0058015

Date: 12 March 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-TW-1&2 - Soil Sampling
Subject: Inorganics - Data Package No. W03587-ST (SDG No. W03587)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W03587-ST prepared by Severn Trent Services (ST). 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
B12C89-B	8/23/01	Soil	C	See note 2, 3 & 4*
B12DC1-A	8/24/01	Soil	C	See note 1, 2 & 4*
B12ML4-A	8/26/01	Soil	C	See note 2 & 4
B12ML5-A	8/27/01	Soil	C	See note 2
B12ML6-A	8/27/01	Soil	C	See note 2
B12ML7	8/28/01	Soil	C	See note 2

* - Laboratory reported the sample arrived without an intact custody seal.
1 - Metals by 6010B (aluminum, bismuth, cadmium, calcium, chromium (total), copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, silver, sodium, vanadium, zinc); mercury by 7470.
2 - Metals by 6010B (cadmium, chromium (total), copper, lead, nickel, silver); mercury by 7470.
3 - TCLP by 6010B (chromium)
4 - TCLP by 6010B (lead)

Data validation was conducted in accordance with the BHI validation statement of work and the 200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan, DOE/RL-2000-38, Rev. 0, February 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

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DATA QUALITY OBJECTIVES

- **Holding Times/Preservation**

Analytical holding times for ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is 28 days for mercury and 6 months for ICP metals.

Due to a lack of proper preservation (cooler temperatures of 17°C and 18°C), all ICP metal result in all samples but B12ML7 were qualified as estimates and flagged "J".

All other holding times were acceptable.

- **Blanks**

Preparation (Method) 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 target required quantitation limit (TRQL), 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 TRQL, 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 laboratory blank contamination, all TCLP lead results were qualified as estimates and flagged "J".

All preparation blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **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 70-130%. Samples with a spike recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 35% for soil samples. If RPD values are out of specification and the sample concentration is greater than five times the TRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the TRQL and the sample concentration is less than five times the TRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for laboratory duplicates are an RPD less than 35% for positive sample results greater than five times the TRQL or plus or minus 2 times the TRQL for positive sample results less than five times the TRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

Due to an RPD of 51%, the chromium results in samples B12C89-B and B12DC1-A were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

  Reported analytical detection levels are compared against 200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan, DOE/RL-2000-38, Rev. 0, February 2001 target required quantitation limits (TRQL) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific TRQL.

- **Completeness**

  Data package No. W03587-ST was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). Due to the laboratory not analyzing for all requested analytes, the completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a lack of proper preservation (cooler temperatures of 17°C and 18°C), all ICP metal result in all samples but B12ML7 were qualified as estimates and flagged "J". Due to an RPD of 51%, the chromium results in samples B12C89-B and B12DC1-A were qualified as estimates and flagged "J". Due to laboratory blank contamination, all TCLP lead 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-2000-38, Rev. 0, *200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan*, February 2001.

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 minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

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

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W03587	REVIEWER: TLI	DATE: 3/12/02	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium	J	B12C89-B B12DC1-A	RPD
TCLP lead	J	All	Blank contamination
All	J	All except B12ML7	Sample preservation

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																	
Laboratory: ST																	
Case:	SDG: W03587																
Sample Number		B12C89-B		B12DC1-A		B12ML4-A		B12ML5-A		B12ML6-A		B12ML7					
Remarks																	
Sample Date		08/23/01		08/24/01		08/26/01		08/27/01		08/27/01		08/28/01					
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver		3.1	J	1.9	J	ND	UJ	ND	UJ	ND	UJ	ND	U				
Aluminum		NA		9630	J	NA		NA		NA		NA					
Calcium		NA		11900	J	NA		NA		NA		NA					
Cadmium	0.5	ND	UJ	ND	UJ	ND	UJ	ND	UJ	ND	UJ	ND	U				
Chromium		142	J	73.2	J	46.2	J	27.4	J	12.4	J	9.3					
Copper	2.5	13.6	J	20.5	J	23.4	J	16.6	J	15.0	J	11.1					
Iron		NA		34900	J	NA		NA		NA		NA					
Magnesium		NA		6460	J	NA		NA		NA		NA					
Manganese		NA		1650	J	NA		NA		NA		NA					
Molybdenum		NA		ND	UJ	NA		NA		NA		NA					
Nickel	4	22.7	J	66.6	J	39.6	J	13.9	J	10	J	10.1					
Lead	10	349	J	308	J	285	J	76.5	J	5.6	J	ND	U				
Vanadium		NA		88.4	J	NA		NA		NA		NA					
Zinc		NA		127	J	NA		NA		NA		NA					
Bismuth		NA		3300	J	NA		NA		NA		NA					
Potassium		NA		1900	J	NA		NA		NA		NA					
Sodium		NA		1310	J	NA		NA		NA		NA					
Mercury	0.2	0.12	J	0.42	J	0.13	J	0.051	J	ND	UJ	ND	U				
TCLP - ug/L																	
Chromium	10	23.8	J	NA		NA		NA		NA		NA					
Lead	100	79.6	J	23.0	J	46.1	J	NA		NA		NA					

ND = Not detected

NA = Not analyzed

BECHTEL HANFORD, INC.

Client Sample ID: B12C89-B

TOTAL Metals

Lot-Sample #...: F1H290206-002 Matrix.....: SOLID
Date Sampled...: 08/23/01 Date Received..: 08/29/01
% Moisture.....: 13

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1247187						
Silver	3.1 J	1.1	mg/kg	SW846 6010B	09/04-09/14/01	EJQ4N1AH
		Dilution Factor: 1		MDL.....: 1.1		
Cadmium	ND U	0.57	mg/kg	SW846 6010B	09/04-09/07/01	EJQ4N1AC
		Dilution Factor: 1		MDL.....: 0.20		
Chromium	142	1.1	mg/kg	SW846 6010B	09/04-09/07/01	EJQ4N1AD
		Dilution Factor: 1		MDL.....: 0.34		
Copper	13.6	2.9	mg/kg	SW846 6010B	09/04-09/07/01	EJQ4N1AE
		Dilution Factor: 1		MDL.....: 0.44		
Nickel	22.7	4.6	mg/kg	SW846 6010B	09/04-09/07/01	EJQ4N1AG
		Dilution Factor: 1		MDL.....: 0.99		
Lead	349	11.5	mg/kg	SW846 6010B	09/04-09/07/01	EJQ4N1AF
		Dilution Factor: 1		MDL.....: 3.7		
Prep Batch #...: 1248153						
Mercury	0.12 J	0.11	mg/kg	SW846 Hg Mod 7470	09/05/01	EJQ4N1AQ
		Dilution Factor: 1		MDL.....: 0.028		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

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BECHTEL HANFORD, INC.

Client Sample ID: B12DC1-A

TOTAL Metals

Lot-Sample #...: F1H290206-001 Matrix.....: SOLID
Date Sampled...: 08/24/01 Date Received..: 08/29/01
% Moisture.....: 10

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1247187						
Silver	1.9 J	1.1	mg/kg	SW846 6010B	09/04-09/14/01	EJQX81CJ
		Dilution Factor: 1		MDL.....: 0.11		
Aluminum	9630	22.2	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81CM
		Dilution Factor: 1		MDL.....: 2.7		
Calcium	11900	556	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81CQ
		Dilution Factor: 1		MDL.....: 10.7		
Cadmium	ND U	0.56	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81CU
		Dilution Factor: 1		MDL.....: 0.022		
Chromium	73.2	1.1	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81CX
		Dilution Factor: 1		MDL.....: 0.10		
Copper	20.5	2.8	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81C2
		Dilution Factor: 1		MDL.....: 0.42		
Iron	34900	11.1	mg/kg	SW846 6010B	09/04-09/14/01	EJQX81C5
		Dilution Factor: 1		MDL.....: 2.5		
Magnesium	6460	556	mg/kg	SW846 6010B	09/04-09/14/01	EJQX81C8
		Dilution Factor: 1		MDL.....: 10.4		
Manganese	1650	1.7	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81DC
		Dilution Factor: 1		MDL.....: 0.067		
Molybdenum	ND U	4.4	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81DF
		Dilution Factor: 1		MDL.....: 0.97		
Nickel	66.6	4.4	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81DJ
		Dilution Factor: 1		MDL.....: 0.96		
Lead	308	0.33	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81DM
		Dilution Factor: 1		MDL.....: 0.17		
Vanadium	88.4	5.6	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81DQ
		Dilution Factor: 1		MDL.....: 0.43		
Zinc	127	2.2	mg/kg	SW846 6010B	09/04-09/07/01	EJQX81DU
		Dilution Factor: 1		MDL.....: 0.76		

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BECHTEL HANFORD, INC.

Client Sample ID: B12DC1-A

TOTAL Metals

Lot-Sample #...: F1H290206-001 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Potassium	1900	556	mg/kg	SW846 6010B	09/04-09/14/01	EJQX81D2
		Dilution Factor: 1		MDL.....: 314		
Sodium	1310	556	mg/kg	SW846 6010B	09/04-09/14/01	EJQX81D5
		Dilution Factor: 1		MDL.....: 10.8		
Prep Batch #...: 1248153						
Mercury	0.42	0.11	mg/kg	SW846 Hg Mod 7470	09/05/01	EJQX81AX
		Dilution Factor: 1		MDL.....: 0.027		
Prep Batch #...: 1268526						
Bismuth	3300	22.2	mg/kg	SW846 6010B	09/25-10/01/01	EJQX82DX
		Dilution Factor: 1		MDL.....: 2.3		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2/12/02

BECHTEL HANFORD, INC.

Client Sample ID: B12ML4-A

TOTAL Metals

Lot-Sample #...: F1H310250-002 **Matrix.....:** SOLID
Date Sampled...: 08/26/01 **Date Received..:** 08/31/01
% Moisture.....: 18

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1248153						
Mercury	0.13 J	0.12	mg/kg	SW846 Hg Mod 7470	09/05/01	EJXPV1A2
		Dilution Factor: 1		MDL.....: 0.029		
Prep Batch #...: 1254213						
Cadmium	ND U J	0.61	mg/kg	SW846 6010B	09/11-09/20/01	EJXPV1A3
		Dilution Factor: 1		MDL.....: 0.21		
Chromium	46.2	1.2	mg/kg	SW846 6010B	09/11-09/20/01	EJXPV1A4
		Dilution Factor: 1		MDL.....: 0.37		
Copper	23.4	3.1	mg/kg	SW846 6010B	09/11-09/20/01	EJXPV1A5
		Dilution Factor: 1		MDL.....: 0.46		
Lead	285	12.2	mg/kg	SW846 6010B	09/11-09/20/01	EJXPV1A6
		Dilution Factor: 1		MDL.....: 4.0		
Nickel	39.6	4.9	mg/kg	SW846 6010B	09/11-09/20/01	EJXPV1A7
		Dilution Factor: 1		MDL.....: 1.1		
Silver	ND U	1.2	mg/kg	SW846 6010B	09/11-09/20/01	EJXPV1A8
		Dilution Factor: 1		MDL.....: 1.1		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

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STL St. Louis

BECHTEL HANFORD, INC.

Client Sample ID: B12ML5-A

TOTAL Metals

Lot-Sample #...: F1H310250-003 **Matrix.....:** SOLID
Date Sampled...: 08/27/01 **Date Received..:** 08/31/01
% Moisture.....: 15

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1248153						
Mercury	0.051 B J	0.12	mg/kg	SW846 Hg Mod 7470	09/05/01	EJXP71A2
		Dilution Factor: 1		MDL.....: 0.028		
Prep Batch #...: 1254213						
Cadmium	ND U J	0.59	mg/kg	SW846 6010B	09/11-09/20/01	EJXP71A3
		Dilution Factor: 1		MDL.....: 0.20		
Chromium	27.4	1.2	mg/kg	SW846 6010B	09/11-09/20/01	EJXP71A4
		Dilution Factor: 1		MDL.....: 0.35		
Copper	16.6	2.9	mg/kg	SW846 6010B	09/11-09/20/01	EJXP71A5
		Dilution Factor: 1		MDL.....: 0.45		
Lead	76.5	11.7	mg/kg	SW846 6010B	09/11-09/20/01	EJXP71A6
		Dilution Factor: 1		MDL.....: 3.8		
Nickel	13.9	4.7	mg/kg	SW846 6010B	09/11-09/20/01	EJXP71A7
		Dilution Factor: 1		MDL.....: 1.0		
Silver	ND U	1.2	mg/kg	SW846 6010B	09/11-09/20/01	EJXP71A8
		Dilution Factor: 1		MDL.....: 1.1		

NOTE(S):

B Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

2/17/02

BECHTEL HANFORD, INC.

Client Sample ID: B12ML6-A

TOTAL Metals

Lot-Sample #...: F1H310250-004 **Matrix.....:** SOLID
Date Sampled...: 08/27/01 **Date Received..:** 08/31/01
% Moisture.....: 11

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1248153						
Mercury	ND J	0.11	mg/kg	SW846 Hg Mod 7470	09/05/01	EJXQC1A2
		Dilution Factor: 1		MDL.....: 0.027		
Prep Batch #...: 1254213						
Cadmium	ND U J	0.56	mg/kg	SW846 6010B	09/11-09/20/01	EJXQC1A3
		Dilution Factor: 1		MDL.....: 0.19		
Chromium	12.4	1.1	mg/kg	SW846 6010B	09/11-09/20/01	EJXQC1A4
		Dilution Factor: 1		MDL.....: 0.34		
Copper	15.0	2.8	mg/kg	SW846 6010B	09/11-09/20/01	EJXQC1A5
		Dilution Factor: 1		MDL.....: 0.43		
Lead	5.6 B	11.3	mg/kg	SW846 6010B	09/11-09/20/01	EJXQC1A6
		Dilution Factor: 1		MDL.....: 3.6		
Nickel	10	4.5	mg/kg	SW846 6010B	09/11-09/20/01	EJXQC1A7
		Dilution Factor: 1		MDL.....: 0.97		
Silver	ND U	1.1	mg/kg	SW846 6010B	09/11-09/20/01	EJXQC1A8
		Dilution Factor: 1		MDL.....: 1.0		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

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STL St. Louis

BECHTEL HANFORD, INC.

Client Sample ID: B12ML7

TOTAL Metals

Lot-Sample #...: F1H310250-001 Matrix.....: SOLID
Date Sampled...: 08/28/01 Date Received..: 08/31/01
% Moisture.....: 13

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1248153						
Mercury	ND	0.11	mg/kg	SW846 Hg Mod 7470	09/05/01	EJXPC1AP
		Dilution Factor: 1		MDL.....: 0.028		
Prep Batch #...: 1254213						
Cadmium	ND UJ	0.57	mg/kg	SW846 6010B	09/11-09/20/01	EJXPC1AQ
		Dilution Factor: 1		MDL.....: 0.20		
Chromium	9.3 J	1.1	mg/kg	SW846 6010B	09/11-09/20/01	EJXPC1AR
		Dilution Factor: 1		MDL.....: 0.34		
Copper	11.1 J	2.9	mg/kg	SW846 6010B	09/11-09/20/01	EJXPC1AT
		Dilution Factor: 1		MDL.....: 0.44		
Lead	ND UJ	11.5	mg/kg	SW846 6010B	09/11-09/20/01	EJXPC1AU
		Dilution Factor: 1		MDL.....: 3.7		
Nickel	10.1 J	4.6	mg/kg	SW846 6010B	09/11-09/20/01	EJXPC1AV
		Dilution Factor: 1		MDL.....: 0.99		
Silver	ND UJ	1.1	mg/kg	SW846 6010B	09/11-09/20/01	EJXPC1AW
		Dilution Factor: 1		MDL.....: 1.1		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

2/17/02

L St. Louis

BECHTEL HANFORD, INC.

Client Sample ID: B12C89-B

TCLP Metals

Lot-Sample #...: F2B160152-001 **Matrix.....:** SOLID
Date Sampled...: 08/23/01 **Date Received..:** 02/14/02
Leach Date.....: 02/19/02 **Leach Batch #..:** P205011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2051346						
Chromium	23.8 ~~B~~ J	250	ug/L	SW846 6010B	02/20-02/21/02	ET8X21AA
		Dilution Factor: 2.5		MDL.....: 0.33		
Lead	79.6 ~~B~~ J	250	ug/L	SW846 6010B	02/20-02/21/02	ET8X21AC
		Dilution Factor: 2.5		MDL.....: 1.6		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

3/12/02

BECHTEL HANFORD, INC.

Client Sample ID: B12DC1-A

TCLP Metals

Lot-Sample #...: F2B160152-002 **Matrix.....:** SOLID
Date Sampled...: 08/24/01 **Date Received..:** 02/14/02
Leach Date.....: 02/19/02 **Leach Batch #..:** P205011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2051346						
Lead	23.0 ~~B,J~~ J	250	ug/L	SW846 6010B	02/20-02/21/02	ET9DX1AA
		Dilution Factor: 2.5		MDL.....: 1.6		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

3/12/02

BECHTEL HANFORD, INC.

Client Sample ID: B12ML1 ~~4A~~ 4-A Dayes 2/27/02

TCLP Metals

Lot-Sample #...: F2B160152-003 Matrix.....: SOLID
Date Sampled...: 08/26/01 Date Received..: 02/14/02
Leach Date.....: 02/19/02 Leach Batch #..: P205011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2051346						
Lead	46.1 ~~B,J~~ J	250	ug/L	SW846 6010B	02/20-02/21/02	KT9D21AA
		Dilution Factor: 2.5		MDL.....: 1.6		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

JR 3/12/02

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

SEVERN TRENT SERVICES

STL St. Louis

CASE NARRATIVE

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

October 3, 2001

Attention: Joan Kessner

Project Number	:	43018
SAF	:	B01-058
SDG	:	W03587
Number of Samples	:	six
Sample Matrix	:	soil
Data Deliverable	:	Summary
Date SDG Closed	:	September 13, 2001

II. Introduction

Between September 29 and 31, 2001, six (6) "solid" samples were received by STL–St. Louis for chemical analysis. The samples were received at the St. Louis lab outside temperature criteria. See the COC and CUR forms for details of sample condition and temperature. See the attached Sample Summary form for the Lab ID's and corresponding Client Ids.

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. This report is not complete without the Case Narrative. Results are reported "as received"; i.e. wet weight, unless otherwise noted on the data sheets.

Analyses requested: see the attached methods summary sheet

Deviation from Request: The metals were done using method 6010B in place of 6010A.

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.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

STL St. Louis is a part of Severn Trent Laboratories, Inc.

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.

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 MS recoveries for several metals were outside control limits. The spike data was flagged with an "N" qualifier. LCS recoveries met criteria.

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

There was no recovery of the matrix spike for the Cyanide analysis of sample B12DC1-A. LCS recovery was acceptable. The spike data was flagged with an "N" qualifier.

There was no TOC MS recovery for sample B12DC1-A and the data is flagged with an "N" qualifier. The sample was spiked with 80 ul of a 600 ppm TOC standard. The spike was analyzed by itself with a reading of 640. The sample was weighted and the spike was added on top. When the sample plus the spike was burned, a very low result was given. It is believed that sample matrix was the interference.

