Date: 9 March 2000
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-F/DR Phase III Below-grade Areas Sampling and Analysis
Subject: Radiochemistry - Data Package No. W03005A-QES & W03005B-QES (SDG No. W03005)

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INTRODUCTION

This memo presents the results of data validation on Summary Data Package Nos. W03005A-QES and W03005B-QES which were prepared by Quanterra Environmental Services. 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
B0XB60	1/5/00	Solid	C	See note 1
B0XB61	1/5/00	Solid	C	See note 1
B0XB62	1/5/00	Solid	C	See note 1
B0XB63	1/5/00	Solid	C	See note 1
B0XB64	1/5/00	Solid	C	See note 1
B0XB65	1/5/00	Solid	C	See note 1
B0XB66	1/5/00	Solid	C	See note 1
B0XB67	1/6/00	Solid	C	See note 1
B0XB68	1/6/00	Solid	C	See note 1
B0XB69	1/6/00	Solid	C	See note 1
B0XB70	1/6/00	Solid	C	See note 1
B0XB71	1/6/00	Solid	C	See note 1
B0XB72	1/6/00	Solid	C	See note 1
B0XB73	1/6/00	Solid	C	See note 1
B0XBH5	1/3/00	Solid	C	See note 1
B0XBH6	1/3/00	Solid	C	See note 1
B0XBH7	1/3/00	Solid	C	See note 1
B0XBH8	1/3/00	Solid	C	See note 1

1- Gamma spectroscopy; alpha spectroscopy (isotopic plutonium and americium-241); total strontium; nickel-63; tritium; carbon-14; technetium-99.

Data validation was conducted in accordance with the BHI validation statement of work and the "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). 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**

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.

Due to the analysis being conducted 9 days after distillation, the nickel-63 results in samples B0XB60, B0XB61, B0XB62, B0XB63, B0XB64, B0XB65, B0XB66, B0XBH5, B0XBH6, B0XBH7 and B0XBH8 were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **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.

Due to laboratory blank contamination, the carbon-14 results in samples B0XB67, B0XB68, B0XB70, B0XB71, B0XB72 and B0XB73 were qualified as estimates and flagged "J".

Due to laboratory blank contamination, the nickel-63 results in samples B0XB67, B0XB68, B0XB70, B0XB72 and B0XB73 were qualified as estimates and flagged "J".

All other laboratory blank results were acceptable.

Field Blanks

One equipment blank (B0XBH5) was submitted for analysis. Strontium-90 and carbon-14 were detected in the equipment blank. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **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 is 70-130% (80-120% for gamma spectroscopy). 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 a matrix spike recovery of 69%, all nickel-63 results in samples B0XB60, B0XB61, B0XB62, B0XB63, B0XB64, B0XB65, B0XB66, B0XBH5, B0XBH6, B0XBH7 and B0XBH8 were qualified as estimates and flagged "J".

Due to an LCS recovery of 69%, the nickel-63 results in samples B0XB67, B0XB68, B0XB69, B0XB70, B0CB71, B0XB72 and B0XB73 were qualified as estimates and flagged "J".

Due to the lack of a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J".

All other 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

Two pair of field duplicate samples (samples B0XB70/B0XB71 and B0XBH7/B0XBH8) were submitted to QES 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 105DR PQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory MDAs were at or below the analyte-specific PQL.

- **Completeness**

Data Package No. W03005A & W03005B (SDG No. W03005) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the analysis being conducted 9 days after distillation, the nickel-63 results in samples B0XB60, B0XB61, B0XB62, B0XB63, B0XB64, B0XB65, B0XB66, B0XBH5, B0XBH6, B0XBH7 and B0XBH8 were qualified as estimates and flagged "J".

- Due to laboratory blank contamination, the carbon-14 results in samples B0XB67, B0XB68, B0XB70, B0XB71, B0XB72 and B0XB73 were qualified as estimates and flagged "J".

- Due to laboratory blank contamination, the nickel-63 results in samples B0XB67, B0XB68, B0XB70, B0XB72 and B0XB73 were qualified as estimates and flagged "J".

- Due to a matrix spike recovery of 69%, all nickel-63 results in samples B0XB60, B0XB61, B0XB62, B0XB63, B0XB64, B0XB65, B0XB66, B0XBH5, B0XBH6, B0XBH7 and B0XBH8 were qualified as estimates and flagged "J".

- Due to an LCS recovery of 69%, the nickel-63 results in samples B0XB67, B0XB68, B0XB69, B0XB70, B0CB71, B0XB72 and B0XB73 were qualified as estimates and flagged "J".

- Due to the lack of a matrix spike analysis, all carbon-14 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.

REFERENCES

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

DOE/RL-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

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: W03005	REVIEWER: TLI	DATE: 3/9/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14	J	B0XB67, B0XB68, B0XB70, B0XB71, B0XB72, B0XB73	Blank contamination
Nickel-63	J	B0XB67, B0XB68, B0XB70, B0XB72, B0XB73	Blank contamination
Nickel-63	J	B0XB60, B0XB61, B0XB62, B0XB63, B0XB64, B0XB65, B0XB66, B0XBH5, B0XBH6, B0XBH7, B0XBH8	Matrix spike
Nickel-63	J	B0XB67, B0XB68, B0XB69, B0XB70, B0CB71, B0XB72, B0XB73	LCS recovery
Carbon-14	J	All	No matrix spike
Nickel-63	J	B0XB60, B0XB61, B0XB62, B0XB63, B0XB64, B0XB65, B0XB66, B0XBH5, B0XBH6, B0XBH7, B0XBH8	Holding time

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOLID MATRIX, (PCi/G)

Project: BECHTEL-HANFORD
Laboratory: Quanterra
Case | SDG: W03005

Sample Number		B0XB60		B0XB61		B0XB62		B0XB63		B0XB64		B0XB65		B0XB66		B0XB67		B0XB68			
Location		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c			
Remarks																					
Sample Date		1/5/00		1/5/00		1/5/00		1/5/00		1/5/00		1/5/00		1/5/00		1/6/00		1/6/00			
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Americium-241	1	0.00	U	0.0277		-0.000391	U	0.00571	U	0.00	U	-0.000622	U	-0.000797	U	0.00487	U	0.00	U		
Plutonium-238	1	-0.000499	U	-0.000404	U	0.0198		-0.000370	U	-0.000350	U	0.00	U	0.00448	U	-0.000867	U	-0.000353	U		
Plutonium-239/240	1	-0.000499	U	0.00424	U	-0.000322	U	-0.000370	U	-0.000350	U	0.00	U	0.00	U	0.005	U	-0.000706	U		
Barium-133		0.0190	U	-0.0143	U	0.0224	U	0.00910	U	0.0110	U	-0.00261	U	-0.00441	U	0.0220	U	-0.00927	U		
Cobalt-60	0.1	0.0285	U	-0.00751	U	-0.000218	U	0.00419	U	0.0398	U	0.0571	U	-0.00135	U	0.0232	U	0.0283	U		
Cesium 137	0.1	0.000616	U	0.0241	U	0.0205	U	0.0229	U	0.0561		0.0363	U	0.0181	U	0.0290	U	0.0620			
Europium-152	0.2	0.0121	U	0.0358	U	-0.0127	U	0.021	U	-0.0170	U	0.003	U	0.0169	U	0.0172	U	-0.0434	U		
Europium-154	0.2	-0.0182	U	0.0479	U	0.0204	U	-0.0808	U	-0.00110	U	0.0244	U	0.0419	U	0.00184	U	0.0242	U		
Europium-155	0.1	0.0585	U	-0.0152	U	0.0422	U	0.0425	U	0.0302	U	0.0191	U	0.0234	U	0.0273	U	0.0227	U		
Strontium	1	0.0506	U	0.0187	U	0.000945	U	0.166		0.0336	U	0.0851	U	-0.00516	U	0.0258	U	0.0405	U		
Carbon-14	50	6.30	J	1.12	J	1.14	J	6.51	J	6.37	J	0.814	UJ	5.80	J	1.40	J	1.25	J		
Nickel-63	30	4.24	UJ	4.47	UJ	6.25	J	23.0	J	4.16	J	4.62	UJ	4.02	UJ	5.78	J	9.32	J		
Technetium-99	15	0.374	U	-0.326	U	-0.468	U	0.382	U	0.210	U	0.187	U	0.218	U	-0.115	U	-0.0453	U		

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RADIOCHEMISTRY ANALYSIS, SOLID MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W03005																				
Sample Number		B0XB69		B0XB70		B0XB71		B0XB72		B0XB73		B0XBH5		B0XBH6		B0XBH7		B0XBH8			
Location		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 231		Rm. 231		Rm. 231		Rm. 231			
Remarks						Duplicate						E. Blank						Duplicate			
Sample Date		1/6/00		1/6/00		1/6/00		1/6/00		1/6/00		1/3/00		1/3/00		1/3/00		1/3/00			
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Americium-241	1	0.0126		-0.000420	U	0.00	U	-0.000333	U	0.00486	U	0.00	U	0.0148	U	0.00	U	-0.000692	U		
Plutonium-238	1	0.00	U	0.00511	U	0.00	U	-0.000337	U	-0.00155	U	-0.00381	U	0.00498	U	0.00473	U	-0.00171	U		
Plutonium-239/240	1	0.00	U	0.00	U	-0.000691	U	0.00420	U	0.00644	U	0.00437	U	-0.000398	U	0.00	U	0.00	U		
Barium-133		-0.0135	U	0.0237	U	0.00749	U	-0.00758	U	-0.00577	U	-0.00282	U	-0.00535	U	-0.00669	U	0.0112	U		
Cobalt-60	0.1	0.0263	U	-0.00204	U	0.00473	U	0.0287	U	0.0354	U	0.00368	U	0.00124	U	0.0200	U	0.00179	U		
Cesium 137	0.1	0.0555		0.00260	U	0.0134	U	0.0239	U	0.0742		0.0260	U	0.0273	U	0.0246	U	0.0155	U		
Europium-152	0.2	-0.0106	U	-0.01430	U	-0.0560	U	0.0180	U	0.0358	U	0.0314	U	0.0216	U	-0.0475	U	0.00477	U		
Europium-154	0.2	-0.0389	U	-0.00232	U	-0.00400	U	0.0217	U	-0.0123	U	-0.0364	U	-0.00242	U	-0.0151	U	-0.00356	U		
Europium-155	0.1	0.0336	U	0.0373	U	0.0477	U	0.0460	U	0.0101	U	0.0679	U	0.00306	U	0.0315	U	-0.00452	U		
Strontium	1	0.0767	U	0.0646	U	0.00469	U	0.0423	U	0.00756	U	0.151		0.0805	U	0.0536	U	0.0913	U		
Carbon-14	50	0.302	UJ	1.83	J	2.54	J	1.66	J	5.77	J	0.905	J	0.659	UJ	0.134	UJ	0.169	UJ		
Nickel-63	30	6.57	UJ	7.08	J	4.00	UJ	5.77	J	4.88	J	4.54	UJ	4.10	UJ	3.07	UJ	5.98	J		
Technetium-99	15	-0.123	U	0.0357	U	0.283	U	0.231	U	-0.112	U	-0.0578	U	-0.0406	U	-0.0179	U	0.787	U		

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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73R010	MATRIX:	OTHER
CLIENT ID:	B0XB60	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~1.52E+02~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	0.00E+00	U	0.0E+00	1.1E-02	1.25E-02	pCi/g	86.42%	RICHRC5080
PU-238	-4.99E-04	U	1.0E-03	1.0E-03	2.51E-02	pCi/g	50.92%	RICHRC5010
PU239/40	-4.99E-04	U	1.0E-03	1.0E-03	2.51E-02	pCi/g	50.92%	RICHRC5010
BA-133	1.90E-02	U	2.8E-02	2.8E-02	4.16E-02	pCi/g		RICHRC5017
CO-60	2.85E-02	U	2.3E-02	2.3E-02	4.19E-02	pCi/g		RICHRC5017
CS-137	6.16E-04	U	2.4E-02	2.4E-02	4.03E-02	pCi/g		RICHRC5017
EU-152	1.21E-02	U	5.4E-02	5.4E-02	9.14E-02	pCi/g		RICHRC5017
EU-154	-1.82E-02	U	6.5E-02	6.5E-02	1.09E-01	pCi/g		RICHRC5017
EU-155	5.85E-02	U	4.0E-02	4.0E-02	6.78E-02	pCi/g		RICHRC5017
STRONTIUM	5.06E-02	U	5.1E-02	5.3E-02	1.06E-01	pCi/g	92.40%	RICHRC5006
C-14	6.30E+00	~~J~~ J	3.0E-01	8.6E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.24E+00	U J	2.4E-01	3.1E+00	4.82E+00	pCi/g	94.93%	RICHRC5069
TC-99	3.74E-01	U	1.9E-02	6.9E-01	7.79E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/16/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73RE10	MATRIX:	OTHER
CLIENT ID:	B0XB61	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~4.56E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	2.77E-02		2.5E-02	2.6E-02	2.26E-02	pCi/g	74.99%	RICHRC5080
PU-238	-4.04E-04	U	8.1E-04	8.1E-04	2.03E-02	pCi/g	82.69%	RICHRC5010
PU239/40	4.24E-03	U	1.0E-02	1.0E-02	2.31E-02	pCi/g	82.69%	RICHRC5010
BA-133	-1.43E-02	U	2.6E-02	2.6E-02	3.78E-02	pCi/g		RICHRC5017
CO-60	-7.51E-03	U	2.4E-02	2.4E-02	4.05E-02	pCi/g		RICHRC5017
CS-137	2.41E-02	U	2.3E-02	2.3E-02	4.13E-02	pCi/g		RICHRC5017
EU-152	3.58E-02	U	5.6E-02	5.6E-02	8.53E-02	pCi/g		RICHRC5017
EU-154	4.79E-02	U	7.1E-02	7.1E-02	1.29E-01	pCi/g		RICHRC5017
EU-155	-1.52E-02	U	5.3E-02	5.3E-02	8.50E-02	pCi/g		RICHRC5017
STRONTIUM	1.87E-02	U	5.3E-02	5.3E-02	1.20E-01	pCi/g	85.40%	RICHRC5006
C-14	1.12E+00	J	7.2E-02	6.2E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.47E+00	U J	2.9E-01	3.4E+00	6.38E+00	pCi/g	88.46%	RICHRC5069
TC-99	-3.26E-01	U	1.7E-02	6.4E-01	7.84E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/14/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

