H0709-TM1/RECR

RECRA ENVIRONMENTAL INC.

0072385

*Chemical and Environmental Measurement Information*

**Recra LabNet Philadelphia**
**Analytical Report**

**Client:** TNU-HANFORD B99-093
**RFW #:** 9912L120
**SDG/SAF #:** H0709/B99-093

**W.O. #:** 10985-001-001-9999-00
**Date Received:** 12-30-99

**GC/MS VOLATILE**

Eight (8) solid (charcoal) samples were collected on 12-28-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 01-07,08,10-2000.

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.

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2. The samples were analyzed within required holding time.

3. Non-target compounds were not detected in the samples.

4. These samples required a medium level analysis (4g extracted with 10mL Methanol) with additional 5 to 50-fold instrument dilutions due to high levels of target compounds. The surrogate and matrix spike compounds were added prior to purging the samples.

5. Three (3) of sixty-three (63) surrogate recoveries were outside EPA QC limits. All out of criteria samples were diluted, reanalyzed on 01-08-2000 and reported.

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

7. All blank spike recoveries were within EPA QC limits.

8. All method blanks contained the common laboratory contaminant Methylene Chloride and Acetone at levels less than 2x the CRQL. The method blank 00LVN013-MB1 also contained the target compound Carbon Tetrachloride at a level less than the CRQL. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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Data
Log In

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

03-09-00
Date

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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 17 pages.



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# 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. |

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# 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. |

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**Recra** LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 001T012

Initiator: [illegible] RFW Batch: 9912420 Parameter: 0624
Date: 1/11/00 Samples: All Matrix: Solid
Client: [illegible] 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. QC Problem** (Include all relevant specific results; attach data if necessary)

Daily Blank has carbon tetrachloride contamination @ 1 ppb. Samples all have CT at very high levels (all required medium plus dilution to get CT in range). CT hits will have "B" flag on summary due to blank contamination

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

Cross contamination of MeOH or IS/SS from syringes due to high levels.

**3. Discussion and Proposed Action**

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

Other Description:

1) IS/SS and MeOH were disposed of & replaced.
2) Because CT levels are so high in samples, report w/ "B" flag & Note in narrative. (Do not re-analyze)

**4. Project Manager Instructions**...signature/date: [signature] Johnson

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
✓ Client Contacted: Date/Person Rick Weiss 1/11/00
__ Add
__ Cancel

report & Narrate

**5. Final Action**...signature/date: _____

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ 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 [illegible] | __ | __ Metals: Doughty |
| __ | X Lab Manager: M. Taylor | __ | __ Inorganic: Perrone |
| ✓ | X Project Mgr: Stone/Carey/Schrenkel/Johnson | __ | __ GC/LC: Schnell |
| ✓ | X Section Mgr: Wesson/Daniels | __ | __ MS: LeMin/Taylor |
| __ | X QA (file): Racioppi | __ | __ Log-in: Toder |
| __ | __ Data Management: Feldman | __ | __ Admin: Soos |
| __ | __ Sample Prep: Schnell/Doughty/Kauffman | __ | __ Other: _____ |

L-WI-006/E-03/99

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**Recra LabNet - Lionville Laboratory**

Volatiles by GC/MS, HSL List

Report Date: 03/08/00 16:27

RFW Batch Number: **9912L120** Client: **TNU-HANFORD B99-093** Work Order: 10985001001 Page: 1a

