United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Region 1, New England

SDMS DocID 280860

Laboratory Report

Jim Split Data from 11/3/07 * Metals

December 4, 2007

Superfund Records Center
SITE:
BREAK:
OTHER:

Jim DiLorenzo - HBO
USEPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 07110022
Project: Olin Chemical - Wilmington, MA
Analysis: Total Recoverable Metals in Water by ICP
EPA Chemist: Michael Dowling
MD 12/27/07

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Samples were analyzed following the EPA Region I SOP, EIASOP-INGDVICP0.

The sample preparation and analysis SOP's are based on Methods 3005A and 6010B as stated in "Test Methods for Evaluating Solid Waste," 3rd ed., Final Update III, 7/92 and 12/96.

The samples were analyzed on a Perkin Elmer 4300 Dual View Inductively Coupled Plasma Optical Emission Spectrometer.

Date Samples Received by the Laboratory: 11/14/07

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Report may contain multiple sections and each section will be numbered independently.

If you have any questions please call me at 617-918-8340

Sincerely,

Daniel N. Boudreau 1/3/08

Daniel N. Boudreau
Chemistry Team Leader

## Qualifiers:

| | |
|---|---|
| **RL** | Reporting limit |
| **ND** | Not Detected above reporting limit |
| **NA** | Not Applicable |
| **NC** | Not calculated since analyte concentration is ND |
| **J1** | Estimated value due to MS recovery outside accceptance criteria |
| **J2** | Estimated value due to LFB result outside acceptance criteria |
| **J3** | Estimated value due to RPD result outside acceptance criteria |
| **J4** | Estimated value due to LCS result outside acceptance criteria |
| **B** | Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank. |
| **R** | No recovery was calculated since the analyte concentration is greater than four times the spike level. |

Comments:

The samples were prepared and analyzed by ESAT contractors.

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**Olin Chemical - Wilmington, MA**

**Total Recoverable Metals in Water by ICP**

| | | | |
|---|---|---|---|
| Client Sample ID: | MW202D | Lab Sample ID: | AA76878 |
| Date of Collection: | 11/13/2007 | Matrix | Water |
| Date of Preparation: | 11/28/2007 | Final Volume: | 50 mL |
| Date of Analysis: | 11/30/2007 | Sample Dilution: | 1 |
| Volume Prepared: | 50 mL | pH: | <2 |

| CAS Number | Parameter | Concentration ug/L | RL ug/L | Qualifier |
|---|---|---|---|---|
| 7429-90-5 | Aluminum | **590** | 440 | |
| 7440-36-0 | Antimony | ND | 40 | |
| 7440-38-2 | Arsenic | ND | 20 | |
| 7440-39-3 | Barium | ND | 20 | |
| 7440-41-7 | Beryllium | ND | 8 | |
| 7440-43-9 | Cadmium | ND | 10 | |
| 7440-70-2 | Calcium | **130000** | 400 | |
| 7440-47-3 | Chromium | **78** | 20 | |
| 7440-48-4 | Cobalt | **47** | 20 | |
| 7440-50-8 | Copper | ND | 20 | |
| 7439-89-6 | Iron | **2700** | 40 | |
| 7439-92-1 | Lead | ND | 20 | |
| 7439-95-4 | Magnesium | **25000** | 100 | |
| 7439-96-5 | Manganese | **2300** | 20 | |
| 7440-02-0 | Nickel | **73** | 20 | |
| 7782-49-2 | Selenium | ND | 20 | |
| 7440-22-4 | Silver | ND | 10 | |
| 7440-28-0 | Thallium | ND | 20 | |
| 7440-62-2 | Vanadium | ND | 10 | |
| 7440-66-6 | Zinc | **56** | 20 | |

Comments:

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**Olin Chemical - Wilmington, MA**

**Total Recoverable Metals in Water by ICP**

| | | | |
|---|---|---|---|
| Client Sample ID: | MW10S | Lab Sample ID: | AA76879 |
| Date of Collection: | 11/13/2007 | Matrix | Water |
| Date of Preparation: | 11/28/2007 | Final Volume: | 50 mL |
| Date of Analysis: | 11/30/2007 | Sample Dilution: | 1 |
| Volume Prepared: | 50 mL | pH: | <2 |

