ORP-114
(02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
March 9, 2005	N/A
3. Project No. 200-PW-2 & 4	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package SDG H2877	GRP/200-PW-2/200-PW-4	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)	4/6/2005 Date; Reviewer/Point of Contact	4/4/2005 Date; Reviewer/Point of Contact
	Requester	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, page 12 is missing. This probably is the data sheet for B1B5D8.		case [illegible]	C
2	Radiochemistry, pg 23, comment on item 8 states that B1B5D7 - T99 - 105% - J. However, the validation report stated that tracer recovery out side the QC limit was 115%. These appear to be inconsistent.		11590 case [illegible]	C
3	Wet Chemistry, pg 2, HOLD TIMES states that "all hold times were exceeded by greater that twice the limit. However, pg 19, item 6 comment says "all exceeded by <2X - J all" these are inconsistent.		All were less than case [illegible]	C

RECEIVED
OCT 27 2005
EDMC

0067330

REVIEW COMMENT RECORD (RCR)

1. Date 03/10/05	2. Review No.
3. Project No. 200-PW-2/200-PW-4	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 H2877	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 03/10/2005 Date R. L. Weiss Author/Originator	Reviewer/Point of Contact 4-4-05 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	Radiochemistry, Page 10; Ni-63 result for B1B5D9 should be –0.157.		Cancel K	ok RLW 4-4-05
2	Radiochemistry, Page 12 is missing from the package.		Cancel K	ok RLW 4-4-05
3	Radiochemistry, Page 20; No sample numbers listed in the header.		Cancel K	ok RLW 4-4-05
4	Wet Chemistry – No Comments.			

F03-333

APR 2005
RECEIVED

Date: 9 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Wet Chemistry - Data Package No. H2877-LLI (SDG No. H2877)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2877 prepared by Lionville Laboratory Inc. (LLI). 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
B1B5D7	11/15/04	Soil	C	See note 1
B1B5D8	11/16/04	Soil	C	See note 1
B1B5D9	11/16/04	Soil	C	See note 1

1 - Oil & grease by 413.1, chromium VI by 7196A and nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). 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 PARAMETERS

- **Holding Times/Sample Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI and 28 days for oil & grease and nitrate/nitrite.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and

"UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than than twice the limit, all results were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike

Matrix spike (MS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike and LCS recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

Laboratory Control Sample

The LCS is used to monitor the overall performance of all steps in the analysis. Recoveries must fall within the range of 80% to 120% for LCS analysis. Samples with a recovery of less than 50% are rejected and flagged "UR". Samples with a recovery of 50% to 79% and a sample recovery below the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All LCS results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicate samples were submitted for analysis.

- **Analytical 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 undetected oil & grease results were reported above the RTQL. Under the FHI statement of work, no qualification is required. All other results met the RTQL.

- **Completeness**

Data package No. H2877 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 holding time being exceeded by less than than twice the limit, all 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.

All undetected oil & grease results were reported above 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-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with FHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

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.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H2877	REVIEWER: TLI	DATE: 3/9/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	Holding time

* - 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

GENERAL CHEMISTRY ANALYSIS, SOILMATRIX, (MG/KG)

Project: FLUOR-HANFORD									
Laboratory: LLI									
Case	SDG: H2877								
Sample Number		B1B5D7		B1B5D8		B1B5D9			
Remarks									
Sample Date		11/15/04		11/16/04		11/16/04			
General Chemistry	RTQL	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.22	UJ	0.21	UJ	0.21	UJ		
NO2/NO3		32.4	J	14.3	J	14.0	J		
Oil & Grease	200	736	UJ*	697	UJ*	751	J		

* - RTQL exceeded

000010

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/07/05

CLIENT: TNUHANFORD F03-006 H2877
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0412L376

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B1B5D7	% Solids	90.5	%	0.01	1.0
		Chromium VI	0.22 u J	MG/KG	0.22	1.0
		Nitrate Nitrite	32.4 J	MG/KG	2.0	10.0
		Oil & Grease Gravimetri	736 u J	MG/KG	736	1.0
-002	B1B5D8	% Solids	95.7	%	0.01	1.0
		Chromium VI	0.21 u J	MG/KG	0.21	1.0
		Nitrate Nitrite	14.3 J	MG/KG	2.1	10.0
		Oil & Grease Gravimetri	697 u J	MG/KG	697	1.0
-003	B1B5D9	% Solids	95.8	%	0.01	1.0
		Chromium VI	0.21 u J	MG/KG	0.21	1.0
		Nitrate Nitrite	14.0 J	MG/KG	2.0	10.0
		Oil & Grease Gravimetri	751 J	MG/KG	696	1.0

3/7/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006 H2877
LVL#: 04121L376

W.O.#: 11343-606-001-9999-00
Date Received: 12-07-04

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

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 blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI, Nitrate Nitrite and Oil and Grease were within the 75-125% control limits.

