0093074

# SAF-RC-182
# ARRA 100-F Remaining Sites Remediation – Soil In-Process
# FINAL DATA PACKAGE

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt H4-21 KW 12/29/10
INITIAL/DATE

**COMMENTS:**

**SDG K2510 SAF-RC-182**

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

**Sample Location: 600-351 Site**

RECEIVED
JAN 04 2011
EDMC

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

7 December 2010

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DEC 2010

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 1011036 |
| SDG # | K2510 |
| SAF # | RC-182 |
| Date Received | 11/05/10 |
| # Samples | 2 |
| Matrix | SOIL |
| Volatiles | X |
| Semivolatiles | X |
| Pest/PCB | X |
| Glycols | |
| DRO/KRO/GRO | |
| PAHs | |
| Herbicides | X |
| Metals | X |
| Inorganics | |

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

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| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>11/16/2010 13:56 |

## Analytical Report for Volatile Organic Compounds by SW846 8260B

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1CM93 | 1011036-01 | Soil | 11/02/2010 10:10 | 11/05/2010 10:00 |
| J1CM94 | 1011036-02 | Soil | 11/02/2010 10:30 | 11/05/2010 10:00 |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-182 K2510
**LVL #:** 1011036

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 11-05-2010

## GC/MS VOLATILE

Two (2) soil samples were collected on 11-02-2010.

The samples and associated QC samples were prepared and analyzed 09-07-2010 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on SW846 Method 5030A, Rev. 1, July 1992 and the analysis procedure was based on SW846 Method 8260B for TCL Volatile target compounds.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from a sample(s) that met LvL's sample acceptance policy.
2. Samples were analyzed within hold time.
3. Non-target compounds were not detected in these samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blanks were below the reporting limit for all target analytes.
8. Samples are reported on a dry weight basis.
9. All internal standard area and retention time criteria were met.
10. Manual integrations are performed according to SOP QA-125 to produce quality data with utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").


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.

11. "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
LvL Laboratory Manager

11/17/10
Date

# GLOSSARY

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Indicates that the 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 concetration 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

## 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. |

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications 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 quan modifications:

| | | |
|---|---|---|
| MP | - | Missed Peak: Manually added peak not found by automatic quan program. |
| PA | - | Peak Assignment: quan 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. |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

## J1CM93

### 1011036-01 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Volatile Organic Compounds by SW846 8260B** | | | | | | | | |
| 1,1,1-Trichloroethane | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1,2,2-Tetrachloroethane | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1,2-Trichloroethane | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1-Dichloroethane | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1-Dichloroethene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,2-Dichloroethane | 6.12 U | 6.12 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,2-Dichloroethene (total) | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,2-Dichloropropane | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 2-Butanone | 12.2 U | 12.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 2-Hexanone | 12.2 U | 12.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 4-Methyl-2-pentanone | 12.2 U | 12.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| **Acetone** | **6.63** J | 12.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Benzene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Bromodichloromethane | 6.12 U | 6.12 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Bromoform | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Bromomethane | 10.2 U | 10.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Carbon Disulfide | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Carbon Tetrachloride | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chlorobenzene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chloroethane | 10.2 U | 10.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chloroform | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chloromethane | 10.2 U | 10.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| cis-1,2-Dichloroethene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| cis-1,3-Dichloropropene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Dibromochloromethane | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Ethylbenzene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| **Methylene Chloride** | **5.55** B, J | 6.12 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Styrene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Tetrachloroethene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| trans-1,2-Dichloroethene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Toluene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| trans-1,3-Dichloropropene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Trichloroethene | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Vinyl chloride | 10.2 U | 10.2 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Xylenes, total | 5.10 U | 5.10 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| *Surrogate: 1,2-Dichloroethane-d4* | *124 %* | *63-151* | | | *L011125* | *11/08/2010* | *11/08/2010* | *8260B* |
| *Surrogate: Toluene-d8* | *105 %* | *68-140* | | | *L011125* | *11/08/2010* | *11/08/2010* | *8260B* |
| *Surrogate: 4-Bromofluorobenzene* | *109 %* | *66-122* | | | *L011125* | *11/08/2010* | *11/08/2010* | *8260B* |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

## J1CM94

### 1011036-02 (Soil)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Volatile Organic Compounds by SW846 8260B** | | | | | | | | | |
| 1,1,1-Trichloroethane | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1,2,2-Tetrachloroethane | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1,2-Trichloroethane | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1-Dichloroethane | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,1-Dichloroethene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,2-Dichloroethane | 5.93 | U | 5.93 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,2-Dichloroethene (total) | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 1,2-Dichloropropane | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 2-Butanone | 11.9 | U | 11.9 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 2-Hexanone | 11.9 | U | 11.9 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| 4-Methyl-2-pentanone | 11.9 | U | 11.9 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| **Acetone** | **5.30** | J | 11.9 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Benzene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Bromodichloromethane | 5.93 | U | 5.93 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Bromoform | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Bromomethane | 9.89 | U | 9.89 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Carbon Disulfide | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Carbon Tetrachloride | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chlorobenzene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chloroethane | 9.89 | U | 9.89 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chloroform | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Chloromethane | 9.89 | U | 9.89 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| cis-1,2-Dichloroethene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| cis-1,3-Dichloropropene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Dibromochloromethane | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Ethylbenzene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| **Methylene Chloride** | **4.14** | B, J | 5.93 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Styrene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Tetrachloroethene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| trans-1,2-Dichloroethene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Toluene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| trans-1,3-Dichloropropene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Trichloroethene | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Vinyl chloride | 9.89 | U | 9.89 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| Xylenes, total | 4.94 | U | 4.94 | ug/kg dry | 1 | L011125 | 11/08/2010 | 11/08/2010 | 8260B |
| *Surrogate: 1,2-Dichloroethane-d4* | *110 %* | | *63-151* | | | *L011125* | *11/08/2010* | *11/08/2010* | *8260B* |
| *Surrogate: Toluene-d8* | *96 %* | | *68-140* | | | *L011125* | *11/08/2010* | *11/08/2010* | *8260B* |
| *Surrogate: 4-Bromofluorobenzene* | *91 %* | | *66-122* | | | *L011125* | *11/08/2010* | *11/08/2010* | *8260B* |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

## Volatile Organic Compounds by SW846 8260B - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011125 - SW 5030A** | | | | | | | | | |
| **Blank (L011125-BLK1)** | | | Prepared & Analyzed: 11/08/2010 | | | | | | |
| 1,1,1-Trichloroethane | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 1,1,2,2-Tetrachloroethane | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 1,1,2-Trichloroethane | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 1,1-Dichloroethane | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 1,1-Dichloroethene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 1,2-Dichloroethane | 6.00 U | 6.00 | ug/kg wet | | | | | | |
| 1,2-Dichloroethene (total) | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 1,2-Dichloropropane | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| 2-Butanone | 12.0 U | 12.0 | ug/kg wet | | | | | | |
| 2-Hexanone | 12.0 U | 12.0 | ug/kg wet | | | | | | |
| 4-Methyl-2-pentanone | 12.0 U | 12.0 | ug/kg wet | | | | | | |
| Acetone | 12.0 U | 12.0 | ug/kg wet | | | | | | |
| Benzene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Bromodichloromethane | 6.00 U | 6.00 | ug/kg wet | | | | | | |
| Bromoform | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Bromomethane | 10.0 U | 10.0 | ug/kg wet | | | | | | |
| Carbon Disulfide | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Carbon Tetrachloride | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Chlorobenzene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Chloroethane | 10.0 U | 10.0 | ug/kg wet | | | | | | |
| Chloroform | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Chloromethane | 10.0 U | 10.0 | ug/kg wet | | | | | | |
| cis-1,2-Dichloroethene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| cis-1,3-Dichloropropene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Dibromochloromethane | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Ethylbenzene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Methylene Chloride | 2.85 J | 6.00 | ug/kg wet | | | | | | |
| Styrene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Tetrachloroethene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| trans-1,2-Dichloroethene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Toluene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| trans-1,3-Dichloropropene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Trichloroethene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| Vinyl chloride | 10.0 U | 10.0 | ug/kg wet | | | | | | |
| Xylenes, total | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *49.5* | | *ug/kg wet* | *50.000* | | *99* | *63-151* | | |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
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Phone: 610-280-3000
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

## Volatile Organic Compounds by SW846 8260B - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011125 - SW 5030A** | | | | | | | | | |
| **Blank (L011125-BLK1)** | | | Prepared & Analyzed: 11/08/2010 | | | | | | |
| *Surrogate: Toluene-d8* | *48.9* | | *ug/kg wet* | *50.000* | | *98* | *68-140* | | |
| *Surrogate: 4-Bromofluorobenzene* | *47.8* | | *ug/kg wet* | *50.000* | | *96* | *66-122* | | |
| **LCS (L011125-BS1)** | | | Prepared & Analyzed: 11/08/2010 | | | | | | |
| 1,1,1-Trichloroethane | 46.0 | 5.00 | ug/kg wet | 50.000 | | 92 | 60-140 | | |
| 1,1,2,2-Tetrachloroethane | 48.9 | 5.00 | ug/kg wet | 50.000 | | 98 | 70-130 | | |
| 1,1,2-Trichloroethane | 50.2 | 5.00 | ug/kg wet | 50.000 | | 100 | 70-130 | | |
| 1,1-Dichloroethane | 45.9 | 5.00 | ug/kg wet | 50.000 | | 92 | 60-140 | | |
| 1,1-Dichloroethene | 44.4 | 5.00 | ug/kg wet | 50.000 | | 89 | 60-130 | | |
| 1,2-Dichloroethane | 48.0 | 6.00 | ug/kg wet | 50.000 | | 96 | 60-140 | | |
| 1,2-Dichloroethene (total) | 93.1 | 5.00 | ug/kg wet | 100.00 | | 93 | 60-140 | | |
| 1,2-Dichloropropane | 47.6 | 5.00 | ug/kg wet | 50.000 | | 95 | 70-130 | | |
| 2-Butanone | 69.7 | 12.0 | ug/kg wet | 50.000 | | 139 | 20-200 | | |
| 2-Hexanone | 63.4 | 12.0 | ug/kg wet | 50.000 | | 127 | 20-200 | | |
| 4-Methyl-2-pentanone | 54.5 | 12.0 | ug/kg wet | 50.000 | | 109 | 50-150 | | |
| Acetone | 71.8 | 12.0 | ug/kg wet | 50.000 | | 144 | 20-200 | | |
| Benzene | 46.3 | 5.00 | ug/kg wet | 50.000 | | 93 | 70-130 | | |
| Bromodichloromethane | 49.4 | 6.00 | ug/kg wet | 50.000 | | 99 | 60-140 | | |
| Bromoform | 53.1 | 5.00 | ug/kg wet | 50.000 | | 106 | 60-140 | | |
| Bromomethane | 34.3 | 10.0 | ug/kg wet | 50.000 | | 69 | 50-180 | | |
| Carbon Disulfide | 42.2 | 5.00 | ug/kg wet | 50.000 | | 84 | 60-140 | | |
| Carbon Tetrachloride | 53.2 | 5.00 | ug/kg wet | 50.000 | | 106 | 60-140 | | |
| Chlorobenzene | 48.2 | 5.00 | ug/kg wet | 50.000 | | 96 | 70-130 | | |
| Chloroethane | 54.3 | 10.0 | ug/kg wet | 50.000 | | 109 | 50-180 | | |
| Chloroform | 48.2 | 5.00 | ug/kg wet | 50.000 | | 96 | 60-140 | | |
| Chloromethane | 43.6 | 10.0 | ug/kg wet | 50.000 | | 87 | 50-180 | | |
| cis-1,2-Dichloroethene | 47.3 | 5.00 | ug/kg wet | 50.000 | | 95 | 60-140 | | |
| cis-1,3-Dichloropropene | 47.7 | 5.00 | ug/kg wet | 50.000 | | 95 | 70-130 | | |
| Dibromochloromethane | 50.6 | 5.00 | ug/kg wet | 50.000 | | 101 | 70-130 | | |
| Ethylbenzene | 47.4 | 5.00 | ug/kg wet | 50.000 | | 95 | 70-130 | | |
| Methylene Chloride | 39.8 | 6.00 | ug/kg wet | 50.000 | | 80 | 50-180 | | |
| Styrene | 48.7 | 5.00 | ug/kg wet | 50.000 | | 97 | 70-130 | | |
| Tetrachloroethene | 48.5 | 5.00 | ug/kg wet | 50.000 | | 97 | 60-140 | | |
| trans-1,2-Dichloroethene | 45.8 | 5.00 | ug/kg wet | 50.000 | | 92 | 60-140 | | |
| Toluene | 46.9 | 5.00 | ug/kg wet | 50.000 | | 94 | 70-130 | | |
| trans-1,3-Dichloropropene | 51.5 | 5.00 | ug/kg wet | 50.000 | | 103 | 70-130 | | |
| Trichloroethene | 49.0 | 5.00 | ug/kg wet | 50.000 | | 98 | 70-130 | | |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

## Volatile Organic Compounds by SW846 8260B - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011125 - SW 5030A** | | | | | | | | | |
| **LCS (L011125-BS1)** | | | Prepared & Analyzed: 11/08/2010 | | | | | | |
| Vinyl chloride | 46.5 | 10.0 | ug/kg wet | 50.000 | | 93 | 50-180 | | |
| Xylenes, total | 146 | 5.00 | ug/kg wet | 150.00 | | 97 | 70-130 | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *50.3* | | *ug/kg wet* | *50.000* | | *101* | *63-151* | | |
| *Surrogate: Toluene-d8* | *49.4* | | *ug/kg wet* | *50.000* | | *99* | *68-140* | | |
| *Surrogate: 4-Bromofluorobenzene* | *47.2* | | *ug/kg wet* | *50.000* | | *94* | *66-122* | | |
| **Matrix Spike (L011125-MS3)** | | **Source: 1011036-02** | Prepared & Analyzed: 11/08/2010 | | | | | | |
| 1,1,1-Trichloroethane | 45.4 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 94 | 60-140 | | |
| 1,1,2,2-Tetrachloroethane | 59.6 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 123 | 70-130 | | |
| 1,1,2-Trichloroethane | 60.9 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 126 | 70-130 | | |
| 1,1-Dichloroethane | 51.2 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 105 | 60-140 | | |
| 1,1-Dichloroethene | 41.8 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 86 | 60-130 | | |
| 1,2-Dichloroethane | 54.9 | 5.82 | ug/kg dry | 48.503 | 5.93 U | 113 | 60-140 | | |
| 1,2-Dichloroethene (total) | 99.2 | 4.85 | ug/kg dry | 97.007 | 4.94 U | 102 | 60-140 | | |
| 1,2-Dichloropropane | 51.9 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 107 | 70-130 | | |
| 2-Butanone | 51.1 | 11.6 | ug/kg dry | 48.503 | 11.9 U | 105 | 20-200 | | |
| 2-Hexanone | 55.3 | 11.6 | ug/kg dry | 48.503 | 11.9 U | 114 | 20-200 | | |
| 4-Methyl-2-pentanone | 59.0 | 11.6 | ug/kg dry | 48.503 | 11.9 U | 122 | 50-150 | | |
| Acetone | 42.5 | 11.6 | ug/kg dry | 48.503 | 5.30 | 77 | 20-200 | | |
| Benzene | 47.3 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 98 | 70-130 | | |
| Bromodichloromethane | 51.0 | 5.82 | ug/kg dry | 48.503 | 5.93 U | 105 | 60-140 | | |
| Bromoform | 55.9 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 115 | 60-140 | | |
| Bromomethane | 34.4 | 9.70 | ug/kg dry | 48.503 | 9.89 U | 71 | 50-180 | | |
| Carbon Disulfide | 38.8 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 80 | 60-140 | | |
| Carbon Tetrachloride | 52.1 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 107 | 60-140 | | |
| Chlorobenzene | 47.9 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 99 | 70-130 | | |
| Chloroethane | 56.9 | 9.70 | ug/kg dry | 48.503 | 9.89 U | 117 | 50-180 | | |
| Chloroform | 53.1 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 110 | 60-140 | | |
| Chloromethane | 40.9 | 9.70 | ug/kg dry | 48.503 | 9.89 U | 84 | 50-180 | | |
| cis-1,2-Dichloroethene | 51.3 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 106 | 60-140 | | |
| cis-1,3-Dichloropropene | 50.6 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 104 | 70-130 | | |
| Dibromochloromethane | 56.3 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 116 | 70-130 | | |
| Ethylbenzene | 48.1 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 99 | 70-130 | | |
| Methylene Chloride | 44.5 | 5.82 | ug/kg dry | 48.503 | 4.14 | 83 | 50-180 | | |
| Styrene | 47.5 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 98 | 70-130 | | |
| Tetrachloroethene | 49.5 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 102 | 60-140 | | |
| trans-1,2-Dichloroethene | 47.9 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 99 | 60-140 | | |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

# Volatile Organic Compounds by SW846 8260B - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011125 - SW 5030A** | | | | | | | | | |
| **Matrix Spike (L011125-MS3)** | | **Source: 1011036-02** | Prepared & Analyzed: 11/08/2010 | | | | | | |
| Toluene | 49.7 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 102 | 70-130 | | |
| trans-1,3-Dichloropropene | 55.6 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 115 | 70-130 | | |
| Trichloroethene | 47.4 | 4.85 | ug/kg dry | 48.503 | 4.94 U | 98 | 70-130 | | |
| Vinyl chloride | 46.5 | 9.70 | ug/kg dry | 48.503 | 9.89 U | 96 | 50-180 | | |
| Xylenes, total | 144 | 4.85 | ug/kg dry | 145.51 | 4.94 U | 99 | 70-130 | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *55.7* | | *ug/kg dry* | *48.503* | | *115* | *63-151* | | |
| *Surrogate: Toluene-d8* | *50.2* | | *ug/kg dry* | *48.503* | | *103* | *68-140* | | |
| *Surrogate: 4-Bromofluorobenzene* | *48.4* | | *ug/kg dry* | *48.503* | | *100* | *66-122* | | |
| **Matrix Spike Dup (L011125-MSD3)** | | **Source: 1011036-02** | Prepared & Analyzed: 11/08/2010 | | | | | | |
| 1,1,1-Trichloroethane | 41.6 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 91 | 60-140 | 3 | 20 |
| 1,1,2,2-Tetrachloroethane | 56.8 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 124 | 70-130 | 0.7 | 20 |
| 1,1,2-Trichloroethane | 55.3 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 121 | 70-130 | 4 | 20 |
| 1,1-Dichloroethane | 47.2 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 103 | 60-140 | 2 | 20 |
| 1,1-Dichloroethene | 39.6 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 86 | 60-130 | 0.08 | 20 |
| 1,2-Dichloroethane | 52.1 | 5.51 | ug/kg dry | 45.905 | 5.93 U | 113 | 60-140 | 0.2 | 20 |
| 1,2-Dichloroethene (total) | 94.7 | 4.59 | ug/kg dry | 91.810 | 4.94 U | 103 | 60-140 | 0.9 | 20 |
| 1,2-Dichloropropane | 48.3 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 105 | 70-130 | 2 | 20 |
| 2-Butanone | 48.6 | 11.0 | ug/kg dry | 45.905 | 11.9 U | 106 | 20-200 | 0.4 | 20 |
| 2-Hexanone | 49.6 | 11.0 | ug/kg dry | 45.905 | 11.9 U | 108 | 20-200 | 5 | 20 |
| 4-Methyl-2-pentanone | 52.1 | 11.0 | ug/kg dry | 45.905 | 11.9 U | 113 | 50-150 | 7 | 20 |
| Acetone | 43.6 | 11.0 | ug/kg dry | 45.905 | 5.30 | 83 | 20-200 | 8 | 20 |
| Benzene | 44.4 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 97 | 70-130 | 1 | 20 |
| Bromodichloromethane | 48.8 | 5.51 | ug/kg dry | 45.905 | 5.93 U | 106 | 60-140 | 1 | 20 |
| Bromoform | 51.9 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 113 | 60-140 | 2 | 20 |
| Bromomethane | 35.5 | 9.18 | ug/kg dry | 45.905 | 9.89 U | 77 | 50-180 | 9 | 20 |
| Carbon Disulfide | 36.1 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 79 | 60-140 | 2 | 20 |
| Carbon Tetrachloride | 51.9 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 113 | 60-140 | 5 | 20 |
| Chlorobenzene | 43.2 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 94 | 70-130 | 5 | 20 |
| Chloroethane | 51.9 | 9.18 | ug/kg dry | 45.905 | 9.89 U | 113 | 50-180 | 4 | 20 |
| Chloroform | 50.1 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 109 | 60-140 | 0.4 | 20 |
| Chloromethane | 41.7 | 9.18 | ug/kg dry | 45.905 | 9.89 U | 91 | 50-180 | 7 | 20 |
| cis-1,2-Dichloroethene | 49.2 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 107 | 60-140 | 1 | 20 |
| cis-1,3-Dichloropropene | 48.8 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 106 | 70-130 | 2 | 20 |
| Dibromochloromethane | 51.6 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 113 | 70-130 | 3 | 20 |
| Ethylbenzene | 43.7 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 95 | 70-130 | 4 | 20 |
| Methylene Chloride | 42.0 | 5.51 | ug/kg dry | 45.905 | 4.14 | 83 | 50-180 | 0.8 | 20 |