~~0000~~

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73RR10	MATRIX:	OTHER
CLIENT ID:	B0XB62	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~3.84E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	-3.91E-04	U	7.8E-04	7.9E-04	1.97E-02	pCi/g	84.57%	RICHRC5080
PU-238	1.98E-02		1.8E-02	1.8E-02	1.62E-02	pCi/g	83.19%	RICHRC5010
PU239/40	-3.22E-04	U	6.4E-04	6.5E-04	1.62E-02	pCi/g	83.19%	RICHRC5010
BA-133	2.24E-02	U	2.0E-02	2.0E-02	3.00E-02	pCi/g		RICHRC5017
CO-60	-2.18E-04	U	2.1E-02	2.1E-02	3.67E-02	pCi/g		RICHRC5017
CS-137	2.05E-02	U	2.0E-02	2.0E-02	3.55E-02	pCi/g		RICHRC5017
EU-152	-1.27E-02	U	4.0E-02	4.0E-02	6.75E-02	pCi/g		RICHRC5017
EU-154	2.04E-02	U	6.1E-02	6.1E-02	1.07E-01	pCi/g		RICHRC5017
EU-155	4.22E-02	U	3.5E-02	3.5E-02	6.05E-02	pCi/g		RICHRC5017
STRONTIUM	9.45E-04	U	5.0E-02	5.0E-02	1.19E-01	pCi/g	88.20%	RICHRC5006
C-14	1.14E+00	J	7.3E-02	6.2E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	6.25E+00	J	3.5E-01	3.4E+00	5.19E+00	pCi/g	88.41%	RICHRC5069
TC-99	-4.68E-01	U	2.5E-02	6.3E-01	7.79E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/14/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73T410	MATRIX:	OTHER
CLIENT ID:	B0XB63	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~4.81E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	5.71E-03	U	1.2E-02	1.3E-02	2.50E-02	pCi/g	64.20%	RICHRC5080
PU-238	-3.70E-04	U	7.4E-04	7.4E-04	1.86E-02	pCi/g	72.36%	RICHRC5010
PU239/40	-3.70E-04	U	7.4E-04	7.4E-04	1.86E-02	pCi/g	72.36%	RICHRC5010
BA-133	9.10E-03	U	2.4E-02	2.4E-02	3.64E-02	pCi/g		RICHRC5017
CO-60	4.19E-03	U	2.4E-02	2.4E-02	4.26E-02	pCi/g		RICHRC5017
CS-137	2.29E-02	U	2.2E-02	2.2E-02	3.95E-02	pCi/g		RICHRC5017
EU-152	2.11E-02	U	4.8E-02	4.8E-02	8.17E-02	pCi/g		RICHRC5017
EU-154	-8.08E-02	U	7.4E-02	7.4E-02	1.17E-01	pCi/g		RICHRC5017
EU-155	4.25E-02	U	4.2E-02	4.2E-02	7.17E-02	pCi/g		RICHRC5017
STRONTIUM	1.66E-01	~~J~~	6.6E-02	8.1E-02	1.13E-01	pCi/g	88.00%	RICHRC5006
C-14	6.51E+00	~~J~~ J	3.0E-01	8.7E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	2.30E+01	~~J~~ J	1.6E+00	5.5E+00	1.22E+01	pCi/g	91.15%	RICHRC5069
TC-99	3.82E-01	U	1.9E-02	6.9E-01	7.81E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/16/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73T510	MATRIX:	OTHER
CLIENT ID:	B0XB64	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~3.72E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	0.00E+00	U	0.0E+00	1.9E-02	2.09E-02	pCi/g	50.81%	RICHRC5080
PU-238	-3.50E-04	U	7.0E-04	7.0E-04	1.76E-02	pCi/g	71.54%	RICHRC5010
PU239/40	-3.50E-04	U	7.0E-04	7.0E-04	1.76E-02	pCi/g	71.54%	RICHRC5010
BA-133	1.10E-02	U	2.2E-02	2.2E-02	3.18E-02	pCi/g		RICHRC5017
CO-60	3.98E-02	U	1.9E-02	1.9E-02	3.69E-02	pCi/g		RICHRC5017
CS-137	5.61E-02		3.1E-02	3.1E-02	2.89E-02	pCi/g		RICHRC5017
EU-152	-1.70E-02	U	4.5E-02	4.5E-02	7.00E-02	pCi/g		RICHRC5017
EU-154	-1.10E-03	U	4.9E-02	4.9E-02	8.44E-02	pCi/g		RICHRC5017
EU-155	3.02E-02	U	3.1E-02	3.1E-02	5.20E-02	pCi/g		RICHRC5017
STRONTIUM	3.36E-02	U	4.7E-02	4.8E-02	1.02E-01	pCi/g	96.60%	RICHRC5006
C-14	6.37E+00	J	3.0E-01	8.6E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.16E+00	U J	2.4E-01	3.2E+00	5.01E+00	pCi/g	94.99%	RICHRC5069
TC-99	2.10E-01	U	1.1E-02	6.8E-01	7.78E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/16/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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~~0003~~

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73T810	MATRIX:	OTHER
CLIENT ID:	B0XB65	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~1.92E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	-6.22E-04	U	1.2E-03	1.2E-03	3.13E-02	pCi/g	52.93%	RICHRC5080
PU-238	0.00E+00	U	0.0E+00	1.2E-02	1.30E-02	pCi/g	63.64%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.2E-02	1.30E-02	pCi/g	63.64%	RICHRC5010
BA-133	-2.61E-03	U	2.2E-02	2.2E-02	3.04E-02	pCi/g		RICHRC5017
CO-60	5.71E-02	U	2.9E-02	2.9E-02	4.05E-02	pCi/g		RICHRC5017
CS-137	3.63E-02	U	2.0E-02	2.0E-02	3.52E-02	pCi/g		RICHRC5017
EU-152	3.18E-03	U	4.3E-02	4.3E-02	7.17E-02	pCi/g		RICHRC5017
EU-154	2.44E-02	U	6.0E-02	6.0E-02	1.06E-01	pCi/g		RICHRC5017
EU-155	1.91E-02	U	3.2E-02	3.2E-02	5.59E-02	pCi/g		RICHRC5017
STRONTIUM	8.51E-02	U	5.4E-02	5.9E-02	1.05E-01	pCi/g	93.90%	RICHRC5006
C-14	8.14E-01	U J	5.4E-02	6.0E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.62E+00	U J	2.7E-01	3.0E+00	4.81E+00	pCi/g	96.34%	RICHRC5069
TC-99	1.87E-01	U	9.5E-03	6.8E-01	7.87E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/16/00

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73TC10	MATRIX:	OTHER
CLIENT ID:	B0XB66	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~5.16E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	-7.97E-04	U	1.6E-03	1.6E-03	4.01E-02	pCi/g	53.08%	RICHRC5080
PU-238	4.48E-03	U	9.0E-03	9.0E-03	1.21E-02	pCi/g	69.49%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.1E-02	1.21E-02	pCi/g	69.49%	RICHRC5010
BA-133	-4.41E-03	U	2.3E-02	2.3E-02	3.18E-02	pCi/g		RICHRC5017
CO-60	-1.35E-03	U	2.2E-02	2.2E-02	3.80E-02	pCi/g		RICHRC5017
CS-137	1.81E-02	U	2.0E-02	2.0E-02	3.49E-02	pCi/g		RICHRC5017
EU-152	1.69E-02	U	4.4E-02	4.4E-02	7.46E-02	pCi/g		RICHRC5017
EU-154	4.19E-02	U	6.3E-02	6.3E-02	1.11E-01	pCi/g		RICHRC5017
EU-155	2.34E-02	U	3.6E-02	3.6E-02	5.91E-02	pCi/g		RICHRC5017
STRONTIUM	-5.16E-03	U	4.8E-02	4.8E-02	1.17E-01	pCi/g	85.80%	RICHRC5006
C-14	5.80E+00	~~U~~ J	2.8E-01	8.3E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.02E+00	U J	2.5E-01	3.5E+00	6.36E+00	pCi/g	80.53%	RICHRC5069
TC-99	2.18E-01	U	1.1E-02	6.9E-01	8.33E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/16/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75L310	MATRIX:	OTHER
CLIENT ID:	B0XB67	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~1.14E+02~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	4.87E-03	U	1.1E-02	1.1E-02	2.13E-02	pCi/g	58.48%	RICHRC5080
PU-238	-8.67E-04	U	1.2E-03	1.2E-03	2.47E-02	pCi/g	78.01%	RICHRC5010
PU239/40	4.54E-03	U	1.1E-02	1.1E-02	2.47E-02	pCi/g	78.01%	RICHRC5010
BA-133	2.20E-02	U	2.6E-02	2.6E-02	3.88E-02	pCi/g		RICHRC5017
CO-60	2.32E-02	U	2.2E-02	2.2E-02	4.14E-02	pCi/g		RICHRC5017
CS-137	2.90E-02	U	2.2E-02	2.2E-02	3.86E-02	pCi/g		RICHRC5017
EU-152	1.72E-02	U	5.3E-02	5.3E-02	8.45E-02	pCi/g		RICHRC5017
EU-154	1.84E-03	U	6.2E-02	6.2E-02	1.07E-01	pCi/g		RICHRC5017
EU-155	2.73E-02	U	3.7E-02	3.7E-02	6.23E-02	pCi/g		RICHRC5017
STRONTIUM	2.58E-02	U	5.3E-02	5.4E-02	1.20E-01	pCi/g	91.80%	RICHRC5006
C-14	1.40E+00	~~U~~ J	9.1E-02	7.2E-01	9.53E-01	pCi/g	100.00%	RICHRC5022
NI-63	5.78E+00	~~U~~ J	3.4E-01	3.8E+00	5.64E+00	pCi/g	79.41%	RICHRC5069
TC-99	-1.15E-01	U	5.9E-03	7.4E-01	8.45E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LC10	MATRIX:	OTHER
CLIENT ID:	B0XB68	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~5.11E+01~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	0.00E+00	U	0.0E+00	1.2E-02	1.34E-02	pCi/g	63.85%	RICHRC5080
PU-238	-3.53E-04	U	7.1E-04	7.1E-04	1.78E-02	pCi/g	75.81%	RICHRC5010
PU239/40	-7.06E-04	U	1.0E-03	1.0E-03	2.02E-02	pCi/g	75.81%	RICHRC5010
BA-133	-9.27E-03	U	2.6E-02	2.6E-02	3.76E-02	pCi/g		RICHRC5017
CO-60	2.83E-02	U	2.6E-02	2.6E-02	4.64E-02	pCi/g		RICHRC5017
CS-137	6.20E-02		3.2E-02	3.2E-02	3.57E-02	pCi/g		RICHRC5017
EU-152	-4.34E-02	U	5.6E-02	5.6E-02	8.39E-02	pCi/g		RICHRC5017
EU-154	2.42E-02	U	7.3E-02	7.3E-02	1.26E-01	pCi/g		RICHRC5017
EU-155	2.27E-02	U	4.8E-02	4.8E-02	8.40E-02	pCi/g		RICHRC5017
STRONTIUM	4.05E-02	U	5.8E-02	5.9E-02	1.27E-01	pCi/g	89.00%	RICHRC5006
C-14	1.25E+00	J	8.1E-02	6.1E-01	8.10E-01	pCi/g	100.00%	RICHRC5022
NI-63	9.32E+00	J	5.3E-01	5.5E+00	7.99E+00	pCi/g	55.07%	RICHRC5069
TC-99	-4.53E-02	U	2.3E-03	7.4E-01	8.08E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LE10	MATRIX:	OTHER
CLIENT ID:	B0XB69	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~5.13E+01~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	1.26E-02		1.5E-02	1.5E-02	1.14E-02	pCi/g	73.68%	RICHRC5080
PU-238	0.00E+00	U	0.0E+00	9.6E-03	1.06E-02	pCi/g	81.40%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	9.6E-03	1.06E-02	pCi/g	81.40%	RICHRC5010
BA-133	-1.35E-02	U	2.2E-02	2.2E-02	3.08E-02	pCi/g		RICHRC5017
CO-60	2.63E-02	U	2.1E-02	2.1E-02	3.80E-02	pCi/g		RICHRC5017
CS-137	5.55E-02		3.4E-02	3.4E-02	2.96E-02	pCi/g		RICHRC5017
EU-152	-1.06E-02	U	4.3E-02	4.3E-02	7.05E-02	pCi/g		RICHRC5017
EU-154	-3.89E-02	U	6.3E-02	6.3E-02	1.03E-01	pCi/g		RICHRC5017
EU-155	3.36E-02	U	3.3E-02	3.3E-02	5.76E-02	pCi/g		RICHRC5017
STRONTIUM	7.67E-02	U	6.3E-02	6.7E-02	1.30E-01	pCi/g	90.50%	RICHRC5006
C-14	3.02E-01	U J	2.1E-02	5.7E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	6.57E+00	U J	3.8E-01	5.0E+00	7.57E+00	pCi/g	62.85%	RICHRC5069
TC-99	-1.23E-01	U	6.2E-03	7.3E-01	8.16E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LH10	MATRIX:	OTHER
CLIENT ID:	B0XB70	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~2.19E+01~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	-4.20E-04	U	8.4E-04	8.4E-04	2.11E-02	pCi/g	61.68%	RICHRC5080
PU-238	5.11E-03	U	1.0E-02	1.0E-02	1.39E-02	pCi/g	62.89%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.3E-02	1.38E-02	pCi/g	62.89%	RICHRC5010
BA-133	2.37E-02	U	2.8E-02	2.8E-02	4.30E-02	pCi/g		RICHRC5017
CO-60	-2.04E-03	U	2.7E-02	2.7E-02	4.66E-02	pCi/g		RICHRC5017
CS-137	2.60E-03	U	2.4E-02	2.4E-02	4.17E-02	pCi/g		RICHRC5017
EU-152	-1.43E-02	U	5.4E-02	5.4E-02	9.10E-02	pCi/g		RICHRC5017
EU-154	-2.32E-03	U	8.0E-02	8.0E-02	1.39E-01	pCi/g		RICHRC5017
EU-155	3.73E-02	U	4.3E-02	4.3E-02	7.35E-02	pCi/g		RICHRC5017
STRONTIUM	6.46E-02	U	6.1E-02	6.4E-02	1.28E-01	pCi/g	84.10%	RICHRC5006
C-14	1.83E+00	J	1.1E-01	6.4E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	7.08E+00	J	4.0E-01	4.0E+00	5.83E+00	pCi/g	79.26%	RICHRC5069
TC-99	3.57E-02	U	1.8E-03	7.4E-01	8.06E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LJ10	MATRIX:	OTHER
CLIENT ID:	B0XB71	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~2.19E+01~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	0.00E+00	U	0.0E+00	1.1E-02	1.21E-02	pCi/g	69.72%	RICHRC5080
PU-238	0.00E+00	U	0.0E+00	1.1E-02	1.17E-02	pCi/g	74.40%	RICHRC5010
PU239/40	-6.91E-04	U	9.8E-04	9.8E-04	1.97E-02	pCi/g	74.40%	RICHRC5010
BA-133	7.49E-03	U	2.3E-02	2.3E-02	3.34E-02	pCi/g		RICHRC5017
CO-60	4.73E-03	U	2.1E-02	2.1E-02	3.62E-02	pCi/g		RICHRC5017
CS-137	1.34E-02	U	2.0E-02	2.0E-02	3.45E-02	pCi/g		RICHRC5017
EU-152	-5.60E-02	U	4.6E-02	4.6E-02	7.31E-02	pCi/g		RICHRC5017
EU-154	-4.00E-03	U	6.1E-02	6.1E-02	1.05E-01	pCi/g		RICHRC5017
EU-155	4.77E-02	U	3.4E-02	3.4E-02	5.96E-02	pCi/g		RICHRC5017
STRONTIUM	4.69E-03	U	5.2E-02	5.2E-02	1.22E-01	pCi/g	93.00%	RICHRC5006
C-14	2.54E+00	~~U~~ J	1.5E-01	6.8E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.00E+00	U J	2.4E-01	4.3E+00	6.79E+00	pCi/g	74.59%	RICHRC5069
TC-99	2.83E-01	U	1.4E-02	7.6E-01	8.06E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/10/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LL10	MATRIX:	OTHER
CLIENT ID:	B0XB72	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~4.60E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	-3.33E-04	U	6.7E-04	6.7E-04	1.67E-02	pCi/g	76.67%	RICHRC5080
PU-238	-3.37E-04	U	6.7E-04	6.8E-04	1.69E-02	pCi/g	81.34%	RICHRC5010
PU239/40	4.20E-03	U	8.4E-03	8.4E-03	1.14E-02	pCi/g	81.34%	RICHRC5010
BA-133	-7.58E-03	U	2.8E-02	2.8E-02	4.00E-02	pCi/g		RICHRC5017
CO-60	2.87E-02	U	2.6E-02	2.6E-02	4.80E-02	pCi/g		RICHRC5017
CS-137	2.39E-02	U	2.3E-02	2.3E-02	4.15E-02	pCi/g		RICHRC5017
EU-152	1.80E-02	U	5.4E-02	5.4E-02	9.25E-02	pCi/g		RICHRC5017
EU-154	2.17E-02	U	6.8E-02	6.8E-02	1.22E-01	pCi/g		RICHRC5017
EU-155	4.60E-02	U	4.2E-02	4.2E-02	7.15E-02	pCi/g		RICHRC5017
STRONTIUM	4.23E-02	U	5.1E-02	5.3E-02	1.10E-01	pCi/g	100.00%	RICHRC5006
C-14	1.66E+00	~~U~~ J	1.0E-01	6.3E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	5.77E+00	~~U~~ J	3.3E-01	3.0E+00	4.38E+00	pCi/g	101.60%	RICHRC5069
TC-99	2.31E-01	U	1.1E-02	7.5E-01	8.06E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/10/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LM10	MATRIX:	OTHER
CLIENT ID:	B0XB73	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~HEXCHROME~~	~~4.46E+00~~		~~N/A~~	~~N/A~~	~~8.00E-02~~	~~mg/kg~~	~~N/A~~	~~EPA7196~~
AM-241	4.86E-03	U	9.7E-03	9.8E-03	1.32E-02	pCi/g	63.29%	RICHRC5080
PU-238	-1.55E-03	U	1.8E-03	1.8E-03	3.22E-02	pCi/g	65.11%	RICHRC5010
PU239/40	6.44E-03	U	1.3E-02	1.3E-02	1.75E-02	pCi/g	65.11%	RICHRC5010
BA-133	-5.77E-03	U	2.4E-02	2.4E-02	3.43E-02	pCi/g		RICHRC5017
CO-60	3.54E-02	U	2.3E-02	2.3E-02	4.35E-02	pCi/g		RICHRC5017
CS-137	7.42E-02		2.9E-02	2.9E-02	3.11E-02	pCi/g		RICHRC5017
EU-152	3.58E-02	U	5.0E-02	5.0E-02	8.36E-02	pCi/g		RICHRC5017
EU-154	-1.23E-02	U	5.9E-02	5.9E-02	1.01E-01	pCi/g		RICHRC5017
EU-155	1.01E-02	U	3.5E-02	3.5E-02	5.82E-02	pCi/g		RICHRC5017
STRONTIUM	7.56E-03	U	5.3E-02	5.3E-02	1.25E-01	pCi/g	95.10%	RICHRC5006
C-14	5.77E+00	J	2.8E-01	8.2E-01	8.10E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.88E+00	J	2.8E-01	3.2E+00	4.83E+00	pCi/g	107.75%	RICHRC5069
TC-99	-1.12E-01	U	5.8E-03	7.4E-01	8.63E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/10/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73TD10	MATRIX:	OTHER
CLIENT ID:	B0XBH5	DATE RECEIVED:	1/5/2000 11:00:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~AM-241~~	~~0.00E+00~~	~~U~~	~~0.0E+00~~	~~1.5E-02~~	~~1.66E-02~~	~~pCi/g~~	~~64.48%~~	~~RICHRC5008~~
PU-238	-3.81E-04	U	7.6E-04	7.6E-04	1.92E-02	pCi/g	68.34%	RICHRC5010
PU239/40	4.37E-03	U	9.5E-03	9.6E-03	1.91E-02	pCi/g	68.34%	RICHRC5010
BA-133	-2.82E-03	U	2.5E-02	2.5E-02	3.59E-02	pCi/g		RICHRC5017
CO-60	3.68E-03	U	2.1E-02	2.1E-02	3.75E-02	pCi/g		RICHRC5017
CS-137	2.60E-02	U	2.2E-02	2.2E-02	3.98E-02	pCi/g		RICHRC5017
EU-152	3.14E-02	U	4.9E-02	4.9E-02	8.25E-02	pCi/g		RICHRC5017
EU-154	-3.64E-02	U	6.8E-02	6.8E-02	1.13E-01	pCi/g		RICHRC5017
EU-155	6.79E-02	U	3.7E-02	3.7E-02	6.34E-02	pCi/g		RICHRC5017
STRONTIUM	1.51E-01		6.3E-02	7.6E-02	1.10E-01	pCi/g	94.50%	RICHRC5006
C-14	9.05E-01	J	5.9E-02	6.1E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.54E+00	U J	2.8E-01	3.5E+00	6.12E+00	pCi/g	83.46%	RICHRC5069
TC-99	-5.78E-02	U	3.0E-03	6.6E-01	7.95E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 13