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:

Marti Ward

Marti Ward
St. Louis Project Manager

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SEVERN TRENT SERVICES

STL St. Louis

CASE NARRATIVE

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

February 22, 2002

Attention: Joan Kessner

Project Number	:	43018
SAF	:	B01-058
SDG	:	W03587A
Number of Samples	:	six
Sample Matrix	:	soil
Data Deliverable	:	Summary
Date SDG Closed	:	September 13, 2001

II. Introduction

Between September 29 and 31, 2001, six (6) "solid" samples were received by STL--St. Louis for chemical analysis. The samples were received at the St. Louis lab outside temperature criteria. See the COC and CUR forms for details of sample condition and temperature. See the attached Sample Summary form for the Lab ID's and corresponding Client Ids. On February14, 2002, the client requested additional analysis. This report contains the results for the additional analysis.

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. This report is not complete without the Case Narrative. Results are reported "as received"; i.e. wet weight, unless otherwise noted on the data sheets.

Analyses requested: see the attached methods summary sheet

Deviation from Request: The metals were done using method 6010B in place of 6010A.

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.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

STL St. Louis is a part of Severn Trent Laboratories, Inc.

SEVERN TRENT SERVICES

STL St. Louis

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.

TCLP Metals: The TCLP metals analysis was requested after the TCLP leach holding time had expired.

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 MS/MSD were not run on a sample in this SDG. The data for the "batch" QC is included at the back of the data report. Recoveries were in control.

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:

Marti Ward

Marti Ward
St. Louis Project Manager

STL St. Louis is a part of Severn Trent Laboratories, Inc.

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-058-166 | Page 1 of 2

Collector: Thomas G./Watson D.	Company Contact: Todd, M.R.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Date Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: VIKING Sn 08/98 050011	Field Logbook No.: EL-1518-1	COA: B20TW2 A44C 8/23/01	Method of Shipment: Fed EX
Shipped To: SEVERN TRENT	Offsite Property No.: RSB 106563		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiological Field Instrument Readings on bottles ranged from 15MR B/4.5MR γ to 3.0 MR B/1.3MR γ. Possible presence of (Americium) of this sample

COA

Sample originally sent to RCF for on site analysis. Page 2 of 2 represents custody transfer to RCF. The sample was picked up from RCF and re-[illegible] for off-site analysis. [illegible] appropriate off site custody [illegible]. Page 1 of 2 represents custody transfer to offsite laboratory [illegible] directed analysis.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	sG	sG	sG	sG	sG	sG	sG
No. of Container(s)	1	1	1	1	1	1	1
Volume	60mL	60mL	[illegible]	120mL	250mL	[illegible]	250mL
	Chromium Hex - 7196	Mercury - 7470 - (CV)	VOA - 8260A (TCL)	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.

Sample No.	Matrix*	Sample Date	Sample Time										
B12C88	SOIL	8-23-01	0130	X	X		X	X					~~B12C89~~ B12M38

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Greg Thomas/Greg Thomas	8/23/01 0815	200 TW1 & 2 Site Trailer	8/23/01 0815
200 TW1 & 2 Trailer Site	8/28/01 0815	R. Thoren	8-28-01 0815
R. Thoren	8-28-01 0900	FEDEX	
		[illegible]	8/29/01 0850

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) ~~Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D~~
(4) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Gross-Alpha, Neptunium-237; [illegible]~~

Samples stored in Ref.# [illegible] in the 3728 Shipping Facility on [illegible]. Collector not available to relinquish samples on [illegible] for shipment.

RT 8-28-01

Matrix*: W=Water, O=Oil, A=Air, SO=Sediment, SO=Solid, S=Sludge, W=Water, O=Oil, A=Air, SO=Sediment, SO=Solid, S=Sludge, T=Tissue, SO=Solid, 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)

ET 8-28

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-206	Page 1 of ~~1~~ 2
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.: VIKING SN 08/98 050011	Field Logbook No.: EL-1518-1	COA: B20TW2A44C ~~B20TW2674C~~ GT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated ST. LOUIS	Offsite Property No.: RSR 106563 8/24/01		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiologic. Field Instrument Reading 35mR/3 2 mR V on bottles. Possible α.

Samples stored in Ref.# Site Trailer at the 3728 Shipping Facility on 8/24/01. Collector not available to relinquish samples on 8/28/01 for shipment.

ET 8-28-01

023

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (1) in Special Instructions.	VOA - 8260 (TCL)	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time									Tie to
B12DC1	SOIL	8/24/01	0200	X		X			X			B12MK0

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Gary Thomas/Greg Thomas	8/24/01 0600	200TW 1&2 Site Trailer	8/24/01 0600
200TW 1&2 Site Trailer	8/28/01 0415	R.T. Thoren	8.28.01 0415
R.T. Thoren	8.28.01 0850	FED EX	
		[illegible]	8.29.01 0850

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(2) Semi-VOA - 8270A (Add On) (Tributyl phosphate), TPH Diesel Range - WTPH-D~~ GT 8/24/01
(3) ICP Metals - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)
~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

DJW 08/15/01

Matrix *: S=Soil; SD=Sediment; SO=Solid; SI=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		B01-058-249	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.: VIKING S/N 08/98050012	Field Logbook No.: EL-1518-1	COA: B20TW2A44C ~~B20TW2074C~~ GT	Method of Shipment: Fed EX	Data Turnaround: 45 Days
Shipped To: Severn Trent Incorporated - ST. Louis	Offsite Property No.: RSR 107053 8/27/01		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

1500mR/B, 800cpm, 100mR } ON CONTACT

Samples stored in Ref. # [illegible] at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/29/01 for shipment. RT 8.30.01

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan		
Sample No.	Matrix *	Sample Date	Sample Time						Tie to	
B12ML4	SOIL	8/26/01	2345	X	X		X		B12MK1	

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: DS WATSON/[illegible]	Date/Time: 08/27/01 0645	Received By/Stored In: REF TW H2	Date/Time: 08/27/01 0645
Relinquished By/Removed From: Ref TW H2	Date/Time: 0330 8.30.01	Received By/Stored In: R Thorer	Date/Time: 0330 8.30.01
Relinquished By/Removed From: R Thorer	Date/Time: 0800 8.30.01	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) ~~Semi-VOA - 8270A (Add-On) (Thiodiphosphate); TPH Diesel Range - WTPH-D~~
(4) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=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: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-250	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.: VIKING SN 08 98 0500R	Field Logbook No.: EL-1518-1	COA: B20TWL4H4C	Method of Shipment: Fed EX	Data Turnaround: 45 Days
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 107053 8/27/01		Bill of Lading/Air Bill No.: WK	

POSSIBLE SAMPLE HAZARDS/REMARKS: FIELD RADIOLOGICAL INSTRUMENTS WITHIN 100 CPM 20 mR/h 3 cm CONTACT <0.5 mR/h

Samples stored in Ref. # TW1-2 at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/28/01 for shipment. TCT 8.30.01 SBB

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time									
B12ML5	SOIL	8/27/01	0115	X	X		X					B12ML2

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: [illegible]	08/27/01 0645	REF. TW1-2	08/27/01 0645
Relinquished By/Removed From: RJ TWILAZ	8.30.01 0550	RJ Thorne	8.30.01 0550
Relinquished By/Removed From: RJ Thorne	8.30.01 0600	FED EX	
Relinquished By/Removed From: FED EX			
Relinquished By/Removed From			
Relinquished By/Removed From			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) ~~Semi-VOA - 8270A (Add-On) {Triethyl phosphate}; TPH Diesel Range - WTPH-D~~
(4) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spectroscopy (Radium-226, Radium-228); Isotopic Plutonium, Isotopic Thorium (Thorium-232), Americium-241; Carbon-14; Magnesium-237, Nickel-63, Strontium-89,90 - Total-Sr, Technetium-99, Total Uranium, Tritium - H3, Isotopic Uranium~~

Matrix *: S=Soil; SD=Sediment; SO=Solid; SL=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: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

3587

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-251	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	
Ice Chest No.: VIKING S/N 08/980500	Field Logbook No.: ZEL-1518-1	COA: B20TW2A44C ~~B20TW2074C~~ JT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 107053 8/27/01		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD RADIOLOGICAL INSTRUMENTS INDICATE SOCAMD TMRA LASARY } ON CONTACT

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8.30.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan	TIE	TO
Sample No.	Matrix *	Sample Date	Sample Time							
B12ML6	SOIL	8/27/01	0430	X	X		X		B12MK3	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DG WATSON/[signature]	08/27/01 0745	REF. 1B	08/27/01 0745
Ref 1B 3728	8.30.01 0430	R. Thoren	8.30.01 0430
R. Thoren	8.30.01 0500	FED EX	
FED EX			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D~~
~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

10/5/01 [initials]

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

LABORATORY SECTION	Received By: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-252	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.R. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC-01-0216	Field Logbook No.: EL-1518-1 — COA B20TW2A44C ~~B20TW2074C~~ JT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: A010288 8/28/01	Bill of Lading/Air Bill No.: 4235795 4 6965	

POSSIBLE SAMPLE HAZARDS/REMARKS: Radiological. Field Instruments Reading background

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
SAMPLE ANALYSIS	See Item (1) in Special Instructions	Mercury - 7470 - (CV)	Cesium 137 Hot - 7[illegible]	See Item (2) in Special Instructions	VOA - 8260A (TCL)	See Item (3) in Special Instructions	See Item (4) in Special Instructions	Activity Scan		
Sample No.	Matrix*	Sample Date	Sample Time							
B12ML7	SOIL	08/28/01	0100	X	X		X			B12MK4

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thompson / Ray Turner	8/28/01 0800	RA 12 3728	8/28/01 0800
Ref 12 3728	8/30/01 0800	R. Thorp	8-30-01 0800
R. Thorp	8/30/01 0830	FED EX	
FED EX			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA - 8270A (Add-On) (Tributyl-phosphate); TPH-Diesel Range - WTPH-D
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90; Total Sr; Technetium-99; Total Uranium; Tritium; H3; Isotopic Uranium

Samples stored in Ref.# 12 at the 3728 Shipping Facility on 8/28/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8-30-01

Matrix*: SO=Soil, SD=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, P=Paper, Wp=Wipe, L=Liquid, Vg=Vegetation, X=Other

LABORATORY SECTION	Received By: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

TRENT SERVICES

Lot No.: FIH310250

Condition Upon Receipt Form
St. Louis Laboratory

Client: Hanford

Date: 083101 Time: 0920

Quote No: 43018

Initiated by: JL

Shipper/No: 4476546152 Fed Ex

COC/RFA Numbers: B01-058-249 -250 -251

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	Y N	Sample received in undamaged condition.	5.	Y N	Sample volume sufficient for analysis.
2.	Y N	Sample received within 4°C ± 2°C*	6.	Y N	Sample received with Chain of Custody.
		Record temperature: 18°	7.	Y N	Chain of Custody matches sample IDs on containers.
3.	Y N N/A	Sample received with proper pH**.	8.	Y N	Custody seal received intact and tamper evident on cooler.
4.	Y N	Sample received in proper containers.	9.	Y N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Tinet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes:

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: Jill Clark Date: 083101

Project Management Review: Michael Date: 9.4.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

SL-ADMIN-0004, Revised 5/24/01
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TRENT SERVICES

Lot No.: F1H290206
W03587

Condition Upon Receipt Form
St. Louis Laboratory

Client: Flour Hanford
Quote No: 43018
Shipper/No: FedX 4476 5461 26

Date: 8.29.01 Time: 0850
Initiated by: SJ
COC/RFA Numbers: BD1-058-206, 166, 238

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	(Y) N	Sample received in undamaged condition.	5.	(Y) N	Sample volume sufficient for analysis.
2.	Y (N)	Sample received within 4°C ± 2°C*	6.	(Y) N	Sample received with Chain of Custody.
		Record temperature: 17	7.	(Y) N	Chain of Custody matches sample IDs on containers.
3.	Y N	Sample received with proper pH**. Soil N/A	8.	(Y) N	Custody seal received intact and tamper evident on cooler.
4.	(Y) N	Sample received in proper containers.	9.	Y (N)	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes: Blue ice melted - not enough to cool samples. All jars contaminated on outside with radioactive soil granules. We used Control solution to clean the outside of the jars. All jars were swiped as well as the inside of the cooler. After swiping found no contamination.
Also, shipping container is expired and should not be used. Mfg. date is 1998

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: [signature] Date: 8.29.01

Project Management Review: Mullard Date: 8.29.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200 TW 1+2			DATA PACKAGE: W03587		
VALIDATOR: TCL		LAB: STL		DATE: 2/10/02	
CASE:			SDG: W03587		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	TCLP 6010B	
SAMPLES/MATRIX					
B12C89-B B12DC1-A B12ML6-A B12ML7					
B12ML5-A B12ML4					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

ICP interference checks acceptable? ..... Yes No N/A

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: TCLP lead J all blank cont

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

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

Comments: NO MS/MSD = J (all but DCI) C89 C

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: Chromium 51% – J only
manganese 200% DCI ~~No MS/MSD all had~~
Bismuth 200 U-ok ~~DCI – J allowed~~

~~No MS/MSD 6, 7 4 + 5~~

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

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

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

Transcription/calculation errors? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

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

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

MSA performed as required? ..... Yes No N/A

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

Transcription/calculation errors? ..... Yes No N/A

Comments:

8. HOLDING TIMES (all levels)

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

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

Comments:

all but ML7 extra 17° or 18° F

J all but ML7

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F1H290206 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F1I040000-187 Prep Batch #...: 1247187						
Aluminum	3.2 B	20.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AC
		Dilution Factor: 1				
Cadmium	ND	0.50	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AE
		Dilution Factor: 1				
Cadmium	ND	0.50	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AV
		Dilution Factor: 1				
Calcium	127 B	500	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AD
		Dilution Factor: 1				
Chromium	ND	1.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AF
		Dilution Factor: 1				
Chromium	ND	1.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AW
		Dilution Factor: 1				
Copper	ND	2.5	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AG
		Dilution Factor: 1				
Copper	ND	2.5	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AX
		Dilution Factor: 1				
Iron	14.2	10.0	mg/kg	SW846 6010B	09/04-09/14/01	EJ09D1AH
		Dilution Factor: 1				
Lead	0.21 B	0.30	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AN
		Dilution Factor: 1				
Lead	ND	10.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1A0
		Dilution Factor: 1				
Magnesium	ND	500	mg/kg	SW846 6010B	09/04-09/14/01	EJ09D1AJ
		Dilution Factor: 1				
Manganese	0.15 B	1.5	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AK
		Dilution Factor: 1				
Molybdenum	ND	4.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AL
		Dilution Factor: 1				
Nickel	ND	4.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AM
		Dilution Factor: 1				

(Continued on next page)

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F1H290206 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Nickel	ND	4.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1A1
		Dilution Factor: 1				
Silver	ND	1.0	mg/kg	SW846 6010B	09/04-09/14/01	EJ09D1AA
		Dilution Factor: 1				
Silver	ND	1.0	mg/kg	SW846 6010B	09/04-09/14/01	EJ09D1A2
		Dilution Factor: 1				
Vanadium	ND	5.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AP
		Dilution Factor: 1				
Zinc	5.2	2.0	mg/kg	SW846 6010B	09/04-09/07/01	EJ09D1AQ
		Dilution Factor: 1				
Potassium	ND	500	mg/kg	SW846 6010B	09/04-09/14/01	EJ09D1AT
		Dilution Factor: 1				
Sodium	ND	500	mg/kg	SW846 6010B	09/04-09/14/01	EJ09D1AU
		Dilution Factor: 1				

MB Lot-Sample #: F1I050000-153 Prep Batch #...: 1248153

Mercury	ND	0.10	mg/kg	SW846 Hg Mod 7470	09/05/01	EJ2GF1AA
		Dilution Factor: 1				

MB Lot-Sample #: F1I250000-526 Prep Batch #...: 1268526

Bismuth	ND	20.0	mg/kg	SW846 6010B	09/25-10/01/01	EK3NA1AA
		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 #...: F1H310250 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F1I050000-153 Prep Batch #...: 1248153						
Mercury	ND	0.10	mg/kg	SW846 Hg Mod 7470	09/05/01	EJ2GF1AA
		Dilution Factor: 1				
MB Lot-Sample #: F1I110000-213 Prep Batch #...: 1254213						
Cadmium	ND	0.50	mg/kg	SW846 6010B	09/11-09/20/01	EKAR31AA
		Dilution Factor: 1				
Chromium	ND	1.0	mg/kg	SW846 6010B	09/11-09/20/01	EKAR31AC
		Dilution Factor: 1				
Copper	ND	2.5	mg/kg	SW846 6010B	09/11-09/20/01	EKAR31AD
		Dilution Factor: 1				
Lead	ND	10.0	mg/kg	SW846 6010B	09/11-09/20/01	EKAR31AE
		Dilution Factor: 1				
Nickel	ND	4.0	mg/kg	SW846 6010B	09/11-09/20/01	EKAR31AF
		Dilution Factor: 1				
Silver	ND	1.0	mg/kg	SW846 6010B	09/11-09/20/01	EKAR31AG
		Dilution Factor: 1				

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F1H290206 **Matrix.....:** SOLID
Date Sampled...: 08/24/01 **Date Received..:** 08/29/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F1H290206-001 Prep Batch #...: 1247187									
Aluminum									
	9630	222	11100 N	mg/kg	651		SW846 6010B	09/04-09/07/01	EJQX81CN
	9630	222	11400 N	mg/kg	784	2.6	SW846 6010B	09/04-09/07/01	EJQX81CP
			Dilution Factor: 1						
Cadmium									
	ND	5.56	3.55 N	mg/kg	64		SW846 6010B	09/04-09/07/01	EJQX81CV
	ND	5.56	3.52 N	mg/kg	63	0.88	SW846 6010B	09/04-09/07/01	EJQX81CW
			Dilution Factor: 1						
Calcium									
	11900	5560	17000	mg/kg	93		SW846 6010B	09/04-09/07/01	EJQX81CR
	11900	5560	15000 N	mg/kg	57	12	SW846 6010B	09/04-09/07/01	EJQX81CT
			Dilution Factor: 1						
Chromium									
	73.2	22.2	158 N	mg/kg	383		SW846 6010B	09/04-09/07/01	EJQX81C0
	73.2	22.2	93.6 *	mg/kg	92	51	SW846 6010B	09/04-09/07/01	EJQX81C1
			Dilution Factor: 1						
Copper									
	20.5	27.8	45.4	mg/kg	89		SW846 6010B	09/04-09/07/01	EJQX81C3
	20.5	27.8	49.5	mg/kg	104	8.8	SW846 6010B	09/04-09/07/01	EJQX81C4
			Dilution Factor: 1						
Iron									
	34900	111	34500 N	mg/kg	0.0		SW846 6010B	09/04-09/14/01	EJQX81C6
	34900	111	34000 N	mg/kg	0.0	0.0	SW846 6010B	09/04-09/14/01	EJQX81C7
			Dilution Factor: 1						
Lead									
	308	55.6	307 N	mg/kg	0.0		SW846 6010B	09/04-09/07/01	EJQX81DN
	308	55.6	273 N	mg/kg	0.0	0.0	SW846 6010B	09/04-09/07/01	EJQX81DP
			Dilution Factor: 1						
Magnesium									
	6460	5560	16300 N	mg/kg	178		SW846 6010B	09/04-09/14/01	EJQX81C9
	6460	5560	15500 N	mg/kg	162	5.5	SW846 6010B	09/04-09/14/01	EJQX81DA
			Dilution Factor: 1						

