Date: 17 August 1999
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Areas - Full Protocol - Waste Site 116-B-9
Subject: Radiochemistry - Data Package No. H0387-TNU (SDG No. H0387)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0387-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0V6N7	04/15/99	Soil	C	See note 1
B0V6N8	04/15/99	Soil	C	See note 1
B0V6N9	04/15/99	Soil	C	See note 1
B0V6P0	04/15/99	Soil	C	See note 1
B0V6P1	04/15/99	Soil	C	See note 1
B0V6P2	04/15/99	Soil	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium, isotopic plutonium and americium-241); total strontium; nickel-63.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 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

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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 with liquid scintillation requiring analysis within 7 days of distillation.

All holding times were acceptable, however, due to the americium-241 analysis in sample B0V6P1 and the isotopic plutonium (aspec) analysis in samples B0V6P0 and B0V6P1 being conducted four days later than the rest of the SDG, those results were qualified as estimates and flagged "J".

- **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 MDA, 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 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 blank results were acceptable although the detection limit for uranium-238 exceeded the target detection limit (TDL).

Equipment Blanks

One equipment blank (B0V6N9) was submitted for analysis. Uranium-233/234, uranium-238 (alpha spec), potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **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 and matrix spike recovery range is either 70-130% or ±3 sigma. 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.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the 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 CRDL and the RPD is less than 30 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

One pair of field duplicate samples (samples B0V6N7/B0V6N8) were submitted to TNU for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the contract specified MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The reported detection limit exceeded the TDL for uranium-238 (GEA) in all samples and europium-155 in sample B0V6N8. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

- **Completeness**

  Data Package No. H0387 (SDG No. H0387) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the americium-241 analysis in sample B0V6P1 and the isotopic plutonium (aspec) analysis in samples B0V6P0 and B0V6P1 being conducted four days later than the rest of the SDG, those results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI 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.

The reported detection limit exceeded the TDL for uranium-238 (GEA) in all samples and europium-155 in sample B0V6N8. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI 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 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 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 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 QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0387	REVIEWER: TLI	DATE: 8/17/99	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Isotopic Plutonium (aspec)	J/UJ	B0V6P0, B0V6P1	Analyzed 4 days after the rest of the SDG
Americium-241 (aspec)	J/UJ	B0V6P1	Analyzed 4 days after the rest of the SDG

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																							
Laboratory: TNU																							
Case	SDG: H0387																						
Sample Number		B0V6N7		B0V6N8		B0V6N9		B0V6P0		B0V6P1		B0V6P2											
Location		116-B-9		116-B-9		116-B-9		116-B-9		116-B-9		116-B-9											
Remarks		A1		Duplicate		Equip. Blank		A2		A3		A4											
Sample Date		04/15/99		04/15/99		04/15/99		04/15/99		04/15/99		04/15/99											
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q								
Uranium-234	0.1	0.377		0.367		0.201		0.422		0.434		0.330											
Uranium-235	0.1	0.060	U	0.026	U	0.019	U	0.028	U	0.040	U	0.020	U										
Uranium-238	0.1	0.420		0.461		0.232		0.411		0.401		0.364											
Plutonium-238	0.1	0	U	-0.010	U	0	U	0.010	UJ	0.005	UJ	0.020	U										
Plutonium-239/40	0.1	0.004	U	0	U	0.003	U	0	UJ	0	UJ	0	U										
Nickel-63	30	-0.526	U	1.32	U	-0.020	U	0.169	U	0.137	U	0.725	U										
Americium-241	0.1	0.022	U	0.013	U	0	U	0	U	0	UJ	-0.004	U										
Strontium (total)	1	-0.015	U	-0.011	U	0.113	U	-0.061	U	-0.053	U	0.115	U										
Potassium-40		11.9		11.7		5.35		11.4		11.6		10.8											
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U										
Cesium 137	0.05	U	U	U	U	U	U	U	U	U	U	U	U										
Europium 152	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Europium 154	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Europium 155	0.05	U	U	U	U	U	U	U	U	U	U	U	U										
Radium-226		0.416		0.436		0.192		0.463		0.504		0.464											
Radium-228		0.629		0.655		0.240		0.640		0.661		0.652											
Thorium-228		0.588		0.592		0.179		0.604		0.613		0.609											
Thorium-232		0.629		0.655		0.240		0.640		0.661		0.652											
Americium-241 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Uranium-238 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Uranium-235 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U										

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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-01 B0V6N7

DATA SHEET

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-01	Client sample id	B0V6N7
Dept sample id	7115-001	Location/Matrix	100BC 116-B-9 Shallow SOLID
Received	04/20/99	Collected	04/15/99 09:15
% solids	96.4	Custody/SAF No	B99-002-80 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.377	0.12	0.068	0.30		U
Uranium 235	15117-96-1	0.060	0.052	0.066	0.30	U	U
Uranium 238	U-238	0.420	0.12	0.054	0.30		U
Plutonium 238	13981-16-3	0	0.014	0.034	0.050	U	PU
Plutonium 239/240	PU-239/240	0.004	0.007	0.027	0.050	U	PU
Nickel 63	13981-37-8	-0.526	1.5	2.5	20	U	NI_L
Americium 241	14596-10-2	0.022	0.026	0.042	0.050	U	AM
Total Strontium	SR-RAD	-0.015	0.12	0.16	1.0	U	SR
Potassium 40	13966-00-2	11.9	0.29	0.12			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.012	0.050	U	GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.044	0.10	U	GAM
Radium 226	13982-63-3	0.416	0.026	0.024	0.10		GAM
Radium 228	15262-20-1	0.629	0.050	0.048	0.20		GAM
Thorium 228	14274-82-9	0.588	0.017	0.015			GAM
Thorium 232	TH-232	0.629	0.050	0.048			GAM
Americium 241	14596-10-2	U		0.039		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Uranium 235	15117-96-1	U		0.046		U	GAM

100 BC Areas-Full Protocol

pcw 8/13/99

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																							
Laboratory: TNU																							
Case	SDG: H0387																						
Sample Number		B0V6N7		B0V6N8		B0V6N9		B0V6P0		B0V6P1		B0V6P2											
Location		116-B-9		116-B-9		116-B-9		116-B-9		116-B-9		116-B-9											
Remarks		A1		Duplicate		Equip. Blank		A2		A3		A4											
Sample Date		04/15/99		04/15/99		04/15/99		04/15/99		04/15/99		04/15/99											
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q								
Uranium-234	0.1	0.377		0.367		0.201		0.422		0.434		0.33											
Uranium-235	0.1	0.06	U	0.026	U	0.019	U	0.028	U	0.04	U	0.02	U										
Uranium-238	0.1	0.42		0.461		0.232		0.411		0.401		0.364											
Plutonium-238	0.1	0	U	-0.01	U	0	U	0.01	UJ	0.005	UJ	0.02	U										
Plutonium-239/40	0.1	0.004	U	0	U	0.003	U	0	UJ	0	UJ	0	U										
Nickel-63	30	-0.526	U	1.32	U	-0.02	U	0.169	U	0.137	U	0.725	U										
Americium-241	0.1	0.022	U	0.013	U	0	U	0	U	0	UJ	-0.004	U										
Strontium (total)	1	-0.015	U	-0.011	U	0.113	U	-0.061	U	-0.053	U	0.115	U										
Potassium-40		11.9		11.7		5.35		11.4		11.6		10.8											
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U										
Cesium 137	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Europium 152	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Europium 154	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Europium 155	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Radium-226		0.416		0.436		0.192		0.463		0.504		0.464											
Radium-228		0.629		0.655		0.24		0.64		0.661		0.652											
Thorium-228		0.588		0.592		0.179		0.604		0.613		0.609											
Thorium-232		0.629		0.655		0.24		0.64		0.661		0.652											
Americium-241 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Uranium-238 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U										
Uranium-235 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U										

