Date: 24 April 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. WSCF20060179 (60179)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 60179 prepared by WSCF Analytical Laboratories (WSCF). 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
B1HVN5	3/14/06	Soil	C	See note 1

1 – Technetium-99.

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

RECEIVED
JUN 03 2010
EDMC

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.

MAY 2006
RECEIVED

- **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.

Field Blanks

No field blanks were submitted for analysis.

- **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.

No matrix spike analysis was conducted, however, at the direction of FHI, no qualifiers were applied to the results (see page 24). (The matrix spike reported on page 23 is a post-digestion spike)

- **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 then 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.

No matrix spike duplicate analysis was conducted, however, at the direction of FHI, no qualifiers were applied (see page 24). (The duplicate reported on page 23 is a post-digestion spike duplicate.)

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quanitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RTQL.

- **Completeness**

Data package SDG No. 60719 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

No matrix spike or matrix spike duplicate analysis were conducted, however, at the direction of FHI, no qualifiers were applied to the results (see page 24).

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.

Appendix 1

Glossary of Data Reporting Qualifiers

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.

UJ - 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

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: 60179	REVIEWER: TLI	Project: 200-UW-1	PAGE 1 OF 1
COMMENTS: No qualifiers assigned (see page 24)			

* - 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

Project: FLUOR-HANFORD			
Laboratory: WSCF			
Case	SDG: 60179		
Sample Number		B1HVN5	
Remarks			
Sample Date		3/14/06	
Radiochemistry	RTQL	Result	Q
Technetium-99	1	-0.600	U

000010

* - 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.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Deanna Klages H8-40 **Group #:** 20060179

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
Radiochemistry														
W060000458	B1HVN5	K	14133-76-7	Tc-99 by Liquid Scin.	SOLID	LA-508-421	U	-0.600	pCi/g	1.00	0.50	03/18/06	03/14/06	03/14/06
W060000458	B1HVN5	K	E,T,C	Tc-99 Counting Error	SOLID	LA-508-421		100	%	1.00	0.0	03/18/06	03/14/06	03/14/06

RRZ

4/22/06

000011

MDL=Minimum Detection Limit U - Analyzed for but not detected above limiting criteria.
RQ=Result Qualifier

DF=Dilution Factor

* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Sample Delivery Group	**WSCF20060179**
Sample Matrix	**SOLID**
Sample Visual	**N/A**
SAF Number	**R06-019**
Data Deliverable	**Summary Report**

Introduction

One (1) soil sample (B1HVN5) from the 200-UW-1 Operable Unit Clean Soil was received at the WSCF Laboratory on March 14, 2006. The sample was received in a cool condition with ice present in the coolers. The sample was analyzed for the analyte indicated on the attached copy of the chain of custody (COC) form in accordance with the *200-UW-1 Operable Unit Letter of Instruction*, referenced in the cover letter.

The sample was taken using the Multi-Increment Sampling Program, which requires the entire sample submitted to be analyzed. This does not allow for laboratory sample duplicates or matrix spikes.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical method. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, method references, and Laboratory QC information. Copies of the chain of custody and sample receipt are included as Attachment 3.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report,* page 10, for a complete listing of approved analytical methods used.

Radiochemistry Comments

– There are no holding times associated with WSCF radiochemical methods.

Tecnicium-99 - A Blank, Laboratory Control Sample, Post Digestion Spike and Post Digestion Duplicate were analyzed with this delivery group of less than 20 samples. See page 11 for QC details. All QC controls are within the established limits.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.