| | Cust ID: | B0XB94 | | B0XB94 | | B0XB94 | | B0XB94 | | B0XB95 | | B0XB95 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 001 DL | | 001 MS | | 001 MSD | | 002 | | 002 DL | |
| | Matrix: | SOLID | | SOLID | | SOLID | | SOLID | | SOLID | | SOLID | |
| | D.F.: | 1.03 | | 5.13 | | 5.13 | | 5.13 | | 1.29 | | 32.3 | |
| | Units: | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | |
| | Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Surrogate Recovery | Toluene-d8 | 98 | % | 102 | % | 93 | % | 100 | % | 101 | % | 100 | % |
| | Bromofluorobenzene | 89 | % | 91 | % | 92 | % | 100 | % | 96 | % | 88 | % |
| | 1,2-Dichloroethane-d4 | 117 | % | 100 | % | 103 | % | 111 | % | 124 * | % | 99 | % |
| Chloromethane | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| Bromomethane | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| Vinyl Chloride | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| Chloroethane | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| Methylene Chloride | | 520 | BJ | 5200 | BJD | 2700 | BJ | 5300 | BJ | 1100 | BJ | 22000 | BJD |
| Acetone | | 2400 | U | 2800 | BJD | 3700 | BJ | 4900 | BJ | 410 | BJ | 23000 | BJD |
| Carbon Disulfide | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| 1,1-Dichloroethene | | 1200 | U | 6000 | U | 99 | % | 116 | % | 1300 | U | 32000 | U |
| 1,1-Dichloroethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| 1,2-Dichloroethene (total) | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Chloroform | | 2000 | | 1800 | JD | 2000 | J | 2200 | J | 24000 | | 23000 | JD |
| 1,2-Dichloroethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| 2-Butanone | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| 1,1,1-Trichloroethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Carbon Tetrachloride | | 170000 | E | 140000 | BD | 130000 | B | 150000 | B | 600000 | E | 680000 | BD |
| Bromodichloromethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 470 | J | 32000 | U |
| 1,2-Dichloropropane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| cis-1,3-Dichloropropene | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Trichloroethene | | 400 | J | 6000 | U | 93 | % | 111 | % | 7800 | | 7700 | JD |
| Dibromochloromethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| 1,1,2-Trichloroethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Benzene | | 1200 | U | 6000 | U | 93 | % | 113 | % | 1300 | U | 32000 | U |
| Trans-1,3-Dichloropropene | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Bromoform | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| 4-Methyl-2-pentanone | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| 2-Hexanone | | 2400 | U | 12000 | U | 12000 | U | 12000 | U | 2600 | U | 65000 | U |
| Tetrachloroethene | | 320 | J | 6000 | U | 6000 | U | 6000 | U | 2800 | | 32000 | U |
| 1,1,2,2-Tetrachloroethane | | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Toluene | | 1200 | U | 6000 | U | 96 | % | 111 | % | 1300 | U | 32000 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9912L120** Client: **TNU-HANFORD B99-093** Work Order: 10985001001 Page: 1b

| Cust ID: | B0XB94 | | B0XB94 | | B0XB94 | | B0XB94 | | B0XB95 | | B0XB95 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 001 | | 001 DL | | 001 MS | | 001 MSD | | 002 | | 002 DL | |
| Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Chlorobenzene | 1200 | U | 6000 | U | 93 | % | 107 | % | 1300 | U | 32000 | U |
| Ethylbenzene | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Styrene | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |
| Xylene (total) | 1200 | U | 6000 | U | 6000 | U | 6000 | U | 1300 | U | 32000 | U |

*= Outside of EPA CLP QC limits.

**Recra LabNet - Lionville Laboratory**

Volatiles by GC/MS, HSL List

Report Date: 03/08/00 16:27

RFW Batch Number: **9912L120** Client: **TNU-HANFORD B99-093** Work Order: 10985001001 Page: 2a

