0075074

# SAF-RC-007
# 100-N Ancillary Facilities & 190-DR ETF
# Analytical Data Requirements - Liquid
# FINAL DATA PACKAGE

RECEIVED
JAN 03 2008
EDMC

**COMPLETE COPY OF DATA PACKAGE TO:**

| | | |
|---|---|---|
| James Crocker | X5-50 | KW 12/27/07<br>INITIAL/DATE |
| Amy Hood | X5-50 | KW 12/27/07<br>INITIAL/DATE |
| Tom Edmundson | X5-50 | KW 12/27/07<br>INITIAL/DATE |

**COMMENTS:**

**SDG K1050** **SAF-RC-007**

Rad only Chem only X Rad & Chem

X Complete Partial

**Waste Site: 108N/163N Chemical Transfer Lines**

EBERLINE
SERVICES

RECEIVED
DEC 2007

December 20, 2007

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #630**
**Eberline Services R7-12-067-7730, SDG K1050**

Dear Ms. Kessner:

Enclosed is the data report for two water samples designated under SAF No. RC-007, received at Eberline Services on December 11, 2007. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

*MCM/njv*

*Enclosure: Data Package*

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

## 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1050 was composed of two water samples designated under SAF No. RC-007 with a Project Designation of: 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 17, 2007.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta Analysis

The DER for the duplicate gross alpha analysis was 3.3. No other problems were encountered during the course of the analyses.

### 2.2 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

## 3.0 Case Narrative Certification Statement

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

Mel Mann
**Melissa C. Mannion**
**Senior Program Manager**

12/20/07
**Date**

E B E R L I N E  S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP K1050

| | |
|---|---|
| SDG | 7730 |
| Contact | Melissa C. Mannion |

| | |
|---|---|
| Client | Hanford |
| Contract | No. 630 |
| Case no | SDG_K1050 |

# S U M M A R Y  D A T A  S E C T I O N

## T A B L E  O F  C O N T E N T S


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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-TOC |
| Version | 3.06 |
| Report date | 12/17/07 |

SDG 7730
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

# ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.



Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/17/07

SDG 7730
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG K1050

# ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.



Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

## LAB SAMPLE SUMMARY

SDG 7730
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG K1050

| LAB SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| R712067-01 | J16385 | 108N/163N Chemical Trans | WATER | | RC-007 | RC-007-022 | 12/05/07 12:58 |
| R712067-02 | J16386 | 108N/163N Chemical Trans | WATER | | RC-007 | RC-007-022 | 12/05/07 13:04 |
| R712067-03 | Lab Control Sample | | WATER | | RC-007 | | |
| R712067-04 | Method Blank | | WATER | | RC-007 | | |
| R712067-05 | Duplicate (R712067-01) | 108N/163N Chemical Trans | WATER | | RC-007 | | 12/05/07 12:58 |



Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

## QC SUMMARY

SDG 7730
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG K1050

| : BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| '30 | RC-007-022 | J16385 | WATER | | 2.0 L | | 12/11/07 | 6 | R712067-01 | 7730-001 |
| | | J16386 | WATER | | 2.0 L | | 12/11/07 | 6 | R712067-02 | 7730-002 |
| | | Method Blank | WATER | | | | | | R712067-04 | 7730-004 |
| | | Lab Control Sample | WATER | | | | | | R712067-03 | 7730-003 |
| | | Duplicate (R712067-01) | WATER | | 2.0 L | | 12/11/07 | 6 | R712067-05 | 7730-005 |

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

SDG 7730
Contact Melissa C. Mannion

## PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG K1050

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Proportional Counting | | | | | | | | | | | | |
| 93A | WATER | Gross Alpha in Water | 6133-093 | 20.0 | 2 | | | 1 | 1 | 1/1 | | |
| 93B | WATER | Gross Beta in Water | 6133-093 | 15.0 | 2 | | | 1 | 1 | 1/1 | | |
| Gamma Spectroscopy | | | | | | | | | | | | |
| GAM | WATER | Gamma Emitters | 6133-093 | 15.0 | 2 | | | 1 | 1 | 1/1 | | |

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



Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

SDG 7730
Contact Melissa C. Mannion

## LAB WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG K1050

| AB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| 712067-01 | J16385 | | | 7730-001 | 93A/93 | | 12/14/07 | 12/17/07 | BW | Gross Alpha in Water |
| 12/05/07 | 108N/163N Chemical Trans | | WATER | 7730-001 | 93B/93 | | 12/14/07 | 12/17/07 | BW | Gross Beta in Water |
| 12/11/07 | RC-007-022 | RC-007 | | 7730-001 | GAM | | 12/13/07 | 12/17/07 | CSS | Gamma Emitters |
| 712067-02 | J16386 | | | 7730-002 | 93A/93 | | 12/16/07 | 12/17/07 | BW | Gross Alpha in Water |
| 12/05/07 | 108N/163N Chemical Trans | | WATER | 7730-002 | 93B/93 | | 12/16/07 | 12/17/07 | BW | Gross Beta in Water |
| 12/11/07 | RC-007-022 | RC-007 | | 7730-002 | GAM | | 12/13/07 | 12/17/07 | CSS | Gamma Emitters |
| 712067-03 | Lab Control Sample | | | 7730-003 | 93A/93 | | 12/14/07 | 12/17/07 | BW | Gross Alpha in Water |
| | | | WATER | 7730-003 | 93B/93 | | 12/14/07 | 12/17/07 | BW | Gross Beta in Water |
| | | RC-007 | | 7730-003 | GAM | | 12/14/07 | 12/17/07 | CSS | Gamma Emitters |
| 712067-04 | Method Blank | | | 7730-004 | 93A/93 | | 12/14/07 | 12/17/07 | BW | Gross Alpha in Water |
| | | | WATER | 7730-004 | 93B/93 | | 12/14/07 | 12/17/07 | BW | Gross Beta in Water |
| | | RC-007 | | 7730-004 | GAM | | 12/14/07 | 12/17/07 | CSS | Gamma Emitters |
| 712067-05 | Duplicate (R712067-01) | | | 7730-005 | 93A/93 | | 12/16/07 | 12/17/07 | BW | Gross Alpha in Water |
| 12/05/07 | 108N/163N Chemical Trans | | WATER | 7730-005 | 93B/93 | | 12/16/07 | 12/17/07 | BW | Gross Beta in Water |
| 12/11/07 | | RC-007 | | 7730-005 | GAM | | 12/14/07 | 12/17/07 | CSS | Gamma Emitters |

## COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| 93A/93 | RC-007 | Gross Alpha in Water | 900.0_ALPHABETA_GPC | 2 | | | 1 | 1 | 1 | 5 |
| 93B/93 | RC-007 | Gross Beta in Water | 900.0_ALPHABETA_GPC | 2 | | | 1 | 1 | 1 | 5 |
| GAM | RC-007 | Gamma Emitters | GAMMA_GS | 2 | | | 1 | 1 | 1 | 5 |
| TOTALS | | | | 6 | | | 3 | 3 | 3 | 15 |