John E. Trechter

John E. Trechter
WSCF Client Services

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-019-001 | PAGE 1 OF 1

COLLECTOR: KB Hulse 03/29/06	COMPANY CONTACT: TRECHTER, JE	TELEPHONE NO.	PROJECT COORDINATOR: TRECHTER, JE
PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days		
SAMPLING LOCATION: Spoils Pile	PROJECT DESIGNATION: 200-UW-1 Operable Unit, Clean Soil from Trench between 216-U-8 and 21		SAF NO.: R06-019
AIR QUALITY: ☐			
ICE CHEST NO.: SESP	FIELD LOGBOOK NO.: DTS-SAWS-H100	COA: 121595ES20	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A

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

SPECIAL HANDLING AND/OR STORAGE: 20060179

POSSIBLE SAMPLE HAZARDS/ REMARKS:

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1HVN5	W0600045 8	S	3/14/06	1050	1X60mL G/P 20.6 grams	Technetium-99 (Tc-99)	None

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
K. B. HULSE [signature]	3-14-06 1355	TA FRAZIER [signature]	3-14-06 1355
K. B. HULSE			

SPECIAL INSTRUCTIONS: Sample will been taken using the multiple-increment sampling program. This requires the entire sample provided in each bottle to be used in analysis. Reporting format the same as GPP, including QC.

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

00004

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: 60179		
VALIDATOR: TCR		LAB: WSCF		DATE: 4/20/06	
			SDG: 60179		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
B1HVN5					
					Soil

1. Completeness ..... ☐ N/A

Technical verification forms present?..... Yes No N/A

Comments:

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: no FB

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:

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: ~~no tracer~~ [illegible] 4/25/[illegible]

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: used a post-digestion spike [illegible]
(no goal assigned per TAI
See page 24)

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: Used a post-digestion dup – ~~JKH~~ 4/24 See page 24
(no qual assigned per FHH)
(See page 24)

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:

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: 20060179
Matrix: SOLID
Test: TC99 by Liquid Scin.

SAF Number: R06-019
Sample Date: 03/14/06
Receive Date:03/14/06

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W060000452									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Tc-99 by Liquid Scin.	14133-76-7	U-0.7	n/a	RPD	03/18/06	0.000	20.000	
MS	Tc-99 by Liquid Scin.	14133-76-7	86.0	86.000	% Recov	03/18/06	75.000	125.000	
BATCH QC									
BLANK	Tc-99 by Liquid Scin.	14133-76-7	-0.2	-0.200	pCi/g	03/18/06	-10.000	1000.000	
LCS	Tc-99 by Liquid Scin.	14133-76-7	10.1	89.381	% Recov	03/18/06	75.000	125.000	

000023

You replied on 4/28/2006 5:13 PM.

Christian, Bruce

From: Trent, Stephen J [Stephen_J_Trent@RL.gov] **Sent:** Fri 4/28/2006 3:30 PM
To: Christian, Bruce
Cc: Lynch, Sherry A
Subject: RE: Validation Direction on Data Package WSCF20060179
Attachments:

Bruce,

First, do you have a new email? Should we start sending everything to Bchristian@TLIsolutions.com?

Second, regarding the matrix spike issue below, I understand that your reading of the validation procedure would have you qualify these data. However, my direction is to accept the post digestion matrix spike as adequate for this multi-increment sample Tc-99 sample analysis. If you want, you can include this direction in your narrative.

Steve

-----Original Message-----
From: Christian, Bruce [mailto:BChristian@TLIsolutions.com]
Sent: Thursday, April 27, 2006 6:30 PM
To: Trent, Stephen J
Subject: RE: Validation Direction on Data Package WSCF20060179

My reading of the the validation guidelines is that a matrix spike is required. The qualification is appropriate.

From: Trent, Stephen J [mailto:Stephen_J_Trent@RL.gov]
Sent: Thu 4/27/2006 4:07 PM
To: Christian, Bruce
Cc: Lynch, Sherry A
Subject: Validation Direction on Data Package WSCF20060179

Bruce,

I spoke with Rich Weiss concerning the "J" data qualification of the Tc-99 value in WSCF20060179. As you noted, the lab ran a "post digestion" spike which does not necessarily meet the intent of a matrix spike. While not desirable, Rich and I agreed that it would be ok to give you a more flexible interpretation. Go ahead and consider the "post digestion" matrix spike QC as appropriate for this particular validation and remove the "J" qualification.

Call or email if you have any questions.

Steve Trent
Sample Management Project Coordinator
Fluor Hanford - Groundwater Remediation Project

000024