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-02 B0V6N8

DATA SHEET

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-02	Client sample id	B0V6N8
Dept sample id	7115-002	Location/Matrix	100BC 116-B-9 Shallow SOLID
Received	04/20/99	Collected	04/15/99 09:15
% solids	96.2	Custody/SAF No	B99-002-80 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.367	0.10	0.055	0.30		U
Uranium 235	15117-96-1	0.026	0.035	0.067	0.30	U	U
Uranium 238	U-238	0.461	0.12	0.055	0.30		U
Plutonium 238	13981-16-3	-0.010	0.014	0.038	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.014	0.032	0.050	U	PU
Nickel 63	13981-37-8	1.32	1.7	2.8	20	U	NI_L
Americium 241	14596-10-2	0.013	0.026	0.047	0.050	U	AM
Total Strontium	SR-RAD	-0.011	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	11.7	0.48	0.24			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.020	0.050	U	GAM
Europium 152	14683-23-9	U		0.053	0.10	U	GAM
Europium 154	15585-10-1	U		0.071	0.10	U	GAM
Europium 155	14391-16-3	U		0.061	0.10	U	GAM
Radium 226	13982-63-3	0.436	0.041	0.041	0.10		GAM
Radium 228	15262-20-1	0.655	0.091	0.096	0.20		GAM
Thorium 228	14274-82-9	0.592	0.026	0.026			GAM
Thorium 232	TH-232	0.655	0.091	0.096			GAM
Americium 241	14596-10-2	U		0.081		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	U		0.090		U	GAM

100 BC Areas-Full Protocol

RM
8/13/99

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-03 B0V6N9

DATA SHEET

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-03	Client sample id	B0V6N9
Dept sample id	7115-003	Location/Matrix	100BC 116-B-9 Shallow SOLID
Received	04/20/99	Collected	04/15/99 08:05
% solids	100.0	Custody/SAF No	B99-002-80 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.201	0.079	0.059	0.30		U
Uranium 235	15117-96-1	0.019	0.019	0.072	0.30	U	U
Uranium 238	U-238	0.232	0.080	0.059	0.30		U
Plutonium 238	13981-16-3	0	0.010	0.023	0.050	U	PU
Plutonium 239/240	PU-239/240	0.003	0.007	0.016	0.050	U	PU
Nickel 63	13981-37-8	-0.020	1.5	2.5	20	U	NI_L
Americium 241	14596-10-2	0	0.022	0.049	0.050	U	AM
Total Strontium	SR-RAD	0.113	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	5.35	0.35	0.18			GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 137	10045-97-3	U		0.014	0.050	U	GAM
Europium 152	14683-23-9	U		0.042	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.041	0.10	U	GAM
Radium 226	13982-63-3	0.192	0.030	0.030	0.10		GAM
Radium 228	15262-20-1	0.240	0.074	0.075	0.20		GAM
Thorium 228	14274-82-9	0.179	0.019	0.018			GAM
Thorium 232	TH-232	0.240	0.074	0.075			GAM
Americium 241	14596-10-2	U		0.060		U	GAM
Uranium 238	U-238	U		2.1		U	GAM
Uranium 235	15117-96-1	U		0.065		U	GAM

100 BC Areas-Full Protocol

8/13/99

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-04 B0V6P0

DATA SHEET

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-04	Client sample id	B0V6P0
Dept sample id	7115-004	Location/Matrix	100BC 116-B-9 Shallow SOLID
Received	04/20/99	Collected	04/15/99 10:00
% solids	98.2	Custody/SAF No	B99-002-80 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.442	0.13	0.059	0.30		U
Uranium 235	15117-96-1	0.028	0.038	0.072	0.30	U	U
Uranium 238	U-238	0.411	0.11	0.059	0.30		U
Plutonium 238	13981-16-3	0.010	0.019	0.037	0.050	U J	PU
Plutonium 239/240	PU-239/240	0	0.019	0.046	0.050	U J	PU
Nickel 63	13981-37-8	0.169	1.6	2.6	20	U	NI_L
Americium 241	14596-10-2	0	0.038	0.069	0.050	U	AM
Total Strontium	SR-RAD	-0.061	0.11	0.16	1.0	U	SR
Potassium 40	13966-00-2	11.4	0.30	0.13			GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.050	U	GAM
Europium 152	14683-23-9	U		0.032	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.037	0.10	U	GAM
Radium 226	13982-63-3	0.463	0.026	0.023	0.10		GAM
Radium 228	15262-20-1	0.640	0.055	0.053	0.20		GAM
Thorium 228	14274-82-9	0.604	0.017	0.015			GAM
Thorium 232	TH-232	0.640	0.055	0.053			GAM
Americium 241	14596-10-2	U		0.041		U	GAM
Uranium 238	U-238	U		1.6		U	GAM
Uranium 235	15117-96-1	U		0.070		U	GAM

100 BC Areas-Full Protocol

8/13/99

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-05 B0V6P1

DATA SHEET

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-05	Client sample id	B0V6P1
Dept sample id	7115-005	Location/Matrix	100BC 116-B-9 Shallow SOLID
Received	04/20/99	Collected	04/15/99 10:30
% solids	97.0	Custody/SAF No	B99-002-80 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.434	0.12	0.063	0.30		U
Uranium 235	15117-96-1	0.040	0.040	0.076	0.30	U	U
Uranium 238	U-238	0.401	0.12	0.063	0.30		U
Plutonium 238	13981-16-3	0.005	0.031	0.056	0.050	U J	PU
Plutonium 239/240	PU-239/240	0	0.020	0.056	0.050	U J	PU
Nickel 63	13981-37-8	0.137	1.5	2.4	20	U	NI_L
Americium 241	14596-10-2	0	0.044	0.098	0.050	U J	AM
Total Strontium	SR-RAD	-0.053	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	11.6	0.41	0.21			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.028	0.050	U	GAM
Europium 152	14683-23-9	U		0.041	0.10	U	GAM
Europium 154	15585-10-1	U		0.069	0.10	U	GAM
Europium 155	14391-16-3	U		0.045	0.10	U	GAM
Radium 226	13982-63-3	0.504	0.040	0.035	0.10		GAM
Radium 228	15262-20-1	0.661	0.10	0.096	0.20		GAM
Thorium 228	14274-82-9	0.613	0.021	0.019			GAM
Thorium 232	TH-232	0.661	0.10	0.096			GAM
Americium 241	14596-10-2	U		0.023		U	GAM
Uranium 238	U-238	U		2.5		U	GAM
Uranium 235	15117-96-1	U		0.061		U	GAM