3/16/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73TJ10	MATRIX:	OTHER
CLIENT ID:	B0XBH6	DATE RECEIVED:	1/5/2000 11:00:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~AM-241~~	~~1.48E-02~~	~~U~~	~~2.1E-02~~	~~2.1E-02~~	~~2.01E-02~~	~~pCi/g~~	~~53.01%~~	~~RICHRC5000~~
PU-238	4.98E-03	U	1.0E-02	1.0E-02	1.35E-02	pCi/g	62.80%	RICHRC5010
PU239/40	-3.98E-04	U	8.0E-04	8.0E-04	2.00E-02	pCi/g	62.80%	RICHRC5010
BA-133	-5.35E-03	U	2.8E-02	2.8E-02	3.87E-02	pCi/g		RICHRC5017
CO-60	1.24E-03	U	2.1E-02	2.1E-02	3.71E-02	pCi/g		RICHRC5017
CS-137	2.73E-02	U	2.3E-02	2.3E-02	4.00E-02	pCi/g		RICHRC5017
EU-152	2.16E-02	U	5.5E-02	5.5E-02	8.84E-02	pCi/g		RICHRC5017
EU-154	-2.42E-03	U	6.2E-02	6.2E-02	1.08E-01	pCi/g		RICHRC5017
EU-155	3.06E-03	U	3.6E-02	3.6E-02	6.00E-02	pCi/g		RICHRC5017
STRONTIUM	8.05E-02	U	5.5E-02	6.0E-02	1.10E-01	pCi/g	94.40%	RICHRC5006
C-14	6.59E-01	U J	4.4E-02	6.0E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.10E+00	U J	2.4E-01	3.1E+00	4.98E+00	pCi/g	92.00%	RICHRC5069
TC-99	-4.06E-02	U	2.1E-03	6.6E-01	7.91E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 13

3/16/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73TL10	MATRIX:	OTHER
CLIENT ID:	B0XBH7	DATE RECEIVED:	1/5/2000 11:00:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~AM-241~~	~~0.00E+00~~	~~U~~	~~0.0E+00~~	~~1.8E-02~~	~~2.05E-02~~	~~pCi/g~~	~~50.67%~~	~~RICHRC5080~~
PU-238	4.73E-03	U	1.0E-02	1.0E-02	2.07E-02	pCi/g	59.08%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.3E-02	1.39E-02	pCi/g	59.08%	RICHRC5010
BA-133	-6.69E-03	U	3.0E-02	3.0E-02	4.29E-02	pCi/g		RICHRC5017
CO-60	2.00E-02	U	2.7E-02	2.7E-02	4.78E-02	pCi/g		RICHRC5017
CS-137	2.46E-02	U	2.6E-02	2.6E-02	4.50E-02	pCi/g		RICHRC5017
EU-152	-4.75E-02	U	7.7E-02	7.7E-02	9.66E-02	pCi/g		RICHRC5017
EU-154	-1.51E-02	U	8.2E-02	8.2E-02	1.40E-01	pCi/g		RICHRC5017
EU-155	3.15E-02	U	4.9E-02	4.9E-02	8.28E-02	pCi/g		RICHRC5017
STRONTIUM	5.36E-02	U	5.5E-02	5.7E-02	1.16E-01	pCi/g	84.80%	RICHRC5006
C-14	1.34E-01	U J	9.4E-03	5.7E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	3.07E+00	U J	1.9E-01	3.4E+00	6.18E+00	pCi/g	93.75%	RICHRC5069
TC-99	-1.79E-02	U	9.2E-04	6.6E-01	7.83E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 13

3/14/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73TM10	MATRIX:	OTHER
CLIENT ID:	B0XBH8	DATE RECEIVED:	1/5/2000 11:00:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
~~AM-241~~	~~-6.92E-04~~	~~U~~	~~1.4E-03~~	~~1.4E-03~~	~~3.48E-02~~	~~pCi/g~~	~~47.13%~~	~~RICHRC5080~~
PU-238	-1.71E-03	U	1.5E-03	1.6E-03	2.41E-02	pCi/g	78.13%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.0E-02	1.15E-02	pCi/g	78.13%	RICHRC5010
BA-133	1.12E-02	U	2.3E-02	2.3E-02	3.52E-02	pCi/g		RICHRC5017
CO-60	1.79E-03	U	2.3E-02	2.3E-02	3.85E-02	pCi/g		RICHRC5017
CS-137	1.55E-02	U	2.1E-02	2.1E-02	3.63E-02	pCi/g		RICHRC5017
EU-152	4.77E-03	U	5.1E-02	5.1E-02	7.93E-02	pCi/g		RICHRC5017
EU-154	-3.56E-03	U	6.6E-02	6.6E-02	1.12E-01	pCi/g		RICHRC5017
EU-155	-4.52E-03	U	4.9E-02	4.9E-02	7.99E-02	pCi/g		RICHRC5017
STRONTIUM	9.13E-02	U	5.9E-02	6.4E-02	1.15E-01	pCi/g	85.90%	RICHRC5006
C-14	1.69E-01	U J	1.2E-02	5.7E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	5.98E+00	J	3.4E-01	3.3E+00	5.10E+00	pCi/g	101.09%	RICHRC5069
TC-99	7.87E-01	U	3.8E-02	7.2E-01	7.90E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 13

3/16/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra

Quanterra
2800 George Washington Way
Richland, Washington 99352-1613

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

February 21, 2000

Attention: Joan Kessner

FEB 2000
RECEIVED
Data
Log In

SAF Number	:	B00-013
Date SDG Closed	:	January 10, 2000
Number of Samples	:	Eleven (11)
Sample Type	:	Other
SDG Number	:	W03005A
Data Deliverable	:	21-Day / Summary

I. Introduction

On January 5, 2000, eleven other (matrix: solid) samples were received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9D73R010	B0XB60	OTHER	1/5/00
9D73RE10	B0XB61	OTHER	1/5/00
9D73RR10	B0XB62	OTHER	1/5/00
9D73T410	B0XB63	OTHER	1/5/00
9D73T510	B0XB64	OTHER	1/5/00
9D73T810	B0XB65	OTHER	1/5/00
9D73TC10	B0XB66	OTHER	1/5/00
9D73TD10	B0XBH5	OTHER	1/5/00
9D73TJ10	B0XBH6	OTHER	1/5/00
9D73TL10	B0XBH7	OTHER	1/5/00
9D73TM10	B0XBH8	OTHER	1/5/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017
Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010
Americium-241 by method RICH-RC-5080
Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5078
Nickel-63 by method RICH-RC-5069
Carbon-14 by method RICH-RC-5022
Chemical Analyses
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W03005A include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017:
The LCS, batch blank, samples and sample duplicate (B0XB64) results are within contractual requirements.

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, samples and sample duplicate (B0XB65) results are within contractual requirements.

Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010:
The LCS, batch blank, samples and sample duplicate (B0XB63) results are within contractual requirements.

Americium-241 by method RICH-RC-5080:
The LCS, batch blank, samples and sample duplicate (B0XB63) results are within contractual requirements.

Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5078:
The LCS, batch blank, samples, sample duplicate (B0XB62) and sample matrix spike (B0XB62) results are within contractual requirements.

Nickel-63 by method RICH-RC-5069:
The luminescence value for sample B0XB63 was elevated due to excessive quench caused by the sample matrix. The TSIE/quench value (86) was slightly below the lower calibration limit (92), therefore, the calculated result was extrapolated from the calibration curve. Since the MDA meets the CRDL and the sample result is below the CRDL, the data were accepted for reporting. Except as noted, the LCS, batch blank, samples, sample duplicate (B0XB61) and sample matrix spike (B0XB61) results are within contractual requirements.

Carbon-14 by method RICH-RC-5022:
For solid matrices, the laboratory control and batch blank samples are direct count analyses. The LCS, batch blank, samples and sample duplicate (B0XB60) results are within contractual requirements.

Chemical Analyses
Chromium Hex by EPA method 7196:
The sample matrix spike recovery did not meet acceptance criteria. The matrix spike was reanalyzed. The reanalysis result was within limits and the data were accepted for reporting. Except as noted, the LCS, batch blank, sample, sample duplicate (B0XB66) and sample matrix spike/matrix spike duplicate (B0XB66) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell

Jackie Waddell
Project Manager

Quanterra
2800 George Washington Way
Richland, Washington 99352-1613

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

February 24, 2000

Attention: Joan Kessner

FEB 2000
RECEIVED
Data
Log In

SAF Number	:	B00-013
Date SDG Closed	:	January 10, 2000
Number of Samples	:	Seven (7)
Sample Type	:	Other
SDG Number	:	W03005B
Data Deliverable	:	21-Day / Summary

I. Introduction

On January 6, 2000, seven other (matrix: solid) samples were received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9D75L310	B0XB67	OTHER	1/6/00
9D75LC10	B0XB68	OTHER	1/6/00
9D75LE10	B0XB69	OTHER	1/6/00
9D75LH10	B0XB70	OTHER	1/6/00
9D75LJ10	B0XB71	OTHER	1/6/00
9D75LL10	B0XB72	OTHER	1/6/00
9D75LM10	B0XB73	OTHER	1/6/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were: **Gamma Spectroscopy**
Gamma Scan by method RICH-RC-5017

Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010
Americium-241 by method RICH-RC-5080
Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5078
Nickel-63 by method RICH-RC-5069
Carbon-14 by method RICH-RC-5022
Chemical Analyses
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W03005B include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017:
The LCS, batch blank, samples and sample duplicate (B0XB71) results are within contractual requirements.

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, samples and sample duplicate (B0XB72) results are within contractual requirements.

Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010:
The LCS, batch blank, samples and sample duplicate (B0XB70) results are within contractual requirements.

Americium-241 by method RICH-RC-5080:
The LCS, batch blank, samples and sample duplicate (B0XB70) results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by method RICH-RC-5078:

The LCS, batch blank, samples, sample duplicate (B0XB69) and sample matrix spike (B0XB69) results are within contractual requirements.

Nickel-63 by method RICH-RC-5069:

The LCS, batch blank, samples, sample duplicate (B0XB68) and sample matrix spike (B0XB68) results are within contractual requirements.

Carbon-14 by method RICH-RC-5022:

For solid matrices, the laboratory control and batch blank samples are direct count analyses. The LCS, batch blank, samples and sample duplicate (B0XB67) results are within contractual requirements.

Chemical Analyses

Chromium Hex by EPA method 7196:

The LCS, batch blank, sample, sample duplicate (B0XB73) and sample matrix spike/matrix spike duplicate (B0XB73) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell

Jackie Waddell
Project Manager

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B00-013-110 | Page 1 of 1

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 9L	Data Turnaround: 21 Days	Air Quality:	
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed	SAF No.: B00-013	
Ice Chest No.: EIZL-96-065	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment: Hand Delivered
Shipped To: Quanterra Incorporated	Offsite Property No.		Bill of Lading/Air Bill No.

