





28 March 2006



Joan Kessner  
WC-Hanford  
3190 Washington Way  
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 #	0602L287
SDG #	K0224
SAF #	RC-032
Date Received	2/16/06
# Samples	5
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
PAH	
DRO/KRO/GRO	
GC Alcohols	
Herbicides	
Metals	
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

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD RC-032 K0224



DATE RECEIVED: 02/16/06

LVL LOT # : 06025287

CLIENT ID / ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J117M8						
% SOLIDS	001	S	06L&S014	02/14/06	02/21/06	02/22/06
CHROMIUM VI	001	S	06LVI012	02/14/06	02/27/06	02/27/06
CHROMIUM VI	001 REP	S	06LVI012	02/14/06	02/27/06	02/27/06
CHROMIUM VI	001 MS	S	06LVI012	02/14/06	02/27/06	02/27/06
CHROMIUM VI	001 MSD	S	06LVI012	02/14/06	02/27/06	02/27/06
J117M9						
% SOLIDS	002	S	06L&S014	02/14/06	02/21/06	02/22/06
CHROMIUM VI	002	S	06LVI012	02/14/06	02/27/06	02/27/06
J117N0						
% SOLIDS	003	S	06L&S014	02/14/06	02/21/06	02/22/06
CHROMIUM VI	003	S	06LVI012	02/14/06	02/27/06	02/27/06
J117N1						
% SOLIDS	004	S	06L&S014	02/14/06	02/21/06	02/22/06
CHROMIUM VI	004	S	06LVI012	02/14/06	02/27/06	02/27/06
J117N2						
% SOLIDS	005	S	06L&S014	02/14/06	02/21/06	02/22/06
CHROMIUM VI	005	S	06LVI012	02/14/06	02/27/06	02/27/06
LAB QC:						
CHROMIUM VI	MB1	S	06LVI012	N/A	02/27/06	02/27/06
CHROMIUM VI	MB1 BS	S	06LVI012	N/A	02/27/06	02/27/06
CHROMIUM VI	MB1 BSD	S	06LVI012	N/A	02/27/06	02/27/06



**Analytical Report**

**Client:** TNU-HANFORD RC-032 K0224  
**LVL#:** 0602L287

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 02-16-06

**INORGANIC NARRATIVE**

1. This narrative covers the analyses of 5 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.  

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blank for Chromium VI was within the method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

3/24/06  
Date

njpl02-287

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 11 pages.

**Lionville Laboratory Incorporated**

**WET CHEMISTRY**

**METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS**

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

## 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 03/06/06

CLIENT: TNUHANFORD RC-032 K0224  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L287

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J117M8	% Solids	97.4	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-002	J117M9	% Solids	97.5	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.20	1.0
-003	J117N0	% Solids	96.5	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-004	J117N1	% Solids	98.7	%	0.01	1.0
		Chromium VI	0.22	MG/KG	0.20	1.0
-005	J117N2	% Solids	97.3	%	0.01	1.0
		Chromium VI	0.25	MG/KG	0.21	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/06/06

CLIENT: TNUHANFORD RC-032 K0224  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L287

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI012-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/06/06

CLIENT: TNUHANFORD RC-032 K0224  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L287

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J117M8	Soluble Chromium VI	4.3	0.20u	4.1	102.1	1.0
		Insoluble Chromium VI	1210	0.20u	1070	113.4	100
BLANK10	06LVI012-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.2	1.0
		Insoluble Chromium VI	1110	0.20u	1080	102.5	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/06/06

CLIENT: TNUHANFORD RC-032 K0224  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L287

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J117M8	Chromium VI	0.20u	0.20u	NC	1.0



Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-032-012	Page 1 of 1
Collector Coffman/Stankovich	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH		Price Code SL	Data Turnaround 21 days	
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sample Location 116-F-8 Overburden		SAF No. RC-032	Air Quality <input type="checkbox"/>			
Ice Chest No. AFS-04-054	Field Logbook No. EFL-1174	COA R116F82000	Method of Shipment FedEx				
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060289		Bill of Lading/Air Bill No. See OSPC				
POSSIBLE SAMPLE HAZARDS/REMARKS NA < DOT Limits				Preservation	Cool 4C	None	
Special Handling and/or Storage of 4 degrees C				Type of Container	G/P	G/P	
				No. of Container(s)	1	10 E	
				Volume	60mL	500mL	
SAMPLE ANALYSIS				Chromium Hex - 7196	See App (1) in Special Instructions.		
Sample No.	Matrix *	Sample Date	Sample Time				
J117M8	SOIL	2-14-06	0720	X			
J117M9	SOIL	2-14-06	0735	X			
J117N0	SOIL	2-14-06	0745	X			
J117N1	SOIL	2-14-06	0755	X			
J117N2	SOIL	2-14-06	0720	X			
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS		
Relinquished By/Removed From <i>MCC</i>	Date/Time 1415	Received By/Stored In <i>3728/2C</i>	Date/Time 2/14/06	1415	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable)  Personnel not available to Relinquish samples from 3728 Ref # <u>2C</u> on <u>2/15/06</u>		
Relinquished By/Removed From <i>3728/2C</i>	Date/Time 2-15-06	Received By/Stored In <i>R2 Steffler R.P. Staff</i>	Date/Time 1100	2-15-06			
Relinquished By/Removed From <i>R2 Steffler R.P. Staff</i>	Date/Time 1600	Received By/Stored In <i>Fed Ex</i>	Date/Time				
Relinquished By/Removed From <i>Joe C</i>	Date/Time 2-16-06	Received By/Stored In <i>D. Smith</i>	Date/Time 0915	2-16-06			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				
LABORATORY SECTION	Received By	Title		Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time			

**Lionville Laboratory Incorporated  
SAMPLE RECEIPT CHECKLIST (SRC)**

CLIENT: TNU Hanford

Date: 2-16-06

Purchase Order / Project# /  
SAF# / SOW# / Release #: RC-032

LvLI Batch #: 06026287

Sample Custodian: J. Spruiell

NOTE: EXPLAIN ALL DISCREPANCIES

- |                                                                                                                             |                                                                     |                                                      |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------|
| 1. Samples Hand Delivered or <u>Shipped</u>                                                                                 | Carrier <u>Red Ex</u>                                               | Airbill# 7918 6271 0232                              |
| 2. Custody seals on coolers or shipping container intact, signed and dated?                                                 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals      Comments      |
| 3. Outside of coolers or shipping containers are free from damage?                                                          | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 5. Samples received <u>cooled</u> or ambient?<br><u>IR</u>                                                                  | Temp <u>2.3 °C</u>                                                  | Cooler # <u>AFS-04-054</u>                           |
| 6. Custody seals on sample containers intact, signed and dated?                                                             | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals                    |
| 7. coc signed and dated?                                                                                                    | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 8. Sample containers are intact?                                                                                            | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 9. All samples on coc received? All samples received on coc?                                                                | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 10. All sample label information matches coc?                                                                               | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 11. Samples properly preserved?                                                                                             | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 12. Samples received within hold times? Short holds taken to wet lab?                                                       | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 13. VOA, TOC, TOX free of headspace?                                                                                        | <input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A              |
| 14. QC stickers placed on bottles designated by client?                                                                     | <input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A              |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)     | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                                                      |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)                             | <input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> No Discrepancies |

SR-002-B





**EBERLINE**  
SERVICES



March 6, 2006

Ms. Joan Kessner  
Washington Closure Hanford  
3190 George Washington Way  
MSIN H9-02  
Richland, WA 99352

Reference: **P.O. #630**  
**Eberline Services R6-02-105-7388, SDG K0224**

Dear Ms. Kessner:

Enclosed is the data report for five solid samples designated under SAF No. RC-032 received at Eberline Services on February 16, 2006. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

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](http://www.eberlineservices.com)

**1.0 GENERAL**

Washington Closure Hanford (WCH) Sample Delivery Group K0224 was composed of five solid (soil) samples designated under SAF No. RC-032 with a Project Designation of: 100-F Remaining Sites Burial Grounds – Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on March 6, 2006.

**2.0 ANALYSIS NOTES**

**2.1 Gamma Spectroscopy**

No problems were encountered during the course of the analyses.