| | Cust ID: | B0XB96 | | B0XB96 | | B0XB97 | | B0XB97 | | B0XB98 | | B0XB99 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 003 | | 003 DL | | 004 | | 004 DL | | 005 | | 006 | |
| | Matrix: | SOLID | | SOLID | | SOLID | | SOLID | | SOLID | | SOLID | |
| | D.F.: | 1.03 | | 51.3 | | 1.14 | | 57.1 | | 25.0 | | 2.16 | |
| | Units: | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | | UG/KG | |
| | Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Surrogate Recovery | Toluene-d8 | 103 | % | 97 | % | 100 | % | 98 | % | 99 | % | 99 | % |
| | Bromofluorobenzene | 92 | % | 94 | % | 91 | % | 93 | % | 94 | % | 94 | % |
| | 1,2-Dichloroethane-d4 | 121 | % | 97 | % | 121 | % | 98 | % | 102 | % | 100 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Chloromethane | | 350 | J | 94000 | U | 570 | J | 110000 | U | 59000 | U | 5200 | U |
| Bromomethane | | 1900 | U | 94000 | U | 2200 | U | 110000 | U | 59000 | U | 5200 | U |
| Vinyl Chloride | | 1900 | U | 94000 | U | 2200 | U | 110000 | U | 59000 | U | 5200 | U |
| Chloroethane | | 1900 | U | 94000 | U | 2200 | U | 110000 | U | 59000 | U | 5200 | U |
| Methylene Chloride | | 820 | BJ | 33000 | BJD | 1300 | B | 71000 | BD | 37000 | B | 3300 | B |
| Acetone | | 1900 | U | 28000 | BJD | 700 | BJ | 34000 | BJD | 18000 | BJ | 1700 | BJ |
| Carbon Disulfide | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 1,1-Dichloroethene | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 1,1-Dichloroethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 1,2-Dichloroethene (total) | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Chloroform | | 7200 | | 47000 | U | 12000 | | 10000 | JD | 30000 | U | 1900 | J |
| 1,2-Dichloroethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 2-Butanone | | 1900 | U | 94000 | U | 2200 | U | 110000 | U | 59000 | U | 5200 | U |
| 1,1,1-Trichloroethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Carbon Tetrachloride | | 610000 | E | 700000 | BD | 830000 | E | 1000000 | BD | 340000 | B | 150000 | BE |
| Bromodichloromethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 1,2-Dichloropropane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| cis-1,3-Dichloropropene | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Trichloroethene | | 530 | J | 47000 | U | 400 | J | 56000 | U | 30000 | U | 2600 | U |
| Dibromochloromethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 1,1,2-Trichloroethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Benzene | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Trans-1,3-Dichloropropene | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Bromoform | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| 4-Methyl-2-pentanone | | 1900 | U | 94000 | U | 2200 | U | 110000 | U | 59000 | U | 5200 | U |
| 2-Hexanone | | 1900 | U | 94000 | U | 2200 | U | 110000 | U | 59000 | U | 5200 | U |
| Tetrachloroethene | | 440 | J | 47000 | U | 350 | J | 56000 | U | 30000 | U | 2600 | U |
| 1,1,2,2-Tetrachloroethane | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Toluene | | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9912L120 Client: TNU-HANFORD B99-093 Work Order: 10985001001 Page: 2b

| Cust ID: | B0XB96 | | B0XB96 | | B0XB97 | | B0XB97 | | B0XB98 | | B0XB99 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 003 | | 003 DL | | 004 | | 004 DL | | 005 | | 006 | |
| Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Chlorobenzene | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Ethylbenzene | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Styrene | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |
| Xylene (total) | 940 | U | 47000 | U | 1100 | U | 56000 | U | 30000 | U | 2600 | U |

*= Outside of EPA CLP QC limits.

**Recra LabNet - Lionville Laboratory**

Volatiles by GC/MS, HSL List

Report Date: 03/08/00 16:27

RFW Batch Number: **9912L120** Client: **TNU-HANFORD B99-093** Work Order: 10985001001 Page: 3a

| | Cust ID: | B0XB99 | B0XBB0 | B0XBB0 | B0XBB1 | B0XBB1 | VBLKOY |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 006 DL | 007 | 007 DL | 008 | 008 DL | 00LVN012-MB1 |
| | Matrix: | SOLID | SOLID | SOLID | SOLID | SOLID | SOIL |
| | D.F.: | 5.41 | 1.11 | 27.8 | 1.14 | 28.6 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| | Level: | MED | MED | MED | MED | MED | MED |
| Surrogate Recovery | Toluene-d8 | 100 % | 100 % | 103 % | 101 % | 98 % | 100 % |
| | Bromofluorobenzene | 98 % | 83 % | 99 % | 89 % | 94 % | 98 % |
| | 1,2-Dichloroethane-d4 | 103 % | 122 * % | 107 % | 130 * % | 103 % | 117 % |
| | | fl | fl | fl | fl | fl | fl |
| Chloromethane | | 13000 U | 490 J | 45000 U | 430 J | 40000 U | 1200 U |
| Bromomethane | | 13000 U | 1800 U | 45000 U | 1600 U | 40000 U | 1200 U |
| Vinyl Chloride | | 13000 U | 1800 U | 45000 U | 1600 U | 40000 U | 1200 U |
| Chloroethane | | 13000 U | 1800 U | 45000 U | 1600 U | 40000 U | 1200 U |
| Methylene Chloride | | 5500 JBD | 480 BJ | 28000 BD | 1000 B | 20000 BJD | 260 J |
| Acetone | | 4700 JBD | 370 BJ | 16000 BJD | 450 BJ | 15000 BJD | 150 J |
| Carbon Disulfide | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 1,1-Dichloroethene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 1,1-Dichloroethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 1,2-Dichloroethene (total) | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Chloroform | | 1600 JD | 5800 | 5400 JD | 4400 | 4100 JD | 620 U |
| 1,2-Dichloroethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 2-Butanone | | 13000 U | 1800 U | 45000 U | 1600 U | 40000 U | 1200 U |
| 1,1,1-Trichloroethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Carbon Tetrachloride | | 150000 D | 400000 E | 430000 BD | 360000 E | 340000 BD | 620 U |
| Bromodichloromethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 1,2-Dichloropropane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| cis-1,3-Dichloropropene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Trichloroethene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Dibromochloromethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 1,1,2-Trichloroethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Benzene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Trans-1,3-Dichloropropene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Bromoform | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 4-Methyl-2-pentanone | | 13000 U | 1800 U | 45000 U | 1600 U | 40000 U | 1200 U |
| 2-Hexanone | | 13000 U | 1800 U | 45000 U | 1600 U | 40000 U | 1200 U |
| Tetrachloroethene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| 1,1,2,2-Tetrachloroethane | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |
| Toluene | | 6600 U | 910 U | 23000 U | 800 U | 20000 U | 620 U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9912L120** Client: **TNU-HANFORD B99-093** Work Order: 10985001001 Page: 3b