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

Preservation	Cool 4C	None	None
Type of Container	aG	aG	aG
No. of Container(s)	1	1	1
Volume	60mL	60mL	120mL
	7196 CR6 Hexavalent Chromium (1)	ICP Metals - 6010A (Superfund) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions

Sample No.	Matrix *	Sample Date	Sample Time				
XB67	Other Solid	1-6-00	0858	X	X	X	D75L3
XB68	Other Solid	1-6-00	0911	X	X	X	D75LC
XB69	Other Solid	1-6-00	0923	X	X	X	D75LE
XB70	Other Solid	1-6-00	0936	X	X	X	D75LH
XB71	Other Solid	1-6-00	0936	X	X	X	D75LJ

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Fahlberg/Fahlberg	1-6-00 1200	K. Lightenhiser	1-6-00 1200

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RAD SCREEN BOX BF6

Matrix *: S-Soil; SE-Sediment; SD-Solid; S-Sludge; W-Water; O-Oil; A-Air; DS-Drum Solids; DL-Drum Liquids; T-Tissue; WI-Wipe; L-Liquid; V-Vegetation; X-Other

LABORATORY SECTION: Received By | Title | Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

EE-011 (10/99)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-013-115

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: ERL-96-065	Field Logbook No.: EL 1424	COA: R105F2280c	Method of Shipment: Hand Delivered
Shipped To: Quanterra Incorporated	Offsite Property No.		Bill of Lading/Air Bill No.

Price Code: 9L

Air Quality

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	None									
Type of Container	aG	aG	aG									
No. of Container(s)	1	1	1									
Volume	60mL	60mL	120mL									
SAMPLE ANALYSIS	7196 CR6 Hexavalent Chromium (1)	ICP Metals - 6010A (Superfrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions									
Sample No.	Matrix *	Sample Date	Sample Time									
DXB72	Other Solid	1-6-00	0949	X	X	X	D7SLL					
30XB73	OTHER SOLID	1-6-00	1012	X	X	X	D7SLM					

B00000039

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
J. Fahlberg / R. Fahlberg	1-6-00 1200	K. Hellenbrand / K. Hellenbrand	1-6-00 1200

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RAD SCREEN BOX BF-6

Matrix *

S - Soil
SD - Sediment
SO - Solid
S - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
T - Tissue
WI - Wipe
L - Liquid
V - Vegetation
X - Other

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-013-103	Page 1 of 1

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: EIRC-96-065	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment:
Shipped To: Quanterra Incorporated	Offsite Property No.:		Bill of Lading/Air Bill No.:

Price Code: 9L

Air Quality: ☐

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

Due 1-26

Preservation				Cool 4C	None	None							
Type of Container				aG	aG	aG							
No. of Container(s)				1	1	1							
Volume				60mL	60mL	120mL							
				7196_CR6: Hexavalent Chromium (1)	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.							
Sample No.	Matrix *	Sample Date	Sample Time										
B0XB60	Other Solid	1-5-00	0841	X	X	X	D73	RO					
BoxB61	OTHER SOLID	1-5-00	0848	X	X	X	D73	RE					
BoxB62	OTHER SOLID	1-5-00	0900	X	X	X	D73	RR					
BoxB63	OTHER SOLID	1-5-00	0911	X	X	X	D73	T4					
BoxB64	OTHER SOLID	1-5-00	0922	X	X	X	D73	T5					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R Fahlberg / R Fahlberg	1115 1-5-00	K. Adtenberg / K. Adtenberg	1115 1-5-00

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133) Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RAD SAMPLE B0XB56

Matrix *

S=Soil
SE=Sediment
SO=Solid
S=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-013-108	Page 1 of 1

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 9L	Data Turnaround: 21 Days	Air Quality: ☐	
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: ERL-96-065	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment:
Shipped To: Quanterra Incorporated	Offsite Property No.:		Bill of Lading/Air Bill No.:

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	None								
Type of Container	aG	aG	aG								
No. of Container(s)	1	1	1								
Volume	60mL	60mL	120mL								
SAMPLE ANALYSIS	7196_CR6: Hexavalent Chromium (1)	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time										
B0XB65	Other Solid	1-5-00	0937	X	X	X	D73	T8					
BoxB66	OTHER SOLID	1-5-00	0947	X	X	X	D73	TC					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R Fahlberg / R Fahlberg	Date/Time: 1115 1-5-00	Received By: K Schattenberg / K Schattenberg	Date/Time: 1115 1-5-00
Relinquished By	Date/Time	Received By	Date/Time: 2100 CAM
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RAD SCREEN BOX BFC

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

00021

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-013-146	Page 1 of 1

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ	Price Code: 9L; Air Quality: ☐	Data Turnaround: 21 Days
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105F		SAF No.: B00-013		
Ice Chest No.: ERC 94010	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment: Gov. Vehicle		
Shipped To: Quanterra Incorporated	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None										
Type of Container	aG	aG										
No. of Container(s)	1	1										
Volume	60mL	120mL										
SAMPLE ANALYSIS	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.										
Sample No.	Matrix *	Sample Date	Sample Time									
B0XBH5 (8)	Other Solid	1-3-00	12:30	X	X	D73	TD					BoxBF9
BoxBH6	OTHER SOLID	1-3-00	12:48	X	X	D73	TJ					BoxBF9
BoxBH7	OTHER SOLID	1-3-00	12:53	X	X	D73	TL					BoxBF9
BoxBH8	OTHER SOLID	1-3-00	12:53	X	X	D73	TM					BoxBF9

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg	Date/Time: R. Fahlberg 1-3-00 1450	Received By: R. E. A 1-3-00	Date/Time: 1450
Relinquished By: R. E. A 1-5-00	Date/Time: 0900	Received By: R.A. Thoren 1-5-00	Date/Time: 0900
Relinquished By: R.A. Thoren 1-5-00	Date/Time: 1100	Received By: R. Goldenburg 1-5-00	Date/Time: 1100
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100F/DR			DATA PACKAGE: W03005		
VALIDATOR: TLI		LAB: QES		DATE: 3/6/00	
CASE:			SDG: W03005		
ANALYSES PERFORMED					
☐ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☒ C14	X Ni-63	~~X Fe~~
SAMPLES/MATRIX BOXB60 BOXB61 BOXB62 BOXB63 BOXB64					
BOXB65 BOXB66 BOXB67 BOXB68 BOXB69 BOXB70					
BOXB71 BOXB72 BOXB73 BOXBH5 BOXBH6 BOXBH7					
BOXBH8					
					Solid

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: ~~EF~~

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: C14✓ Mg63✓ tcr✓ pu✓ Am✓ gs✓ SR✓ A
SR-90 C14 in EB (H5)
C14✓ Ni63✓ tcr✓ pu✓ am241✓ gs✓ SR✓
C14 67,68,70,71,72,73 -J
Ni 67,68,70,~~71~~,72,73-J

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: C14 - No ms J others ok A
Ni all B
Ni-63 69 90 60-66 H5-H8 J all

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: C14 ✓ Ni63 ✓ Tc99 ✓ pu ✓ am ✓ gamma ✓ Sr ✓ A
C14 ✓ Ni63 ✓ Tc99 ✓ pu ✓ Am ✓ gamma ✓ Sr ✓ B
L 69.5570 J/UJ all B 67-73

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: A ✓ B ✓

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: C14 ✓ Ni63 ✓ Tc ✓ pu ✓ Am ✓ gamma ✓ Sr ✓ A
C14 ✓ Ni63 ✓ Tc99 ✓ pu ✓ Am ✓ gamma ✓ Sr ✓ B

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: 71/70 - C14 32.9 ok w/in TDL
H7/49 - ok

10. Holding Times

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

Comments: 1R N1-63 60-66 H5-H8 R J
9 days to analysis

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:

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03005B / 9848

LAB SAMPLE ID: D780G11B MATRIX: OTHER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
NI-63	6.35E+00	J	3.6E-01	3.8E+00	5.52E+00	pCi/g	86.21%	RICHRC5069

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra Analytical Services, Inc

rptChemRadBlank; v3.41

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	D780G12S	MATRIX:	OTHER

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
NI-63	4.26E+02		6.8E+00	3.2E+01	4.73E+00	pCi/g	100.12%	6.12E+02	69.59%

Number of Results: 1

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra Analytical Services, Inc

rptChemRadLcs; v3.41

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03005B / 9848

LAB SAMPLE ID: D780C11X MATRIX: OTHER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
C-14	1.84E+00	J	1.3E-01	2.0E-01	N/A	pCi/g	100.00%	RICHRC5022

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra Analytical Services, Inc

rptChemRadBlank; v3.41

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03005B / 9848

LAB SAMPLE ID: D780C11X MATRIX: OTHER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
C-14	1.84E+00	J	1.3E-01	2.0E-01	N/A	pCi/g	100.00%	RICHRC5022

Number of Results: 1

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra Analytical Services, Inc

rptChemRadBlank; v3.41

Quanterra

MATRIX SPIKE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A / 9838
LAB SAMPLE ID:	D73RE1AW	MATRIX:	OTHER

ANALYTE	SPIKE RESULT*	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
NI-63	4.19E+02		6.7E+00	3.1E+01	4.69E+00	pCi/g	4.47E+00	6.07E+02	69.00%

Number of Results: 1

*Spike Result Corrected For Sample Result

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra Analytical Services, Inc

rptChemRadMatrixSpike; v3.41

Quanteq

Liquid Scintillation Counting Sheet

QC BATCH Number: 00071660 1-25-00

Position	WorkOrder No.	Volume Analyzed (g, mL, L, Hr)	Total Sample Volume (g, mL, L) OR Multiplier	Vial Label or Spike Value
1	D76D9103B	5		880.89
2	D73RE10AS	.25		
3	D73RE10CX	.24		
4	D73RE102	.27		
5	D73RR102	.27		
6	D73RD102	.27		
7	D73TC102	.28		
8	D73TD102	.27		
9	D73TJ102	.27		
10	D73TL102	.25		
11	D73TM102	.24		
12	D73T4102	.25		
13	D76D9104B	5		
14	D73T5102 ~~D73T351D2~~	.26		
15	D73T8102	.27		
16	D76D9101B	.25		
17	D76D9102C	.35		232.66
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: NI63
Matrix: Solid
Client: BHI
Date Cocktail Added: 2-4-00
Total Count Time: 100 min
Volume Counted: 5 mls
Tray No(s): 5,3
Initials: [illegible]

Counting Information

Tower No: 3
LSC#: 5
CR Initials: [illegible]

Comments

counted 2/15/00

[illegible] 3/1/00

RC-114, Rev. 1, 4/99

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 March 2000

Information Request #3

W03005 - Rad

No matrix spike is present for C-14.

lab doesn't do.
data not available.

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 March 2000

Information Request #1

W03005 - Inorganics

The case narrative incorrectly states that there are 21 samples in the SDG (I count 18)

2 wrong!!

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 March 2000

Information Request #4

W03005 - Inorganic

The date of preparation and analysis for mercury is given as 2/4/00 for all samples. However, on the client analysis summaries indicate that the analysis was required by 2/3/00, which would indicate that preparation/extraction took place much earlier. I need clarification of the preparation/extraction and analysis dates.

→ huh?!?

New narrative faxed to validator cleared this IR also. Lab mentioned missing Hg holding times in narrative

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Quanterra
Environmental Services

CASE NARRATIVE
Revised 3/8/00

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

February 9, 2000

Attention: Joan Kessner

Quote Number	:	33811
SDG	:	W03005
Number of Samples	:	**eighteen (18)**
Sample Matrix	:	Solid
Data Deliverable	:	Summary
Date SDG Closed	:	January 12, 2000

II. Introduction

Between January 5, 2000 and January 6, 2000, **eighteen (18)** "solid" samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The samples were received at the St. Louis lab within the temperature criteria. See the attached Sample Summary for a listing of Client Ids and their associated Lab numbers.

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: ICP Metals - 6010 Super Trace - Lead
Mercury - 7471 - CV

Deviation from Request: None

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

MS- Matrix Spike.
MSD- Matrix Spike Duplicate.

V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The initial analysis of the Mercury samples had LCS recoveries outside QC limits at 159% and 165%. The samples were re-digested and re-analyzed. The LCS recoveries met criteria in the re-analysis. The re-analysis data is reported in the package.

The Mercury prep and analysis was done outside of holding time. The prep and analysis was done on 2/4/00. Holding times were expired from 1 to 4 days.

I certify that this Summary is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

3/9/00

Marti Ward
St. Louis Project Manager

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

Attn: BHI Sample Management
3190 George Washington Way
MSIN: H9-03
Phone: 375-9439
FAX: 372-9487

BHI Sample Management

Fax

To: Jackie **From:** Jan

Fax: 375-5590 **Pages:** 4

Phone: 375-3131 **Date:** 3/6

Re: validation help **CC:**

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• **Comments:**

Jackie -
hi. we are validating W03005 on a 7-day clock - so i need help getting these information requests resolved.

thanks,
J

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 March 2000

Information Request #4

W03005 - Inorganic

The date of preparation and analysis for mercury is given as 2/4/00 for all samples. However, on the client analysis summaries indicate that the analysis was required by 2/3/00, which would indicate that preparation/extraction took place much earlier. I need clarification of the preparation/extraction and analysis dates.

FAX

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Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 6 March 2000

Information Request #3

W03005 - Rad

No matrix spike is present for C-14.

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 March 2000

Information Request #2

W03005 - Rad

I need the preparation and analysis dates for all LCS analytes.

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 March 2000

Information Request #1

W03005 - Inorganics

The case narrative incorrectly states that there are 21 samples in the SDG (I count 18)

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 March 2000

Information Request #2

W03005 - Rad

I need the preparation and analysis dates for all ~~LCS~~ LSC analytes.

→ i know there is a disconnect between the validation procedure & the lab sow — please help w/ the data till we get this resolved.....