8. The replicate analyses Chromium VI, Nitrate Nitrite and Oil and Grease were within the 20% 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

1/14/05
Date

njp\i12-376

00000004

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 13 pages.

03

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

FLUOR Hanford Inc.

COLLECTOR: Pope/Pfister/Wiberg/Tyra / HUGHES	COMPANY CONTACT: LC Hulstrom	TELEPHONE NO.: 373-3928	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 200-PW2/216-S-7, 24.0-26.5 ft	PROJECT DESIGNATION: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		SAF NO.: F03-006
ICE CHEST NO.: GRP-04-009	FIELD LOGBOOK NO.: HNF-N-3361	COA: 119153E510	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: See RSR D0079		BILL OF LADING/AIRBILL NO.: See RSR D0079

PRICE CODE: 8N

AIR QUALITY: ☐

DATA TURNAROUND: 45 Days / 45 Days

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: ~~B1B586~~ B1B573 GT 12/6/04

PRESERVATION	Cool 4C
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B1B5D7	SOIL	11-15-04	09:30	✓

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Kevin D. Hughes [signature]	11-15-04 13:00	S-7 Site Fridge	11-15-04 / 13:00
S-7 Site fridge	11-23-04 / 14:30	Kevin D. Hughes [signature]	11-23-04 14:30
Kevin D. Hughes [signature]	11-23-04 / 15:40	MO-026 Site fridge #3	11-23-04 / 15:40
MO-026 Ref. 3	12/6/04 0846	M.A. Boucher / M.A. Boucher	12/6/04 0846
M.A. Boucher / M.A. Boucher	12/6/04 0846	Fed Ex	
Fed Ex	12-7-04 1215	V. Hennessy	12-7-04 1215

SPECIAL INSTRUCTIONS

(1)Chromium Hex - 7196; NO2/NO3 - 353.2; Oil & Grease - 413.1;

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

000014

11

FLUOR Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COLLECTOR: Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT: LC Hulstrom	TELEPHONE NO.: 373-3928	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 200-PW2/216-S-7, 34.0-36.5 ft	PROJECT DESIGNATION: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		SAF NO.: F03-006
ICE CHEST NO.: GRP-04-009	FIELD LOGBOOK NO.: HNF-N-336 1	COA: 119153ES10	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Lionville Laboratory Incorporated	OFFSITE PROPERTY NO.: See RSR D0079		BILL OF LADING/AIR BILL NO.: See RSR D0079

PRICE CODE: 8N

AIR QUALITY: ☐

DATA TURNAROUND: 45 Days / 45 Days

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: ~~B1B587~~ AST 12/4/04
B1B574
B1B575

PRESERVATION	Cool 4C
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B1B5D8	SOIL	11-16-04	13:35	✓
B1B5D9	SOIL	11-16-04	13:35	—

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Kevin D. Hughes [signature]	11-16-04 1500	S-7 Site fridge	11-16-04 1500
S-7 Site fridge	11-23-04 / 14:30	Kevin D Hughes [signature]	11-23-04 14:30
Kevin D Hughes [signature]	11-23-04 15:40	MO-026 Site fridge #3	11-23-04 15:40
MO-026 Ref 3	12/6/04 0846	M.A. Baucher M.A. Baucher	12/6/04 0845
M.A. Baucher M.A. Baucher	12/6/04 0845	[signature]	
[signature]	12-7-04 1215	[signature]	12-7-04 1215

SPECIAL INSTRUCTIONS

(1)Chromium Hex - 7196; NO2/NO3 - 353.2; Oil & Grease - 413.1;

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

000015

000013

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2/200-PW-4			DATA PACKAGE: H2877		
VALIDATOR: TLT		LAB: LLI		DATE: 3/7/05	
			SDG: H2877		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
B1B5D7	B1B5D8	B1B5D9			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes ~~No~~ N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

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

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

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

Comments: Oil + Grease – over RTQL No FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A