| Cust ID: | B0XB99 | | B0XBB0 | | B0XBB0 | | B0XBB1 | | B0XBB1 | | VBLKOY | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 006 DL | | 007 | | 007 DL | | 008 | | 008 DL | | 00LVN012-MB1 | |
| Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Chlorobenzene | 6600 | U | 910 | U | 23000 | U | 800 | U | 20000 | U | 620 | U |
| Ethylbenzene | 6600 | U | 910 | U | 23000 | U | 800 | U | 20000 | U | 620 | U |
| Styrene | 6600 | U | 910 | U | 23000 | U | 800 | U | 20000 | U | 620 | U |
| Xylene (total) | 6600 | U | 910 | U | 23000 | U | 800 | U | 20000 | U | 620 | U |

*= Outside of EPA CLP QC limits.

**Recra LabNet - Lionville Laboratory**

Volatiles by GC/MS, HSL List

Report Date: 03/08/00 16:27

RFW Batch Number: **9912L120** Client: **TNU-HANFORD B99-093** Work Order: 10985001001 Page: 4a

| | | | | |
|---|---|---|---|---|
| | Cust ID: | **VBLKOZ** | **VBLKOZ BS** | **VBLKPA** |
| Sample Information | RFW#: | **00LVN013-MB1** | **00LVN013-MB1** | **00LVN014-MB1** |
| | Matrix: | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG |
| | Level: | MED | MED | MED |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Toluene-d8 | 102 | % | 106 | % | 104 | % |
| Surrogate | Bromofluorobenzene | 90 | % | 104 | % | 96 | % |
| Recovery | 1,2-Dichloroethane-d4 | 101 | % | 112 | % | 101 | % |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chloromethane | 1200 | U | 1200 | U | 1200 | U | |
| Bromomethane | 1200 | U | 1200 | U | 1200 | U | |
| Vinyl Chloride | 1200 | U | 1200 | U | 1200 | U | |
| Chloroethane | 1200 | U | 1200 | U | 1200 | U | |
| Methylene Chloride | 640 | | 570 | BJ | 470 | J | |
| Acetone | 350 | J | 510 | BJ | 370 | J | |
| Carbon Disulfide | 620 | U | 620 | U | 620 | U | |
| 1,1-Dichloroethene | 620 | U | 111 | % | 620 | U | |
| 1,1-Dichloroethane | 620 | U | 620 | U | 620 | U | |
| 1,2-Dichloroethene (total) | 620 | U | 620 | U | 620 | U | |
| Chloroform | 620 | U | 620 | U | 620 | U | |
| 1,2-Dichloroethane | 620 | U | 620 | U | 620 | U | |
| 2-Butanone | 1200 | U | 1200 | U | 1200 | U | |
| 1,1,1-Trichloroethane | 620 | U | 620 | U | 620 | U | |
| Carbon Tetrachloride | 160 | J | 200 | BJ | 620 | U | |
| Bromodichloromethane | 620 | U | 620 | U | 620 | U | |
| 1,2-Dichloropropane | 620 | U | 620 | U | 620 | U | |
| cis-1,3-Dichloropropene | 620 | U | 620 | U | 620 | U | |
| Trichloroethene | 620 | U | 103 | % | 620 | U | |
| Dibromochloromethane | 620 | U | 620 | U | 620 | U | |
| 1,1,2-Trichloroethane | 620 | U | 620 | U | 620 | U | |
| Benzene | 620 | U | 106 | % | 620 | U | |
| Trans-1,3-Dichloropropene | 620 | U | 620 | U | 620 | U | |
| Bromoform | 620 | U | 620 | U | 620 | U | |
| 4-Methyl-2-pentanone | 1200 | U | 1200 | U | 1200 | U | |
| 2-Hexanone | 1200 | U | 1200 | U | 1200 | U | |
| Tetrachloroethene | 620 | U | 620 | U | 620 | U | |
| 1,1,2,2-Tetrachloroethane | 620 | U | 620 | U | 620 | U | |
| Toluene | 620 | U | 107 | % | 620 | U | |