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

7730-004 Method Blank

## METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7730 | Client/Case no | Hanford | SDG K1050 | |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R712067-04 | Client sample id | Method Blank | | |
| Dept sample id | 7730-004 | Material/Matrix | | WATER | |
| | | SAF No | RC-007 | | |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | -0.072 | 1.8 | 3.40 | 3.00 | U | 93A |
| Gross Beta | 12587-47-2 | -0.984 | 1.2 | 2.11 | 4.00 | U | 93B |
| Potassium 40 | 13966-00-2 | U | | 463 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 18.2 | 25.0 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 17.4 | 15.0 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 40.3 | | U | GAM |
| Radium 228 | 15262-20-1 | U | | 76.4 | | U | GAM |
| Europium 152 | 14683-23-9 | U | | 51.0 | 50.0 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 57.0 | 50.0 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 42.6 | 50.0 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 28.6 | | U | GAM |
| Thorium 232 | TH-232 | U | | 76.4 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 72.8 | | U | GAM |
| Uranium 238 | U-238 | U | | 2050 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 17.6 | | U | GAM |
| Antimony 125 | 14234-35-6 | U | | 41.1 | | U | GAM |
| Barium 133 | 13981-41-4 | U | | 20.9 | | U | GAM |

100-N Ancillary Facili. & 190-DR ETF

QC-BLANK #64044



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 12/17/07 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

7730-003

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7730

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1050

Contract No. 630

Lab sample id R712067-03

Dept sample id 7730-003

Client sample id Lab Control Sample

Material/Matrix WATER

SAF No RC-007

| ANALYTE | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI-FIERS | TEST | ADDED pCi/L | 2σ ERR pCi/L | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross Alpha | 38.9 | 6.1 | 3.64 | 3.00 | | 93A | 33.7 | 1.3 | 115 | 56-144 | 70-130 |
| Gross Beta | 33.3 | 2.5 | 1.80 | 4.00 | | 93B | 31.4 | 1.3 | 106 | 73-127 | 80-120 |
| Cobalt 60 | 530 | 27 | 16.1 | 25.0 | | GAM | 536 | 21 | 99 | 76-124 | 80-120 |
| Cesium 137 | 608 | 27 | 19.6 | 15.0 | | GAM | 568 | 23 | 107 | 74-126 | 80-120 |

100-N Ancillary Facili. & 190-DR ETF

QC-LCS #64043

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

7730-005 J16385

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7730 | | | Client/Case no | Hanford SDG K1050 |
| Contact | Melissa C. Mannion | | | Contract | No. 630 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R712067-05 | Lab sample id | R712067-01 | Client sample id | J16385 |
| Dept sample id | 7730-005 | Dept sample id | 7730-001 | Location/Matrix | 108N/163N Chemical Trans WATER |
| | | Received | 12/11/07 | Collected/Volume | 12/05/07 12:58 2.0 L |
| | | | | Custody/SAF No | RC-007-022 RC-007 |

| ANALYTE | DUPLICATE pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI-FIERS | TEST | ORIGINAL pCi/L | 2σ ERR (COUNT) | MDA pCi/L | QUALI-FIERS | RPD % | 3σ TOT | DER σ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross Alpha | -4.10 | 1.8 | 3.78 | 3.00 | U | 93A | 0.250 | 1.8 | 3.07 | U | - | | 3.3 |
| Gross Beta | 7.60 | 0.80 | 0.965 | 4.00 | | 93B | 6.80 | 0.87 | 1.11 | | 11 | 40 | 0.8 |
| Potassium 40 | U | | 281 | | U | GAM | U | | 173 | U | - | | 0.6 |
| Cobalt 60 | U | | 10.2 | 25.0 | U | GAM | U | | 9.15 | U | - | | 0.2 |
| Cesium 137 | U | | 10.9 | 15.0 | U | GAM | U | | 8.59 | U | - | | 0.3 |
| Radium 226 | U | | 24.2 | | U | GAM | U | | 16.4 | U | - | | 0.5 |
| Radium 228 | U | | 46.6 | | U | GAM | U | | 37.9 | U | - | | 0.3 |
| Europium 152 | U | | 30.4 | 50.0 | U | GAM | U | | 24.3 | U | - | | 0.3 |
| Europium 154 | U | | 32.3 | 50.0 | U | GAM | U | | 24.8 | U | - | | 0.4 |
| Europium 155 | U | | 27.9 | 50.0 | U | GAM | U | | 26.4 | U | - | | 0.1 |
| Thorium 228 | U | | 17.8 | | U | GAM | U | | 14.8 | U | - | | 0.3 |
| Thorium 232 | U | | 46.6 | | U | GAM | U | | 37.9 | U | - | | 0.3 |
| Uranium 235 | U | | 47.8 | | U | GAM | U | | 40.2 | U | - | | 0.2 |
| Uranium 238 | U | | 1210 | | U | GAM | U | | 1130 | U | - | | 0.1 |
| Americium 241 | U | | 10.8 | | U | GAM | U | | 69.8 | U | - | | 1.7 |
| Antimony 125 | U | | 24.7 | | U | GAM | U | | 22.4 | U | - | | 0.1 |
| Barium 133 | U | | 12.0 | | U | GAM | U | | 10.3 | U | - | | 0.2 |

100-N Ancillary Facili. & 190-DR ETF

QC-DUP#1 64045



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 12/17/07 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

7730-001 J16385

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7730 | Client/Case no | Hanford SDG K1050 |
| Contact | Melissa C. Mannion | Contract | No. 630 |
| Lab sample id | R712067-01 | Client sample id | J16385 |
| Dept sample id | 7730-001 | Location/Matrix | 108N/163N Chemical Trans WATER |
| Received | 12/11/07 | Collected/Volume | 12/05/07 12:58 2.0 L |
| | | Custody/SAF No | RC-007-022 RC-007 |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 0.250 | 1.8 | 3.07 | 3.00 | U | 93A |
| Gross Beta | 12587-47-2 | 6.80 | 0.87 | 1.11 | 4.00 | | 93B |
| Potassium 40 | 13966-00-2 | U | | 173 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 9.15 | 25.0 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 8.59 | 15.0 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 16.4 | | U | GAM |
| Radium 228 | 15262-20-1 | U | | 37.9 | | U | GAM |
| Europium 152 | 14683-23-9 | U | | 24.3 | 50.0 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 24.8 | 50.0 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 26.4 | 50.0 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 14.8 | | U | GAM |
| Thorium 232 | TH-232 | U | | 37.9 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 40.2 | | U | GAM |
| Uranium 238 | U-238 | U | | 1130 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 69.8 | | U | GAM |
| Antimony 125 | 14234-35-6 | U | | 22.4 | | U | GAM |
| Barium 133 | 13981-41-4 | U | | 10.3 | | U | GAM |

100-N Ancillary Facili. & 190-DR ETF



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 12/17/07 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