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/16/2010 13:56 |

## Volatile Organic Compounds by SW846 8260B - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011125 - SW 5030A** | | | | | | | | | |
| **Matrix Spike Dup (L011125-MSD3)** | **Source: 1011036-02** | | Prepared & Analyzed: 11/08/2010 | | | | | | |
| Styrene | 43.1 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 94 | 70-130 | 4 | 20 |
| Tetrachloroethene | 43.3 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 94 | 60-140 | 8 | 20 |
| trans-1,2-Dichloroethene | 45.5 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 99 | 60-140 | 0.4 | 20 |
| Toluene | 44.8 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 98 | 70-130 | 5 | 20 |
| trans-1,3-Dichloropropene | 53.1 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 116 | 70-130 | 0.9 | 20 |
| Trichloroethene | 43.9 | 4.59 | ug/kg dry | 45.905 | 4.94 U | 96 | 70-130 | 2 | 20 |
| Vinyl chloride | 43.2 | 9.18 | ug/kg dry | 45.905 | 9.89 U | 94 | 50-180 | 2 | 20 |
| Xylenes, total | 130 | 4.59 | ug/kg dry | 137.71 | 4.94 U | 95 | 70-130 | 4 | 20 |
| *Surrogate: 1,2-Dichloroethane-d4* | *53.8* | | *ug/kg dry* | *45.905* | | *117* | *63-151* | | |
| *Surrogate: Toluene-d8* | *45.3* | | *ug/kg dry* | *45.905* | | *99* | *68-140* | | |
| *Surrogate: 4-Bromofluorobenzene* | *43.4* | | *ug/kg dry* | *45.905* | | *95* | *66-122* | | |

# PREPARATION BENCH SHEET

L011125

**Lionville Laboratory**

**Printed: 11/15/2010 12:04:57PM**

**Matrix: Solid** **Prepared using: VOAGCMS - SW 5030A** **Surrogate used: 0902344**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011003-01 | 8260B TCL VOC | 11/08/2010 09:48 | 6.1 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011003-02 | 8260B TCL VOC | 11/08/2010 10:20 | 5.5 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011003-03 | 8260B TCL VOC | 11/08/2010 10:53 | 5.2 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011015-01 | 8260B TCL VOC | 11/08/2010 11:26 | 5.1 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011015-02 | 8260B TCL VOC | 11/08/2010 14:10 | 1.1 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011015-03 | 8260B TCL VOC | 11/08/2010 13:37 | 5.3 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011015-04 | 8260B TCL VOC | 11/08/2010 13:04 | 5.9 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011015-05 | 8260B TCL VOC | 11/08/2010 14:45 | 1.4 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011036-01 | 8260B TCL VOC | 11/08/2010 16:58 | 5.1 | 5 | | | | 5 | WC-Hanford, Inc. | |
| 1011036-02 | 8260B TCL VOC | 11/08/2010 17:30 | 5.2 | 5 | | | | 5 | WC-Hanford, Inc. | |
| L011125-BLK1 | QC | 11/08/2010 09:06 | 5 | 5 | | | | 5 | | |
| L011125-BS1 | QC | 11/08/2010 08:33 | 5 | 5 | 1000841 | | 2.5 | 5 | | |
| L011125-MS1 | QC | 11/08/2010 11:58 | 5.6 | 5 | 1000841 | 1011003-03 | 2.5 | 5 | | |
| L011125-MS2 | QC | 11/08/2010 15:52 | 4.9 | 5 | 1000841 | 1011015-01 | 2.5 | 5 | | |
| L011125-MS3 | QC | 11/08/2010 18:03 | 5.3 | 5 | 1000841 | 1011036-02 | 2.5 | 5 | | |
| L011125-MSD1 | QC | 11/08/2010 12:31 | 6 | 5 | 1000841 | 1011003-03 | 2.5 | 5 | | |
| L011125-MSD2 | QC | 11/08/2010 16:25 | 5.4 | 5 | 1000841 | 1011015-01 | 2.5 | 5 | | |
| L011125-MSD3 | QC | 11/08/2010 18:36 | 5.6 | 5 | 1000841 | 1011036-02 | 2.5 | 5 | | |

Extracts Relinquished By Date

Extracts Received By Date

Lionville Laboratory Use Only

1011 036

# Custody Transfer Record/Lab Work Request

Page 1 of 1

SRC

LVLI Lionville Laboratory Inc.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF# RC-182

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: STD TAT: 15 days

Date Rec'd: 11/5/10 Date Due: 11-20-10

| | A | B | C | D | E | | | F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | VOA | 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| #/Type Container (~~Liquid~~ / Solid) | 1AG | 1AG | 1AG | 1AG | 1AG | | | 1 | | | | | | | |
| Volume | 60 | 60 | 60 | 60 | 60 | | | 60 | | | | | | | |
| Preservatives | — | — | — | — | — | | | — | | | | | | | |
| ANALYSES REQUESTED → | ORGANIC | | | | | | | INORG | | | | | | | |
| | VOA | BNA | ~~Pest~~ PCB | ~~Chlor~~ Herb | Pest | | | Metal ~~Hg~~ | CN | | | | | | |
| Lionville Laboratory Use Only | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 01 | J1CM93 | | | Soil | 11-2-10 | 1010 | X | X | X | X | X | | | X | | | | | | | |
| | 02 | 1 94 | | | 1 | 1 | 1030 | X | X | X | X | X | | | X | | | | | | | |

Special Instructions: Run matrix QC

Met① = HSL + B, Mo, Si
NOTL

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 11/5/10 | 1000 |
| | | | |

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

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

00000015

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-182-019 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>D. Rice | Company Contact<br>S. Van Den Hende | Telephone No.<br>509-551-3934 | Project Coordinator<br>KESSNER, JH | Price Code SV 11/1/10 ~~8L~~ 8K | Data Turnaround SV 10/28/10 ~~21 Days~~ 15 Days |
| Project Designation<br>ARRA 100F Remaining Sites Remediation - Soil In-Process | Sampling Location<br>600-351 Site | | SAF No.<br>RC-182 | | |
| Ice Chest No. AFS-04-025 | Field Logbook No.<br>EL-1651 | COA S603518100 ~~S11FX1Y000~~ SV 11/1/10 | Method of Shipment<br>FedEx | | |
| Shipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No. A100611 | | Bill of Lading/Air Bill No.<br>See OSPC | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

~~None~~ JEB 11-4-10
Pot. RAD <DOT Limits

**Special Handling and/or Storage**

*Cool 4 Degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | | | |
| Type of Container | G/P | G | aG | aG | aG | aG | G/P | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | Pesticides - 8081 | Chloro-Herbicides - EPA8151 | RCF GEA Shipping Screen | | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1CM93 | SOIL | 11/2/10 | 1010 | X | X | X | X | X | X | X | | AREA | #1 |
| J1CM94 | SOIL | 11/2/10 | 1030 | X | X | X | X | X | X | | | AREA | #2 |
| ~~J1CM95~~ | ~~SOIL~~ SV 11/2/10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| ~~Relinquished By/Removed From~~ David D. Rice | 11-2-10 1105 | RT Coffman / RT Coffman | 11/2/10 1105 |
| Relinquished By/Removed From RT Coffman / RT Coffman | 11/2/10 1540 | ~~Received By/Stored In~~ J. E. Bauhl | 11-2-10 1540 |
| ~~Relinquished By/Removed From~~ J. E. Bauhl | WCH 11-4-10 1000 | Received By/Stored In FED EX | |
| Relinquished By/Removed From FED EX | 11-5-10 1000 | Received By/Stored In VICTOR HERNANDEZ | 11-5-10 1000 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

~~None~~ SV 11/2/10

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY LRE
DATE 11-4-10

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=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 |

WCH-EE-011

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-182

Date: 11/5/10

LvL Batch #: 1011036

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FED EX | | Airbill # 7940 8360 9518 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2-5° | °C | Cooler # AFS-04-025 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA. TOC. TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☑ Yes 11/5/10 | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy. which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____ Date _____

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264 Welsh Pool Roac
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

RECEIVED
DEC 2010

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>12/01/2010 23:06 |

## Analytical Report for Chlorinated Herbicides by SW846 8151A

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1CM93 | 1011036-01 | Soil | 11/02/2010 10:10 | 11/05/2010 10:00 |
| J1CM94 | 1011036-02 | Soil | 11/02/2010 10:30 | 11/05/2010 10:00 |

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Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-182 K2510
**LVL #:** 1011036

**W.O. #:** 60049-001-001-0001
**Date Received:** 11-05-2010

## HERBICIDE

Three (3) soil samples were collected on 11-02-2010.

The samples and their associated QC samples were extracted 11-10-2010 and analyzed 11-29-10 according to criteria set forth in Lionville Laboratory SOPs. The extraction and analysis procedures were based on SW846 Method 8151A.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. Four (4) of sixteen (16) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 10GC386) has been enclosed.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. The samples were reported on a dry weight basis.
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 hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

12/4/10
Date

r:\group\data\2010\herb\wc-hanford\1011036jes.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.

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 10GC386

Initiator: Catherine Carey
Date: 12/01/10
Client: CC Hanford

Batch: 1011036
Samples: MS2 | MSD2
Method: SW846/MCAWW/CLP/

Parameter: Herb
Matrix: SOIL
Prep Batch: L011171

**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)

several spike recoveries low in L011171-MS2 | MSD2

BS OKay

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

Matrix

**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)

Narrate

**4. Project Manager Instructions**...signature/date: 12/4/10

__ 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: DPS 12-02-10 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 for diposition.**

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# GLOSSARY OF 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.

.I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

P = This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 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.

## 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.

NS = Not Spiked.

SP = Indicates Spiked Compound.

NPM = No pattern match for multi-component target analytes.

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 23:06 |

## J1CM93

### 1011036-01 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Chlorinated Herbicides by SW846 8151A** | | | | | | | | |
| Dalapon | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| Dicamba | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| Dichloroprop | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4-D | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4,5-TP (Silvex) | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4,5-T | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| Dinoseb | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4-DB | 34.2 U | 34.2 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| *Surrogate: DCAA* | *52 %* | *40-150* | | | *L011171* | *11/10/2010* | *11/29/2010* | *8151A* |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 23:06 |

## J1CM94

### 1011036-02 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Chlorinated Herbicides by SW846 8151A** | | | | | | | | |
| Dalapon | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| Dicamba | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| **Dichloroprop** | **11.4 J** | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4-D | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4,5-TP (Silvex) | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4,5-T | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| Dinoseb | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| 2,4-DB | 33.7 U | 33.7 | ug/kg dry | 1 | L011171 | 11/10/2010 | 11/29/2010 | 8151A |
| *Surrogate: DCAA* | *48 %* | *40-150* | | | *L011171* | *11/10/2010* | *11/29/2010* | *8151A* |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 23:06 |

## Chlorinated Herbicides by SW846 8151A - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011171 - SW 8151A** | | | | | | | | | |
| **Blank (L011171-BLK1)** | | | Prepared: 11/10/2010 Analyzed: 11/29/2010 | | | | | | |
| Dalapon | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| Dicamba | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| Dichloroprop | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| 2,4-D | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| 2,4,5-TP (Silvex) | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| 2,4,5-T | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| Dinoseb | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| 2,4-DB | 33.3 U | 33.3 | ug/kg wet | | | | 40-150 | | |
| *Surrogate: DCAA* | *135* | | *ug/kg wet* | *166.67* | | *81* | *40-150* | | |
| **LCS (L011171-BS1)** | | | Prepared: 11/10/2010 Analyzed: 11/29/2010 | | | | | | |
| Dalapon | 89.2 | 33.3 | ug/kg wet | 166.67 | | 54 | 30-150 | | |
| Dicamba | 122 | 33.3 | ug/kg wet | 166.67 | | 73 | 30-140 | | |
| Dichloroprop | 112 | 33.3 | ug/kg wet | 166.67 | | 67 | 30-150 | | |
| 2,4-D | 99.6 | 33.3 | ug/kg wet | 166.67 | | 60 | 30-150 | | |
| 2,4,5-TP (Silvex) | 119 | 33.3 | ug/kg wet | 166.67 | | 71 | 30-150 | | |
| 2,4,5-T | 106 | 33.3 | ug/kg wet | 166.67 | | 64 | 30-150 | | |
| Dinoseb | 55.6 | 33.3 | ug/kg wet | 166.67 | | 33 | 30-150 | | |
| 2,4-DB | 115 | 33.3 | ug/kg wet | 166.67 | | 69 | 30-150 | | |
| *Surrogate: DCAA* | *126* | | *ug/kg wet* | *166.67* | | *76* | *40-150* | | |
| **Matrix Spike (L011171-MS2)** | | **Source: 1011036-02** | Prepared: 11/10/2010 Analyzed: 11/29/2010 | | | | | | |
| Dalapon | 67.6 | 34.0 | ug/kg dry | 169.96 | 33.7 U | 40 | 30-150 | | |
| Dicamba | 102 | 34.0 | ug/kg dry | 169.96 | 33.7 U | 60 | 30-140 | | |
| Dichloroprop | 88.1 | 34.0 | ug/kg dry | 169.96 | 11.4 | 45 | 30-150 | | |
| 2,4-D | 72.1 | 34.0 | ug/kg dry | 169.96 | 33.7 U | 42 | 30-150 | | |
| 2,4,5-TP (Silvex) | 95.9 | 34.0 | ug/kg dry | 169.96 | 33.7 U | 56 | 30-150 | | |
| 2,4,5-T | 84.5 | 34.0 | ug/kg dry | 169.96 | 33.7 U | 50 | 30-150 | | |
| Dinoseb | 34.0 U | 34.0 | ug/kg dry | 169.96 | 33.7 U | * | 30-150 | | |
| 2,4-DB | 60.0 | 34.0 | ug/kg dry | 169.96 | 33.7 U | 35 | 30-150 | | |
| *Surrogate: DCAA* | *80.2* | | *ug/kg dry* | *169.96* | | *47* | *40-150* | | |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 23:06 |

## Chlorinated Herbicides by SW846 8151A - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011171 - SW 8151A** | | | | | | | | | |
| **Matrix Spike Dup (L011171-MSD2)** | **Source: 1011036-02** | | Prepared: 11/10/2010 Analyzed: 11/29/2010 | | | | | | |
| Dalapon | 82.0 | 33.8 | ug/kg dry | 168.96 | 33.7 U | 49 | 30-150 | 20 | 40 |
| Dicamba | 104 | 33.8 | ug/kg dry | 168.96 | 33.7 U | 62 | 30-140 | 3 | 40 |
| Dichloroprop | 105 | 33.8 | ug/kg dry | 168.96 | 11.4 | 55 | 30-150 | 20 | 40 |
| 2,4-D | 48.9 | 33.8 | ug/kg dry | 168.96 | 33.7 U | 29* | 30-150 | 38 | 40 |
| 2,4,5-TP (Silvex) | 59.1 | 33.8 | ug/kg dry | 168.96 | 33.7 U | 35 | 30-150 | 47* | 40 |
| 2,4,5-T | 45.6 | 33.8 | ug/kg dry | 168.96 | 33.7 U | 27* | 30-150 | 59* | 40 |
| Dinoseb | 33.8 U | 33.8 | ug/kg dry | 168.96 | 33.7 U | * | 30-150 | | 40 |
| 2,4-DB | 64.9 | 33.8 | ug/kg dry | 168.96 | 33.7 U | 38 | 30-150 | 8 | 40 |
| *Surrogate: DCAA* | *81.6* | | *ug/kg dry* | *168.96* | | *48* | *40-150* | | |

# PREPARATION BENCH SHEET

L011171

**Lionville Laboratory**

**Printed: 11/23/2010 10:25:56AM**

**Matrix: Solid** **Prepared using: GC - SW 8151A** **Surrogate used: 1001231**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1010027-07RE1 | 8151A Herbicides | 11/10/2010 22:49 | 30.39 | 10 | | | | 100 | WC-Hanford, Inc. | From L010254 by MLF on 11/10/2010 |
| 1010086-13 | 8151A Herbicides | 11/10/2010 22:49 | 30 | 10 | | | | 100 | LQA | |
| 1011003-01 | 8151A Herbicides | 11/10/2010 22:49 | 30.15 | 10 | | | | 100 | WC-Hanford, Inc. | |
| 1011003-02 | 8151A Herbicides | 11/10/2010 22:49 | 30.25 | 10 | | | | 100 | WC-Hanford, Inc. | |
| 1011003-03 | 8151A Herbicides | 11/10/2010 22:49 | 30.42 | 10 | | | | 100 | WC-Hanford, Inc. | |
| 1011036-01 | 8151A Herbicides | 11/10/2010 22:49 | 30.36 | 10 | | | | 100 | WC-Hanford, Inc. | |
| 1011036-02 | 8151A Herbicides | 11/10/2010 22:49 | 30.47 | 10 | | | | 100 | WC-Hanford, Inc. | |
| L011171-BLK1 | QC | 11/10/2010 22:49 | 30 | 10 | | | | 100 | | |
| L011171-BS1 | QC | 11/10/2010 22:49 | 30 | 10 | 1001904 | | 100 | 100 | | |
| L011171-MS1 | QC | 11/10/2010 22:49 | 30.53 | 10 | 1001904 | 1011003-02 | 100 | 100 | | |
| L011171-MS2 | QC | 11/10/2010 22:49 | 30.25 | 10 | 1001904 | 1011036-02 | 100 | 100 | | |
| L011171-MSD1 | QC | 11/10/2010 22:49 | 30.15 | 10 | 1001904 | 1011003-02 | 100 | 100 | | |
| L011171-MSD2 | QC | 11/10/2010 22:49 | 30.43 | 10 | 1001904 | 1011036-02 | 100 | 100 | | |

Extracts Relinquished By 11/23/10 10:25 Date

Extracts Received By 11-23-10 Date

Lionville Laboratory Use Only

1011 036

# Custody Transfer Record/Lab Work Request

Page 1 of 1

See SRC 9

LVLI Lionville Laboratory, Inc.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF# RC-182