100 BC Areas-Full Protocol

pk
8/13/99

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-06 B0V6P2

DATA SHEET

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-06	Client sample id	B0V6P2
Dept sample id	7115-006	Location/Matrix	100BC 116-B-9 Shallow SOLID
Received	04/20/99	Collected	04/15/99 11:00
% solids	97.0	Custody/SAF No	B99-002-80 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.330	0.11	0.065	0.30		U
Uranium 235	15117-96-1	0.020	0.041	0.078	0.30	U	U
Uranium 238	U-238	0.364	0.12	0.065	0.30		U
Plutonium 238	13981-16-3	0.020	0.032	0.061	0.050	U	PU
Plutonium 239/240	PU-239/240	0	0.016	0.038	0.050	U	PU
Nickel 63	13981-37-8	0.725	1.7	2.8	20	U	NI_L
Americium 241	14596-10-2	-0.004	0.023	0.048	0.050	U	AM
Total Strontium	SR-RAD	0.115	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	10.8	0.49	0.25			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.050	U	GAM
Europium 152	14683-23-9	U		0.050	0.10	U	GAM
Europium 154	15585-10-1	U		0.077	0.10	U	GAM
Europium 155	14391-16-3	U		0.049	0.10	U	GAM
Radium 226	13982-63-3	0.464	0.042	0.039	0.10		GAM
Radium 228	15262-20-1	0.652	0.098	0.099	0.20		GAM
Thorium 228	14274-82-9	0.609	0.026	0.024			GAM
Thorium 232	TH-232	0.652	0.098	0.099			GAM
Americium 241	14596-10-2	U		0.027		U	GAM
Uranium 238	U-238	U		3.0		U	GAM
Uranium 235	15117-96-1	U		0.074		U	GAM

100 BC Areas-Full Protocol

pcw
8/13/99

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0387 is comprised of six solid (soil) samples designated under SAF No. B99-002 with a Project Designation of: 100 BC Areas-Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. All results were faxed to Bechtel Hanford on May 5, 1999 with the exception of Americium-241, which was transmitted to BHI via fax on May 18, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

No problems were encountered during the processing of the samples.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples though recounts were taken for samples BOV6N9, BOV6P0 and BOV6P1.

2.4 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

No problems were encountered during the processing of the samples though a recount was taken for sample BOV6P1.

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-80

Collector: Fahlberg/Kerkow	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100BC 116-B-9 Shallow		SAF No.: B99-002
Ice Chest No.: SML 395	Field Logbook No.: EL 1327-2		Method of Shipment: FED EX.
Shipped To: TMA/~~RECRA~~ RE 4-15-99	Offsite Property No.: A990114		Bill of Lading/Air Bill No.: 423579524824
			COA: R116B92600

Price Code

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None						
Type of Container	aG	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	60mL	125mL	250mL	1000mL						
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
B0V6N7	Soil	4-15-99	0915	X	X			X			tiets	B0V688	
B0V6N8	Soil	4-15-99	0915	X	X			X				B0V688	
B0V6N9	Soil	4-15-99	0805	X	X			X					

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	4-15-99 1635	Ref 1-B	4-15-99 1635
REF 1.B	4 19 99 1030	SJGALE	4 19 99 1030
SJGALE	4 19 99 1030	FED EX.	4-19-99
Fed Ex	4-20-99 1013	JR Cres.	4-20-99 1013

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

NOTE: COLLECTOR UNAVAILABLE TO SIGN COC.

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000019

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-81 Page 1 of 1

Collector: Fahlberg/Kerkow	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100BC 116-B-9 Shallow		SAF No.: B99-002
Ice Chest No.: SML 395	Field Logbook No.: EL 1327-2		Method of Shipment: FED EX
Shipped To: TMA/RECRA R.F. 4-15-99	Offsite Property No.: A990114		Bill of Lading/Air Bill No.: 423579524824
			COA R116B92600

Price Code

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None						
Type of Container	aG	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	60mL	125mL	250mL	1000mL						
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
B0V6P0	Soil	4/15/99	1000	X	X			X				tie to	B0V696
B0V6P1	Soil	4/15/99	1030	X	X			X					B0V6B4
B0V6P2	Soil	4/15/99	1100	X	X			X					B0V6B9

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1635 4-15-99	Ref. 1-B	1635 4-15-99
REF 1-B	41999 1030	SJGALE	41999 1030
SJGALE	41999 1030	FED EX.	4-19-99
Fed Ex	4-20-99 10:30	J R Corso / J R Corso	10:30 4-20-99

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

NOTE: COLLECTOR UNAVAILABLE TO SIGN COC.

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION — Received By — Title — Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

000020

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 116-B-9	DATA PACKAGE: H0387	
VALIDATOR: TLI	LAB: TNU	DATE: 7/6/99
CASE:	SDG: H0387	

ANALYSES PERFORMED

☐ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☒ U1-63		

SAMPLES/MATRIX B0U6N7 B0U6N8 B0U6N9 B0U6P0 B0U6P1 B0U6P2

Soil

1. Completeness . . . . . ☒ N/A

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

Comments:

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A

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

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

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

Comments:

3. Continuing Calibration . . . . . ☒ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . 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? . . . . . Yes No N/A

Comments: U238 over TDL but U
EB U 233/234, U238 (Aspec) K40 Ra 226/228 Th 228/232

5. Matrix Spikes . . . . . ☒ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: Ni-63 use yield

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed?	Yes	No	N/A
LCS recoveries acceptable?	Yes	No	N/A
LCS traceable?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments:

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added?	Yes	No	N/A
Chemical recovery acceptable?	Yes	No	N/A
Chemical carrier traceable?	Yes	No	N/A
Chemical carrier expired?	Yes	No	N/A
Transcription/Calculation errors?	Yes	No	N/A

Comments: IR

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed?	Yes	No	N/A
RPD Values Acceptable?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments:

9. Field QC Samples . . . . . ☐ 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:

10. Holding Times

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: PU aspec run 5/4 (Po-P1)
Am241 P1 5/10

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . Yes No N/A
Results supported in raw data? . . . . . Yes No N/A
Results Acceptable? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A
MDA's meet required detection limits? . . . . . Yes No N/A
Transcription/calculation errors? . . . . . Yes No N/A

