10.2 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 | u | UG/L | 14.4 | 6.0 |
| | | Antimony, TCLP Leachate | 13.8 | u | UG/L | 13.8 | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 | u | UG/L | 19.2 | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 | u | UG/L | 3.0 | 6.0 |
| | | Zinc, TCLP Leachate | 5.8 | | UG/L | 2.4 | 6.0 |
| BLANK1 | 01C0271-MB1 | Mercury, Total | 0.10 | u | UG/L | 0.10 | 1.0 |
| BLANK2 | 01C0271-MB2 | Mercury, TCLP Leachate | 0.10 | u | UG/L | 0.10 | 1.0 |
| BLANK3 | 01C0271-MB3 | Mercury, TCLP Leachate | 1.3 | | UG/L | 0.10 | 1.0 |

Lionville Laboratory, Inc.

*INORGANICS ACCURACY REPORT 11/28/01*

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B12MB7 | Aluminum, Total | 7730 | 7200 | 201 | 263.7* | 1.0 |
| | | Calcium, Total | 9380 | 6680 | 2510 | 107.4 | 1.0 |
| | | Copper, Total | 33.3 | 12.1 | 25.1 | 84.5 | 1.0 |
| | | Iron, Total | 18500 | 19500 | 100 | -1100. * | 1.0 |
| | | Potassium, Total | 3770 | 1230 | 2510 | 100.9 | 1.0 |
| | | Magnesium, Total | 7190 | 4840 | 2510 | 93.4 | 1.0 |
| | | Manganese, Total | 329 | 285 | 50.2 | 88.2* | 1.0 |
| | | Molybdenum, Total | 91.9 | 1.0 | 100 | 90.4 | 1.0 |
| | | Sodium, Total | 2880 | 428 | 2510 | 97.4 | 1.0 |
| | | Tin, Total | 92.6 | 1.8 | 100 | 90.3 | 1.0 |
| -003 | B12MB7 | Silver, TCLP Leachate | 4660 | 3.0 u | 5000 | 93.2 | 6.0 |
| | | Arsenic, TCLP Leachate | 5040 | 23.4 u | 5000 | 100.9 | 6.0 |
| | | Barium, TCLP Leachate | 97100 | 599 | 100000 | 96.5 | 6.0 |
| | | Beryllium, TCLP Leacha | 1020 | 1.2 u | 1000 | 102.4 | 6.0 |
| | | Cadmium, TCLP Leachate | 998 | 1.8 u | 1000 | 99.8 | 6.0 |
| | | Chromium, TCLP Leachat | 5020 | 8.4 u | 5000 | 100.3 | 6.0 |
| | | Nickel, TCLP Leachate | 1040 | 17.8 | 1000 | 102.0 | 6.0 |
| | | Lead, TCLP Leachate | 4960 | 14.4 u | 5000 | 99.2 | 6.0 |
| | | Antimony, TCLP Leachat | 1030 | 13.8 u | 1000 | 103.2 | 6.0 |
| | | Selenium, TCLP Leachat | 1020 | 19.2 u | 1000 | 102.2 | 6.0 |
| | | Vanadium, TCLP Leachat | 1010 | 3.0 u | 1000 | 101.4 | 6.0 |
| | | Zinc, TCLP Leachate | 1060 | 21.5 | 1000 | 103.5 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -004 | B12MB8 | Mercury, TCLP Leachate | 148 | 0.10u | 200 | 74.0 | 50.0 |

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B12MB7 | Aluminum, Total | 7200 | 7220 | 0.35 | 1.0 |
| | | Calcium, Total | 6680 | 6860 | 2.6 | 1.0 |
| | | Copper, Total | 12.1 | 11.2 | 7.7 | 1.0 |
| | | Iron, Total | 19500 | 18700 | 4.4 | 1.0 |
| | | Potassium, Total | 1230 | 1320 | 6.4 | 1.0 |
| | | Magnesium, Total | 4840 | 4820 | 0.45 | 1.0 |
| | | Manganese, Total | 285 | 283 | 0.70 | 1.0 |
| | | Molybdenum, Total | 1.0 | 0.85 | 15.8 | 1.0 |
| | | Sodium, Total | 428 | 425 | 0.89 | 1.0 |
| | | Tin, Total | 1.8 | 1.6 | 11.8 | 1.0 |
| -003REP | B12MB7 | Silver, TCLP Leachate | 3.0 u | 3.0 u | NC | 6.0 |
| | | Arsenic, TCLP Leachate | 23.4 u | 23.4 u | NC | 6.0 |
| | | Barium, TCLP Leachate | 599 | 602 | 0.53 | 6.0 |
| | | Beryllium TCLP Leachate | 1.2 u | 1.2 u | NC | 6.0 |
| | | Cadmium, TCLP Leachate | 1.8 u | 1.8 u | NC | 6.0 |
| | | Chromium, TCLP Leachate | 8.4 u | 8.4 u | NC | 6.0 |
| | | Nickel, Leachate | 17.8 | 25.9 | 37.1 | 6.0 |
| | | Lead, TCLP Leachate | 14.4 u | 14.4 u | NC | 6.0 |
| | | Antimony, Leachate | 13.8 u | 13.8 u | NC | 6.0 |
| | | Selenium, TCLP Leachate | 19.2 u | 19.2 u | NC | 6.0 |
| | | Vanadium, TCLP Leachate | 3.0 u | 3.0 u | NC | 6.0 |
| | | Zinc, Leachate | 21.5 | 16.7 | 25.1 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

*WORK ORDER: 11343-606-001-9999-00*

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -004REP | B12MB8 | Mercury, TCLP Leachate | 0.10u | 0.10u | NC | 1.0 |

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/28/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 01L0562-LC1 | Aluminum, LCS | 496 | 500 | MG/KG | 99.1 |
| | | Bismuth, LCS | 484 | 500 | MG/KG | 96.9 |
| | | Calcium, LCS | 2430 | 2500 | MG/KG | 97.1 |
| | | Copper, LCS | 123 | 125 | MG/KG | 98.1 |
| | | Iron, LCS | 493 | 500 | MG/KG | 98.6 |
| | | Potassium, LCS | 2520 | 2500 | MG/KG | 100.8 |
| | | Magnesium, LCS | 2500 | 2500 | MG/KG | 99.8 |
| | | Manganese, LCS | 75.5 | 75.0 | MG/KG | 100.7 |
| | | Molybdenum, LCS | 494 | 500 | MG/KG | 98.8 |
| | | Sodium, LCS | 2450 | 2500 | MG/KG | 98.0 |
| | | Tin, LCS | 489 | 500 | MG/KG | 97.8 |
| LCS1 | 01L0544-LC1 | Silver, LCS | 497 | 500 | UG/L | 99.4 |
| | | Arsenic, LCS | 9710 | 10000 | UG/L | 97.1 |
| | | Barium, LCS | 4910 | 5000 | UG/L | 98.1 |
| | | Beryllium, LCS | 252 | 250 | UG/L | 100.9 |
| | | Cadmium, LCS | 249 | 250 | UG/L | 99.6 |
| | | Chromium, LCS | 509 | 500 | UG/L | 101.9 |
| | | Nickel, LCS | 2000 | 2000 | UG/L | 100.0 |
| | | Lead, LCS | 2440 | 2500 | UG/L | 97.7 |
| | | Antimony, LCS | 2980 | 3000 | UG/L | 99.3 |
| | | Selenium, LCS | 9410 | 10000 | UG/L | 94.1 |
| | | Vanadium, LCS | 2580 | 2500 | UG/L | 103.2 |
| | | Zinc, LCS | 1000 | 1000 | UG/L | 100.2 |
| LCS1 | 01C0271-LC1 | Mercury, LCS | 4.9 | 5.0 | UG/L | 98.3 |