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

Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A

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

LCS/BSS samples analyzed? ..... Yes No N/A

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

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

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

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

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

Performance audit sample results acceptable? ..... Yes No N/A

Comments: No PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

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

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: all exceeded by <2x – J all

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

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

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

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

Comments: all undetect 0.1 a gross alpha

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/07/05

CLIENT: TNUHANFORD F03-006 H2877 LVL LOT #: 0412L376
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	04LVI045-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0
BLANK10	04LN3B73-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	04LOG045-MB1	Oil & Grease Gravimetri	667 u	MG/KG	667	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/07/05

CLIENT: TNUHANFORD F03-006 H2877

LVL LOT #: 0412L376

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B1B5D7	Nitrate Nitrite	138	32.4	101	104.6	20.0
		Oil & Grease Gravimetr	7600	736 u	7560	100.6	1.0
-003	B1B5D9	Soluble Chromium VI	4.2	0.21u	4.2	100.1	1.0
		Insoluble Chromium VI	1480	0.21u	1240	119.8	100
BLANK10	04LVI045-MB1	Soluble Chromium VI	3.8	0.20u	4.0	95.5	1.0
		Insoluble Chromium VI	1310	0.20u	1150	113.7	100
BLANK10	04LN3B73-MB1	Nitrate Nitrite	5.1	0.20u	5.0	101.6	1.0
BLANK10	04LOG045-MB1	Oil & Grease Gravimetr	6910	667 u	6840	101.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/07/05

CLIENT: TNUHANFORD F03-006 H2877

LVL LOT #: 0412L376

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B1B5D7	Nitrate Nitrite	32.4	31.9	1.6	10.0
		Oil & Grease Gravimetri	736 u	736 u	NC	1.0
-003REP	B1B5D9	Chromium VI	0.21u	0.21u	NC	1.0

00000010

09

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2877

DATE RECEIVED: 12/07/04 LVL LOT # :0412L376

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1B5D7						
% SOLIDS	001	S	04L%S199	11/15/04	12/10/04	12/13/04
CHROMIUM VI	001	S	04LVI045	11/15/04	12/20/04	12/20/04
NITRATE NITRITE	001	S	04LN3B73	11/15/04	12/20/04	12/20/04
NITRATE NITRITE	001 REP	S	04LN3B73	11/15/04	12/20/04	12/20/04
NITRATE NITRITE	001 MS	S	04LN3B73	11/15/04	12/20/04	12/20/04
OIL & GREASE BY GRAV	001	S	04LOG045	11/15/04	12/23/04	12/23/04
OIL AND GREASE BY GR	001 REP	S	04LOG045	11/15/04	12/23/04	12/23/04
OIL AND GREASE BY GR	001 MS	S	04LOG045	11/15/04	12/23/04	12/23/04
B1B5D8						
% SOLIDS	002	S	04L%S199	11/16/04	12/10/04	12/13/04
CHROMIUM VI	002	S	04LVI045	11/16/04	12/20/04	12/20/04
NITRATE NITRITE	002	S	04LN3B73	11/16/04	12/20/04	12/20/04
OIL & GREASE BY GRAV	002	S	04LOG045	11/16/04	12/23/04	12/23/04
B1B5D9						
% SOLIDS	003	S	04L%S199	11/16/04	12/10/04	12/13/04
CHROMIUM VI	003	S	04LVI045	11/16/04	12/20/04	12/20/04
CHROMIUM VI	003 REP	S	04LVI045	11/16/04	12/20/04	12/20/04
CHROMIUM VI	003 MS	S	04LVI045	11/16/04	12/20/04	12/20/04
CHROMIUM VI	003 MSD	S	04LVI045	11/16/04	12/20/04	12/20/04
NITRATE NITRITE	003	S	04LN3B73	11/16/04	12/20/04	12/20/04
OIL & GREASE BY GRAV	003	S	04LOG045	11/16/04	12/23/04	12/23/04
LAB QC:						
CHROMIUM VI	MB1	S	04LVI045	N/A	12/20/04	12/20/04
CHROMIUM VI	MB1 BS	S	04LVI045	N/A	12/20/04	12/20/04
CHROMIUM VI	MB1 BSD	S	04LVI045	N/A	12/20/04	12/20/04
NITRATE NITRITE	MB1	S	04LN3B73	N/A	12/20/04	12/20/04
NITRATE NITRITE	MB1 BS	S	04LN3B73	N/A	12/20/04	12/20/04
OIL & GREASE BY GRAV	MB1	S	04LOG045	N/A	12/23/04	12/23/04
OIL AND GREASE BY GR	MB1 BS	S	04LOG045	N/A	12/23/04	12/23/04