Comments: U-238 all runs EU-155 N8

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0387

N904105-08

Method Blank

METHOD BLANK

SDG	7115	Client/Case no	Hanford SDG-H0387
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904105-08	Client sample id	Method Blank
Dept sample id	7115-008	Material/Matrix	SOLID
		SAF No	B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.015	0.015	0.058	0.30	U	U
Uranium 235	15117-96-1	0.009	0.018	0.071	0.30	U	U
Uranium 238	U-238	0	0.015	0.058	0.30	U	U
Plutonium 238	13981-16-3	-0.003	0.015	0.031	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.005	0.009	0.022	0.050	U	PU
Nickel 63	13981-37-8	0.170	1.4	2.4	20	U	NI_L
Americium 241	14596-10-2	0.002	0.012	0.024	0.050	U	AM
Total Strontium	SR-RAD	-0.098	0.14	0.20	1.0	U	SR
Potassium 40	13966-00-2	U		0.060		U	GAM
Cobalt 60	10198-40-0	U		0.005	0.050	U	GAM
Cesium 137	10045-97-3	U		0.005	0.050	U	GAM
Europium 152	14683-23-9	U		0.010	0.10	U	GAM
Europium 154	15585-10-1	U		0.020	0.10	U	GAM
Europium 155	14391-16-3	U		0.010	0.10	U	GAM
Americium 241	14596-10-2	U		0.010		U	GAM
Uranium 238	U-238	U		0.60		U	GAM
Uranium 235	15117-96-1	U		0.020		U	GAM

100 BC Areas-Full Protocol

QC-BLANK 30585

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/17/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

N904105-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7115
Contact L.A. Johnson

Client/Case no Hanford SDG-H0387
Case no TRB-SBB-207925

Lab sample id N904105-07
Dept sample id 7115-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-002

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
Uranium 233/234	4.74	0.52	0.24	0.30		U	4.95	0.20	96	82-118	80-120
Uranium 235	3.76	0.45	0.063	0.30		U	4.04	0.16	93	81-119	80-120
Uranium 238	5.12	0.55	0.23	0.30		U	5.10	0.20	100	81-119	80-120
Plutonium 238	5.43	0.37	0.032	0.050		PU	5.66	0.23	96	86-114	80-120
Plutonium 239/240	5.67	0.38	0.019	0.050		PU	5.95	0.24	95	87-113	80-120
Nickel 63	172	3.8	2.3	20		NI_L	168	6.7	102	83-117	
Americium 241	4.32	0.40	0.029	0.050		AM					80-120
Total Strontium	14.1	0.46	0.16	1.0		SR	12.6	0.50	112	81-119	
Cesium 137	0.420	0.023	0.010	0.050		GAM	0.381	0.015	110	73-127	80-120

100 BC Areas-Full Protocol

QC-LCS 30584

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/17/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

N904105-09 B0V6N7

DUPLICATE

SDG 7115		Client/Case no Hanford	SDG-H0387
Contact L.A. Johnson		Case no TRB-SBB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N904105-09	Lab sample id N904105-01	Client sample id B0V6N7	
Dept sample id 7115-009	Dept sample id 7115-001	Location/Matrix 100BC 116-B-9 Shallow	SOLID
	Received 04/20/99	Collected 04/15/99 09:15	
	% solids 96.4	Custody/SAF No B99-002-80	B99-002

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
Uranium 233/234	0.378	0.15	0.11	0.30		U	0.377	0.12	0.068		0	77
Uranium 235	0.018	0.035	0.13	0.30	U	U	0.060	0.052	0.066	U	-	
Uranium 238	0.334	0.15	0.11	0.30		U	0.420	0.12	0.054		23	77
Plutonium 238	0.024	0.016	0.031	0.050	U	PU	0	0.014	0.034	U	-	
Plutonium 239/240	0.008	0.008	0.031	0.050	U	PU	0.004	0.007	0.027	U	-	
Nickel 63	-0.456	1.6	2.7	20	U	NI_L	-0.526	1.5	2.5	U	-	
Americium 241	-0.004	0.026	0.052	0.050	U	AM	0.022	0.026	0.042	U	-	
Total Strontium	-0.026	0.096	0.17	1.0	U	SR	-0.015	0.12	0.16	U	-	
Potassium 40	11.0	0.75	0.40			GAM	11.9	0.29	0.12		8	34
Cobalt 60	U		0.040	0.050	U	GAM	U		0.011	U	-	
Cesium 137	U		0.040	0.050	U	GAM	U		0.012	U	-	
Europium 152	U		0.080	0.10	U	GAM	U		0.029	U	-	
Europium 154	U		0.10	0.10	U	GAM	U		0.041	U	-	
Europium 155	U		0.070	0.10	U	GAM	U		0.044	U	-	
Radium 226	0.490	0.072	0.060	0.10		GAM	0.416	0.026	0.024		16	41
Radium 228	0.660	0.20	0.20	0.20		GAM	0.629	0.050	0.048		5	58
Thorium 228	0.600	0.039	0.040			GAM	0.588	0.017	0.015		2	34
Thorium 232	0.660	0.20	0.20			GAM	0.629	0.050	0.048		5	58
Americium 241	U		0.040		U	GAM	U		0.039	U	-	
Uranium 238	U		5.0		U	GAM	U		1.5	U	-	
Uranium 235	U		0.10		U	GAM	U		0.046	U	-	

100 BC Areas-Full Protocol

QC-DUP#1 30586

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 05/17/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
SDG 7115
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207921
Case no SDG-H0387

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAN TEST	SUF-FIX	PLANCHET	Nickel 63
Preparation batch 6880-048					
B0V6N7	N904105-01			7115-001	U
B0V6N8	N904105-02			7115-002	U
B0V6N9	N904105-03			7115-003	U
B0V6P0	N904105-04			7115-004	U
B0V6P1	N904105-05			7115-005	U
B0V6P2	N904105-06			7115-006	U
BLK (QC ID=30585)	N904105-08			7115-008	U
LCS (QC ID=30584)	N904105-07			7115-007	ok
Duplicate (N904105-01)	N904105-09			7115-009	- U

Nominal values and limits from method RDLs (pCi/g) 30
100 BC Areas-Full Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAN TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FROM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-048	2σ prep error 10.0 % Reference Lab Notebook 6880 pg.48															
B0V6N7	N904105-01			2.9	0.500			86		100			17	04/30/99	05/02	LSC-004
B0V6N8	N904105-02			2.8	0.500			80		100			17	04/30/99	05/02	LSC-004
B0V6N9	N904105-03			2.5	0.500			88		100			17	04/30/99	05/02	LSC-004
B0V6P0	N904105-04			2.6	0.500			83		100			17	04/30/99	05/02	LSC-004
B0V6P1	N904105-05			2.4	0.500			88		100			17	04/30/99	05/02	LSC-004
B0V6P2	N904105-06			2.8	0.500			78		100			17	04/30/99	05/02	LSC-004
BLK (QC ID=30585)	N904105-08			2.4	0.500			93		100				04/30/99	05/02	LSC-004
LCS (QC ID=30584)	N904105-07			2.3	0.500			94		100				04/30/99	05/02	LSC-004
Duplicate (N904105-01) (QC ID=30586)	N904105-09			2.7	0.500			81		100			17	04/30/99	05/02	LSC-004
Nominal values and limits from method				30	0.500					10			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMR
Version 1.06
Report date 07/07/99

FAX

TECHLAW, INC.

