

Date: 30 May 2006
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-UW-1 Operable Unit, Soil from Trench Between 216-U-8 and 216-U-12 Cribs
Subject: Radiochemistry - Data Package No. W04901-ST

INTRODUCTION

This memo presents the results of data validation on Data Package No. W04901 prepared by Severn Trent (ST). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
B1J2T4	4/11/06	Soil	C	See note 1
B1J375	4/11/06	Soil	C	See note 1

1 - Selenium-79 by 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. Qualified Data Summary and 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

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

000001



· **Laboratory (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable although the absolute value of the laboratory blank exceeded the RTQL.

Field Blanks

One field blank (B1J375) was submitted for analysis. No analytes were detected in the field blank.

· **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is either 65-135% or 70-130%, depending on the analyte. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS or matrix spike analysis, all selenium-79 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than +/- 35 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

- **Completeness**

Data package SDG No. W04901 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.

000003

MINOR DEFICIENCIES

Due to the lack of an LCS or matrix spike analysis, all selenium-79 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the FHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

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

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000005

Appendix 1

Glossary of Data Reporting Qualifiers

000006

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

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UU - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

000008

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: W04901	REVIEWER: TLI	Project: 200-UW-1	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Selenium-79	J	All	No MS or LCS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000010

Project: FLUOR-HANFORD					
Laboratory: ST					
Case		SDG: W04901			
Sample Number		B1J2T4	B1J375		
Remarks		E. Blank			
Sample Date		4/11/06	4/11/06		
Radiochemistry	RTQL	Result	Q	Result	Q
Selenium-79	0.1	-0.233	UJ	-0.356	UJ

000011

* - RTQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

STL RICHLAND

FORM I

Date: 17-May-06

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04901

Collection Date: 4/11/2006 12:30:00 PM

Lot-Sample No.: J6D140312-1

Report No.: 32102

Received Date: 4/12/2006 3:35:00 PM

Client Sample ID: B1J2T4

COC No.: R06-013-006

Matrix: SOIL SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 8107203	SE79_SEP_IE_LSC			Work Order: H3A6W1AA		Report DB ID: 9H3A6W10					
SE-79	-2.33E-01 U	1.1E+00	1.4E+00	2.81E+00	pCl/g	72%	-0.08	5/11/06 03:05 a		1.0	LSC3
						1.35E+00	1.00E+01			G	

No. of Results: 1 Comments:

Handwritten: ✓
5/29/06

000012

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchSample 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.
 V4.15.0 A97

STL RICHLAND

FORM I
SAMPLE RESULTS

Date: 17-May-06

Lab Name: STL Richland

SDG: W04901

Collection Date: 4/11/2006 11:40:00 AM

Lot-Sample No.: J6D140312-2

Report No. : 32102

Received Date: 4/12/2006 3:35:00 PM

Client Sample ID: B1J375

COC No. : R06-013-006

Matrix: SOIL SOLID

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6107203	SE79_SEP_IE_LSC				Work Order: H3A691AA		Report DB ID: 9H3A6910					
SE-79	-3.56E-01	UJ	1.1E+00	1.4E+00	2.76E+00	pCl/g	70%	-0.13	5/11/06 04:30 a		1.05	LSC3
							1.32E+00	1.00E+01			G	

No. of Results: 1 Comments:

h
5/24/06

000013

STL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
rptSTLrchSample 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.
V4.15.0 A97

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014

Certificate of Analysis

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

May 17, 2006

Attention: John Trechter

SAF Number	:	R06-013
Date SDG Closed	:	April 12, 2006
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W04901
Data Deliverable	:	15 / 15-Day Summary

CASE NARRATIVE

I. Introduction

On April 12, 2006, two soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned to lot J6D140312 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>
B1J2T4	H3A6W	SOIL	4/12/06
B1J375	H3A69	SOIL	4/12/06

II. Sample Receipt

The samples were 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.

The requested analyses were:

Fluor Hanford
May 17, 2006

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.

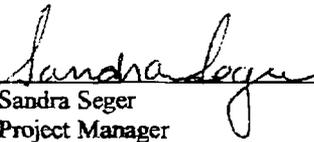
V. Comments

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

There is currently not an available standard for Selenium 79 and an LCS was not analyzed. The batch blank, sample and sample duplicate (B1J2T4) 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:


Sandra Seger
Project Manager

STL RICHLAND

J6D140312 ^{SFS} 4/17/06 004900 W04901 DUE ~~4-28-06~~ 5/1/06 4/27/06

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-013-006

PAGE 1 OF 1

COLLECTOR

HOGAN, JG

COMPANY CONTACT

TRECHTER, JE

TELEPHONE NO.