Quanter

Liquid Scintillation Counting Sheet

QC BATCH Number: 0007166 1-25-00

Position	WorkOrder No.	Volume Analyzed (g mL L Hr)	Total Sample Volume (g mL L) OR Multiplier	Vial Label or Spike Value
1	D76D9103B	5		280.89
2	D73RE10AS	.25		
3	D73RE10CX	.24		
4	D73RE102	.27		
5	D73RR102	.27		
6	D73RD102	.27		
7	D73TC102	.28		
8	D73TD102	.27		
9	D73TJ102	.27		
10	D73TL102	.25		
11	D73TM102	.24		
12	D73T4102	.25		
13	D76D9104B	5		
14	D73T5102 ~~D7T3510~~ 2-17-00	.26		
15	D73T8102	.27		
16	D76D9101B	.25		
17	D76D9102C	.25		282.66
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: NI63
Matrix: Solid
Client: BHI
Date Cocktail Added: 2-4-00
Total Count Time 100 min
Volume Counted: 5 mLs
Tray No(s): 5, 3
Initials: DB, TC

Counting Information

Tower No: 3
LSC#: 5
CR Initials:

Comments

counted 2/13/00

JW 3/7/00

RC-114, Rev.1, 4/99

Liquid Scintillation Counting Sheet

QC BATCH Number: 0007169 1-25-00

Position	WorkOrder No.	Volume Analyzed (g mL L Hr)	Total Sample Volume (g mL L) OR Multiplier	Vial Label or Spike Value
1	D76DF103B	5		
2	D73RE105	2		
3	D73RR10AS			TCSG0109
4	D73RR10CX			
5	D73RR105	1.9 1.28		
6	D73RQ105			
7	D73TC105			
8	D73TD105			
9	D73TJ105			
10	D73TL105			
11	D73TM105			
12	D73T4105			
13	D76DF104B	5		
14	D73T5105	2		
15	D73T8105			
16	D76DF101B			
17	D76DF102C			TCSE0351
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: TC99

Matrix: Solid

Client: BHI

Date Cocktail Added: 2-9-00

Total Count Time 100 min

Volume Counted: 5 mLs

Tray No(s): 29, 31

Initials: AD

Counting Information

Tower No: 6

LSC#: 3

CR Initials: BC 1630 2/9/2000

Comments

Counted 2/11/00

JW 3/7/00

RC-114, Rev.1, 4/99

Liquid Scintillation Counting Sheet

QC BATCH Number: 0010187

Position	WorkOrder No.	Volume Analyzed (g, mL, L, lb)	Total Sample Volume (g, mL, L) OR Multiplier	Vial Label or Spike Value
1	D780C-1-01BN			
2	D780C-1-03BN			
3	D780C-1-02C			CSE0057 PR.2/7/00 EX.2/7/00
4	D75LC-1-07	2.0 gr		30-243
5	D75LE-1-07			
6	D75LH-1-07			
7	D75LJ-1-07			
8	D75LL-1-07			
9	D75LM-1-07			
10	D75L3-1-07	1.70		
11	D75L3-1-0AX	1.70		
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: C-14

Matrix: Concrete

Client: BHI

Date Cocktail Added: 2-7-00

Total Count Time: 90 min

Volume Counted: 5 mLs

Tray No(s): 8

Initials: DM

Counting Information

Tower No: 9

LSC#: 4

CR Initials: N

Comments

Counted 2/8/00

JW 3/1/00

RC-114, Rev.1, 4/99

Quanter.

Liquid Scintillation Counting Sheet

QC BATCH Number: 0010188

1-26-00

Position	WorkOrder No.	Volume Analyzed (g mL L Hr)	Total Sample Volume (g mL L) OR Multiplier	Vial Label or Spike Value
1	D75LC10A5	.24		281.25 DPM
2	D75LC10CX	.25		
3	D75LC102	.27		
4	D75LE102	.25		
5	D75LH102	.26		
6	D75LJ102	.24		
7	D75LL102	.27		
8	D75LM102	.23		
9	D75L3102	.27		
10	D780G101B	.25		
11	D780G102C	↓		282.88
12	D780G103B	5		
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: N463

Matrix: Solid

Client: BHI

Date Cocktail Added: 2-14-00

Total Count Time: 00 min

Volume Counted: 5 mLs

Tray No(s): 3

Initials: RS

Counting Information

Tower No: 3

LSC#: 5

CR Initials: 1615 2/14/2000 GL

Comments

Counted 2/18/00

JW 3/7/00

RC-114, Rev.1, 4/99

Quanter

1/26/00

Liquid Scintillation Counting Sheet

QC BATCH Number: 0010189

Position	WorkOrder No.	Volume Analyzed (g mL L Hr)	Total Sample Volume (g mL L) OR Multiplier	Vial Label or Spike Value
1	D75LC105	2		
2	D75LE10A S			TCSG0104
3	D75LE10L X			
4	D75LE105			
5	D75LH105			
6	D75LJ105			
7	D75LL105			
8	D75LM105			
9	D75L3105			
10	D780M101 B			
11	D780M102 C			TCSB0345
12	D780M103 B	5		
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: Tc-99

Matrix: Biological

Client: BHI

Date Cocktail Added: 2-9-00

Total Count Time 100 min

Volume Counted: 5 mLs

Tray No(s): 20

Initials: DS

Counting Information

Tower No: 3

LSC#: 3

CR Initials: DAD 16302 P/2/00

Comments

Counted 2/12/00

JW 3/7/00

RC-114, Rev.1, 4/99

Liquid Scintillation Counting Sheet

QC BATCH Number: 0007163

Position	WorkOrder No.	Volume Analyzed (g, mL, L, Hr)	Total Sample Volume (g, mL, L) OR Multiplier	Vial Label or Spike Value
1	D76D7-1-01B N			
2	D76D7-1-03B N			
3	D76D7-1-02C			CSE0056
4	D73RE-1-07			
5	D73RR-1-07			
6	D73RO-1-0AX			
7	D73RO-1-07			
8	D73TC-1-07			
9	D73TD-1-07			
10	D73TJ-1-07			
11	D73TL-1-07			
12	D73TM-1-07			
13	D73T4-1-07			
14	D73T5-1-07			
15	D73T8-1-07			
16				
17				
18				
19				
20				
21				
22				
23				
24				

Preparation Information

Analysis: C-14

Matrix: Concrete

Client: BHI

Date Cocktail Added: 2-2-00

Total Count Time 10 min

Volume Counted: 5 mLs

Tray No(s) 27, 30

Initials: DM

Counting Information

Tower No: 11

LSC#: 30

CR Initials: [illegible]

Comments

counted 2/3/00

JW 3/7/00

RC-114, Rev. 1, 4/99

Ref W03005 Rad
Ni-63 Rejects

Validation Criteria for Sample Preparation of Materials for Ni-63 Analysis.

The radionuclide validation procedure (WHC-SD-EN-SPP-001, rev. 1) contains the following qualification criteria for sample preparation for analysis by Liquid Scintillation Counting (section. 8.6.2):

> "If the samples were not analyzed within seven days of distillation, qualify the results as unusable (R for detects, UR for non-detects)."

This criteria is essentially specific to analysis for tritium only and should not be applied as written to other analyses performed by Liquid Scintillation Counting. This is primarily due to the fact that other radionuclides analyzed by this method do not use distillation to recover and purify the radionuclide in a potentially volatile chemical form (water for tritium).

The following is a copy of the method summary portion of the analytical procedure (RICH-RC-5069) used by the Quanterra Richland Laboratory to prepare Ni-63 analysis samples for counting:

> "A weighed soil sample is prepared by acid digestion of microwave bomb digestion. Inspection of the volume of residue determines which of two initial iron removal procedures is used. Iron removal is achieved for smaller residues by use of extraction-chromatography while larger residues are treated by ion exchange. The sample is finally purified by extraction chromatography. The sample activity is measured by liquid scintillation."

The recovered and purified Ni-63 is essentially non-volatile and stable for long lengths of time.

Samples analyzed using Liquid Scintillation Counting should be analyzed within a reasonable timeframe from addition of the scintillation cocktail to the sample vial. This is due to potential degradation of the cocktail mixture, particularly if plastic sample vials are used. An appropriate validation criteria for this is:

> "If the samples were not analyzed within seven days of addition of the scintillation cocktail, qualify the results as estimated (J for detects, UJ for non-detects)."

This criteria is expected to be incorporated into the next revision of the validation procedure and should be used for non-tritium radionuclides analyzed by Liquid Scintillation Counting.

No other comment for Rad or Chem

RZM

Review Comment Record (RCR)

1. Date	2. Review No.
3/13/00	BHI/QA0018
3. Project	**4. Page**
105-F/DR	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No. W03005	105-F/DR Phase III Below-grade Areas Sampling and Analysis	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 _____ 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. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Radiochemistry: Page 11, sample B0XB60 for Cs-137 the report indicates the value as 0.00616; whereas, the laboratory results sheet has the value as 0.000616.			
2	Inorganic: Page 11, sample B0XB73 the result reported for Hg is 5.4; whereas, as indicated on the laboratory results sheet the value should be 0.54.			
3				
4				
5				

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: 9 March 2000

Rejected data

W03005-Rad

The nickel-63 results in SDG W03005A will be rejected and flagged "R" due to the distillation to analysis time exceeding the 7 day limit.

Ref WO5005 Rad
Ni-63 Rejects

Validation Criteria for Sample Preparation of Materials for Ni-63 Analysis.

The radionuclide validation procedure (WHC-SD-EN-SPP-001, rev. 1) contains the following qualification criteria for sample preparation for analysis by Liquid Scintillation Counting (section. 8.6.2):

> "If the samples were not analyzed within seven days of distillation, qualify the results as unusable (R *for detects*, UR *for non-detects*)."

This criteria is essentially specific to analysis for tritium only and should not be applied as written to other analyses performed by Liquid Scintillation Counting. This is primarily due to the fact that other radionuclides analyzed by this method do not use distillation to recover and purify the radionuclide in a potentially volatile chemical form (water for tritium).

The following is a copy of the method summary portion of the analytical procedure (RICH-RC-5069) used by the Quanterra Richland Laboratory to prepare Ni-63 analysis samples for counting:

> "A weighed soil sample is prepared by acid digestion of microwave bomb digestion. Inspection of the volume of residue determines which of two initial iron removal procedures is used. Iron removal is achieved for smaller residues by use of extraction-chromatography while larger residues are treated by ion exchange. The sample is finally purified by extraction chromatography. The sample activity is measured by liquid scintillation."

The recovered and purified Ni-63 is essentially non-volatile and stable for long lengths of time.

Samples analyzed using Liquid Scintillation Counting should be analyzed within a reasonable timeframe from addition of the scintillation cocktail to the sample vial. This is due to potential degradation of the cocktail mixture, particularly if plastic sample vials are used. An appropriate validation criteria for this is:

> "If the samples were not analyzed within seven days of addition of the scintillation cocktail, qualify the results as estimated (J *for detects*, UJ *for non-detects*)."

This criteria is expected to be incorporated into the next revision of the validation procedure and should be used for non-tritium radionuclides analyzed by Liquid Scintillation Counting.

No other comment for Rad or Chem

Change Mad

R2 ND

3/16/00

Review Comment Record (RCR)

1. Date	2. Review No.
3/13/00	BHI/QA0018
3. Project	**4. Page**
105-F/DR	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No. W03005	105-F/DR Phase III Below-grade Areas Sampling and Analysis	Claude Stacey	BHI/QA	H0-16/372-9203

17. Comment Submittal Approval:

Organization Manager (Optional) — Date

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact — Author/Originator

11. CLOSED

3/16/00 — Date

C. Stacey — 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	Radiochemistry: Page 11, sample B0XB60 for Cs-137 the report indicates the value as 0.00616; whereas, the laboratory results sheet has the value as 0.000616.		Correct K	
2	Inorganic: Page 11, sample B0XB73 the result reported for Hg is 5.4; whereas, as indicated on the laboratory results sheet the value should be 0.54.		Correct K	
3				
4				
5				

MAR 16 '00 09:32AM BHI S&D MANAGEMENT 509 372 9487 P.1/2

Date: 9 March 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-F/DR Phase III Below-grade Areas Sampling and Analysis
Subject: Inorganics - Data Package No. W03005-QES (SDG No. W03005)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W03005-QES prepared by Quanterra Environmental Services (QES). 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
B0XB60	1/5/00	Solid	C	See note 1 & 2
B0XB61	1/5/00	Solid	C	See note 1 & 2
B0XB62	1/5/00	Solid	C	See note 1 & 2
B0XB63	1/5/00	Solid	C	See note 1 & 2
B0XB64	1/5/00	Solid	C	See note 1 & 2
B0XB65	1/5/00	Solid	C	See note 1 & 2
B0XB66	1/5/00	Solid	C	See note 1 & 2
B0XB67	1/6/00	Solid	C	See note 1 & 2
B0XB68	1/6/00	Solid	C	See note 1 & 2
B0XB69	1/6/00	Solid	C	See note 1 & 2
B0XB70	1/6/00	Solid	C	See note 1 & 2
B0XB71	1/6/00	Solid	C	See note 1 & 2
B0XB72	1/6/00	Solid	C	See note 1 & 2
B0XB73	1/6/00	Solid	C	See note 1 & 2
B0XBH5	1/3/00	Solid	C	See note 1
B0XBH6	1/3/00	Solid	C	See note 1
B0XBH7	1/3/00	Solid	C	See note 1
B0XBH8	1/3/00	Solid	C	See note 1

1 - ICP metals by 6010B 'supertrace' (lead); mercury by 7471A.
2 - Hexavalent chromium

Data validation was conducted in accordance with the BHI validation statement of work and "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). 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, 30 days for chromium VI and 28 days for mercury.

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

All other 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 mercury results in samples B0XB62, B0XB67 and B0XB69 were qualified as undetected and flagged "U".

All other preparation blank results were acceptable.

Field Blanks

One equipment blank (B0XBH5) was submitted for analysis. Lead and mercury were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **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 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".

All laboratory duplicate results were acceptable.

Field Duplicate Samples

Two pair of field duplicate samples (samples B0XB70/B0XB71 and B0XBH7/B0XBH8) were submitted to QES for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPD for lead (33%) in sample duplicate pair B0XB70/B0XB71 was outside QC limits. The mercury RPD (53%) in sample duplicate pair B0XBH7/B0XBH8 was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105DR PQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. W03005-QES (SDG No. W03005) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the holding times being exceeded by less than twice the limit, all mercury results were qualified as estimates and flagged "J". Due to preparation blank contamination, the mercury results in samples B0XB62, B0XB67 and B0XB69 were qualified as undetected and flagged "U". 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.

REFERENCES

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

DOE/RL-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

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: W03005	REVIEWER: TLI	DATE: 3/9/00	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	U	B0XB62, B0XB67, B0XB69	Blank contamination
Mercury	J	All	Holding time

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W03005																				
Sample Number		B0XB60		B0XB61		B0XB62		B0XB63		B0XB64		B0XB65		B0XB66		B0XB67		B0XB68			
Location		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c			
Remarks																					
Sample Date		1/5/00		1/5/00		1/5/00		1/5/00		1/5/00		1/5/00		1/5/00		1/6/00		1/6/00			
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.08	0.084	J	0.078	J	0.073	UJ	0.13	J	0.26	J	0.076	J	0.38	J	0.050	UJ	0.11	J		
Lead	0.5	6.2		6.4		8.8		12.0		2.8		11.6		5.8		11.5		11.7			
Chromium VI	0.1	152		4.56		3.84		4.81		3.72		1.92		5.16		114		51.1			
Sample Number		B0XB69		B0XB70		B0XB71		B0XB72		B0XB73		B0XBH5		B0XBH6		B0XBH7		B0XBH8			
Location		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 228c		Rm. 231		Rm. 231		Rm. 231		Rm. 231			
Remarks						Duplicate						E. Blank						Duplicate			
Sample Date		1/6/00		1/6/00		1/6/00		1/6/00		1/6/00		1/3/00		1/3/00		1/3/00		1/3/00			
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.08	0.041	UJ	0.13	J	0.079	J	0.11	J	0.54	J	0.83	J	0.38	J	0.18	J	0.31	J		
Lead	0.5	8.5		9.2		6.6		11.5		7.6		27.2		36.0		9.1		9.8			
Chromium VI	0.1	51.3		21.9		21.9		4.59		4.46		NA		NA		NA		NA			

NA = Not analyzed

000011

BECHTEL HANFORD, INC.