(8) Metals Dig

Lionville Laboratory Use Only
0108L587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: TNU-Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-Code-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day

Date Rec'd: 8-16-01 Date Due: 9-15-01

| | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | | 5 |
| #/Type Container – Liquid | | | | | | | | | | | | | | | 2 |
| #/Type Container – Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | | 1 |
| Volume – Liquid | | | | | | | | | | | | | | | 0 |
| Volume – Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | | 5 |
| Preservatives | - | - | - | | - | | - | - | | - | - | | | | 2 |
| ANALYSES REQUESTED (ORGANIC) | VOA | BNA | Pest/PCB | Herb | A.C. Ext. | | TCLP Met. | INORG Metal | CN | | HC | | | | TCLP |
| Lionville Laboratory Use Only | OA24H | OA25X | OPCB | | ODPO OGPO | | ITCLP | Met① | | ICP9 | Inorg① | | | | Met② |
| 001 B12MB7 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | | |
| 002 " 8 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | | |
| 003 " 7 top of 001 | | | | | | | | | | | | | | | ✓ |
| 004 " 8 " 002 | | | | | | | | | | | | | | | ✓ |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected |
|---|---|---|---|---|---|---|
| 001 | B12MB7 | | | S | 8-13-01 | 1110 |
| 002 | " 8 | | | " | " | 1138 |
| 003 | " 7 top of 001 | | | L | " | - |
| 004 | " 8 " 002 | | | " | " | " |

Special Instructions: SOF B01-103
Run Matrix QC
* See lab chron

DATE/REVISIONS:
Met① 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg① 2. ICNO2, ICNO3, INH3N, ICNTO, IPH,
" 3. ISED
Met② 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
" 5. Zn, Hg (leachates) + As
11-26-01 6. Add As to tclp Met ②

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE | | ORIGINAL | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 4.4° °C

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

RFW LOT # :0108L587

| CLIENT ID | RFW # | MTX | PREP # | COLLECTN | DATE REC | EXT/PREP | ANALYSIS |
|---|---|---|---|---|---|---|---|
| B12MB7 | 001 | S | 01LVH343 | 08/13/01 | 08/16/01 | N/A | 08/20/01 |
| B12MB7 | 001 MS | S | 01LVH343 | 08/13/01 | 08/16/01 | N/A | 08/20/01 |
| B12MB7 | 001 MSD | S | 01LVH343 | 08/13/01 | 08/16/01 | N/A | 08/20/01 |
| B12MB8 | 002 | S | 01LVH343 | 08/13/01 | 08/16/01 | N/A | 08/20/01 |
| LAB QC: | | | | | | | |
| VBLKMU | MB1 | S | 01LVH343 | N/A | N/A | N/A | 08/20/01 |
| VBLKMU | MB1 BS | S | 01LVH343 | N/A | N/A | N/A | 08/20/01 |

LIONVILLE LABORATORY INC.

**Client:** TNU-HANFORD B01-103
**RFW #:** 0108L587
**SDG/SAF #:** H1461/B01-103

**W.O. #:** 11343-606-001-9999-00
**Date Received:** 08-16-2001

**GC/MS VOLATILE**

Two (2) soil samples were collected on 08-13-2001.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 08-20-2001.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. Samples were analyzed within required holding time.
3. A non-target compound was detected in sample B12MB7.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than 2x the CRQL.
8. Internal standard area and retention time criteria were met.
9. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor
President
Lionville Laboratory Incorporated

9/10/01
Date

som\group\data\voa\tnu-hanford\0108-587.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 2 pages.



208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

## GLOSSARY OF VOA DATA

### DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated *sample quantitation limit which is included and corrected for dilution and percent moisture.*

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a *positively identified TCL compound.*

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = *Indicates presumptive evidence of a compound.* This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = *Additional qualifiers used as required are explained in the case narrative.*

# GLOSSARY OF VOA DATA

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

LYONVILLE LABORATORY INC

# TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

**MP** - Missed Peak: manually added peak not found by automatic quantitation program.

**PA** - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

**RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

**SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

**CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

**PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

**Lionville Laboratory, Inc.**

Volatiles by GC/MS, HSL List

Report Date: 09/07/01 13:22

RFW Batch Number: **0108L587** Client: **TNUHANFORD B01-103 H1461** Work Order: 11343606001 Page: 1a

| | Cust ID: | B12MB7 | | B12MB7 | | B12MB7 | | B12MB8 | | VBLKMU | | VBLKMU BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 001 MS | | 001 MSD | | 002 | | 01LVH343-MB1 | | 01LVH343-MB1 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 1.04 | | 1.02 | | 0.980 | | 0.962 | | 1.00 | | 1.00 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | |
| Surrogate Recovery | Toluene-d8 | 106 | % | 106 | % | 105 | % | 108 | % | 104 | % | 100 | % |
| | Bromofluorobenzene | 102 | % | 102 | % | 100 | % | 106 | % | 103 | % | 100 | % |
| | 1,2-Dichloroethane-d4 | 107 | % | 106 | % | 104 | % | 112 | % | 105 | % | 100 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Chloromethane | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Bromomethane | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Vinyl Chloride | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Chloroethane | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Methylene Chloride | | 11 | B | 11 | B | 11 | B | 11 | B | 5 | | 4 | JB |
| Acetone | | 10 | U | 10 | U | 10 | U | 13 | | 10 | U | 10 | U |
| Carbon Disulfide | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,1-Dichloroethene | | 5 | U | 108 | % | 107 | % | 5 | U | 5 | U | 102 | % |
| 1,1-Dichloroethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloroethene (total) | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Chloroform | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloroethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 2-Butanone | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 1,1,1-Trichloroethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Carbon Tetrachloride | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Bromodichloromethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,2-Dichloropropane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| cis-1,3-Dichloropropene | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Trichloroethene | | 5 | U | 87 | % | 83 | % | 5 | U | 5 | U | 86 | % |
| Dibromochloromethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,1,2-Trichloroethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Benzene | | 5 | U | 105 | % | 100 | % | 5 | U | 5 | U | 100 | % |
| Trans-1,3-Dichloropropene | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Bromoform | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 4-Methyl-2-pentanone | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Hexanone | | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Tetrachloroethene | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| 1,1,2,2-Tetrachloroethane | | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Toluene | | 5 | U | 106 | % | 101 | % | 5 | U | 5 | U | 100 | % |

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0108L587** Client: **TNUHANFORD B01-103 H1461** Work Order: 11343606001 Page: 1b

| Cust ID: | B12MB7 | | B12MB7 | | B12MB7 | | B12MB8 | | VBLKMU | | VBLKMU BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 001 | | 001 MS | | 001 MSD | | 002 | | 01LVH343-MB1 | | 01LVH343-MB1 | |
| Chlorobenzene | 5 | U | 99 | % | 95 | % | 5 | U | 5 | U | 98 | % |
| Ethylbenzene | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Styrene | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |
| Xylene (total) | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U |

*= Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B12MB7

Lab Name: Lionville Labs, Inc. Contract: 11343606001

Lab Code: Lionvi Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 0108L587-001

Sample wt/vol: 4.80 (g/mL) G Lab File ID: h082013

Level: (low/med) LOW Date Received: 08/16/01

% Moisture: not dec. 1 Date Analyzed: 08/20/01

Column: (pack/cap) CAP Dilution Factor: 1.04

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 24.531 | 20 | J |

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B12MB8

Lab Name: Lionville Labs, Inc. Contract: 11343606001

Lab Code: Lionvi Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 0108L587-002

Sample wt/vol: 5.20 (g/mL) G Lab File ID: h082016

Level: (low/med) LOW Date Received: 08/16/01

% Moisture: not dec. 4 Date Analyzed: 08/20/01

Column: (pack/cap) CAP Dilution Factor: 0.962

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1E

VOLATILE ORGANICS ANALYSIS SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKMU

Lab Name: Lionville Labs, Inc. Contract: 11343606001

Lab Code: Lionvi Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 01LVH343-MB1

Sample wt/vol: 5.00 (g/mL) G Lab File ID: h082007

Level: (low/med) LOW Date Received: 08/20/01

% Moisture: not dec. 0 Date Analyzed: 08/20/01

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 VOA-TIC 1/87 Rev.