7730-002 J16386

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7730 | Client/Case no | Hanford SDG K1050 |
| Contact | Melissa C. Mannion | Contract | No. 630 |
| Lab sample id | R712067-02 | Client sample id | J16386 |
| Dept sample id | 7730-002 | Location/Matrix | 108N/163N Chemical Trans WATER |
| Received | 12/11/07 | Collected/Volume | 12/05/07 13:04 2.0 L |
| | | Custody/SAF No | RC-007-022 RC-007 |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | -110 | 140 | 271 | 3.00 | U | 93A |
| Gross Beta | 12587-47-2 | 218 | 82 | 127 | 4.00 | | 93B |
| Potassium 40 | 13966-00-2 | 180 | 79 | 67.2 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 6.35 | 25.0 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 5.12 | 15.0 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 12.0 | | U | GAM |
| Radium 228 | 15262-20-1 | U | | 23.8 | | U | GAM |
| Europium 152 | 14683-23-9 | U | | 14.0 | 50.0 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 16.2 | 50.0 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 12.3 | 50.0 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 9.46 | | U | GAM |
| Thorium 232 | TH-232 | U | | 23.8 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 21.6 | | U | GAM |
| Uranium 238 | U-238 | U | | 703 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 7.56 | | U | GAM |
| Antimony 125 | 14234-35-6 | U | | 14.2 | | U | GAM |
| Barium 133 | 13981-41-4 | U | | 5.76 | | U | GAM |

100-N Ancillary Facili. & 190-DR ETF



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 12/17/07 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

Test 93A Matrix WATER
SDG 7730
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG K1050

## ESULTS

| AB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Gross Alpha |
|---|---|---|---|---|---|
| :eparation batch 6133-093 | | | | | |
| '12067-01 | 93 | | 7730-001 | J16385 | U |
| '12067-02 | 93 | | 7730-002 | J16386 | U |
| '12067-03 | 93 | | 7730-003 | LCS (QC ID=64043) | ok |
| '12067-04 | 93 | | 7730-004 | BLK (QC ID=64044) | U |
| '12067-05 | 93 | | 7730-005 | Duplicate (R712067-01) | OUT U |

ominal values and limits from method RDLs (pCi/L) 3.00
)0-N Ancillary Facili. & 190-DR ETF

## ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/L | ALIQ L | PREP FAC | DILU-TION | RESID mg | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6133-093 | | | 2σ prep error 20.0 % Reference Lab Notebook #6133, pg. 93 | | | | | | | | | | | | | |
| '12067-01 | 93 | | J16385 | 3.07 | 0.300 | | | 192 | | 400 | | | 9 | 12/13/07 | 12/14 | GRB-115 |
| '12067-02 | 93 | | J16386 | 271 | 0.0040 | | | 238 | | 400 | | | 11 | 12/13/07 | 12/16 | GRB-107 |
| '12067-03 | 93 | | LCS (QC ID=64043) | 3.64 | 0.300 | | | 60 | | 100 | | | | 12/13/07 | 12/14 | GRB-109 |
| '12067-04 | 93 | | BLK (QC ID=64044) | 3.40 | 0.300 | | | 62 | | 100 | | | | 12/13/07 | 12/14 | GRB-110 |
| '12067-05 | 93 | | Duplicate (R712067-01) (QC ID=64045) | 3.78 | 0.300 | | | 195 | | 400 | | | 11 | 12/13/07 | 12/16 | GRB-109 |
| ominal values and limits from method | | | | 3.00 | 0.300 | | | 5-250 | | 100 | | | 180 | | | |

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 57.0 ± 239
RESIDUE 149 ± 165

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

Test 93B Matrix WATER
SDG 7730
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG K1050

## ESULTS

| AB AMPLE ID | RAW TEST | SUF- FIX | PLANCHET | CLIENT SAMPLE ID | Gross Beta |
|---|---|---|---|---|---|
| :eparation batch 6133-093 | | | | | |
| '12067-01 | 93 | | 7730-001 | J16385 | 6.80 |
| '12067-02 | 93 | | 7730-002 | J16386 | 218 |
| '12067-03 | 93 | | 7730-003 | LCS (QC ID=64043) | ok |
| '12067-04 | 93 | | 7730-004 | BLK (QC ID=64044) | U |
| '12067-05 | 93 | | 7730-005 | Duplicate (R712067-01) | ok |
| ominal values and limits from method | | | | RDLs (pCi/L) | 4.00 |

)0-N Ancillary Facili. & 190-DR ETF

## ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF- FIX | CLIENT SAMPLE ID | MDA pCi/L | ALIQ L | PREP FAC | DILU- TION | RESID mg | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL- YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6133-093 | | | 2σ prep error 15.0 % Reference Lab Notebook #6133, pg. 93 | | | | | | | | | | | | | |
| '12067-01 | 93 | | J16385 | 1.11 | 0.300 | | | 192 | | 400 | | | 9 | 12/13/07 | 12/14 | GRB-115 |
| '12067-02 | 93 | | J16386 | 127 | 0.0040 | | | 238 | | 400 | | | 11 | 12/13/07 | 12/16 | GRB-107 |
| '12067-03 | 93 | | LCS (QC ID=64043) | 1.80 | 0.300 | | | 60 | | 100 | | | | 12/13/07 | 12/14 | GRB-109 |
| '12067-04 | 93 | | BLK (QC ID=64044) | 2.11 | 0.300 | | | 62 | | 100 | | | | 12/13/07 | 12/14 | GRB-110 |
| '12067-05 | 93 | | Duplicate (R712067-01) (QC ID=64045) | 0.965 | 0.300 | | | 195 | | 400 | | | 11 | 12/13/07 | 12/16 | GRB-109 |
| ominal values and limits from method | | | | 4.00 | 0.300 | | | 5-250 | | 100 | | | 180 | | | |

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 26.6 ± 112
FOR 5 SAMPLES RESIDUE 149 ± 165

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/17/07

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1050

Test GAM Matrix WATER
SDG 7730
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

GAMMA EMITTERS

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG K1050

## .ESULTS

| AB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Cobalt 60 | | Cesium 137 | |
|---|---|---|---|---|---|---|---|---|
| :eparation batch 6133-093 | | | | | | | | |
| /12067-01 | | | 7730-001 | J16385 | U | | U | |
| /12067-02 | | | 7730-002 | J16386 | U | | U | |
| /12067-03 | | | 7730-003 | LCS (QC ID=64043) | ok | | ok | |
| /12067-04 | | | 7730-004 | BLK (QC ID=64044) | U | | U | |
| /12067-05 | | | 7730-005 | Duplicate (R712067-01) | - | U | - | U |
| ›minal values and limits from method | | | | RDLs (pCi/L) | 25.0 | | 15.0 | |
| )0-N Ancillary Facili. & 190-DR ETF | | | | | | | | |