*= Outside of EPA CLP QC limits.

| Cust ID: | **VBLKOZ** | | **VBLKOZ BS** | | **VBLKPA** | |
|---|---|---|---|---|---|---|
| RFW#: | **00LVN013-MB1** | | **00LVN013-MB1** | | **00LVN014-MB1** | |
| Level: | MED | | MED | | MED | |
| Chlorobenzene | 620 | U | 104 | % | 620 | U |
| Ethylbenzene | 620 | U | 620 | U | 620 | U |
| Styrene | 620 | U | 620 | U | 620 | U |
| Xylene (total) | 620 | U | 620 | U | 620 | U |

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-093

DATE RECEIVED: 12/30/99 RFW LOT # :9912L120

| CLIENT ID | RFW # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B0XB94 | 001 M1 | SO | 00LVN012 | 12/28/99 | N/A | 01/07/00 |
| B0XB94 | 001 M2 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB94 | 001 MS M1 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB94 | 001 MSD M1 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB95 | 002 M1 | SO | 00LVN012 | 12/28/99 | N/A | 01/07/00 |
| B0XB95 | 002 M2 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB96 | 003 M1 | SO | 00LVN012 | 12/28/99 | N/A | 01/07/00 |
| B0XB96 | 003 M2 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB97 | 004 M1 | SO | 00LVN012 | 12/28/99 | N/A | 01/07/00 |
| B0XB97 | 004 M2 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB98 | 005 M1 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB99 | 006 M1 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XB99 | 006 M2 | SO | 00LVN014 | 12/28/99 | N/A | 01/10/00 |
| B0XBB0 | 007 M1 | SO | 00LVN012 | 12/28/99 | N/A | 01/07/00 |
| B0XBB0 | 007 M2 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |
| B0XBB1 | 008 M1 | SO | 00LVN012 | 12/28/99 | N/A | 01/07/00 |
| B0XBB1 | 008 M2 | SO | 00LVN013 | 12/28/99 | N/A | 01/08/00 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| VBLKOY | MB1 | S | 00LVN012 | N/A | N/A | 01/07/00 |
| VBLKOZ | MB1 | S | 00LVN013 | N/A | N/A | 01/08/00 |
| VBLKOZ | MB1 BS | S | 00LVN013 | N/A | N/A | 01/08/00 |
| VBLKPA | MB1 | S | 00LVN014 | N/A | N/A | 01/10/00 |

| RECRA LabNet Use Only |
|---|
| 9912L120 |

# Custody Transfer Record/Lab Work Request

Page 1 of 2

**All** FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) Gems wet Perrone

RECRA LabNet

Client: TNU Hanford B99-093
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: Orlette Johnson
QC: spec Del: std TAT: 30 day
Date Rec'd: 12-30-99 Date Due: 1/29/00
Account #:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 1 | | | | | | | | | 4 | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | 1AG | | | | | | | | | 1AG | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | 250 | | | | | | | | | 60 | | | | | |
| Preservatives | | – | | | | | | | | | – | | | | | |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | | INORG: Metal | CN | BomB | | | | | |