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F1H290206 **Matrix.....:** SOLID
Date Sampled...: 08/24/01 **Date Received..:** 08/29/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese									
	1650	55.6	1750 N	mg/kg	187		SW846 6010B	09/04-09/07/01	EJQX81DD
	1650	55.6	1420 N,*	mg/kg	0.0	200	SW846 6010B	09/04-09/07/01	EJQX81DE
			Dilution Factor: 1						
Molybdenum									
	ND	111	105	mg/kg	95		SW846 6010B	09/04-09/07/01	EJQX81DG
	ND	111	103	mg/kg	92	2.6	SW846 6010B	09/04-09/07/01	EJQX81DH
			Dilution Factor: 1						
Nickel									
	66.6	55.6	140 N	mg/kg	132		SW846 6010B	09/04-09/07/01	EJQX81DK
	66.6	55.6	113 *	mg/kg	84	21	SW846 6010B	09/04-09/07/01	EJQX81DL
			Dilution Factor: 1						
Silver									
	1.9	5.56	8.19	mg/kg	114		SW846 6010B	09/04-09/14/01	EJQX81CK
	1.9	5.56	7.56	mg/kg	103	8.0	SW846 6010B	09/04-09/14/01	EJQX81CL
			Dilution Factor: 1						
Vanadium									
	88.4	55.6	147	mg/kg	105		SW846 6010B	09/04-09/07/01	EJQX81DR
	88.4	55.6	145	mg/kg	102	0.93	SW846 6010B	09/04-09/07/01	EJQX81DT
			Dilution Factor: 1						
Zinc									
	127	55.6	175	mg/kg	87		SW846 6010B	09/04-09/07/01	EJQX81DV
	127	55.6	153 N	mg/kg	48	13	SW846 6010B	09/04-09/07/01	EJQX81DW
			Dilution Factor: 1						
Potassium									
	1900	5560	7300	mg/kg	97		SW846 6010B	09/04-09/14/01	EJQX81D3
	1900	5560	6890	mg/kg	90	5.8	SW846 6010B	09/04-09/14/01	EJQX81D4
			Dilution Factor: 1						
Sodium									
	1310	5560	7000	mg/kg	102		SW846 6010B	09/04-09/14/01	EJQX81D6
	1310	5560	7190	mg/kg	106	2.8	SW846 6010B	09/04-09/14/01	EJQX81D7
			Dilution Factor: 1						

MS Lot-Sample #: F1H290206-001 **Prep Batch #...:** 1248153

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F1H290206 **Matrix.....:** SOLID
Date Sampled...: 08/24/01 **Date Received..:** 08/29/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Mercury									
	0.42	0.556	1.08	mg/kg	119		SW846 Hg Mod	09/05/01	EJQX81AO
	0.42	0.556	0.962	mg/kg	97	12	SW846 Hg Mod	09/05/01	EJQX81A1

Dilution Factor: 1

MS Lot-Sample #: F1H290206-001 **Prep Batch #...:** 1268526

Bismuth									
	3300	222	3680 N	mg/kg	168		SW846 6010B	09/25-10/01/01	EJQX81EQ
	3300	222	3180 N,*	mg/kg	0.0	200	SW846 6010B	09/25-10/01/01	EJQX81ER

Dilution Factor: 1

NOTE(S):

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

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

St. Louis

METHOD BLANK REPORT

TCLP Metals

Client Lot #...: F2B160152 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F2B190000-315		Prep Batch #...: 2051346				
Leach Date.....: 02/19/02		Leach Batch #..: P205011				
Chromium	ND	250	ug/L	SW846 6010B	02/20-02/21/02	EVA361AF
		Dilution Factor: 2.5				
Lead	27.0 B	250	ug/L	SW846 6010B	02/20-02/21/02	EVA361AG
		Dilution Factor: 2.5				

NOTE(S):

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

B Estimated result. Result is less than RL.

St. Louis

LABORATORY CONTROL SAMPLE DATA REPORT

TCLP Metals

Client Lot #...: F2B160152 Matrix.....: SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F2B200000-346 Prep Batch #...: 2051346							
Chromium	2500	2430	ug/L	97	SW846 6010B	02/20-02/21/02	EVDHT1AE
			Dilution Factor: 2.5				
Lead	2500	2540	ug/L	102	SW846 6010B	02/20-02/21/02	EVDHT1AF
			Dilution Factor: 2.5				

NOTE(S):

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

St. Louis

MATRIX SPIKE SAMPLE DATA REPORT

TCLP Metals

Client Lot #...: F2B160152 **Matrix.....:** SOLID
Date Sampled...: 02/14/02 **Date Received..:** 02/15/02

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F2B180140-001 **Prep Batch #...:** 2051346									
Leach Date.....: 02/19/02 **Leach Batch #..:** P205011									
Chromium									
	1.3	12500	11200	ug/L	90		SW846 6010B	02/20-02/21/02	ET9NA1AV
	1.3	12500	11400	ug/L	91	1.7	SW846 6010B	02/20-02/21/02	ET9NA1AW
			Dilution Factor: 2.5						
Lead									
	29.9	12500	11900	ug/L	95		SW846 6010B	02/20-02/21/02	ET9NA1AX
	29.9	12500	12100	ug/L	97	1.8	SW846 6010B	02/20-02/21/02	ET9NA1A0
			Dilution Factor: 2.5						

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F1H310250 **Matrix.....:** SOLID
Date Sampled...: 08/28/01 **Date Received..:** 08/31/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F1H310250-001 **Prep Batch #...:** 1254213									
Cadmium									
	ND	5.75	4.71	mg/kg	82		SW846 6010B	09/11-09/20/01	EJXPC1AX
	ND	5.75	4.61	mg/kg	80	2.2	SW846 6010B	09/11-09/20/01	EJXPC1A0
			Dilution Factor: 1						
Chromium									
	9.3	23.0	30.6	mg/kg	93		SW846 6010B	09/11-09/20/01	EJXPC1A1
	9.3	23.0	36.4	mg/kg	118	18	SW846 6010B	09/11-09/20/01	EJXPC1A2
			Dilution Factor: 1						
Copper									
	11.1	28.7	39.5	mg/kg	99		SW846 6010B	09/11-09/20/01	EJXPC1A3
	11.1	28.7	43.2	mg/kg	111	8.9	SW846 6010B	09/11-09/20/01	EJXPC1A4
			Dilution Factor: 1						
Lead									
	ND	57.5	55.2	mg/kg	96		SW846 6010B	09/11-09/20/01	EJXPC1A5
	ND	57.5	54.2	mg/kg	94	1.6	SW846 6010B	09/11-09/20/01	EJXPC1A6
			Dilution Factor: 1						
Nickel									
	10.1	57.5	61.0	mg/kg	89		SW846 6010B	09/11-09/20/01	EJXPC1A7
	10.1	57.5	77.7 *	mg/kg	118	24	SW846 6010B	09/11-09/20/01	EJXPC1A8
			Dilution Factor: 1						
Silver									
	ND	5.75	5.00	mg/kg	87		SW846 6010B	09/11-09/20/01	EJXPC1A9
	ND	5.75	4.99	mg/kg	87	0.13	SW846 6010B	09/11-09/20/01	EJXPC1CA
			Dilution Factor: 1						

NOTE(S):

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

Results and reporting limits have been adjusted for dry weight.

* Relative percent difference (RPD) is outside stated control limits.

Date: 12 March 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-TW-1&2 - Soil Sampling
Subject: Radiochemistry/Chromium VI - Data Package No. W03587-ST (SDG No. W03587)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W03587-ST prepared by Severn Trent Services (ST). 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
B12C89-B	8/23/01	Soil	C	See note 1
B12DC1-A	8/24/01	Soil	C	See note 1
B12ML5-A	8/27/01	Soil	C	Analysis cancelled
B12ML6-A	8/27/01	Soil	C	See note 1
B12ML7	8/28/01	Soil	C	See note 1 & 2

1-Hexavalent chromium.
2-Tritium; carbon-14; nickel-63; total strontium; americium-241; technetium-99; isotopic uranium, plutonium and thorium; neptunium-237; gamma spectroscopy; total uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the *200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan*, DOE/RL-2000-38, Rev. 0, February 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **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 and hexavalent chromium is 30 days.

All holding times were acceptable.

- **Method Blanks**

Radiochemistry

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 minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All radiochemistry blank results were acceptable.

Chromium VI (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 target required quantitation limit (TRQL), 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 TRQL, 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.

All chromium VI blank results were acceptable.

- **Accuracy**

Radiochemistry

Accuracy is evaluated from laboratory control sample (LCS) or samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS and matrix spike (MS) recovery range is 70-130%. 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, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30%, tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to an LCS and matrix spike recovery of 69%, the technetium-99 result in sample B12ML7 was qualifed as an estimate and flagged "J".

Due to the lack of a matrix spike analysis, all tritium and carbon-14 results in sample B12ML7 were qualified as estimates and flagged 'J'.

All other accuracy results were acceptable.

Chromium VI

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 70-130%. Samples with a spike recovery of less than 25% and a sample result below the instrument detection limit (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.

Due to an LCS recovery of 145%, the chromium VI result in samples B12DC1-A and B12C89-B were qualified as estimates and flagged "J".

Due to the lack of a matrix spike analysis, the chromium VI results in samples B12C89-B and B12DC1-A were qualified as estimates and flagged "J".

All other chromium VI blank results were acceptable.

- **Laboratory Duplicates**

Radiochemistry

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

All radiochemistry duplicate results were acceptable.

Chromium VI

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 35% for soil samples. If RPD values are out of specification and the sample concentration is greater than five times the TRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the TRQL and the sample concentration is less than five times the TRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for laboratory duplicates are an RPD less than 35% for positive sample results greater than five times the TRQL or plus or minus 2 times the TRQL for positive sample results less than five times the TRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All chromium VI blank results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against 200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan, DOE/RL-2000-38, Rev. 0, February 2001 TRQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory MDAs were at or below the analyte-specific TRQL.

- **Completeness**

  Data package No. W03587-ST was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an LCS recovery of 145%, the chromium VI result in samples B12DC1-A and B12C89-B were qualified as estimates and flagged "J". Due to an LCS and matrix spike recovery of 69%, the technetium-99 result in sample B12ML7 was qualifed as an estimate and flagged "J". Due to the lack of a matrix spike analysis, all tritium and carbon-14 results in sample B12ML7 were qualified as estimates and flagged 'J'. Due to the lack of a matrix spike analysis, the chromium VI results in samples B12C89-B and B12DC1-A 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-2000-38, Rev. 0, *200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan*, February 2001.

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 minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W03587	REVIEWER: TLI	DATE: 3/12/02	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ChromiumVI	J	B12DC1-A B12C89-B	LCS recovery
Technetium-99	J	B12ML7	LCS & MS recovery
Tritium Carbon-14	J	B12ML7	No matrix spike analysis
Chromium VI	J	B12DC1-A B12C89-B	No matrix spike analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD															
Laboratory: Severn Trent Services															
Case	SDG: W03597														
Sample Number		B12C89-B		B12DC1-A		B12ML6-A		B12ML7							
Sample Date		08/23/01		08/24/01		08/27/01		08/28/01							
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	NA		NA		NA		1.68	UJ						
Carbon-14	50	NA		NA		NA		-0.0247	UJ						
Nickel-63	30	NA		NA		NA		-0.129	U						
Total Strontium	1	NA		NA		NA		39.5							
Americium-241	1	NA		NA		NA		0.0764							
Technetium-99	15	NA		NA		NA		-0.441	UJ						
Thorium-228		NA		NA		NA		0.693							
Thorium-230		NA		NA		NA		0.516							
Thorium-232	1	NA		NA		NA		0.562							
Total Uranium (ug/g)	1	NA		NA		NA		2.02							
Uranium-234	1	NA		NA		NA		0.884							
Uranium-235	1	NA		NA		NA		0.0698							
Uranium-238	1	NA		NA		NA		0.789							
Neptunium-237	1	NA		NA		NA		0	U						
Plutonium-238	1	NA		NA		NA		-0.000403	U						
Plutonium-239/240	1	NA		NA		NA		0.451							
Cobalt 60	0.05	NA		NA		NA		0.0111	U						
Cesium 137	0.1	NA		NA		NA		5.06							
Radium-226	0.1	NA		NA		NA		0.575							
Radium-228	0.2	NA		NA		NA		0.971							
Europium 152	0.1	NA		NA		NA		0.0224	U						
Europium 154	0.1	NA		NA		NA		0.0177	U						
Europium 155	0.1	NA		NA		NA		-0.0425	U						
Hexavalent Chromium*	0.5	15.1	J	17.8	J	0.08	U	0.08	U						

NA = Not analyzed

* - units mg/kg

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

FORM I

SAMPLE RESULTS

Date: 02-Jan-02

Lab Name:	STL Richland	**SDG:**	W03587	**Collection Date:**	8/23/01 1:30:00 PM
Lot-Sample No.:	J1I100167-	**Report No. :**	18500	**Received Date:**	9/10/01 12:30:00 PM
Client Sample ID:	B12C89-B Dayes 1/7/02	**COC No. :**	B01-058-206	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch N

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1267165	Work Order:			Report DB ID: 9EJ95M20								
HEXCHROME	1.51E+01	J		0.0E+00	8.00E-02	mg/kg	N/A	*(188.7)*	9/27/01		3.0	EPA7196
							3.00E-02	*N/A*			G	

Number of Results: 1

Comments:

2/14/02

000021

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM I

Date: 02-Jan-02

SAMPLE RESULTS

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/24/01 2:00:00 PM
Lot-Sample No.:	J1I100167-	Report No. :	18500	Received Date:	9/10/01 12:30:00 PM
Client Sample ID:	B12DC1-A Daynes 1/7/02	COC No. :	B01-058-206	Matrix:	SOIL

Ordered by Client Sample ID, Batch N

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1267165	Work Order:			Report DB ID: 9EJ95K20								
HEXCHROME	1.78E+01	J		0.0E+00	8.00E-02	mg/kg	N/A	(222.)	9/27/01		2.8	EPA7196
							3.00E-02	N/A			G	

Number of Results: 1

Comments:

000022

2/16/02

0014

STL Richland

rptSTLRchSample V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM I

SAMPLE RESULTS

Date: 02-Jan-02

Lab Name:	STL Richland	**SDG:**	W03587	**Collection Date:**	8/27/01 4:30:00 AM
Lot-Sample No.:	J1H300271-	**Report No. :**	18500	**Received Date:**	8/30/01 12:10:00 PM
Client Sample ID:	B12ML6-A Dayres 1/7/02	**COC No. :**	B01-058-251	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch N

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1247459	Work Order: EJT9N1AA			Report DB ID: 9EJT9N10								
HEXCHROME	8.00E-02	U		0.0E+00	8.00E-02	mg/kg	N/A	(1.)	9/9/01		2.835	EPA7196
							3.00E-02	N/A			G	

Number of Results: 1

Comments:

000013

2/14/02

0015

STL Richland
rptSTLRchSample V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 02-Jan-02

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/28/01
Lot-Sample No.:	J1H300187-	Report No. :	18500	Received Date:	8/30/01 8:55:00 AM
Client Sample ID:	B12ML7	COC No. :	B01-058-252	Matrix:	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1242487	Work Order: EJTF11AA			Report DB ID: 9EJTF110								
HEXCHROME	8.00E-02	U		0.0E+00	8.00E-02	mg/kg	N/A	(1.)	9/9/01		2.59	EPA7196
							3.00E-02	N/A			G	
Batch: 1263498	Work Order: EJTF11AF			Report DB ID: 9EJTF110								
PU-238	-4.03E-04	U	8.1E-04	8.1E-04	2.03E-02	pCi/g	61.19%	-0.02	12/22/01 12:01 p		2.02	RICHRC5010
						3.31E-03	1.00E+00	-1.			G	ALP17
PU239/40	4.51E-01		9.5E-02	1.2E-01	2.29E-02	pCi/g	61.19%	(19.7)	12/22/01 12:01 p		2.02	RICHRC5010
						4.67E-03	1.00E+00	(7.5)			G	ALP17
Batch: 1263500	Work Order: EJTF11AG			Report DB ID: 9EJTF110								
AM-241	7.64E-02		3.7E-02	4.0E-02	2.07E-02	pCi/g	84.68%	(3.7)	12/27/01 12:55 p		2.02	RICHRC5080
						4.22E-03	1.00E+00	(3.8)			G	ALP17
Batch: 1263506	Work Order: EJTF11AC			Report DB ID: 9EJTF110								
U-234	8.84E-01		2.1E-01	2.7E-01	4.81E-02	pCi/g	49.51%	(18.4)	12/19/01 08:38 p		1.01	RICHRC5079
						7.87E-03	1.00E+00	(6.5)			G	ALP9
U-235	6.98E-02		5.9E-02	6.0E-02	5.46E-02	pCi/g	49.51%	(1.3)	12/19/01 08:38 p		1.01	RICHRC5079
						1.11E-02	1.00E+00	(2.3)			G	ALP9
U-238	7.89E-01		1.9E-01	2.5E-01	3.24E-02	pCi/g	49.51%	(24.4)	12/19/01 08:38 p		1.01	RICHRC5079
							1.00E+00	(6.3)			G	ALP9
								Ratio U-234/238 = 1.1				
Batch: 1263508	Work Order: EJTF11AK			Report DB ID: 9EJTF110								
TOTAL-URANIUM	2.02E+00		0.0E+00	3.3E-01	9.78E-06	ug/g		(206451.6)	12/11/01 05:29 p	1.0	1.0	RICHRC5015
						3.46E-06	1.00E+00	(12.4)		ML	ML	LIP3

STL Richland

rptSTLRchSample V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

2/14/02

FORM I

SAMPLE RESULTS

Date: 02-Jan-02

Lab Name:	STL Richland	**SDG:**	W03587	**Collection Date:**	8/28/01
Lot-Sample No.:	J1H300187-	**Report No. :**	18500	**Received Date:**	8/30/01 8:55:00 AM
Client Sample ID:	B12ML7	**COC No. :**	B01-058-252	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch N