**Case Narrative Certification Statement**

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

  
\_\_\_\_\_  
Melissa C. Mannion  
Senior Program Manager

3/6/06  
\_\_\_\_\_  
Date

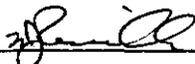
EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP K0224

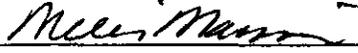
SDG 7388  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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	
About this section	1
Sample Summaries	3
Prep Batch Summary	5
Work Summary	6
Method Blanks	8
Lab Control Samples	9
Duplicates	10
Data Sheets	11
Method Summaries	16
Report Guides	17
End of Section	31

  
Prepared by

  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG K0224

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.

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

**SAMPLE SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF CUSTODY	COLLECTED
				SAMPLE ID	SAF NO		
J117M8	116-F-8 Overburden	SOLID		R602105-01	RC-032	RC-032-012	02/14/06 07:20
J117M9	116-F-8 Overburden	SOLID		R602105-02	RC-032	RC-032-012	02/14/06 07:35
J117N0	116-F-8 Overburden	SOLID		R602105-03	RC-032	RC-032-012	02/14/06 07:45
J117N1	116-F-8 Overburden	SOLID		R602105-04	RC-032	RC-032-012	02/14/06 07:55
J117N2	116-F-8 Overburden	SOLID		R602105-05	RC-032	RC-032-012	02/14/06 07:20
Method Blank		SOLID		R602105-07	RC-032		
Lab Control Sample		SOLID		R602105-06	RC-032		
Duplicate (R602105-04)	116-F-8 Overburden	SOLID		R602105-08	RC-032		02/14/06 07:55

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-CS  
 Version 3.06  
 Report date 03/06/06

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7388	RC-032-012	J117M8	SOLID	97.3	649 g		02/16/06	2	R602105-01	7388-001
		J117M9	SOLID	97.1	654 g		02/16/06	2	R602105-02	7388-002
		J117N0	SOLID	96.3	622 g		02/16/06	2	R602105-03	7388-003
		J117N1	SOLID	97.8	671 g		02/16/06	2	R602105-04	7388-004
		J117N2	SOLID	97.2	633 g		02/16/06	2	R602105-05	7388-005
		Method Blank	SOLID						R602105-07	7388-007
		Lab Control Sample	SOLID						R602105-06	7388-006
		Duplicate (R602105-04)	SOLID	97.8	671 g		02/16/06	2	R602105-08	7388-008

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 03/06/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

TEST	MATRIX	METHOD	PREPARATION ERROR				PLANCHETS ANALYZED			QUALI-
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	
Gamma Spectroscopy										
GAM	SOLID	Gamma Scan	7169-165	15.0	5			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 03/06/06

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

**WORK SUMMARY**

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	COLLECTED	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD
LOCATION		RECEIVED	PLANCHET		FIX				
CUSTODY	SAF No								
J117M8		R602105-01	7388-001	GAM		02/24/06	02/28/06	CSS	Gamma Scan
116-F-8 Overburden	SOLID	02/14/06							
RC-032-012	RC-032	02/16/06							
J117M9		R602105-02	7388-002	GAM		02/24/06	02/28/06	CSS	Gamma Scan
116-F-8 Overburden	SOLID	02/14/06							
RC-032-012	RC-032	02/16/06							
J117N0		R602105-03	7388-003	GAM		02/24/06	02/28/06	CSS	Gamma Scan
116-F-8 Overburden	SOLID	02/14/06							
RC-032-012	RC-032	02/16/06							
J117N1		R602105-04	7388-004	GAM		02/27/06	02/28/06	CSS	Gamma Scan
116-F-8 Overburden	SOLID	02/14/06							
RC-032-012	RC-032	02/16/06							
J117N2		R602105-05	7388-005	GAM		02/24/06	02/28/06	CSS	Gamma Scan
116-F-8 Overburden	SOLID	02/14/06							
RC-032-012	RC-032	02/16/06							
Method Blank	SOLID	R602105-07	7388-007	GAM		02/25/06	02/28/06	CSS	Gamma Scan
	RC-032								
Lab Control Sample	SOLID	R602105-06	7388-006	GAM		02/25/06	02/28/06	CSS	Gamma Scan
	RC-032								
Duplicate (R602105-04)	SOLID	R602105-08	7388-008	GAM		02/25/06	02/28/06	CSS	Gamma Scan
116-F-8 Overburden	SOLID	02/14/06							
	RC-032	02/16/06							

