REVIEW COMMENT RECORD (RCR)

1. Date 04/06/05	2. Review No.
3. Project No. 200-LW-1/LW-2	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Validation Package for SDG WSCF20042054	Borehole Soil Sampling	RL Weiss	ERC - S&DM	Sigma 1 372-9631

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. Closed
Organization Manager (Optional)	R. L. Weiss Reviewer/Point of Contract	Reviewer/Point of Contact
	04/06/2005 Date	4-15-05 Date
	R. L. Weiss Author/Originator	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	Radiochemistry, Page 8; Last line in table appears to be an incorrect entry.			OK RLW 4-15-05

RECEIVED
OCT 27 2005
EDMC

0007326

ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
March 30, 2005	N/A
3. Project No.	4. Page 1 of 1
200-LW-1 & 2	

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package SDG 42054	GRP/200-LW-1 & 2, Characterization - soil	Bill Thackaberry	Env & Science Assurance (QA)	E6-35 372-0742

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	4/14/05 Date; Reviewer/Point of Contact; Requester	4/14/05 Date; Reviewer/Point of Contact; Requester

12. Item	13a. 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). Provide separate attachments if necessary.	16. Status
1	Radiochemistry, pg 3 & 4, Detection level paragraph & minor deficiencies paragraph refers to the "BHI" statement of work. This validation is to be performed to the statement of work issued by FH.		Comm K	C
2	Page 24, Appendix A, Radiochemical Data Validation Checklist, checklist item 8, Tracer Recovery, is incomplete.		Comm K	C

FD 3-025

APR 2005
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Date: 28 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Radiochemistry - Data Package No. WSCF20042054 (SDG No. 42054)

INTRODUCTION

This memo presents the results of data validation on Data Package No. 42054 prepared by 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	Media	Validation	Analysis
B19189	10/26/04	Soil	C	See note 1

1 - Gamma spectroscopy, neptunium-237, isotopic uranium, isotopic plutonium and americium-241.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66,Draft A, Redline, May 2002). 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.

- **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 70-130% or 65-135%. 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 an LCS recovery of 36%, all neptunium-237 results were qualified as estimates and flagged "J".

Due to the lack of an LCS analysis, all plutonium-238, uranium-234 and uranium-235 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 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.

All duplicate results were acceptable.

Field Duplicate Samples

No field duplicate samples 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. Three analytes exceeded the RTQLs. Under the FHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific RTQL.

- **Completeness**

Data package SDG No. 42054 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 94%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an LCS recovery of 36%, all neptunium-237 results were qualified as estimates and flagged "J". Due to the lack of an LCS analysis, all plutonium-238, uranium-234 and uranium-235 results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may

be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Three analytes exceeded the RTQLs. 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-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

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: 42054	REVIEWER: TLI	DATE: 3/24/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Uranium-234 Uranium235 Plutonium-238	J	All	No LCS analysis
Neptunium-237	J	All	LCS recovery

* - 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

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: FLUOR-HANFORD							
Laboratory: WSCF							
Case	SDG: WSCF200442054						
Sample Number		B19189					
Remarks							
Sample Date		10/26/04					
Radiochemistry	RTQL	Result	Q	Result	Q	Result	Q
Americium-241	1	7.50					
Antimony-125		0.827	U				
Cobalt-60	0.05	0.670					
Cesium-134		0.104	U				
Cesium-137	0.1	4710					
Europium 152	0.1	0.147	U*				
Europium 154	0.1	0.647	U*				
Europium 155	0.1	0.136	U*				
Neptunium-237	1	0.0120	UJ				
Plutonium-238	1	0.590	J				
Plutonium-239/240	1	12.0					
Uranium-234	1	43.0	J				
Uranium-235	1	1.80	J				
Uranium-238	1	27.0					

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: Steve Trent
Project: F03-025: F03-025