451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 13 August 1999

Information Request

H0387 - Inorganics

The new case narrative (7/21/99) indicates that the matrix spike for CR VI is below QC limits. That doesn't appear to be the case.

FAX

TECHLAW, INC.
451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 23 July 1999

Information Request

H0387 - Radiochemistry

Page 1 (americium-241 method summary) indicates that sample B0V6P was analyzed 4 days after the rest of the SDG. Apply Qualifiers as per procedure

Page 3 (~~americium-241~~ Pu method summary) indicates that samples B0V6N9, B0V6P0 and B0V6P1 were run 3, 4 and four days respectively after the other samples.

B0V6N9 - Run on following monday

B0V6P0
B0V6P1 } Apply Qualifiers as per procedure

K L Weis
8-11-99

Matrix SOLID
7115
L.A. Johnson

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0387

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6880-048					
B0V6N7	N904105-01			7115-001	U
B0V6N8	N904105-02			7115-002	U
B0V6N9	N904105-03			7115-003	U
B0V6P0	N904105-04			7115-004	U
B0V6P1	N904105-05			7115-005	U
B0V6P2	N904105-06			7115-006	U
BLK (QC ID=30585)	N904105-08			7115-008	U
LCS (QC ID=30584)	N904105-07			7115-007	No data
Duplicate (N904105-01)	N904105-09			7115-009	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
100 BC Areas-Full Protocol

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 6880-048	2σ prep error 5.0 % Reference Lab Notebook 6880 pg.48															
B0V6N7	N904105-01			0.042	0.500			68		802			21	05/06/99	05/06	SS-035
B0V6N8	N904105-02			0.047	0.500			71		802			21	05/06/99	05/06	SS-036
B0V6N9	N904105-03			0.049	0.500			86		802			21	05/06/99	05/06	SS-038
B0V6P0	N904105-04			0.069	0.500			78		802			21	05/06/99	05/06	SS-039
B0V6P1	N904105-05			0.098	0.500			75		1054			25	05/06/99	05/10	SS-034
B0V6P2	N904105-06			0.048	0.500			73		802			21	05/06/99	05/06	SS-043
BLK (QC ID=30585)	N904105-08			0.024	1.00			72		802				05/06/99	05/06	SS-044
LCS (QC ID=30584)	N904105-07			0.029	1.00			88		436				05/06/99	05/08	SS-058
Duplicate (N904105-01) (QC ID=30586)	N904105-09			0.052	0.500			67		802			21	05/06/99	05/06	SS-045
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/07/99

Matrix SOLID
7115
L.A. Johnson

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0387

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6880-048								
B0V6N7	N904105-01			7115-001	U		U	
B0V6N8	N904105-02			7115-002	U		U	
B0V6N9	N904105-03			7115-003	U		U	
B0V6P0	N904105-04			7115-004	U		U	
B0V6P1	N904105-05			7115-005	U		U	
B0V6P2	N904105-06			7115-006	U		U	
BLK (QC ID=30585)	N904105-08			7115-008	U		U	
LCS (QC ID=30584)	N904105-07			7115-007	ok		ok	
Duplicate (N904105-01)	N904105-09			7115-009	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
100 BC Areas-Full Protocol								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX 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 6880-048	2σ prep error 5.0 %			Reference Lab Notebook 6880 pg.48												
B0V6N7	N904105-01			0.034	0.500			81		818			15	04/30/99	04/30	SS-013
B0V6N8	N904105-02			0.038	0.500			85		818			15	04/30/99	04/30	SS-005
B0V6N9	N904105-03			0.023	0.500			89		1557			18	04/30/99	05/03	SS-006
B0V6P0	N904105-04			0.046	0.500			86		586			19	04/30/99	05/04	SS-007
B0V6P1	N904105-05			0.056	0.500			70		639			19	04/30/99	05/04	SS-045
B0V6P2	N904105-06			0.061	0.500			67		894			15	04/30/99	04/30	SS-038
BLK (QC ID=30585)	N904105-08			0.031	1.00			88		894				04/30/99	04/30	SS-042
LCS (QC ID=30584)	N904105-07			0.032	1.00			86		894				04/30/99	04/30	SS-039
Duplicate (N904105-01) (QC ID=30586)	N904105-09			0.031	0.500			63		894			15	04/30/99	04/30	SS-045
Nominal values and limits from method				1.0	0.500			20-105		10	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/07/99

FAX

TECHLAW, INC.

451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 23 July 1999

Information Request

H0387 - Radiochemistry

Page 1 (americium-241 method summary) indicates that sample B0V6P was analyzed 4 days after the rest of the SDG.

Page 3 (americium-241 method summary) indicates that samples B0V6N9, B0V6P0 and B0V6P1 were run 3, 4 and four days respectively after the other samples.

FAX

TECHLAW, INC.
451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 22 July 1999

Information Request

H0387 - Radiochemistry

Page 1, method summaries indicates that sample B0V6P1 (am-241)was run 4 days after the rest of the SDG. Page 3 indicates that samples B0V6N9, B0V6P0 and B0V6P1 were run 3, 4 and four days respectively after the other samples.

Superceded by IR dated 7/23/99

FAX

TECHLAW, INC.
451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 6 July 1999

Information Request

H0387 - Inorganics

On page 006 of the chrome VI data, the numbers appear to be incorrect for the chrome VI percent recovery.

FAX

TECHLAW, INC.
451 Hills, Suite 23
Richland, WA 99352
509-375-9667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 6 July 1999

Information Request

H0387 - Inorganics

On page 006 of the chrome VI data, the numbers appear to be incorrect for the chrome VI percent recovery.

- % recovery corrected in summary
- narrative statement corrected for ✓ control limit.

Per collection for 87 Cr 6

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-002
RFW# : 9904L720
SDG# : H0387
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 04-20-99

INORGANIC CASE NARRATIVE

The narrative is revised to clarify matrix spike recovery information.

1. This narrative covers the analyses of 6 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 cooler temperature was recorded on the chain-of-custody.

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Sample (LCS) for Insoluble Chromium VI was within the laboratory control limits (LCL), however LCS for Soluble Chromium VI was above the LCL of 79.8-118.6%; the Chromium VI results are below the reporting limit and would not be considered biased high.