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-CWS  
 Version 3.06  
 Report date 03/06/06

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

**WORK SUMMARY, cont.**

SDG 738B  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	RC-032	Gamma Scan	GAMMA_GS	5			1	1	1	8
TOTALS				5			1	1	1	8

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

Page 7

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-CWS  
 Version 3.06  
 Report date 03/06/06

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K0224**

R602105-07

Method Blank

**METHOD BLANK**

SDG <u>7388</u>	Client/Case no <u>Hanford</u>	SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602105-07</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7388-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-032</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	U		1.1		U	GAM
Cobalt 60	10198-40-0	U		<u>0.071</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.11</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.27</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.15</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.18</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.14</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.084		U	GAM
Thorium 232	TH-232	U		0.27		U	GAM
Uranium 235	15117-96-1	U		0.23		U	GAM
Uranium 238	U-238	U		7.4		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM
Silver 108m	14391-65-2	U		0.045		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

QC-BLANK #56182

**METHOD BLANKS**

Page 1

**SUMMARY DATA SECTION**

Page 8

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

R602105-06

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7388</u>	Client/Case no <u>Hanford</u> SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>
Lab sample id <u>R602105-06</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7388-006</u>	Material/Matrix <u>SOLID</u>
	SAF No <u>RC-032</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS
Cobalt 60	2.84	0.28	<u>0.15</u>	0.050	GAM	2.78	0.11	102	72-128	80-120
Cesium 137	3.02	0.23	<u>0.15</u>	0.10	GAM	2.82	0.11	107	72-128	80-120

100F RemainsSitesBurialGrnd-SoilFullP

QC-LCS #56181
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

R602105-08

J117N1

**DUPLICATE**

SDG <u>7388</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R602105-08</u> Dept sample id <u>7388-008</u> % solids <u>97.8</u>	ORIGINAL Lab sample id <u>R602105-04</u> Dept sample id <u>7388-004</u> Received <u>02/16/06</u> % solids <u>97.8</u>	Client/Case no <u>Hanford</u> SDG <u>K0224</u> Contract No. <u>630</u> Client sample id <u>J117N1</u> Location/Matrix <u>116-F-8 Overburden</u> <u>SOLID</u> Collected/Weight <u>02/14/06 07:55</u> <u>671 g</u> Custody/SAF No <u>RC-032-012</u> <u>RC-032</u>
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ANALYTE	DUPLICATE		MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
	pCi/g	2σ ERR (COUNT)					pCi/g	2σ ERR (COUNT)					
Potassium 40	13.3	1.9	0.81			GAM	13.8	2.9	0.85		4	50	0.2
Cobalt 60	U		<u>0.085</u>	0.050	U	GAM	U		<u>0.090</u>	U	-		0.1
Cesium 137	U		0.094	0.10	U	GAM	U		0.087	U	-		0.1
Radium 226	0.327	0.17	<u>0.19</u>	0.10		GAM	0.408	0.19	<u>0.18</u>		22	109	0.6
Radium 228	0.669	0.36	<u>0.31</u>	0.20		GAM	0.700	0.37	<u>0.34</u>		5	118	0.1
Europium 152	U		<u>0.22</u>	0.10	U	GAM	U		<u>0.20</u>	U	-		0.1
Europium 154	U		<u>0.37</u>	0.10	U	GAM	U		<u>0.30</u>	U	-		0.3
Europium 155	U		<u>0.22</u>	0.10	U	GAM	U		<u>0.25</u>	U	-		0.2
Thorium 228	0.547	0.10	0.12			GAM	0.401	0.13	0.15		31	61	1.5
Thorium 232	0.669	0.36	0.31			GAM	0.700	0.37	0.34		5	118	0.1
Uranium 235	U		0.31		U	GAM	U		0.30	U	-		0
Uranium 238	U		14		U	GAM	U		11	U	-		0.3
Americium 241	U		0.24		U	GAM	U		0.31	U	-		0.4
Silver 108m	U		0.064		U	GAM	U		0.061	U	-		0.1