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1263510	**Work Order: EJTF11AJ**			**Report DB ID: 9EJTF110**								
TH-228	6.93E-01		1.4E-01	1.7E-01	6.18E-02	pCi/g	82.20%	*(11.2)*	12/19/01 10:21 a		2.02	RICHRC5011
						2.12E-02	1.00E+00	*(8.)*			G	ALP117
TH-230	5.16E-01		1.1E-01	1.4E-01	2.92E-02	pCi/g	82.20%	*(17.7)*	12/19/01 10:21 a		2.02	RICHRC5011
						5.94E-03	1.00E+00	*(7.6)*			G	ALP117
TH-232	5.62E-01		1.2E-01	1.4E-01	1.73E-02	pCi/g	82.20%	*(32.5)*	12/19/01 10:21 a		2.02	RICHRC5011
							1.00E+00	*(7.8)*			G	ALP117
Batch: 1263511	**Work Order: EJTF11AP**			**Report DB ID: 9EJTF110**								
C-14	-2.47E-02	U J	3.2E-01	5.0E-01	7.84E-01	pCi/g	100.00%	*-0.03*	11/7/01 10:18 p		2.017	C14_LSC
						3.75E-01	5.00E+01	*-0.1*			G	LSC3
Batch: 1263512	**Work Order: EJTF11AE**			**Report DB ID: 9EJTF110**								
NI-63	-1.29E-01	U	2.8E+00	4.4E+00	6.87E+00	pCi/g	84.65%	*-0.02*	12/11/01 07:31 p		0.25	NI63LSC
						3.33E+00	3.00E+01	*-0.06*			G	LSC6
Batch: 1263515	**Work Order: EJTF11AL**			**Report DB ID: 9EJTF110**								
TC-99	-4.41E-01	U J	3.0E-01	5.0E-01	7.45E-01	pCi/g	100.00%	*-0.59*	11/12/01 02:06 p		2.0	RICHRC5078
						3.62E-01	1.50E+01	*-(1.8)*			G	LSC3
Batch: 1263519	**Work Order: EJTF11AM**			**Report DB ID: 9EJTF110**								
H-3	1.68E+00	U J	1.2E+00	1.9E+00	2.82E+00	pCi/g	100.00%	*0.6*	11/7/01 10:29 p		5.017	906.0_H3_LCS
						1.30E+00	4.00E+02	*(1.8)*			G	LSC4
Batch: 1263520	**Work Order: EJTF11AD**			**Report DB ID: 9EJTF110**								
STRONTIUM	3.95E+01		1.0E+00	1.1E+01	2.49E-01	pCi/g	50.60%	*(158.7)*	12/28/01 07:21 p		6.02	SRTOT_SEP_PRECIP
						1.16E-01	1.00E+00	*(7.5)*			G	GPC32A

STL Richland
rptSTLRchSample V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

2/11/02

000025

FORM I

SAMPLE RESULTS

Date: 02-Jan-02

Lab Name:	STL Richland	**SDG:**	W03587	**Collection Date:**	8/28/01
Lot-Sample No.:	J1H300187-	**Report No. :**	18500	**Received Date:**	8/30/01 8:55:00 AM
Client Sample ID:	B12ML7	**COC No. :**	B01-058-252	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1263522	Work Order: EJTF11AV			Report DB ID: 9EJTF110								
CO-60	1.11E-02	U	2.6E-02	2.6E-02	4.63E-02	pCi/g		*0.24*	11/19/01 01:11 p		56.7	RICHRC5017
							5.00E-02	*0.84*			g	GER5$1
CS-137	5.06E+00		6.1E-01	6.1E-01	3.89E-02	pCi/g		*(130.)*	11/19/01 01:11 p		56.7	RICHRC5017
							1.00E-01	*(16.7)*			g	GER5$1
EU-152	2.24E-02	U	7.5E-02	7.5E-02	1.15E-01	pCi/g		*0.19*	11/19/01 01:11 p		56.7	RICHRC5017
							1.00E-01	*0.59*			g	GER5$1
EU-154	1.77E-02	U	7.1E-02	7.1E-02	1.25E-01	pCi/g		*0.14*	11/19/01 01:11 p		56.7	RICHRC5017
							1.00E-01	*0.5*			g	GER5$1
EU-155	-4.25E-02	U	5.2E-02	5.2E-02	8.39E-02	pCi/g		*-0.51*	11/19/01 01:11 p		56.7	RICHRC5017
							1.00E-01	*-(1.6)*			g	GER5$1
RA-226	5.75E-01		1.0E-01	1.0E-01	7.13E-02	pCi/g		*(8.1)*	11/19/01 01:11 p		56.7	RICHRC5017
							1.00E-01	*(11.3)*			g	GER5$1
RA-228	9.71E-01		2.0E-01	2.0E-01	1.51E-01	pCi/g		*(6.4)*	11/19/01 01:11 p		56.7	RICHRC5017
							2.00E-01	*(9.6)*			g	GER5$1
Batch: 1263524	Work Order: EJTF11AQ			Report DB ID: 9EJTF110								
NP-237	0.00E+00	U	0.0E+00	1.4E-02	1.60E-02	pCi/g	68.90%	*0.*	12/14/01 10:24 a		2.02	D3XW
							1.00E+00	*0.*			G	ALP129

000026

Number of Results: 24

Comments:

JK 2/14/02

TL Richland
tSTLRchSample V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

URGENT
SERVICES

CERTIFICATE OF ANALYSIS

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

December 31, 2001

Attention: Joan Kessner

SAF Number	:	B01-058
Date SDG Closed	:	September 13, 2001
Number of Samples	:	Five (5)
Sample Type	:	Soil
SDG Number	:	W03587
Data Deliverable	:	45-Day / Summary

I. Introduction

On Between August 30 and September 10, 2001, five soil samples were received at STL Richland (STLR) for chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

STLR ID#	BHI ID#	MATRIX	DATE OF RECEIPT
EJTF1	B12ML7	SOIL	8/30/01
EJT8D	B12ML5-A	SOIL	8/30/01
EJT9N	B12ML6-A Daynes	SOIL	8/30/01
EJ95K	B12DC1-A 1/7/02	SOIL	9/10/01
EJ95M	B12C89-B	SOIL	9/10/01

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:

Alpha Spectroscopy
Americium-241 by method RICH-RC-5080
Neptunium-237 by method RICH-RC-5009
Plutonium-238, -239/40 by method RICH-RC-5010

Thorium-228, 230, 232 by method RICH-RC-5084
Uranium-234, -235, -238 by method RICH-RC-5079
Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017
Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Liquid Scintillation Counting
Carbon-14 by method RICH-RC-5022
Nickel-63 by method RICH-RC-5069
Technetium-99 by method RICH-RC-5078
Tritium by method RICH-RC-5007
Total Uranium
Total Uranium by method RICH-RC-5058
Chemical Analyses
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W03587 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

Alpha Spectroscopy

Americium-241 by method RICH-RC-5080:

The reagent LCS was accidentally spilled during preparation. The tracer yield is low (19.5%) however, the radiochemical recovery is acceptable. The matrix LCS tracer yield and radiochemical recovery is acceptable. Except as noted, the LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Neptunium-237 by method RICH-RC-5009:

The LCS was recounted to verify radiochemical recovery. The recount was acceptable. The LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Plutonium-238, -239/40 by method RICH-RC-5010:
The reagent LCS was accidentally spilled during preparation. The tracer yield is low (15.7%) however, the radiochemical recovery is acceptable. The matrix LCS tracer yield and radiochemical recovery is acceptable. Except as noted, the LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Thorium-228, 230, 232 by method RICH-RC-5084:
The LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Uranium-234, -235, -238 by method RICH-RC-5079:
The LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017:
The LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Gas Proportional Counting
Total Strontium by method RICH-RC-5006:
The LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Liquid Scintillation Counting
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, sample and sample duplicate (B12ML7) results are within contractual requirements.

Nickel-63 by method RICH-RC-5069:
The LCS, batch blank, sample, sample duplicate (B12ML7) and sample matrix spike (B12ML7) results are within contractual requirements.

Technetium-99 by method RICH-RC-5078:
The LCS, batch blank, sample, sample duplicate (B12ML7) and sample matrix spike (B12ML7) results are within contractual requirements.

Tritium by method RICH-RC-5007:
The LCS, batch blank, sample and sample duplicate (B12ML7) results are within contractual requirements.

Total Uranium
Total Uranium by method RICH-RC-5058:
The LCS, batch blank, sample, sample duplicate (B12ML7) and sample matrix spike (B12ML7) results are within contractual requirements.

Chemical Analyses
Chromium Hex by EPA method 7196:
The samples were prepared as three analytical batches. The sample and sample duplicate agreement was unacceptable for the analytical batch containing B12DC1 and B12C89. The batch was reanalyzed and accepted. The LCS, batch blank, samples, sample duplicate (B12ML7, B12ML6 and B12DC1) and sample matrix spike (B12ML7, B12ML6 and B12DC1) 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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-058-166 | Page 1 of 2

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (309) 372-9631	Project Coordinator: TRENT, BJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058
Ice Chest No.: VIKING Sn 08/98 050011	Field Logbook No.: EL-1518-1	COA: B20TW2 A4/4C ~~B20TW2 4C~~ BT 8/23/01	Method of Shipment: Fed EX
Shipped To: ~~TMA/RECRA~~ SENCRN TRENT	Offsite Property No.: RSR 106563		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiological Field Instrument Readings on bottles ranged from 1.5MRB/<.5MRY to 3.0MRB/1.3MRY. Possible (mercury) of this sample

[illegible] sample originally sent to [illegible] for on site analysis. [illegible] Page 2 of 2 represents custody transfer to [illegible]. The sample was picked up [illegible] and re[illegible] for off-site analysis. ~~A [illegible]~~ RTB-28-01 [illegible] appropriate off site custo[illegible] Page 1 of 2 represents custody transfer [illegible] directed analysis.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	sG	sG	sG	sG	sG	sG	sG
No. of Container(s)	1	1	1	1	1	1	1
Volume	60mL	60mL	40mL	120mL	250mL	250mL	250mL
	Chromium Hex - 7196	Mercury - 7470 - (CV)	VOA 8260A (TCL)	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time									
B12C89 BEJ95M	SOIL	8-23-01	0130	X	X		X	X				Tie to ~~B12C89A~~ B12MJ8
2 of 2 B												
Returning 1x100ml jar for Hercules 090501												

CHAIN OF POSSESSION	Date/Time	Sign/Print Name	Date/Time
Relinquished By: Greg Thomas/Greg Thomas	0815 8/23/01	Received By: Received on 200 TW1 & 2 site Trailer	0815 8/23/01
Relinquished By: 200 TW1 & 2 Trailer Site	0845 8-28-01	Received By: R. Thoren	0845 8-28-01
Relinquished By: R. Thoren	0900 8-28-01	Received By: FEDEX	
Relinquished By:		Received By: 82901	0850
Relinquished By: Jill Clarke	090501 1700	Received By: [illegible]	09/04/1 1230
Relinquished By:		Received By:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) [Cadmium, Chromium, Copper, Nickel, Silver]; ICP Metals - 6010A (Add-on) [Lead]
(2) IC Anions - 300.0 [Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate]; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) ~~Semi-VOA - 8270A (Add-On) [Tributyl phosphate]; TPH-Diesel Range - WTPH-D~~
(4) ~~Gamma Spectroscopy [Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155]; Gamma Spec - Add-on [Radium-226, Radium-228]; Isotopic Plutonium; Isotopic Thorium [Thorium-232]; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-90,00~~

Samples stored in Ref. [illegible] at the 3728 Shipping Facility on [illegible]. Collector not available to relinquish samples on [illegible] for shipment.

RT 8-28-01

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

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

HI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-206	Page 1 of 1
lector homas G./Watson D.	Company Contact Todd, M.E.	Telephone No. (509) 372-9631	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐
ject Designation 00-TW-1 & 2 - Soil Sampling	Sampling Location B-7A/200 E		SAF No. B01-058	Data Turnaround 45 Days
Chest No. King SN 08/98 050011	Field Logbook No. EL-1518-1	COA B20TW2A44K B00TW2074C	Method of Shipment Fed EX	
pping Container RT 8.28.01 ~~Secure Trust Incorporated RICHLAND ST LOUIS~~	Offsite Property No. PSP 106563 8/24/01		Bill of Lading/Air Bill No. N/A	

OSSIBLE SAMPLE HAZARDS/REMARKS
adiological Field Instruments Reading 35mrB
mrγ on bottles. Possible α

Samples stored in Ref.# 5 at the 3728 Shipping Facility on 8 28 01. Collector not available to relinquish samples on 8 28 01 RT 8-28-01 for shipment.

SD

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	P	aG		
No. of Container(s)	1	1	1	1	1	1	8	1		
Volume	60mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (1) in Special Instructions.	VOA - 8260A (GCL)	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		
W03587										
JI100167										

Sample No.	Matrix *	Sample Date	Sample Time	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (1) in Special Instructions.	VOA - 8260A (GCL)	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		
2DC1-A EJ95K	SOIL	8/24/01	0200		X					X	X	B12	MKO
Returning 4 60ml jars for Hexcr 9.090501													
Add on 2nd Chk													

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Greg Thomas/Greg Thomas	0600 8/24/01	Received By/Stored In: 200TW1&2 Site Trailer	0600 8/24/01
Relinquished By/Removed From: 200TW1&2 Site Trailer	0415 8.28.01	Received By/Stored In: R. Thorne	0415 8.28.01
Relinquished By/Removed From: R. Thorne	0450 8.28.01	Received By/Stored In: FEDEX	
Relinquished By/Removed From:		Received By/Stored In: Sue Miller	8.29.01 0852
Relinquished By/Removed From: Joe Clarke	090501 1700	Received By/Stored In: [illegible]	09/10/01 1230
Relinquished By/Removed From:		Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen-in Nitrate, Nitrogen-in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(2) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D
(3) ICP MS/HS - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=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

HI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-251	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.: VIKING S/N 08 98 05000	Field Logbook No.: EL-1518-1	COA: B20TW2-A4NC ~~B20TW2874C~~	Method of Shipment: Fed EX	Data Turnaround: 45 Days
Shipped To: Severn Trent Incorporated – RICHLAND	Offsite Property No.: RSR 10694 8/27/01		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS: FIELD RADIOLOGICAL INSTRUMENTS INDICATE 20CPM, 1MR/B, <0.5MRB ON CONTACT

Samples stored in Ref.# 1B at the
☐ 3728 Shipping Facility on 8/27/01
☐ Collector not available to relinquish
☐ samples on 8/30/01 for shipment. RT 8.30.01
COLLECTOR SIGN/DATE/SIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See Item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (2) in Special Instructions.	VOA - 8260A (TCL)	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		
Sample No.	Matrix *	Sample Date	Sample Time							
B12ML0 AEJT9N	SOIL	8/27/01	0430			X			X	X	B12MK3
Dayes 1/7/02										

CHAIN OF POSSESSION / Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DS WATSON	08/27/01 0745	REF. 1B	08/27/01 0745
Ref 1B 3728	8/30/01 0430	R.T. Thore	8/30/01 0430
R.T. Thore	8/30/01 0800	R.T. Thore	8/30/01
R.T. Thore	8/30/01 1210	Pat Kinchy	8-30-01 1210

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chlorides, Fluorides, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Cobalt-60; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium.

Cooling Req May not be met

Matrix *: D-Soil, SD-Sediment, SO-Solid, SL-Sludge, W-Water, O-Oil, A-Air, DS-Drum Solid, DL-Drum Liq, T-Tissue, Wp-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)

Q-27038 WO3587 JIH 300271 Due 9-20-01

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-058-250 | Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058
Ice Chest No.: Viking S/N 08 9805000	Field Logbook No.: EL-1518-1	COA: B20TW2044C ~~B20TW2694C~~ AT	Method of Shipment: Fed EX
Shipped To: Severn Trent Incorporated ~ RICHLAND	Offsite Property No.: RSR 106949 8/27/01		Bill of Lading/Air Bill No.: NA

Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD RADIOLOGICAL INSTRUMENTS INDICATE 100cPM, 20mR/h, <0.5mR/h } ON CONTACT

Samples stored in Ref.# TW1 & 2 at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8/30/01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See item (1) in Special Instructions.	Mercury - 7470 - (CV) 8/15/01	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions. 8/15/01	See item (4) in Special Instructions.	Activity Scan		

RT 8/30/01

Sample No.	Matrix *	Sample Date	Sample Time									Tie to
B12ML5-AEJT8D Dayes 1/7/02	SOIL	8/27/01	0115			X				X	X	B12MK2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
OS Watson [signature]	08/27/01 0645	REF TW1&2	08/27/01 0645
Ref TW1&2	8.30.01 0330	R. Thorne [signature]	8.30.01 0330
R. Thorne [signature]	8.30.01 0500	FEDEX	RT 8.30.01
R. Thorne [signature]	8.30.01 1210	Pam Kaufer [signature]	8-30-01 1210
		0.2000 mr/hr	

SPECIAL INSTRUCTIONS

~~(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)~~
~~(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045~~
~~(3) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~
~~(4) Gamma Spectroscopy (Gamma-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

Cooling Req May not be met

RT 8.30.01

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solid, DL=Drum Liquid, 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		B01-058-252	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.: SmL 1320	Field Logbook No.: EL-1518-1	COA: B2STW2A4K B20TW2G74G ST 8/28/01	Method of Shipment: ~~Fed Ex~~ HAND Delivery	Data Turnaround: 45 Days
Shipped To: Severn Trent Incorporated - RICHLAND	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radiological. Field Instruments Reading background

Samples stored in Ref.# B at the 3728 Shipping Facility on 8/28/01
Collector not available to relinquish samples on 8/30/01 for shipment.
RT 8/30/01

SDG W03587 JIH300187

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See Item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (2) in Special Instructions.	VOA - 8260A (TCL)	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time									
B12ML7 EJTF1	SOIL	08/28/01	0800			X				X	X	B12MK4

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	0800 8/28/01	RF 12	0800 8/28/01
R of 12 3728	0930 8:30 01	R R Rhore	0930 8.30.01
R R Rhore	0830 8:30 01	Greg Thomas/Greg Thomas	0830 8/30/01
Greg Thomas/Greg Thomas	0855 8/30/01	[illegible]	8/30/01 0855
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
(1) ICP-Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

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

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200 tw 1+2			DATA PACKAGE: W03587		
VALIDATOR: TLI		LAB: ST		DATE: 2/6/02	
CASE:			SDG: W03587		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium NLG3	CR VI		
SAMPLES/MATRIX					
B12C89-B	B12DC1-A	B12MLG-A	B12MC7		
B12MC5-A					
				Soil	

1. Completeness ..... ☒ N/A

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

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

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

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

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

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

Comments: _____

3. Continuing Calibration (Levels D, E) ..... ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

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

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

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

Comments: _____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

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

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A
Method blank results acceptable? ..... Yes No N/A
Analytes detected in method blank? ..... Yes No N/A
Field blank(s) analyzed? ..... Yes No N/A
Field blank results acceptable? ..... Yes No N/A
Analytes detected in field blank(s)? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: MLG-A ✓ DCIA ✓ 8+ ✓ 7 ✓

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A
LCS/BSS recoveries acceptable? ..... Yes No N/A
LCS/BSS traceable? (Levels D,E) ..... Yes No N/A
LCS/BSS expired? (Levels D,E) ..... Yes No N/A
LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: L7 ✓ L6 ✓

DCI C87 145% - J all detect
TC99 - 69% L7 - J

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... Yes No N/A
Chemical recovery acceptable? ..... Yes No N/A
Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