## :ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/L | ALIQ L | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6133-093 | | | 2σ prep error 15.0 % Reference Lab Notebook #6133, pg. 93 | | | | | | | | | | | | | |
| /12067-01 | | | J16385 | 49.3 | 0.500 | | | | | 724 | | | 8 | 12/12/07 | 12/13 | MB,05,00 |
| /12067-02 | | | J16386 | 24.7 | 0.500 | | | | | 724 | | | 8 | 12/12/07 | 12/13 | MB,07,00 |
| /12067-03 | | | LCS (QC ID=64043) | 19.6 | 0.500 | | | | | 301 | | | | 12/12/07 | 12/14 | MB,08,00 |
| /12067-04 | | | BLK (QC ID=64044) | 87.5 | 0.500 | | | | | 302 | | | | 12/12/07 | 12/14 | MB,06,00 |
| /12067-05 | | | Duplicate (R712067-01) (QC ID=64045) | 58.7 | 0.500 | | | | | 966 | | | 9 | 12/12/07 | 12/14 | MB,06,00 |
| ›minal values and limits from method | | | | 15.0 | 0.500 | | | | | 100 | | | 180 | | | |

| PROCEDURES | REFERENCE | GAMMA_GS |
|---|---|---|
| | CP-100 | Ge(Li) Preparation for Commercial Samples, rev 7 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 48.0 | ± | 55.0 |
| | YIELD | | ± | |

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/17/07

SDG 7730
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

## SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.



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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/17/07

SDG 7730
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

# PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.



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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

# WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.



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# REPORT GUIDE

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Contract No. 630
Case no SDG K1050

## DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).



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# DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG K1050

# DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.



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Form DVD-RG
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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

# LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.



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Contact Melissa C. Mannion

REPORT GUIDE

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Contract No. 630
Case no SDG K1050

# DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.



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GUIDE, cont.

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Contract No. 630
Case no SDG_K1050

## DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.



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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

# MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits



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SDG 7730
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG K1050

## MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.



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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K1050

# METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'



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## METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

SDG 7730
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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## METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant



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## METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-007-022 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Hood/ Sherman | Company Contact: James Crocker | Telephone No.: 373-9733 | Project Coordinator: KESSNER, JH |
| Price Code: 7K | Data Turnaround: ~~15~~ 7 Days DA 12/3/07 | | |
| Project Designation: 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re | Sampling Location: 108N/163N Chemical Transfer Lines K1050 (7730) | | SAF No.: RC-007 |
| Ice Chest No.: GRP-05-001 | Field Logbook No.: EL-1516-12 | COA: R108N01000 | Method of Shipment: FED EX |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: A080089 | | Bill of Lading/Air Bill No.: See OSPC |

POSSIBLE SAMPLE HAZARDS/REMARKS

potential Acidic or Caustic

Special Handling and/or Storage

*RCF Screen*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | HNO3 to pH <2 | HNO3 to pH <2 | None | HNO3 to pH <2 | Cool 4C | | | | | | |
| Type of Container | G/P | G/P | G/P | G/P | P | | | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Volume | 1000mL | 1000mL | 60mL | 500mL | 500mL | | | | | | |
| SAMPLE ANALYSIS | Gross Alpha; Gross Beta | See item (1) in Special Instructions. | RCF GEA Shipping Screen | See item (2) in Special Instructions. | See item (3) in Special Instructions. | | | | | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| J16385 / WATER / 12-05-07 / 1258 | X | X | X | X | X | | | | | | |
| J16386 / WATER / 12-05-07 / 1304 | X | X | X | X | X | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: Jerry J. Sherman | 12-5-07 1330 | Amy Hood | 12/5/07 1330 |
| Relinquished By/Removed From: A. Hood | 12-5-07 1620 | Received By/Stored In: 3728/2A | 12/5/07 1620 |
| Relinquished By/Removed From: 3728/2A | 12-10-07 0915 | Received By/Stored In: K.M. Singleton | 12-10-07 0915 |
| Relinquished By/Removed From: K.M. Singleton | 12-10-07 1500 WCH | Received By/Stored In: FED EX | |
| Relinquished By/Removed From: Fed Ex | | Received By/Stored In: | 12/11/07 10:00 |
| Relinquished By/Removed From | | Received By/Stored In | |

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Antimony-125, Barium-133, Radium-226, Radium-228}
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ~~ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc}~~; Mercury - 7470 - (CV) DA 12/3/07
(3) ~~IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}~~; pH (Water) - 9040 DA 11/29/07

samples from 3728 Ref # 2A
3728 Custodian removed samples for shipping on 12/10/07.
Sampler unavailable to relinquish

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

EBERLINE

# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 12/11/07 10:00 CoC No. RC-007-022

Container I.D. No. ~~GRP-05-01~~ HFS-04-007 Requested TAT (Days) 7 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [Y] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [Y] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]
5. Packing material is. Wet [ ] Dry [Y]
6. Number of samples in shipping container 2 Sample Matrix W
7. Number of containers per sample 2 (Or see CoC ____ )
8. Samples are in correct container Yes [Y] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ]
10. Samples have. Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]
11. Samples are. In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are Preserved [X] Not preserved [ ] pH ____ Preservative ____
13. Describe any anomalies:
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date ____
15. Inspected by [signature] Date 12/11/07 Time 10:30

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe |
|---|---|---|---|---|---|---|---|
| ALL SAMPLES | <60 | | | | | | |

Ion Chamber Ser. No. ____ Calibration date ____

Alpha Meter Ser. No. ____ Calibration date ____

Beta/Gamma Meter Ser. No. 100482 Calibration date 09 MAY 07

LIONVILLE LABORATORY INC.

RECEIVED DEC 2007

19 December 2007

Joan Kessner
WC-Hanford
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 # | 0712L308 |
| SDG # | K1050 |
| SAF # | RC-007 |
| Date Received | 12/11/07 |
| # Samples | 1 |
| Matrix | WATER |
| Volatiles | |
| Semivolatiles | |
| Pest/PCB | |
| Glycols | |
| DRO/KRO/GRO | |
| GC Alcohols | |
| Herbicides | |
| Metals | X |
| Inorganics | X |

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

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\b_ltrs.doc

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

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-007 K1050

RECEIVED DEC 2007

DATE RECEIVED: 12/11/07 LVL LOT # :0712L308

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS | ANALYSIS TIME |
|---|---|---|---|---|---|---|---|
| J16385 | | | | | | | |
| PH | 001 | W | 07LPH077 | 12/05/07 | 12/12/07 | 12/12/07 | 0947 |
| PH | 001 REP | W | 07LPH077 | 12/05/07 | 12/12/07 | 12/12/07 | 0950 |
| J16386 | | | | | | | |
| PH | 002 | W | 07LPH077 | 12/05/07 | 12/12/07 | 12/12/07 | 0953 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client:** TNU-HANFORD RC-007 K1050
**LVL#:** 0712L308

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 12-11-07

**INORGANIC NARRATIVE**

1. This narrative covers the analysis of 2 water samples.

2. The samples were prepared and analyzed in accordance with the method checked on the attached glossary.

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

3. Sample holding times as required by the method and/or contract were not met as the sample was received past hold (see the sample chronology summary for analyses times for short hold samples).