373-7046

PROJECT COORDINATOR

TRECHTER, JE

SAMPLING LOCATION

U-8 Trench

PROJECT DESIGNATION

200-UW-1 Operable Unit, Soil from Trench between 216-U-8 and 216-U-12

SAF NO.

R06-013

PRICE CODE 9C

DATA TURNAROUND

AIR QUALITY

15 Days / 15 Days

ICE CHEST NO.

TJ-9

FIELD LOGBOOK NO.

DTS-SAWS H99

COA

12159SES20

METHOD OF SHIPMENT

GOVERNMENT VEHICLE

SHIPPED TO

Severn Trent Incorporated, Richland

OFFSITE PROPERTY NO.

N/A

BILL OF LADING/ATR BILL NO.

N/A

MATRIX*
OL = OTHER LIQUID
OS = OTHER SOLID
S = SOIL
W = WATER

SPECIAL HANDLING AND/OR STORAGE

POSSIBLE SAMPLE HAZARDS/ REMARKS

Sample BU2T4 contains radioactive material that does not meet DOT limits or exceed lab acceptance criteria.

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1J2T4		S	04-11-06	1230	1X60mL G/P Selenium-79 (Se-79)	20.6 gr H3A6W	None
B1J375		S	↓	1140	1X60mL G/P Selenium-79 (Se-79)	23.0 gr H3A69	None

000017

CHAIN OF POSSESSION

SIGN / PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM

DURATEK

DATE/TIME

APR 12 2006 15:25 PM

RECEIVED BY/STORED IN

Shanda W. Baker

DATE/TIME

4/12/06 15:35 PM

STL, send copy of chain of custody (COC) to John Trechter within 24 hours of sample receipt. All samples have been taken using the multiple-increment sampling program. This requires the entire sample provided in each bottle to be used in analysis.

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

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

Appendix 5

Data Validation Supporting Documentation

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: _____

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: no LCS - J cell

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: _____

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: no matrix spike - J all

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: _____

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: _____

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: ~~- note absolute value of relative error RQL~~

all over

Appendix 6

Additional Documentation Requested by Client

STL RICHLAND

FORM II

Date: 17-May-06

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04901

Collection Date: 4/11/2006 12:30:00 PM

Lot-Sample No.: J6D140312-1

Report No.: 32102

Received Date: 4/12/2006 3:35:00 PM

Client Sample ID: B1J2T4 DUP

COC No.: R06-013-006

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/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 8107203	SE79_SEP_IE_LSC			Work Order: H3A6W1AC		Report DB ID: H3A6W1CR			Orig Sa DB ID: 9H3A6W10			
SE-79	-7.63E-01	U	1.2E+00	1.5E+00	3.10E+00	pCi/g	64%	-0.25	5/11/06 03:47 a		1.02	LSC3
	-2.33E-01	U	RPD -108.4			1.00E+01		-0.99			G	

No. of Results: 1 Comments:

000026

STL Richland RPD - Relative Percent Difference.
 rptSTLRchDupV4.1 MDC|MDA,Le - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 5.0 A97 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

FORM II
BLANK RESULTS

Date: 17-May-06

Lab Name: STL Richland

SDG: W04901

Matrix: SOIL

Report No.: 32102

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	Alliquot Size	Primary Detector
Batch: 6107203	SE79_SEP_IE_LSC											
					Work Order: H3EW01AA	Report DB ID: H3EW01AB						
SE-79	-1.55E+00	U	2.7E+00	3.3E+00	6.65E+00	pCi/g	31%	-0.23	5/11/06 05:12 a		1.0	LSC3
					3.19E+00	1.00E+01		-0.94			G	

No. of Results: 1 Comments:

000027

STL Richland
rptSTLRchBlank
V4.15.0 A87

MDC|MDA,Lc - Detection, Decision Level based on Instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

REVIEW COMMENT RECORD (RCR)

1. Date 06/06/06

2. Review No.

3. Project No.

4. Page 1 of 1

200-UW-1

5. Document Number(s)/Title(s)
Validation Package for SDG W04900 & W04901

6. Program/Project/Building Number
Trench between 216-U-8 & 216-U-12
and Clay Pipe Analysis

7. Reviewer
RL Weiss

8. Organization/Group
WCH - S&DM

9. Location/Phone
Sigma 1
372-9631

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

06/06/06

Date

R. L. Weiss

Reviewer/Point of Contract

R. L. Weiss

Author/Originator

11. Closed

Reviewer/Point of Contact

Date

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	W04901, Pages 3 & 24: All results missed RTQL.			
2	W04900 – No Comments			