APR 2005
RECEIVED

Date: 9 March 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling
Subject: Radiochemistry - Data Package No. H2877-EB (SDG No. H2877)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2877 prepared by Eberline Services (EB). 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
B1B5D7	11/15/04	Soil	C	See note 1
B1B5D8	11/16/04	Soil	C	See note 1
B1B5D9	11/16/04	Soil	C	See note 1

1 -Tritium, carbon-14, nickel-63, technetium-99, iodine-129, isotopic thorium.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan (DOE/RL-2000-60, Rev. 1, December 2000). 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, therefore, no field blank data was available for review.

- **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 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 the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J".

Due to a tracer recovery outside QC limits (115%), the technetium-99 result in sample B1B5D7 was qualified as an estimate 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. All reported laboratory detection levels met the analyte specific RTQL.

- **Completeness**

Data package SDG No. H2877 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 the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J". Due to a tracer recovery outside QC limits

(115%), the technetium-99 result in sample B1B5D7 was qualified as an estimate 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.

REFERENCES

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

DOE/RL-2000-60, Rev. 1, *200-PW-2 Uranium-Rich Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, December 2000.

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: H2877	REVIEWER: TLI	DATE: 3/9/05	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Technetium-99	J	B1B5D7	Tracer yield
Thorium-228 Thorium-232	J	All	No 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

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: FLUOR-HANFORD							
Laboratory: EB							
Case	SDG: H2877						
Sample Number		B1B5D7		B1B5D8		B1B5D9	
Remarks							
Sample Date		11/15/04		11/16/04		11/16/04	
Radiochemistry	RTQL	Result	Q	Result	Q	Result	Q
Tritium	400	618		312		374	
Carbon-14	50	2.15	U	2.15	U	2.29	U
Nickel-63	30	13.7		-0.504	U	-0.157	U
Technetium-99	15	14.7	J	4.98		4.03	
Thorium-228	1	4.78	J	3.67	J	3.97	J
Thorium-230	1	0.779		0.522		0.498	
Thorium-232	1	0.656	J	0.488	J	0.630	J
Iodine-129	2	0.040	U	-0.982	U	-0.445	U

000010

* - TDL 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.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412070-01

B1B5D7

DATA SHEET

SDG	7174	Client/Case no	Hanford SDG H2877
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R412070-01	Client sample id	B1B5D7
Dept sample id	7174-001	Location/Matrix	200-PW2/216-S-7,24-26.5' SOLID
Received	12/07/04	Collected/Weight	11/15/04 09:30 34.8 g
% solids	91.3	Custody/SAF No	F03-006-289 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	618	26	4.4	400		H
Carbon 14	14762-75-5	2.16	2.0	3.3	50	U	C
Nickel 63	13981-37-8	13.7	2.5	3.5	30		NI_L
Technetium 99	14133-76-7	14.7	0.63	0.45	15	J	TC
Thorium 228	14274-82-9	4.78	0.91	0.50	1.0	J	TH
Thorium 230	14269-63-7	0.779	0.18	0.21	1.0		TH
Thorium 232	TH-232	0.656	0.13	0.062	1.0	J	TH
Iodine 129	15046-84-1	0.040	0.66	1.5	2.0	U	I

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

3/7/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412070-02 **B1B5D8**

DATA SHEET

SDG	7174	Client/Case no	Hanford SDG H2877
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R412070-02	Client sample id	B1B5D8
Dept sample id	7174-002	Location/Matrix	200-PW2/216-S-7,34-36.5' SOLID
Received	12/07/04	Collected/Weight	11/16/04 13:35 77.9 g
% solids	95.5	Custody/SAF No	F03-006-290 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	312	13	2.2	400		H
Carbon 14	14762-75-5	2.15	2.0	3.3	50	U	C
Nickel 63	13981-37-8	-0.504	1.9	3.3	30	U	NI_L
Technetium 99	14133-76-7	4.98	0.45	0.55	15		TC
Thorium 228	14274-82-9	3.67	0.84	0.51	1.0	J	TH
Thorium 230	14269-63-7	0.522	0.16	0.21	1.0		TH
Thorium 232	TH-232	0.488	0.12	0.051	1.0	J	TH
Iodine 129	15046-84-1	-0.982	2.0	4.6	2.0	U	I