Client Sample ID: B0XB60

TOTAL Metals

Lot-Sample #...: F0A060175-001 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	6.2	0.30	mg/kg	SW846 6010B	01/27/00	D7557101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.084 J	0.033	mg/kg	SW846 7471A	02/04/00	D7557204
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB61

TOTAL Metals

Lot-Sample #...: F0A060175-002 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	6.4	0.30	mg/kg	SW846 6010B	01/27/00	D755C101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.078 J	0.033	mg/kg	SW846 7471A	02/04/00	D755C202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB62

TOTAL Metals

Lot-Sample #...: F0A060175-003 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	8.8	0.30	mg/kg	SW846 6010B	01/27/00	D755D101
		Dilution Factor: 1				
Prep Batch #...: 0036128						
Mercury	0.073 UJ	0.033	mg/kg	SW846 7471A	02/04/00	D755D202
		Dilution Factor: 1				

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB63

TOTAL Metals

Lot-Sample #...: F0A060175-004 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	12.0	0.30	mg/kg	SW846 6010B	01/27/00	D755H101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.13 J	0.033	mg/kg	SW846 7471A	02/04/00	D755H202
		Dilution Factor: 1		MDL.....: 0.0070		

JM
3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB64

TOTAL Metals

Lot-Sample #...: F0A060175-005 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	2.8	0.30	mg/kg	SW846 6010B	01/27/00	D755L101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.26 J	0.033	mg/kg	SW846 7471A	02/04/00	D755L202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB65

TOTAL Metals

Lot-Sample #...: F0A060175-006 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	11.6	0.30	mg/kg	SW846 6010B	01/27/00	D755W101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.076 J	0.033	mg/kg	SW846 7471A	02/04/00	D755W202
		Dilution Factor: 1		MDL.....: 0.0070		

pw
3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB66

TOTAL Metals

Lot-Sample #...: F0A060175-007 Matrix.....: SOLID
Date Sampled...: 01/05/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	5.8	0.30	mg/kg	SW846 6010B	01/27/00	D7560101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.38 J	0.033	mg/kg	SW846 7471A	02/04/00	D7560202
		Dilution Factor: 1		MDL.....: 0.0070		

pr
3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB67

TOTAL Metals

Lot-Sample #...: F0A070135-001 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	11.5	0.30	mg/kg	SW846 6010B	01/27/00	D76G1101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.050 UJ	0.033	mg/kg	SW846 7471A	02/04/00	D76G1204
		Dilution Factor: 1		MDL.....: 0.0070		

pr
3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB68

TOTAL Metals

Lot-Sample #...: F0A070135-002 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	11.7	0.30	mg/kg	SW846 6010B	01/27/00	D76GJ101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.11 J	0.033	mg/kg	SW846 7471A	02/04/00	D76GJ202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB69

TOTAL Metals

Lot-Sample #...: F0A070135-003 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	8.5	0.30	mg/kg	SW846 6010B	01/27/00	D76GL101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.041 U J	0.033	mg/kg	SW846 7471A	02/04/00	D76GL202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB70

TOTAL Metals

Lot-Sample #...: F0A070135-004 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	9.2	0.30	mg/kg	SW846 6010B	01/27/00	D76GP101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.13 J	0.033	mg/kg	SW846 7471A	02/04/00	D76GP202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB71

TOTAL Metals

Lot-Sample #...: F0A070135-005 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	6.6	0.30	mg/kg	SW846 6010B	01/27/00	D76GQ101
		Dilution Factor: 1		MDL.....\....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.079 J	0.033	mg/kg	SW846 7471A	02/04/00	D76GQ202
		Dilution Factor: 1		MDL.....: 0.0070		

Pr 3/8/00

~~000047~~

BECHTEL HANFORD, INC.

Client Sample ID: B0XB72

TOTAL Metals

Lot-Sample #...: F0A070135-006 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	11.5	0.30	mg/kg	SW846 6010B	01/27/00	D76GR101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.11 J	0.033	mg/kg	SW846 7471A	02/04/00	D76GR202
		Dilution Factor: 1		MDL.....: 0.0070		

pw
3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XB73

TOTAL Metals

Lot-Sample #...: F0A070135-007 Matrix.....: SOLID
Date Sampled...: 01/06/00 Date Received..: 01/06/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027167						
Lead	7.6	0.30	mg/kg	SW846 6010B	01/27/00	D76GT101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.54 J	0.033	mg/kg	SW846 7471A	02/04/00	D76GT202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XBH5

TOTAL Metals

Lot-Sample #...: F0A060175-008 Matrix.....: SOLID
Date Sampled...: 01/03/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	27.2	0.30	mg/kg	SW846 6010B	01/27/00	D7563101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.83 J	0.033	mg/kg	SW846 7471A	02/04/00	D7563202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XBH6

TOTAL Metals

Lot-Sample #...: F0A060175-009 Matrix.....: SOLID
Date Sampled...: 01/03/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	36.0	0.30	mg/kg	SW846 6010B	01/27/00	D7565101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.38 J	0.033	mg/kg	SW846 7471A	02/04/00	D7565202
		Dilution Factor: 1		MDL.....: 0.0070		

JPW 3/8/00

BECHTEL HANFORD, INC.

Client Sample ID: B0XBH7

TOTAL Metals

Lot-Sample #...: F0A060175-010 Matrix.....: SOLID
Date Sampled...: 01/03/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	9.1	0.30	mg/kg	SW846 6010B	01/27/00	D7567101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.18 J	0.033	mg/kg	SW846 7471A	02/04/00	D7567202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

~~000063~~

BECHTEL HANFORD, INC.

Client Sample ID: B0XBH8

TOTAL Metals

Lot-Sample #...: F0A060175-011 Matrix.....: SOLID
Date Sampled...: 01/03/00 Date Received..: 01/05/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0027162						
Lead	9.8	0.30	mg/kg	SW846 6010B	01/27/00	D756A101
		Dilution Factor: 1		MDL.....: 0.15		
Prep Batch #...: 0036128						
Mercury	0.31 J	0.033	mg/kg	SW846 7471A	02/04/00	D756A202
		Dilution Factor: 1		MDL.....: 0.0070		

3/8/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73R010	MATRIX:	OTHER
CLIENT ID:	B0XB60	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	1.52E+02		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~0.00E+00~~	~~U~~	~~0.0E+00~~	~~1.1E-02~~	~~1.25E-02~~	~~pCi/g~~	~~86.42%~~	~~RICHRC5080~~
PU-238	-4.99E-04	U	1.0E-03	1.0E-03	2.51E-02	pCi/g	50.92%	RICHRC5010
PU239/40	-4.99E-04	U	1.0E-03	1.0E-03	2.51E-02	pCi/g	50.92%	RICHRC5010
BA-133	1.90E-02	U	2.8E-02	2.8E-02	4.16E-02	pCi/g		RICHRC5017
CO-60	2.85E-02	U	2.3E-02	2.3E-02	4.19E-02	pCi/g		RICHRC5017
CS-137	6.16E-04	U	2.4E-02	2.4E-02	4.03E-02	pCi/g		RICHRC5017
EU-152	1.21E-02	U	5.4E-02	5.4E-02	9.14E-02	pCi/g		RICHRC5017
EU-154	-1.82E-02	U	6.5E-02	6.5E-02	1.09E-01	pCi/g		RICHRC5017
EU-155	5.85E-02	U	4.0E-02	4.0E-02	6.78E-02	pCi/g		RICHRC5017
STRONTIUM	5.06E-02	U	5.1E-02	5.3E-02	1.06E-01	pCi/g	92.40%	RICHRC5006
C-14	6.30E+00	J	3.0E-01	8.6E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.24E+00	U	2.4E-01	3.1E+00	4.82E+00	pCi/g	94.93%	RICHRC5069
TC-99	3.74E-01	U	1.9E-02	6.9E-01	7.79E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

5/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73RE10	MATRIX:	OTHER
CLIENT ID:	B0XB61	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	4.56E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~2.77E-02~~	~~J~~	~~2.5E-02~~	~~2.6E-02~~	~~2.26E-02~~	~~pCi/g~~	~~74.99%~~	~~RICHRC5080~~
PU-238	-4.04E-04	U	8.1E-04	8.1E-04	2.03E-02	pCi/g	82.69%	RICHRC5010
PU239/40	4.24E-03	U	1.0E-02	1.0E-02	2.31E-02	pCi/g	82.69%	RICHRC5010
BA-133	-1.43E-02	U	2.6E-02	2.6E-02	3.78E-02	pCi/g		RICHRC5017
CO-60	-7.51E-03	U	2.4E-02	2.4E-02	4.05E-02	pCi/g		RICHRC5017
CS-137	2.41E-02	U	2.3E-02	2.3E-02	4.13E-02	pCi/g		RICHRC5017
EU-152	3.58E-02	U	5.6E-02	5.6E-02	8.53E-02	pCi/g		RICHRC5017
EU-154	4.79E-02	U	7.1E-02	7.1E-02	1.29E-01	pCi/g		RICHRC5017
EU-155	-1.52E-02	U	5.3E-02	5.3E-02	8.50E-02	pCi/g		RICHRC5017
STRONTIUM	1.87E-02	U	5.3E-02	5.3E-02	1.20E-01	pCi/g	85.40%	RICHRC5006
C-14	1.12E+00	J	7.2E-02	6.2E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.47E+00	U	2.9E-01	3.4E+00	6.38E+00	pCi/g	88.46%	RICHRC5069
TC-99	-3.26E-01	U	1.7E-02	6.4E-01	7.84E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73RR10	MATRIX:	OTHER
CLIENT ID:	B0XB62	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.84E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~-3.91E-04~~	~~U~~	~~7.8E-04~~	~~7.9E-04~~	~~1.07E-02~~	~~pCi/g~~	~~84.57%~~	~~RICHRC5080~~
PU-238	1.98E-02	J	1.8E-02	1.8E-02	1.62E-02	pCi/g	83.19%	RICHRC5010
PU239/40	-3.22E-04	U	6.4E-04	6.5E-04	1.62E-02	pCi/g	83.19%	RICHRC5010
BA-133	2.24E-02	U	2.0E-02	2.0E-02	3.00E-02	pCi/g		RICHRC5017
CO-60	-2.18E-04	U	2.1E-02	2.1E-02	3.67E-02	pCi/g		RICHRC5017
CS-137	2.05E-02	U	2.0E-02	2.0E-02	3.55E-02	pCi/g		RICHRC5017
EU-152	-1.27E-02	U	4.0E-02	4.0E-02	6.75E-02	pCi/g		RICHRC5017
EU-154	2.04E-02	U	6.1E-02	6.1E-02	1.07E-01	pCi/g		RICHRC5017
EU-155	4.22E-02	U	3.5E-02	3.5E-02	6.05E-02	pCi/g		RICHRC5017
STRONTIUM	9.45E-04	U	5.0E-02	5.0E-02	1.19E-01	pCi/g	88.20%	RICHRC5006
C-14	1.14E+00	J	7.3E-02	6.2E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	6.25E+00	J	3.5E-01	3.4E+00	5.19E+00	pCi/g	88.41%	RICHRC5069
TC-99	-4.68E-01	U	2.5E-02	6.3E-01	7.79E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73T410	MATRIX:	OTHER
CLIENT ID:	B0XB63	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	4.81E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~5.71E-03~~	~~U~~	~~1.2E-02~~	~~1.3E-02~~	~~2.50E-02~~	~~pCi/g~~	~~64.20%~~	~~RICHRC5080~~
PU-238	-3.70E-04	U	7.4E-04	7.4E-04	1.86E-02	pCi/g	72.36%	RICHRC5010
PU239/40	-3.70E-04	U	7.4E-04	7.4E-04	1.86E-02	pCi/g	72.36%	RICHRC5010
BA-133	9.10E-03	U	2.4E-02	2.4E-02	3.64E-02	pCi/g		RICHRC5017
CO-60	4.19E-03	U	2.4E-02	2.4E-02	4.26E-02	pCi/g		RICHRC5017
CS-137	2.29E-02	U	2.2E-02	2.2E-02	3.95E-02	pCi/g		RICHRC5017
EU-152	2.11E-02	U	4.8E-02	4.8E-02	8.17E-02	pCi/g		RICHRC5017
EU-154	-8.08E-02	U	7.4E-02	7.4E-02	1.17E-01	pCi/g		RICHRC5017
EU-155	4.25E-02	U	4.2E-02	4.2E-02	7.17E-02	pCi/g		RICHRC5017
STRONTIUM	1.66E-01	J	6.6E-02	8.1E-02	1.13E-01	pCi/g	88.00%	RICHRC5006
C-14	6.51E+00	J	3.0E-01	8.7E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	2.30E+01	J	1.6E+00	5.5E+00	1.22E+01	pCi/g	91.15%	RICHRC5069
TC-99	3.82E-01	U	1.9E-02	6.9E-01	7.81E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73T510	MATRIX:	OTHER
CLIENT ID:	B0XB64	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.72E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~0.00E+00~~	~~U~~	~~0.0E+00~~	~~1.9E-02~~	~~2.09E-02~~	~~pCi/g~~	~~50.81%~~	~~RICHRC5080~~
PU-238	-3.50E-04	U	7.0E-04	7.0E-04	1.76E-02	pCi/g	71.54%	RICHRC5010
PU239/40	-3.50E-04	U	7.0E-04	7.0E-04	1.76E-02	pCi/g	71.54%	RICHRC5010
BA-133	1.10E-02	U	2.2E-02	2.2E-02	3.18E-02	pCi/g		RICHRC5017
CO-60	3.98E-02	U	1.9E-02	1.9E-02	3.69E-02	pCi/g		RICHRC5017
CS-137	5.61E-02	J	3.1E-02	3.3E-02	2.89E-02	pCi/g		RICHRC5017
EU-152	-1.70E-02	U	4.5E-02	4.5E-02	7.00E-02	pCi/g		RICHRC5017
EU-154	-1.10E-03	U	4.9E-02	4.9E-02	8.44E-02	pCi/g		RICHRC5017
EU-155	3.02E-02	U	3.1E-02	3.1E-02	5.20E-02	pCi/g		RICHRC5017
STRONTIUM	3.36E-02	U	4.7E-02	4.8E-02	1.02E-01	pCi/g	96.60%	RICHRC5006
C-14	6.37E+00	J	3.0E-01	8.6E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.16E+00	U	2.4E-01	3.2E+00	5.01E+00	pCi/g	94.99%	RICHRC5069
TC-99	2.10E-01	U	1.1E-02	6.8E-01	7.78E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00
pw