Lionville Laboratory Use Only
01081587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc

Client: TNU- Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-6006-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 5 | |
| Preservatives | | - | - | - | | - | | - | - | | - | - | | | 2 | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/ PCB | Herb | TIC, GIV, Ext. | | TCLP Met. | Metal | CN | | HC | | | Reactivity | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| Matrix Codes | Lab ID | Client ID/Description | Matrix OC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Ola24H | Ola25X | OPCB | | ODPO OGPO | | ITCLP | Met(1) | | ICRL9 | Inorg(1) | | | Met(2) |
| | 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| | 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| | 003 | 7 tclp of 001 | | | L | * | - | | | | | | | | | | | | | | ✓ |
| | 004 | 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Special Instructions: Saf B01-103
Run Matrix QC
* See lab chron

DATE/REVISIONS:
Mrt(1) 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg(1) 2. TCNO2, TCNO3, TNH3N, TCNTO, TPH,
1 3. ISED
Mrt(2) 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | | ORIGINAL REWRITTEN | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 6461

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.4° °C

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| ollector<br>R Fahlberg | Company Contact<br>D Weekes | Telephone No.<br>372-9130 | Project Coordinator<br>TRENT, SJ |
| Price Code 8N | Data Turnaround<br>45 Days | Air Quality ☐ | |
| roject Designation<br>200 Area RCRA Drilling Waste Designation | Sampling Location<br>200 East | | SAF No.<br>B01-103 |
| ce Chest No. ERC 96-036 | Field Logbook No.<br>EL 1517-2 | COA JRCRA14114<br>~~XL1013CHGR~~ RF 8-13-01 | Method of Shipment<br>Fed EX |
| hipped To<br>TMA/RECRA | Offsite Property No. A#10323 | | Bill of Lading/Air Bill No. 4235 7954 - 6461 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref.# ZB at the 3728 Shipping Facility on 8/13/01.
Collector not available to relinquish samples on 8/15/01 for shipment.
RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RT 8-15-01 | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| B12MB7 | SOIL | 8-13-01 | 1110 | X | X | X | X | X | X | X | X | | B12MB9 |
| B12MB8 | SOIL | 8-13-01 | 1138 | X | X | X | X | X | X | X | X | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg / R. Fahlberg | 8-13-01 1300 | RF / ZB | 8-13-01 1300 |
| RF / ZB | 8-15-01 0900 | R Thore / R. Thore | 8-15-01 0900 |
| R. Thore / R. Thore | 8-15-01 0900 | FEDEX | |
| FEDEX | 8-16-01 9:40 | Carlos Bonny | 8-16-01 9:40 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium; Tritium-H3~~
RT 8-15-01

**Matrix ***
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B12MB7 | 001 | S | 01LE0968 | 08/13/01 | 08/17/01 | 09/04/01 |
| B12MB7 | 001 MS | S | 01LE0968 | 08/13/01 | 08/17/01 | 09/04/01 |
| B12MB7 | 001 MSD | S | 01LE0968 | 08/13/01 | 08/17/01 | 09/04/01 |
| B12MB8 | 002 | S | 01LE0968 | 08/13/01 | 08/17/01 | 09/04/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| PBLKNN | MB1 | S | 01LE0968 | N/A | 08/17/01 | 09/04/01 |
| PBLKNN | MB1 BS | S | 01LE0968 | N/A | 08/17/01 | 09/04/01 |

29-10-01

LIONVILLE LABORATORY INC.

## Analytical Report

**Client:** TNU HANFORD B01-103
**LVL#:** 0108L587
**SDG/SAF#:** H1461/B01-103

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 08-16-01

**PCB**

The set of samples consisted of two (2) soil samples collected on 08-13-01.

The samples and their associated QC samples were extracted on 08-17-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 09-04-01. The extraction procedure was based on method 3550 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

9/11/01
Date

pef\r:\group\data\pest\08L-587.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.



208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

# GLOSSARY OF PESTICIDE/PCB DATA

## DATA QUALIFIERS

**U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

**J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

**E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**I** = Interference.

## ABBREVIATIONS

**BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

**BSD** = Indicates blank spike duplicate.

**MS** = Indicates matrix spike.

**MSD** = Indicates matrix spike duplicate.

**DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

**NA** = Not Applicable.

**DF** = Dilution Factor.

**NR** = Not Required.

**SP** = Indicates Spiked Compound.

## GLOSSARY OF PESTICIDE/PCB DATA

| | | |
|---|---|---|
| **P** | = | This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P". |
| **D** | = | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **C** | = | This flag applies to a compound that has been confirmed by GC/MS. |

R:/SHARE/HPLC/PESTICIDE/PCBGLOS

**Lionville Laboratory, Inc.**

PCBs by GC

Report Date: 09/09/01 14:03

RFW Batch Number: 0108L587 Client: TNUHANFORD B01-103 H1461 Work Order: 11343606001 Page: 1

| | Cust ID: | B12MB7 | B12MB7 | B12MB7 | B12MB8 | PBLKNN | PBLKNN BS |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 01LE0968-MB1 | 01LE0968-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Surrogate: Tetrachloro-m-xylene | | 98 % | 102 % | 88 % | 60 % | 68 % | 92 % |
| Decachlorobiphenyl | | 95 % | 105 % | 93 % | 82 % | 89 % | 100 % |
| Aroclor-1016 | | 34 U | 33 U | 34 U | 34 U | 33 U | 33 U |
| Aroclor-1221 | | 67 U | 66 U | 67 U | 69 U | 67 U | 67 U |
| Aroclor-1232 | | 34 U | 33 U | 34 U | 34 U | 33 U | 33 U |
| Aroclor-1242 | | 34 U | 33 U | 34 U | 34 U | 33 U | 33 U |
| Aroclor-1248 | | 34 U | 33 U | 34 U | 34 U | 33 U | 33 U |
| Aroclor-1254 | | 34 U | 89 % | 74 % | 34 U | 33 U | 77 % |
| Aroclor-1260 | | 34 U | 33 U | 34 U | 34 U | 33 U | 33 U |