| CAS Number | Parameter | Concentration ug/L | RL ug/L | Qualifier |
|---|---|---|---|---|
| 7429-90-5 | Aluminum | **1500** | 440 | |
| 7440-36-0 | Antimony | ND | 40 | |
| 7440-38-2 | Arsenic | ND | 20 | |
| 7440-39-3 | Barium | **47** | 20 | |
| 7440-41-7 | Beryllium | ND | 8 | |
| 7440-43-9 | Cadmium | ND | 10 | |
| 7440-70-2 | Calcium | **4800** | 400 | |
| 7440-47-3 | Chromium | ND | 20 | |
| 7440-48-4 | Cobalt | ND | 20 | |
| 7440-50-8 | Copper | ND | 20 | |
| 7439-89-6 | Iron | **590** | 40 | |
| 7439-92-1 | Lead | ND | 20 | |
| 7439-95-4 | Magnesium | **580** | 100 | |
| 7439-96-5 | Manganese | **53** | 20 | |
| 7440-02-0 | Nickel | ND | 20 | |
| 7782-49-2 | Selenium | ND | 20 | |
| 7440-22-4 | Silver | ND | 10 | |
| 7440-28-0 | Thallium | ND | 20 | |
| 7440-62-2 | Vanadium | ND | 10 | |
| 7440-66-6 | Zinc | **79** | 20 | |

Comments:

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**Olin Chemical - Wilmington, MA**

**Total Recoverable Metals in Water by ICP**

| | | | |
|---|---|---|---|
| Client Sample ID: | GW39 | Lab Sample ID: | AA76880 |
| Date of Collection: | 11/13/2007 | Matrix | Water |
| Date of Preparation: | 11/28/2007 | Final Volume: | 50 mL |
| Date of Analysis: | 11/30/2007 | Sample Dilution: | 1 |
| Volume Prepared: | 50 mL | pH: | <2 |

| CAS Number | Parameter | Concentration ug/L | RL ug/L | Qualifier |
|---|---|---|---|---|
| 7429-90-5 | Aluminum | ND | 440 | |
| 7440-36-0 | Antimony | ND | 40 | |
| 7440-38-2 | Arsenic | ND | 20 | |
| 7440-39-3 | Barium | **27** | 20 | |
| 7440-41-7 | Beryllium | ND | 8 | |
| 7440-43-9 | Cadmium | ND | 10 | |
| 7440-70-2 | Calcium | **110000** | 400 | |
| 7440-47-3 | Chromium | ND | 20 | |
| 7440-48-4 | Cobalt | ND | 20 | |
| 7440-50-8 | Copper | ND | 20 | |
| 7439-89-6 | Iron | ND | 40 | |
| 7439-92-1 | Lead | ND | 20 | |
| 7439-95-4 | Magnesium | **1700** | 100 | |
| 7439-96-5 | Manganese | **110** | 20 | |
| 7440-02-0 | Nickel | ND | 20 | |
| 7782-49-2 | Selenium | ND | 20 | |
| 7440-22-4 | Silver | ND | 10 | |
| 7440-28-0 | Thallium | ND | 20 | |
| 7440-62-2 | Vanadium | ND | 10 | |
| 7440-66-6 | Zinc | ND | 20 | |

Comments:

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**Olin Chemical - Wilmington, MA**

**Total Recoverable Metals in Water by ICP**

| | | | |
|---|---|---|---|
| Client Sample ID: | GW76S | Lab Sample ID: | AA76881 |
| Date of Collection: | 11/13/2007 | Matrix | Water |
| Date of Preparation: | 11/28/2007 | Final Volume: | 50 mL |
| Date of Analysis: | 11/30/2007 | Sample Dilution: | 1 |
| Volume Prepared: | 50 mL | pH: | <2 |

| CAS Number | Parameter | Concentration ug/L | RL ug/L | Qualifier |
|---|---|---|---|---|
| 7429-90-5 | Aluminum | ND | 440 | |
| 7440-36-0 | Antimony | ND | 40 | |
| 7440-38-2 | Arsenic | ND | 20 | |
| 7440-39-3 | Barium | ND | 20 | |
| 7440-41-7 | Beryllium | ND | 8 | |
| 7440-43-9 | Cadmium | ND | 10 | |
| 7440-70-2 | Calcium | **6600** | 400 | |
| 7440-47-3 | Chromium | ND | 20 | |
| 7440-48-4 | Cobalt | ND | 20 | |
| 7440-50-8 | Copper | ND | 20 | |
| 7439-89-6 | Iron | **42** | 40 | |
| 7439-92-1 | Lead | ND | 20 | |
| 7439-95-4 | Magnesium | **490** | 100 | |
| 7439-96-5 | Manganese | **82** | 20 | |
| 7440-02-0 | Nickel | ND | 20 | |
| 7782-49-2 | Selenium | ND | 20 | |
| 7440-22-4 | Silver | ND | 10 | |
| 7440-28-0 | Thallium | ND | 20 | |
| 7440-62-2 | Vanadium | ND | 10 | |
| 7440-66-6 | Zinc | ND | 20 | |