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

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

Comments:

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

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

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

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

Comments:

9. Matrix Spikes (Levels C, D, E) ..... ☐ N/A

Matrix spike analyzed? ..... Yes No N/A

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

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

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

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: No MS 3H ~~MS~~ J +C99 - 69.4820 J M7

No C14 - J

CRVI - 873 DC1-A - J cal - No MS

Appendix A – Radiochemical Data Validation Checklist

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: - RPD's reported ok
- analytes w/ RER's appear to be within QC limits

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

Field duplicate sample(s) analyzed? ..... Yes No N/A

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

Field split sample(s) analyzed? ..... Yes No N/A

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

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

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

Comments:

12. Holding Times (All levels)

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

Comments:

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A
Results supported in raw data?(Levels D, E) Yes No N/A
Results Acceptable? (Levels D, E) Yes No N/A
Transcription/Calculation errors? (Levels D, E) Yes No N/A
MDA's meet required detection limits? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments:

Appendix 6

Additional Documentation Requested by Client

FORM II

Date: 02-Jan-02

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/24/01 2:00:00 PM
Lot-Sample No.:	J1I100167-	Report No. :	18500	Received Date:	9/10/01 12:30:00 PM
Client Sample ID:	B12DC1-A DUP Daynes 01/7/02	COC No. :	B01-058-206	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1267165	Work Order:			Report DB ID: EJ95K1AH		Orig Sa DB ID: 9EJ95K20						
HEXCHROME	1.68E+01			0.0E+00	8.00E-02	mg/kg	N/A	(209.5)	9/27/01		2.8	EPA7196
	1.78E+01	RPD	0.1			3.00E-02		N/A			G	

Number of Results: 1

Comments:

000035

STL Richland

ptSTLRchDupV3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

Date: 02-Jan-02

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/27/01 4:30:00 AM
Lot-Sample No.:	J1H300271-	Report No. :	18500	Received Date:	8/30/01 12:10:00 PM
Client Sample ID:	B12ML6 DUP -A Daynes 1/7/02	COC No. :	B01-058-251	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1247459	Work Order: EJT9N1AE			Report DB ID: EJT9N1ER			Orig Sa DB ID: 9EJT9N10					
HEXCHROME	8.00E-02	U		0.0E+00	8.00E-02	mg/L	N/A	(1.)	9/9/01		2.835	EPA7196
	8.00E-02	RPD	0.0					N/A			G	

Number of Results: 1

Comments:

000036

TL Richland
xtSTLRchDupV3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/28/01
Lot-Sample No.:	J1H300187-	Report No. :	18500	Received Date:	8/30/01 8:55:00 AM
Client Sample ID:	B12ML7 DUP	COC No. :	B01-058-252	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1242487	Work Order:	EJTF11AT		Report DB ID:	EJTF11TR	Orig Sa DB ID:	9EJTF110					
HEXCHROME	8.00E-02	U		0.0E+00	8.00E-02	mg/kg	N/A	(1.)	9/9/01		2.591	EPA7196
	8.00E-02	RPD	0.0			3.00E-02		N/A			G	
atch: 1263498	Work Order:	EJTF11AW		Report DB ID:	EJTF11WR	Orig Sa DB ID:	9EJTF110					
PU-238	4.20E-03	U	1.0E-02	1.0E-02	2.29E-02	pCi/g	61.24%	0.18	12/22/01 12:01 p		2.03	RICHRC5010
	-4.03E-04	RER	0.9			1.00E+00		0.83			G	ALP37
PU239/40	5.33E-01		1.0E-01	1.4E-01	2.28E-02	pCi/g	61.24%	(23.4)	12/22/01 12:01 p		2.03	RICHRC5010
	4.51E-01	RER	0.9			1.00E+00		(7.9)			G	ALP37
											Alpha Spec Result Sum = 5.4E-01	
atch: 1263500	Work Order:	EJTF11AX		Report DB ID:	EJTF11XR	Orig Sa DB ID:	9EJTF110					
AM-241	1.72E-01		4.8E-02	5.6E-02	1.52E-02	pCi/g	93.98%	(11.3)	12/27/01 12:56 p		2.03	RICHRC5080
	7.64E-02	RER	2.8			1.00E+00		(6.2)			G	ALP38
											Alpha Spec Result Sum = 7.1E-01	
latch: 1263506	Work Order:	EJTF11A0		Report DB ID:	EJTF110R	Orig Sa DB ID:	9EJTF110					
U-234	9.17E-01		2.1E-01	2.8E-01	3.15E-02	pCi/g	53.09%	(29.2)	12/19/01 08:38 p		1.01	RICHRC5079
	8.84E-01	RER	0.2			1.00E+00		(6.6)			G	ALP10
U-235	2.32E-02	U	3.3E-02	3.3E-02	3.15E-02	pCi/g	53.09%	0.74	12/19/01 08:38 p		1.01	RICHRC5079
	6.98E-02	RER	1.4			1.00E+00		(1.4)			G	ALP10
U-238	6.14E-01		1.7E-01	2.1E-01	4.67E-02	pCi/g	53.09%	(13.1)	12/19/01 08:38 p		1.01	RICHRC5079
	7.89E-01	RER	1.1			1.00E+00		(5.9)			G	ALP10
								Ratio U-234/238 = 1.5		*Alpha Spec Result Sum = 2.3E+00*		
latch: 1263508	Work Order:	EJTF11A2		Report DB ID:	EJTF112R	Orig Sa DB ID:	9EJTF110					
TOTAL-URANIUM	2.18E+00		0.0E+00	3.5E-01	9.78E-06	ug/g		(223149.4)	12/11/01 05:40 p	1.05	1.05	RICHRC5015
	2.02E+00	RER	0.7			1.00E+00		(12.4)		ML	ML	LIP3
											Alpha Spec Result Sum = 2.3E+00	

TL Richland

otSTLRchDupV3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

000027

FORM II

Date: 02-Jan-02

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/28/01
Lot-Sample No.:	J1H300187-1	Report No. :	18500	Received Date:	8/30/01 8:55:00 AM
Client Sample ID:	B12ML7 DUP	COC No. :		Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263510	Work Order: EJTF11A3			Report DB ID: EJTF113R		Orig Sa DB ID: 9EJTF110						
TH-228	8.16E-01		1.6E-01	2.0E-01	6.21E-02	pCi/g	78.64%	(13.1)	12/19/01 10:22 a		2.03	RICHRC5011
	6.93E-01	RER	0.9			1.00E+00		(8.2)			G	ALP118
TH-230	5.32E-01		1.2E-01	1.4E-01	2.78E-02	pCi/g	78.64%	(19.1)	12/19/01 10:22 a		2.03	RICHRC5011
	5.16E-01	RER	0.2			1.00E+00		(7.4)			G	ALP118
TH-232	6.16E-01		1.3E-01	1.6E-01	1.87E-02	pCi/g	78.64%	(32.8)	12/19/01 10:22 a		2.03	RICHRC5011
	5.62E-01	RER	0.5			1.00E+00		(7.8)			G	ALP118
											Alpha Spec Result Sum = 2.0E+00	
atch: 1263511	Work Order: EJTF11A4			Report DB ID: EJTF114R		Orig Sa DB ID: 9EJTF110						
C-14	1.27E-01	U	3.3E-01	5.1E-01	7.84E-01	pCi/g	100.00%	0.16	11/7/01 11:00 p		2.014	C14_LSC
	-2.47E-02	RER	0.4			5.00E+01		0.5			G	LSC3
											Alpha Spec Result Sum = 2.0E+00	
atch: 1263512	Work Order: EJTF11A6			Report DB ID: EJTF116R		Orig Sa DB ID: 9EJTF110						
NI-63	-1.44E+00	U	2.3E+00	3.6E+00	5.73E+00	pCi/g	90.59%	-0.25	12/11/01 10:56 p		0.28	NI63LSC
	-1.29E-01	RER	0.5			3.00E+01		-0.79			G	LSC6
											Alpha Spec Result Sum = 2.0E+00	
atch: 1263515	Work Order: EJTF11A7			Report DB ID: EJTF117R		Orig Sa DB ID: 9EJTF110						
TC-99	-3.19E-01	U	3.0E-01	5.0E-01	7.48E-01	pCi/g	100.00%	-0.43	11/12/01 03:08 p		2.0	RICHRC5078
	-4.41E-01	RER	0.3			1.50E+01		-(1.3)			G	LSC3
											Alpha Spec Result Sum = 2.0E+00	
atch: 1263519	Work Order: EJTF11A9			Report DB ID: EJTF119R		Orig Sa DB ID: 9EJTF110						
H-3	3.43E-01	U	1.2E+00	1.7E+00	2.84E+00	pCi/g	100.00%	0.12	11/7/01 11:11 p		5.018	906.0_H3_LCS
	1.68E+00	RER	1.0			4.00E+02		0.39			G	LSC4
											Alpha Spec Result Sum = 2.0E+00	
atch: 1263520	Work Order: EJTF11CA			Report DB ID: EJTF11AR		Orig Sa DB ID: 9EJTF110						

000028

TL Richland
ptSTLRchDupV3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda[Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	W03587	Collection Date:	8/28/01
Lot-Sample No.:	J1H300187-1	Report No. :	18500	Received Date:	8/30/01 8:55:00 AM
Client Sample ID:	B12ML7 DUP	COC No. :		Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC/MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
STRONTIUM	3.86E+01		1.0E+00	1.0E+01	2.58E-01	pCi/g	47.20%	(149.6)	12/28/01 07:21 p		6.01	SRTOT_SEP_PRECI
	3.95E+01	RER	0.1			1.00E+00		(7.5)			G	GPC32B
atch: 1263522	Work Order: EJTF11CC			Report DB ID: EJTF11CR		Orig Sa DB ID: 9EJTF110						
CO-60	8.73E-03	U	2.9E-02	2.9E-02	5.06E-02	pCi/g		0.17	11/19/01 01:12 p		54.2	RICHRC5017
	1.11E-02	RER	0.1			5.00E-02		0.59			g	GER1$1
CS-137	5.97E+00		7.1E-01	7.1E-01	4.45E-02	pCi/g		(134.3)	11/19/01 01:12 p		54.2	RICHRC5017
	5.06E+00	RER	1.9			1.00E-01		(16.7)			g	GER1$1
EU-152	-8.90E-02	U	8.6E-02	8.6E-02	1.15E-01	pCi/g		-0.78	11/19/01 01:12 p		54.2	RICHRC5017
	2.24E-02	RER	2.0			1.00E-01		-(2.1)			g	GER1$1
EU-154	-1.17E-01	U	8.6E-02	8.6E-02	1.35E-01	pCi/g		-0.87	11/19/01 01:12 p		54.2	RICHRC5017
	1.77E-02	RER	2.4			1.00E-01		-(2.7)			g	GER1$1
EU-155	-1.94E-02	U	5.9E-02	5.9E-02	9.86E-02	pCi/g		-0.2	11/19/01 01:12 p		54.2	RICHRC5017
	-4.25E-02	RER	0.6			1.00E-01		-0.65			g	GER1$1
RA-226	5.86E-01		1.1E-01	1.1E-01	8.11E-02	pCi/g		(7.2)	11/19/01 01:12 p		54.2	RICHRC5017
	5.75E-01	RER	0.2			1.00E-01		(10.7)			g	GER1$1
RA-228	1.16E+00	U	2.3E-01	2.3E-01	2.54E-01	pCi/g		(4.5)	11/19/01 01:12 p		54.2	RICHRC5017
	9.71E-01	RER	1.2			2.00E-01		(9.8)			g	GER1$1
atch: 1263524	Work Order: EJTF11CD			Report DB ID: EJTF11DR		Orig Sa DB ID: 9EJTF110						
NP-237	0.00E+00	U	0.0E+00	1.3E-02	1.41E-02	pCi/g	80.61%	0.	12/14/01 10:25 a		2.01	D3XW
	0.00E+00	RER	0.0			1.00E+00		0.			G	ALP130

Number of Results: 24

Comments:

TL Richland
tSTL.RchDupV3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC/MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

BLANK RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1H300000- **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1242487	Work Order: EJVQ11AA			Report DB ID: EJVQ11AB								
HEXCHROME	2.00E-03			0.0E+00	2.00E-03	mg/L	N/A	1. N/A	9/9/01		100.0 ML	EPA7196

Number of Results: 1

Comments:

000040

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I040000-

Report No. : 18500

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
itch: 1247459	Work Order:	EJ1211AA		Report DB ID:	EJ1211AB							
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1. N/A	9/9/01		100.0 ML	EPA7196

Number of Results: 1

Comments:

000041

TL Richland

tSTLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-498 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1263498	Work Order:	EKTQX1AA		Report DB ID:	EKTQX1AX							
PU-238	-8.24E-04	U	1.2E-03	1.2E-03	2.35E-02	pCi/g	56.97%	-0.04	12/22/01 12:02 p		2.01	RICHRC5010
					4.79E-03	1.00E+00		-(1.4)			G	ALP38
PU239/40	-1.23E-03	U	1.4E-03	1.4E-03	2.56E-02	pCi/g	56.97%	-0.05	12/22/01 12:02 p		2.01	RICHRC5010
					5.86E-03	1.00E+00		-(1.7)			G	ALP38
tch: 1263498	Work Order:	EKTQX1AD		Report DB ID:	EKTQX1DB							
PU-238	-1.98E-03	U	2.8E-03	2.8E-03	5.64E-02	pCi/g	24.90%	-0.04	12/22/01 12:02 p		2.0	RICHRC5010
					1.15E-02	1.00E+00		-(1.4)			G	ALP41
PU239/40	2.07E-02	U	3.5E-02	3.5E-02	6.57E-02	pCi/g	24.90%	0.31	12/22/01 12:02 p		2.0	RICHRC5010
					1.62E-02	1.00E+00		(1.2)			G	ALP41

lumber of Results: 4

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-500 Report No.: 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1263500	Work Order: EKTQ71AA			Report DB ID: EKTQ71AX								
AM-241	3.67E-03	U	9.8E-03	9.8E-03	2.41E-02	pCi/g	78.75%	0.15	12/27/01 12:56 p		2.01	RICHRC5080
					5.52E-03	1.00E+00		0.75			G	ALP37
tch: 1263500	Work Order: EKTQ71AD			Report DB ID: EKTQ71DB								
AM-241	9.07E-03	U	1.8E-02	1.8E-02	2.46E-02	pCi/g	45.41%	0.37	12/27/01 12:58 p		2.0	RICHRC5080
						1.00E+00		1.			G	ALP47

lumber of Results: 2

Comments:

000043

L Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-506 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1263506	Work Order: EKTRG1AA			Report DB ID: EKTRG1AB								
U-234	2.30E-02	U	3.0E-02	3.0E-02	4.59E-02	pCi/g	76.74%	0.5	12/19/01 08:39 p		1.0	RICHRC5079
					1.13E-02	1.00E+00		(1.5)			G	ALP11
U-235	-6.87E-04	U	1.4E-03	1.4E-03	3.46E-02	pCi/g	76.74%	-0.02	12/19/01 08:39 p		1.0	RICHRC5079
					5.65E-03	1.00E+00		-1.			G	ALP11
U-238	7.90E-03	U	1.7E-02	1.7E-02	3.46E-02	pCi/g	76.74%	0.23	12/19/01 08:39 p		1.0	RICHRC5079
					5.65E-03	1.00E+00		0.91			G	ALP11

Ratio U-234/238 = 2.9

Number of Results: 3

Comments:

000044

L Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

BLANK RESULTS

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-508 Report No. : 18500 Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263508	Work Order:	EKTRM1AA		Report DB ID:	EKTRM1AB							
OTAL-URANIUM	1.22E-02		0.0E+00	2.9E-03	9.78E-06	ug/g		(1245.4)	12/11/01 05:44 p	1.0	1.0	RICHRC5015
					3.46E-06			(8.3)		ML	ML	LIP3

Number of Results: 1

Comments:

000035

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-510 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1263510	Work Order: EKTRX1AA			Report DB ID: EKTRX1AB								
TH-228	2.83E-02	U	3.0E-02	3.0E-02	3.75E-02	pCi/g	77.18%	0.75	12/19/01 10:22 a		2.0	RICHRC5011
					8.58E-03	1.00E+00		(1.9)			G	ALP119
TH-230	1.34E-02	U	1.9E-02	1.9E-02	1.81E-02	pCi/g	77.18%	0.74	12/19/01 10:22 a		2.0	RICHRC5011
						1.00E+00		(1.4)			G	ALP119
TH-232	0.00E+00	U	0.0E+00	1.6E-02	1.81E-02	pCi/g	77.18%	0.	12/19/01 10:22 a		2.0	RICHRC5011
						1.00E+00		0.			G	ALP119

lumber of Results: 3

:omments:

000046

L Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-511 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263511	Work Order:	EKTR51AE		Report DB ID:	EKTR51EB							
C-14	3.29E-01	U	3.4E-01	5.2E-01	7.89E-01	pCi/g	100.00%	0.42	11/7/01 08:53 p		2.0	C14_LSC
					3.78E-01	5.00E+01		(1.3)			G	LSC3

Number of Results: 1

Comments:

000027

L Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

BLANK RESULTS

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-512 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263512	Work Order:	EKTR61AA		Report DB ID:	EKTR61AB							
NI-63	-9.92E-01	U	2.6E+00	4.1E+00	6.46E+00	pCi/g	90.44%	-0.15	12/12/01 12:38 a		0.25	NI63LSC
					3.13E+00	3.00E+01		-0.48			G	LSC6

Number of Results: 1

Comments:

000078

0032

L Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

BLANK RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J11200000-515 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1263515	Work Order: EKTR71AA			Report DB ID: EKTR71AB								
TC-99	-2.50E-01	U	3.0E-01	5.1E-01	7.45E-01	pCi/g	100.00%	-0.34	11/12/01 05:12 p		2.0	RICHRC5078
					3.62E-01	1.50E+01		-0.99			G	LSC3

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-519 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263519	Work Order: EKTT21AE			Report DB ID: EKTT21EB								
H-3	2.59E-02	U	1.1E-01	1.7E-01	2.81E-01	pCi/g	100.00%	0.09	11/7/01 09:04 p		10.0	906.0_H3_LCS
					1.30E-01	4.00E+02		0.3			G	LSC4

Number of Results: 1

Comments:

000050

TL Richland

tSTLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-520 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263520	Work Order:	EKTT71AA		Report DB ID:	EKTT71AB							
STRONTIUM	4.06E-02	U	6.7E-02	6.8E-02	1.49E-01	pCi/g	89.10%	0.27	12/28/01 07:21 p		6.0	SRTOT_SEP_PRECIP
					6.91E-02	1.00E+00		(1.2)			G	GPC32C

Number of Results: 1

Comments:

000051

000051

TL Richland

tSTLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-522 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
atch: 1263522	Work Order: EKTT81AA			Report DB ID: EKTT81AX								
CO-60	9.42E-03	U	2.0E-02	2.0E-02	3.69E-02	pCi/g		0.26	11/19/01 01:13 p		52.0	RICHRC5017
						5.00E-02		0.94			g	GER7$1
CS-137	-8.84E-03	U	1.8E-02	1.8E-02	3.08E-02	pCi/g		-0.29	11/19/01 01:13 p		52.0	RICHRC5017
						1.00E-01		-0.97			g	GER7$1
EU-152	-2.14E-02	U	4.4E-02	4.4E-02	7.29E-02	pCi/g		-0.29	11/19/01 01:13 p		52.0	RICHRC5017
						1.00E-01		-0.97			g	GER7$1
EU-154	1.68E-02	U	5.5E-02	5.5E-02	9.92E-02	pCi/g		0.17	11/19/01 01:13 p		52.0	RICHRC5017
						1.00E-01		0.61			g	GER7$1
EU-155	-1.74E-03	U	3.6E-02	3.6E-02	5.99E-02	pCi/g		-0.03	11/19/01 01:13 p		52.0	RICHRC5017
						1.00E-01		-0.1			g	GER7$1
RA-226	1.63E-02	U	1.1E-01	1.1E-01	8.86E-02	pCi/g		0.18	11/19/01 01:13 p		52.0	RICHRC5017
						1.00E-01		0.31			g	GER7$1
RA-228	-1.82E-02	U	1.4E-01	1.4E-01	1.66E-01	pCi/g		-0.11	11/19/01 01:13 p		52.0	RICHRC5017
						2.00E-01		-0.26			g	GER7$1

umber of Results: 7

omments:

000052

. Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

BLANK RESULTS

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-524 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1263524	Work Order:	EKTVC1AA		Report DB ID:	EKTVC1AB							
NP-237	-5.85E-04	U	1.2E-03	1.2E-03	2.94E-02	pCi/g	57.96%	-0.02	12/14/01 10:25 a		2.0	D3XW
					4.81E-03	1.00E+00		-1.			G	ALP131

lumber of Results: 1

Comments:

000053

. Richland

STLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 02-Jan-02

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I240000-

Report No. : 18500

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
tch: 1267165	Work Order:			Report DB ID: EKORC1AA								
HEXCHROME	0.00E+00	U		0.0E+00	2.00E-03	mg/L	N/A	0. N/A	9/27/01		100.0 ML	EPA7196

lumber of Results: 1

:omments:

000054

. Richland

;TLRchBlank V3.81 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1H300000- **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1242487	Work Order: EJVQ11AC			Report DB ID: EJVQ11CS									
HEXCHROME	9.61E-01			0.0E+00	2.00E-03	mg/L	N/A	1.00E+00		96.10%	9/9/01	100.0	EPA7196
							Rec Limits:	85.	115.	0.0		ML	

Number of Results: 1

Comments:

000055

. Richland

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I040000-

Report No. : 18500

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1247459	Work Order: EJ1211AC			Report DB ID: EJ1211CS									
HEXCHROME	9.57E-01			0.0E+00	2.00E-03	mg/L	N/A	1.00E+00		95.70%	9/9/01	100.0	EPA7196
							Rec Limits:	85.	115.	0.0		ML	

Number of Results: 1

Comments:

000056

. Richland

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I100167-

Report No. : 18500

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1267165	Work Order:			Report DB ID: EJ95K1AG									
HEXCHROME	5.80E+01			0.0E+00	8.00E-02	mg/kg	N/A	3.98E+01		145.60%	9/27/01	2.8	EPA7196
							Rec Limits:	85.	115.	0.5		G	

Number of Results: 1

Comments:

000037

L Richland

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-498 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1263498	Work Order: EKTQX1AC			Report DB ID: EKTQX1CM									
PU239/40	3.35E+00		2.5E-01	6.0E-01	2.38E-02	pCi/g	64.15%	3.35E+00	1.0E-01	100.17%	12/22/01 12:02 p	2.03	RICHRC5010
							Rec Limits:	70.	130.	0.0		G	ALP39
atch: 1263498	Work Order: EKTQX1AE			Report DB ID: EKTQX1ES									
PU239/40	3.57E+00		5.5E-01	1.0E+00	8.51E-02	pCi/g	15.70%	3.39E+00	1.1E-01	105.37%	12/22/01 12:03 p	2.0	RICHRC5010
							Rec Limits:	70.	130.	0.1		G	ALP47

Number of Results: 2

Comments:

000058

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-500 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1263500	Work Order: EKTQ71AC			Report DB ID: EKTQ71CM									
AM-241	4.45E+00		2.9E-01	8.2E-01	1.86E-02	pCi/g	82.50%	4.47E+00	3.7E-02	99.54%	12/27/01 12:57 p	2.03	RICHRC5080
							Rec Limits:	70.	130.	0.0		G	ALP39
atch: 1263500	Work Order: EKTQ71AE			Report DB ID: EKTQ71ES									
AM-241	5.58E+00		6.8E-01	1.5E+00	5.62E-02	pCi/g	19.49%	4.53E+00	3.8E-02	123.11%	12/27/01 12:58 p	2.0	RICHRC5080
							Rec Limits:	70.	130.	0.2		G	ALP48

Number of Results: 2

Comments:

000059

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-506 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263506	Work Order: EKTRG1AC			Report DB ID: EKTRG1CS									
U-234	3.38E+00		3.6E-01	7.5E-01	2.54E-02	pCi/g	69.10%	3.29E+00	2.0E-02	102.71%	12/19/01 08:39 p	1.0	RICHRC5079
							Rec Limits:	70.	130.	0.0		G	ALP12
U-235	1.22E-01		6.8E-02	7.2E-02	2.54E-02	pCi/g	69.10%	1.50E-01	9.0E-04	81.07%	12/19/01 08:39 p	1.0	RICHRC5079
							Rec Limits:	70.	130.	-0.2		G	ALP12
U-238	3.13E+00		3.4E-01	7.0E-01	2.54E-02	pCi/g	69.10%	3.45E+00	2.1E-02	90.74%	12/19/01 08:39 p	1.0	RICHRC5079
							Rec Limits:	70.	130.	-0.1		G	ALP12

Number of Results: 3

Comments:

000060

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

LCS RESULTS

Date: 02-Jan-02

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-508 **Report No. :** 18500 **Matrix:** WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263508	Work Order: EKTRM1AC			Report DB ID: EKTRM1CS									
OTAL-URANIUM	1.03E+01		0.0E+00	1.7E+00	9.78E-06	ug/g		1.01E+01	6.3E-02	101.77%	12/11/01 05:49 p	1.0	RICHRC5015
							Rec Limits:	70.	130.	0.0		ML	LIP3

Number of Results: 1

Comments:

000001

. Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I200000-510

Report No. : 18500

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263510	Work Order: EKTRX1AC			Report DB ID: EKTRX1CS									
TH-230	1.06E+00		1.7E-01	2.3E-01	1.90E-02	pCi/g	77.47%	1.15E+00	3.4E-02	92.33%	12/19/01 10:22 a	2.0	RICHRC5011
							Rec Limits:	70.	130.	-0.1		G	ALP120

Number of Results: 1

Comments:

290062

. Richland

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-511 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1263511	Work Order: EKTR51AC			Report DB ID: EKTR51CS									
C-14	1.66E+01		7.2E-01	1.3E+00	7.88E-01	pCi/g	100.00%	1.81E+01	6.2E-01	91.58%	11/7/01 09:36 p	2.0	C14_LSC
							Rec Limits:	70.	130.	-0.1		G	LSC3

Number of Results: 1

Comments:

000063

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

LCS RESULTS

Date: 02-Jan-02

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I200000-512

Report No. : 18500

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1263512	Work Order: EKTR61AC			Report DB ID: EKTR61CS									
NI-63	4.78E+02		8.5E+00	3.5E+01	6.25E+00	pCi/g	93.16%	5.05E+02	1.7E+01	94.65%	12/12/01 02:20 a	0.25	NI63LSC
							Rec Limits:	70.	130.	-0.1		G	LSC6

Number of Results: 1

Comments:

000064

L Richland

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

LCS RESULTS

Date: 02-Jan-02

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1I200000-515 Report No. : 18500 Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263515	Work Order: EKTR71AC			Report DB ID: EKTR71CS									
TC-99	4.74E+01		9.0E-01	3.3E+00	7.45E-01	pCi/g	100.00%	6.78E+01	1.1E+00	69.97%	11/12/01 06:14 p	2.0	RICHRC5078
							Rec Limits:	70.	130.	-0.3		G	LSC3

Number of Results: 1

Comments:

000035

. Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.

STLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J11200000-519 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263519	Work Order: EKTT21AC			Report DB ID: EKTT21CS									
H-3	1.84E+00		2.0E-01	3.0E-01	2.85E-01	pCi/g	100.00%	1.38E+00	4.8E-02	118.99%	11/7/01 09:46 p	10.0	906.0_H3_LCS
							Rec Limits:	70.	130.	0.2		G	LSC4

Number of Results: 1

Comments:

000065

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-520 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263520	Work Order: EKTT71AC			Report DB ID: EKTT71CS									
STRONTIUM	1.12E+00		1.5E-01	3.3E-01	1.59E-01	pCi/g	89.90%	1.14E+00	1.4E-02	98.15%	12/28/01 07:21 p	6.0	SRTOT_SEP_PRECIP
							Rec Limits:	70.	130.	0.0		G	GPC32D

Number of Results: 1

Comments:

000067

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1I200000-522 **Report No. :** 18500 **Matrix:** SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1263522	Work Order: EKTT81AC			Report DB ID: EKTT81CM									
CS-137	9.78E-01		1.5E-01	1.5E-01	7.83E-02	pCi/g		9.44E-01	1.0E+00	103.60%	11/19/01 01:14 p	26.61	RICHRC5017
							Rec Limits:	70.	130.	0.0		g	GER3$1
RA-226	1.59E+00		2.6E-01	2.6E-01	1.40E-01	pCi/g		2.14E+00	2.5E+00	74.27%	11/19/01 01:14 p	26.61	RICHRC5017
							Rec Limits:	70.	130.	-0.3		g	GER3$1

Number of Results: 2

Comments:

000038

TL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.

tSTLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I200000-524

Report No. : 18500

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1263524	Work Order: EKTVC2AC			Report DB ID: EKTVC2CS									
NP-237	8.70E-01		1.5E-01	2.1E-01	1.80E-02	pCi/g	63.24%	9.02E-01	2.7E-02	96.47%	12/18/01 03:29 p	2.0	D3XW
							Rec Limits:	70.	130.	0.0		G	ALP127

Number of Results: 1

Comments:

000039

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 02-Jan-02

LCS RESULTS

Lab Name: STL Richland

SDG: W03587

Lot-Sample No.: J1I240000-

Report No. : 18500

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1267165	Work Order:			Report DB ID: EKORC1AC									
HEXCHROME	9.53E-01			0.0E+00	2.00E-03	mg/L	N/A	1.00E+00		95.30%	9/27/01	100.0	EPA7196
							Rec Limits:	.	.	0.0		ML	

Number of Results: 1

Comments:

020000

0051

TL Richland

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

tSTLRchLcs V3.81 A97

FORM II

Date: 02-Jan-02

MATRIX SPIKE RESULTS

Lab Name: STL Richland SDG: W03587

Lot-Sample No.: J1H300187- Report No. : 18500 Matrix: SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Exp-ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
tch: 1242487	Work Order:	EJTF11AR		Report DB ID:	EJTF11RW		Orig Sa DB ID:	9EJTF110					
HEXCHROME	3.39E+01			0.0E+00	8.00E-02	mg/kg	N/A	84.97%	3.99E+01		9/9/01	2.591	EPA7196
	8.00E-02	RPD	2.0									G	
tch: 1242487	Work Order:	EJTF11AU		Report DB ID:	EJTF11UW		Orig Sa DB ID:	9EJTF110					
HEXCHROME	6.51E+02			0.0E+00	8.00E-02	mg/kg	N/A	92.22%	7.06E+02		9/9/01	2.593	EPA7196
	8.00E-02	RPD	2.0									G	

Number of Results: 2

Comments:

000071

0052

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 02-Jan-02

MATRIX SPIKE RESULTS

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1H300187-1 **Report No. :** 18500 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Exp-ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
latch: 1263506	Work Order:	EJTF11A1		Report DB ID:	EJTF111W		Orig Sa DB ID:	9EJTF110					
TOTAL-URANIUM	8.97E+00		0.0E+00	2.6E+00	9.78E-06	ug/g		92.67%	9.68E+00	6.1E-02	12/11/01 05:34 p	1.04	RICHRC5015
	2.02E+00	RER	5.2									ML	LIP3
latch: 1263512	Work Order:	EJTF11A5		Report DB ID:	EJTF115W		Orig Sa DB ID:	9EJTF110					
NI-63	4.51E+02		8.3E+00	3.3E+01	6.35E+00	pCi/g	83.86%	95.94%	4.70E+02	.6E+01	12/11/01 09:13 p	0.27	NI63LSC
	-1.29E-01	RER	27.0									G	LSC6
latch: 1263515	Work Order:	EJTF11A8		Report DB ID:	EJTF118W		Orig Sa DB ID:	9EJTF110					
TC-99	1.57E+02		1.6E+00	9.8E+00	7.45E-01	pCi/g	100.00%	69.66%	2.26E+02	.8E+00	11/12/01 04:10 p	2.0	RICHRC5078
	-4.41E-01	RER	32.2									G	LSC3

Number of Results: 3

Comments:

220000

0057

TL Richland
xSTLRchMs V3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

MATRIX SPIKE RESULTS

Date: 02-Jan-02

Lab Name: STL Richland **SDG:** W03587

Lot-Sample No.: J1H300271- **Report No. :** 18500 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Exp-ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
atch: 1247459	Work Order: EJT9N1AD			Report DB ID: EJT9N1DW			Orig Sa DB ID: 9EJT9N10						
HEXCHROME	3.55E+01			0.0E+00	8.00E-02	mg/kg	N/A	89.20%	3.98E+01		9/9/01	2.836	EPA7196
	8.00E-02	RPD	2.0									G	
atch: 1247459	Work Order: EJT9N1AF			Report DB ID: EJT9N1FW			Orig Sa DB ID: 9EJT9N10						
HEXCHROME	6.61E+02			0.0E+00	8.00E-02	mg/kg	N/A	95.53%	6.92E+02		9/9/01	2.834	EPA7196
	8.00E-02	RPD	2.0									G	

Number of Results: 2

Comments:

000073

0058

L Richland

tSTLRchMs V3.81 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

Date: 12 March 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-TW-1&2 - Soil Sampling
Subject: Wet Chemistry - Data Package No. W03587-ST (SDG No. W03587)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W03587-ST prepared by Severn Trent Services (ST). 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
B12C89-B	8/23/01	Soil	C	See note 1 & 2*
B12DC1-A	8/24/01	Soil	C	See note 1 & 2*
B12ML4-A	8/26/01	Soil	C	See note 1 & 2
B12ML5-A	8/27/01	Soil	C	See note 1 & 2
B12ML6-A	8/27/01	Soil	C	See note 1 & 2
B12ML7	8/28/01	Soil	C	See note 1 & 2

* - Laboratory reported the sample arrived without an intact custody seal.
1 - IC Anions - 300.0A (chloride, fluoride, nitrate, nitrite, phosphate, sulfate); cyanide - 9010A; total organic carbon (TOC) - 9060; ammonia - 350.1; pH - 9045A; nitrate/nitrite 353.1.
2 - Nitrate, nitrite and phosphate results in all samples were not validated and a J qualifier was applied per BHI instruction.

Data validation was conducted in accordance with the BHI validation statement of work and the 200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan, DOE/RL-2000-38, Rev. 0, February 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times/Preservation**

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 28 days for ammonia, nitrate/nitrite and IC anions (chloride, sulphate, fluoride); 14 days for cyanide and total organic carbon (TOC); 2 days for IC anions (nitrate, nitrite, phosphate); and immediate for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the samples being received at the laboratory without proper preservation (cooler temperature 17°C instead of 4°C), the TOC, ammonia and cyanide results in samples B12C89-B and B12DC1-A were qualified as estimates and flagged "J".

Due to the samples being received at the laboratory without proper preservation (cooler temperature 18°C instead of 4°C), the TOC, ammonia and cyanide results in samples B12ML4-A, B12ML5-A and B12ML6-A were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than twice the limits, the following analytes were qualified as estimates and flagged "J": Cyanide in sample B12ML4-A and total organic carbon in all samples.

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

Holding times for non-validated results were as follows:

Phosphate - 14 days (B12C89-B), 12 days (B12DC1-A), 11 days (B12ML4-A), 10 days (B12ML5-A & B12ML6-A), 9 days (B12ML7).

Nitrate - 14 days (B12C89-B), 13 days (B12DC1-A), 11 days (B12ML4-A), 10 days (B12ML5-A & B12ML6-A), 9 days (B12ML7).

Nitrite - 18 days (B12C89-B), 12 days (B12DC1-A), 15 days (B12ML4-A), 14 days (B12ML5-A & B12ML6-A), 13 days (B12ML7).

Holding times were met for all other parameters and samples.

- **Method Blanks**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **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 75% to 125% (70-130% for TOC). Samples with a spike recovery of less than 30% and a sample value below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% (30-69% for TOC) and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% (130% and 70% for TOC) and a sample result greater than the IDL are qualified "J". Finally, for samples with a spike recovery greater than 125% (130% for TOC) and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries of 0%, all detected cyanide results were qualified as estimates and flagged "J" and all undetected cyanide results were rejected and flagged "R".

Due to a matrix spike recovery of 0%, all TOC results were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 35%. If RPD values are out of specification and the sample concentration is greater than five times the target required quantitation limit (TRQL), all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the TRQL and the sample concentration is less than five times the TRQL, all associated sample results are qualified as estimated and flagged "J/UJ".

All laboratory duplicate results were within the required control limits.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against 200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan, DOE/RL-2000-38, Rev. 0, February 2001 target required quantitation limits (TRQL) to ensure that laboratory detection levels meet the required criteria. The TRQL was exceeded for ammonia in sample B12C89-B and cyanide in sample B12ML4-A. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TRQL.

- **Completeness**

Data package No. W03587 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 98.4%.

MAJOR DEFICIENCIES

Due to matrix spike recoveries of 0%, all undetected (B12ML4-A) cyanide results were rejected and flagged "R". Rejected data is unusable and should not be recorded.

MINOR DEFICIENCIES

Due to the holding time being exceeded by less than twice the limits, the following analytes were qualified as estimates and flagged "J": Cyanide in sample B12ML4-A and total organic carbon in all samples. Due to the holding time being exceeded by greater than twice the limits, all pH results were qualified as estimates and flagged "J". Due to the samples being received at the laboratory without proper preservation (cooler temperature 17°C instead of 4°C), the TOC, ammonia and cyanide results in samples B12C89-B and B12DC1-A were qualified as estimates and flagged "J". Due to the samples being received at the laboratory without proper preservation (cooler temperature 18°C instead of 4°C), the TOC, ammonia and cyanide results in samples B12ML4-A, B12ML5-A and B12ML6-A were qualified as estimates and flagged "J". Due to matrix spike recoveries of 0%, all detected cyanide results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 0%, all TOC results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The TRQL was exceeded for ammonia in sample B12C89-B and cyanide in sample B12ML4-A. Under the BHI statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2000-38, Rev. 0, *200-TW-1 Scavenged Waste Group Operable Unit and 200-TW-2 Tank Waste Group Operable Unit RI/FS Work Plan*, February 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WHC procedures 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. 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.