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73T810	MATRIX:	OTHER
CLIENT ID:	B0XB65	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	1.92E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~-6.22E-04~~	~~U~~	~~1.2E-03~~	~~1.2E-03~~	~~3.13E-02~~	~~pCi/g~~	~~52.93%~~	~~RICHRC5080~~
PU-238	0.00E+00	U	0.0E+00	1.2E-02	1.30E-02	pCi/g	63.64%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.2E-02	1.30E-02	pCi/g	63.64%	RICHRC5010
BA-133	-2.61E-03	U	2.2E-02	2.2E-02	3.04E-02	pCi/g		RICHRC5017
CO-60	5.71E-02	U	2.9E-02	2.9E-02	4.05E-02	pCi/g		RICHRC5017
CS-137	3.63E-02	U	2.0E-02	2.0E-02	3.52E-02	pCi/g		RICHRC5017
EU-152	3.18E-03	U	4.3E-02	4.3E-02	7.17E-02	pCi/g		RICHRC5017
EU-154	2.44E-02	U	6.0E-02	6.0E-02	1.06E-01	pCi/g		RICHRC5017
EU-155	1.91E-02	U	3.2E-02	3.2E-02	5.59E-02	pCi/g		RICHRC5017
STRONTIUM	8.51E-02	U	5.4E-02	5.9E-02	1.05E-01	pCi/g	93.90%	RICHRC5006
C-14	8.14E-01	U	5.4E-02	6.0E-01	8.27E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.62E+00	U	2.7E-01	3.0E+00	4.81E+00	pCi/g	96.34%	RICHRC5069
TC-99	1.87E-01	U	9.5E-03	6.8E-01	7.87E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005A/ 9838
LAB SAMPLE ID:	9D73TC10	MATRIX:	OTHER
CLIENT ID:	B0XB66	DATE RECEIVED:	1/5/2000 11:15:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	5.16E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~-7.97E-04~~	~~U~~	~~1.6E-03~~	~~1.6E-03~~	~~4.01E-02~~	~~pCi/g~~	~~53.08%~~	~~RICHRC5080~~
PU-238	4.48E-03	U	9.0E-03	9.0E-03	1.21E-02	pCi/g	69.49%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.1E-02	1.21E-02	pCi/g	69.49%	RICHRC5010
BA-133	-4.41E-03	U	2.3E-02	2.3E-02	3.18E-02	pCi/g		RICHRC5017
CO-60	-1.35E-03	U	2.2E-02	2.2E-02	3.80E-02	pCi/g		RICHRC5017
CS-137	1.81E-02	U	2.0E-02	2.0E-02	3.49E-02	pCi/g		RICHRC5017
EU-152	1.69E-02	U	4.4E-02	4.4E-02	7.46E-02	pCi/g		RICHRC5017
EU-154	4.19E-02	U	6.3E-02	6.3E-02	1.11E-01	pCi/g		RICHRC5017
EU-155	2.34E-02	U	3.6E-02	3.6E-02	5.91E-02	pCi/g		RICHRC5017
STRONTIUM	-5.16E-03	U	4.8E-02	4.8E-02	1.17E-01	pCi/g	85.80%	RICHRC5006
C-14	5.80E+00	J	2.8E-01	8.3E-01	8.26E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.02E+00	U	2.5E-01	3.5E+00	6.36E+00	pCi/g	80.53%	RICHRC5069
TC-99	2.18E-01	U	1.1E-02	6.9E-01	8.33E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT-GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75L310	MATRIX:	OTHER
CLIENT ID:	B0XB67	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	1.14E+02		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~4.87E-03~~	~~U~~	~~1.1E-02~~	~~1.1E-02~~	~~2.13E-02~~	~~pCi/g~~	~~58.48%~~	~~RICHRC5080~~
PU-238	-8.67E-04	U	1.2E-03	1.2E-03	2.47E-02	pCi/g	78.01%	RICHRC5010
PU239/40	4.54E-03	U	1.1E-02	1.1E-02	2.47E-02	pCi/g	78.01%	RICHRC5010
BA-133	2.20E-02	U	2.6E-02	2.6E-02	3.88E-02	pCi/g		RICHRC5017
CO-60	2.32E-02	U	2.2E-02	2.2E-02	4.14E-02	pCi/g		RICHRC5017
CS-137	2.90E-02	U	2.2E-02	2.2E-02	3.86E-02	pCi/g		RICHRC5017
EU-152	1.72E-02	U	5.3E-02	5.3E-02	8.45E-02	pCi/g		RICHRC5017
EU-154	1.84E-03	U	6.2E-02	6.2E-02	1.07E-01	pCi/g		RICHRC5017
EU-155	2.73E-02	U	3.7E-02	3.7E-02	6.23E-02	pCi/g		RICHRC5017
STRONTIUM	2.58E-02	U	5.3E-02	5.4E-02	1.20E-01	pCi/g	91.80%	RICHRC5006
C-14	1.40E+00	J	9.1E-02	7.2E-01	9.53E-01	pCi/g	100.00%	RICHRC5022
NI-63	5.78E+00	J	3.4E-01	3.8E+00	5.64E+00	pCi/g	79.41%	RICHRC5069
TC-99	-1.15E-01	U	5.9E-03	7.4E-01	8.45E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LC10	MATRIX:	OTHER
CLIENT ID:	B0XB68	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	5.11E+01		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~0.00E+00~~	~~U~~	~~0.0E+00~~	~~1.2E-02~~	~~1.34E-02~~	~~pCi/g~~	~~63.85%~~	~~RICHRC5080~~
PU-238	-3.53E-04	U	7.1E-04	7.1E-04	1.78E-02	pCi/g	75.81%	RICHRC5010
PU239/40	-7.06E-04	U	1.0E-03	1.0E-03	2.02E-02	pCi/g	75.81%	RICHRC5010
BA-133	-9.27E-03	U	2.6E-02	2.6E-02	3.76E-02	pCi/g		RICHRC5017
CO-60	2.83E-02	U	2.6E-02	2.6E-02	4.64E-02	pCi/g		RICHRC5017
CS-137	6.20E-02	J	3.2E-02	3.2E-02	3.57E-02	pCi/g		RICHRC5017
EU-152	-4.34E-02	U	5.6E-02	5.6E-02	8.39E-02	pCi/g		RICHRC5017
EU-154	2.42E-02	U	7.3E-02	7.3E-02	1.26E-01	pCi/g		RICHRC5017
EU-155	2.27E-02	U	4.8E-02	4.8E-02	8.40E-02	pCi/g		RICHRC5017
STRONTIUM	4.05E-02	U	5.8E-02	5.9E-02	1.27E-01	pCi/g	89.00%	RICHRC5006
C-14	1.25E+00	J	8.1E-02	6.1E-01	8.10E-01	pCi/g	100.00%	RICHRC5022
NI-63	9.32E+00	J	5.3E-01	5.5E+00	7.99E+00	pCi/g	55.07%	RICHRC5069
TC-99	-4.53E-02	U	2.3E-03	7.4E-01	8.08E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

pw 3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LE10	MATRIX:	OTHER
CLIENT ID:	B0XB69	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	5.13E+01		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~1.26E-02~~	~~J~~	~~1.5E-02~~	~~1.5E-02~~	~~1.14E-02~~	~~pCi/g~~	~~73.68%~~	~~RICHRC5080~~
PU-238	0.00E+00	U	0.0E+00	9.6E-03	1.06E-02	pCi/g	81.40%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	9.6E-03	1.06E-02	pCi/g	81.40%	RICHRC5010
BA-133	-1.35E-02	U	2.2E-02	2.2E-02	3.08E-02	pCi/g		RICHRC5017
CO-60	2.63E-02	U	2.1E-02	2.1E-02	3.80E-02	pCi/g		RICHRC5017
CS-137	5.55E-02	J	3.4E-02	3.4E-02	2.96E-02	pCi/g		RICHRC5017
EU-152	-1.06E-02	U	4.3E-02	4.3E-02	7.05E-02	pCi/g		RICHRC5017
EU-154	-3.89E-02	U	6.3E-02	6.3E-02	1.03E-01	pCi/g		RICHRC5017
EU-155	3.36E-02	U	3.3E-02	3.3E-02	5.76E-02	pCi/g		RICHRC5017
STRONTIUM	7.67E-02	U	6.3E-02	6.7E-02	1.30E-01	pCi/g	90.50%	RICHRC5006
C-14	3.02E-01	U	2.1E-02	5.7E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	6.57E+00	U	3.8E-01	5.0E+00	7.57E+00	pCi/g	62.85%	RICHRC5069
TC-99	-1.23E-01	U	6.2E-03	7.3E-01	8.16E-01	pCi/g	100.00%	RICHRC5076

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

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SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LH10	MATRIX:	OTHER
CLIENT ID:	B0XB70	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	2.19E+01		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~-4.20E-04~~	~~U~~	~~8.4E-04~~	~~8.4E-04~~	~~2.11E-02~~	~~pCi/g~~	~~61.68%~~	~~RICHRC5080~~
PU-238	5.11E-03	U	1.0E-02	1.0E-02	1.39E-02	pCi/g	62.89%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	1.3E-02	1.38E-02	pCi/g	62.89%	RICHRC5010
BA-133	2.37E-02	U	2.8E-02	2.8E-02	4.30E-02	pCi/g		RICHRC5017
CO-60	-2.04E-03	U	2.7E-02	2.7E-02	4.66E-02	pCi/g		RICHRC5017
CS-137	2.60E-03	U	2.4E-02	2.4E-02	4.17E-02	pCi/g		RICHRC5017
EU-152	-1.43E-02	U	5.4E-02	5.4E-02	9.10E-02	pCi/g		RICHRC5017
EU-154	-2.32E-03	U	8.0E-02	8.0E-02	1.39E-01	pCi/g		RICHRC5017
EU-155	3.73E-02	U	4.3E-02	4.3E-02	7.35E-02	pCi/g		RICHRC5017
STRONTIUM	6.46E-02	U	6.1E-02	6.4E-02	1.28E-01	pCi/g	84.10%	RICHRC5006
C-14	1.83E+00	J	1.1E-01	6.4E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	7.08E+00	J	4.0E-01	4.0E+00	5.83E+00	pCi/g	79.26%	RICHRC5069
TC-99	3.57E-02	U	1.8E-03	7.4E-01	8.06E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
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Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LJ10	MATRIX:	OTHER
CLIENT ID:	B0XB71	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	2.19E+01		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~0.00E+00~~	~~U~~	~~0.0E+00~~	~~1.1E-02~~	~~1.21E-02~~	~~pCi/g~~	~~69.72%~~	~~RICHRC5080~~
PU-238	0.00E+00	U	0.0E+00	1.1E-02	1.17E-02	pCi/g	74.40%	RICHRC5010
PU239/40	-6.91E-04	U	9.8E-04	9.8E-04	1.97E-02	pCi/g	74.40%	RICHRC5010
BA-133	7.49E-03	U	2.3E-02	2.3E-02	3.34E-02	pCi/g		RICHRC5017
CO-60	4.73E-03	U	2.1E-02	2.1E-02	3.62E-02	pCi/g		RICHRC5017
CS-137	1.34E-02	U	2.0E-02	2.0E-02	3.45E-02	pCi/g		RICHRC5017
EU-152	-5.60E-02	U	4.6E-02	4.6E-02	7.31E-02	pCi/g		RICHRC5017
EU-154	-4.00E-03	U	6.1E-02	6.1E-02	1.05E-01	pCi/g		RICHRC5017
EU-155	4.77E-02	U	3.4E-02	3.4E-02	5.96E-02	pCi/g		RICHRC5017
STRONTIUM	4.69E-03	U	5.2E-02	5.2E-02	1.22E-01	pCi/g	93.00%	RICHRC5006
C-14	2.54E+00	J	1.5E-01	6.8E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.00E+00	U	2.4E-01	4.3E+00	6.79E+00	pCi/g	74.59%	RICHRC5069
TC-99	2.83E-01	U	1.4E-02	7.6E-01	8.06E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LL10	MATRIX:	OTHER
CLIENT ID:	B0XB72	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	4.59E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~3.33E-04~~	~~U~~	~~6.7E-04~~	~~6.7E-04~~	~~1.67E-02~~	~~pCi/g~~	~~76.67%~~	~~RICHRC5080~~
PU-238	-3.37E-04	U	6.7E-04	6.8E-04	1.69E-02	pCi/g	81.34%	RICHRC5010
PU239/40	4.20E-03	U	8.4E-03	8.4E-03	1.14E-02	pCi/g	81.34%	RICHRC5010
BA-133	-7.58E-03	U	2.8E-02	2.8E-02	4.00E-02	pCi/g		RICHRC5017
CO-60	2.87E-02	U	2.6E-02	2.6E-02	4.80E-02	pCi/g		RICHRC5017
CS-137	2.39E-02	U	2.3E-02	2.3E-02	4.15E-02	pCi/g		RICHRC5017
EU-152	1.80E-02	U	5.4E-02	5.4E-02	9.25E-02	pCi/g		RICHRC5017
EU-154	2.17E-02	U	6.8E-02	6.8E-02	1.22E-01	pCi/g		RICHRC5017
EU-155	4.60E-02	U	4.2E-02	4.2E-02	7.15E-02	pCi/g		RICHRC5017
STRONTIUM	4.23E-02	U	5.1E-02	5.3E-02	1.10E-01	pCi/g	100.00%	RICHRC5006
C-14	1.66E+00	J	1.0E-01	6.3E-01	8.11E-01	pCi/g	100.00%	RICHRC5022
NI-63	5.77E+00	J	3.3E-01	3.0E+00	4.38E+00	pCi/g	101.60%	RICHRC5069
TC-99	2.31E-01	U	1.1E-02	7.5E-01	8.06E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA; Richland	SDG: /RPT GRP:	W03005B / 9848
LAB SAMPLE ID:	9D75LM10	MATRIX:	OTHER
CLIENT ID:	B0XB73	DATE RECEIVED:	1/6/2000 12:00:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	4.46E+00		N/A	N/A	8.00E-02	mg/kg	N/A	EPA7196
~~AM-241~~	~~4.86E-03~~	~~U~~	~~9.7E-03~~	~~9.8E-03~~	~~1.32E-02~~	~~pCi/g~~	~~63.29%~~	~~RICHRC5080~~
PU-238	-1.55E-03	U	1.8E-03	1.8E-03	3.22E-02	pCi/g	65.11%	RICHRC5010
PU239/40	6.44E-03	U	1.3E-02	1.3E-02	1.75E-02	pCi/g	65.11%	RICHRC5010
BA-133	-5.77E-03	U	2.4E-02	2.4E-02	3.43E-02	pCi/g		RICHRC5017
CO-60	3.54E-02	U	2.3E-02	2.3E-02	4.35E-02	pCi/g		RICHRC5017
CS-137	7.42E-02	J	2.9E-02	2.9E-02	3.11E-02	pCi/g		RICHRC5017
EU-152	3.58E-02	U	5.0E-02	5.0E-02	8.36E-02	pCi/g		RICHRC5017
EU-154	-1.23E-02	U	5.9E-02	5.9E-02	1.01E-01	pCi/g		RICHRC5017
EU-155	1.01E-02	U	3.5E-02	3.5E-02	5.82E-02	pCi/g		RICHRC5017
STRONTIUM	7.56E-03	U	5.3E-02	5.3E-02	1.25E-01	pCi/g	95.10%	RICHRC5006
C-14	5.77E+00	J	2.8E-01	8.2E-01	8.10E-01	pCi/g	100.00%	RICHRC5022
NI-63	4.88E+00	J	2.8E-01	3.2E+00	4.83E+00	pCi/g	107.75%	RICHRC5069
TC-99	-1.12E-01	U	5.8E-03	7.4E-01	8.63E-01	pCi/g	100.00%	RICHRC5078

Number of Results: 14

3/8/00

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Quanterra
Environmental Services

CASE NARRATIVE
Revised 3/8/00

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

February 9, 2000

Attention: Joan Kessner

Quote Number	:	33811
SDG	:	W03005
Number of Samples	:	eighteen (18)
Sample Matrix	:	Solid
Data Deliverable	:	Summary
Date SDG Closed	:	January 12, 2000

II. Introduction

Between January 5, 2000 and January 6, 2000, eighteen (18) "solid" samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The samples were received at the St. Louis lab within the temperature criteria. See the attached Sample Summary for a listing of Client Ids and their associated Lab numbers.

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: ICP Metals – 6010 Super Trace – Lead
Mercury – 7471 - CV

Deviation from Request: None

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank. Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

MS- Matrix Spike.
MSD- Matrix Spike Duplicate.

V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The initial analysis of the Mercury samples had LCS recoveries outside QC limits at 159% and 165%. The samples were re-digested and re-analyzed. The LCS recoveries met criteria in the re-analysis. The re-analysis data is reported in the package.

The Mercury prep and analysis was done outside of holding time. The prep and analysis was done on 2/4/00. Holding times were expired from 1 to 4 days.