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

R
3/7/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412070-03

B1B5D9

DATA SHEET

SDG	7174	Client/Case no	Hanford SDG H2877
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R412070-03	Client sample id	B1B5D9
Dept sample id	7174-003	Location/Matrix	200-PW2/216-S-7,34-36.5' SOLID
Received	12/07/04	Collected/Weight	11/16/04 13:35 81.0 g
% solids	95.8	Custody/SAF No	F03-006-290 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	374	16	2.5	400		H
Carbon 14	14762-75-5	2.29	1.8	2.9	50	U	C
Nickel 63	13981-37-8	-0.157	2.0	3.4	30	U	NI_L
Technetium 99	14133-76-7	4.03	0.39	0.56	15		TC
Thorium 228	14274-82-9	3.97	0.84	0.40	1.0	J	TH
Thorium 230	14269-63-7	0.498	0.16	0.21	1.0		TH
Thorium 232	TH-232	0.630	0.13	0.051	1.0	J	TH
Iodine 129	15046-84-1	-0.445	0.63	1.4	2.0	U	I

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

3/7/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/15/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2877 was composed of three solid (soil) samples designated under SAF No. F03-006 with a Project Designation of: 200-PW-2/200-PW-4 OU-Borehole Soil Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The samples were analyzed in preparation batches with QC samples from SDG H2860 (SAF No. F03-006).

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

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

2/15/5
Date

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-289	PAGE 1 OF 1

COLLECTOR Pope/Pfister/Wiberg/Tyra	**COMPANY CONTACT** LC Hulstrom	**TELEPHONE NO.** 373-3928	**PROJECT COORDINATOR** TRENT, SJ
SAMPLING LOCATION 200-PW2/216-S-7, 24.0-26.5 ft / HUGHES	**PROJECT DESIGNATION** 200-PW-2/200-PW-4 OU - Borehole Soil Sampling H2877 (7174)		**SAF NO.** F03-006
ICE CHEST NO. ERC-99-025	**FIELD LOGBOOK NO.** HNF-N-3361	**COA** 119153ES10	**METHOD OF SHIPMENT** Federal Express
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** Su RSR D0080		**BILL OF LADING/AIR BILL NO.** Su RSR D0080

PRICE CODE 8N

AIR QUALITY ☐

DATA TURNAROUND 45 Days / 45 Days

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: ~~B1B506~~ MAB B1B573 12/6/04

PRESERVATION	None
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B1B5D7	SOIL	11-15-04	0930	X								

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Kevin D. Hughes [signature]	11-15-04 13:00	S-7 Site fridge	11-15-04 / 13:00
S-7 Site fridge	11-23-04 / 14:30	Kevin D. Hughes [signature]	11-23-04 / 14:30
Kevin D. Hughes [signature]	11-23-04 / 15:40	MO-026 Site fridge #3	11-23-04 / 15:40
MO-026 RH 3	12/6/04 0820	M.A. Baechler / M.A. Baechler	12/6/04 0820
M.A. Baechler / M.A. Baechler	12/6/04 0820	Fed Ex	
Fed Ex	12/7/04 10:40	[signature]	12/7/04 1135

SPECIAL INSTRUCTIONS

(1)Technetium-99; Isotopic Thorium {Thorium-232} Carbon-14; Iodine-129; Nickel-63; Tritium - H3;

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

000017

0400000

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-290	PAGE 1 OF 1

COLLECTOR Pope/Pfister/Wiberg/Tyra	**COMPANY CONTACT** LC Hulstrom	**TELEPHONE NO.** 373-3928	**PROJECT COORDINATOR** TRENT, SJ
SAMPLING LOCATION 200-PW2/216-S-7, 34.0-36.5 ft	**PROJECT DESIGNATION** 200-PW-2/200-PW-4 OU - Borehole Soil Sampling H2877 (7174)		**SAF NO.** F03-006
ICE CHEST NO. ERC-99-025	**FIELD LOGBOOK NO.** HNF-N-336 1	**COA** 119153E510	**METHOD OF SHIPMENT** Federal Express
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** 26 RSR D0080		**BILL OF LADING/AIR BILL NO.** 26 RSR D0080