100F RemainSitesBurialGrnd-SoilFullP

QC-DUP#4 56183

**DUPLICATES**

Page 1

**SUMMARY DATA SECTION**

Page 10

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-DUP  
 Version 3.06  
 Report date 03/06/06

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K0224**

R602105-01

J117M8

**DATA SHEET**

SDG <u>7388</u>	Client/Case no <u>Hanford</u>	SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602105-01</u>	Client sample id <u>J117M8</u>	
Dept sample id <u>7388-001</u>	Location/Matrix <u>116-F-8 Overburden</u>	<u>SOLID</u>
Received <u>02/16/06</u>	Collected/Weight <u>02/14/06 07:20</u>	<u>649 g</u>
% solids <u>97.3</u>	Custody/SAF No <u>RC-032-012</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	9.73	1.4	1.1			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.350	0.19	0.18	0.10		GAM
Radium 228	15262-20-1	U		0.47	0.20	U	GAM
Europium 152	14683-23-9	U		0.32	0.10	U	GAM
Europium 154	15585-10-1	U		0.34	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	0.666	0.15	0.15			GAM
Thorium 232	TH-232	U		0.47		U	GAM
Uranium 235	15117-96-1	U		0.35		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM
Silver 108m	14391-65-2	U		0.074		U	GAM

100F RemainsitesBurialGrnd-SoilFullP

**DATA SHEETS**

Page 1

**SUMMARY DATA SECTION**

Page 11

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K0224**

R602105-02

J117M9

**DATA SHEET**

SDG <u>7388</u>	Client/Case no <u>Hanford</u>	SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602105-02</u>	Client sample id <u>J117M9</u>	
Dept sample id <u>7388-002</u>	Location/Matrix <u>116-F-8 Overburden</u>	<u>SOLID</u>
Received <u>02/16/06</u>	Collected/Weight <u>02/14/06 07:35</u>	<u>654 g</u>
% solids <u>97.1</u>	Custody/SAF No <u>RC-032-012</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	U		1.9		U	GAM
Cobalt 60	10198-40-0	U		<u>0.061</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.051</u>	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.13</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.26</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.17</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.16</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.13</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.37		U	GAM
Thorium 232	TH-232	U		0.26		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		5.7		U	GAM
Americium 241	14596-10-2	U		0.17		U	GAM
Silver 108m	14391-65-2	U		0.036		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

Lab id <u>EBRINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K0224**

R602105-03

J117N0

**DATA SHEET**

SDG <u>7388</u>	Client/Case no <u>Hanford</u>	SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602105-03</u>	Client sample id <u>J117N0</u>	
Dept sample id <u>7388-003</u>	Location/Matrix <u>116-F-8 Overburden</u>	<u>SOLID</u>
Received <u>02/16/06</u>	Collected/Weight <u>02/14/06 07:45</u>	<u>622 g</u>
% solids <u>96.3</u>	Custody/SAF No <u>RC-032-012</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	4.10	2.8	0.60			GAM
Cobalt 60	10198-40-0	U		<u>0.059</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	0.151	0.12	<u>0.11</u>	0.10		GAM
Radium 228	15262-20-1	U		<u>0.45</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.14</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.19</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.16</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.399	0.11	0.093			GAM
Thorium 232	TH-232	U		0.45		U	GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		7.3		U	GAM
Americium 241	14596-10-2	U		0.20		U	GAM
Silver 108m	14391-65-2	U		0.036		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K0224**