Group #: WSCF20042054

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ		Result	Unit	DF	MDL	Analyze	Sample	Receive
Radiochemistry															
W040002150	B19189	TRENT	14596-10-2	Americium-241	SOIL	LA-508-471			7.50	pCi/g	1.00	0.033	11/19/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Am-241 by AEA Total Cntg Error	SOIL	LA-508-471		+-	1.6	pCi/g	1.00	0.0	11/19/04	10/26/04	11/04/04
W040002150	B19189	TRENT	14234-35-6	Antimony-125	SOIL	LA-508-481	U		0.827	pCi/g	1.00	1.2	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Sb-125 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	0.88	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	10198-40-0	Cobalt-60	SOIL	LA-508-481			0.670	pCi/g	1.00	0.089	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Co-60 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	0.10	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	13967-70-9	Cesium-134	SOIL	LA-508-481	U		0.104	pCi/g	1.00	0.27	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Cs-134 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	0.16	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	10045-97-3	Cesium-137	SOIL	LA-508-481			4.71e+03	pCi/g	1.00	0.40	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Cs-137 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	5.8e+02	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	14683-23-9	Europium-152	SOIL	LA-508-481	U		0.147	pCi/g	1.00	1.1	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Eu-152 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	0.64	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	15585-10-1	Europium-154	SOIL	LA-508-481	U		0.647	pCi/g	1.00	0.40	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Eu-154 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	0.25	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	14391-16-3	Europium-155	SOIL	LA-508-481	U		0.136	pCi/g	1.00	1.1	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Eu-155 Rel. Count Error (GEA)	SOIL	LA-508-481		+-	0.64	pCi/g	1.00	0.0	11/10/04	10/26/04	11/04/04
W040002150	B19189	TRENT	13994-20-2	Neptunium-237	SOIL	LA-508-471	U J		0.0120	pCi/g	1.00	0.018	11/23/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Np-237 by AEA Total Ctng Error	SOIL	LA-508-471		+-	0.12	pCi/g	1.00	0.0	11/23/04	10/26/04	11/04/04
W040002150	B19189	TRENT	13981-16-3	Plutonium-238	SOIL	LA-508-471	J		0.590	pCi/g	1.00	0.12	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Pu-238 by AEA Total Cntg Error	SOIL	LA-508-471		+-	0.19	pCi/g	1.00	0.0	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	PU-239/240	Pu-239/240 by AEA	SOIL	LA-508-471			12.0	pCi/g	1.00	0.036	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	Pu-239/240 AEA Total Cntg Err	SOIL	LA-508-471		+-	3.1	pCi/g	1.00	0.0	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	U-233/234	Uranium-233/234	SOIL	LA-508-471	J		43.0	pCi/g	1.00	0.067	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	U-233/234 AEA Total Cntg Error	SOIL	LA-508-471		+-	11	pCi/g	1.00	0.0	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	15117-96-1	Uranium-235	SOIL	LA-508-471	J		1.80	pCi/g	1.00	0.016	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	U-235 by AEA Total Cntg Error	SOIL	LA-508-471		+-	0.50	pCi/g	1.00	0.0	11/21/04	10/26/04	11/04/04

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

Report WGPP/ver. 1.1
Groundwater Remediation Program

3/25/05

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
Project: F03-025: F03-025

Group #: WSCF20042054

Sample #	Client ID		CAS #	Test Performed	Matrix	WSCF Method	RQ	Result	Unit	DF	MDL	Analyze	Sample	Receive
W040002150	B19189	TRENT	U-238	Uranium-238	SOIL	LA-508-471		27.0	pCi/g	1.00	0.073	11/21/04	10/26/04	11/04/04
W040002150	B19189	TRENT	E,T,C	U-238 by AEA Total Cntg Error	SOIL	LA-508-471	+-	7.0	pCi/g	1.00	0.10	11/21/04	10/26/04	11/04/04

K
3/25/05

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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	**WSCF20042054, Rev. 1**
Sample Matrix	**Soil**
Sample Visual	**N/A**
SAF Number	**F03-025**
Data Deliverable	**Summary Report**

Introduction

One (1) 200-LW-1/LW-2 Characterization – Soil, 216 T-28, 22.5' – 25', GRP sample (B19189) was received at the WSCF Laboratory on November 4, 2004. The sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 1) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 2) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. A copy of the chain of custody and Request for Sample Analysis forms is included as Attachment 3.