4. The results presented in this report are derived from samples that did not meet LvLI's sample acceptance policy as noted on the Sample Receipt Checklist.

5. The replicate analysis was within the 20% Relative Percent Difference (RPD) control limit.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/17/07
Date

njp\i12-308

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

**Lionville Laboratory Incorporated**

## WET CHEMISTRY

## METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

| | EPA /600 | SW846 | OTHER |
|---|---|---|---|
| :idity | ___ 305.1 | | |
| _Alkalinity ___Bicarbonate ___Carbonate | ___ 310.1 | | |
| )D | ___ 405.1 | | ___ 5210B (b) |
| n Chromatography: | | | |
| _Bromide ___Chloride ___Fluoride | ___ 300.0 | ___ 9056 | |
| _Nitrate ___Nitrite ___Phosphate | ___ 300.0 | ___ 9056 | |
| _Sulfate ___Formate ___Acetate ___Oxalate | ___ 300.0 | ___ 9056 | |
| ıloride | ___ 325.2 | ___ 9251 | |
| ıorine, Residual | ___ 330.5 (mod) | | |
| /anide, Amenable to Chlorination | ___ 335.2 | ___ 9010B | |
| /anide, Total | ___ 335.2 | ___ 9010B ___ 9014 | ___ ILMO4.0 (e) |
| /anide, Weak Acid Dissociable | | ___ | ___ 412 (a) ___ 4500CN-I (b |
| )D | ___ 410.4(mod) | | ___ 5220C (b) |
| ɔlor | ___ 110.2 | | |
| ɔrrosivity by Coupon | | ___ 1110(mod) | |
| ıromium VI | | ___ 7196A | ___ 3500Cr-D (b) |
| uoride | ___ 340.2 | | ___ 4500-FC |
| ardness, Calcium | ___ 215.2 | | |
| ardness, Total | ___ 130.2 | | |
| dide | | | ___ ASTM D19P202 (1) |
| ırfactant | ___ 425.1 | | |
| _Nitrate-Nitrite ___Nitrate ___Nitrite | ___ 353.2 | | |
| mmonia | ___ 350.3 | | |
| ɔtal___ Kjeldahl ___ Organic Nitrogen | ___ 351.3 | | |
| ɔtal___ Organic ___ Inorganic Carbon | ___ 415.1 | ___ 9060 | |
| il & Grease | ___ 413.1 | ___ 9070 | |
| ✓ pH ____ pH; paper | ___ 150.1 | ✓ 9040B ___ 9041A | |
| ɛtroleum Hydrocarbons, Total Recoverable | ___ 418.1 | | |
| ıenol | ___ 420.1 ___ 420.2 | ___ 9065 ___ 9066 | |
| _Ortho ___Total Phosphate | ___ 365.2 | | ___ 4500-P B ___ C |
| ılinity | | | ___ 210A (a) ___ 2520 (b) |
| ɛttleable Solids | ___ 160.5 | | |
| ılfide | ___ 376.1 | ___ 9030B/9034 (acid soluble) | |
| eactive ___Cyanide ___Sulfide | | ___ Section 7.3 (__9014__9030B) | |
| ilica | ___ 370.1 | | |
| ılfite | ___ 377.1 | | |
| ılfate | ___ 375.4 | ___ 9038 | |
| ɔecific Conductance | ___ 120.1 | ___ 9050A | |
| ɔecific Gravity | | | ___ D5057-90 ___ 213E (a) |
| ynthetic Precipitation Leach | ___ 1312 | | |
| otal ___Dissolved __Suspended ___Solids | 160 ___.1 ___.2 ___.3 | | |
| otal Organic Halides | ___ 450.1 | ___ 9020B | |
| urbidity | ___ 180.1 | | |
| olatile Solids: | | | |
| _Total __Dissolved __Suspended | ___ 160.4 | | |
| ɔther: | | Method: | |

**Lionville Laboratory Incorporated**

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

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

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

## ABBREVIATIONS

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

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

## ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | J16385 | pH | 7.1 | PH UNIT | 0.01 | 1.0 |
| -002 | J16386 | pH | 2.9 | PH UNIT | 0.01 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/14/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | J16385 | pH | 7.1 | 7.1 | 0.6 | 1.0 |

onville Laboratory Use Only

7712L308

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

ent TNU Hanford RC-007

t. Final Proj. Sampling Date

ject# 11343-606-001-9999-00

ject Contact/Phone#

onville Laboratory Project Manager OJohnson

SW846 Del STD TAT 3 days 12-11-07 4

te Rec'd 12-11-07 Date Due 12-18-07

| | | A | | | | | | | | | B | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | | | | | | | 3 | | | 3 | | | | |
| #/Type Container | Liquid | | | | | | | | 1P | | | 1P | | | | |
| | Solid | | | | | | | | | | | | | | | |
| Volume | | | | | | | | | 500 | | | 500 | | | | |
| Preservatives | | | | | | | | | HNO3 | | | — | | | | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | ICP Metal Hg | CN | | 4 | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | | | | | | | | RCRA | | | IPH | | | | |

| TRIX DES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP Leachate, Wipe, Other, Fish | 001 | T16385 | | | W | 12-5-7 | 1258 | | | | | | | X | | | X | | | |
| | 002 | T16386 | | | ⊥ | ⊥ | 1300 | | | | | | | X | | | X | | | |

ecial Instructions: Run matrix QC.

Special Instructions:

12-11-07 1. Client changed TAT TO 3days

2.

3.

4.

5.

6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| FED EX | [illegible] | 12/11/7 | 0935 |

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

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

000000007

**Washington Closure Hanford** | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | **RC-007-022** | Page 1 of 1

| | | | |
|---|---|---|---|
| Collector: Hood/Sherman | Company Contact: James Crocker | Telephone No.: 373-9733 | Project Coordinator: KESSNER, JH |
| Price Code: 7K | Data Turnaround: ~~15~~ 7 Days 12/3/07 | | |
| Project Designation: 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re | Sampling Location: 108N/163N Chemical Transfer Lines | | SAF No.: RC-007 |
| Ice Chest No.: AFS-04-006 ~~A080104~~ 12-10-07 | Field Logbook No.: EL-1516-12 | COA: R108N01000 | Method of Shipment: FED EX |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: A080104 12-10-07 | | Bill of Lading/Air Bill No.: See OSPC |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

potential toxic or caustic

**Special Handling and/or Storage**

*RCF Screen*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | HNO3 to pH <2 | HNO3 to pH <2 | None | HNO3 to pH <2 | Cool 4C | | | | | | |
| Type of Container | G/P | G/P | G/P | G/P | P | | | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Volume | 1000mL | 1000mL | 60mL | 500mL | 500mL | | | | | | |
| SAMPLE ANALYSIS | Gross Alpha; Gross Beta | See item (1) in Special Instructions. | RCF Screen | See item (2) in Special Instructions. | See item (3) in Special Instructions. | | | | | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| J16385 / WATER / 12-05-07 / 1258 | Y | Y | Y | Y | Y | | | | | | |
| J16386 / WATER / 12-05-07 / 1304 | Y | Y | | Y | Y | | | | | | |