R602105-04

J117N1

**DATA SHEET**

SDG <u>7388</u>	Client/Case no <u>Hanford</u>	SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602105-04</u>	Client sample id <u>J117N1</u>	
Dept sample id <u>7388-004</u>	Location/Matrix <u>116-F-8 Overburden</u>	<u>SOLID</u>
Received <u>02/16/06</u>	Collected/Weight <u>02/14/06 07:55</u>	<u>671 g</u>
% solids <u>97.8</u>	Custody/SAF No <u>RC-032-012</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	13.8	2.9	0.85			GAM
Cobalt 60	10198-40-0	U		0.090	0.050	U	GAM
Cesium 137	10045-97-3	U		0.087	0.10	U	GAM
Radium 226	13982-63-3	0.408	0.19	0.18	0.10		GAM
Radium 228	15262-20-1	0.700	0.37	0.34	0.20		GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.401	0.13	0.15			GAM
Thorium 232	TH-232	0.700	0.37	0.34			GAM
Uranium 235	15117-96-1	U		0.30		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM
Silver 108m	14391-65-2	U		0.061		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

**DATA SHEETS**

Page 4

**SUMMARY DATA SECTION**

Page 14

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K0224**

R602105-05

J117N2

**DATA SHEET**

SDG <u>7388</u>	Client/Case no <u>Hanford</u>	SDG <u>K0224</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602105-05</u>	Client sample id <u>J117N2</u>	
Dept sample id <u>7388-005</u>	Location/Matrix <u>116-F-8 Overburden</u>	<u>SOLID</u>
Received <u>02/16/06</u>	Collected/Weight <u>02/14/06 07:20</u>	<u>633 g</u>
% solids <u>97.2</u>	Custody/SAF No <u>RC-032-012</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	11.3	1.6	1.0			GAM
Cobalt 60	10198-40-0	U		<u>0.15</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.14</u>	0.10	U	GAM
Radium 226	13982-63-3	0.394	0.21	<u>0.22</u>	0.10		GAM
Radium 228	15262-20-1	U		<u>0.63</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.42</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.44</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.29</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.744	0.22	0.20			GAM
Thorium 232	TH-232	U		0.63		U	GAM
Uranium 235	15117-96-1	U		0.43		U	GAM
Uranium 238	U-238	U		16		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Silver 108m	14391-65-2	U		0.097		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

**DATA SHEETS**

Page 5

**SUMMARY DATA SECTION**

Page 15

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/06/06</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K0224

**METHOD SUMMARY**

GAMMA SCAN  
GAMMA SPECTROSCOPY

Test GAM Matrix SOLID  
SDG 7388  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Contract SDG K0224

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7169-165					
J117M8	R602105-01		7388-001	U	U
J117M9	R602105-02		7388-002	U	U
J117N0	R602105-03		7388-003	U	U
J117N1	R602105-04		7388-004	U	U
J117N2	R602105-05		7388-005	U	U
Method Blank	R602105-07		7388-007	U	U
Lab Control Sample	R602105-06		7388-006	ok	ok
Duplicate (R602105-04)	R602105-08		7388-008	- U	- U
Nominal values and limits from method RDLs (pCi/g) 0.050 0.10					
100F RemainsSitesBurialGrnd-SoilFullp					

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	PWHM keV	DRIFT keV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7169-165 2σ prep error 15.0 % Reference Lab Notebook No. 7162 pg.165																
J117M8	R602105-01		<u>21</u>	180				189		10	02/24/06	02/24	JR,04,00			
J117M9	R602105-02		<u>12</u>	191				189		10	02/24/06	02/24	JR,08,00			
J117N0	R602105-03		<u>12</u>	181				189		10	02/24/06	02/24	JR,02,00			
J117N1	R602105-04		<u>23</u>	195				106		13	02/24/06	02/27	JR,02,00			
J117N2	R602105-05		<u>29</u>	175				119		10	02/24/06	02/24	JR,04,00			
Method Blank	R602105-07		<u>16</u>	175				117			02/24/06	02/25	JR,05,00			
Lab Control Sample	R602105-06		<u>0.15</u>	175				116			02/24/06	02/25	JR,03,00			
Duplicate (R602105-04)	R602105-08		<u>20</u>	195				113		11	02/24/06	02/25	JR,03,00			
Nominal values and limits from method 0.050 175 100 180																

PROCEDURES REFERENCE GAMMA\_GS  
SPP-100 Ge(Li) Preparation for Commercial Samples, rev 7

AVERAGES ± 2 SD MDA 17 ± 18  
FOR 8 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

Page 16

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-CMS  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG K0224

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.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 17

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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.