I certify that this Summary is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

3/8/00

Marti Ward
St. Louis Project Manager

Quanterra
2800 George Washington Way
Richland, Washington 99352-1613

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

February 24, 2000

Attention: Joan Kessner

FEB 2000
RECEIVED
Data
Log In

SAF Number	:	B00-013
Date SDG Closed	:	January 10, 2000
Number of Samples	:	Seven (7)
Sample Type	:	Other
SDG Number	:	W03005B
Data Deliverable	:	21-Day / Summary

I. Introduction

On January 6, 2000, seven other (matrix: solid) samples were received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9D75L310	B0XB67	OTHER	1/6/00
9D75LC10	B0XB68	OTHER	1/6/00
9D75LE10	B0XB69	OTHER	1/6/00
9D75LH10	B0XB70	OTHER	1/6/00
9D75LJ10	B0XB71	OTHER	1/6/00
9D75LL10	B0XB72	OTHER	1/6/00
9D75LM10	B0XB73	OTHER	1/6/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were: **Gamma Spectroscopy**
Gamma Scan by method RICH-RC-5017

Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010
Americium-241 by method RICH-RC-5080
Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5078
Nickel-63 by method RICH-RC-5069
Carbon-14 by method RICH-RC-5022
Chemical Analyses
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W03005B include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017:
The LCS, batch blank, samples and sample duplicate (B0XB71) results are within contractual requirements.

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, samples and sample duplicate (B0XB72) results are within contractual requirements.

Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010:
The LCS, batch blank, samples and sample duplicate (B0XB70) results are within contractual requirements.

Americium-241 by method RICH-RC-5080:
The LCS, batch blank, samples and sample duplicate (B0XB70) results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by method RICH-RC-5078:

The LCS, batch blank, samples, sample duplicate (B0XB69) and sample matrix spike (B0XB69) results are within contractual requirements.

Nickel-63 by method RICH-RC-5069:

The LCS, batch blank, samples, sample duplicate (B0XB68) and sample matrix spike (B0XB68) results are within contractual requirements.

Carbon-14 by method RICH-RC-5022:

For solid matrices, the laboratory control and batch blank samples are direct count analyses. The LCS, batch blank, samples and sample duplicate (B0XB67) results are within contractual requirements.

Chemical Analyses

Chromium Hex by EPA method 7196:

The LCS, batch blank, sample, sample duplicate (B0XB73) and sample matrix spike/matrix spike duplicate (B0XB73) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell

Jackie Waddell
Project Manager

Quanterra

Quanterra
2800 George Washington Way
Richland, Washington 99352-1613

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

February 21, 2000

Attention: Joan Kessner

FEB 2000
RECEIVED
Data
Log In

SAF Number	:	B00-013
Date SDG Closed	:	January 10, 2000
Number of Samples	:	Eleven (11)
Sample Type	:	Other
SDG Number	:	W03005A
Data Deliverable	:	21-Day / Summary

I. Introduction

On January 5, 2000, eleven other (matrix: solid) samples were received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9D73R010	B0XB60	OTHER	1/5/00
9D73RE10	B0XB61	OTHER	1/5/00
9D73RR10	B0XB62	OTHER	1/5/00
9D73T410	B0XB63	OTHER	1/5/00
9D73T510	B0XB64	OTHER	1/5/00
9D73T810	B0XB65	OTHER	1/5/00
9D73TC10	B0XB66	OTHER	1/5/00
9D73TD10	B0XBH5	OTHER	1/5/00
9D73TJ10	B0XBH6	OTHER	1/5/00
9D73TL10	B0XBH7	OTHER	1/5/00
9D73TM10	B0XBH8	OTHER	1/5/00

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017
Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010
Americium-241 by method RICH-RC-5080
Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5078
Nickel-63 by method RICH-RC-5069
Carbon-14 by method RICH-RC-5022
Chemical Analyses
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W03005A include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017:
The LCS, batch blank, samples and sample duplicate (B0XB64) results are within contractual requirements.

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, samples and sample duplicate (B0XB65) results are within contractual requirements.

Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010:
The LCS, batch blank, samples and sample duplicate (B0XB63) results are within contractual requirements.

Americium-241 by method RICH-RC-5080:
The LCS, batch blank, samples and sample duplicate (B0XB63) results are within contractual requirements.

Liquid Scintillation Counting
Technetium-99 by method RICH-RC-5078:
The LCS, batch blank, samples, sample duplicate (B0XB62) and sample matrix spike (B0XB62) results are within contractual requirements.

Nickel-63 by method RICH-RC-5069:
The luminescence value for sample B0XB63 was elevated due to excessive quench caused by the sample matrix. The TSIE/quench value (86) was slightly below the lower calibration limit (92), therefore, the calculated result was extrapolated from the calibration curve. Since the MDA meets the CRDL and the sample result is below the CRDL, the data were accepted for reporting. Except as noted, the LCS, batch blank, samples, sample duplicate (B0XB61) and sample matrix spike (B0XB61) results are within contractual requirements.

Carbon-14 by method RICH-RC-5022:
For solid matrices, the laboratory control and batch blank samples are direct count analyses. The LCS, batch blank, samples and sample duplicate (B0XB60) results are within contractual requirements.

Chemical Analyses
Chromium Hex by EPA method 7196:
The sample matrix spike recovery did not meet acceptance criteria. The matrix spike was reanalyzed. The reanalysis result was within limits and the data were accepted for reporting. Except as noted, the LCS, batch blank, sample, sample duplicate (B0XB66) and sample matrix spike/matrix spike duplicate (B0XB66) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Jackie Waddell
Project Manager

Quanterra

Clouseau

Nonconformance Memo

NCM #: F00041
NCM Initiated By: Ed Kao
Date Opened: 02/01/00
Date Closed: N/A

Classification: Deficiency
Status: PMREVIEW
Production Area: Metals
Tests: 7471A
Lot #'s (Sample #'s): F0A060175 (1,10,11,2,3,4,5,6,7,8,9); F0A070135 (1,2,3,4,5,6,7); F0A110152 (6) W03005
QC Batch: 0026218

Nonconformance: QC data exceeded criteria
Subcategory: Other (explanation required)

Problem Description / Root Cause

Name	Date	Description
Ed Kao	02/01/00	The LCS soil were outside of acceptance criteria (159% and 165%). However, the MS/MSDs were 116%/117% and 125%/123%. In addition, upon further investigation we tested the same Lot# but different bottle (there were 4 bottles of LCS soil with the same Lot#) and the LCS soil passed. In conclusion, we attributed contamination to that specific bottle.

Corrective Action

Name	Date	Corrective Action
Ed Kao	02/01/00	The bottle that tested fine will be used and all other bottles are to be discontinued effectively.

Client Notification Summary

Client	Project Manager	Date Notified	Response Date	How Notified
BECHTEL HANFORD, INC.	Ward, Marti	02/01/00	02/01/00	in writing

Response	Response Details
Process "as-is"	

Approval History

Name	Date Approved:	Position
Ed Kao	02/01/00	Group Leader
Ward, Marti	02/01/00	Project Manager

Client required re-analysis

~~000004~~

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-013-103

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 9L	Data Turnaround: 21 Days	Air Quality: ☐	
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: EZC-96-065	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment:
Shipped To: Quanterra Incorporated	Offsite Property No.: 100% fuel		Bill of Lading/Air Bill No.:

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SDG W03005

SAMPLE ANALYSIS Due 1-26

JOA050173

Preservation	Cool 4C	None	None							
Type of Container	aG	aG	aG							
No. of Container(s)	1	1	1							
Volume	60mL	60mL	120mL							
	7196_CR6: Hexavalent Chromium (1)	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time											
B0XB60	Other Solid	1-5-00	0841	X	X	X	D73	RO						
B0XB61	OTHER SOLID	1-5-00	0848	X	X	X	D73	RE						
B0XB62	OTHER SOLID	1-5-00	0900	X	X	X	D73	RR						
B0XB63	OTHER SOLID	1-5-00	0911	X	X	X	D73	T4						
B0XB64	OTHER SOLID	1-5-00	0922	X	X	X	D73	T5						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1-5-00 1115	K. Ashenburg / K. Ashenburg	1-5-00 1115
K. Ashenburg / K. Ashenburg	1-5-00 1600	[illegible]	1-6-00 830

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RAD SAMPLE B0XBF6

Matrix *

S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-013-108 | Page 1 of 1

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 9L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: ERL-96-065	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment:
Shipped To: Quanterra Incorporated	Offsite Property No.: 100F/DR		Bill of Lading/Air Bill No.:

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	None								
Type of Container	aG	aG	aG								
No. of Container(s)	1	1	1								
Volume	60mL	60mL	120mL								
SAMPLE ANALYSIS	7196_CR6: Hexavalent Chromium (1)	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time											
B0XB65	Other Solid	1-5-00	0937	X	X	X	D73	T8						
BOXB66	OTHER SOLID	1-5-00	0947	X	X	X	D73	TC						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: R Fahlberg / R. Fahlberg	1-5-00 11:5	Received By: K. Achterberg / K. Achterberg	1-5-00 1115
Relinquished By: K. Achterberg / K. Achterberg	1-5-00 1600	Received By: [illegible]	1-6-00 AM 830
Relinquished By		Received By	
Relinquished By		Received By	
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RMD SCREEN BOXBFC

Matrix *
S=Soil
SR=Sediment
SO=Solid
S=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-013-146 | Page 1 of 1

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105F		SAF No.: B00-013
Ice Chest No.: ERC94010	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment: Gov. Vehicle
Shipped To: Quanterra Incorporated	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Price Code: 9L | Data Turnaround: 21 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None									
Type of Container	sG	sG									
No. of Container(s)	1	1									
Volume	60mL	120mL									
SAMPLE ANALYSIS	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time								
B0XBH5 (8)	Other Solid	1-3-00	12:30	X	X	D73	TD				BoxBF9
BoxBH6	Other Solid	1-3-00	12:48	X	X	D73	TJ				BoxBF9
BoxBH7	Other Solid	1-3-00	12:53	X	X	D73	TL				BoxBF9
BoxBH8	Other Solid	1-3-00	12:53	X	X	D73	TM				BoxBF9

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
K. Fahlberg / R. Fahlberg	1 42 1-3-00	R. F. 1-A	1450 1-3-00
R. A. 1-5-00	0900	R. Thoren 1-5-00	0900
R. A. Thoren / R. Thoren	1-5-00 1100	K. Lichtenberg 1-5-00	1100
K. Lichtenberg 1-5-00	1600	[illegible] 1-6-00	1400 830

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

Matrix *: S=Soil; SE=Sediment; SO=Solid; S=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; Wi=Wipe; L=Liquid; V=Vegetation; X=Other

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B00-013-110 | Page 1 of 1

Collector: Fahlberg W03005	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 9L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: EIZC-96-065	Field Logbook No.: EL 1424	COA: R105F2280C	Method of Shipment: Hand Delivered
Shipped To: Quanterra Incorporated	Offsite Property No.		Bill of Lading/Air Bill No.

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	None								
Type of Container	sG	sG	sG								
No. of Container(s)	1	1	1								
Volume	60mL	60mL	120mL								
SAMPLE ANALYSIS	7196_CR6; Hexavalent Chromium (1)	ICP Metals - 6010A (Supernate) (Lead); Mercury - 7471 - (CV)	See item (1) in Special Instructions.								

SDG W03005 JOA060216 Due 1-27 Rush 1-10

Sample No.	Matrix *	Sample Date	Sample Time											
B0XB67	Other Solid	1-6-00	0858	X	X	X	D75L3							
BoXB68	Other Solid	1-6-00	0911	X	X	X	D75LC							
BoXB69	Other Solid	1-6-00	0923	X	X	X	D75LE							
BoXB70	Other Solid	1-6-00	0936	X	X	X	D75LH							
BoXB71	Other Solid	1-6-00	0936	X	X	X	D75LJ							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1200 1-6-00	K. Ashenburg	1200 1-6-00
K. Ashenburg	1200 1-6-00	[illegible]	1/7/00 [illegible]

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

TIED TO RED SLEEVE BOXBF6

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-013-115	Page 1 of 1

Collector: Fahlberg W03605	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 9L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 105-F/DR Phase III Below-grade Areas Sampling and Analy	Sampling Location: 105 F Solids Feed		SAF No.: B00-013
Ice Chest No.: ERC-96-065	Field Logbook No.: EL 1424	COA: R105F2280c	Method of Shipment: Hand Delivery
Shipped To: Quanterra Incorporated	Offsite Property No.		Bill of Lading/Air Bill No.

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None	None
Type of Container	aG	aG	aG
No. of Container(s)	1	1	1
Volume	60mL	60mL	120mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	7196_CR6: Hexavalent Chromium (1)	ICP Metals - 6010A (Supertrace) (Lead); Mercury - 7471 - (CV) 100%	See Item (1) in Special Instructions.								
B0XB72	Other Solid	1-6-00	0949	X	X	X	D7SLL							
B0XB73	Other Solid	1-6-00	1012	X	X	X	D7SLM							

CHAIN OF POSSESSION — Sign/Print Name

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1200 1-6-00	R. Fahlberg	1200 1-6-00
R. Fahlberg	1-6-00 1600	R. Fahlberg	1-6-00 1600
			1/7/00 1000

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cobalt-60); Gamma Spec - Add-on (Barium-133); Isotopic Plutonium; Strontium-89,90 -- Total Sr; Technetium-99; Americium-241; Nickel-63; Carbon-14

* TIRD TO RAD SCREEN BOX BF6

Matrix *: S=Soil; SE=Sediment; SO=Solid; S=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

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

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 F/DR			DATA PACKAGE: W0300S		
VALIDATOR: TLI		LAB: QES		DATE: 3/6/00	
CASE:			SDG: W0300S		

ANALYSES PERFORMED

☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☒ CRUT	☐

SAMPLES/MATRIX	BOXB60	BOXB61	BOXB62	BOXB63	BOXB64
BOXB65	BOXB66	BOXB67	BOXB68	BOXB69	BOXB70
BOXB71	BOXB72	BOXB73	BOXBH5	BOXBH6	BOXBH7
BOXBH8					
					solid

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: Hg - see attached summary

J all Hg

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: lead ok Hg - 69, 67 U both
62 U
Pb + Hg in e. blank

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:

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:

FDup 70/71 Hg 48% ok w/in CRPL

Pb 33%

W7/W8 AG 53%

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:

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F0A060175 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F0A270000-162 Prep Batch #...: 0027162						
Lead	ND	0.30	mg/kg	SW846 6010B	01/27/00	D7WKJ101
		Dilution Factor: 1				
MB Lot-Sample #: F0B050000-128 Prep Batch #...: 0036128						
Mercury	0.015 B	0.033	mg/kg	SW846 7471A	02/04/00	D88W8101
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F0A070135 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F0A270000-167 **Prep Batch #...:** 0027167						
Lead	ND	0.30	mg/kg	SW846 6010B	01/27/00	D7WKW101
		Dilution Factor: 1				
MB Lot-Sample #: F0B050000-128 **Prep Batch #...:** 0036128						
Mercury	0.015 B	0.033	mg/kg	SW846 7471A	02/04/00	D88W8101
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

HOLDING TIME SUMMARY

SDG: W03005	VALIDATOR: TLI	DATE: 3/8/00	PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOXB60-B66	Hg	1/5/00	2/4/00	2/4/00	30	0	J/UJ
BOXB67-B73	Hg	1/6/00	2/4/00	2/4/00	29	0	J/UJ
BOXB75-B78	Hg	1/3/00	2/4/00	2/4/00	32	0	J/UJ