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: STD TAT: 15 days

Date Rec'd: 11/5/10 Date Due: 11-20-10

| | A | B | C | D | E | | | F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | VOA | 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| #/Type Container (~~Liquid~~ / Solid) | 1AG | 1AG | 1AG | 1AG | 1AG | | | 1 | | | | | | | |
| Volume | 60 | 60 | 60 | 60 | 60 | | | 60 | | | | | | | |
| Preservatives | — | — | — | — | — | | | — | | | | | | | |
| ANALYSES REQUESTED | ORGANIC | | | | | | | INORG | | | | | | | |
| | VOA | BNA | ~~Pest~~/PCB | ~~Chlor~~ Herb | Pest | | | Metal ~~TCL~~ | CN | | | | | | |
| Lionville Laboratory Use Only | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |

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 |
|---|---|---|---|---|---|---|
| 01 | J1CM93 | | | Soil | 11-2-10 | 1010 |
| 02 | 1 94 | | | 1 | 1 | 1030 |

Special Instructions: Run matrix QC

Met① = HSL + B, Mo, Si
NOTL

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 11/5/10 | 1000 |
| | | | |

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

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

9999999819

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-182-019 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>D. Rice | Company Contact<br>S. Van Den Hende | Telephone No.<br>509-551-3934 | Project Coordinator<br>KESSNER, JH |
| Price Code SV 11/1/10 ~~8L~~ 8K | Data Turnaround SV 10/28/10 ~~21 Days~~ 15 Days | | |
| Project Designation<br>ARRA 100F Remaining Sites Remediation - Soil In-Process | Sampling Location<br>600-351 Site | | SAF No.<br>RC-182 |
| Ice Chest No. AFS-04-025 | Field Logbook No.<br>EL-1651 | COA S603518100 ~~S11FX1Y000~~ SV 11/1/10 | Method of Shipment<br>FedEx |
| Shipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No. A100611 | | Bill of Lading/Air Bill No.<br>See OSPC |

POSSIBLE SAMPLE HAZARDS/REMARKS

~~None~~ JEB 11-4-10
Pot. RAD <DOT Limits

Special Handling and/or Storage

*Cool 4 Degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | | | |
| Type of Container | G/P | G | aG | aG | aG | aG | G/P | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | Pesticides - 8081 | Chloro-Herbicides - EPA8151 | RCF GEA Shipping Screen | | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1CM93 | SOIL | 11/2/10 | 1010 | X | X | X | X | X | X | | | AREA | #1 |
| J1CM94 | SOIL | 11/2/10 | 1030 | X | X | X | X | X | X | | | AREA | #2 |
| ~~J1CM95~~ | ~~SOIL~~ SV 11/2/10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| ~~Relinquished By/Removed From~~ David D. Rice | 11-2-10 1105 | Received By/Stored In RT Coffman / RT Coffman | 11/2/10 1105 |
| Relinquished By/Removed From RT Coffman / RT Coffman | 11/2/10 1540 | Received By/Stored In J.E. Bauhl | 11-2-10 1540 |
| Relinquished By/Removed From J.E. Bauhl WCH | 11-4-10 1000 | Received By/Stored In FED EX | |
| Relinquished By/Removed From FED EX | 11-5-10 1000 | Received By/Stored In Victor Hernandez | 11-5-10 1000 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

SPECIAL INSTRUCTIONS

~~None~~ SV 11/2/10

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY LRE
DATE 11-4-10

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=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 |

WCH-EE-011

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-182

Date: 11/5/10

LvL Batch #: 1011036

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FedEx | | Airbill # 7940 8360 9518 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2-5° | °C | Cooler # AFS-04-025 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA. TOC. TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☑ Yes 11/5/10 | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy. which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____ Date _____

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

RECEIVED
DEC 2010

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>11/29/2010 19:40 |

## Analytical Report for Polychlorinated Biphenyls by SW846 8082

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1CM93 | 1011036-01 | Soil | 11/02/2010 10:10 | 11/05/2010 10:00 |
| J1CM94 | 1011036-02 | Soil | 11/02/2010 10:30 | 11/05/2010 10:00 |

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264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-182 K2510
**LVL #:** 1011036

**W.O. #:** 60049-001-001-0001-00
**Received:** 11-05-2010

## PCBs

Two (2) soil samples were collected on 11-02-2010.

The samples and associated QC samples were extracted 11-15-2010 and analyzed 11-17,19,20,24-2010 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8082. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A,

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.

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

3. Two (2) of twelve (12) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#10GC383) has been enclosed.

4. The method blank was below the reporting limits for all target compounds.

5. All blank spike recoveries were within acceptance criteria.

6. Four (4) of four (4) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#10GC383) has been enclosed.

7. Three (3) samples required instrument dilutions due to high concentrations of non-target analytes. The samples J1CM94, L0112226-MS2, and L0112226-MSD2 required a 50-fold instrument dilution. Reporting limits have been adjusted to reflect the necessary dilutions.

8. The samples are reported on a dry weight basis.

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

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.


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 13 pages.

11. 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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

12/4/10
Date

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 10GC383

Initiator: Catherine Carey
Date: 11.29.10
Client: WC Hanford

Batch: 1011036
Samples: L011226-MS2 | MSD2
Method: SW846/MCAWW/CLP/

Parameter: PCB
Matrix: SOIL
Prep Batch: L011226

**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)

DCB recovery high

Spike recoveries outside QC limits

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

Sample needed a large dilution for very large non target peaks in the sample

**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)

N. Narrate, JD.

**4. Project Manager Instructions**...signature/date: 12/4/10

__ 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: 12-02-10 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 for diposition.**

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# GLOSSARY OF 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.

. I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

P = This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 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.

## 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.

NS = Not Spiked.

SP = Indicates Spiked Compound.

NPM = No pattern match for multi-component target analytes.

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/29/2010 19:40 |

## J1CM93

### 1011036-01 (Soil)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Polychlorinated Biphenyls by SW846 8082** | | | | | | | | | |
| Aroclor 1016 | 13.6 | U | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| Aroclor 1221 | 13.6 | U | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| Aroclor 1232 | 13.6 | U | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| Aroclor 1242 | 13.6 | U | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| Aroclor 1248 | 13.6 | U | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| **Aroclor 1254** | **4.88** | J | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| Aroclor 1260 | 13.6 | U | 13.6 | ug/kg dry | 1 | L011226 | 11/15/2010 | 11/17/2010 | 8082 |
| *Surrogate: Decachlorobiphenyl* | *89 %* | | *43-144* | | | *L011226* | *11/15/2010* | *11/17/2010* | *8082* |
| *Surrogate: Tetrachloro-meta-xylene* | *113 %* | | *52-141* | | | *L011226* | *11/15/2010* | *11/17/2010* | *8082* |

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Exton, PA 19341
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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/29/2010 19:40 |

## J1CM94

### 1011036-02 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | |
| **Polychlorinated Biphenyls by SW846 8082** | | | | | | | | |
| Aroclor 1016 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| Aroclor 1221 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| Aroclor 1232 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| Aroclor 1242 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| Aroclor 1248 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| Aroclor 1254 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| Aroclor 1260 | 680 U | 680 | ug/kg dry | 50 | L011226 | 11/15/2010 | 11/19/2010 | 8082 |
| *Surrogate: Decachlorobiphenyl* | *140 %* | *43-144* | | | *L011226* | *11/15/2010* | *11/19/2010* | *8082* |
| *Surrogate: Tetrachloro-meta-xylene* | *114 %* | *52-141* | | | *L011226* | *11/15/2010* | *11/19/2010* | *8082* |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/29/2010 19:40 |

## Polychlorinated Biphenyls by SW846 8082 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011226 - SW 3540C** | | | | | | | | | |
| **Blank (L011226-BLK2)** | | | Prepared: 11/15/2010 Analyzed: 11/17/2010 | | | | | | |
| Aroclor 1016 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| Aroclor 1221 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| Aroclor 1232 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| Aroclor 1242 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| Aroclor 1248 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| Aroclor 1254 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| Aroclor 1260 | 13.3 U | 13.3 | ug/kg wet | | | | | | |
| *Surrogate: Decachlorobiphenyl* | *38.0* | | *ug/kg wet* | *33.333* | | *114* | *43-144* | | |
| *Surrogate: Tetrachloro-meta-xylene* | *42.5* | | *ug/kg wet* | *33.337* | | *127* | *52-141* | | |
| **LCS (L011226-BS2)** | | | Prepared: 11/15/2010 Analyzed: 11/24/2010 | | | | | | |
| Aroclor 1016 | 131 | 13.3 | ug/kg wet | 166.67 | | 78 | 50-138 | | |
| Aroclor 1260 | 134 | 13.3 | ug/kg wet | 166.67 | | 80 | 50-148 | | |
| *Surrogate: Decachlorobiphenyl* | *31.0* | | *ug/kg wet* | *33.333* | | *93* | *43-144* | | |
| *Surrogate: Tetrachloro-meta-xylene* | *30.1* | | *ug/kg wet* | *33.337* | | *90* | *52-141* | | |
| **Matrix Spike (L011226-MS2)** | | **Source: 1011036-02** | Prepared: 11/15/2010 Analyzed: 11/20/2010 | | | | | | |
| Aroclor 1016 | 667 U | 667 | ug/kg dry | 167.20 | 680 U | * | 50-138 | | |
| Aroclor 1260 | 667 U | 667 | ug/kg dry | 167.20 | 680 U | * | 50-148 | | |
| *Surrogate: Decachlorobiphenyl* | *62.3* | | *ug/kg dry* | *33.440* | | *186** | *43-144* | | |
| *Surrogate: Tetrachloro-meta-xylene* | *40.0* | | *ug/kg dry* | *33.443* | | *120* | *52-141* | | |
| **Matrix Spike Dup (L011226-MSD2)** | | **Source: 1011036-02** | Prepared: 11/15/2010 Analyzed: 11/20/2010 | | | | | | |
| Aroclor 1016 | 301 J, D | 670 | ug/kg dry | 167.96 | 680 U | 179* | 50-138 | | 40 |
| Aroclor 1260 | 251 J, D | 670 | ug/kg dry | 167.96 | 680 U | 149* | 50-148 | | 40 |
| *Surrogate: Decachlorobiphenyl* | *71.6* | | *ug/kg dry* | *33.593* | | *213** | *43-144* | | |
| *Surrogate: Tetrachloro-meta-xylene* | *44.1* | | *ug/kg dry* | *33.596* | | *131* | *52-141* | | |

# PREPARATION BENCH SHEET

L011226

**Lionville Laboratory**

**Printed: 12/2/2010 7:21:02AM**

**Matrix: Solid** **Prepared using: GC - SW 3540C** **Surrogate used: 1001740**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011036-01 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-01 | 8082 PCBs | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8082 PCBs | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011067-01 | 8082 PCBs | 11/15/2010 11:05 | 30.24 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011067-02 | 8081A TCL Pesticides | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | Added for BatchQC in: L011226 |
| 1011067-02 | 8082 PCBs | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | |
| L011226-BLK1 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PEST |
| L011226-BLK2 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PCB |
| L011226-BS1 | QC | 11/15/2010 11:05 | 30 | 10 | 1001086 | | 250 | 250 | | PEST |
| L011226-BS2 | QC | 11/15/2010 11:05 | 30 | 10 | 1001362 | | 250 | 250 | | PCB |
| L011226-MS1 | QC | 11/15/2010 11:05 | 30.17 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MS2 | QC | 11/15/2010 11:05 | 30.75 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MS3 | QC | 11/15/2010 11:05 | 15.68 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |
| L011226-MSD1 | QC | 11/15/2010 11:05 | 30.52 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MSD2 | QC | 11/15/2010 11:05 | 30.61 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MSD3 | QC | 11/15/2010 11:05 | 15.42 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |

Adjusted prep method Rec 12/2/10

Extracts Relinquished By Date

Extracts Received By Date

# PREPARATION BENCH SHEET

L011226

**Lionville Laboratory**

**Printed: 11/17/2010 1:41:31PM**

**Matrix: Solid** **Prepared using: GC - SW 3540/3550** **Surrogate used: 1001740**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011036-01 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-01 | 8082 PCBs | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8082 PCBs | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011067-01 | 8082 PCBs | 11/15/2010 11:05 | 30.24 | 10 | | | | 250 | WC-Hanford, Inc. | |
| ~~1011067-02~~ | ~~8081A TCL Pesticides~~ | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | Added for BatchQC in: L011226 |
| 1011067-02 | 8082 PCBs | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | |
| L011226-BLK1 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PEST |
| L011226-BLK2 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PCB |
| L011226-BS1 | QC | 11/15/2010 11:05 | 30 | 10 | 1001086 | | 250 | 250 | | PEST |
| L011226-BS2 | QC | 11/15/2010 11:05 | 30 | 10 | 1001362 | | 250 | 250 | | PCB |
| L011226-MS1 | QC | 11/15/2010 11:05 | 30.17 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MS2 | QC | 11/15/2010 11:05 | 30.75 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MS3 | QC | 11/15/2010 11:05 | 15.68 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |
| L011226-MSD1 | QC | 11/15/2010 11:05 | 30.52 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MSD2 | QC | 11/15/2010 11:05 | 30.61 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MSD3 | QC | 11/15/2010 11:05 | 15.42 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |

Surfer Cleaned
11/17/10 CAC

CS 11/17/10
Extracts Relinquished By Date

LK 11/17/10
Extracts Received By Date

Lionville Laboratory Use Only

1011 036

# Custody Transfer Record/Lab Work Request

Page 1 of 1

See SRC 9

LVLI Lionville Laboratory Inc.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF# RC-182

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: STD TAT: 15 days

Date Rec'd: 11/5/10 Date Due: 11-20-10

| | | A | B | C | D | E | | | F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | VOA | 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| #/Type Container | ~~Liquid~~ Solid | 1AG | 1AG | 1AG | 1AG | 1AG | | | 1 | | | | | | | |
| Volume | | 60 | 60 | 60 | 60 | 60 | | | 60 | | | | | | | |
| Preservatives | | — | — | — | — | — | | | — | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | ~~Pest~~ PCB | ~~Chlor~~ Herb | Pest | | | ~~Metal~~ HG | CN | | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |

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 | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1CM93 | | | Soil | 11-2-10 | 1010 | X | X | X | X | X | | | X | | | | | | | |
| 02 | 1 94 | | | 1 | 1 | 1030 | X | X | X | X | X | | | X | | | | | | | |

Special Instructions: Run matrix QC

Met① = HSL + B, Mo, Si
NOTL

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 11/5/10 | 1000 |
| | | | |

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

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

11B0000001

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-182-019 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>D. Rice | Company Contact<br>S. Van Den Hende | Telephone No.<br>509-551-3934 | Project Coordinator<br>KESSNER, JH | Price Code SV 11/1/10 ~~8L~~ 8K | Data Turnaround SV 10/28/10 ~~21 Days~~ 15 Days |
| Project Designation<br>ARRA 100F Remaining Sites Remediation - Soil In-Process | Sampling Location<br>600-351 Site | | SAF No.<br>RC-182 | | |
| Ice Chest No. AFS-04-025 | Field Logbook No.<br>EL-1651 | COA S603518100 ~~S11FX1Y000~~ SV 11/1/10 | Method of Shipment<br>FedEx | | |
| Shipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No. A100611 | | Bill of Lading/Air Bill No.<br>See OSPC | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

~~None~~ JEB 11-4-10
Pot. RAD <DOT Limits

**Special Handling and/or Storage**

*Cool 4 Degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | | | |
| Type of Container | G/P | G | aG | aG | aG | aG | G/P | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | Pesticides - 8081 | Chloro-Herbicides - EPA8151 | RCF/GEA Shipping Screen | | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1CM93 | SOIL | 11/2/10 | 1010 | X | X | X | X | X | X | | | AREA | #1 |
| J1CM94 | SOIL | 11/2/10 | 1030 | X | X | X | X | X | X | | | AREA | #2 |
| ~~J1CM95~~ | ~~SOIL~~ SV 11/2/10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: David D. Rice | 11-2-10 1105 | RT COFFMAN / RT Coffman | 11/2/10 1105 |
| Relinquished By/Removed From: RT COFFMAN / RT Coffman | 11/2/10 1540 | ~~Received By/Stored In~~ J.E. Bentel | 11-2-10 1540 |
| Relinquished By/Removed From: J.E. Bentel | WCH 11-4-10 1000 | Received By/Stored In: FED EX | |
| Relinquished By/Removed From: FED EX | 11-5-10 1000 | Received By/Stored In: VICTOR HERNANDEZ | 11-5-10 1000 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

~~None~~ SV 11/2/10

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY SRE
DATE 11-4-10

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 |

WCH-EE-011

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-182

Date: 11/5/10

LvL Batch #: 1011036

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FED EX | | Airbill # 7940 8360 9518 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2.5° | °C | Cooler # AFS-04-025 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA. TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☑ Yes 11/15/10 | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy. which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |
| Person Contacted _____ | | Date _____ | |

LIONVILLE LABORATORY
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Exton, PA 19341
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Fax: 610-280-3041

RECEIVED
DEC 2010

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>11/22/2010 10:47 |

## Analytical Report for Metals by SW846 6000/7000 series

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1CM93 | 1011036-01 | Soil | 11/02/2010 10:10 | 11/05/2010 10:00 |
| J1CM94 | 1011036-02 | Soil | 11/02/2010 10:30 | 11/05/2010 10:00 |

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A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

## Case Narrative

**Client:** WC-HANFORD RC-182
**LVL#:** 10111036
**SDG/SAF#:** K2510/RC-182

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 11-05-10

**METALS**

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvL) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

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

2. The samples were prepared and analyzed in accordance with methods listed on the data report forms.

   Sample J1CM93 was rerun and reported with a 24-fold dilution for Lead due to high concentration of Lead in the sample.

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

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD), or samples greater than 20X MB value}.

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer.

10. The matrix spike (MS) recoveries for 6 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 19 pages.

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

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| J1CM93 | Aluminum | 22,000 | 115.1 |
| | Antimony | 100 | 90.5 |
| | Arsenic | 1,000 | 67.0 |
| | Iron | 42,000 | 109.5 |
| | Lead | 2,000 | 105.4 |
| | Silicon | 2,100 | 146.2 |

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Antimony, Cadmium, and Mercury were less than ten times the MDL.

13. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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
Laboratory Manager
Lionville Laboratory

11/22/10
Date

alm/10-036

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

## Notes and Definitions

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| J | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). |
| B | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag) |
| * | Value outside QC acceptance criteria |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| wet | Sample results reported on a wet weight basis |
| RPD | Relative Percent Difference |

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| | | |
|---|---|---|
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| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

## J1CM93

### 1011036-01 (Soil)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Aluminum** | **6320** | | 3.29 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Antimony** | **1.33** | | 0.395 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Arsenic** | **2040** | | 0.658 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Barium** | **71.9** | | 0.329 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Beryllium** | **0.238** | | 0.132 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Boron** | **1.29** | B | 1.32 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Cadmium** | **0.565** | | 0.132 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Calcium** | **3130** | | 65.8 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Chromium** | **8.10** | | 0.132 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Cobalt** | **5.19** | | 1.32 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Copper** | **15.1** | | 0.658 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Iron** | **17800** | | 13.2 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Lead** | **9450** | | 7.90 | mg/kg dry | 24 | L011201 | 11/12/2010 | 11/21/2010 | 6010B |
| **Magnesium** | **3480** | | 49.4 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Manganese** | **227** | | 3.29 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Molybdenum** | **0.331** | B | 1.32 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Nickel** | **8.11** | | 2.63 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Potassium** | **1370** | | 263 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| Selenium | 0.197 | U | 0.197 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Silicon** | **529** | | 1.32 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| Silver | 0.132 | U | 0.132 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Sodium** | **156** | | 32.9 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Vanadium** | **41.7** | | 1.65 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Zinc** | **93.5** | | 6.58 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Mercury** | **0.0230** | B | 0.0260 | mg/kg dry | 1 | L011276 | 11/18/2010 | 11/19/2010 | 7471A |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

## J1CM94

**1011036-02 (Soil)**

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Aluminum** | **10200** | | 4.51 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Antimony** | **0.293** | B | 0.541 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Arsenic** | **461** | | 0.902 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Barium** | **182** | | 0.451 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Beryllium** | **0.290** | | 0.180 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Boron** | **2.34** | | 1.80 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Cadmium** | **0.0538** | B | 0.180 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Calcium** | **3640** | | 90.2 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Chromium** | **13.4** | | 0.180 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Cobalt** | **5.18** | | 1.80 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Copper** | **15.6** | | 0.902 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Iron** | **23900** | | 18.0 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Lead** | **2180** | | 0.451 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Magnesium** | **3620** | | 67.6 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Manganese** | **225** | | 4.51 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Molybdenum** | **0.379** | B | 1.80 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Nickel** | **9.46** | | 3.61 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Potassium** | **2250** | | 361 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| Selenium | 0.271 | U | 0.271 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Silicon** | **1410** | | 1.80 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| Silver | 0.180 | U | 0.180 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Sodium** | **271** | | 45.1 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Vanadium** | **54.8** | | 2.25 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| **Zinc** | **54.3** | | 9.02 | mg/kg dry | 1 | L011201 | 11/12/2010 | 11/18/2010 | 6010B |
| Mercury | 0.0250 | U | 0.0250 | mg/kg dry | 1 | L011276 | 11/18/2010 | 11/19/2010 | 7471A |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

# Metals by SW846 6000/7000 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L011201 - SW 3050B** | | | | | | | | | | |
| **Blank (L011201-BLK2)** | | | | Prepared: 11/12/2010 Analyzed: 11/18/2010 | | | | | | |
| Aluminum | 4.63 | U | 4.63 | mg/kg wet | | | | | | |
| Antimony | 0.556 | U | 0.556 | mg/kg wet | | | | | | |
| Arsenic | 0.926 | U | 0.926 | mg/kg wet | | | | | | |
| Barium | 0.463 | U | 0.463 | mg/kg wet | | | | | | |
| Beryllium | 0.185 | U | 0.185 | mg/kg wet | | | | | | |
| Boron | 1.85 | U | 1.85 | mg/kg wet | | | | | | |
| Cadmium | 0.185 | U | 0.185 | mg/kg wet | | | | | | |
| Calcium | 6.05 | B | 92.6 | mg/kg wet | | | | | | |
| Chromium | 0.185 | U | 0.185 | mg/kg wet | | | | | | |
| Cobalt | 1.85 | U | 1.85 | mg/kg wet | | | | | | |
| Copper | 0.926 | U | 0.926 | mg/kg wet | | | | | | |
| Iron | 18.5 | U | 18.5 | mg/kg wet | | | | | | |
| Lead | 0.463 | U | 0.463 | mg/kg wet | | | | | | |
| Magnesium | 3.60 | B | 69.4 | mg/kg wet | | | | | | |
| Manganese | 4.63 | U | 4.63 | mg/kg wet | | | | | | |
| Molybdenum | 1.85 | U | 1.85 | mg/kg wet | | | | | | |
| Nickel | 3.70 | U | 3.70 | mg/kg wet | | | | | | |
| Potassium | 370 | U | 370 | mg/kg wet | | | | | | |
| Selenium | 0.278 | U | 0.278 | mg/kg wet | | | | | | |
| Silicon | 1.85 | U | 1.85 | mg/kg wet | | | | | | |
| Silver | 0.185 | U | 0.185 | mg/kg wet | | | | | | |
| Sodium | 46.3 | U | 46.3 | mg/kg wet | | | | | | |
| Vanadium | 2.31 | U | 2.31 | mg/kg wet | | | | | | |
| Zinc | 9.26 | U | 9.26 | mg/kg wet | | | | | | |
| **Duplicate (L011201-DUP2)** | | **Source: 1011036-01** | | Prepared: 11/12/2010 Analyzed: 11/18/2010 | | | | | | |
| Aluminum | 6500 | | 3.61 | mg/kg dry | | 6320 | | | 3 | 20 |
| Antimony | 0.967 | | 0.433 | mg/kg dry | | 1.33 | | | 32* | 20 |
| Arsenic | 1450 | | 0.722 | mg/kg dry | | 2040 | | | 34* | 20 |
| Barium | 68.9 | | 0.361 | mg/kg dry | | 71.9 | | | 4 | 20 |
| Beryllium | 0.238 | | 0.144 | mg/kg dry | | 0.238 | | | 0.05 | 20 |
| Boron | 1.31 | B | 1.44 | mg/kg dry | | 1.29 | | | 1 | 20 |
| Cadmium | 0.346 | | 0.144 | mg/kg dry | | 0.565 | | | 48* | 20 |
| Calcium | 3250 | | 72.2 | mg/kg dry | | 3130 | | | 4 | 20 |
| Chromium | 7.80 | | 0.144 | mg/kg dry | | 8.10 | | | 4 | 20 |
| Cobalt | 5.29 | | 1.44 | mg/kg dry | | 5.19 | | | 2 | 20 |
| Copper | 14.4 | | 0.722 | mg/kg dry | | 15.1 | | | 5 | 20 |

LIONVILLE LABORATORY
A division of Ebeline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

## Metals by SW846 6000/7000 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L011201 - SW 3050B** | | | | | | | | | | |
| **Duplicate (L011201-DUP2)** | | **Source: 1011036-01** | | Prepared: 11/12/2010 Analyzed: 11/18/2010 | | | | | | |
| Iron | 18800 | | 14.4 | mg/kg dry | | 17800 | | | 6 | 20 |
| Lead | 5290 | | 0.361 | mg/kg dry | | 9450 | | | 57* | 20 |
| Magnesium | 3650 | | 54.2 | mg/kg dry | | 3480 | | | 5 | 20 |
| Manganese | 234 | | 3.61 | mg/kg dry | | 227 | | | 3 | 20 |
| Molybdenum | 0.342 | B | 1.44 | mg/kg dry | | 0.331 | | | 3 | 20 |
| Nickel | 8.36 | | 2.89 | mg/kg dry | | 8.11 | | | 3 | 20 |
| Potassium | 1370 | | 289 | mg/kg dry | | 1370 | | | 0.02 | 20 |
| Selenium | 0.217 | U | 0.217 | mg/kg dry | | 0.197 U | | | | 20 |
| Silicon | 572 | | 1.44 | mg/kg dry | | 529 | | | 8 | 20 |
| Silver | 0.144 | U | 0.144 | mg/kg dry | | 0.132 U | | | | 20 |
| Sodium | 161 | | 36.1 | mg/kg dry | | 156 | | | 3 | 20 |
| Vanadium | 45.7 | | 1.81 | mg/kg dry | | 41.7 | | | 9 | 20 |
| Zinc | 95.1 | | 7.22 | mg/kg dry | | 93.5 | | | 2 | 20 |
| **Matrix Spike (L011201-MS2)** | | **Source: 1011036-01** | | Prepared: 11/12/2010 Analyzed: 11/18/2010 | | | | | | |
| Aluminum | 7280 | | 15.5 | mg/kg dry | 155.25 | 6320 | 622* | 75-125 | | |
| Antimony | 16.1 | | 0.776 | mg/kg dry | 38.812 | 1.33 | 38* | 75-125 | | |
| Arsenic | 2110 | | 0.776 | mg/kg dry | 155.25 | 2040 | 45* | 75-125 | | |
| Barium | 204 | | 0.388 | mg/kg dry | 155.25 | 71.9 | 85 | 75-125 | | |
| Beryllium | 3.39 | | 0.155 | mg/kg dry | 3.8812 | 0.238 | 81 | 75-125 | | |
| Boron | 60.1 | | 1.55 | mg/kg dry | 77.624 | 1.29 | 76 | 75-125 | | |
| Cadmium | 3.83 | | 0.194 | mg/kg dry | 3.8812 | 0.565 | 84 | 75-125 | | |
| Calcium | 5020 | | 15.5 | mg/kg dry | 1940.6 | 3130 | 97 | 75-125 | | |
| Chromium | 21.0 | | 0.155 | mg/kg dry | 15.525 | 8.10 | 83 | 75-125 | | |
| Cobalt | 35.0 | | 1.55 | mg/kg dry | 38.812 | 5.19 | 77 | 75-125 | | |
| Copper | 29.7 | | 0.776 | mg/kg dry | 19.406 | 15.1 | 75 | 75-125 | | |
| Iron | 18400 | | 15.5 | mg/kg dry | 77.624 | 17800 | 750* | 75-125 | | |
| Lead | 6960 | | 0.388 | mg/kg dry | 38.812 | 9450 | -6430* | 75-125 | | |
| Magnesium | 5120 | | 58.2 | mg/kg dry | 1940.6 | 3480 | 84 | 75-125 | | |
| Manganese | 261 | | 3.88 | mg/kg dry | 38.812 | 227 | 87 | 75-125 | | |
| Molybdenum | 62.5 | | 1.55 | mg/kg dry | 77.624 | 0.331 | 80 | 75-125 | | |
| Nickel | 38.3 | | 3.10 | mg/kg dry | 38.812 | 8.11 | 78 | 75-125 | | |
| Potassium | 3050 | | 310 | mg/kg dry | 1940.6 | 1370 | 86 | 75-125 | | |
| Selenium | 121 | | 0.776 | mg/kg dry | 155.25 | 0.197 U | 78 | 75-125 | | |
| Silicon | 688 | | 1.55 | mg/kg dry | 77.624 | 529 | 206* | 75-125 | | |
| Silver | 3.28 | | 0.155 | mg/kg dry | 3.8812 | 0.132 U | 84 | 75-125 | | |
| Sodium | 1900 | | 38.8 | mg/kg dry | 1940.6 | 156 | 90 | 75-125 | | |

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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

# Metals by SW846 6000/7000 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011201 - SW 3050B** | | | | | | | | | |
| **Matrix Spike (L011201-MS2)** | | **Source: 1011036-01** | Prepared: 11/12/2010 Analyzed: 11/18/2010 | | | | | | |
| Vanadium | 76.8 | 1.94 | mg/kg dry | 38.812 | 41.7 | 91 | 75-125 | | |
| Zinc | 130 | 7.76 | mg/kg dry | 38.812 | 93.5 | 93 | 75-125 | | |
| **Reference (L011201-SRM2)** | | | Prepared: 11/12/2010 Analyzed: 11/18/2010 | | | | | | |
| Aluminum | 7050 | 44.1 | mg/kg wet | 6766.6 | | 104 | 0-225.5 | | |
| Antimony | 43.0 | 2.21 | mg/kg wet | 56.630 | | 76 | 0-225.6 | | |
| Arsenic | 114 | 2.21 | mg/kg wet | 113.85 | | 100 | 85-115 | | |
| Barium | 303 | 1.10 | mg/kg wet | 298.35 | | 102 | 75.7-124.3 | | |
| Beryllium | 109 | 0.441 | mg/kg wet | 108.32 | | 101 | 85.2-114.8 | | |
| Boron | 83.8 | 4.41 | mg/kg wet | 86.580 | | 97 | 68.5-131.6 | | |
| Cadmium | 230 | 0.551 | mg/kg wet | 224.09 | | 103 | 84.9-115.1 | | |
| Calcium | 3470 | 44.1 | mg/kg wet | 3305.9 | | 105 | 82.8-117.2 | | |
| Chromium | 81.4 | 0.441 | mg/kg wet | 77.590 | | 105 | 76.8-123.2 | | |
| Cobalt | 170 | 4.41 | mg/kg wet | 163.19 | | 104 | 79.4-120.6 | | |
| Copper | 261 | 2.21 | mg/kg wet | 265.65 | | 98 | 82.4-117.6 | | |
| Iron | 8640 | 44.1 | mg/kg wet | 8202.8 | | 105 | 78.9-121.1 | | |
| Lead | 189 | 1.10 | mg/kg wet | 187.62 | | 101 | 81.5-118.5 | | |
| Magnesium | 8960 | 165 | mg/kg wet | 8352.3 | | 107 | 84.2-115.8 | | |
| Manganese | 1010 | 11.0 | mg/kg wet | 951.35 | | 106 | 69-131 | | |
| Molybdenum | 240 | 4.41 | mg/kg wet | 234.78 | | 102 | 80.1-119.9 | | |
| Nickel | 225 | 8.82 | mg/kg wet | 220.85 | | 102 | 81.4-118.6 | | |
| Potassium | 14900 | 882 | mg/kg wet | 14177 | | 105 | 85.7-114.3 | | |
| Selenium | 189 | 2.21 | mg/kg wet | 187.99 | | 100 | 78.8-121.2 | | |
| Silicon | 1070 | 4.41 | mg/kg wet | 939.78 | | 114 | 0-272.3 | | |
| Silver | 82.7 | 0.441 | mg/kg wet | 83.960 | | 98 | 81.9-118.1 | | |
| Sodium | 10100 | 110 | mg/kg wet | 9587.1 | | 105 | 83.5-116.4 | | |
| Vanadium | 106 | 5.51 | mg/kg wet | 97.430 | | 108 | 75.8-124.2 | | |
| Zinc | 198 | 22.1 | mg/kg wet | 196.52 | | 101 | 78.9-121.1 | | |

264 Welsh Pool Road
Exton, PA 19341
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:47 |

## Metals by SW846 6000/7000 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L011276 - SW 7471A Prep** | | | | | | | | | | |
| **Blank (L011276-BLK1)** | | | | Prepared: 11/18/2010 Analyzed: 11/19/2010 | | | | | | |
| Mercury | 0.0290 | U | 0.0290 | mg/kg wet | | | | | | |
| **Duplicate (L011276-DUP1)** | | **Source: 1011036-01** | | Prepared: 11/18/2010 Analyzed: 11/19/2010 | | | | | | |
| Mercury | 0.0159 | B | 0.0275 | mg/kg dry | | 0.0230 | | | 36.3* | 20 |
| **Matrix Spike (L011276-MS1)** | | **Source: 1011036-01** | | Prepared: 11/18/2010 Analyzed: 11/19/2010 | | | | | | |
| Mercury | 0.188 | | 0.0260 | mg/kg dry | 0.14447 | 0.0230 | 114 | 75-125 | | |
| **Reference (L011276-SRM1)** | | | | Prepared: 11/18/2010 Analyzed: 11/19/2010 | | | | | | |
| Mercury | 1.25 | | 0.0265 | mg/kg wet | 1.2600 | | 98.9 | 65.9-133.3 | | |

**Lionville Laboratory** **Logbook #:** 937

## SAMPLE DIGESTION RECORD

Digestion Batch #: L011201
Date/Time Initiated: 11/12/10 1140
Date/Time Completed: 11/12/10 ~~1530~~ 1550
Analyst: JSS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)

Digested / Undigested (circle one)
Balance #: N/A
Balance Cal Verification: Y NA
Temp: 96
BLOCK 1 2 (circle one)

**NOTE**: All temperatures are recorded as corrected temperatures

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/ TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 1011003-01 | | 0.73 | 50 | | TO | Fine | Brown | Rocks | N/A |
| L011201-Dup1 | | 0.64 | 50 | | | | | | |
| -MS1 | 0.5 | 0.61 | 50 | | | | | | |
| 1011003-02 | | 0.65 | 50 | | | Fine | Brown | Rocks | |
| -03 | | 0.58 | 50 | | | Fine | Brown | Rocks | |
| 1011036-01 | | 0.79 | 50 | | | Fine | Brown | Rocks | |
| L011201-Dup2 | | 0.72 | 50 | | | | | | |
| -MS2 | 0.5 | 0.67 | 50 | | | | | | |
| 1011036-02 | | 0.57 | 50 | | | Fine | Brown | Rocks | |
| 1011039-01 | | 0.65 | 50 | | | Fine | Brown | Rocks | |
| -02 | | 0.52 | 50 | | | Fine | Brown | $H_2O$ | |
| L011201-DupB | | 0.54 | 50 | | | | | | |
| -MS3 | 0.5 | 0.78 | 50 | | | | | | |
| 1011039-03 | | 0.56 | 50 | | | Fine | Brown | $H_2O$/Lves | |
| 1011062-12 | | 0.66 | 50 | | | coarse | Dry wall | | |
| L011201-BLK1 | | 0.54 | 50 | | | Coarse | Boiling chips | | |
| -SRM1 | | 0.68 | 50 | | | Fine | dusty pink soil | | |

JSS
11/12/10

Spiking IDs / Expiration Date:
MS#: 8100-04-16
-17
-18
6072-087-14
LCS#: 1001320

Reagent IDs:
$HNO_3$ J14073
HCl J35092
$H_2O_2$ H28J00
1:1 $HNO_3$ 637-026-07
1:1 HCl

File ID#:

Data Review By / Date: 11/16/10

R:\group\QA\SOP\
Signed\SPI\Metals Digestion log.doc

Page #:



000000011

# PREPARATION BENCH SHEET

L011201

**Lionville Laboratory**

**Printed: 11/22/2010 9:44:49AM**

**Matrix: Solid** **Prepared using: METALS - SW 3050B** **(No Surrogate)**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011003-01 | 6010B HSL Metals | 11/12/2010 10:58 | 0.73 | 50 | | | | | WC-Hanford, Inc. | HSL + B, Mo, Si (No TL) |
| 1011003-01 | 6010B ICP Metals | 11/12/2010 10:58 | 0.73 | 50 | | | | | WC-Hanford, Inc. | Added for BatchQC in: L011201 |
| 1011003-01 | 6010B ICP Trace | 11/12/2010 10:58 | 0.73 | 50 | | | | | WC-Hanford, Inc. | Added for BatchQC in: L011201 |
| 1011003-02 | 6010B HSL Metals | 11/12/2010 10:58 | 0.65 | 50 | | | | | WC-Hanford, Inc. | HSL + B, Mo, Si (No TL) |
| 1011003-03 | 6010B HSL Metals | 11/12/2010 10:58 | 0.58 | 50 | | | | | WC-Hanford, Inc. | HSL + B, Mo, Si (No TL) |
| 1011036-01 | 6010B HSL Metals | 11/12/2010 10:58 | 0.79 | 50 | | | | | WC-Hanford, Inc. | Added for BatchQC in: L011201 |
| 1011036-01 | 6010B ICP Metals | 11/12/2010 10:58 | 0.79 | 50 | | | | | WC-Hanford, Inc. | Added for BatchQC in: L011201 |
| 1011036-01 | 6010B ICP Trace | 11/12/2010 10:58 | 0.79 | 50 | | | | | WC-Hanford, Inc. | HSL + B, Mo, Si (no TL) |
| 1011036-02 | 6010B ICP Trace | 11/12/2010 10:58 | 0.5 | 50 | | | | | WC-Hanford, Inc. | HSL + B, Mo, Si (no TL) |
| 1011039-01 | 6010B ICP Trace | 11/12/2010 10:58 | 0.65 | 50 | | | | | WC-Hanford, Inc. | |
| 1011039-02 | 6010B HSL Metals | 11/12/2010 10:58 | 0.52 | 50 | | | | | WC-Hanford, Inc. | Added for BatchQC in: L011201 |
| 1011039-02 | 6010B ICP Metals | 11/12/2010 10:58 | 0.52 | 50 | | | | | WC-Hanford, Inc. | Added for BatchQC in: L011201 |
| 1011039-02 | 6010B ICP Trace | 11/12/2010 10:58 | 0.52 | 50 | | | | | WC-Hanford, Inc. | |
| 1011039-03 | 6010B ICP Trace | 11/12/2010 10:58 | 0.56 | 50 | | | | | WC-Hanford, Inc. | |
| 1011062-12 | 6010B ICP Metals | 11/12/2010 10:58 | 0.66 | 50 | | | | | S.M. Stoller | |
| L011201-BLK1 | QC | 11/12/2010 10:58 | 0.54 | 50 | | | | | | |
| L011201-BLK2 | QC | 11/12/2010 10:58 | 0.54 | 50 | | | | | | added due to client detection limits 003, 036 |
| L011201-BLK3 | QC | 11/12/2010 10:58 | 0.54 | 50 | | | | | | added due to diff client detection limits 039 |
| L011201-DUP1 | QC | 11/12/2010 10:58 | 0.64 | 50 | | 1011003-01 | | | | |
| L011201-DUP2 | QC | 11/12/2010 10:58 | 0.72 | 50 | | 1011036-01 | | | | |