7. The matrix spike (MS) recovery for Insoluble Chromium VI was within the 75-125% control limits, however MS recovery for Soluble Chromium VI was below the control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

July 21 1999
Date

njp\04-720r

The results presented in this report relate only to the analytical testing and conditions of the samples at 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 12 pages.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 06/23/99

CLIENT: TMU-HANFORD B99-002 RECRA LOT #: 9904L720
WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0V6N7	% Solids	96.9	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-002	B0V6N8	% Solids	96.5	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-003	B0V6N9	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-004	B0V6P0	% Solids	97.6	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-005	B0V6P1	% Solids	96.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-006	B0V6P2	% Solids	96.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/23/99

CLIENT: TMU-HANFORD B99-002

RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI035-NB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 04/23/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L720
WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-006	B0V6P2	Soluble Chromium VI	3.0	0.41u	4.1	73.2	1.0
		Insoluble Chromium VI	1290	0.41u	1160	110.6	100
BLANK10	99LVI035-MB1	Soluble Chromium VI	1.1	0.40u	0.80	125.0	1.0
		Insoluble Chromium VI	1280	0.40u	1160	110.1	100

FAX

TECHLAW, INC.

~~451 Hills, Suite 23~~
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 6 July 1999

Information Request

H0387 - Radiochemistry

No nickel-63 yield data is present on Summary Data Section Page 28.

Revised sheets attached
RLW 7-7-99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
SDG 7115
Contact L.A. Johnson

Client Hanford
Contract TRB-SEB-207925
Case no SDG-H0387

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-FIX	PLANCHET	Nickel 63	
Preparation batch 6880-048						
B0V6N7	N904105-01			7115-001	U	
B0V6N8	N904105-02			7115-002	U	
B0V6N9	N904105-03			7115-003	U	
B0V6P0	N904105-04			7115-004	U	
B0V6P1	N904105-05			7115-005	U	
B0V6P2	N904105-06			7115-006	U	
BLK (QC ID=30585)	N904105-08			7115-008	U	
LCS (QC ID=30584)	N904105-07			7115-007	ok	
Duplicate (N904105-01)	N904105-09			7115-009	-	U

Nominal values and limits from method RDLs (pCi/g) 30
100 BC Areas-Pull Protocol

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUP-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 6880-048 2σ prep error 10.0 % Reference Lab Notebook 6880 pg.48																
B0V6N7	N904105-01			2.5	0.500			86		100			17	04/30/99	05/02	LSC-004
B0V6N8	N904105-02			2.8	0.500			90		100			17	04/30/99	05/02	LSC-004
B0V6N9	N904105-03			2.5	0.500			99		100			17	04/30/99	05/02	LSC-004
B0V6P0	N904105-04			2.6	0.500			83		100			17	04/30/99	05/02	LSC-004
B0V6P1	N904105-05			2.4	0.500			88		100			17	04/30/99	05/02	LSC-004
B0V6P2	N904105-06			2.8	0.500			79		100			17	04/30/99	05/02	LSC-004
BLK (QC ID=30585)	N904105-08			2.4	0.500			93		100				04/30/99	05/02	LSC-004
LCS (QC ID=30584)	N904105-07			2.3	0.500			94		100				04/30/99	05/02	LSC-004
Duplicate (N904105-01) (QC ID=30586)	N904105-09			2.7	0.500			81		100			17	04/30/99	05/02	LSC-004
Nominal values and limits from method				30	0.500					10			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0387

Test NI L Matrix SOLID	Client Hanford
SDG 7115	Contract TRB-SBB-207925
Contact L.A. Johnson	Case no SDG-H0387

METHOD SUMMARY, cont.

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

PROCEDURES	REFERENCE	NI63LSC
	EP-060	Soil Preparation, rev 0
	EP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD	MDA 2.6	± 0.36
FOR 9 SAMPLES	YIELD 86	± 11

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.05
Report date	07/07/99

Date: 17 August 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Areas - Full Protocol - Waste Site 116-B-9
Subject: Inorganics - Data Package No. H0387-RLN (SDG No. H0387)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0387-RLN prepared by RECRA LabNet (RLN). 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	Analysis
B0V6N7	4/15/99	Soil	C	See note 1
B0V6N8	4/15/99	Soil	C	See note 1
B0V6N9	4/15/99	Soil	C	See note 1
B0V6P0	4/15/99	Soil	C	See note 1
B0V6P1	4/15/99	Soil	C	See note 1
B0V6P2	4/15/99	Soil	C	See note 1

1 - ICP metals by 6010A (lead and total chromium); hexavalent chromium by 7196; mercury by 7471

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 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

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for metals 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 six (6)

months for lead & total chromium; 30 days for chromium VI; and 28 days for mercury.

All holding times were acceptable.

- **Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to preparation blank contamination, the chromium (total) result in sample B0V6N9 was qualified as an estimate and flagged "J".

All other preparation blank results were acceptable although the target detection limit (TDL) for chromium VI was exceeded.

Equipment Blanks

One equipment blank (B0V6N9) was submitted for analysis. Chromium (total) and lead were detected in the equipment blank. Under the BHI statement of work, no qualification is required. No other analytes were detected in the equipment blank.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

Due to a RPD outside QC limits (32%), lead results in all samples were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicates

One sample duplicate pair (B0V6N7/B0V6N8) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan TDLs or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The following had reported detection limits above their TDL: Chromium VI in all samples. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data package No. H0387-RLN (SDG No. H0387) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to preparation blank contamination, the chromium (total) result in sample B0V6N9 was qualified as an estimate and flagged "J". Due to a RPD outside QC limits (32%), lead results in all samples were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The following had reported detection limits above their TDL: Chromium VI in all samples. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI 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 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 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 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 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

DATA QUALIFICATION SUMMARY

SDG: H0387	REVIEWER: TLI	DATE: 8/17/99	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lead	J	All	RPD outside QC limits
Chromium (total)	J	B0V6N9	Blank contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																							
Laboratory: RECRA LabNet																							
Case	SDG: H0387																						
Sample Number		B0V6N7		B0V6N8		B0V6N9		B0V6P0		B0V6P1		B0V6P2											
Location		116-B-9		116-B-9		116-B-9		116-B-9		116-B-9		116-B-9											
Remarks		A1		Duplicate		Equip. Blank		A2		A3		A4											
Sample Date		4/15/99		4/15/99		4/15/99		4/15/99		4/15/99		4/15/99											
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q								
Chromium (total)	0.5	13.2		12.8		0.42	J	9.0		10.1		10.1											
Mercury	0.06	0.17		0.21		0.02	U	0.39		0.20		0.22											
Lead	2	11.7	J	11.2	J	3.2	J	6.5	J	11.1	J	12.0	J										
Chromium VI	0.1	0.41	U	0.42	U	0.40	U	0.41	U	0.41	U	0.41	U										

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/03/99

CLIENT: TMU-HANFORD B99-002

RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0V6N7	Chromium, Total	13.2	MG/KG	0.06	1.0
		Mercury, Total	0.17	MG/KG	0.02	1.0
		Lead, Total	11.7 J	MG/KG	0.18	1.0
-002	B0V6N8	Chromium, Total	12.8	MG/KG	0.05	1.0
		Mercury, Total	0.21	MG/KG	0.02	1.0
		Lead, Total	11.2 J	MG/KG	0.16	1.0
-003	B0V6N9	Chromium, Total	0.42 J	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.2 J	MG/KG	0.16	1.0
-004	B0V6P0	Chromium, Total	9.0	MG/KG	0.06	1.0
		Mercury, Total	0.39	MG/KG	0.02	1.0
		Lead, Total	6.5 J	MG/KG	0.17	1.0
-005	B0V6P1	Chromium, Total	10.1	MG/KG	0.05	1.0
		Mercury, Total	0.20	MG/KG	0.02	1.0
		Lead, Total	11.1 J	MG/KG	0.16	1.0
-006	B0V6P2	Chromium, Total	10.1	MG/KG	0.05	1.0
		Mercury, Total	0.22	MG/KG	0.02	1.0
		Lead, Total	12.0 J	MG/KG	0.15	1.0