Analytical Methodology for Requested Analyses

Radiochemistry

- All RadChem analyses (AEA (Plutonium, Americium and Uranium) and GEA) except Neptunium-237 were run by internal WDOE accredited WSCF procedures. Analytical work was performed with no deviations to the approved method.

Radiochemistry Comments

RadChem – There are no hold times associated with these WDOE accredited methods. A Blank, Laboratory Control Sample and Duplicate were analyzed with each delivery group per the GRP Letter of Instruction. See pages 10 through 14 for QC details. Analytical Notes:

- Americium-241, Plutonium-239/240 and Uranium-238 - Duplicate QC samples were analyzed on sample# B19187 (SDG# 20042022, SAF# F03-025).

- Uranium-234, Urananium-235 and Plutonium-238 Additional Batch QC Data for Group 20042230:

Radiochemical Isotopic Results					
Batch ID	Associated Samples (Customer ID)	Lab Sample ID	QC Sample	Isotope	Result
24083			Blank U ISO	U-234	1.94e-02 pCi/g
				U-235	1.48e-02 pCi/g
	B19187	W040002092	Duplicate U ISO on W040002092	U-234	3.13e+01 pCi/g (7.8%)
				U-235	1.79e+00 pCi/g (6.9%)
24085			Blank Pu ISO	Pu-238	-9.22e-03 pCi/g
	B19187	W040002092	Duplicate Pu ISO on W040002092	Pu-238	3.75e-01 pCi/g (24%)

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
BLANK		Pu-242	76.8
LCS		Pu-242	81.2
B19187	W040002092	Pu-242	73.0
DUPLICATE	W040002092	Pu-242	92.6
B19189	W040002150	Pu-242	79.6
BLANK		Am-243	76.2
LCS		Am-243	82.3
B19187	W040002092	Am-243	92.5
DUPLICATE	W040002092	Am-243	95.7
B19189	W040002150	Am-243	94.9
BLANK		U-232	85.2

Radiochemical Tracer Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Tracer Recovery (Percent)
LCS		U-232	77.0
B19187	W040002092	U-232	40.0
DUPLICATE	W040002092	U-232	38.6
B19189	W040002150	U-232	50.3

- Neptunium-237 – Spike (Np-237) recoveries for each sample are listed below. Laboratory control sample recovery was below established limits and may be attributed to a slight excess of ascorbic acid which occurs due to low iron levels in the matrix and causes retention of the Neptunium during separation. The solid matrix sample spike recoveries were within established laboratory limits. Sample result was not flagged but should be considered suspect.

Radiochemical Matrix Spike Percent Recovery			
Sample Number	Lab Sample ID	Isotope	Matrix Spike Recovery (Percent)
LCS		Np-237	36.5
DUPLICATE	W040002150	Np-237	91.5
B19189	W040002150	Np-237	110.5

All other 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.

Herlene S. Rich
WSCF Production Control

Abbreviations

Hg – mercury
IC – ion chromatography
ICP – inductively coupled plasma
ICP/AES – ICP/atomic emission spectroscopy
ICP/MS – ICP/mass spectrometry
Total U – total uranium
AT/TB – total alpha/total beta
AEA – Alpha Energy Analysis
WTPH-G – Total Hydrocarbons-Gasoline
Am – americium
Cm - curium
Pu – plutonium
Np – neptunium
GEA – gamma energy analysis
H3 – Tritium
Sr – Strontium 89, 90
WTPH-D – Total Hydrocarbons-Diesel
TSS – Total Suspended Solids

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-057	PAGE 1 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra 12/V	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-T-28; 22.5ft-25ft	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-356-1	COA 119143ES10	METHOD OF SHIPMENT Government Vehicle		
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
N/A

20047054

SPECIAL HANDLING AND/OR STORAGE
Radioactive fire to: B19IC7

PRESERVATION				Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
TYPE OF CONTAINER				Gs*	aG	aG	Gs*	P	aG	aG		
NO. OF CONTAINER(S)				3	1	1	3	1	1	1		
VOLUME				40mL	120mL	120mL	40mL	500mL	250mL	120mL		
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	PCBs - 8082;	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	SEE ITEM (5) IN SPECIAL INSTRUCTIONS	SEE ITEM (6) IN SPECIAL INSTRUCTIONS		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19189	SOIL	10-26-04	0941	X	X	X	X	X	X	X		
11004002150												