09-10-01

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory Use Only
01081587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TOU-Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-6000-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | 60 | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 500 | |
| Preservatives | | - | - | - | | - | | - | - | | - | - | | | - | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | H.C. Pest. Met. | | TCLP Met. | Metal | CN | | IC | | | TCLP | |
| Lionville Laboratory Use Only | | Ola2414 | Ola2SX | OPCB | | ODTPO OSPRO | | ITCLP | Mrt① | | ICPLO | Inorg① | | | Mrt② | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Ola2414 | Ola2SX | OPCB | | ODTPO OSPRO | | ITCLP | Mrt① | | ICPLO | Inorg① | | | Mrt② |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil | 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| SE - Sediment | 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| SO - Solid | 003 | 7 tclp of 001 | | | L | * | - | | | | | | | | | | | | | | ✓ |
| SL - Sludge | 004 | 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ |
| W - Water | | | | | | | | | | | | | | | | | | | | | |
| O - Oil | | | | | | | | | | | | | | | | | | | | | |
| A - Air | | | | | | | | | | | | | | | | | | | | | |
| DS - Drum Solids | | | | | | | | | | | | | | | | | | | | | |
| DL - Drum Liquids | | | | | | | | | | | | | | | | | | | | | |
| L - EP/TCLP Leachate | | | | | | | | | | | | | | | | | | | | | |
| WI - Wipe | | | | | | | | | | | | | | | | | | | | | |
| X - Other | | | | | | | | | | | | | | | | | | | | | |
| F - Fish | | | | | | | | | | | | | | | | | | | | | |

Special Instructions: Saf B01-103
Run Matrix QC
* See labchron

DATE/REVISIONS:
Mrt① 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg① 2. ICNO2, ICNO3, INH3N, ICNTO, IPH,
1 3. ISED
Mrt② 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL REWRITTEN | | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 6461

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: R Fahlberg | Company Contact: D Weekes — Telephone No.: 372-9130 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area RCRA Drilling Waste Designation | Sampling Location: 200 East | SAF No.: B01-103 | Air Quality ☐ |
| Ice Chest No.: ERC 96-036 | Field Logbook No.: EL 1517-2 — COA JRCRA14114 ~~XL1013CHGR~~ RF 8-13-01 | Method of Shipment: Fed EX | |
| Shipped To: TMA/RECRA | Offsite Property No.: A#10323 | Bill of Lading/Air Bill No.: 4235 7954 — 6461 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref.# ZB at the 3728 Shipping Facility on 8/13/01. Collector not available to relinquish samples on 8/15/01 for shipment. RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RT 8-15-01 | | |
| Sample No. | Matrix* | Sample Date | Sample Time | | | | | | | | |
| B12MB7 | SOIL | 8-13-01 | 1110 | X | X | X | X | X | X | X | X | | B12MB9 |
| B12MB8 | SOIL | 8-13-01 | 1138 | X | X | X | X | X | X | X | X | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**CHAIN OF POSSESSION** — *Sign/Print Names*

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg / R. Fahlberg | 8-13-01 1300 | RaF 2-B | 8-13-01 1300 |
| Relinquished By/Removed From: RaF 2B | 8-15-01 0900 | Received By/Stored In: R Thore / RT | Date/Time 0900 8-15-01 |
| Relinquished By/Removed From: RT / R Thore | Date/Time 0900 8-15-01 | Received By/Stored In: FEDEX | Date/Time |
| Relinquished By/Removed From: FEDEX | 8-16-01 9:40 | Received By/Stored In: Carlos Barrera | 8-16-01 9:40 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241, Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Isotopic Uranium, Tritium - H3~~ 8-15 RT

**Matrix***
S=Soil
SD=Sediment
SO=Solid
Sl=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wp=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
GRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B12MB7 | 001 | S | 01LVJ820 | 08/13/01 | N/A | 08/20/01 |
| B12MB7 | 001 MS | S | 01LVJ820 | 08/13/01 | N/A | 08/20/01 |
| B12MB7 | 001 MSD | S | 01LVJ820 | 08/13/01 | N/A | 08/20/01 |
| B12MB8 | 002 | S | 01LVJ820 | 08/13/01 | N/A | 08/20/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| TBLKZC | MB1 | S | 01LVJ820 | N/A | N/A | 08/20/01 |
| TBLKZC | MB1 BS | S | 01LVJ820 | N/A | N/A | 08/20/01 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client** : TNU-HANFORD B01-103
**LVL#** : 0108L587
**SDG/SAF#:** H1461/B01-103

**W.O #:** 11343-606-001-9999-00
**Date Received:** 08-16-01

**GASOLINE RANGE ORGANICS**

The set of samples consisted of two (2) soil samples collected on 08-13-01

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on Method 8015B for Gasoline Range Organic (GRO) target compounds on 08-20-01.

1. The cooler temperature has been recorded on the chain-of-custody.

2. All required holding times for analysis have been met.

3. All surrogate recoveries were within acceptance criteria.

4. The blank spike recovery was within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All initial calibrations associated with this data set were within acceptance criteria.

7. All continuing calibration standards analyzed prior to the samples were within acceptance criteria.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

9/17/01
Date

r:\share\gcpest\narr temp\tnu587gro.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

# GLOSSARY OF GASOLINE RANGE ORGANICS DATA

## DATA QUALIFIERS

**U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

**J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

**E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**I** = Interference.

## ABBREVIATIONS

**BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

**BSD** = Indicates blank spike duplicate.

**MS** = Indicates matrix spike.

**MSD** = Indicates matrix spike duplicate.

**DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

**NA** = Not Applicable.

**DF** = Dilution Factor.

**NR** = Not Required.

**SP** = Indicates Spiked Compound.

## GLOSSARY OF GASOLINE RANGE ORGANICS DATA

| | | |
|---|---|---|
| **D** | = | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| **C** | = | This flag applies to a compound that has been confirmed by GC/MS. |

R:/SHARE/GCVOLATILE/GCVOLATILEGLOS.DOC

**Lionville Laboratory, Inc.**

GAS RANGE ORGANICS

Report Date: 09/12/01 11:21

RFW Batch Number: **0108L587** Client: **TNUHANFORD B01-103 H1461** Work Order: 11343606001 Page: 1

| | Cust ID: | B12MB7 | B12MB7 | B12MB7 | B12MB8 | TBLKZC | TBLKZC BS |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 01LVJ820-MB1 | 01LVJ820-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Fluorobenzene | | 87 % | 93 % | 97 % | 102 % | 106 % | 111 % |
| Gasoline Range Organics (GRO) | | 40 U | 93 % | 94 % | 40 U | 40 U | 114 % |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Flg 9/14/01

Lionville Laboratory Use Only: 0108L587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: TRU-Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-Coxo.001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | 60 | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 60 | |
| Preservatives | | - | - | - | | - | | - | - | | - | - | | | - | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | Misc. Inst. Ret. | | TCLP Mct. | Metal | CN | | HC | | | TCLP | |
| Lionville Laboratory Use Only | | OA24H | OA25X | OPCB | | ODPO OCPG | | ITCLP | Mct(1) | | ICAP | Inorg(1) | | | Mct(2) | |

| MATRIX CODES | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | OA24H | OA25X | OPCB | | ODPO OCPG | | ITCLP | Mct(1) | | ICAP | Inorg(1) | | | Mct(2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, Wi - Wipe, X - Other, F - Fish | 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| | 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| | 003 | 7 tcp of 001 | | | L | 1 | 1 | | | | | | | | | | | | | | ✓ |
| | 004 | 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ |

Special Instructions: Saf B01-103
Run Matrix QC
* See labchron

DATE/REVISIONS:
Mct(1) 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg(1) 2. TCNO2, TCNO3, TNH3N, TCNTO, TPH,
1 3. ISED
Mct(2) 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
Airbill # SEE BELOW
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Temper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE | | ORIGINAL | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Lionville Laboratory Use Only: 0108L587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: TRU-Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-0000-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | 100 | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 56 | |
| Preservatives | | - | - | | | - | | - | - | | - | - | | | - | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | Alc. Ester | | TCLP Metals | Metal | CN | | IC | | | Pest | |
| Lionville Laboratory Use Only | | OA24H | OA25X | OPCB | | ODPO OGPO | | ITCLP | Mt(1) | | ICP | Inorg(1) | | | Mt(2) | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | OA24H | OA25X | OPCB | | ODPO OGPO | | ITCLP | Mt(1) | | ICP | Inorg(1) | | | Mt(2) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil | 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | | |
| SE - Sediment | 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | | |
| SO - Solid | 003 | 7 tclp of 001 | | | L | * | — | | | | | | | | | | | | | | ✓ | |
| SL - Sludge | 004 | 8 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ | |
| W - Water | | | | | | | | | | | | | | | | | | | | | | |
| O - Oil | | | | | | | | | | | | | | | | | | | | | | |
| A - Air | | | | | | | | | | | | | | | | | | | | | | |
| DS - Drum Solids | | | | | | | | | | | | | | | | | | | | | | |
| DL - Drum Liquids | | | | | | | | | | | | | | | | | | | | | | |
| L - EP/TCLP Leachate | | | | | | | | | | | | | | | | | | | | | | |
| WI - Wipe | | | | | | | | | | | | | | | | | | | | | | |
| X - Other | | | | | | | | | | | | | | | | | | | | | | |
| F - Fish | | | | | | | | | | | | | | | | | | | | | | |

Special Instructions: Saf B01-103
Run Matrix QC
* See labchron

DATE/REVISIONS:
Mt(1) 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg(1) 2. ICNO2, ICNO3, INH3N, ICNTO, IPH
1 3. ISED
Mt(2) 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V
1 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # SEE BELOW
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE | | ORIGINAL | |

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 02 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: R Fahlberg | Company Contact: D Weekes | Telephone No.: 372-9130 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐ | |
| Project Designation: 200 Area RCRA Drilling Waste Designation | Sampling Location: 200 East | SAF No.: B01-103 | |
| Ice Chest No.: ERC 96-036 | Field Logbook No.: EL 1517-2 | COA JRCRA14114 ~~XL1913CHGR~~ RF 8-13-01 | Method of Shipment: Fed EX |
| Shipped To: TMA/RCRA | Offsite Property No.: A010323 | | Bill of Lading/Air Bill No.: 4235 7954 - 6461 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref. 2B at the 3728 Shipping Facility on 8/13/01.
Collector not available to relinquish samples on 8/15/01 for shipment.
RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RT 8-13-01 | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| B12MB7 / SOIL / 8-13-01 / 1110 | X | X | X | X | X | X | X | X | | | B12MB9 |
| B12MB8 / SOIL / 8-13-01 / 1138 | X | X | X | X | X | X | X | X | | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|---|
| Relinquished By/Removed From: R. Fahlberg | R. Fahlberg | 8-13-01 1300 | Received By/Stored In: RF 2B | 8-13-01 1300 |
| Relinquished By/Removed From: RF 2B | | 8-15-01 0900 | Received By/Stored In: R Thorne | 8-15-01 0900 |
| Relinquished By/Removed From: R Thorne | R Thorne | 8-15-01 0900 | Received By/Stored In: FEDEX | |
| Relinquished By/Removed From: FEDEX | | 8-16-01 9:40 | Received By/Stored In: Carlos Garcia | 8-16-01 9:40 |
| Relinquished By/Removed From | | | Received By/Stored In | |
| Relinquished By/Removed From | | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155) - Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241, Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 -- Total U, Technetium-99, Isotopic Uranium; Tritium-3H~~
8-15-01 RT

**Matrix ***
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B12MB7 | | | | | | |
| % SOLIDS | 001 | S | 01L%S107 | 08/13/01 | 08/17/01 | 08/20/01 |
| % SOLIDS | 001 REP | S | 01L%S107 | 08/13/01 | 08/17/01 | 08/20/01 |
| NITRITE BY IC | 001 | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| NITRITE BY IC | 001 REP | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| NITRITE BY IC | 001 MS | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| NITRATE BY IC | 001 | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| NITRATE BY IC | 001 REP | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| NITRATE BY IC | 001 MS | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| TOTAL CYANIDE | 001 | S | 01LC077 | 08/13/01 | 08/17/01 | 08/17/01 |
| TOTAL CYANIDE | 001 REP | S | 01LC077 | 08/13/01 | 08/17/01 | 08/17/01 |
| TOTAL CYANIDE | 001 MS | S | 01LC077 | 08/13/01 | 08/17/01 | 08/17/01 |
| CHROMIUM VI | 001 | S | 01LVI074 | 08/13/01 | 09/10/01 | 09/10/01 |
| AMMONIA | 001 | S | 01LAM042 | 08/13/01 | 09/06/01 | 09/06/01 |
| AMMONIA | 001 REP | S | 01LAM042 | 08/13/01 | 09/06/01 | 09/06/01 |
| AMMONIA | 001 MS | S | 01LAM042 | 08/13/01 | 09/06/01 | 09/06/01 |
| PH | 001 | S | 01LPH056 | 08/13/01 | 08/17/01 | 08/17/01 |
| PH | 001 REP | S | 01LPH056 | 08/13/01 | 08/17/01 | 08/17/01 |
| SULFIDE | 001 | S | 01LSD041 | 08/13/01 | 08/21/01 | 08/21/01 |
| TCLP | 001 | S | 01LTO104 | 08/13/01 | 08/28/01 | 08/29/01 |
| B12MB8 | | | | | | |
| % SOLIDS | 002 | S | 01L%S107 | 08/13/01 | 08/17/01 | 08/20/01 |
| NITRITE BY IC | 002 | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| NITRATE BY IC | 002 | S | 01LICE60 | 08/13/01 | 09/12/01 | 09/12/01 |
| TOTAL CYANIDE | 002 | S | 01LC077 | 08/13/01 | 08/17/01 | 08/17/01 |
| CHROMIUM VI | 002 | S | 01LVI074 | 08/13/01 | 09/10/01 | 09/10/01 |
| CHROMIUM VI | 002 REP | S | 01LVI074 | 08/13/01 | 09/10/01 | 09/10/01 |
| CHROMIUM VI | 002 MS | S | 01LVI074 | 08/13/01 | 09/10/01 | 09/10/01 |
| CHROMIUM VI | 002 MSD | S | 01LVI074 | 08/13/01 | 09/10/01 | 09/10/01 |
| AMMONIA | 002 | S | 01LAM042 | 08/13/01 | 09/06/01 | 09/06/01 |
| PH | 002 | S | 01LPH056 | 08/13/01 | 08/17/01 | 08/17/01 |
| SULFIDE | 002 | S | 01LSD041 | 08/13/01 | 08/21/01 | 08/21/01 |
| SULFIDE | 002 REP | S | 01LSD041 | 08/13/01 | 08/21/01 | 08/21/01 |
| SULFIDE | 002 MS | S | 01LSD041 | 08/13/01 | 08/21/01 | 08/21/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| TCLP | 002 | S | 01LTO104 | 08/13/01 | 08/28/01 | 08/29/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| NITRITE BY IC | MB1 | S | 01LICE60 | N/A | 09/12/01 | 09/12/01 |
| NITRITE BY IC | MB1 BS | S | 01LICE60 | N/A | 09/12/01 | 09/12/01 |
| NITRATE BY IC | MB1 | S | 01LICE60 | N/A | 09/12/01 | 09/12/01 |
| NITRATE BY IC | MB1 BS | S | 01LICE60 | N/A | 09/12/01 | 09/12/01 |
| TOTAL CYANIDE | LCS L | S | 01LC077 | N/A | 08/17/01 | 08/17/01 |
| TOTAL CYANIDE | LCS L | S | 01LC077 | N/A | 08/17/01 | 08/17/01 |
| TOTAL CYANIDE | MB1 | S | 01LC077 | N/A | 08/17/01 | 08/17/01 |
| CHROMIUM VI | MB1 | S | 01LVI074 | N/A | 09/10/01 | 09/10/01 |
| CHROMIUM VI | MB1 BS | S | 01LVI074 | N/A | 09/10/01 | 09/10/01 |
| CHROMIUM VI | MB1 BSD | S | 01LVI074 | N/A | 09/10/01 | 09/10/01 |
| AMMONIA | MB1 | S | 01LAM042 | N/A | 09/06/01 | 09/06/01 |
| AMMONIA | MB1 BS | S | 01LAM042 | N/A | 09/06/01 | 09/06/01 |
| AMMONIA | MB1 BSD | S | 01LAM042 | N/A | 09/06/01 | 09/06/01 |
| SULFIDE | MB1 | S | 01LSD041 | N/A | 08/21/01 | 08/21/01 |
| SULFIDE | MB1 BS | S | 01LSD041 | N/A | 08/21/01 | 08/21/01 |
| SULFIDE | MB1 BSD | S | 01LSD041 | N/A | 08/21/01 | 08/21/01 |