Extracts Relinquished By Date

Extracts Received By Date

# PREPARATION BENCH SHEET

L011201

**Lionville Laboratory**

**Printed: 11/22/2010 9:44:49AM**

**Matrix: Solid** **Prepared using: METALS - SW 3050B** **(No Surrogate)**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| L011201-DUP3 | QC | 11/12/2010 10:58 | 0.54 | 50 | | 1011039-02 | | | | |
| L011201-MS1 | QC | 11/12/2010 10:58 | 0.61 | 50 | 1001843 | 1011003-01 | 500 | | | |
| L011201-MS2 | QC | 11/12/2010 10:58 | 0.67 | 50 | 1001843 | 1011036-01 | 500 | | | |
| L011201-MS3 | QC | 11/12/2010 10:58 | 0.78 | 50 | 1001843 | 1011039-02 | 500 | | | |
| L011201-SRM1 | QC | 11/12/2010 10:58 | 0.68 | 50 | 1001320 | | 680 | | | |
| L011201-SRM2 | QC | 11/12/2010 10:58 | 0.68 | 50 | 1001320 | | 680 | | | added due to client detection limits 003, 036 |
| L011201-SRM3 | QC | 11/12/2010 10:58 | 0.68 | 50 | 1001320 | | 680 | | | added due to diff client detection limits 039 |

Extracts Relinquished By Date

Extracts Received By Date

Lionville Laboratory

# MERCURY PREPARATION

Logbook # 844

Analyst: [illegible]
Date 11/18/10
Start Time/Temp: 2200 / 95°
End Time/Temp: 2230 / 96°

Instrument ID: HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) Y

Prep Batch: L011276
Worksheet: HG111901
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one)

**NOTE: All temperatures are recorded as corrected temperatures.**

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| Blank | | | | 10 ml | 50 | |
| 0.2 ug/l | | 0.100 | | 10 ml | 50 | |
| 1.0 ug/l | | 0.500 | | 10 ml | 50 | |
| 2.0 ug/l | | 1.000 | | 10 ml | 50 | |
| 5.0 ug/l | | 2.500 | | 10 ml | 50 | |
| 10.0 ug/l | | 5.000 | | 10 ml | 50 | |
| ICV | | 0.125 | 2.5 | 10 ml | 50 | |
| CCV | | 0.250 | 5.0 | 10 ml | 50 | |
| ICB/CCB | | | | 10 ml | 50 | |
| L011276-BLK1 | | | | 0.31 | 50 | |
| SRM1 | | | | 0.34 | 50 | |
| 1011036-01 | | | | 0.36 | 50 | |
| L011276-DUP1 | | | | 0.34 | 50 | |
| MS1 | | 0.500 | 1.0 | 0.36 | 50 | |
| 1011036-02 | | | | 0.37 | 50 | |
| 1011039-01 | | | | 0.39 | 50 | |
| 02 | | | | 0.37 | 50 | |
| L011276-DUP2 | | | | 0.37 | 50 | |
| MS2 | | 0.500 | 1.0 | 0.35 | 50 | |
| 1011039-03 | | | | 0.38 | 50 | |
| 1011090-01 | | | | 0.34 | 50 | |
| L011276-DUP3 | | | | 0.34 | 50 | |
| MS3 | | 0.500 | 1.0 | 0.36 | 50 | |
| 1011090-02 | | | | 0.35 | 50 | |
| 03 | | | | 0.39 | 50 | |
| 1011093-01 | | | | 0.32 | 50 | |
| L011276-DUP4 | | | | 0.38 | 50 | |

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | 0901995B AI | 11/18/10 1620 |
| ICV/CCV/LCS | 0902297A I.V. | ↓ |

Reviewed By/Date: [illegible] 11/22/10

se book # 9368 for std traceability information

Soil LCS True Value = 1.26 mg/Kg
Standard # 1001320

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Soil LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory

# MERCURY PREPARATION

Logbook # 844

Analyst: [illegible]
Date 11/18/10
Start Time/Temp: [illegible] 01
End Time/Temp: [illegible]

Instrument ID: HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Prep Batch: L011276
Worksheet: HG111901
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

**NOTE: All temperatures are recorded as corrected temperatures.**

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| L011276-MS4 | | 0.500 | 1.0 | 0.36 | 50 | |
| 1011106-01 | | | | 0.37 | 50 | |
| 02 | | | | 0.38 | 50 | |
| L011276-DUP5 | | | | 0.36 | 50 | |
| MS5 | | 0.500 | 1.0 | 0.36 | 50 | |
| 1011106-03 | | | | 0.38 | 50 | |
| 04 | | | | 0.33 | 50 | |
| 05 | | | | 0.37 | 50 | |
| 06 | | | | 0.37 | 50 | |
| 1011108-01 | | | | 0.37 | 50 | |
| L011276-DUP6 | | | | 0.39 | 50 | |
| MS6 | | 0.500 | 1.0 | 0.37 | 50 | |
| 1011108-02 | | | | 0.38 | 50 | |

PN 11/18/10

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | | |
| ICV/CCV/LCS | | |

Reviewed By/Date: [illegible] 11/22/10

se book # 9368 for std traceability information

Soil LCS True Value = [illegible] mg/Kg
Standard # [illegible]

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Soil LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

Page #:

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/22/2010 10:35 |

# Wet Chemistry
## Lionville Laboratory

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| **J1CM93 (1011036-01) Soil** | | | | | | | | |
| **%Solids** | 96.1 | 0.1 | % by Weight | 1 | L011126 | 11/08/2010 | 11/08/2010 | EPA 160.6 |
| **J1CM94 (1011036-02) Soil** | | | | | | | | |
| **%Solids** | 97.3 | 0.1 | % by Weight | 1 | L011126 | 11/08/2010 | 11/08/2010 | EPA 160.6 |

Lionville Laboratory Use Only

1011 036

# Custody Transfer Record/Lab Work Request

Page 1 of 1

SPC

LVLI LIONVILLE LABORATORY INC.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF# RC-182

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: STD TAT: 15 days

Date Rec'd: 11/5/10 Date Due: 11-20-10

| | | A | B | C | D | E | | | F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | VOA | 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| #/Type Container | ~~Liquid~~ / Solid | 1AG | 1AG | 1AG | 1AG | 1AG | | | 1 | | | | | | | |
| Volume | | 60 | 60 | 60 | 60 | 60 | | | 60 | | | | | | | |
| Preservatives | | — | — | — | — | — | | | — | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | ~~Pest~~ PCB | ~~Chlor~~ Herb | Pest | | | ~~Metal~~ HG | CN | | | | | | |
| Lionville Laboratory Use Only | | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |

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 | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1CM93 | | | Soil | 11-2-10 | 1010 | X | X | X | X | X | | | X | | | | | | | |
| 02 | 1 94 | | | 1 | 1 | 1030 | X | X | X | X | X | | | X | | | | | | | |

Special Instructions: Run matrix QC

Met① = HSL + B, Mo, Si
NOTL

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 11/5/10 | 1000 |
| | | | |

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

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

0000000017

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-182-019 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>D. Rice | Company Contact<br>S. Van Den Hende | Telephone No.<br>509-551-3934 | Project Coordinator<br>KESSNER, JH |
| Price Code SV 11/4/10 ~~8L~~ 8K | Data Turnaround SV 10/28/10 ~~21 Days~~ 15 Days | | |
| Project Designation<br>ARRA 100F Remaining Sites Remediation - Soil In-Process | Sampling Location<br>600-351 Site | | SAF No.<br>RC-182 |
| Ice Chest No. AFS-04-025 | Field Logbook No.<br>EL-1651 | COA S603518100 ~~S11FX1Y000~~ SV 11/1/10 | Method of Shipment<br>FedEx |
| Shipped To<br>EBERLINE SERVICES LIONVILLE | Offsite Property No. A100611 | | Bill of Lading/Air Bill No.<br>See OSPC |

POSSIBLE SAMPLE HAZARDS/REMARKS
~~None~~ JEB 11-4-10
Pot. RAD <DOT Limits

Special Handling and/or Storage
*Cool 4 Degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | | |
| Type of Container | G/P | G | aG | aG | aG | aG | G/P | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | Pesticides - 8081 | Chloro-Herbicides - EPA8151 | RCF GEA Shipping Screen | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1CM93 | SOIL | 11/2/10 | 1010 | X | X | X | X | X | X | | | AREA | #1 |
| J1CM94 | SOIL | 11/2/10 | 1030 | X | X | X | X | X | X | | | AREA | #2 |
| ~~J1CM95~~ | ~~SOIL~~ SV 11/2/10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: David D. Rice | 11-2-10 1105 | RT COFFMAN / RT Coffman | 11/2/10 1105 |
| Relinquished By/Removed From: RT COFFMAN / RT Coffman | 11/2/10 1540 | Received By/Stored In: J.E. Barlow | 11-2-10 1540 |
| Relinquished By/Removed From: J.E. Barlow | WCH 11-4-10 1000 | Received By/Stored In: FED EX | |
| Relinquished By/Removed From: FED EX | 11-5-10 1000 | Received By/Stored In: VICTOR HERNANDEZ | 11-5-10 1000 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

SPECIAL INSTRUCTIONS
~~None~~ SV 11/2/10

(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY LRE
DATE 11-4-10

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

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

WCH-EE-011

000000018

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-182

Date: 11/5/10

LvL Batch #: 1011036

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FedEx | | Airbill # 7940 8360 9518 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2.5° | °C | Cooler # AFS-04-025 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA. TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☑ Yes 11/5/10 | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____ Date _____

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

RECEIVED
DEC 2010

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>12/01/2010 20:33 |

## Analytical Report for Organochlorine Pesticides by SW846 8081A

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1CM93 | 1011036-01 | Soil | 11/02/2010 10:10 | 11/05/2010 10:00 |
| J1CM94 | 1011036-02 | Soil | 11/02/2010 10:30 | 11/05/2010 10:00 |

LIONVILLE LABORATORY
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264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-182 K2510
**LVL #:** 1011036

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 11-05-2010

## CHLORINATED PESTICIDES

Two (2) soil samples were collected on 11-02-2010.

The samples and associated QC samples were extracted 11-15-2010 and analyzed 11-29,30-2010 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8081A for client specified target compounds. All samples received Copper-Sulfur cleanup based on SW846 method 3660A.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from a sample(s) that met LvL's sample acceptance policy.

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

3. The samples required a 4-fold instrument dilution due to the nature of the matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

4. All obtainable surrogate recoveries were within acceptance criteria.

5. The method blank was below the reporting limit for all target compounds.

6. All blank spike recoveries were within acceptance criteria.

7. Nine (9) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#10GC385) has been enclosed.

8. The samples are reported on a dry weight basis.

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

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.


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 15 pages.

11. 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 hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

12/4/10
Date

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 10GC385

Initiator: Catherine Carey
Date: 12/01/10
Client: WC-Hanford

Batch: 1011036
Samples: MS1/MSD1
Method: SW846/MCAWW/CLP/

Parameter: Pest
Matrix: SOIL
Prep Batch: L011226

**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)

several spike recoveries are low in MS1/MSD1

BS okay

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

Matrix

**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)

Narrate
LD.

**4. Project Manager Instructions**...signature/date: 12/4/10

__ 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: 12-12-10

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 for diposition.**

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# GLOSSARY OF 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.

. I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

P = This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 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.

## 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.

NS = Not Spiked.

SP = Indicates Spiked Compound.

NPM = No pattern match for multi-component target analytes.

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 20:33 |

## J1CM93

### 1011036-01 (Soil)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Organochlorine Pesticides by SW846 8081A** | | | | | | | | | |
| alpha-BHC | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| gamma-BHC | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| beta-BHC | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| delta-BHC | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Heptachlor | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Aldrin | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Heptachlor epoxide | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| gamma-Chlordane | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| alpha-Chlordane | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Endosulfan I | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| 4,4'-DDE | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Dieldrin | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Endrin | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| 4,4'-DDD | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Endosulfan II | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| 4,4'-DDT | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Endrin aldehyde | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| **Endosulfan sulfate** | **1.50** | J, D | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Methoxychlor | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Endrin ketone | 1.36 | U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| Toxaphene | 20.5 | U | 20.5 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/29/2010 | 8081A |
| *Surrogate: Tetrachloro-meta-xylene* | *68.0 %* | | *28-166* | | | *L011226* | *11/15/2010* | *11/29/2010* | *8081A* |
| *Surrogate: Decachlorobiphenyl* | *75.0 %* | | *37-153* | | | *L011226* | *11/15/2010* | *11/29/2010* | *8081A* |

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 20:33 |

## J1CM94

### 1011036-02 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Organochlorine Pesticides by SW846 8081A** | | | | | | | | |
| alpha-BHC | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| gamma-BHC | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| beta-BHC | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| delta-BHC | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Heptachlor | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Aldrin | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Heptachlor epoxide | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| gamma-Chlordane | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| alpha-Chlordane | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Endosulfan I | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| 4,4'-DDE | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Dieldrin | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Endrin | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| 4,4'-DDD | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Endosulfan II | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| 4,4'-DDT | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Endrin aldehyde | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Endosulfan sulfate | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Methoxychlor | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Endrin ketone | 1.36 U | 1.36 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| Toxaphene | 20.4 U | 20.4 | ug/kg dry | 4 | L011226 | 11/15/2010 | 11/30/2010 | 8081A |
| *Surrogate: Tetrachloro-meta-xylene* | *43.0 %* | *28-166* | | | *L011226* | *11/15/2010* | *11/30/2010* | *8081A* |
| *Surrogate: Decachlorobiphenyl* | *45.0 %* | *37-153* | | | *L011226* | *11/15/2010* | *11/30/2010* | *8081A* |

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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 20:33 |

## Organochlorine Pesticides by SW846 8081A - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011226 - SW 3540C** | | | | | | | | | |
| **Blank (L011226-BLK1)** | | | Prepared: 11/15/2010 Analyzed: 11/29/2010 | | | | | | |
| alpha-BHC | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| gamma-BHC | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| beta-BHC | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| delta-BHC | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Heptachlor | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Aldrin | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Heptachlor epoxide | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| gamma-Chlordane | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| alpha-Chlordane | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Endosulfan I | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| 4,4'-DDE | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Dieldrin | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Endrin | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| 4,4'-DDD | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Endosulfan II | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| 4,4'-DDT | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Endrin aldehyde | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Endosulfan sulfate | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Methoxychlor | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Endrin ketone | 0.333 U | 0.333 | ug/kg wet | | | | | | |
| Toxaphene | 5.00 U | 5.00 | ug/kg wet | | | | | | |
| *Surrogate: Tetrachloro-meta-xylene* | *24.7* | | *ug/kg wet* | *33.337* | | *74.0* | *28-166* | | |
| *Surrogate: Decachlorobiphenyl* | *21.7* | | *ug/kg wet* | *33.333* | | *65.0* | *37-153* | | |
| **LCS (L011226-BS1)** | | | Prepared: 11/15/2010 Analyzed: 11/29/2010 | | | | | | |
| alpha-BHC | 35.0 | 0.333 | ug/kg wet | 33.333 | | 105 | 61-142 | | |
| gamma-BHC | 37.4 | 0.333 | ug/kg wet | 33.333 | | 112 | 65-142 | | |
| beta-BHC | 37.2 | 0.333 | ug/kg wet | 33.333 | | 112 | 71-134 | | |
| delta-BHC | 35.3 | 0.333 | ug/kg wet | 33.333 | | 106 | 53-144 | | |
| Heptachlor | 31.5 | 0.333 | ug/kg wet | 33.333 | | 94.6 | 70-138 | | |
| Aldrin | 33.8 | 0.333 | ug/kg wet | 33.333 | | 101 | 70-143 | | |
| Heptachlor epoxide | 35.8 | 0.333 | ug/kg wet | 33.333 | | 107 | 72-140 | | |
| gamma-Chlordane | 36.5 | 0.333 | ug/kg wet | 33.333 | | 110 | 74-140 | | |
| alpha-Chlordane | 36.6 | 0.333 | ug/kg wet | 33.333 | | 110 | 74-138 | | |
| Endosulfan I | 36.5 | 0.333 | ug/kg wet | 33.333 | | 110 | 81-141 | | |
| 4,4'-DDE | 40.3 | 0.333 | ug/kg wet | 33.333 | | 121 | 82-145 | | |
| Dieldrin | 36.6 | 0.333 | ug/kg wet | 33.333 | | 110 | 79-144 | | |

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 20:33 |

## Organochlorine Pesticides by SW846 8081A - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011226 - SW 3540C** | | | | | | | | | |
| **LCS (L011226-BS1)** | | | Prepared: 11/15/2010 Analyzed: 11/29/2010 | | | | | | |
| Endrin | 36.4 | 0.333 | ug/kg wet | 33.333 | | 109 | 73-147 | | |
| 4,4'-DDD | 38.5 | 0.333 | ug/kg wet | 33.333 | | 116 | 77-148 | | |
| Endosulfan II | 36.4 | 0.333 | ug/kg wet | 33.333 | | 109 | 80-140 | | |
| 4,4'-DDT | 36.7 | 0.333 | ug/kg wet | 33.333 | | 110 | 82-142 | | |
| Endrin aldehyde | 34.5 | 0.333 | ug/kg wet | 33.333 | | 104 | 59-133 | | |
| Endosulfan sulfate | 34.9 | 0.333 | ug/kg wet | 33.333 | | 105 | 77-135 | | |
| Methoxychlor | 30.6 | 0.333 | ug/kg wet | 33.333 | | 91.9 | 77-136 | | |
| Endrin ketone | 36.5 | 0.333 | ug/kg wet | 33.333 | | 110 | 85-134 | | |
| *Surrogate: Tetrachloro-meta-xylene* | *28.7* | | *ug/kg wet* | *33.337* | | *86.0* | *28-166* | | |
| *Surrogate: Decachlorobiphenyl* | *13.7* | | *ug/kg wet* | *33.333* | | *41.0* | *37-153* | | |
| **Matrix Spike (L011226-MS1)** | | **Source: 1011036-01** | Prepared: 11/15/2010 Analyzed: 11/30/2010 | | | | | | |
| alpha-BHC | 27.2 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 79.0 | 61-142 | | |
| gamma-BHC | 26.4 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 76.7 | 65-142 | | |
| beta-BHC | 19.5 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 56.7* | 71-134 | | |
| delta-BHC | 16.3 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 47.2* | 53-144 | | |
| Heptachlor | 29.3 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 85.1 | 70-138 | | |
| Aldrin | 27.7 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 80.2 | 70-143 | | |
| Heptachlor epoxide | 26.2 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 76.0 | 72-140 | | |
| gamma-Chlordane | 25.5 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 74.0 | 74-140 | | |
| alpha-Chlordane | 25.9 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 75.0 | 74-138 | | |
| Endosulfan I | 27.1 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 78.5* | 81-141 | | |
| 4,4'-DDE | 28.8 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 83.4 | 82-145 | | |
| Dieldrin | 27.8 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 80.5 | 79-144 | | |
| Endrin | 28.9 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 83.9 | 73-147 | | |
| 4,4'-DDD | 27.0 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 78.4 | 77-148 | | |
| Endosulfan II | 23.8 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 69.1* | 80-140 | | |
| 4,4'-DDT | 26.9 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 78.1* | 82-142 | | |
| Endrin aldehyde | 21.1 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 61.1 | 59-133 | | |
| Endosulfan sulfate | 23.2 D | 1.38 | ug/kg dry | 34.477 | 1.50 | 62.8* | 77-135 | | |
| Methoxychlor | 30.2 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 87.7 | 77-136 | | |
| Endrin ketone | 26.3 D | 1.38 | ug/kg dry | 34.477 | 1.36 U | 76.3* | 85-134 | | |
| *Surrogate: Tetrachloro-meta-xylene* | *34.5* | | *ug/kg dry* | *34.480* | | *100* | *28-166* | | |
| *Surrogate: Decachlorobiphenyl* | *29.6* | | *ug/kg dry* | *34.477* | | *86.0* | *37-153* | | |