Comments:

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**Olin Chemical - Wilmington, MA**

**Total Recoverable Metals in Water by ICP**

| | | | |
|---|---|---|---|
| Client Sample ID: | GW55S | Lab Sample ID: | AA76882 |
| Date of Collection: | 11/13/2007 | Matrix | Water |
| Date of Preparation: | 11/28/2007 | Final Volume: | 50 mL |
| Date of Analysis: | 11/30/2007 | Sample Dilution: | 1 |
| Volume Prepared: | 50 mL | pH: | <2 |

| CAS Number | Parameter | Concentration ug/L | RL ug/L | Qualifier |
|---|---|---|---|---|
| 7429-90-5 | Aluminum | **21000** | 440 | |
| 7440-36-0 | Antimony | ND | 40 | |
| 7440-38-2 | Arsenic | ND | 20 | |
| 7440-39-3 | Barium | **58** | 20 | |
| 7440-41-7 | Beryllium | ND | 8 | |
| 7440-43-9 | Cadmium | ND | 10 | |
| 7440-70-2 | Calcium | **50000** | 400 | |
| 7440-47-3 | Chromium | ND | 20 | |
| 7440-48-4 | Cobalt | **53** | 20 | |
| 7440-50-8 | Copper | ND | 20 | |
| 7439-89-6 | Iron | **9400** | 40 | |
| 7439-92-1 | Lead | ND | 20 | |
| 7439-95-4 | Magnesium | **5700** | 100 | |
| 7439-96-5 | Manganese | **1400** | 20 | |
| 7440-02-0 | Nickel | **67** | 20 | |
| 7782-49-2 | Selenium | ND | 20 | |
| 7440-22-4 | Silver | ND | 10 | |
| 7440-28-0 | Thallium | ND | 40 | |
| 7440-62-2 | Vanadium | ND | 10 | |
| 7440-66-6 | Zinc | **74** | 20 | |

Comments:

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**Olin Chemical - Wilmington, MA**

**Laboratory Reagent Blank**

| | | | |
|---|---|---|---|
| Client Sample ID: | N/A | Lab Sample ID: | N/A |
| Date of Collection: | N/A | Matrix | Water |
| Date of Preparation: | 11/28/2007 | Final Volume: | 50 mL |
| Date of Analysis: | 11/30/2007 | Sample Dilution: | 1 |
| Volume Prepared: | 50 mL | pH: | <2 |

| CAS Number | Parameter | Concentration ug/L | RL ug/L | Qualifier |
|---|---|---|---|---|
| 7429-90-5 | Aluminum | ND | 440 | |
| 7440-36-0 | Antimony | ND | 40 | |
| 7440-38-2 | Arsenic | ND | 20 | |
| 7440-39-3 | Barium | ND | 20 | |
| 7440-41-7 | Beryllium | ND | 8 | |
| 7440-43-9 | Cadmium | ND | 10 | |
| 7440-70-2 | Calcium | ND | 400 | |
| 7440-47-3 | Chromium | ND | 20 | |
| 7440-48-4 | Cobalt | ND | 20 | |
| 7440-50-8 | Copper | ND | 20 | |
| 7439-89-6 | Iron | ND | 40 | |
| 7439-92-1 | Lead | ND | 20 | |
| 7439-95-4 | Magnesium | ND | 100 | |
| 7439-96-5 | Manganese | ND | 20 | |
| 7440-02-0 | Nickel | ND | 20 | |
| 7782-49-2 | Selenium | ND | 20 | |
| 7440-22-4 | Silver | ND | 10 | |
| 7440-28-0 | Thallium | ND | 20 | |
| 7440-62-2 | Vanadium | ND | 10 | |
| 7440-66-6 | Zinc | ND | 20 | |

Comments:

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**METALS MATRIX SPIKE (MS) RESULTS**