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 | RECRA LabNet Use Only: 0024H | | | | | | | | | 1BOMB | 1CCL | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | BOX B94 | | | SO | 122899 | 1140 | ✓ | | | | | | | | | ✓ | | | | | |
| 002 | 95 | | | | | 1155 | ✓ | | | | | | | | | ✓ | | | | | |
| 003 | 96 | | | | | 1247 | ✓ | | | | | | | | | ✓ | | | | | |
| 004 | 97 | | | | | 1255 | ✓ | | | | | | | | | ✓ | | | | | |
| 005 | 98 | | | | | 1300 | ✓ | | | | | | | | | ✓ | | | | | |
| 006 | 99 | | | | | 1315 | ✓ | | | | | | | | | ✓ | | | | | |
| 007 | B0 | | | | | 1320 | ✓ | | | | | | | | | ✓ | | | | | |
| 008 | B1 | | | | | 1325 | ✓ | | | | | | | | | ✓ | | | | | |
| 009 | 94 Bomb of 001 | | | LW | * | – | | | | | | | | | | | ✓ | | | | |
| 010 | 95 2 | | | | | – | | | | | | | | | | | ✓ | | | | |

Special Instructions:
Saf # B99-093

COMPOSITE WASTE

DATE/REVISIONS:
1. * see labchron
2.
3. Run matrix QC
2-8-00 4. IBomB + ICCL cancelled for all samples
2-8-00 5. 001-008 VOA relogged to 0002L393
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FedEx | TReppel | 123099 | 0920 |
| | | | |

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

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

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 4235 7953 3038
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape 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. 3.9 °C

| RECRA LabNet Use Only |
|---|
| 99 12L 120 |

# Custody Transfer Record/Lab Work Request

Page 2 of 2

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

RECRA LabNet

Client TNU-Hanford

Est. Final Proj. Sampling Date

Project #

Project Contact/Phone #

RECRA Project Manager

QC Del TAT

see pg ①

Date Rec'd Date Due

Account #

| | | |
|---|---|---|
| Refrigerator # | | |
| #/Type Container | Liquid | |
| | Solid | |
| Volume | Liquid | |
| | Solid | |
| Preservatives | | |

ANALYSES REQUESTED →

| ORGANIC | | | | INORG | |
|---|---|---|---|---|---|
| VOA | BNA | Pest/PCB | Herb | Metal | CN |

RECRA LabNet Use Only

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 | ICCL |
|---|---|---|---|---|---|---|---|
| | Bomb of 00 | | | | | | |
| 011 | BOXB96 3 | | | W | * | — | ✓ |
| 12 | 97 4 | | | | | | ✓ |
| 13 | 98 5 | | | | | | ✓ |
| 14 | 99 6 | | | | | | ✓ |
| 15 | BØ 7 | | | | | | ✓ |
| 16 | B1 8 | | | | | | ✓ |

Special Instructions:

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

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

COC Tape 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. ___ °C

see pg ①

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Jedeck | Janson for TK | 12/30/99 | 0920 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B99-093-06 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>gale | Company Contact<br>Rohay, VJ | Telephone No.<br>372-9098 | Project Coordinator<br>TRENT, SJ | Price Code 9N<br>Air Quality ☐ | Data Turnaround<br>45 Days |
| Project Designation<br>200-ZP-2 Passive Soil Vapor Extraction - Other Solid | Sampling Location<br>200 west | | SAF No.<br>B99-093 | | |
| Ice Chest No. | Field Logbook No.<br>EL-1435 | COA<br>R20ZP2DP60 | Method of Shipment<br>Federal Express | | |
| Shipped To<br>TMA/RECRA<br>BZB 12-28-99 | Offsite Property No.<br>A000051 | | Bill of Lading/Air Bill No.<br>4235-7953-3038 | | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | | | | | | | | | |
| Type of Container | aG | G | | | | | | | | | |
| No. of Container(s) | 1 | 1 | | | | | | | | | |
| Volume | 60mL | 250mL | | | | | | | | | |
| SAMPLE ANALYSIS | Total Chloride by Bomb Combustion | VOA - 8260A (TCL) | | | | | | | | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| B0XB94 / Other Solid / 12-28-99 / 1140 | X | X | | | | | | | | | |
| B0XB95 / Other Solid / 12-28-99 / 1155 | X | X | | | | | | | | | |
| B0XB96 / Other Solid / 12-28-99 / 1247 | X | X | | | | | | | | | |
| B0XB97 / Other Solid / 12-28-99 / 1255 | X | X | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | SPECIAL INSTRUCTIONS |
|---|---|---|
| Relinquished By / Date/Time<br>SJ GALE 122899 1500 | Received By / Date/Time<br>REF. 2-C | SAMPLE COLLECTED FROM < 2000pCi<br>NON-RAD AREA |
| Relinquished By / Date/Time<br>REF 2C 12-29-99/1030 | Received By Doug Downey / Date/Time<br>Doug Downey 12-29-99/1030 | |
| Relinquished By / Date/Time<br>FEDEX 12-30-99 0920 | Received By / Date/Time<br>THoppel 12-30-99 0920 | |
| Relinquished By / Date/Time | Received By / Date/Time | |
| Relinquished By / Date/Time | Received By / Date/Time | |
| Relinquished By / Date/Time | Received By / Date/Time | |