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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 12/01/2010 20:33 |

## Organochlorine Pesticides by SW846 8081A - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011226 - SW 3540C** | | | | | | | | | |
| **Matrix Spike Dup (L011226-MSD1)** | **Source: 1011036-01** | | Prepared: 11/15/2010 Analyzed: 11/30/2010 | | | | | | |
| alpha-BHC | 27.9 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 82.0 | 61-142 | 3.73 | 40 |
| gamma-BHC | 27.9 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 81.9 | 65-142 | 6.56 | 40 |
| beta-BHC | 29.7 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 87.1 | 71-134 | 42.3* | 40 |
| delta-BHC | 24.5 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 71.8 | 53-144 | 41.3* | 40 |
| Heptachlor | 29.6 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 86.9 | 70-138 | 2.09 | 40 |
| Aldrin | 27.9 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 81.9 | 70-143 | 2.10 | 40 |
| Heptachlor epoxide | 26.6 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 78.0 | 72-140 | 2.60 | 40 |
| gamma-Chlordane | 25.7 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 75.5 | 74-140 | 2.01 | 40 |
| alpha-Chlordane | 26.1 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 76.6 | 74-138 | 2.11 | 40 |
| Endosulfan I | 28.9 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 84.8 | 81-141 | 7.72 | 40 |
| 4,4'-DDE | 30.2 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 88.6 | 82-145 | 6.05 | 40 |
| Dieldrin | 29.5 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 86.6 | 79-144 | 7.30 | 40 |
| Endrin | 36.2 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 106 | 73-147 | 23.6 | 40 |
| 4,4'-DDD | 31.4 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 92.0 | 77-148 | 16.0 | 40 |
| Endosulfan II | 26.5 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 77.7* | 80-140 | 11.7 | 40 |
| 4,4'-DDT | 28.5 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 83.6 | 82-142 | 6.80 | 40 |
| Endrin aldehyde | 26.5 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 77.7 | 59-133 | 23.9 | 40 |
| Endosulfan sulfate | 26.1 D | 1.36 | ug/kg dry | 34.081 | 1.50 | 72.1* | 77-135 | 13.7 | 40 |
| Methoxychlor | 31.6 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 92.6 | 77-136 | 5.44 | 40 |
| Endrin ketone | 30.8 D | 1.36 | ug/kg dry | 34.081 | 1.36 U | 90.4 | 85-134 | 16.9 | 40 |
| *Surrogate: Tetrachloro-meta-xylene* | *33.4* | | *ug/kg dry* | *34.085* | | *98.0* | *28-166* | | |
| *Surrogate: Decachlorobiphenyl* | *26.9* | | *ug/kg dry* | *34.081* | | *79.0* | *37-153* | | |

# PREPARATION BENCH SHEET

L011226

**Lionville Laboratory**

**Printed: 12/2/2010 3:12:52PM**

**Matrix: Solid** **Prepared using: GC - SW 3540C** **Surrogate used: 1001740**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011036-01 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-01 | 8082 PCBs | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8082 PCBs | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011067-01 | 8082 PCBs | 11/15/2010 11:05 | 30.24 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011067-02 | 8081A TCL Pesticides | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | Added for BatchQC in: L011226 |
| 1011067-02 | 8082 PCBs | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | |
| L011226-BLK1 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PEST |
| L011226-BLK2 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PCB |
| L011226-BS1 | QC | 11/15/2010 11:05 | 30 | 10 | 1001086 | | 250 | 250 | | PEST |
| L011226-BS2 | QC | 11/15/2010 11:05 | 30 | 10 | 1001362 | | 250 | 250 | | PCB |
| L011226-MS1 | QC | 11/15/2010 11:05 | 30.17 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MS2 | QC | 11/15/2010 11:05 | 30.75 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MS3 | QC | 11/15/2010 11:05 | 15.68 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |
| L011226-MSD1 | QC | 11/15/2010 11:05 | 30.52 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MSD2 | QC | 11/15/2010 11:05 | 30.61 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MSD3 | QC | 11/15/2010 11:05 | 15.42 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |

Adj std prep method 12/2/10

Extracts Relinquished By Date

Extracts Received By Date

# PREPARATION BENCH SHEET

L011226

**Lionville Laboratory**

**Printed: 11/17/2010 1:41:31PM**

**Matrix: Solid** **Prepared using: GC - SW 3540/3550** **Surrogate used: 1001740**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011036-01 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-01 | 8082 PCBs | 11/15/2010 11:05 | 30.49 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8081A TCL Pesticides | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011036-02 | 8082 PCBs | 11/15/2010 11:05 | 30.18 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1011067-01 | 8082 PCBs | 11/15/2010 11:05 | 30.24 | 10 | | | | 250 | WC-Hanford, Inc. | |
| ~~1011067-02~~ | ~~8081A TCL Pesticides~~ | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | Added for BatchQC in: L011226 |
| 1011067-02 | 8082 PCBs | 11/15/2010 11:05 | 16.34 | 10 | | | | 250 | WC-Hanford, Inc. | |
| L011226-BLK1 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PEST |
| L011226-BLK2 | QC | 11/15/2010 11:05 | 30 | 10 | | | | 250 | | PCB |
| L011226-BS1 | QC | 11/15/2010 11:05 | 30 | 10 | 1001086 | | 250 | 250 | | PEST |
| L011226-BS2 | QC | 11/15/2010 11:05 | 30 | 10 | 1001362 | | 250 | 250 | | PCB |
| L011226-MS1 | QC | 11/15/2010 11:05 | 30.17 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MS2 | QC | 11/15/2010 11:05 | 30.75 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MS3 | QC | 11/15/2010 11:05 | 15.68 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |
| L011226-MSD1 | QC | 11/15/2010 11:05 | 30.52 | 10 | 1001086 | 1011036-01 | 250 | 250 | | PEST |
| L011226-MSD2 | QC | 11/15/2010 11:05 | 30.61 | 10 | 1001362 | 1011036-02 | 250 | 250 | | PCB |
| L011226-MSD3 | QC | 11/15/2010 11:05 | 15.42 | 10 | 1001362 | 1011067-02 | 250 | 250 | | PCB |

sulfur cleaned
CAC 11/17/10

CS 11/17/10
Extracts Relinquished By Date

LE 11/17/10
Extracts Received By Date

Lionville Laboratory Use Only

1011 036

# Custody Transfer Record/Lab Work Request

Page 1 of 1

SRC

See

LVLI Lionville Laboratory Inc.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF# RC-182

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: STP TAT: 15 days

Date Rec'd: 11/5/10 Date Due: 11-20-10

| | A | B | C | D | E | | | F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | VOA | 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| #/Type Container (~~Liquid~~ / Solid) | 1AG | 1AG | 1AG | 1AG | 1AG | | | 1 | | | | | | | |
| Volume | 60 | 60 | 60 | 60 | 60 | | | 60 | | | | | | | |
| Preservatives | — | — | — | — | — | | | — | | | | | | | |
| ANALYSES REQUESTED | ORGANIC | | | | | | | INORG | | | | | | | |
| | VOA | BNA | ~~Pest~~ PCB | ~~Pest~~ Herb | Pest | | | Metal ~~Hg~~ | CN | | | | | | |
| | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met 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

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met ① | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1CM93 | | | Soil | 11-2-10 | 1010 | X | X | X | X | X | | | X | | | | | | | |
| 02 | 1 94 | | | 1 | 1 | 1030 | X | X | X | X | X | | | X | | | | | | | |

Special Instructions: Run matrix QC

Met ① = HSL + B, Mo, Si
NOTL

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 11/5/10 | 1000 |
| | | | |

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

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

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-182-019 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>D. Rice | Company Contact<br>S. Van Den Hende | Telephone No.<br>509-551-3934 | Project Coordinator<br>KESSNER, JH |
| Price Code SV 11/1/10 ~~8L~~ 8K | Data Turnaround SV 10/28/10 ~~21 Days~~ 15 Days | | |
| Project Designation<br>ARRA 100F Remaining Sites Remediation - Soil In-Process | Sampling Location<br>600-351 Site | | SAF No.<br>RC-182 |
| Ice Chest No. AFS-04-025 | Field Logbook No.<br>EL-1651 | COA S603518100<br>~~S11FX1Y000~~ SV 11/1/10 | Method of Shipment<br>FedEx |
| Shipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No. A100611 | | Bill of Lading/Air Bill No.<br>See OSPC |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

~~None~~ JEB 11-4-10
Pst. RAD <DOT Limits

**Special Handling and/or Storage**

*Cool 4 Degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | | |
| Type of Container | G/P | G | aG | aG | aG | aG | G/P | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | Pesticides - 8081 | Chloro-Herbicides - EPA8151 | RCF GEA Shipping Screen | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1CM93 | SOIL | 11/2/10 | 1010 | X | X | X | X | X | X | | | AREA | #1 |
| J1CM94 | SOIL | 11/2/10 | 1030 | X | X | X | X | X | X | | | AREA | #2 |
| ~~J1CM95~~ | ~~SOIL~~ SV 11/2/10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | | Sign/Print Names | |
|---|---|---|---|
| Relinquished By/Removed From<br>David D. Rice | Date/Time<br>11-2-10 1105 | Received By/Stored In<br>RT Coffman / RT Coffman | Date/Time 1105<br>11/2/10 |
| Relinquished By/Removed From<br>RT Coffman / RT Coffman | Date/Time 1540<br>11/2/10 | Received By/Stored In<br>J. E. Bauhl | Date/Time 1540<br>11-2-10 |
| Relinquished By/Removed From<br>J. E. Bauhl WCH | Date/Time 1000<br>11-4-10 | Received By/Stored In<br>FED EX | Date/Time |
| Relinquished By/Removed From<br>FED EX | Date/Time<br>11-5-10 1000 | Received By/Stored In<br>VICTOR HERNANDEZ | Date/Time<br>11-5-10 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**

~~None~~ SV 11/2/10

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY SRE
DATE 11-4-10

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

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

WCH-EE-011

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-182

Date: 11/5/10

LvL Batch #: 1011036

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FED EX | | Airbill # 7940 8360 9518 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2-5° | °C | Cooler # AFS-04-025 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA. TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☑ Yes 11/5/10 | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |
| Person Contacted _____ | | Date _____ | |

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Exton, PA 19341
Phone: 610-280-3000
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RECEIVED
DEC 2010

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>11/19/2010 14:25 |

## Analytical Report for Semivolatile Organic Compounds by SW846 8270C

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1CM93 | 1011036-01 | Soil | 11/02/2010 10:10 | 11/05/2010 10:00 |
| J1CM94 | 1011036-02 | Soil | 11/02/2010 10:30 | 11/05/2010 10:00 |

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Exton, Pennsylvania 19341
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Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-182 K2510
**LVL #:** 1011036

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 11-05-2010

## SEMIVOLATILE

Two (2) soil samples were collected on 11-02-2010.

The samples and associated QC samples were extracted 11-08-2010 and analyzed 11-10,15,18-2010 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for TCL Semivolatile target compounds.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from a sample(s) that met LvL's sample acceptance policy.

2. Samples were extracted and analyzed within holding time.

3. Samples J1CM93, L011113-MS4/MSD4 had an elevated final extraction volume of 4mls due to sample matrix. Reporting limits have been adjusted to reflect this change.

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

5. The following extracted samples required dilutions due to sample matrix: J1CM93 and L011113-MS4/MSD4 received a 5 fold dilution. Sample J1CM94 received a 4 fold dilution. Reporting limits have been adjusted to reflect these dilutions.

6. Two (2) of thirty-six (36) obtainable surrogate recoveries were outside acceptance criteria. The surrogate recoveries in L011113-BLK1 were biased high, therefore no impact on the data.

7. The method blank was below the reporting limit for all target compounds.

8. Two (2) of sixty-four (64) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#10MS329) has been enclosed.


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 24 pages.

9. Twenty-three (23) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 10MS329) has been enclosed.

10. The samples were reported on a dry weight basis.

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

12. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

14. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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 hardcopy package has been authorized by the Laboratory Manager or designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

11/22/10
Date

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 10MS329

Initiator: Sharon Saylor
Date: 11-19-10
Client: ~~Wellington RC-152~~

Batch: 1011036
Samples: BS, ms, msd
Method: ~~SW846~~/MCAWW/CLP/

Parameter: 8270
Matrix: SOIL
Prep Batch: L011113

**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)

(1) several Spike recoveries outside QC acceptance Limits in BS, ms, msd

**2. Known or Probable Causes(s)** MS/MSD possible matrix effect samples had elevated final volume dilution for analysis. BS 2,4-dinitrophenol below criteria, acidic phenols subject to erratic chromatographic behavior. dibenz(a,h)anthracene recovery elevated

**3. Discussion and Proposed Action** Other Description: RCH 11/19/10 narrate samples all non-detect no impact on data

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

**4. Project Manager Instructions**...signature/date: 11/22/10

__ 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: Catherine Leary 11/30/10 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 for diposition.**

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): ~~Ford~~
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# GLOSSARY

## DATA QUALIFIERS

U = Indicates that the 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 concetration 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

## 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.

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications 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 quan modifications:

| | | |
|---|---|---|
| MP | - | Missed Peak: Manually added peak not found by automatic quan program. |
| PA | - | Peak Assignment: quan 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. |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## J1CM93
### 1011036-01 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Semivolatile Organic Compounds by SW846 8270C** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 1,2-Dichlorobenzene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 1,3-Dichlorobenzene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 1,4-Dichlorobenzene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,4,5-Trichlorophenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,4,6-Trichlorophenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,4-Dichlorophenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,4-Dimethylphenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,4-Dinitrophenol | 34200 U | 34200 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,4-Dinitrotoluene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2,6-Dinitrotoluene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2-Chloronaphthalene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2-Chlorophenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2-Methylnaphthalene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2-Methylphenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2-Nitroaniline | 34200 U | 34200 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 2-Nitrophenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 3,3'-Dichlorobenzidine | 13700 U | 13700 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 3-Nitroaniline | 34200 U | 34200 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4,6-Dinitro-2-methylphenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4-Bromophenyl Phenyl Ether | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4-Chloro-3-methylphenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4-Chloroaniline | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4-Chlorophenyl Phenyl Ether | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 3- and/or 4-Methylphenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4-Nitroaniline | 34200 U | 34200 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| 4-Nitrophenol | 34200 U | 34200 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Acenaphthene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Acenaphthylene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Anthracene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Benz[a]anthracene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Benzo[a] pyrene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Benzo[b] fluoranthene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Benzo[g,h,i] perylene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Benzo[k] fluoranthene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Bis(2-chloroethoxy) methane | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Bis(2-chloroethyl) ether | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Bis(2-chloroisopropyl) ether | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Bis(2-ethylhexyl) phthalate | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## J1CM93

### 1011036-01 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Semivolatile Organic Compounds by SW846 8270C** | | | | | | | | |
| Butyl Benzyl Phthalate | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Carbazole | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Chrysene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Dibenz[a,h]anthracene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Dibenzofuran | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Diethyl Phthalate | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Dimethyl Phthalate | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Di-n-butyl Phthalate | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Di-n-octyl Phthalate | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Fluoranthene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Fluorene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Hexachlorobenzene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Hexachlorobutadiene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Hexachlorocyclopentadiene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Hexachloroethane | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Indeno[1,2,3-cd]pyrene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Isophorone | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Naphthalene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Nitrobenzene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| N-Nitrosodi-n-propylamine | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| N-Nitrosodiphenylamine | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Pentachlorophenol | 34200 U | 34200 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Phenanthrene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Phenol | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| Pyrene | 6840 U | 6840 | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| **TIC:Unknown1** | **6750** B, J, D | | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| **TIC:Aldol Condensate1** | **82300** A, B, J, D | | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| **TIC:Unknown2** | **5390** J, D | | ug/kg dry | 5 | L011113 | 11/08/2010 | 11/15/2010 | 8270C |
| *Surrogate: 2-Fluorophenol* | *88 %* | *25-121* | | | *L011113* | *11/08/2010* | *11/15/2010* | *8270C* |
| *Surrogate: Phenol-d5* | *74 %* | *24-113* | | | *L011113* | *11/08/2010* | *11/15/2010* | *8270C* |
| *Surrogate: Nitrobenzene-d5* | *80 %* | *23-120* | | | *L011113* | *11/08/2010* | *11/15/2010* | *8270C* |
| *Surrogate: 2-Fluorobiphenyl* | *95 %* | *30-115* | | | *L011113* | *11/08/2010* | *11/15/2010* | *8270C* |
| *Surrogate: 2,4,6-Tribromophenol* | *101 %* | *19-122* | | | *L011113* | *11/08/2010* | *11/15/2010* | *8270C* |
| *Surrogate: p-Terphenyl-d14* | *109 %* | *18-137* | | | *L011113* | *11/08/2010* | *11/15/2010* | *8270C* |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## J1CM94

### 1011036-02 (Soil)

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | |
| **Semivolatile Organic Compounds by SW846 8270C** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 1,2-Dichlorobenzene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 1,3-Dichlorobenzene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 1,4-Dichlorobenzene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,4,5-Trichlorophenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,4,6-Trichlorophenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,4-Dichlorophenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,4-Dimethylphenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,4-Dinitrophenol | 6780 U | 6780 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,4-Dinitrotoluene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2,6-Dinitrotoluene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2-Chloronaphthalene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2-Chlorophenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2-Methylnaphthalene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2-Methylphenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2-Nitroaniline | 6780 U | 6780 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 2-Nitrophenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 3,3'-Dichlorobenzidine | 2710 U | 2710 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 3-Nitroaniline | 6780 U | 6780 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4,6-Dinitro-2-methylphenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4-Bromophenyl Phenyl Ether | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4-Chloro-3-methylphenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4-Chloroaniline | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4-Chlorophenyl Phenyl Ether | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 3- and/or 4-Methylphenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4-Nitroaniline | 6780 U | 6780 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| 4-Nitrophenol | 6780 U | 6780 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Acenaphthene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Acenaphthylene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Anthracene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Benz[a]anthracene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Benzo[a] pyrene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Benzo[b] fluoranthene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Benzo[g,h,i] perylene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Benzo[k] fluoranthene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Bis(2-chloroethoxy) methane | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Bis(2-chloroethyl) ether | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Bis(2-chloroisopropyl) ether | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Bis(2-ethylhexyl) phthalate | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## J1CM94