LIONVILLE LABORATORY INC.

## Analytical Report

**Client:** TNU-HANFORD B01-103 H1461
**LVL#:** 0108L587

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 08-16-01

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Sulfide.

4. The cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits with the exception of Insoluble Chromium VI that was below the control limits that may be attributed to sample inhomogeneity.

8. The replicate analyses were within the 20% RPD control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

09-20-01
Date

njp\i08-587

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

| | ASTM | SW846 | OTHER |
|---|---|---|---|
| % Ash | __ D2216-80 | | |
| % Moisture | __ D2216-80 | | __ ILMO4.0 (e) |
| % Solids | ✓ D2216-80 | | __ ILMO4.0 (e) |
| % Volatile Solids | __ D2216-80 | | |
| ASTM Extraction in Water | __ D3987-81/85 | | |
| BTU | __ D240-87 | | |
| CEC | | __ 9081 | __ c |
| Chromium VI | | ✓ 3060A/7196A | |
| Corrosivity ___ by coupon ___ by pH | | __ 1110(mod) __ 9045C | |
| Cyanide, Total | | ✓ 9010B/9014 | __ ILMO4.0 (e) |
| Cyanide, Reactive | | __ Section 7.3/9014 | |
| Halides, Extractable Organic | | __ 9020B | __ EPA 600/4/84-008 |
| Halides, Total | | __ 9020B | __ EPA 600/4/84-008 |
| EP Toxicity | | __ 1310A | |
| Flash Point | | __ 1010 | |
| Ignitability | | __ 1010 | |
| Oil & Grease | | __ 9071A | |
| Carbon, Total Organic | | __ 9060 | __ Lloyd Kahn (mod) |
| Oxygen Bomb Prep for Anions | __ D240-87(mod) | __ 5050 | |
| Petroleum Hydrocarbons, Total Recoverable | | __ 9071 | __ EPA 418.1 |
| pH, Soil | | ✓ 9045C | |
| Sulfide, Reactive | | __ Section 7.3/9030B | |
| Sulfide | | ✓ 9030B(mod) | |
| Specific Gravity | __ D1429-76C/ | __ D5057-90 | |
| Sulfur, Total | | __ 9056 | |
| Synthetic Preparation Leach | | __ 1312 | |
| Paint Filter | | __ 9095A | |

**Other:** Nitrate, Nitrite **Method:** EPA 300.0

**Other:** Ammonia **Method** EPA 350.3

Lionville Laboratory Incorporated

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/20/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -001 | B12MB7 | % Solids | 99.5 | | % | 0.01 | 1.0 |
| | | Nitrite by IC | 1.26 | u | MG/KG | 1.26 | 1.0 |
| | | Nitrate by IC | 1.43 | | MG/KG | 1.26 | 1.0 |
| | | Cyanide, Total | 0.35 | u | MG/KG | 0.35 | 1.0 |
| | | Chromium VI | 0.40 | u | MG/KG | 0.40 | 1.0 |
| | | Ammonia, as N | 2.3 | u | MG/KG | 2.3 | 1.0 |
| | | pH | 9.0 | | SOIL PH | 0.01 | 1.0 |
| | | Sulfide | 38.3 | u | MG/KG | 38.3 | 1.0 |
| -002 | B12MB8 | % Solids | 95.6 | | % | 0.01 | 1.0 |
| | | Nitrite by IC | 1.31 | u | MG/KG | 1.31 | 1.0 |
| | | Nitrate by IC | 1.31 | u | MG/KG | 1.31 | 1.0 |
| | | Cyanide, Total | 0.48 | u | MG/KG | 0.48 | 1.0 |
| | | Chromium VI | 0.42 | u | MG/KG | 0.42 | 1.0 |
| | | Ammonia, as N | 2.4 | u | MG/KG | 2.4 | 1.0 |
| | | pH | 9.2 | | SOIL PH | 0.01 | 1.0 |
| | | Sulfide | 36.6 | u | MG/KG | 36.6 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/20/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| BLANK10 | 01LICE60-MB1 | Nitrite by IC | 1.25 u | MG/KG | 1.25 | 1.0 |
| | | Nitrate by IC | 1.25 u | MG/KG | 1.25 | 1.0 |
| BLANK1 | 01LC077-MB1 | Cyanide, Total | 0.50 u | MG/KG | 0.50 | 1.0 |
| BLANK10 | 01LVI074-MB1 | Chromium VI | 0.40 u | MG/KG | 0.40 | 1.0 |
| BLANK10 | 01LAM042-MB1 | Ammonia, as N | 2.5 u | MG/KG | 2.5 | 1.0 |
| BLANK10 | 01LSD041-MB1 | Sulfide | 40.0 u | MG/KG | 40.0 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/20/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B12MB7 | Nitrite by IC | 52.3 | 1.26u | 50.3 | 104.0 | 2.0 |
| | | Nitrate by IC | 52.5 | 1.43 | 50.3 | 101.5 | 2.0 |
| | | Cyanide, Total | 4.17 | 0.35u | 4.46 | 93.6 | 1.0 |
| | | Ammonia, as N | 93.2 | 2.3 u | 97.3 | 95.7 | 1.0 |
| -002 | B12MB8 | Soluble Chromium VI | 4.1 | 0.42u | 4.2 | 95.7 | 1.0 |
| | | Insoluble Chromium VI | 1070 | 0.42u | 1480 | 72.4 | 100 |
| | | Sulfide | 342 | 18.3 | 378 | 85.8 | 1.0 |
| BLANK10 | 01LICE60-MB1 | Nitrite by IC | 22.6 | 1.25u | 25.0 | 90.4 | 1.0 |
| | | Nitrate by IC | 24.1 | 1.25u | 25.0 | 96.5 | 1.0 |
| BLANK10 | 01LVI074-MB1 | Soluble Chromium VI | 3.9 | 0.40u | 4.0 | 98.3 | 1.0 |
| | | Insoluble Chromium VI | 1210 | 0.40u | 1160 | 104.2 | 100 |
| BLANK10 | 01LAM042-MB1 | Ammonia, as N | 104 | 2.5 u | 100 | 103.8 | 1.0 |
| | | Ammonia, as N MSD | 114 | 2.5 u | 100 | 113.8 | 1.0 |
| BLANK10 | 01LSD041-MB1 | Sulfide | 365 | 40.0 u | 385 | 94.8 | 1.0 |
| | | Sulfide MSD | 381 | 40.0 u | 385 | 99.0 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 09/20/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKE#1 %RECOV | SPIKE#2 %RECOV | %DIFF |
|---|---|---|---|---|---|
| BLANK10 | 01LAM042-MB1 | Ammonia, as N | 103.8 | 113.8 | 9.2 |
| BLANK10 | 01LSD041-MB1 | Sulfide | 94.8 | 99.0 | 4.3 |