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

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Gary J. Sherman | 12-5-07 1330 | Amy [illegible] | 12/5/07 1330 |
| [illegible] | 12-5-07 1620 | 3728 2A | 12/5/07 1620 |
| 3728 2A | 12-10-07 0915 | [illegible] | 12-10-07 0915 |
| [illegible] | 12-10-07 1500 | FED EX | |
| FED EX | 12-11-07 0935 | [illegible] | 12-11-07 0935 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Antimony-125, Barium-133, Radium-226, Radium-228]
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ~~ICP Metals - 6010A (Supertrace Add-On) [Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc]~~; Mercury - 7470 - (CV) 12/3/07
(3) ~~IC Anions - 300.0 [Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate]~~; pH (Water) - 9040 11/29/07

samples from 3728 Ref # 2A.
3728 Custodian removed samples for shipping on 12/10/07.
Sampler unavailable to relinquish

**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

0000000008

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU HANFORD

Project/SAF/SOW/Release #: BC-030

Date: 12-11-07

LvLI Batch #: 07126307

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FED EX | | Airbill # 7904 0023 8567 |
| 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 plastic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2.7 | °C | Cooler # AFS-04-006 |
| 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 & LvLI) 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 | pH past hold |
| 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 | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☑ No | See #12 |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____ Date _____

lvl

RECEIVED
DEC 2007

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-007 K1050

DATE RECEIVED: 12/11/07 LVL LOT # :0712L308

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| J16385 | | | | | | |
| SILVER, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| SILVER, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| ARSENIC, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| ARSENIC, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| BARIUM, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| BARIUM, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CADMIUM, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CADMIUM, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CHROMIUM, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CHROMIUM, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| MERCURY, TOTAL | 001 | W | 07C0223 | 12/05/07 | 12/12/07 | 12/13/07 |
| MERCURY, TOTAL | 001 REP | W | 07C0223 | 12/05/07 | 12/12/07 | 12/13/07 |
| MERCURY, TOTAL | 001 MS | W | 07C0223 | 12/05/07 | 12/12/07 | 12/13/07 |
| LEAD, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| LEAD, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| SELENIUM, TOTAL | 001 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| SELENIUM, TOTAL | 001 REP | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| J16386 | | | | | | |
| SILVER, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| SILVER, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| ARSENIC, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| ARSENIC, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| BARIUM, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| BARIUM, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CADMIUM, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CADMIUM, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CHROMIUM, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| CHROMIUM, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| MERCURY, TOTAL | 002 | W | 07C0223 | 12/05/07 | 12/12/07 | 12/13/07 |
| LEAD, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| LEAD, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| SELENIUM, TOTAL | 002 | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |
| SELENIUM, TOTAL | 002 MS | W | 07L0621 | 12/05/07 | 12/12/07 | 12/13/07 |

AB QC:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-007 K1050

DATE RECEIVED: 12/11/07 LVL LOT # :0712L308

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| SILVER LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| SILVER, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| ARSENIC LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| ARSENIC, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| BARIUM LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| BARIUM, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| CADMIUM LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| CADMIUM, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| CHROMIUM LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| CHROMIUM, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| MERCURY LABORATORY | LC1 BS | W | 07C0223 | N/A | 12/12/07 | 12/13/07 |
| MERCURY, TOTAL | MB1 | W | 07C0223 | N/A | 12/12/07 | 12/13/07 |
| LEAD LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| LEAD, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| SELENIUM LABORATORY | LC1 BS | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |
| SELENIUM, TOTAL | MB1 | W | 07L0621 | N/A | 12/12/07 | 12/13/07 |

LIONVILLE LABORATORY INC.

Analytical Report

**Client:** TNU-HANFORD RC-007
**LVL#:** 0712L308
**SDG/SAF#:** K1050/RC-007

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 12-11-07

**METALS CASE NARRATIVE**

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) 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 water samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Sample J16386 was reported with a 6-fold dilution for ICP metals due to sample matrix.

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

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

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

6. All preparation/method blanks were within method criteria {greater than the Limit of Quantitation (3-10X the LOD) and samples less than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

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

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

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 14 pages.

10. 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 |
|---|---|---|---|
| J16386 | Barium | 100 | 93.6 |
| | Chromium | 100 | 79.5 |

11. All duplicate analyses were wihtin the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has 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.

13. LvLI 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.

14. 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 Incorporated

12/19/07
Date

jjw/m12-308

LVLI
LIONVILLE LABORATORY INC.

# METALS METHOD GLOSSARY

he following methods are used as reference for the digestion and analysis of samples contained within th
ot#: 0712L308

eaching Procedure: __1310 __1311 __1312 __Other:_____

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

letals Digestion Methods: X 3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

## Metals Analysis Methods

| | SW846 | | EPA | | STD MTD | EPA OSWR | USATHAMA |
|---|---|---|---|---|---|---|---|
| luminum | __6010B | | __200.7 | | | | __99 |
| ntimony | __6010B | __7041 [5] | __200.7 | __204.2 | | | __99 |
| rsenic | X 6010B | __7060A [5] | __200.7 | __206.2 | __3113B | | __99 |
| arium | X 6010B | | __200.7 | | | | __99 |
| eryllium | __6010B | | __200.7 | | | | __99 |
| ismuth | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| oron | __6010B | | __200.7 | | | | __99 |
| admium | X 6010B | __7131A [5] | __200.7 | __213.2 | | | __99 |
| alcium | __6010B | | __200.7 | | | | __99 |
| hromium | X 6010B | __7191 [5] | __200.7 | __218.2 | | | __SS17 |
| obalt | __6010B | | __200.7 | | | | __99 |
| opper | __6010B | __7211 [5] | __200.7 | __220.2 | | | __99 |
| ron | __6010B | | __200.7 | | | | __99 |
| ead | X 6010B | __7421 [5] | __200.7 | __239.2 | __3113B | | __99 |
| ithium | __6010B | __7430 [4] | __200.7 | | | __1620 | __99 |
| agnesium | __6010B | | __200.7 | | | | __99 |
| anganese | __6010B | | __200.7 | | | | __99 |
| ercury | X 7470A [3] | __7471A [3] | __245.1 [2] | __245.5 [2] | | | __99 |
| olybdenum | __6010B | | __200.7 | | | | __99 |
| ickel | __6010B | | __200.7 | | | | __99 |
| otassium | __6010B | __7610 [4] | __200.7 | __258.1 [4] | | | __99 |
| are Earths | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| elenium | X 6010B | __7740 [5] | __200.7 | __270.2 | __3113B | | __99 |
| ilicon | __6010B [1] | | __200.7 | | | __1620 | __99 |
| ilica | __6010B | | __200.7 | | | __1620 | __99 |
| ilver | X 6010B | __7761 [5] | __200.7 | __272.2 | | | __99 |
| odium | __6010B | __7770 [4] | __200.7 | __273.1 [4] | | | __99 |
| trontium | __6010B | | __200.7 | | | | __99 |
| hallium | __6010B | __7841 [5] | __200.7 | __279.2 __200.9 | | | __99 |
| in | __6010B | | __200.7 | | | | __99 |
| itanium | __6010B | | __200.7 | | | | __99 |
| ranium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| anadium | __6010B | | __200.7 | | | | __99 |
| inc | __6010B | | __200.7 | | | | __99 |
| irconium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |

ther:_____ Method:_____

L-WI-033/M-03/01
000000005

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

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

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

## ABBREVIATIONS

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

## ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

L-WI-033/N-04/98

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/18/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -001 | J16385 | Silver, Total | 1.0 | u | UG/L | 1.0 | 1.0 |
| | | Arsenic, Total | 5.0 | u | UG/L | 5.0 | 1.0 |
| | | Barium, Total | 20.4 | | UG/L | 1.0 | 1.0 |
| | | Cadmium, Total | 0.50 | u | UG/L | 0.50 | 1.0 |
| | | Chromium, Total | 2.0 | u | UG/L | 2.0 | 1.0 |
| | | Mercury, Total | 0.06 | u | UG/L | 0.06 | 1.0 |
| | | Lead, Total | 3.0 | u | UG/L | 3.0 | 1.0 |
| | | Selenium, Total | 6.0 | u | UG/L | 6.0 | 1.0 |
| -002 | J16386 | Silver, Total | 6.0 | u | UG/L | 6.0 | 6.0 |
| | | Arsenic, Total | 41.8 | | UG/L | 30.0 | 6.0 |
| | | Barium, Total | 29.6 | | UG/L | 6.0 | 6.0 |
| | | Cadmium, Total | 15.9 | | UG/L | 3.0 | 6.0 |
| | | Chromium, Total | 3320 | | UG/L | 12.0 | 6.0 |
| | | Mercury, Total | 0.1 | | UG/L | 0.06 | 1.0 |
| | | Lead, Total | 141 | | UG/L | 18.0 | 6.0 |
| | | Selenium, Total | 36.0 | u | UG/L | 36.0 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/18/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK1 | 07L0621-MB1 | Silver, Total | 1.0 | u | UG/L | 1.0 | 1.0 |
| | | Arsenic, Total | 5.0 | u | UG/L | 5.0 | 1.0 |
| | | Barium, Total | 1.0 | u | UG/L | 1.0 | 1.0 |
| | | Cadmium, Total | 0.50 | u | UG/L | 0.50 | 1.0 |
| | | Chromium, Total | 2.0 | u | UG/L | 2.0 | 1.0 |
| | | Lead, Total | 3.0 | u | UG/L | 3.0 | 1.0 |
| | | Selenium, Total | 6.0 | u | UG/L | 6.0 | 1.0 |
| BLANK1 | 07C0223-MB1 | Mercury, Total | 0.06 | u | UG/L | 0.06 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/18/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | J16385 | Mercury, Total | 1.1 | 0.06u | 1.0 | 111.2 | 1.0 |
| -002 | J16386 | Silver, Total | 45.4 | 6.0 u | 50.0 | 90.7 | 6.0 |
| | | Arsenic, Total | 1910 | 41.8 | 2000 | 93.4 | 6.0 |
| | | Barium, Total | 1300 | 29.6 | 2000 | 63.6 | 6.0 |
| | | Cadmium, Total | 58.3 | 15.9 | 50.0 | 84.8 | 6.0 |
| | | Chromium, Total | 3580 | 3320 | 200 | 128.3* | 6.0 |
| | | Lead, Total | 555 | 141 | 500 | 82.8 | 6.0 |
| | | Selenium, Total | 1710 | 36.0 u | 2000 | 85.6 | 6.0 |

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/18/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | J16385 | Silver, Total | 1.0 u | 1.0 u | NC | 1.0 |
| | | Arsenic, Total | 5.0 u | 5.0 u | NC | 1.0 |
| | | Barium, Total | 20.4 | 20.1 | 1.6 | 1.0 |
| | | Cadmium, Total | 0.50u | 0.50u | NC | 1.0 |
| | | Chromium, Total | 2.0 u | 2.0 u | NC | 1.0 |
| | | Mercury, Total | 0.06u | 0.06u | NC | 1.0 |
| | | Lead, Total | 3.0 u | 3.0 u | NC | 1.0 |
| | | Selenium, Total | 6.0 u | 6.0 u | NC | 1.0 |

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/18/07

CLIENT: TNUHANFORD RC-007 K1050 LVL LOT #: 0712L308

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

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 07L0621-LC1 | Silver, LCS | 441 | 500 | UG/L | 88.3 |
| | | Arsenic, LCS | 8860 | 10000 | UG/L | 88.6 |
| | | Barium, LCS | 4420 | 5000 | UG/L | 88.4 |
| | | Cadmium, LCS | 220 | 250 | UG/L | 87.8 |
| | | Chromium, LCS | 430 | 500 | UG/L | 86.1 |
| | | Lead, LCS | 2220 | 2500 | UG/L | 88.8 |
| | | Selenium, LCS | 8890 | 10000 | UG/L | 88.9 |
| LCS1 | 07C0223-LC1 | Mercury, LCS | 5.6 | 5.0 | UG/L | 112.2 |

ville Laboratory
orporated

# MERCURY PREPARATION

Logbook # 0386

Analyst: TLB / KMC
Date: 12/12/07
Start Time/Temp: 1415 / 97°
End Time/Temp: 1615 / 93°

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

Prep Batch: 07C0223
Worksheet: HG121301
OP No. ME-HgCVAA, Rev. 02

pH < 2 for Liquids? ✓ Yes __ No (If no: designate affected samples in Comments column, and initiate an SDR)

**NOTE: The Inital/Final Volume for water samples = 33mL, unless otherwise noted.**
**The Final volume for soil samples = 50mL, unless otherwise noted.**

| LvLI Batch # | Container Number | Spike Volume (mL) | Spike Conc. (µg/L) | Initial Wt. or Volume (g or mL) | Final Sample Volume (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| Blanks | 3VG | | | 33mL | 33mL | |
| 0.2 ug/L | PT | 0.067 | | | | |
| 1.0 | X3 | 0.333 | | | | |
| 2.0 | A11 | 0.667 | | | | |
| 5.0 | S | 1.667 | | | | |
| 10.0 | NB | 3.333 | | | | |
| ICV | C7 | 0.0834 | 2.5 | | | |
| CCV | R2 | 0.167 | 5.0 | | | |
| ICB/CCB | 503 | | | | | |
| MB1 | 88 | | | | | PBW123 |
| LC1 | 41 | 0.167 | 5.0 | | | LCSW123 |
| 0712L293-001 | 6T | | | 16.5mL | | lmt'd vol. |
| -001R | P18 | | | | | |
| -001S | JI | 0.334 | 1.0 | | | |
| 0712L308-001 | 222 | | | 33mL | | |
| -001R | K35 | | | | | |
| -001S | 55 | 0.334 | 1.0 | | | |
| -002 | A27 | | | | | |
| 0712L273-003 | 290 | | | 16.5mL | | lmt'd vol. |
| -003R | 8H | | | | | |
| -003S | N4 | 0.334 | 1.0 | | | |
| 0712L304-005 | AHA | | | 33mL | | |
| -005R | 27 | | | | | |
| -005S | 1721 | 0.334 | 1.0 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