**1011036-02 (Soil)**

| Analyte | Result and Qualifier | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|
| | | **Lionville Laboratory** | | | | | | |
| **Semivolatile Organic Compounds by SW846 8270C** | | | | | | | | |
| Butyl Benzyl Phthalate | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Carbazole | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Chrysene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Dibenz[a,h]anthracene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Dibenzofuran | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Diethyl Phthalate | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Dimethyl Phthalate | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Di-n-butyl Phthalate | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Di-n-octyl Phthalate | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Fluoranthene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Fluorene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Hexachlorobenzene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Hexachlorobutadiene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Hexachlorocyclopentadiene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Hexachloroethane | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Indeno[1,2,3-cd]pyrene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Isophorone | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Naphthalene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Nitrobenzene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| N-Nitrosodi-n-propylamine | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| N-Nitrosodiphenylamine | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Pentachlorophenol | 6780 U | 6780 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Phenanthrene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Phenol | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| Pyrene | 1360 U | 1360 | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| **TIC:Unknown 3** | **1850** J, D | | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| **TIC:Unknown 2** | **1810** J, D | | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| **TIC:Unknown 1** | **2990** B, J, D | | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| **TIC:Aldol 1** | **78300** A, B, J, D | | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| **TIC:Unknown 4** | **1860** J, D | | ug/kg dry | 4 | L011113 | 11/08/2010 | 11/18/2010 | 8270C |
| *Surrogate: 2-Fluorophenol* | *87 %* | *25-121* | | | *L011113* | *11/08/2010* | *11/18/2010* | *8270C* |
| *Surrogate: Phenol-d5* | *99 %* | *24-113* | | | *L011113* | *11/08/2010* | *11/18/2010* | *8270C* |
| *Surrogate: Nitrobenzene-d5* | *88 %* | *23-120* | | | *L011113* | *11/08/2010* | *11/18/2010* | *8270C* |
| *Surrogate: 2-Fluorobiphenyl* | *106 %* | *30-115* | | | *L011113* | *11/08/2010* | *11/18/2010* | *8270C* |
| *Surrogate: 2,4,6-Tribromophenol* | *110 %* | *19-122* | | | *L011113* | *11/08/2010* | *11/18/2010* | *8270C* |
| *Surrogate: p-Terphenyl-d14* | *125 %* | *18-137* | | | *L011113* | *11/08/2010* | *11/18/2010* | *8270C* |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **Blank (L011113-BLK1)** | | | Prepared: 11/08/2010 Analyzed: 11/10/2010 | | | | | | |
| 1,2,4-Trichlorobenzene | 330 U | 330 | ug/kg wet | | | | | | |
| 1,2-Dichlorobenzene | 330 U | 330 | ug/kg wet | | | | | | |
| 1,3-Dichlorobenzene | 330 U | 330 | ug/kg wet | | | | | | |
| 1,4-Dichlorobenzene | 330 U | 330 | ug/kg wet | | | | | | |
| 2,4,5-Trichlorophenol | 330 U | 330 | ug/kg wet | | | | | | |
| 2,4,6-Trichlorophenol | 330 U | 330 | ug/kg wet | | | | | | |
| 2,4-Dichlorophenol | 330 U | 330 | ug/kg wet | | | | | | |
| 2,4-Dimethylphenol | 330 U | 330 | ug/kg wet | | | | | | |
| 2,4-Dinitrophenol | 1650 U | 1650 | ug/kg wet | | | | | | |
| 2,4-Dinitrotoluene | 330 U | 330 | ug/kg wet | | | | | | |
| 2,6-Dinitrotoluene | 330 U | 330 | ug/kg wet | | | | | | |
| 2-Chloronaphthalene | 330 U | 330 | ug/kg wet | | | | | | |
| 2-Chlorophenol | 330 U | 330 | ug/kg wet | | | | | | |
| 2-Methylnaphthalene | 330 U | 330 | ug/kg wet | | | | | | |
| 2-Methylphenol | 330 U | 330 | ug/kg wet | | | | | | |
| 2-Nitroaniline | 1650 U | 1650 | ug/kg wet | | | | | | |
| 2-Nitrophenol | 330 U | 330 | ug/kg wet | | | | | | |
| 3,3'-Dichlorobenzidine | 660 U | 660 | ug/kg wet | | | | | | |
| 3-Nitroaniline | 1650 U | 1650 | ug/kg wet | | | | | | |
| 4,6-Dinitro-2-methylphenol | 330 U | 330 | ug/kg wet | | | | | | |
| 4-Bromophenyl Phenyl Ether | 330 U | 330 | ug/kg wet | | | | | | |
| 4-Chloro-3-methylphenol | 330 U | 330 | ug/kg wet | | | | | | |
| 4-Chloroaniline | 330 U | 330 | ug/kg wet | | | | | | |
| 4-Chlorophenyl Phenyl Ether | 330 U | 330 | ug/kg wet | | | | | | |
| 3- and/or 4-Methylphenol | 330 U | 330 | ug/kg wet | | | | | | |
| 4-Nitroaniline | 1650 U | 1650 | ug/kg wet | | | | | | |
| 4-Nitrophenol | 1650 U | 1650 | ug/kg wet | | | | | | |
| Acenaphthene | 330 U | 330 | ug/kg wet | | | | | | |
| Acenaphthylene | 330 U | 330 | ug/kg wet | | | | | | |
| Anthracene | 330 U | 330 | ug/kg wet | | | | | | |
| Benz[a]anthracene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[a] pyrene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[b] fluoranthene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[g,h,i] perylene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[k] fluoranthene | 330 U | 330 | ug/kg wet | | | | | | |
| Bis(2-chloroethoxy) methane | 330 U | 330 | ug/kg wet | | | | | | |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **Blank (L011113-BLK1)** | | | Prepared: 11/08/2010 Analyzed: 11/10/2010 | | | | | | |
| Bis(2-chloroethyl) ether | 330 U | 330 | ug/kg wet | | | | | | |
| Bis(2-chloroisopropyl) ether | 330 U | 330 | ug/kg wet | | | | | | |
| Bis(2-ethylhexyl) phthalate | 330 U | 330 | ug/kg wet | | | | | | |
| Butyl Benzyl Phthalate | 330 U | 330 | ug/kg wet | | | | | | |
| Carbazole | 330 U | 330 | ug/kg wet | | | | | | |
| Chrysene | 330 U | 330 | ug/kg wet | | | | | | |
| Dibenz[a,h]anthracene | 330 U | 330 | ug/kg wet | | | | | | |
| Dibenzofuran | 330 U | 330 | ug/kg wet | | | | | | |
| Diethyl Phthalate | 330 U | 330 | ug/kg wet | | | | | | |
| Dimethyl Phthalate | 330 U | 330 | ug/kg wet | | | | | | |
| Di-n-butyl Phthalate | 330 U | 330 | ug/kg wet | | | | | | |
| Di-n-octyl Phthalate | 330 U | 330 | ug/kg wet | | | | | | |
| Fluoranthene | 330 U | 330 | ug/kg wet | | | | | | |
| Fluorene | 330 U | 330 | ug/kg wet | | | | | | |
| Hexachlorobenzene | 330 U | 330 | ug/kg wet | | | | | | |
| Hexachlorobutadiene | 330 U | 330 | ug/kg wet | | | | | | |
| Hexachlorocyclopentadiene | 330 U | 330 | ug/kg wet | | | | | | |
| Hexachloroethane | 330 U | 330 | ug/kg wet | | | | | | |
| Indeno[1,2,3-cd]pyrene | 330 U | 330 | ug/kg wet | | | | | | |
| Isophorone | 330 U | 330 | ug/kg wet | | | | | | |
| Naphthalene | 330 U | 330 | ug/kg wet | | | | | | |
| Nitrobenzene | 330 U | 330 | ug/kg wet | | | | | | |
| N-Nitrosodi-n-propylamine | 330 U | 330 | ug/kg wet | | | | | | |
| N-Nitrosodiphenylamine | 330 U | 330 | ug/kg wet | | | | | | |
| Pentachlorophenol | 1650 U | 1650 | ug/kg wet | | | | | | |
| Phenanthrene | 330 U | 330 | ug/kg wet | | | | | | |
| Phenol | 330 U | 330 | ug/kg wet | | | | | | |
| Pyrene | 330 U | 330 | ug/kg wet | | | | | | |
| Aldol Condensate3 (TIC5) | 320 A, J | | ug/kg wet | | | | | | |
| Aldol Condensate2 | 104000 A, J | | ug/kg wet | | | | | | |
| Aldol Condensate1 | 1010 A, J | | ug/kg wet | | | | | | |
| Unknown2 | 1510 J | | ug/kg wet | | | | | | |
| Unknown1 | 571 J | | ug/kg wet | | | | | | |
| *Surrogate: 2-Fluorophenol* | *2690* | | *ug/kg wet* | *2500.0* | | *108* | *25-121* | | |
| *Surrogate: Phenol-d5* | *2620* | | *ug/kg wet* | *2500.0* | | *105* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1630* | | *ug/kg wet* | *1666.7* | | *98* | *23-120* | | |

RCC 11/19/10

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **Blank (L011113-BLK1)** | | | Prepared: 11/08/2010 Analyzed: 11/10/2010 | | | | | | |
| *Surrogate: 2-Fluorobiphenyl* | *1960* | | *ug/kg wet* | *1666.7* | | *118** | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *2120* | | *ug/kg wet* | *2500.0* | | *85* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *2370* | | *ug/kg wet* | *1666.7* | | *142** | *18-137* | | |
| **LCS (L011113-BS1)** | | | Prepared: 11/08/2010 Analyzed: 11/10/2010 | | | | | | |
| 1,2,4-Trichlorobenzene | 1740 | 330 | ug/kg wet | 2000.0 | | 87 | 45-110 | | |
| 1,2-Dichlorobenzene | 1880 | 330 | ug/kg wet | 2000.0 | | 94 | 45-105 | | |
| 1,3-Dichlorobenzene | 1840 | 330 | ug/kg wet | 2000.0 | | 92 | 40-100 | | |
| 1,4-Dichlorobenzene | 1820 | 330 | ug/kg wet | 2000.0 | | 91 | 35-105 | | |
| 2,4,5-Trichlorophenol | 2170 | 330 | ug/kg wet | 2000.0 | | 108 | 30-140 | | |
| 2,4,6-Trichlorophenol | 1690 | 330 | ug/kg wet | 2000.0 | | 85 | 20-110 | | |
| 2,4-Dichlorophenol | 1990 | 330 | ug/kg wet | 2000.0 | | 99 | 40-110 | | |
| 2,4-Dimethylphenol | 1950 | 330 | ug/kg wet | 2000.0 | | 98 | 30-105 | | |
| 2,4-Dinitrophenol | 255 J | 1650 | ug/kg wet | 2000.0 | | 13* | 25-130 | | |
| 2,4-Dinitrotoluene | 2190 | 330 | ug/kg wet | 2000.0 | | 109 | 50-115 | | |
| 2,6-Dinitrotoluene | 2230 | 330 | ug/kg wet | 2000.0 | | 111 | 40-120 | | |
| 2-Chloronaphthalene | 2120 | 330 | ug/kg wet | 2000.0 | | 106 | 45-115 | | |
| 2-Chlorophenol | 1930 | 330 | ug/kg wet | 2000.0 | | 97 | 45-105 | | |
| 2-Methylnaphthalene | 1970 | 330 | ug/kg wet | 2000.0 | | 98 | 45-110 | | |
| 2-Methylphenol | 2030 | 330 | ug/kg wet | 2000.0 | | 102 | 40-120 | | |
| 2-Nitroaniline | 2190 | 1650 | ug/kg wet | 2000.0 | | 110 | 45-120 | | |
| 2-Nitrophenol | 1810 | 330 | ug/kg wet | 2000.0 | | 90 | 40-110 | | |
| 3,3'-Dichlorobenzidine | 1980 | 660 | ug/kg wet | 2000.0 | | 99 | 15-130 | | |
| 3-Nitroaniline | 2140 | 1650 | ug/kg wet | 2000.0 | | 107 | 40-130 | | |
| 4,6-Dinitro-2-methylphenol | 524 | 330 | ug/kg wet | 2000.0 | | 26 | 20-140 | | |
| 4-Bromophenyl Phenyl Ether | 2280 | 330 | ug/kg wet | 2000.0 | | 114 | 45-115 | | |
| 4-Chloro-3-methylphenol | 2080 | 330 | ug/kg wet | 2000.0 | | 104 | 35-115 | | |
| 4-Chloroaniline | 1680 | 330 | ug/kg wet | 2000.0 | | 84 | 10-100 | | |
| 4-Chlorophenyl Phenyl Ether | 2160 | 330 | ug/kg wet | 2000.0 | | 108 | 45-110 | | |
| 3- and/or 4-Methylphenol | 2090 | 330 | ug/kg wet | 2000.0 | | 105 | 40-120 | | |
| 4-Nitroaniline | 2230 | 1650 | ug/kg wet | 2000.0 | | 111 | 40-130 | | |
| 4-Nitrophenol | 2000 | 1650 | ug/kg wet | 2000.0 | | 100 | 15-140 | | |
| Acenaphthene | 2060 | 330 | ug/kg wet | 2000.0 | | 103 | 45-110 | | |
| Acenaphthylene | 2100 | 330 | ug/kg wet | 2000.0 | | 105 | 45-115 | | |
| Anthracene | 2290 | 330 | ug/kg wet | 2000.0 | | 114 | 45-130 | | |
| Benz[a]anthracene | 2320 | 330 | ug/kg wet | 2000.0 | | 116 | 45-130 | | |
| Benzo[a] pyrene | 2430 | 330 | ug/kg wet | 2000.0 | | 122 | 45-130 | | |

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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **LCS (L011113-BS1)** | | | Prepared: 11/08/2010 Analyzed: 11/10/2010 | | | | | | |
| Benzo[b] fluoranthene | 2130 | 330 | ug/kg wet | 2000.0 | | 106 | 40-130 | | |
| Benzo[g,h,i] perylene | 2480 | 330 | ug/kg wet | 2000.0 | | 124 | 45-125 | | |
| Benzo[k] fluoranthene | 2180 | 330 | ug/kg wet | 2000.0 | | 109 | 45-125 | | |
| Bis(2-chloroethoxy) methane | 1920 | 330 | ug/kg wet | 2000.0 | | 96 | 45-110 | | |
| Bis(2-chloroethyl) ether | 1770 | 330 | ug/kg wet | 2000.0 | | 88 | 40-110 | | |
| Bis(2-chloroisopropyl) ether | 1840 | 330 | ug/kg wet | 2000.0 | | 92 | 30-115 | | |
| Bis(2-ethylhexyl) phthalate | 2370 | 330 | ug/kg wet | 2000.0 | | 119 | 40-145 | | |
| Butyl Benzyl Phthalate | 2330 | 330 | ug/kg wet | 2000.0 | | 117 | 50-125 | | |
| Carbazole | 2310 | 330 | ug/kg wet | 2000.0 | | 115 | 40-140 | | |
| Chrysene | 2270 | 330 | ug/kg wet | 2000.0 | | 114 | 45-130 | | |
| Dibenz[a,h]anthracene | 2660 | 330 | ug/kg wet | 2000.0 | | 133* | 45-125 | | |
| Dibenzofuran | 2100 | 330 | ug/kg wet | 2000.0 | | 105 | 45-120 | | |
| Diethyl Phthalate | 2250 | 330 | ug/kg wet | 2000.0 | | 112 | 50-125 | | |
| Dimethyl Phthalate | 2230 | 330 | ug/kg wet | 2000.0 | | 111 | 45-130 | | |
| Di-n-butyl Phthalate | 2240 | 330 | ug/kg wet | 2000.0 | | 112 | 50-130 | | |
| Di-n-octyl Phthalate | 2160 | 330 | ug/kg wet | 2000.0 | | 108 | 40-150 | | |
| Fluoranthene | 2250 | 330 | ug/kg wet | 2000.0 | | 112 | 45-130 | | |
| Fluorene | 2120 | 330 | ug/kg wet | 2000.0 | | 106 | 45-120 | | |
| Hexachlorobenzene | 2360 | 330 | ug/kg wet | 2000.0 | | 118 | 45-130 | | |
| Hexachlorobutadiene | 2090 | 330 | ug/kg wet | 2000.0 | | 105 | 45-105 | | |
| Hexachlorocyclopentadiene | 1180 | 330 | ug/kg wet | 2000.0 | | 59 | 10-100 | | |
| Hexachloroethane | 1770 | 330 | ug/kg wet | 2000.0 | | 88 | 35-110 | | |
| Indeno[1,2,3-cd]pyrene | 2570 | 330 | ug/kg wet | 2000.0 | | 128 | 45-130 | | |
| Isophorone | 1760 | 330 | ug/kg wet | 2000.0 | | 88 | 40-110 | | |
| Naphthalene | 1860 | 330 | ug/kg wet | 2000.0 | | 93 | 40-110 | | |
| Nitrobenzene | 1730 | 330 | ug/kg wet | 2000.0 | | 86 | 40-105 | | |
| N-Nitrosodi-n-propylamine | 1940 | 330 | ug/kg wet | 2000.0 | | 97 | 30-130 | | |
| N-Nitrosodiphenylamine | 2220 | 330 | ug/kg wet | 2000.0 | | 111 | 50-120 | | |
| Pentachlorophenol | 962 J | 1650 | ug/kg wet | 2000.0 | | 48 | 25-120 | | |
| Phenanthrene | 2230 | 330 | ug/kg wet | 2000.0 | | 112 | 50-120 | | |
| Phenol | 1960 | 330 | ug/kg wet | 2000.0 | | 98 | 40-115 | | |
| Pyrene | 2200 | 330 | ug/kg wet | 2000.0 | | 110 | 45-125 | | |
| *Surrogate: 2-Fluorophenol* | *2690* | | *ug/kg wet* | *2500.0* | | *107* | *25-121* | | |
| *Surrogate: Phenol-d5* | *2660* | | *ug/kg wet* | *2500.0* | | *106* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1580* | | *ug/kg wet* | *1666.7* | | *95* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1920* | | *ug/kg wet* | *1666.7* | | *115* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *2050* | | *ug/kg wet* | *2500.0* | | *82* | *19-122* | | |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **LCS (L011113-BS1)** | | | Prepared: 11/08/2010 Analyzed: 11/10/2010 | | | | | | |
| *Surrogate: p-Terphenyl-d14* | *2070* | | *ug/kg wet* | *1666.7* | | *124* | *18-137* | | |
| **Matrix Spike (L011113-MS4)** | | **Source: 1011036-01** | Prepared: 11/08/2010 Analyzed: 11/15/2010 | | | | | | |
| 1,2,4-Trichlorobenzene | 1590 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 77 | 45-110 | | |
| 1,2-Dichlorobenzene | 1700 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 82 | 45-105 | | |
| 1,3-Dichlorobenzene | 1530 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 74 | 40-100 | | |
| 1,4-Dichlorobenzene | 1680 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 81 | 35-105 | | |
| 2,4,5-Trichlorophenol | 1470 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 71 | 30-140 | | |
| 2,4,6-Trichlorophenol | 1490 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 72 | 20-110 | | |
| 2,4-Dichlorophenol | 1720 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 83 | 40-110 | | |
| 2,4-Dimethylphenol | 1510 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 73 | 30-105 | | |
| 2,4-Dinitrophenol | 34200 U | 34200 | ug/kg dry | 2072.7 | 34200 U | * | 25-130 | | |
| 2,4-Dinitrotoluene | 1140 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 55 | 50-115 | | |
| 2,6-Dinitrotoluene | 1370 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 66 | 40-120 | | |
| 2-Chloronaphthalene | 1820 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 88 | 45-115 | | |
| 2-Chlorophenol | 1540 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 74 | 45-105 | | |
| 2-Methylnaphthalene | 1670 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 80 | 45-110 | | |
| 2-Methylphenol | 1610 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 77 | 40-120 | | |
| 2-Nitroaniline | 34200 U | 34200 | ug/kg dry | 2072.7 | 34200 U | * | 45-120 | | |
| 2-Nitrophenol | 1210 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 58 | 40-110 | | |
| 3,3'-Dichlorobenzidine | 13700 U | 13700 | ug/kg dry | 2072.7 | 13700 U | * | 15-130 | | |
| 3-Nitroaniline | 34200 U | 34200 | ug/kg dry | 2072.7 | 34200 U | * | 40-130 | | |
| 4,6-Dinitro-2-methylphenol | 6840 U | 6840 | ug/kg dry | 2072.7 | 6840 U | * | 20-140 | | |
| 4-Bromophenyl Phenyl Ether | 1770 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 85 | 45-115 | | |
| 4-Chloro-3-methylphenol | 1350 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 65 | 35-115 | | |
| 4-Chloroaniline | 6840 U | 6840 | ug/kg dry | 2072.7 | 6840 U | * | 10-100 | | |
| 4-Chlorophenyl Phenyl Ether | 1600 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 77 | 45-110 | | |
| 3- and/or 4-Methylphenol | 1270 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 61 | 40-120 | | |
| 4-Nitroaniline | 34200 U | 34200 | ug/kg dry | 2072.7 | 34200 U | * | 40-130 | | |
| 4-Nitrophenol | 34200 U | 34200 | ug/kg dry | 2072.7 | 34200 U | * | 15-140 | | |
| Acenaphthene | 1690 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 82 | 45-110 | | |
| Acenaphthylene | 1730 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 84 | 45-115 | | |
| Anthracene | 1840 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 89 | 45-130 | | |
| Benz[a]anthracene | 2050 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 99 | 45-130 | | |
| Benzo[a] pyrene | 2270 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 110 | 45-130 | | |
| Benzo[b] fluoranthene | 2240 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 108 | 40-130 | | |
| Benzo[g,h,i] perylene | 2000 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 96 | 45-125 | | |