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=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)

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | B99-093-07 | Page 1 of 1 |
|---|---|---|---|---|
| Collector<br>gale | Company Contact<br>Rohay, VJ | Telephone No.<br>372-9098 | Project Coordinator<br>TRENT, SJ | Price Code 9N<br>Air Quality ☐ |
| Project Designation<br>200-ZP-2 Passive Soil Vapor Extraction - Other Solid | Sampling Location<br>200 west | | SAF No.<br>B99-093 | Data Turnaround<br>45 Days |
| Ice Chest No. | Field Logbook No.<br>EL-1435 | COA<br>R20ZP2DP60 | Method of Shipment<br>Federal Express | |
| Shipped To<br>TMA/RECRA<br>5-012-29-99 | Offsite Property No.<br>A000081 | | Bill of Lading/Air Bill No.<br>4235-7953-3038 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | | | | Cool 4C | Cool 4C | | | | | | | |
| Type of Container | | | | aG | G | | | | | | | |
| No. of Container(s) | | | | 1 | 1 | | | | | | | |
| Volume | | | | 60mL | 250mL | | | | | | | |
| SAMPLE ANALYSIS | | | | Total Chloride by Bomb Combustion | VOA - 8260A (TCL) | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| B0XB98 | Other Solid | 12-28-99 | 1300 | X | X | | | | | | | |
| B0XB99 | Other Solid | 12-28-99 | 1315 | X | X | | | | | | | |
| B0XBB0 | Other Solid | 12-28-99 | 1320 | X | X | | | | | | | |
| B0XBB1 | Other Solid | 12-28-99 | 1325 | X | X | | | | | | | |

| CHAIN OF POSSESSION | | Sign/Print Names | |
|---|---|---|---|
| Relinquished By | Date/Time | Received By | Date/Time |
| SJGALE [signature] | 122899 1500 | REF 2-C | |
| Relinquished By | Date/Time | Received By Doug Barnes | Date/Time |
| Ref 2-C | 12-29-99/1030 | [signature] | 12-29-99/1030 |
| Relinquished By | Date/Time | Received By | Date/Time |
| FedEx | 123099 0920 | TKeppel | 123099 0920 |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |
| Relinquished By | Date/Time | Received By | Date/Time |

SPECIAL INSTRUCTIONS

SAMPLE COLLECTED FROM < 2,000pCi NON-RAD AREA

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=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)

ORIGINAL Dayes 1/27/2000

SDR # B00-045
Revision #: 0
Date Initiated: 01/03/00

# SAMPLE DISPOSITION RECORD

SAF: B99-093
OU: 200-ZP-2
Project ID: 200-ZP-2
Task ID: 1
Sampling Event: 200-ZP-2 Passive Soil Vapor Extraction Sampling

Laboratory: TMA/RECRA

Task Manager: G. A. Day

Sampling Information:
Number of Samples: 8
ID Numbers: B0XB94, B0XB98, B0XBB1, B0XB95, B0XB97, B0XB99, B0XBB0, B0XB96
Matrix: Other Solid
Collection Date: 12/28/99

Issue Background:

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

Type: Chain of Custody Problem

Description: No Relinquishing Signature on Chain of Custody

Disposition:

Description: The chain of custody was not properly relinquished to the airborne carrier because the relinquishing party did not sign it. The laboratory continued with all analyses specified on the chain of custody.

Justification: Although the chain of custody was not properly relinquished, other shipping documents that accompanied the chain of custody form can demonstrate custody of the listed samples. The Groundwater/Vadose Zone project will evaluate the impact of the chain of custody problem on data usability.

Approval Signatures:

S. J. Trent — 1/19/00
Project Coordinator (Print/Sign Name) — Date

G. A. Day — 1/20/00
Task Manager (Print/Sign Name) — Date