RK 7/20/99

ATK

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 04/23/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0V6N7	% Solids	96.9	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-002	B0V6N8	% Solids	96.5	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-003	B0V6N9	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-004	B0V6P0	% Solids	97.6	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-005	B0V6P1	% Solids	96.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-006	B0V6P2	% Solids	96.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

7/20/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-002
RFW# : 9904L720
SDG# : H0387
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 04-20-99

INORGANIC CASE NARRATIVE

The narrative is revised to clarify matrix spike recovery information.

1. This narrative covers the analyses of 6 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 cooler temperature was recorded on the chain-of-custody.

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Sample (LCS) for Insoluble Chromium VI was within the laboratory control limits (LCL), however LCS for Soluble Chromium VI was above the LCL of 79.8-118.6%; the Chromium VI results are below the reporting limit and would not be considered biased high.

7. The matrix spike (MS) recovery for Insoluble Chromium VI was within the 75-125% control limits, however MS recovery for Soluble Chromium VI was below the control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

July 21 1999
Date

tjp/404-720r
The results presented in this report relate only to the analytical testing and conditions of the samples at 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 12 pages.

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RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

JUN 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-002
RFW# : 9904L720
SDG/SAF# : H0387/B99-002

W.O.# : 10985-001-001-9999-00
Date Received: 04-20-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.

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

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value} with the exception of Chromium. Refer to the Inorganics Method Blank Data Summary.

   a.) The MB result for Chromium was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample B0V6N9 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample result was reported herein "uncorrected" for the levels found in the MB.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at 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 14 pages.

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11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

for Pat E.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-4-95
Date

mld/m04-720

Collector Fahlberg/Kerkow	Company Contact R Coffman Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code Data Turnaround 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100BC 116-B-9 Shallow	SAF No. B99-002	
Ice Chest No. ERC96-016	Field Logbook No. EL 1327-2	Method of Shipment FED EX	
Shipped To TMA/RECRA RS 4.15.99	Offsite Property No. A990113	Bill of Lading/Air Bill No. 4235 7952 4813	2.6
		COA R116B92600	

POSSIBLE SAMPLE HAZARDS/REMARKS**

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None						
Type of Container	aG	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	60mL	125mL	250mL	1000mL						
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
B0V6N7	Soil	4.15.99	0915			X	X				tiota	Bor	688
B0V6N8	Soil	4.15.99	0915			X	X					Bor	688
B0V6N9	Soil	4.15.99	0805			X	X						

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Coffman / R. Fahlberg	4.15.99 1635	Ref. 1-B	4.15.99 1635
REF 1B	4/1999 1030	SJGALE	4/1999 1030
SJGALE	4/1999 1030	FED EX	
Jedeep			

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

NOTE COLLECTOR UNAVAILABLE TO SIGN COC,

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By J Toder	Title Login Unit Leader	Date/Time 4/20/99 0930
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector Fahlberg/Kerkow	Company Contact R Coffman	Telephone No. 373-5425	Project Coordinator TRENT, SJ	Price Code	Date Turnaround 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100BC 116-B-9 Shallow		SAF No. B99-002		
Ice Chest No. ERC96-016	Field Logbook No. EL 1327-2		Method of Shipment FED EX		
Shipped To TMA/ECRA Rec 4-15-99	Offsite Property No. A990113		Bill of Lading/Air Bill No. 4235795248 13		
			COA R116892600		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None						
Type of Container	sG	sG	sG	sG	sG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	60mL	125mL	250mL	1000mL						
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
B0V6P0	Soil	4-15-99	1000			X	X						B0V616
B0V6P1	Soil	4-15-99	1030			X	X						B0V6B4
B0V6P2	Soil	4-15-99	1100			X	X						B0V6B9

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By R Fahlberg / R Fahlberg 4-15-99	Date/Time 1635	Received By Ref. 1-B	Date/Time 1635 4-15-99
Relinquished By REF 1-B 41999 1030	Date/Time	Received By SJGALE 41999 1030	Date/Time
Relinquished By SJGALE 41999 1030	Date/Time	Received By FED EX	Date/Time
Relinquished By Dealey	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 – Total Sr; Nickel-63
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

NOTE: COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By Foster	Title Login Unit Leader	4/20/99	Date/Time 0930
SAMPLE DISPOSAL SECTION	Disposal Method	Disposed By		Date/Time

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 116-B-9			DATA PACKAGE: H0387		
VALIDATOR: TLI		LAB: RecRA		DATE: 7/6/99	
CASE:			SDG: H0387		
ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☒ CR VI	☐
SAMPLES/MATRIX B0U6N7 B0U6N8 B0U6N9 B0U6P0					
B0U6P1 B0U6P2					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: CR (total) 0.24 lead 0.41 – no qual req
CR VI 4x rep limit but U
BOUNGY J
EB BOUGNY – lead + CR (total)

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: Spike – 1R on CR VI
~~CR VI~~ CR VI 73.2 – ok

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A
Comments: lead 32% RPD — J

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A
Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A
Comments: CRVI — all over

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/03/99

CLIENT: TMU-HANFORD B99-002

RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0V6N7	Chromium, Total	13.2	13.0	1.5	1.0
		Mercury, Total	0.17	0.19	12.1	1.0
		Lead, Total	11.7	8.4	32.8	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/23/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI035-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 04/23/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-006	B0V6P2	Soluble Chromium VI	3.0	0.41u	4.1	81.8	1.0
		Insoluble Chromium VI	1290	0.40u	1160	110.6	100
BLANK10	99LVI03S-MB1	Soluble Chromium VI	1.1	0.40u	0.80	135.0	1.0
		Insoluble Chromium VI	1280	0.40u	1160	110.1	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 04/23/99

CLIENT: TMU-HANFORD B99-002 RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-006REP	B0V6P2	% Solids	96.7	96.4	0.32	1.0
		Chromium VI	0.41u	0.41u	NC	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/03/99

CLIENT: TMU-HANFORD B99-002 RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0V6N7	Chromium, Total	31.9	13.2	19.1	97.9	1.0
		Mercury, Total	0.35	0.17	0.17	107.8	1.0
		Lead, Total	53.4	11.7	47.8	87.2	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/03/99

CLIENT: TWU-HANFORD B99-002 RECRA LOT #: 9904L720

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0241-MB1	Chromium, Total	0.24	MG/KG	0.06	1.0
		Lead, Total	0.41	MG/KG	0.18	1.0
BLANK1	99C0119-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Review Comment Record (RCR)