PRICE CODE 8N

AIR QUALITY ☐

DATA TURNAROUND 45 Days / 45 Days

MATRIX*
A=Air
DE=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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: ~~B1B507~~ B1B574 MAB 12/6/04

PRESERVATION	None											
TYPE OF CONTAINER	aG											
NO. OF CONTAINER(S)	1											
VOLUME	60mL											
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS											

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B1B5D8	SOIL	11-16-04	13:35	✓								
B1B5D9	SOIL	11-16-04	13:35	✓								

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Kevin Hughes [signature]	11-16-04 1500	S-7 Site fridge	11-16-04 1500
S-7 Site fridge	11-23-04 / 14:30	Kevin Hughes [signature]	11-23-04 14:30
Kevin Hughes [signature]	11-23-04 15:40	MO-026 Site fridge #3	11-23-04 15:40
MO-026 RU 3	12/6/04 0820	M.H. Boucher M.H. Boucher	12/6/04 0820
M.H. Boucher M.H. Boucher	12/6/04 0820	Fed Ex	
[signature]	12/7/04 10:40	[signature]	12/7/04 11:15

SPECIAL INSTRUCTIONS
(1)Technetium-99; Isotopic Thorium {Thorium-232} Carbon-14; Iodine-129; Nickel-63; Tritium - H3;

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

000018

00000041

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-PW-2/200-PW4			DATA PACKAGE: H2877		
VALIDATOR: TCT		LAB: EB		DATE: 3/7/05	
			SDG: H2877		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	Ni-63	C-14	I-129
SAMPLES/MATRIX					
B1B5D7	B1B5D8	B1B5D9			
					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: No th 228 + 232 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: B1B5D7 - T99 - 115 - J

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: MS replaced by chemical yield per FHI instructions

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: _____

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412011-05 Method Blank

METHOD BLANK

SDG	7174	Client/Case no	Hanford	SDG H2877	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R412011-05	Client sample id	Method Blank		
Dept sample id	7169-005	Material/Matrix		SOLID	
		SAF No	F03-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.057	0.25	0.42	400	U	H
Carbon 14	14762-75-5	-1.62	2.0	3.6	50	U	C
Nickel 63	13981-37-8	-0.183	1.8	3.1	30	U	NI_L
Total Strontium	SR-RAD	N.A.			1.0		SR
Technetium 99	14133-76-7	-0.022	0.15	0.52	15	U	TC
Thorium 228	14274-82-9	-0.021	0.042	0.094	1.0	U	TH
Thorium 230	14269-63-7	-0.035	0.11	0.22	1.0	U	TH
Thorium 232	TH-232	-0.007	0.028	0.054	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	N.A.			1.0		U_T
Uranium 233/234	U-233/234	N.A.			1.0		U
Uranium 235	15117-96-1	N.A.			1.0		U
Uranium 238	U-238	N.A.			1.0		U
Neptunium 237	13994-20-2	N.A.			1.0		NP
Plutonium 238	13981-16-3	N.A.			1.0		PU
Plutonium 239/240	PU-239/240	N.A.			1.0		PU
Americium 241	14596-10-2	N.A.			1.0		AM
Iodine 129	15046-84-1	-0.432	0.58	1.3	2.0	U	I
Potassium 40	13966-00-2	N.A.					GAM
Cobalt 60	10198-40-0	N.A.			0.050		GAM
Cesium 137	10045-97-3	N.A.			0.10		GAM
Radium 226	13982-63-3	N.A.			0.10		GAM
Radium 228	15262-20-1	N.A.			0.20		GAM
Europium 152	14683-23-9	N.A.			0.10		GAM
Europium 154	15585-10-1	N.A.			0.10		GAM
Europium 155	14391-16-3	N.A.			0.10		GAM
Thorium 228	14274-82-9	N.A.					GAM
Thorium 232	TH-232	N.A.					GAM
Uranium 235	15117-96-1	N.A.					GAM
Uranium 238	U-238	N.A.					GAM

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412011-05

Method Blank

BLANK, cont.