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
T.S. Pope/[signature]	10-26-04 1230	Site Fridge	10-26-04 1230
Site Fridge	11/04/04 0950	Greg Thomas [signature]	11/04/04 0950
Greg Thomas [signature]	11/04/04 1100	[signature]	11/4/04 1100

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

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

A-6003-618(03/03)

000018

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-057	PAGE 2 OF 2
COLLECTOR Pope/Pfister/Wiberg/Tyra	**COMPANY CONTACT** TRENT, STEVE	**TELEPHONE NO.** 373-5689	**PROJECT COORDINATOR** TRENT, SJ	**PRICE CODE** 2A	**DATA TURNAROUND**
SAMPLING LOCATION 216-T-28; 22.5ft-25ft	**PROJECT DESIGNATION** 200-LW-1/LW-2 Characterization - Soil		**SAF NO.** F03-025	**AIR QUALITY** ☐	**24 Hours**
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-356-1	**COA** 119143ES10	**METHOD OF SHIPMENT** Government Vehicle		
SHIPPED TO Waste Sampling & Characterization	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

SPECIAL INSTRUCTIONS

The laboratory is to analyze pH within 24 hours of sample receipt. The laboratory is to report kerosene range organics from the WTPH-D analysis.

(1)~~VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Butanol)~~ *
(2)~~Semi-VOA - 8270A (TCL) {Phenol} Semi-VOA -- 8270A (Add-On) {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range} TPH-Gasoline Range - WTPH-G;~~ *
(3)~~Alcohols, Glycols, & Ketones - 8015 {Ethylene glycol}~~ *
(4)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Antimony-125, Cesium-134} Isotopic Plutonium; Isotopic Uranium; Neptunium-237; Americium-241;
(5)~~ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Copper, Nickel, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Mercury, Selenium, Uranium} ICP Metals - 6010A (Add-on) {Bismuth}~~ *
(6)~~IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorous in phosphate, Sulfate} Cations - (IC) - 300.7 {Nitrogen in ammonium} Cyanide (Total) - 335.2; pH (Soil) - 9045;~~ *

* JT 11/04/04

A-6003-618(03/03)

000019

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: WSCF20042054		
VALIDATOR: TLI		LAB: WSCF		DATE: 3/11/05	
			SDG: 42054		
ANALYSES PERFORMED					
~~Gross Alpha/Beta~~	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			neptunium237
SAMPLES/MATRIX					
B19184					
					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: MB - Np237 - no qualifier

no U234 or U235 blank - J all

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: NP 237 - 34.5% - J all

No Pu238, U234 or U235 LCS - J 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: _____

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: _____

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: NO PU238, U234 or U235 DEP – J all

11. Field QC Samples (Levels C, D E) ..... ☐ N/A 4/6/5

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 FD

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: 3 over

Appendix 6

Additional Documentation Requested by Client

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042054
Matrix: SOLID
Test: Americium by AEA

SAF Number: F03-025
Sample Date: 10/27/04
Receive Date:11/01/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002092									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Americium-241	14596-10-2	4.1e+00	7.059	RPD	11/19/04	0.000	20.000	
BATCH QC									
BLANK	Americium-241	14596-10-2	U1.1e-02	n/a	pCi/g	11/19/04	-10.000	1000.000	
LCS	Americium-241	14596-10-2	4.6e+01	100.000	% Recov	11/19/04	75.000	125.000	

000028

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042054
Matrix: SOLID
Test: Gamma Energy Analysis-grd H2O