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: W03587	REVIEWER: TLI	DATE: 3/12/02	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate Phosphate Nitrite	J	All	BHI instructions
pH Total organic carbon	J	All	Holding time
Cyanide	J	B12ML4-A	Holding time
TOC, ammonia, cyanide	J	All but B12ML7	Sample preservation
Cyanide	J/UR	All	MS recovery
TOC	J	All	MS percent recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

GENERAL CHEMISTRY ANALYSIS, SOIL MATRIX, (MG/KG)

Project: BECHTEL-HANFORD																			
Laboratory: ST																			
Case:	SDG: W03587																		
Sample Number		B12C89-B		B12DC1-A		B12ML4-A		B12ML5-A		B12ML6-A		B12ML7							
Remarks																			
Sample Date		08/23/01		08/24/01		08/26/01		08/27/01		08/27/01		08/28/01							
General Chemistry	TRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phosphate	5	22.4	J	28.2	J	66.5	J	30.4	J	105	J	12.7	J						
pH (pH units)		8.5	J	8.6	J	8.6	J	9.6	J	9.5	J	10.1	J						
Chloride	2	7.4		9.9		7.6		6.3		7.4		5.4							
Fluoride	5	23.6		38.8		38.6		70.0		205		28.8							
Nitrate	2.5	22.9	J	21.2	J	22.1	J	11.5	J	28.5	J	5.4	J						
Nitrate/Nitrite		30.1		ND	U	24.9		14.8		33.4		10.2							
Nitrite	2.5	ND	UJ	ND	UJ	ND	UJ	ND	UJ	ND	UJ	ND	UJ						
Ammonia, as N	0.5	ND	UJ	0.61	J	1.7	J	1.8	J	5.3	J	5.3	J						
Sulfate	5	40.0		48.2		25.0		35.4		42.9		20.4							
Cyanide, total	0.5	0.80	J	0.31	J	ND	UR	0.56	J	0.38	J	0.47	J						
Total Organic Carbon	100	1590	J	847	J	541	J	668	J	771	J	2680	J						

ND = Not detected

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

000011

BECHTEL HANFORD, INC.

Client Sample ID: B12C89-B

General Chemistry

Lot-Sample #...: F1H290206-002 Work Order #...: EJQ4N Matrix.....: SOLID
Date Sampled...: 08/23/01 Date Received..: 08/29/01
% Moisture.....: 13

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	22.4 J	5.7	mg/kg	MCAWW 300.0A	09/06/01	1248337
		Dilution Factor: 1		MDL.....: 0.40		
pH (solid)	8.5 J		No Units	SW846 9045A	08/31/01	1243396
		Dilution Factor: 1		MDL.....:		
Chloride	7.4	2.3	mg/kg	MCAWW 300.0A	09/06/01	1248332
		Dilution Factor: 1		MDL.....: 0.11		
Fluoride	23.6	1.1	mg/kg	MCAWW 300.0A	09/06/01	1248333
		Dilution Factor: 1		MDL.....: 0.069		
Nitrate	22.9 J	0.23	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1		MDL.....: 0.023		
Nitrate/Nitrite as N	30.1	0.57	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1		MDL.....: 0.041		
Nitrite	ND UJ	2.3	mg/kg	MCAWW 300.0A	09/10/01	1248335
		Dilution Factor: 10		MDL.....: 0.23		
Nitrogen, as Ammonia	ND UJ	2.9	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1		MDL.....: 0.15		
Percent Moisture	13.0	0.10	%	MCAWW 160.3 MOD	08/31/01	1248248
		Dilution Factor: 1		MDL.....:		
Sulfate	40.0	5.7	mg/kg	MCAWW 300.0A	09/06/01	1248336
		Dilution Factor: 1		MDL.....: 0.33		
Total Cyanide	0.80 J	0.57	mg/kg	SW846 9010A	09/05/01	1249192
		Dilution Factor: 1		MDL.....: 0.14		
Total Organic Carbon	1590 J	28.7	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1		MDL.....: 17.8		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

2/17/02

000012

3587

BECHTEL HANFORD, INC.

Client Sample ID: B12DC1-A

General Chemistry

Lot-Sample #...: F1H290206-001 Work Order #...: EJQX8 Matrix.....: SOLID
Date Sampled...: 08/24/01 Date Received..: 08/29/01
% Moisture.....: 10

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	28.2 J	5.6	mg/kg	MCAWW 300.0A	09/05/01	1248337
		Dilution Factor: 1		MDL.....: 0.39		
pH (solid)	8.6 J		No Units	SW846 9045A	08/31/01	1243396
		Dilution Factor: 1		MDL.....:		
Chlorides	9.9	2.2	mg/kg	MCAWW 300.0A	09/05/01	1248332
		Dilution Factor: 1		MDL.....: 0.11		
Fluoride	38.8	1.1	mg/kg	MCAWW 300.0A	09/05/01	1248333
		Dilution Factor: 1		MDL.....: 0.067		
Nitrate	21.2 J	0.22	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1		MDL.....: 0.022		
Nitrate/Nitrite as N	ND	0.56	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1		MDL.....: 0.040		
Nitrite	ND ~~J~~ UJ	0.22	mg/kg	MCAWW 300.0A	09/05/01	1248335
		Dilution Factor: 1		MDL.....: 0.022		
Nitrogen, as Ammonia	0.61 ~~B~~ J	2.8	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1		MDL.....: 0.14		
Percent Moisture	10.0	0.10	%	MCAWW 160.3 MOD	08/31/01	1248248
		Dilution Factor: 1		MDL.....:		
Sulfate	48.2	5.6	mg/kg	MCAWW 300.0A	09/05/01	1248336
		Dilution Factor: 1		MDL.....: 0.32		
Total Cyanide	0.31 ~~B~~ J	0.56	mg/kg	SW846 9010A	09/05/01	1249192
		Dilution Factor: 1		MDL.....: 0.14		
Total Organic Carbon	847 J	27.8	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1		MDL.....: 17.2		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

2/17/02

BECHTEL HANFORD, INC.

Client Sample ID: B1ZML4-A

General Chemistry

Lot-Sample #...: F1H310250-002 Work Order #...: EJXFV Matrix.....: SOLID
Date Sampled...: 08/26/01 Date Received..: 08/31/01
% Moisture.....: 18

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	66.5 J	6.1	mg/kg	MCAWW 300.0A	09/06/01	1248337
		Dilution Factor: 1		MDL.....: 0.43		
pH (solid)	8.6 J		No Units	SW846 9045A	09/04/01	1247385
		Dilution Factor: 1		MDL.....:		
Chloride	7.6	2.4	mg/kg	MCAWW 300.0A	09/06/01	1248332
		Dilution Factor: 1		MDL.....: 0.12		
Fluoride	38.6	1.2	mg/kg	MCAWW 300.0A	09/06/01	1248333
		Dilution Factor: 1		MDL.....: 0.073		
Nitrate	22.1 J	0.24	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1		MDL.....: 0.024		
Nitrate/Nitrite as N	24.9	0.61	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1		MDL.....: 0.044		
Nitrite	ND UJ	2.4	mg/kg	MCAWW 300.0A	09/10/01	1248335
		Dilution Factor: 10		MDL.....: 0.24		
Nitrogen, as Ammonia	1.7 J	3.1	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1		MDL.....: 0.16		
Percent Moisture	18.1	0.10	%	MCAWW 160.3 MOD	09/07/01	1255422
		Dilution Factor: 1		MDL.....:		
Sulfate	25.0	6.1	mg/kg	MCAWW 300.0A	09/06/01	1248336
		Dilution Factor: 1		MDL.....: 0.38		
Total Cyanide	ND UJ	0.61	mg/kg	SW846 9010A	09/10/01	1254269
		Dilution Factor: 1		MDL.....: 0.15		
Total Organic Carbon	541 J	30.5	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1		MDL.....: 18.9		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

2/12/02

BECHTEL HANFORD, INC.

Client Sample ID: B12WL5-A

General Chemistry

Lot-Sample #...: F1H310250-003 Work Order #...: EJXP7 Matrix.....: SOLID
Date Sampled...: 08/27/01 Date Received..: 08/31/01
% Moisture.....: 15

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	30.4 J	5.9	mg/kg	MCAWW 300.0A	09/06/01	1248337
		Dilution Factor: 1		MDL.....: 0.41		
pH (solid)	9.6 J		No Units	SW846 9045A	09/04/01	1247385
		Dilution Factor: 1		MDL.....:		
Chloride	6.3	2.3	mg/kg	MCAWW 300.0A	09/06/01	1248332
		Dilution Factor: 1		MDL.....: 0.12		
Fluoride	70.0	1.2	mg/kg	MCAWW 300.0A	09/06/01	1248333
		Dilution Factor: 1		MDL.....: 0.070		
Nitrate	11.5 J	0.23	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1		MDL.....: 0.023		
Nitrate/Nitrite as N	14.8	0.59	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1		MDL.....: 0.042		
Nitrite	ND ~~J~~ UJ	2.3	mg/kg	MCAWW 300.0A	09/10/01	1248335
		Dilution Factor: 10		MDL.....: 0.23		
Nitrogen, as Ammonia	1.8 ~~B~~ J	2.9	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1		MDL.....: 0.15		
Percent Moisture	14.7	0.10	%	MCAWW 160.3 MOD	09/07/01	1255422
		Dilution Factor: 1		MDL.....:		
Sulfate	35.4	5.9	mg/kg	MCAWW 300.0A	09/06/01	1248336
		Dilution Factor: 1		MDL.....: 0.34		
Total Cyanide	0.56 ~~B~~ J	0.59	mg/kg	SW846 9010A	09/10/01	1254269
		Dilution Factor: 1		MDL.....: 0.15		
Total Organic Carbon	668 J	29.3	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1		MDL.....: 18.2		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

2/17/02

000015

BECHTEL HANFORD, INC.

Client Sample ID: B12NL6-A

General Chemistry

Lot-Sample #...: F1H310250-004 Work Order #...: EJXQC Matrix.....: SOLID
Date Sampled...: 08/27/01 Date Received..: 08/31/01
% Moisture.....: 11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	105 J	5.6	mg/kg	MCAWW 300.0A	09/06/01	1248337
		Dilution Factor: 1		MDL.....: 0.39		
pH (solid)	9.5 J		No Units	SW846 9045A	09/04/01	1247385
		Dilution Factor: 1		MDL.....:		
Chloride	7.4	2.3	mg/kg	MCAWW 300.0A	09/05/01	1248332
		Dilution Factor: 1		MDL.....: 0.11		
Fluoride	205	1.1	mg/kg	MCAWW 300.0A	09/05/01	1248333
		Dilution Factor: 1		MDL.....: 0.068		
Nitrate	28.5 J	0.23	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1		MDL.....: 0.023		
Nitrate/Nitrite as N	33.4	0.56	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1		MDL.....: 0.040		
Nitrite	ND UJ	2.3	mg/kg	MCAWW 300.0A	09/10/01	1248335
		Dilution Factor: 10		MDL.....: 0.23		
Nitrogen, as Ammonia	5.3 J	2.8	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1		MDL.....: 0.15		
Percent Moisture	11.2	0.10	%	MCAWW 160.3 MOD	09/07/01	1255422
		Dilution Factor: 1		MDL.....:		
Sulfate	42.9	5.6	mg/kg	MCAWW 300.0A	09/05/01	1248336
		Dilution Factor: 1		MDL.....: 0.33		
Total Cyanide	0.38 J	0.56	mg/kg	SW846 9010A	09/10/01	1254269
		Dilution Factor: 1		MDL.....: 0.14		
Total Organic Carbon	771 J	28.2	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1		MDL.....: 17.5		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

2/12/02

3587

BECHTEL HANFORD, INC.

Client Sample ID: B12ML7

General Chemistry

Lot-Sample #...: F1H310250-001 Work Order #...: EJXPC Matrix.....: SOLID
Date Sampled...: 08/28/01 Date Received..: 08/31/01
% Moisture.....: 13

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho	12.7 J	5.7	mg/kg	MCAWW 300.0A	09/06/01	1248337
		Dilution Factor: 1		MDL.....: 0.40		
pH (solid)	10.1 J		No Units	SW846 9045A	09/04/01	1247385
		Dilution Factor: 1		MDL.....:		
Chloride	5.4	2.3	mg/kg	MCAWW 300.0A	09/06/01	1248332
		Dilution Factor: 1		MDL.....: 0.11		
Fluoride	28.8	1.1	mg/kg	MCAWW 300.0A	09/06/01	1248333
		Dilution Factor: 1		MDL.....: 0.069		
Nitrate	5.4 J	0.23	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1		MDL.....: 0.023		
Nitrate/Nitrite as N	10.2	0.57	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1		MDL.....: 0.041		
Nitrite	ND ~~UJ~~ UJ	2.3	mg/kg	MCAWW 300.0A	09/10/01	1248335
		Dilution Factor: 10		MDL.....: 0.23		
Nitrogen, as Ammonia	5.3 ~~J~~	2.9	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1		MDL.....: 0.15		
Percent Moisture	13.0	0.10	%	MCAWW 160.3 MOD	09/07/01	1255422
		Dilution Factor: 1		MDL.....:		
Sulfate	20.4	5.7	mg/kg	MCAWW 300.0A	09/06/01	1248336
		Dilution Factor: 1		MDL.....: 0.33		
Total Cyanide	0.47 ~~B~~ J	0.57	mg/kg	SW846 9010A	09/10/01	1254269
		Dilution Factor: 1		MDL.....: 0.14		
Total Organic Carbon	2680 J	28.7	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1		MDL.....: 17.8		

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

2/17/02

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

SEVERN TRENT SERVICES

STL St. Louis

CASE NARRATIVE

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

October 3, 2001

Attention: Joan Kessner

Project Number	:	43018
SAF	:	B01-058
SDG	:	W03587
Number of Samples	:	six
Sample Matrix	:	soil
Data Deliverable	:	Summary
Date SDG Closed	:	September 13, 2001

II. Introduction

Between September 29 and 31, 2001, six (6) "solid" samples were received by STL–St. Louis for chemical analysis. The samples were received at the St. Louis lab outside temperature criteria. See the COC and CUR forms for details of sample condition and temperature. See the attached Sample Summary form for the Lab ID's and corresponding Client Ids.

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. This report is not complete without the Case Narrative. Results are reported "as received"; i.e. wet weight, unless otherwise noted on the data sheets.

Analyses requested: see the attached methods summary sheet

Deviation from Request: The metals were done using method 6010B in place of 6010A.

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.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

STL St. Louis is a part of Severn Trent Laboratories, Inc.

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.

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 MS recoveries for several metals were outside control limits. The spike data was flagged with an "N" qualifier. LCS recoveries met criteria.

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

There was no recovery of the matrix spike for the Cyanide analysis of sample B12DC1-A. LCS recovery was acceptable. The spike data was flagged with an "N" qualifier.

There was no TOC MS recovery for sample B12DC1-A and the data is flagged with an "N" qualifier. The sample was spiked with 80 ul of a 600 ppm TOC standard. The spike was analyzed by itself with a reading of 640. The sample was weighted and the spike was added on top. When the sample plus the spike was burned, a very low result was given. It is believed that sample matrix was the interference.

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:

Marti Ward

Marti Ward
St. Louis Project Manager

STL St. Louis is a part of Severn Trent Laboratories, Inc.

SDR # B02-084
Revision #: 0
Date Initiated: 3/20/02

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200-TW-1 & 2 - Soil
Task ID: 1
Sampling Event: 100 B/C Effluent Pipeline & Proximity Site Remediation Activities – Other Solid

Laboratory: Severn Trent Laboratory - St. Louis

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: ~~7~~ 6 3/21/02
ID Numbers: B12C89-B, B12DC1-A, B12ML4-A, B12ML5-A, B12ML6-A, B12ML7
Matrix: Soil
Collection Date: 08/23/01 – 08/28/01

Issue Background:
Class: ☐ Project Data Use ☐ General Laboratory Direction ☒ Validation Direction ☐ Sample Management Direction

Type: Clarification of Direction

Description: Clarification of Direction For Validation of Short Holding-Time Analytes Performed by EPA Method 300.0

Disposition:

Description: The Sampling Authorization Form currently directs the data validator to not validate Nitrate results analyzed using EPA Method 300.0. This is inappropriate for the project and does not address other short hold-time analytes analyzed by Method 300.0 (Nitrite, Phosphate). Revised direction to the data validator shall be, "Due to the radiological characteristics of the samples, short hold-times for Nitrate, Nitrite, and Phosphate analysis via IC Method 300.0 cannot be met. Apply a 'J' qualifier to these results and note actual hold-time achieved in the validation case narrative."

Justification: Applied "J" qualifiers are much more appropriate for the Nitrate, Nitrite, and Phosphate results for soil samples from this project.

Approval Signatures:

S. J. Trent — 3/21/02
Project Coordinator (Print/Sign Name) — Date

M.E. Todd — 3/21/02
Task Manager (Print/Sign Name) — Date

BHI-EE-109 (02/99)

SAMPLE ANALYSIS REQUEST

B01-058-166

Thomas G./Watson D.	Company Contact: Todd, M.R. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days — Air Quality ☐
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: VIKING Sn 08/98 050001	Field Logbook No.: EL-1318-1 — COA: B20TW2 A4HC ~~B20TW2694C~~ BT 8/23/01	Method of Shipment: Fed EX	
Shipped To: ~~Kiralyn~~ EMA/RESRA SEVERN TRENT	Offsite Property No.: RSR 106563	Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiological Field Instrument Readings on bottles ranged from 15MR B/<.5MR Y to 3.0MR B/1.3MR Y. Possible of (mercury) OF THIS SAMPLE

100m

ur sample originally sent to RCF for on site analysis.
Page 2 of 2 represents custody transfer to R[illegible]
he sample was picked up from RCF and re-[illegible]
r off-site analysis. ~~A new COC was generated by~~ 8-28-01
appropriate off site custody [illegible]. Page 1 of 2
represents custody transfer to offsite laboratory for
irected analysis.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None
Type of Container	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1
Volume	60mL	60mL	60mL	120mL	250mL	250mL	250mL
	Chromium Hex - 7196	Mercury - 7470 - (CV)	VOA 8260A (TCL)	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.

Sample No.	Matrix*	Sample Date	Sample Time										Tie #s
B12C89	SOIL	8-23-01	0130	X	X		X	X					~~B12C89-0~~ B12M38

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Greg Thomas/Greg Thomas	8/23/01 0815	200 TW1 & 2 Site Trailer	8/23/01 0815
200 TW1 & 2 Trailer Site	8-28-01 0845	R.T. R. Thoren	8-28-01 0845
R.T. R Thoren	8-28-01 0850	FEDEX	
		[illegible]	8-29-01 0850

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) ~~Semi-VOA - 8270A (Add-On) (Tributylphosphate); TPH-Diesel Range - 8015D~~
(4) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-90/90~~

Samples stored in Ref.# [illegible] at the 3720 Shipping Facility on [illegible]. Collector not available to relinquish samples on [illegible] for shipment.