SDG	7174	Client/Case no	Hanford SDG H2877
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R412011-05	Client sample id	Method Blank
Dept sample id	7169-005	Material/Matrix	SOLID
		SAF No	F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Americium 241	14596-10-2	N.A.					GAM

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

QC-BLANK #51342

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412011-04 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7174 Client/Case no Hanford SDG H2877
Contact Melissa C. Mannion Contract No. 630

Lab sample id R412011-04 Client sample id Lab Control Sample
Dept sample id 7169-004 Material/Matrix SOLID
SAF No F03-006

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	12.1	0.60	0.42	400		H	11.8	0.47	102	82-118	80-120
Carbon 14	1550	16	3.6	50		C	1600	64	97	84-116	80-120
Nickel 63	228	7.3	3.8	30		NI_L	226	9.0	101	83-117	80-120
Total Strontium	N.A.			1.0		SR					80-120
Technetium 99	105	2.5	0.52	15		TC	109	4.4	96	84-116	80-120
Thorium 230	37.1	2.7	0.23	1.0		TH	42.0	1.7	88	87-113	80-120
Total Uranium (ug/g)	N.A.			1.0		U_T					80-120
Uranium 233/234	N.A.			1.0		U					80-120
Uranium 235	N.A.			1.0		U					80-120
Uranium 238	N.A.			1.0		U					80-120
Neptunium 237	N.A.			1.0		NP					80-120
Plutonium 238	N.A.			1.0		PU					80-120
Plutonium 239/240	N.A.			1.0		PU					80-120
Americium 241	N.A.			1.0		AM					80-120
Iodine 129	108	1.3	1.2	2.0		I	116	4.6	93	85-115	80-120
Cobalt 60	N.A.			0.050		GAM					80-120
Cesium 137	N.A.			0.10		GAM					80-120

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

QC-LCS #51341

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

R412070-06

B1B5D7

DUPLICATE

SDG	7174			Client/Case no	Hanford SDG H2877
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R412070-06	Lab sample id	R412070-01	Client sample id	B1B5D7
Dept sample id	7174-006	Dept sample id	7174-001	Location/Matrix	200-PW2/216-S-7,24-26.5' SOLID
		Received	12/07/04	Collected/Weight	11/15/04 09:30 34.8 g
% solids	91.3	% solids	91.3	Custody/SAF No	F03-006-289 F03-006

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	700	29	4.9	400		H	618	26	4.4		12	23
Carbon 14	-0.322	1.6	2.8	50	U	C	2.16	2.0	3.3	U	-	
Nickel 63	14.0	2.4	3.3	30		NI_L	13.7	2.5	3.5		2	43
Technetium 99	15.9	0.82	0.66	15		TC	14.7	0.63	0.45		8	24
Thorium 228	5.31	1.0	0.40	1.0		TH	4.78	0.91	0.50		11	42
Thorium 230	0.643	0.18	0.21	1.0		TH	0.779	0.18	0.21		19	55
Thorium 232	0.636	0.14	0.065	1.0		TH	0.656	0.13	0.062		3	46
Iodine 129	-0.542	1.8	4.1	2.0	U	I	0.040	0.66	1.5	U	-	

200-PW-2/200-PW-4 OU Boreh.SoilSamp.

QC-DUP#1 51572

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2877

Test TC Matrix SOLID
SDG 7174
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2877

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99
Preparation batch 7113-027					
B1B5D7	R412070-01			7174-001	14.7
B1B5D8	R412070-02			7174-002	4.98
B1B5D9	R412070-03			7174-003	4.03
BLK (QC ID=51342)	R412011-05			7169-005	U
LCS (QC ID=51341)	R412011-04			7169-004	ok
Duplicate (R412070-01)	R412070-06			7174-006	ok
Nominal values and limits from method 200-PW-2/200-PW-4 OU Boreh.SoilSamp.				RDLs (pCi/g)	15

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7113-027 2σ prep error 10.0 % Reference Lab Notebook 7113 pg. 027																
B1B5D7	R412070-01			0.45	1.00			115		50			60	01/06/05	01/14	GRB-218
B1B5D8	R412070-02			0.55	1.01			98		50			57	01/06/05	01/12	GRB-229
B1B5D9	R412070-03			0.56	1.02			90		50			57	01/06/05	01/12	GRB-230
BLK (QC ID=51342)	R412011-05			0.52	1.00			97		50				01/06/05	01/11	GRB-228
LCS (QC ID=51341)	R412011-04			0.52	1.00			99		50				01/06/05	01/11	GRB-227
Duplicate (R412070-01) (QC ID=51572)	R412070-06			0.66	1.00			76		50			59	01/06/05	01/13	GRB-228
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 2
	CP-008	Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.54 ± 0.14
YIELD 96 ± 25

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/15/05