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 18

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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.

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 19

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

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).

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

REPORT GUIDES

Page 4

SUMMARY DATA SECTION

Page 20

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
 Contract No. 630  
 Case no SDG\_K0224

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.

REPORT GUIDES

Page 5

SUMMARY DATA SECTION

Page 21

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG K0224

GUIDE, cont.

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.

REPORT GUIDES

Page 6

SUMMARY DATA SECTION

Page 22

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

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.

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 23

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG\_K0224

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.

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 24

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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.

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG\_K0224

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

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 26

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

GUIDE, cont.

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.

REPORT GUIDES

Page 11

SUMMARY DATA SECTION

Page 27

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

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'

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 28

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Case no SDG K0224

GUIDE , c o n t .

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.
- \* Preparation 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.

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/06/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

GUIDE , cont .

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0224

SDG 7388  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_K0224

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.

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 31

Lab id EBRINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/06/06

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-032-012		Page 1 of 1		
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409		Project Coordinator KESSNER, JH		Price Code 8L Data Turnaround		
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-8 Overburden		K0224 (7329)		SAF No. RC-032		Air Quality <input type="checkbox"/> 21 days		
Ice Chest No. ERC-01-030		Field Logbook No. EFL-1174		COA R116F82000		Method of Shipment FedEx				
Shipped To EBERLINE SERVICES LIONVILLE		Offsite Property No. A060303				Bill of Lading/Air Bill No. See ospc				
POSSIBLE SAMPLE HAZARDS/REMARKS NA < DOT Limits			Preservation	Cool 4C	None					
Special Handling and/or Storage all degrees C - no 2/14/06 None			Type of Container	G/P	G/P					
			No. of Container(s)	1	1					
			Volume	160mL	500mL					
SAMPLE ANALYSIS				Chromium Feb 21 96	See item (1) in Special Instructions					
Sample No.	Matrix *	Sample Date	Sample Time							
J117M8	SOIL	2-14-06	0720		X					
J117M9	SOIL	2-14-06	0735		X					
J117N0	SOIL	2-14-06	0745		X					
J117N1	SOIL	2-14-06	0755		X					
J117N2	SOIL	2-14-06	0720		X					
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From MTC Stankovich		Date/Time 2/14/06 1415	Received By/Stored In 3728/2C		Date/Time 2/14/06 1415	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable)				S=Soil SE=Sediment SO=Solid Sl=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WJ=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From 3728/2C		Date/Time 2-15-06 0845	Received By/Stored In RZ Steffler		Date/Time 2-15-06 0815	Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/15/06				
Relinquished By/Removed From RZ Steffler		Date/Time 2-15-06 1620	Received By/Stored In Fed Ex		Date/Time 2-15-06					
Relinquished By/Removed From Fed Ex		Date/Time 2/16/06 10:00	Received By/Stored In Alex Kennedy		Date/Time 2/16/06 10:00					
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time					
LABORATORY SECTION	Received By	Title			Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By			Date/Time					



**RICHMOND, CA LABORATORY**

**SAMPLE RECEIPT CHECKLIST**

Client: WIC HANFORD City RICHLAND State WA  
 Date/Time received 2/16/06 10:00 CoC No. RC-032-012  
 Container I.D. No. ERC-01-038 Requested TAT (Days) 21 P.D. Received Yes [ ] No [ ]

**INSPECTION**

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on snipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 5 Sample Matrix SOIL
7. Number of containers per sample: 1 (Or see CoC \_\_\_\_\_)
8. Samples are in correct container Yes [✓] No [ ]
9. Paperwork agrees with samples? Yes [✓] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
11. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH \_\_\_\_\_ Preservative \_\_\_\_\_
13. Describe any anomalies:  
 \_\_\_\_\_  
 \_\_\_\_\_
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_
15. Inspected by AK Date: 2/16/06 Time: 10:30

Customer Sample No.	cpm	mR/hr	Wide	Customer Sample No.	cpm	mR/hr	Wide

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_