12/13/12/12/07

| Standard: | ID | Prep Date/Time |
|---|---|---|
| LCMS | R16072-75-07B | 12/12/07 1230 |
| LCCV/LCS | US 6072-75-08A | ↓ |

Reviewed By/Date: [signature] 12/14/07

see book # 936X for std traceability information

LCS =US Metals in soil No.3; True Value = 4.70 mg/Kg
Lot # 1RM-021, Lot # E021

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

**Lionville Laboratory Incorporated** Logbook #: 

# SAMPLE DIGESTION RECORD

Digestion Batch #: 07L0621
Date/Time Initiated: 12/12/07 8:00AM
Date/Time Completed: 12/12/07 11:00AM
Analyst(s): MW/KMC
Matrix: Soil / Water Other:
Instr. Type: AA ICP
Parameters: See backup

Digested / Undigested (circle one)
Balance #: 
Balance Cal Verif: Y NA
Hot Plate Temp: 90

SOP: L-SPI-3020 Rev. 00

Method: SW (circle)
- 3005A
- 3010A
- 3015
- 3020A
- 7060A (As/Se)
- 7760A (Ag)
- 3050B
- 3051

DW: 200.7 (1994), 200.9, 3113B

MCAWW: 200.7 (1982), 200 (AA), 206.2 (As/Se)

SM: 3030C (NC)

CLP: ILMO3.0, ILMO4.0

Other: Glass

TWL

| COC Batch # | Spike Vol(s) (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/So/TC | Texture | Color/Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 07L0308-001 | | 100mL | 100mL | L7 | TO | N/A | Clear/colorless | N/A | N/A |
| -002R | | | | | | | | | |
| -003 | | | | | | | | | |
| -003S | 1.0mL | | | | | | | | |
| 07L0621-MB1 | | | | | | | | | |
| -LC1 | 1.0mL | | | | | | | | |

KMC 12/12/07

Spiking IDs: 8100-04-01
MS #: -02
-03
(003)2-003S -01
LCS #: -02
-03
-04
-05

Reagent IDs:
- $HNO_3$: E2C035
- HCL: E330033
- $H_2O_2$
- 1:1 $HNO_3$
- 1:1 HCL

File ID#: IC 062101
LIMS Transfer: Y N updated
Data Review By/Date: 12/17/07

onville Laboratory Use Only
7/12L308

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

VLI

ent TNU Hanford RC-007
. Final Proj. Sampling Date
ject# 11343-606-001-9999-00
ject Contact/Phone#
onville Laboratory Project Manager O Johnson
SW846 Del STD TAT 3 7days 3days
12-11-07
te Rec'd 12-11-07 Date Due 12-18-07

| | | A | | | | | | | | | B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | | | | | | 3 | | | 3 | | | | |
| #/Type Container | Liquid / Solid | | | | | | | 1P | | | 1P | | | | |
| Volume | | | | | | | | 500 | | | 500 | | | | |
| Preservatives | | | | | | | | HNO3 | | | — | | | | |
| ANALYSES REQUESTED | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | | INORG: ICP Metal | Hg | CN | pH | | | | |
| | Lionville Laboratory Use Only | | | | | | | RCRA | | | IPH | | | | |

TRIX DES: Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP Leachate, Wipe, Other, Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | RCRA | IPH |
|---|---|---|---|---|---|---|---|---|
| 001 | I16385 | | | W | 12-7-7 | 1258 | X | X |
| 002 | I16386 | | | ⊥ | ⊥ | 1300 | X | X |

Special Instructions: Run matrix QC.

Special Instructions:
12-11-07 1. Client changed TAT TO 3days
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 12/11/7 | 0935 |

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

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

000000014

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | RC-007-022 | Page 1 of 1 |
|---|---|---|---|---|
| Collector: Hood/ Sherman | Company Contact: James Crocker | Telephone No.: 373-9733 | Project Coordinator: KESSNER, JH | Price Code: 7K | Data Turnaround: ~~15~~ 7 Days 12/3/07 |
| Project Designation: 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re | Sampling Location: 108N/163N Chemical Transfer Lines | | SAF No.: RC-007 | |
| Ice Chest No.: AFS-04-006 ~~A080104~~ 12-10-07 | Field Logbook No.: EL-1516-12 | COA: R108N01000 | Method of Shipment: FED EX | |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: A080104 12-10-07 | | Bill of Lading/Air Bill No.: See OSPC | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

potential Acidic or Caustic

**Special Handling and/or Storage**

*RCF Screen*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | HNO3 to pH <2 | HNO3 to pH <2 | None | HNO3 to pH <2 | Cool 4C | | | | | | |
| Type of Container | G/P | G/P | G/P | G/P | P | | | | | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Volume | 1000mL | 1000mL | 60mL | 500mL | 500mL | | | | | | |
| SAMPLE ANALYSIS | Gross Alpha; Gross Beta | See item (1) in Special Instructions. | RCF Shipping Screen | See item (2) in Special Instructions. | See item (3) in Special Instructions. | | | | | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| J16385 / WATER / 12-05-07 / 1258 | Y | Y | Y | Y | Y | | | | | | |
| J16386 / WATER / 12-05-07 / 1304 | Y | Y | | Y | Y | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: Jerry Sherman | 12-5-07 1330 | Received By/Stored In: Amy [illegible] | 12/5/07 1330 |
| Relinquished By/Removed From: A. [illegible] | 12-5-07 1620 | Received By/Stored In: 3728 2A | 12/5/07 1620 |
| Relinquished By/Removed From: 3728 2A | 12-10-07 0915 | Received By/Stored In: [illegible] | 12-10-07 0915 |
| Relinquished By/Removed From: [illegible] | 12-10-07 1500 | Received By/Stored In: FED EX | |
| Relinquished By/Removed From: FedEx | 12-11-07 0935 | Received By/Stored In: [illegible] | 12-11-07 0935 |
| Relinquished By/Removed From | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Antimony-125, Barium-133, Radium-226, Radium-228}
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ~~ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc}~~; Mercury - 7470 - (CV) 12/3/07
(3) ~~IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}~~; pH (Water) - 9040 11/27/07

samples from 3728 Ref # 29.
3728 Custodian removed samples for shipping on 12/10/07.
Sampler unavailable to relinquish

**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

000000015

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU HANFORD

Project/SAF/SOW/Release #: BC-030

Date: 12-1-07

LvLI Batch #: 0712L307

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FedEx | | AirBill # 7904 0023 8567 |
| 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 plastic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 2-7 °C | | Cooler # AFS-04-006 |
| 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 & LvLI) 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 | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI 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 _____

lvl