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/20/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B12MB7 | % Solids | 99.5 | 99.6 | 0.10 | 1.0 |
| | | Nitrite by IC | 1.26u | 1.26u | NC | 1.0 |
| | | Nitrate by IC | 1.43 | 1.43 | 0.35 | 1.0 |
| | | Cyanide, Total | 0.35u | 0.42u | NC | 1.0 |
| | | Ammonia, as N | 2.3 u | 2.5 u | NC | 1.0 |
| | | pH | 9.0 | 9.1 | 0.9 | 1.0 |
| -002REP | B12MB8 | Chromium VI | 0.42u | 0.42u | NC | 1.0 |
| | | Sulfide | 36.6 u | 38.1 u | NC | 1.0 |

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/20/01

CLIENT: TNUHANFORD B01-103 H1461 LVL LOT #: 0108L587

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCSS1 | 01LC077-LCS1 | Cyanide, Total LCS | 1.93 | 2.0 | MG/KG | 96.6 |
| LCSS2 | 01LC077-LCS2 | Cyanide, Total LCS | 10.1 | 10.0 | MG/KG | 100.8 |

Lionville Laboratory Use Only
01081587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

12

Client: IDU-Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-C0000-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 60 | |
| Preservatives | | - | - | - | | - | | - | - | | - | - | | | - | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | GC/MS Vol. | | TCLP Met. | Metal | CN | | TC | | | TC Met. | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | 8260 VOA | 8270 BNA | OPCB | | ODPO OGPO | | TCLP | Met(1) | | ICP(1) | Inorg(1) | | | Met(2) | |

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | VOA | BNA | OPCB | | ODPO OGPO | | TCLP | Met(1) | | ICP(1) | Inorg(1) | | | Met(2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| 003 | 7 tclp of 001 | | | L | * | - | | | | | | | | | | | | | | ✓ |
| 004 | 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | | | ✓ |

Special Instructions: Soil B01-103
Run Matrix QC
* See labchron

DATE/REVISIONS:
Met(1) 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg(1) 2. TCNO2, TCNO3, TNH3N, TCNTO, TPH,
1 3. TSED
Met(2) 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered ___
Airbill # SEE below
2) Ambient or Chilled
3) Received in Good Condition ✓ or N
4) Samples Properly Preserved ✓ or N
5) Received Within Holding Times ✓ or N

Tamper Resistant Seal was:
1) Present on Outer Package ✓ or N
2) Unbroken on Outer Package ✓ or N
3) Present on Sample ✓ or N
4) Unbroken on Sample ✓ or N
COC Record Present Upon Sample Rec't ✓ or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL PROVIDED | | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 6461

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>R Fahlberg | Company Contact<br>D Weekes | Telephone No.<br>372-9130 | Project Coordinator<br>TRENT, SJ |
| Project Designation<br>200 Area RCRA Drilling Waste Designation | Sampling Location<br>200 East | | SAF No.<br>B01-103 |
| Ice Chest No. ERC 96-036 | Field Logbook No.<br>EL 1517-2 | COA JRCRA14114<br>~~XL1013CHOR~~ RF 8-13-01 | Method of Shipment<br>Fed EX |
| Shipped To<br>TMA/RECRA | Offsite Property No. A010323 | | Bill of Lading/Air Bill No. 4235 2954 - 6461 |

Price Code 8N

Data Turnaround 45 Days

Air Quality ☐

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref.# ZB at the 3728 Shipping Facility on 8/13/01.
Collector not available to relinquish samples on 8/15/01 for shipment.
RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RC 8-13-01 | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| B12MB7 | SOIL | 8-13-01 | 1110 | X | X | X | X | X | X | X | X | | B12MB9 |
| B12MB8 | SOIL | 8-13-01 | 1138 | X | X | X | X | X | X | X | X | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg / R. Fahlberg | 8-13-01 1300 | RAF 2B | 8-13-01 1300 |
| RAF 2B | 8-15-01 0900 | R Thore | 8-15-01 0900 |
| R Thore / R Thore | 8-15-01 0900 | FED EX | |
| FEDEX | 8-16-01 9:40 | Carla Bonny | 8-16-01 9140 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec -- Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium; Tritium - H3~~
8-15-01 RT

**Matrix ***
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wp=Wipe
L=Liquid
Vg=Vegetation
X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 8-16-01 0940

SDG#: 01081587

Work Order Number: —  SAF# B01-103

Shipping Container ID: EBC96-0360  Chain of Custody # B01-103-05

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4.4°
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 16
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   ____tape  ____hazard labels
   ✓custody seals  ____appropriate sample labels

9. Samples are:
   ✓in good condition  ____leaking
   ____broken  ____have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: Carlos Hernandez  Date: 8-16-01

Telephoned to: _____ On _____ By _____

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-103 H1461

DATE RECEIVED: 08/16/01 LVL LOT # :0108L587

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B12MB7 | 001 | S | 01LE0983 | 08/13/01 | 08/22/01 | 09/13/01 |
| B12MB7 | 001 MS | S | 01LE0983 | 08/13/01 | 08/22/01 | 09/13/01 |
| B12MB7 | 001 MSD | S | 01LE0983 | 08/13/01 | 08/22/01 | 09/13/01 |
| B12MB8 | 002 | S | 01LE0983 | 08/13/01 | 08/22/01 | 09/13/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| BLK | MB1 | S | 01LE0983 | N/A | 08/22/01 | 09/13/01 |
| BLK | MB1 BS | S | 01LE0983 | N/A | 08/22/01 | 09/13/01 |

9/14/01

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client:** THU-HANFORD B01-103
**LVL#:** 0108L587
**SDG/SAF#:** H1461/B01-103

**W.O #:** 11343-606-001-9999-00
**Date Received:** 08-16-01

**DIESEL RANGE ORGANICS**

The set of samples consisted of two (2) soil samples collected on 08-13-01.

The samples and their associated QC samples were extracted on 08-22-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 09-13-01. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.

2. The samples were extracted and analyzed within required holding times.

3. All surrogate recoveries were within acceptance criteria.

4. The blank spike recovery was within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All initial calibrations associated with this data set were within acceptance criteria.

7. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

9/17/01
Date

R:\SHARE\GCPEST\narr temp\tnu587dro.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

# GLOSSARY OF DIESEL RANGE ORGANICS DATA

## DATA QUALIFIERS

**U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

**J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

**E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**I** = Interference.

## ABBREVIATIONS

**BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

**BSD** = Indicates blank spike duplicate.

**MS** = Indicates matrix spike.

**MSD** = Indicates matrix spike duplicate.

**DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

**NA** = Not Applicable.

**DF** = Dilution Factor.

**NR** = Not Required.

**SP** = Indicates Spiked Compound.

## GLOSSARY OF DIESEL RANGE ORGANICS DATA

**D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

**C** = This flag applies to a compound that has been confirmed by GC/MS.

**Lionville Laboratory, Inc.**

DIESEL RANGE ORGANICS BY GC

Report Date: 09/14/01 07:46

RFW Batch Number: 0108L587 Client: TNUHANFORD B01-103 H1461 Work Order: 11343606001 Page: 1

| | Cust ID: | B12MB7 | B12MB7 | B12MB7 | B12MB8 | BLK | BLKOBS |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 01LE0983-MB1 | 01LE0983-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | p-Terphenyl | 86 % | 94 % | 92 % | 95 % | 90 % | 86 % |
| Diesel Range Organics | | 12.1 U | 85 % | 84 % | 12.6 U | 12.0 U | 84 % |
| Motor Oil | | 12.1 U | 12.1 U | 12.1 U | 12.6 U | 12.0 U | 12.0 U |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Flg 9/14/01

Lionville Laboratory Use Only
01081587

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory, Inc.

Client: TDU-Hanford B01-103
Est. Final Proj. Sampling Date:
Project #: 11343-Code-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day

Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | 0 | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 600 | 500 | | | 5 | |
| Preservatives | | - | - | - | | - | | - | - | | - | - | | | - | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | TIC | | TCLP Met | Metal | CN | | HC | | | TCO | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | OLC24H | OLC25X | OPCB | | ODPO OCPC | | ITCLP | Met① | | ICP6 | Inorg① | | | Met② | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
Wi - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix OC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | OLC24H | OLC25X | OPCB | | ODPO OCPC | | ITCLP | Met① | | ICP6 | Inorg① | | | Met② |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B12MB57 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| 002 | 8 | | | ⊥ | ⊥ | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| 003 | 7 tclp of 001 | | | L | ⊥ | ⊥ | | | | | | | | | | | | | | ✓ |
| 004 | 8 ⊥ 002 | | | ⊥ | ⊥ | ⊥ | | | | | | | | | | | | | | ✓ |

Special Instructions: Saf B01-103
Run Matrix QC
* See lab chron

DATE/REVISIONS:
Met① 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg① 2. TCNO2, TCNO3, TNH3N, TCNTO, TPH
⊥ 3. TSED
Met② 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
⊥ 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # SEE BELOW
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hernandez | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE | | ORIGINAL | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Lionville Laboratory Use Only
0108LS87

# Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory, Inc.

Client: TRU-Hanford Bol-103
Est. Final Proj. Sampling Date:
Project #: 11343-6006-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 8-16-01 Date Due: 9-15-01

| | | A | B | C | | D | | E | F | | G | H | | | I | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | 5 | 5 | | 1 | | 5 | 5 | | 5 | 5 | | | 5 | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | 1AG | 1AG | | 1AG | | 1AG | 1AG | | 1AG | 1AG | | | 1 | |
| Volume | Liquid | | | | | | | | | | | | | | 40 | |
| | Solid | 120 | 500 | 250 | | 120 | | 500 | 500 | | 60 | 500 | | | 5G | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | VOC 8260 | | TCLP Met | Metal | CN | | HC | | | Met (2) | |
| Lionville Laboratory Use Only | | 8240H | 8250X | OPCB | | ODRO OGRO | | ITCLP | Met (1) | | ICRLO | Inorg (1) | | | Met (2) | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B12MB7 | | | S | 8-13-01 | 1110 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | |
| 002 | 8 | | | 1 | 1 | 1138 | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | |
| 003 | 7 trip of 001 | | | L | X | | | | | | | | | | | | | ✓ | |
| 004 | 8 1 002 | | | 1 | 1 | 1 | | | | | | | | | | | | ✓ | |

Special Instructions: Sof Bol-103
Run Matrix QC
* See lab chron

DATE/REVISIONS:
Met (1) 1. Al, Ca, Cu, Fe, Mg, Mn, K, Na, Bi, Mo, Sn
Inorg (1) 2. ICNO2, ICNO3, INH3N, ICNTO, IPH,
1 3. ISED
Met (2) 4. Ba, Cd, Cr, Pb, Se, Ag, Sb, Be, Ni, V,
1 5. Zn, Hg (leachates)
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # SEE 6E/OW
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FEDEX | Carla Hunt | 8-16-01 | 9:40 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE | | ORIGINAL | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-103-05 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: R Fahlberg | Company Contact: D Weekes — Telephone No.: 372-9130 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days |
| Project Designation: 200 Area RCRA Drilling Waste Designation | Sampling Location: 200 East | SAF No.: B01-103 | Air Quality ☐ |
| Ice Chest No.: ERC 96-036 | Field Logbook No.: EL 1517-2 — COA JRCRA14114 ~~XL1012CHGR~~ RF 8-13-01 | Method of Shipment: Fed EX | |
| Shipped To: TMA/RECRA | Offsite Property No.: A010323 | Bill of Lading/Air Bill No.: 4235954-6461 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Samples stored in Ref.# ZB at the 3728 Shipping Facility on 8/13/01.
Collector not available to relinquish samples on 8/15/01 for shipment.
RT 8-15-01

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | None | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 500mL | 500mL | 60mL | 500mL | 120mL | 120mL | 500mL | 250mL | 1000mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | Chromium Hex - 7196 | See item (3) in Special Instructions. | VOA - 8260A (TCL) | See item (4) in Special Instructions. | See item (5) in Special Instructions. | PCBs - 8082 | See item (6) in Special Instructions. RT 8-15-01 | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| B12MB7 | SOIL | 8-13-01 | 1110 | X | X | X | X | X | X | X | X | | B12MB9 |
| B12MB8 | SOIL | 8-13-01 | 1138 | X | X | X | X | X | X | X | X | | B12MC0 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg / R. Fahlberg | 8-13-01 1300 | Kaf 2-B | 8-13-01 1300 |
| Kaf. 2B | 8-15-01 0900 | R Thore / R. Thore | 8-15-01 0900 |
| R. Thore / R Thore | 8-15-01 0900 | F E W Eng | |
| Ken K | 8-16-01 9:40 | Carlos Hernandez | 8-16-01 9:40 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Calcium, Copper, Iron, Magnesium, Manganese, Potassium, Sodium}; ICP Metals - 6010A (Add-on) {Bismuth, Molybdenum, Tin}
(2) Metals by ICP (TCLP) - 1311/6010 {Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals by ICP (TCLP) Add-on - 1311/6010 {Antimony, Beryllium, Nickel, Vanadium, Zinc}; Mercury (TCLP) - 1311/7470
(3) IC Anions - 300.0 {Nitrate, Nitrite}; Ammonia - 350.3; Total Cyanide - 9010; pH (Soil) - 9045; Sulfides - 9030
(4) Alcohols, Glycols, & Ketones - 8015M (Add-on) {Kerosene, Normal paraffin hydrocarbons (petroleum)}
(5) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}
~~(6) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec. Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241, Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 -- Total Sr, Technetium-99, Isotopic Uranium, Tritium - H3~~
8-15 RT

**Matrix ***
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)