SAF Number: F03-025
Sample Date: 10/26/04
Receive Date:11/04/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002150									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Cobalt-60	10198-40-0	6.54e-01	2.417	RPD	11/10/04	0.000	20.000	
DUP	Cesium-134	13967-70-9	U-9.41e-2	n/a	RPD	11/10/04	0.000	20.000	
DUP	Cesium-137	10045-97-3	4.71e+03	0.000	RPD	11/10/04	0.000	20.000	
DUP	Europium-152	14683-23-9	U-4.14e-1	n/a	RPD	11/10/04	0.000	20.000	
DUP	Europium-154	15585-10-1	U2.86e-01	n/a	RPD	11/10/04	0.000	20.000	
DUP	Europium-155	14391-16-3	U-2.44e-1	n/a	RPD	11/10/04	0.000	20.000	
DUP	Antimony-125	14234-35-6	U9.32e-01	n/a	RPD	11/10/04	0.000	20.000	
BATCH QC									
BLANK	Cobalt-60	10198-40-0	U-9.5e-4	n/a	pCi/g	11/09/04	-10.000	1000.000	
BLANK	Cesium-134	13967-70-9	U2.20e-3	n/a	pCi/g	11/09/04	-10.000	1000.000	
BLANK	Cesium-137	10045-97-3	U-2.1e-3	n/a	pCi/g	11/09/04	-10.000	1000.000	
BLANK	Europium-152	14683-23-9	U4.80e-4	n/a	pCi/g	11/09/04	-10.000	1000.000	
BLANK	Europium-154	15585-10-1	U7.74e-4	n/a	pCi/g	11/09/04	-10.000	1000.000	
BLANK	Europium-155	14391-16-3	U5.40e-3	n/a	pCi/g	11/09/04	-10.000	1000.000	
BLANK	Antimony-125	14234-35-6	U3.60e-3	n/a	pCi/g	11/09/04	-10.000	1000.000	
LCS	Cobalt-60	10198-40-0	4.43e+03	105.728	% Recov	11/10/04	80.000	120.000	
LCS	Cesium-137	10045-97-3	3.88e+03	108.380	% Recov	11/10/04	80.000	120.000	

000029

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042054
Matrix: SOLID
Test: Neptunium by AEA

SAF Number: F03-025
Sample Date: 10/26/04
Receive Date:11/04/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002150									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Neptunium-237	13994-20-2	1.2e-02	0.000	RPD	11/23/04	0.000	25.000	
BATCH QC									
BLANK	Neptunium-237	13994-20-2	4.7e-03	0.005	pCi/g	11/23/04	-10.000	1000.000	
LCS	Neptunium-237	13994-20-2	36.5	36.500	% Recov	11/23/04	75.000	125.000	*

000030

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042054
Matrix: SOLID
Test: Plutonium Isotopics by AEA

SAF Number: F03-025
Sample Date: 10/27/04
Receive Date:11/01/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002092									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Pu-239/240 by AEA	PU-239/240	5.8e+00	0.000	RPD	11/21/04	0.000	20.000	
BATCH QC									
BLANK	Plutonium-238	13981-16-3	U-9.2e-03	n/a	PCT	11/21/04	0.000	1000.000	
BLANK	Pu-239/240 by AEA	PU-239/240	U4.6e-03	n/a	pCi/g	11/21/04	-10.000	1000.000	
LCS	Pu-239/240 by AEA	PU-239/240	4.7e+01	97.713	% Recov	11/21/04	75.000	125.000	

000031

WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: WSCF20042054
Matrix: SOLID
Test: Uranium Isotopics by AEA

SAF Number: F03-025
Sample Date: 10/27/04
Receive Date:11/01/04

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Analysis Date	Lower Limit	Upper Limit	RQ
Lab ID: W040002092									
BATCH QC ASSOCIATED WITH SAMPLE									
DUP	Uranium-238	U-238	2.4e+01	0.000	RPD	11/21/04	0.000	20.000	
BATCH QC									
BLANK	Uranium-238	24678-82-8	U9.7e-03	n/a	pCi/g	11/21/04	-10.000	1000.000	
LCS	Uranium-238	24678-82-8	8.3e+01	109.470	% Recov	11/21/04	75.000	125.000	

000032

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F03-025

Group #: WSCF20042054

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		W040002150 GEA Am-241 detected at 2.8 pCi/g. Np237 LCS is low so the sample result is an estimated value.

000033

Lab Areas: VALGROUP - Group Validation
LOGSAMP - Login for Sample
VALTEST - Test Validation
LOGTEST - Login for Tests
TESTDATA - Test Data Entry

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