

Data Validation Report for Fluor Hanford

VSR07-001
Project 200-UW-1 OU

Radiochemical Validation - Level C

Validation Performed By: Cheryl A. Schlessler Date: 10/05/2006

Validation Reviewed By: Carl Schlessler Date: 10/05/2006

Date: 05 October 2006
To: Fluor Hanford Inc. (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200-UW-1 Operable Unit, Soil from Trench between 216-U-8 and 216-U-12
Cribs
Subject: Radiochemical - Sample Data Group (SDG) W05004

INTRODUCTION

This memorandum presents the results of data validation for SDG W05004 prepared by Severn Trent Laboratories - Richland for radiochemical analysis. A list of samples validated along with the analytical method is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Method
B1KB53	9/10/06	Soil	C	SE79_SEP_IE_LSC
B1KB54	9/10/06	Soil	C	SE79_SEP_IE_LSC
B1KJ40	9/10/06	Soil	C	SE79_SEP_IE_LSC
B1KJ42	9/10/06	Soil	C	SE79_SEP_IE_LSC
B1KJ43	9/10/06	Soil	C	SE79_SEP_IE_LSC

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit, DOE/RL-2005-75, Rev. 0. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

• Holding Times and Sample Preservation

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 180 days, or five half-lives, whichever is shorter. There are no specific preservation requirements for radiochemical soil analysis.

All holding times were acceptable.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by reviewing laboratory control sample results, matrix spike sample results, and chemical recovery factors. Chemical recovery factors are determined through use of a carrier or tracer and provide assessment of the chemical separation process that is affected by the laboratory procedure, sample matrix, and/or interference. Chemical recovery factors are used to correct the sample concentration, uncertainty, and minimum detectable concentration results.

Laboratory Control Samples (LCSs)

An LCS was not performed for Se-79 analysis. The analytical laboratory stated in the case narrative that a Se-79 standard was not available at time of sample analysis. Therefore, all Se-79 sample results, which were non-detects, should be qualified as estimated and flagged "UJ."

Matrix Spike (MS) Samples

MS analysis was not required since the analytical method utilized a carrier to correct for chemical losses during sample preparation.

Carrier/Tracer Recovery Factors

All carrier recovery factors were acceptable.

- **Precision**

Precision is evaluated by reviewing laboratory and field duplicate sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Limits**

Reported minimum detectable concentrations (MDCs) are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDCs were below the CRDL.

- **Completeness**

SDG W05004 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of LCS analysis, all Se-79 results were qualified as estimates and flagged "UJ."

REFERENCES

FHI, Contract #29774, *Validation of Radiological and Chemical Analytical Data*, Fluor Hanford Incorporated, August 24, 2006.

DOE/RL-2005-75, Rev.0, *Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit*, December 2005.

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the FHI statement of work are as follows:

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.
- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDA. The data should be considered usable for decision-making purposes.
- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.
- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.
- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2
Summary of Data Qualification

Radiochemical Data Qualification Summary			
SDG W05004	Reviewer: AQA	Project: 200-UW-1	Page 1 of 1
Analyte	Qualifier	Samples Affected	Reason
Se-79	UJ	All	LCS not performed

Comments: None

Appendix 3

Annotated Laboratory Reports

Sample Results Summary

Date: 03-Oct-06

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 33415

SDG No: W05004

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
6263405	SE79_SEP_IE_LSC								
	B1KB53								
	JD35G2AA	SE-79	<i>UJ</i> 1.06E+00 +- 1.04E+00	U	pCi/g	46%	1.92E+00	1.00E+01	
	B1KB53 DUP								
	JD35G2AC	SE-79	3.55E-01 +- 5.95E-01	U	pCi/g	75%	1.12E+00	1.00E+01	100.0
	B1KB54								
	JD35M2AA	SE-79	<i>UJ</i> 4.27E-01 +- 5.45E-01	U	pCi/g	82%	1.02E+00	1.00E+01	
	B1KJ40								
	JD35R2AA	SE-79	<i>UJ</i> 8.50E-01 +- 5.72E-01	U	pCi/g	80%	1.04E+00	1.00E+01	
	B1KJ42								
	JD35V2AA	SE-79	<i>UJ</i> -2.42E-01 +- 9.41E-01	U	pCi/g	47%	1.84E+00	1.00E+01	
	B1KJ43								
	JD35X2AA	SE-79	<i>UJ</i> 5.08E-01 +- 1.17E+00	U	pCi/g	39%	2.23E+00	1.00E+01	
No. of Results: 6									

Cal
10/5/06

STL Richland RPD - Relative Percent Difference.
 rptSTLRchSaSummary2 V5.0.1
 A2002 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

STL RICHLAND

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Fluor Hanford
P.O. Box 1000, T6-03
Richland, WA 99352

October 3, 2006

Attention: John Trechter

SAF Number	:	R06-013
Date SDG Closed	:	September 11, 2006
Number of Samples	:	Five (5)
Sample Type	:	Soil
SDG Number	:	W05004
Data Deliverable	:	15 / 15-Day Summary

CASE NARRATIVE

I. Introduction

On September 11, 2006, five other solid samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned to lot J6I110179 and assigned the following laboratory ID number to correspond with the Fluor Hanford (FH) specific ID:

<u>FH ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
B1KB53	JD35G	SOIL	9/11/06
B1KB54	JD35M	SOIL	9/11/06
B1KJ40	JD35R	SOIL	9/11/06
B1KJ42	JD35V	SOIL	9/11/06
B1KJ43	JD35X	SOIL	9/11/06

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

Fluor Hanford
October 3, 2006

The requested analyses were:

Liquid Scintillation Counting
Selenium-79 by method RICH-RC-5043

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

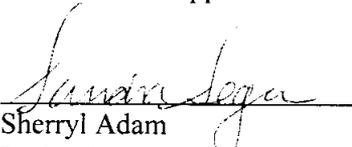
V. Comments

Gas Proportional Counting
Selenium-79 by method RICH-RC-5043

The blank failed on the first analysis. The samples were reanalyzed and were acceptable. There is currently not an available standard for Selenium 79 and an LCS was not analyzed. Except as note, the batch blank, sample and sample duplicate (B1KB53) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for 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.

Reviewed and approved:

for 
Sherryl Adam
Project Manager

Appendix 5

Data Validation Supporting Documentation

APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200-uw-1		DATA PACKAGE: W05004		
VALIDATOR:	CA Schloesslin	LAB: STLR	DATE: 10/5/06		
			SDG: W05004		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	5279 USC		
SAMPLES/MATRIX					
BIKBS3, BIKBS4, BIKJ40, BIKJ42 and BIKJ43					
all soil					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: None

2. Initial Calibration (Levels D, E)..... N/A

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E) N/A

Background Counts checked within required frequency? Yes No N/A

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

5. Blanks (Levels B, C, D, E)..... N/A

Method blank analyzed within required frequency?..... Yes No N/A

Method blank results acceptable?..... Yes No N/A

Analytes detected in method blank?..... Yes No N/A

Field blank(s) analyzed?..... Yes No N/A

Field blank results acceptable?..... Yes No N/A

Analytes detected in field blank(s)?..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes No N/A

Comments: None

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)..... N/A

LCS /BSS analyzed within required frequency?..... Yes No N/A

LCS/BSS recoveries acceptable?..... Yes No N/A

LCS/BSS traceable? (Levels D,E)..... Yes No N/A

LCS/BSS expired? (Levels D,E)..... Yes No N/A

LCS/BSS levels correct? (Levels D,E)..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes No N/A

Comments: LCS not analyzed - not all

7. Chemical Carrier Recovery (Levels C, D, E)..... N/A

Chemical carrier added?..... Yes No N/A

Chemical recovery acceptable?..... Yes No N/A

Chemical carrier traceable? (Levels D, E)..... Yes No N/A

Chemical carrier expired? (Levels D, E)..... Yes No N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No N/A

Comments: None

8. Tracer Recovery (Levels C, D, E)..... N/A

Tracer added? Yes No N/A

Tracer recovery acceptable?..... Yes No N/A

Tracer traceable? (Levels D, E)..... Yes No N/A

Tracer expired? (Levels D, E)..... Yes No N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E)..... N/A

Matrix spike analyzed?..... Yes No N/A

Spike recoveries acceptable?..... Yes No N/A

Spike source traceable? (Levels D, E) Yes No N/A

Spike source expired? Levels D, E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: Matrix spike not performed but carrier analysis acceptable.

10. Duplicates (Levels C, D, E) N/A

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: None

11. Field QC Samples (Levels C, D E) N/A

Field duplicate sample(s) analyzed? Yes No N/A

Field duplicate RPD values acceptable? Yes No N/A

Field split sample(s) analyzed? Yes No N/A

Field split RPD values acceptable? Yes No N/A

Performance audit sample(s) analyzed? Yes No N/A

Performance audit sample results acceptable? Yes No N/A

Comments: No field QC

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: None

13. Results and Detection Limits (All Levels) N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data?(Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E)..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits?..... Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: None

Appendix 6

Additional Documentation Requested By Client

FORM II

Date: 03-Oct-06

DUPLICATE RESULTS

Lab Name: STL Richland
 Lot-Sample No.: J61110179-1
 Client Sample ID: B1KB53 DUP

SDG: W05004
 Report No.: 33415
 COC No.: R06-013-024

Collection Date: 9/10/2006 2:15:00 PM
 Received Date: 9/11/2006 2:10:00 PM
 Matrix: SOIL SOLID

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6263405	SE79_SEP_IE_LSC								Orig Sa DB ID: 9JD35G20			
SE-79	3.55E-01	U	4.8E-01	6.0E-01	1.12E+00	pCi/g	75%	0.32	9/29/06 09:08 a		2.11	LSC3
	1.06E+00	U	RPD 100.0			1.00E+01		(1.2)			G	

No. of Results: 1 Comments:

STL Richland RPD - Relative Percent Difference.
 rptSTLRchDupV5.0 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 .1 A2002 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II
BLANK RESULTS

Date: 03-Oct-06

Lab Name: STL Richland
Matrix: SOIL

SDG: W05004
Report No.: 33415

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6263405	SE79_SEP_IE_LSC	U	8.6E-01	1.1E+00	JENQP1AA	pCi/g	41%	-0.25	9/29/06 01:30 p		2.0	LSC3
					JENQP1AB	1.00E+01		-0.98			G	

No. of Results: 1 Comments:

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchBlank U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.
 V5.0.1 A2002