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Exton, PA 19341
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|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-182<br>Project Number: K2510<br>Project Manager: Joan Kessner | **Reported:**<br>11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **Matrix Spike (L011113-MS4)** | **Source: 1011036-01** | | Prepared: 11/08/2010 Analyzed: 11/15/2010 | | | | | | |
| Benzo[k] fluoranthene | 2270 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 109 | 45-125 | | |
| Bis(2-chloroethoxy) methane | 1800 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 87 | 45-110 | | |
| Bis(2-chloroethyl) ether | 1650 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 79 | 40-110 | | |
| Bis(2-chloroisopropyl) ether | 1700 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 82 | 30-115 | | |
| Bis(2-ethylhexyl) phthalate | 2670 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 129 | 40-145 | | |
| Butyl Benzyl Phthalate | 2420 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 117 | 50-125 | | |
| Carbazole | 2090 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 101 | 40-140 | | |
| Chrysene | 2310 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 112 | 45-130 | | |
| Dibenz[a,h]anthracene | 1660 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 80 | 45-125 | | |
| Dibenzofuran | 1760 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 85 | 45-120 | | |
| Diethyl Phthalate | 1830 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 88 | 50-125 | | |
| Dimethyl Phthalate | 1770 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 86 | 45-130 | | |
| Di-n-butyl Phthalate | 2060 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 100 | 50-130 | | |
| Di-n-octyl Phthalate | 2730 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 132 | 40-150 | | |
| Fluoranthene | 2130 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 103 | 45-130 | | |
| Fluorene | 1720 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 83 | 45-120 | | |
| Hexachlorobenzene | 1940 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 94 | 45-130 | | |
| Hexachlorobutadiene | 1820 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 88 | 45-105 | | |
| Hexachlorocyclopentadiene | 6840 U | 6840 | ug/kg dry | 2072.7 | 6840 U | * | 10-100 | | |
| Hexachloroethane | 1420 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 68 | 35-110 | | |
| Indeno[1,2,3-cd]pyrene | 1850 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 89 | 45-130 | | |
| Isophorone | 1680 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 81 | 40-110 | | |
| Naphthalene | 1660 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 80 | 40-110 | | |
| Nitrobenzene | 1710 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 82 | 40-105 | | |
| N-Nitrosodi-n-propylamine | 1780 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 86 | 30-130 | | |
| N-Nitrosodiphenylamine | 1750 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 84 | 50-120 | | |
| Pentachlorophenol | 34200 U | 34200 | ug/kg dry | 2072.7 | 34200 U | * | 25-120 | | |
| Phenanthrene | 1890 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 91 | 50-120 | | |
| Phenol | 1590 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 77 | 40-115 | | |
| Pyrene | 2670 J, D | 6840 | ug/kg dry | 2072.7 | 6840 U | 129* | 45-125 | | |
| *Surrogate: 2-Fluorophenol* | *2430* | | *ug/kg dry* | *2590.9* | | *94* | *25-121* | | |
| *Surrogate: Phenol-d5* | *2400* | | *ug/kg dry* | *2590.9* | | *93* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1520* | | *ug/kg dry* | *1727.3* | | *88* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1660* | | *ug/kg dry* | *1727.3* | | *96* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *2310* | | *ug/kg dry* | *2590.9* | | *89* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *1740* | | *ug/kg dry* | *1727.3* | | *101* | *18-137* | | |

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Exton, PA 19341
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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **Matrix Spike Dup (L011113-MSD4)** | **Source: 1011036-01** | | Prepared: 11/08/2010 Analyzed: 11/15/2010 | | | | | | |
| 1,2,4-Trichlorobenzene | 1600 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 78 | 45-110 | 2 | 40 |
| 1,2-Dichlorobenzene | 1650 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 80 | 45-105 | 2 | 40 |
| 1,3-Dichlorobenzene | 1550 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 75 | 40-100 | 2 | 40 |
| 1,4-Dichlorobenzene | 1520 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 74 | 35-105 | 9 | 40 |
| 2,4,5-Trichlorophenol | 1420 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 69 | 30-140 | 3 | 40 |
| 2,4,6-Trichlorophenol | 1640 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 80 | 20-110 | 10 | 40 |
| 2,4-Dichlorophenol | 1600 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 78 | 40-110 | 6 | 40 |
| 2,4-Dimethylphenol | 1680 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 82 | 30-105 | 12 | 40 |
| 2,4-Dinitrophenol | 33900 U | 33900 | ug/kg dry | 2053.6 | 34200 U | * | 25-130 | | 40 |
| 2,4-Dinitrotoluene | 1330 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 65 | 50-115 | 16 | 40 |
| 2,6-Dinitrotoluene | 1380 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 67 | 40-120 | 1 | 40 |
| 2-Chloronaphthalene | 1800 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 88 | 45-115 | 0.05 | 40 |
| 2-Chlorophenol | 1760 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 86 | 45-105 | 14 | 40 |
| 2-Methylnaphthalene | 1890 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 92 | 45-110 | 13 | 40 |
| 2-Methylphenol | 1630 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 79 | 40-120 | 2 | 40 |
| 2-Nitroaniline | 33900 U | 33900 | ug/kg dry | 2053.6 | 34200 U | * | 45-120 | | 40 |
| 2-Nitrophenol | 6780 U | 6780 | ug/kg dry | 2053.6 | 6840 U | * | 40-110 | | 40 |
| 3,3'-Dichlorobenzidine | 13600 U | 13600 | ug/kg dry | 2053.6 | 13700 U | * | 15-130 | | 40 |
| 3-Nitroaniline | 33900 U | 33900 | ug/kg dry | 2053.6 | 34200 U | * | 40-130 | | 40 |
| 4,6-Dinitro-2-methylphenol | 6780 U | 6780 | ug/kg dry | 2053.6 | 6840 U | * | 20-140 | | 40 |
| 4-Bromophenyl Phenyl Ether | 1830 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 89 | 45-115 | 4 | 40 |
| 4-Chloro-3-methylphenol | 1720 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 84 | 35-115 | 25 | 40 |
| 4-Chloroaniline | 6780 U | 6780 | ug/kg dry | 2053.6 | 6840 U | * | 10-100 | | 40 |
| 4-Chlorophenyl Phenyl Ether | 1670 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 81 | 45-110 | 5 | 40 |
| 3- and/or 4-Methylphenol | 1540 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 75 | 40-120 | 21 | 40 |
| 4-Nitroaniline | 33900 U | 33900 | ug/kg dry | 2053.6 | 34200 U | * | 40-130 | | 40 |
| 4-Nitrophenol | 33900 U | 33900 | ug/kg dry | 2053.6 | 34200 U | * | 15-140 | | 40 |
| Acenaphthene | 1850 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 90 | 45-110 | 10 | 40 |
| Acenaphthylene | 1830 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 89 | 45-115 | 6 | 40 |
| Anthracene | 1910 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 93 | 45-130 | 5 | 40 |
| Benz[a]anthracene | 2220 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 108 | 45-130 | 9 | 40 |
| Benzo[a] pyrene | 2250 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 109 | 45-130 | 0.1 | 40 |
| Benzo[b] fluoranthene | 2390 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 117 | 40-130 | 8 | 40 |
| Benzo[g,h,i] perylene | 2190 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 107 | 45-125 | 10 | 40 |
| Benzo[k] fluoranthene | 2510 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 122 | 45-125 | 11 | 40 |
| Bis(2-chloroethoxy) methane | 1810 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 88 | 45-110 | 2 | 40 |

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-182 | |
| 2620 Fermi Avenue | Project Number: K2510 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 11/19/2010 14:25 |

## Semivolatile Organic Compounds by SW846 8270C - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L011113 - SW 3540C** | | | | | | | | | |
| **Matrix Spike Dup (L011113-MSD4)** | **Source: 1011036-01** | | Prepared: 11/08/2010 Analyzed: 11/15/2010 | | | | | | |
| Bis(2-chloroethyl) ether | 1700 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 83 | 40-110 | 4 | 40 |
| Bis(2-chloroisopropyl) ether | 1820 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 89 | 30-115 | 8 | 40 |
| Bis(2-ethylhexyl) phthalate | 2710 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 132 | 40-145 | 2 | 40 |
| Butyl Benzyl Phthalate | 2380 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 116 | 50-125 | 0.5 | 40 |
| Carbazole | 2110 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 103 | 40-140 | 2 | 40 |
| Chrysene | 2330 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 113 | 45-130 | 2 | 40 |
| Dibenz[a,h]anthracene | 2070 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 101 | 45-125 | 23 | 40 |
| Dibenzofuran | 1810 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 88 | 45-120 | 4 | 40 |
| Diethyl Phthalate | 2000 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 98 | 50-125 | 10 | 40 |
| Dimethyl Phthalate | 1880 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 92 | 45-130 | 7 | 40 |
| Di-n-butyl Phthalate | 2250 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 110 | 50-130 | 10 | 40 |
| Di-n-octyl Phthalate | 3020 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 147 | 40-150 | 11 | 40 |
| Fluoranthene | 2310 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 113 | 45-130 | 9 | 40 |
| Fluorene | 1770 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 86 | 45-120 | 4 | 40 |
| Hexachlorobenzene | 2100 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 102 | 45-130 | 9 | 40 |
| Hexachlorobutadiene | 1750 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 85 | 45-105 | 3 | 40 |
| Hexachlorocyclopentadiene | 6780 U | 6780 | ug/kg dry | 2053.6 | 6840 U | * | 10-100 | | 40 |
| Hexachloroethane | 1370 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 67 | 35-110 | 2 | 40 |
| Indeno[1,2,3-cd]pyrene | 2080 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 102 | 45-130 | 13 | 40 |
| Isophorone | 1620 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 79 | 40-110 | 2 | 40 |
| Naphthalene | 1770 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 86 | 40-110 | 7 | 40 |
| Nitrobenzene | 1620 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 79 | 40-105 | 5 | 40 |
| N-Nitrosodi-n-propylamine | 1560 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 76 | 30-130 | 12 | 40 |
| N-Nitrosodiphenylamine | 1870 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 91 | 50-120 | 8 | 40 |
| Pentachlorophenol | 33900 U | 33900 | ug/kg dry | 2053.6 | 34200 U | * | 25-120 | | 40 |
| Phenanthrene | 2160 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 105 | 50-120 | 15 | 40 |
| Phenol | 1580 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 77 | 40-115 | 0.6 | 40 |
| Pyrene | 2800 J, D | 6780 | ug/kg dry | 2053.6 | 6840 U | 136* | 45-125 | 6 | 40 |
| *Surrogate: 2-Fluorophenol* | *2440* | | *ug/kg dry* | *2567.0* | | *95* | *25-121* | | |
| *Surrogate: Phenol-d5* | *2250* | | *ug/kg dry* | *2567.0* | | *88* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1460* | | *ug/kg dry* | *1711.4* | | *85* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1650* | | *ug/kg dry* | *1711.4* | | *96* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *2410* | | *ug/kg dry* | *2567.0* | | *94* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *1780* | | *ug/kg dry* | *1711.4* | | *104* | *18-137* | | |

# PREPARATION BENCH SHEET

L011113

**Lionville Laboratory**

**Printed: 11/17/2010 11:16:15AM**

**Matrix: Solid** **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1001763**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011003-01 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.1 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011003-02 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.24 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011003-03 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.68 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011022-02 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.78 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011035-01 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.5 | 4 | | | | 500 | WC-Hanford, Inc. | |
| 1011036-01 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.11 | 4 | | | | 500 | WC-Hanford, Inc. | |
| 1011036-02 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.04 | 1 | | | | 500 | WC-Hanford, Inc. | |
| L011113-BLK1 | QC | 11/08/2010 12:14 | 30 | 1 | | | | 500 | | |
| L011113-BS1 | QC | 11/08/2010 12:14 | 30 | 1 | 1001857 | | 600 | 500 | | |
| L011113-MS1 | QC | 11/08/2010 12:14 | 30.21 | 1 | 1001857 | 1011003-02 | 600 | 500 | | |
| L011113-MS2 | QC | 11/08/2010 12:14 | 30.08 | 1 | 1001857 | 1011022-02 | 600 | 500 | | |
| L011113-MS3 | QC | 11/08/2010 12:14 | 30.64 | 4 | 1001857 | 1011035-01 | 600 | 500 | | |
| L011113-MS4 | QC | 11/08/2010 12:14 | 30.11 | 4 | 1001857 | 1011036-01 | 600 | 500 | | |
| L011113-MSD1 | QC | 11/08/2010 12:14 | 30.18 | 1 | 1001857 | 1011003-02 | 600 | 500 | | |
| L011113-MSD2 | QC | 11/08/2010 12:14 | 30.5 | 1 | 1001857 | 1011022-02 | 600 | 500 | | |
| L011113-MSD3 | QC | 11/08/2010 12:14 | 30.19 | 4 | 1001857 | 1011035-01 | 600 | 500 | | |
| L011113-MSD4 | QC | 11/08/2010 12:14 | 30.39 | 4 | 1001857 | 1011036-01 | 600 | 500 | | |

adjusted method. PR 11/17/10

Extracts Relinquished By Date

Extracts Received By Date

# PREPARATION BENCH SHEET

L011113

**Lionville Laboratory**

**Printed: 11/10/2010 1:43:45PM**

**Matrix: Solid** **Prepared using: SVOCGCMS - SW 3540/3550** **Surrogate used: 1001763**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1011003-01 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.1 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011003-02 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.24 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011003-03 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.68 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011022-02 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.78 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1011035-01 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.5 | 4 | | | | 500 | WC-Hanford, Inc. | |
| 1011036-01 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.11 | 4 | | | | 500 | WC-Hanford, Inc. | |
| 1011036-02 | 8270C TCL SVOC | 11/08/2010 12:14 | 30.04 | 1 | | | | 500 | WC-Hanford, Inc. | |
| L011113-BLK1 | QC | 11/08/2010 12:14 | 30 | 1 | | | | 500 | | |
| L011113-BS1 | QC | 11/08/2010 12:14 | 30 | 1 | | | | 500 | | |
| L011113-MS1 | QC | 11/08/2010 12:14 | 30.21 | 1 | | 1011003-02 | | 500 | | |
| L011113-MS2 | QC | 11/08/2010 12:14 | 30.08 | 1 | | 1011022-02 | | 500 | | |
| L011113-MS3 | QC | 11/08/2010 12:14 | 30.64 | 4 | | 1011035-01 | | 500 | | |
| L011113-MS4 | QC | 11/08/2010 12:14 | 30.11 | 4 | | 1011036-01 | | 500 | | |
| L011113-MSD1 | QC | 11/08/2010 12:14 | 30.18 | 1 | | 1011003-02 | | 500 | | |
| L011113-MSD2 | QC | 11/08/2010 12:14 | 30.5 | 1 | | 1011022-02 | | 500 | | |
| L011113-MSD3 | QC | 11/08/2010 12:14 | 30.19 | 4 | | 1011035-01 | | 500 | | |
| L011113-MSD4 | QC | 11/08/2010 12:14 | 30.39 | 4 | | 1011036-01 | | 500 | | |

Extracts Relinquished By — Date: 11/10/10

Extracts Received By — Date: 11/10/10 1400

| Lionville Laboratory Use Only |
|---|
| 1011 036 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

SRC

LVLI LIONVILLE LABORATORY INC.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF# RC-182

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: STD TAT: 15 days

Date Rec'd: 11/5/10 Date Due: 11-20-10

| | | A | B | C | D | E | | | F | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | VOA | 1 | 1 | 1 | 1 | | | 1 | | | | | | | |
| #/Type Container | ~~Liquid~~ Solid | 1AG | 1AG | 1AG | 1AG | 1AG | | | 1 | | | | | | | |
| Volume | | 60 | 60 | 60 | 60 | 60 | | | 60 | | | | | | | |
| Preservatives | | — | — | — | — | — | | | — | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | ~~Pest~~ PCB | ~~Chlor~~ Herb | Pest | | | ~~Metal~~ Hg | CN | | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |

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 | 8260 | 8270 | 8082 | 8157 | 8081 | | | Met① | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1CM93 | | | Soil | 11-2-10 | 1010 | X | X | X | X | X | | | X | | | | | | | |
| 02 | 1 94 | | | 1 | 1 | 1030 | X | X | X | X | X | | | X | | | | | | | |

Special Instructions: Run matrix QC

Met① = HSL + B, Mo, Si
NOTL

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 11/5/10 | 1000 |
| | | | |

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

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

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-182-019 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>D. Rice | Company Contact<br>S. Van Den Hende | Telephone No.<br>509-551-3934 | Project Coordinator<br>KESSNER, JH | Price Code SV 11/1/10 ~~S1~~ 8K | Data Turnaround SV 10/28/10 ~~21 Days~~ 15 Days |
| Project Designation<br>ARRA 100F Remaining Sites Remediation - Soil In-Process | Sampling Location<br>600-351 Site | | SAF No.<br>RC-182 | | |
| Ice Chest No. AFS-09-025 | Field Logbook No.<br>EL-1651 | COA S603518100 ~~S11FX1Y000~~ SV 11/1/10 | Method of Shipment<br>FedEx | | |
| Shipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No. A100611 | | Bill of Lading/Air Bill No.<br>See OSPC | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

~~None~~ JEB 11-4-10
Pot. RAD <DOT Limits

**Special Handling and/or Storage**

*Cool 4 Degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | | | | |
| Type of Container | G/P | G | aG | aG | aG | aG | G/P | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | 60mL | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | Pesticides - 8081 | Chloro-Herbicides - EPA8151 | RCF GEA Shipping Screen | | | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1CM93 | SOIL | 11/2/10 | 1010 | X | X | X | X | X | X | | | AREA | #1 |
| J1CM94 | SOIL | 11/2/10 | 1030 | X | X | X | X | X | X | | | AREA | #2 |
| ~~J1CM95~~ | ~~SOIL~~ SV 11/2/10 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

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

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| David D. Rice | 11-2-10 1105 | RT Coffman / RT Coffman | 11/2/10 1105 |
| RT Coffman / RT Coffman | 11/2/10 1540 | J. E. Bauhl | 11-2-10 1540 |
| J. E. Bauhl | WCH 11-4-10 1000 | FED EX | |
| [illegible] | 11-5-10 1000 | Victor Hernandez | 11-5-10 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**

~~None~~ SV 11/2/10

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY [illegible] DATE 11-4-10

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=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 |

WCH-EE-011

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-182

Date: 11/5/10

LvL Batch #: 1011036

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FED EX | | Airbill # 7940 8360 9518 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2-5° | °C | Cooler # AFS-04-025 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA. TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☑ Yes 11/5/10 | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |
| Person Contacted _____ | | Date _____ | |