Olin Chemical - Wilmington, MA

Sample ID: AA76882

| COMPOUND | SPIKE ADDED ug/L | SAMPLE CONCENTRATION ug/L | MS CONCENTRATION ug/L | MS % REC | QC LIMITS (% REC) |
|---|---|---|---|---|---|
| Aluminum | 500 | 21000 | 21800 | R | 75 - 125 |
| Antimony | 500 | ND | 543 | 109 | 75 - 125 |
| Arsenic | 500 | ND | 533 | 107 | 75 - 125 |
| Barium | 500 | 58 | 559 | 100 | 75 - 125 |
| Beryllium | 200 | ND | 209 | 105 | 75 - 125 |
| Cadmium | 250 | ND | 251 | 100 | 75 - 125 |
| Chromium | 500 | ND | 508 | 102 | 75 - 125 |
| Cobalt | 500 | 53 | 568 | 103 | 75 - 125 |
| Copper | 500 | ND | 520 | 104 | 75 - 125 |
| Iron | 500 | 9400 | 9790 | R | 75 - 125 |
| Lead | 500 | ND | 504 | 101 | 75 - 125 |
| Manganese | 500 | 1400 | 1850 | 90 | 75 - 125 |
| Nickel | 500 | 67 | 578 | 102 | 75 - 125 |
| Selenium | 500 | ND | 525 | 105 | 75 - 125 |
| Silver | 100 | ND | 98.0 | 98 | 75 - 125 |
| Thallium | 500 | ND | 494 | 99 | 75 - 125 |
| Vanadium | 500 | ND | 515 | 103 | 75 - 125 |
| Zinc | 500 | 74 | 597 | 105 | 75 - 125 |

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**Laboratory Duplicate Results**

Olin Chemical - Wilmington, MA

Sample ID: AA76878

| COMPOUND | SAMPLE RESULT ug/L | SAMPLE DUPLICATE RESULT ug/L | PRECISION RPD % | QC LIMITS RPD (%) |
|---|---|---|---|---|
| Aluminum | 590 | 580 | 1.7 | 20 |
| Antimony | ND | ND | NC | 20 |
| Arsenic | ND | ND | NC | 20 |
| Barium | ND | ND | NC | 20 |
| Beryllium | ND | ND | NC | 20 |
| Cadmium | ND | ND | NC | 20 |
| Calcium | 130000 | 130000 | 0 | 20 |
| Chromium | 78 | 78 | 0 | 20 |
| Cobalt | 47 | 47 | 0 | 20 |
| Copper | ND | ND | NC | 20 |
| Iron | 2700 | 2700 | 0 | 20 |
| Lead | ND | ND | NC | 20 |
| Magnesium | 25000 | 25000 | 0 | 20 |
| Manganese | 2300 | 2300 | 0 | 20 |
| Nickel | 73 | 73 | 0 | 20 |
| Selenium | ND | ND | NC | 20 |
| Silver | ND | ND | NC | 20 |
| Thallium | ND | ND | NC | 20 |
| Vanadium | ND | ND | NC | 20 |
| Zinc | 56 | 50 | 11 | 20 |

Comments:

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**Laboratory Fortified Blank (LFB) Results**

Olin Chemical - Wilmington, MA

| COMPOUND | LFB AMOUNT SPIKED ug/L | LFB RESULT ug/L | LFB RECOVERY % | QC LIMITS % |
|---|---|---|---|---|
| Aluminum | 500 | 505 | 101 | 85 - 115 |
| Antimony | 500 | 531 | 106 | 85 - 115 |
| Arsenic | 500 | 508 | 102 | 85 - 115 |
| Barium | 500 | 507 | 101 | 85 - 115 |
| Beryllium | 200 | 202 | 101 | 85 - 115 |
| Cadmium | 250 | 248 | 99 | 85 - 115 |
| Calcium | 5000 | 5100 | 102 | 85 - 115 |
| Chromium | 500 | 509 | 102 | 85 - 115 |
| Cobalt | 500 | 524 | 105 | 85 - 115 |
| Copper | 500 | 503 | 101 | 85 - 115 |
| Iron | 500 | 523 | 105 | 85 - 115 |
| Lead | 500 | 512 | 102 | 85 - 115 |
| Magnesium | 5000 | 5100 | 102 | 85 - 115 |
| Manganese | 500 | 513 | 103 | 85 - 115 |
| Nickel | 500 | 517 | 103 | 85 - 115 |
| Selenium | 500 | 518 | 104 | 85 - 115 |
| Silver | 100 | 101 | 101 | 85 - 115 |
| Thallium | 500 | 527 | 105 | 85 - 115 |
| Vanadium | 500 | 502 | 100 | 85 - 115 |
| Zinc | 500 | 515 | 103 | 85 - 115 |

Samples in Batch: AA76878, AA76879, AA76880, AA76881, AA76882