1. Date	2. Review No.
8/19/99	BHI/QA99014
3. Project	**4. Page**
116-B-9	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H0387-TNU & RLN (SDG No. H0387)	100-BC Areas – Full Protocol - 116-B-9	Claude Stacey	BHI/QA	H0-16/372-9208

17. *Comment Submittal Approval:*

Organization Manager (Optional) _____ Date _____

10. *Agreement with indicated comment disposition(s)*

Reviewer/Point of Contact _____

Author/Originator _____

11. *CLOSED*

8/21/99 Date

Reviewer/Point of Contact _____

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. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Inorganic: Page 2, under holding Times last sentence has, ". . . for chrome VI;" this should be ". . . for chromium VI;"		Corrected 8/23/99 ~~8/25/99~~	
2	Inorganic: Page 2, under Blanks next to last sentence has ". . . results in sample B0VN69 was . . ." The sample number should be B0V6N9. Also, on page 004, under Minor Deficiencies second line has B0VN69 which should be B0V6N9.		corrected 8/23/99	
3	Inorganic: Page 029 is duplicate of page 011without the validation notations and should be removed..		corrected 8/23/99	
4	RadChem: OK No Comments			

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@CH2M.com]
Sent: Wednesday, August 18, 1999 10:21 AM
To: Duncan, Jeanette/RLO-HAN
Subject: Validation Review - H0399, H0387, H0377

Jeanette -

H0387 (B-3) - No comments
H0399 (B-9) - No comments
H0377 (B-12) - Analytical Detection Levels (p. 3). Validator stated that Chromium VI had reported detection limits above TDL in samples B0V1W9 and B0V1X0. This is true, but it is also true for samples B0V1W7 and B0V1W8.

I have already given you my comments on H0393 (B-6B) and H0401 (B-4), and Dave Corbett is reviewing B-2. So, that is all of my comments on validation reports I have received to date.

Tina Routt
CH2M Hill Richland Office
(509) 375-3444, ext. 211
(509) 375-5566 fax

Comments – RL Weiss

SDG H0399 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VD41, B0VD43, B0VD44 failed. Correct summary table and narrative.

- Minor Deficiencies - Remove 1st paragraph (does not reflect earlier statement in PRECISION and no "J" were applied to the data.

SDG H0434 Inorganic – No comments

SDG H0434 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VF69, B0VF70, B0VF71, B0V72, failed. Correct summary table and narrative.

- Need to apply "J" flag to Am-241 results on pg. 14 (B0VF72).

SDG H0387 Inorganic – No comments

SDG H0387 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V6N8 failed. Correct summary table and narrative.

corrected [illegible] 8/25/95

SDG H0377 Inorganic – No comments.

SDG H0377 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V1X0 failed. Correct summary table and narrative.

SDG H0437 Inorganic

- ACCURACY – MS failure was for Hg not Pb. Correct narrative, tables, and annotated results.

SDG H0437 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VFK2, B0VFK4, B0VFK5 failed. Correct summary table and narrative.

- The package has 2 narrative sections. The one with the "wrong" waste site (116-B6A) appears to be more correct except for waste site identity.

Comments – RL Weiss

SDG H0399 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VD41, B0VD43, B0VD44 failed. Correct summary table and narrative.

- Minor Deficiencies - Remove 1st paragraph (does not reflect earlier statement in PRECISION and no "J" were applied to the data.

SDG H0434 Inorganic – No comments

SDG H0434 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VF69, B0VF70, B0VF71, B0V72, failed. Correct summary table and narrative.

- Need to apply "J" flag to Am-241 results on pg. 14 (B0VF72).

SDG H0387 Inorganic – No comments

SDG H0387 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V6N8 failed. Correct summary table and narrative.

SDG H0377 Inorganic – No comments.

SDG H0377 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V1X0 failed. Correct summary table and narrative.

SDG H0437 Inorganic

- ACCURACY – MS failure was for Hg not Pb. Correct narrative, tables, and annotated results.

SDG H0437 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VFK2, B0VFK4, B0VFK5 failed. Correct summary table and narrative.

- The package has 2 narrative sections. The one with the "wrong" waste site (116-B6A) appears to be more correct except for waste site identity.

SDG H0393 Inorganic – No comments.

SDG H0393 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VD36, B0VD39, B0VB3 failed. Correct summary table and narrative.

SDG H0436 Inorganic – No comments.

SDG H0436 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VLC4, B0VLC6 failed. Correct summary table and narrative.

SDG H0409 Inorganic – No comments.

SDG H0409 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VFL1, B0VFL2, B0VFL3, B0VFL4, B0VFL6, B0VFM3, B0VFM6 failed. Correct summary table and narrative.

Review Comment Record (RCR)

1. Date	2. Review No.
8/19/99	BHI/QA99014
3. Project	**4. Page**
116-B-9	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H0387-TNU & RLN (SDG No. H0387)	100-BC Areas – Full Protocol - 116-B-9	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional) _____ Date _____

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact _____ Date _____

Author/Originator _____

11. CLOSED

Reviewer/Point of Contact _____

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. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Inorganic: Page 2, under holding Times last sentence has, ". . . for chrome VI;" this should be ". . . for chromium VI;"			
2	Inorganic: Page 2, under Blanks next to last sentence has ". . . results in sample B0VN69 was . . ." The sample number should be B0V6N9. Also, on page 004, under Minor Deficiencies second line has B0VN69 which should be B0V6N9.			
3	Inorganic: Page 029 is duplicate of page 011without the validation notations and should be removed..			
4	RadChem: OK No Comments			

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@CH2M.com]
Sent: Wednesday, August 18, 1999 10:21 AM
To: Duncan, Jeanette/RLO-HAN
Subject: Validation Review - H0399, H0387, H0377

Jeanette -

H0387 (B-3) - No comments
H0399 (B-9) - No comments
H0377 (B-12) - Analytical Detection Levels (p. 3). Validator stated that Chromium VI had reported detection limits above TDL in samples B0V1W9 and B0V1X0. This is true, but it is also true for samples B0V1W7 and B0V1W8.

I have already given you my comments on H0393 (B-6B) and H0401 (B-4), and Dave Corbett is reviewing B-2. So, that is all of my comments on validation reports I have received to date.

Tina Routt
CH2M Hill Richland Office
(509) 375-3444, ext. 211
(509) 375-5566 fax

FAX

TECHLAW, INC.
451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 13 August 1999

Information Request

H0387 - Inorganics

The new case narrative (7/21/99) indicates that the matrix spike for CR VI is below QC limits. That doesn't appear to be the case.

Case narrative is discussing lab established parameter. Our validation parameter is greater. Validate to our parameters

R W
8-16-99

TRANSMISSION RESULT REPORT (AUG 16 '99 08:35AM)

BHI S&D MANAGEMENT 509 372 9487

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
030	MEMORY TX		3755151	01/01	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

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H0387 - Inorganics