RT 8-28-01

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
D=Liquid
V=Vegetation
X=Other

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

SH-SE-011 (10/98)

13587

ZT 8 01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-206	Page 1 of ~~1~~ 2

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days — Air Quality ☐
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: VIKING SN 08/98 050011	Field Logbook No.: EL-1518-1 — COA: B20TW2A44C ~~B20TW2674C~~ DT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated ST. LOUIS	Offsite Property No.: RSR 106563 8/24/01	BSI of Lading/Air BSI No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiologic. Field Instrument Reading 35mR/3 2 mR ✓ on bottles. Possible α.

Samples stored in Ref.# Site Trailer at the 3728 Shipping Facility on 8/24/01. Collector not available to relinquish samples on 8/28/01 for shipment.

ZT 8.28.01

0023

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
SAMPLE ANALYSIS	Mercury - 7470 - (CV)	Chromium Hex - 7196 DSW 08/15/01	See Item (1) in Special Instructions.	VOA - 8260 (TCL)	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions. DSW 08/15/01	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time									Tie to
B12DC1	SOIL	8/24/01	0200	X		X			X			B12MK0

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	0600 8/24/01	200TW1&2 Site Trailer	0600 8/24/01
200TW1&2 Site Trailer	0415 8/28/01	R.T. Thoren	0415 8.28.01
R.T. Thoren	0850 8.28.01	FEDEX	
		[illegible] 8.29.01	0850

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045

~~(2) Semi-VOA - 8270A (Add On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~ DT 8/24/01

(3) ICP Metals - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)

~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 = Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

DJW 08/15/01

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=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	B01-058-249	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.R. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Date Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: Viking S/N OR/98050012	Field Logbook No.: EL-1518-1 — COA: B26TW2AHC R26TW2674C BT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. Louis	Offsite Property No.: RSR 107053 8/27/01	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

15 aDMR 8 GROSS Alpha 1 aDMR } ON CONTACT

Samples stored in Ref. TW1 at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8.30.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See Item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (2) in Special Instructions.	VOA - 8260A (TCL)	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time									Tie to
B12ML4	SOIL	8/26/01	2345	X	X		X					B12MK1

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: D. Watson/[illegible]	08/27/01 0845	Received By/Stored In: REF TW1&2	08/27/01 0845
Relinquished By/Removed From: Ref TW1&2	8.30.01 0830	Received By/Stored In: RT R Thorell	8.30.01 0830
Relinquished By/Removed From: RT R Thorell	8.30.01 0830	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) ~~Semi-VOA - 8270A (Add-On) (Tributyl phosphate); EPA Cleanup Method - WTPH-D~~
(4) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Strontium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 — Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

Matrix *: A=Air; SD=Sediment; SO=Soil; SS=Solids; W=Water; O=Oil; A=Air; DS=Dust Solids; DL=Dust Liquid; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By: [signature]	Title:	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method:	Disposed By:	Date/Time:

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-250	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: VIKING SN 08 98 050012	Field Logbook No.: EL-1518-1	COA: B20TW1A4H4C -B00PW307-4G UT	Method of Shipment: Fed EX
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 10705 8/27/01	Bill of Lading/Air Bill No.: WRF	

POSSIBLE SAMPLE HAZARDS/REMARKS: FIELD RADIOLOGICAL INSTRUMENTS INDICATE 100 CPM & 20 mR/H ON CONTACT <0.5 mR/H

Samples stored in Ref. # TW1-2 at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/28/01 for shipment. TCT 8:30.01 SEB

S0035

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See Item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (2) in Special Instructions.	VOA - 8260A (TCL)	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		

Sample No.	Matrix *	Sample Date	Sample Time										
B12ML5	SOIL	8/27/01	0115	X	X		X					B12MK2	

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: DSWATSON/RTHORNE	08/27/01 0645	REF. TW1-2	08/27/01 0645
Relinquished By/Removed From: RJ THORNE	8:30.01 0380	RJ THORNE	8:30.01 0380
Relinquished By/Removed From: RJ THORNE	8:30.01 0800	FED EX	
Relinquished By/Removed From: FED EX			
Relinquished By/Removed From			
Relinquished By/Removed From			

SPECIAL INSTRUCTIONS:
(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA - 8270A (AdNPCS) (Tributyl phosphate); TPH-Diesel Range - WTPH-D
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium, Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total-Sr; Technetium-99; Total Uranium; Tritium - HT; Isotopic Uranium

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=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: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

27

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-251	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	
Ice Chest No.: VIKING S/N 08/980500	Field Logbook No.: 7EL-1518-I	COA: B20TW2A44C ~~B20TW2874C~~ JT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 107053 8/27/01		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD RADIOLOGICAL INSTRUMENTS INDICATE
DOCPM
TMRS } ON CONTACT
<0.5mRY

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8.30.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See Item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See Item (2) in Special Instructions.	VOA - 8260A (TCL)	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan	TIE	TO
Sample No.	Matrix *	Sample Date	Sample Time							
B12ML6	SOIL	8/27/01	0430	X	X		X		B12MK3	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TG WATSON/[signature]	08/27/01 0745	REF-1B	08/27/01 0745
Ref 1B 3728	8.30.01 0430	R.Thorer	8.30.01 0430
R.T. R.Thorer	8.30.01 0500	FED EX	
FED EX			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTTH-D~~
~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

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

10/5/01 [initials]

LABORATORY SECTION	Received By: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-252	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days — Air Quality ☐
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: ERC-01-026	Field Logbook No.: EL-1518-1 — COA: B20TW2A44C ~~B20TW2074C~~ JT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: A010288 8/28/01	Bill of Lading/Air Bill No.: 42357954 6965	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radiological. Field Instruments
Reading background
Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan		
									ME TO	

Sample No.	Matrix *	Sample Date	Sample Time										
B12ML7	SOIL	08/28/01	0100	X	X		X					B12MK4	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas / Greg Thomas	8/28/01 0500	Ref 1B 3728	8/28/01 0500
Ref 1B 3728	8:30:01 0930	R Thoro	8-30-01 0930
R Thoro	8:30:01 0930	FED EX	
FED EX			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) (Cadmium, Chromium, Copper, Nickel, Silver); ICP Metals - 6010A (Add-on) (Lead)
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA - 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D
(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 8/28/01. Collector not available to relinquish samples on 8/30/01 for shipment.

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

LABORATORY SECTION	Received By: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

TRINT SERVICES

Lot No.: F1H290206
W03587

Condition Upon Receipt Form
St. Louis Laboratory

Client: Fluor Hanford
Quote No: 43018
Shipper/No: FedX 4476546126

Date: 8.29.01 Time: 0850
Initiated by: SJ
COC/RFA Numbers: B01-058-206, 166, 238

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	Y N	Sample received in undamaged condition.	5.	Y N	Sample volume sufficient for analysis.
2.	Y N	Sample received within 4°C ± 2°C*	6.	Y N	Sample received with Chain of Custody.
		Record temperature: 17	7.	Y N	Chain of Custody matches sample IDs on containers.
3.	Y N	Sample received with proper pH**. Soil N/A	8.	Y N	Custody seal received intact and tamper evident on cooler.
4.	Y N	Sample received in proper containers.	9.	Y N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Tinet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes: Blue ice melted - not enough to cool samples. All jars contaminated on outside with radioactive soil granules. We used Contrad solution to clean the outside of the jars. All jars were swiped as well as the inside of the cooler. After swiping found no contamination.
Also, shipping container is expired and should not be used. Mfg. date is 1998

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: [signature] Date: 8.29.01

Project Management Review: [signature] Date: 8.29.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

SEVERN TRENT SERVICES

Lot No.: FIH310250

Condition Upon Receipt Form
St. Louis Laboratory

Client: Hanford Date: 083101 Time: 0920

Quote No: 43018 Initiated by: [illegible]

Shipper/No: 4476546152 Fed Ex COC/RFA Numbers: B01-058-249 -250 -251

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	Y N	Sample received in undamaged condition.	5.	Y N	Sample volume sufficient for analysis.
2.	Y N	Sample received within 4°C ± 2°C*	6.	Y N	Sample received with Chain of Custody.
		Record temperature: 18	7.	Y N	Chain of Custody matches sample IDs on containers.
3.	Y N N/A	Sample received with proper pH**.	8.	Y N	Custody seal received intact and tamper evident on cooler.
4.	Y N	Sample received in proper containers.	9.	Y N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes:

Corrective Actions:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: Jill Clarke Date: 083101

Project Management Review: [illegible] Date: 9.4.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

000029

SL-ADMIN-0004, Revised 5/24/01
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4:

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200 TW 1&2			DATA PACKAGE: W03587		
VALIDATOR: TLI		LAB: ST		DATE: 2/10/00	
CASE:			SDG: W03587		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	Cyanide	
SAMPLES/MATRIX					
B12C99-B B12DC1-A B12ML4-A B12ML5-A					
B12ML6-A B12ML7					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

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

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

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

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

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

Comments: MS cyanide 0%
foc

Aug 31
Sep 30

Holding time

	Aug	Sep
89	8	
C1	7	
L4	5	cyanide (13 days) — J
L5	4	
L6	4	
L7	3	

(Am N/nit Cl flor sulf) ok

L4 cyanide (13 days)

Toc	C1 (26 days)	89 (27)	L7 (22)	L4 (28)	L5 (23)	L6 (23)
nitrate	C1 (13 days)	89 (14)	L7 (9)	L4 (11)	L5 (10)	L6 (10)
nitrite	C1 (17)	89 (18)	L7 (13)	L4 (15)	L5 (14)	L6 (14)
phosphor	C1 (12)	89 (14)	L7 (9)	L4 (11)	L5 (10)	L6 (10)

ptt all over

phosphat J all
nitrate J all
nitrite OR all
ptt J all

000023A

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

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

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

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

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

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

Comments: dup ammonia 38% - ok

6. HOLDING TIMES (all levels)

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

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

Comments: TOC ammonia cyanide - all but
MC7 J (17 + 18' at receipt) J all

See page 33A

000023

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: ammonia 89
Cyanide 64

000034

Appendix 6

Additional Documentation Requested by Client

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F1H290206 Matrix.....: SOLID
Date Sampled...: 08/24/01 Date Received..: 08/29/01

Percnt Moisture: 0.0

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
ortho-Phosphate			Work Order #...:		EJQX81AV	MS Lot-Sample #: F1H290206-001		
	28.2	206	232	mg/kg	99	MCAWW 300.0A	09/06/01	1248337
			Dilution Factor: 46.3					
Chloride			Work Order #...:		EJQX81EL	MS Lot-Sample #: F1H290206-001		
	9.9	103	107	mg/kg	94	MCAWW 300.0A	09/05/01	1248332
			Dilution Factor: 1					
Fluoride			Work Order #...:		EJQX81AG	MS Lot-Sample #: F1H290206-001		
	38.8	103	137	mg/kg	95	MCAWW 300.0A	09/06/01	1248333
			Dilution Factor: 1					
Nitrate			Work Order #...:		EJQX81AK	MS Lot-Sample #: F1H290206-001		
	21.2	20.6	41.5	mg/kg	99	MCAWW 300.0A	09/06/01	1248334
			Dilution Factor: 1					
Nitrate/Nitrite as N			Work Order #...:		EJQX81A6	MS Lot-Sample #: F1H290206-001		
	ND	27.8	33.8	mg/kg	122	MCAWW 353.1	09/18/01	1262180
			Dilution Factor: 1					
Nitrite			Work Order #...:		EJQX81AN	MS Lot-Sample #: F1H290206-001		
	ND	5.15	5.17	mg/kg	100	MCAWW 300.0A	09/06/01	1248335
			Dilution Factor: 1					
Nitrite			Work Order #...:		EJQ4N1AX	MS Lot-Sample #: F1H290206-002		
	ND	47.8	44.1	mg/kg	92	MCAWW 300.0A	09/10/01	1248335
			Dilution Factor: 1					
Nitrogen, as Ammonia			Work Order #...:		EJQX81A3	MS Lot-Sample #: F1H290206-001		
	0.61	34.3	37.1	mg/kg	106	MCAWW 350.1	09/08/01	1251215
			Dilution Factor: 1					
Sulfate			Work Order #...:		EJQX81AR	MS Lot-Sample #: F1H290206-001		
	48.2	206	241	mg/kg	93	MCAWW 300.0A	09/06/01	1248336
			Dilution Factor: 46.3					
Total Cyanide			Work Order #...:		EJQX81A9	MS Lot-Sample #: F1H290206-001		
	0.31	5.56		mg/kg	0	SW846 9010A	09/05/01	1249192
			Dilution Factor: 1					

(Continued on next page)

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: F1H290206 Matrix.....: SOLID
Date Sampled...: 08/24/01 Date Received..: 08/29/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon			Work Order #...: EJQX81CG			MS Lot-Sample #: F1H290206-001		
	847	667	607 N	mg/kg	0	SW846 9060	09/19/01	1262471
			Dilution Factor: 1					

NOTE(S):

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

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F1H290206 Work Order #...: EJQX8-SMP EJQX8-DUP Matrix.....: SOLID

Date Sampled...: 08/24/01 Date Received..: 08/29/01

% Moisture.....: 10

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride						SD Lot-Sample #:	F1H290206-001	
	9.9	9.6	mg/kg	3.4	(0-35)	MCAWW 300.0A	09/05/01	1248332
			Dilution Factor: 1					
Fluoride						SD Lot-Sample #:	F1H290206-001	
	38.8	37.7	mg/kg	3.1	(0-35)	MCAWW 300.0A	09/05/01	1248333
			Dilution Factor: 1					
Nitrate						SD Lot-Sample #:	F1H290206-001	
	21.2	23.7	mg/kg	11	(0-35)	MCAWW 300.0A	09/06/01	1248334
			Dilution Factor: 1					
Nitrite						SD Lot-Sample #:	F1H290206-001	
	ND	ND	mg/kg	0	(0-35)	MCAWW 300.0A	09/05/01	1248335
			Dilution Factor: 1					
Sulfate						SD Lot-Sample #:	F1H290206-001	
	48.2	48.8	mg/kg	1.2	(0-20)	MCAWW 300.0A	09/05/01	1248336
			Dilution Factor: 1					
Phosphate as P, Ortho						SD Lot-Sample #:	F1H290206-001	
	28.2	31.5	mg/kg	11	(0-35)	MCAWW 300.0A	09/05/01	1248337
			Dilution Factor: 1					
Nitrogen, as Ammonia						SD Lot-Sample #:	F1H290206-001	
	0.61 B	0.42	mg/kg	38	(0-35)	MCAWW 350.1	09/08/01	1251215
			Dilution Factor: 1					
Nitrate/Nitrite as N						SD Lot-Sample #:	F1H290206-001	
	ND	ND	mg/kg	0	(0-35)	MCAWW 353.1	09/18/01	1262180
			Dilution Factor: 1					
Total Cyanide						SD Lot-Sample #:	F1H290206-001	
	0.31 B	ND	mg/kg	200	(0-35)	SW846 9010A	09/05/01	1249192
			Dilution Factor: 1					
pH (solid)						SD Lot-Sample #:	F1H290206-001	
	8.6	8.5	No Units	1.5	(0-20)	SW846 9045A	08/31/01	1243396
			Dilution Factor: 1					
Total Organic Carbon						SD Lot-Sample #:	F1H290206-001	
	847	825	mg/kg	2.7	(0-30)	SW846 9060	09/19/01	1262471
			Dilution Factor: 1					

(Continued on next page)

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F1H310250 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: EJ3ER1AA		MB Lot-Sample #:	F1I050000-332	
	ND	2.0	mg/kg	MCAWW 300.0A	09/05/01	1248332
		Dilution Factor: 1				
Fluoride		Work Order #: EJ3EV1AA		MB Lot-Sample #:	F1I050000-333	
	ND	1.0	mg/kg	MCAWW 300.0A	09/05/01	1248333
		Dilution Factor: 1				
Nitrate		Work Order #: EJ3E31AA		MB Lot-Sample #:	F1I050000-334	
	ND	0.20	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1				
Nitrate/Nitrite as N		Work Order #: EKNP61AA		MB Lot-Sample #:	F1I190000-180	
	ND	0.50	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1				
Nitrite		Work Order #: EJ3E51AA		MB Lot-Sample #:	F1I050000-335	
	ND	0.20	mg/kg	MCAWW 300.0A	09/05/01	1248335
		Dilution Factor: 1				
Nitrogen, as Ammonia		Work Order #: EJ8791AA		MB Lot-Sample #:	F1I080000-215	
	ND	2.5	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1				
Phosphate as P, Ortho		Work Order #: EJ3E91AA		MB Lot-Sample #:	F1I050000-337	
	ND	5.0	mg/kg	MCAWW 300.0A	09/05/01	1248337
		Dilution Factor: 1				
Sulfate		Work Order #: EJ3E81AA		MB Lot-Sample #:	F1I050000-336	
	ND	5.0	mg/kg	MCAWW 300.0A	09/05/01	1248336
		Dilution Factor: 1				
Total Cyanide		Work Order #: EKA481AA		MB Lot-Sample #:	F1I110000-269	
	ND	0.50	mg/kg	SW846 9010A	09/10/01	1254269
		Dilution Factor: 1				
Total Organic Carbon		Work Order #: EKRTN1AA		MB Lot-Sample #:	F1I190000-471	
	ND	25.0	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1				

NOTE(S):

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

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F1H290206 Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: EJ3ER1AA		MB Lot-Sample #:	F1I050000-332	
	ND	2.0	mg/kg	MCAWW 300.0A	09/05/01	1248332
		Dilution Factor: 1				
Fluoride		Work Order #: EJ3EV1AA		MB Lot-Sample #:	F1I050000-333	
	ND	1.0	mg/kg	MCAWW 300.0A	09/05/01	1248333
		Dilution Factor: 1				
Nitrate		Work Order #: EJ3E31AA		MB Lot-Sample #:	F1I050000-334	
	ND	0.20	mg/kg	MCAWW 300.0A	09/06/01	1248334
		Dilution Factor: 1				
Nitrate/Nitrite as N		Work Order #: EKNP61AA		MB Lot-Sample #:	F1I190000-180	
	ND	0.50	mg/kg	MCAWW 353.1	09/18/01	1262180
		Dilution Factor: 1				
Nitrite		Work Order #: EJ3E51AA		MB Lot-Sample #:	F1I050000-335	
	ND	0.20	mg/kg	MCAWW 300.0A	09/05/01	1248335
		Dilution Factor: 1				
Nitrogen, as Ammonia		Work Order #: EJ8791AA		MB Lot-Sample #:	F1I080000-215	
	ND	2.5	mg/kg	MCAWW 350.1	09/08/01	1251215
		Dilution Factor: 1				
Phosphate as P, Ortho		Work Order #: EJ3E91AA		MB Lot-Sample #:	F1I050000-337	
	ND	5.0	mg/kg	MCAWW 300.0A	09/05/01	1248337
		Dilution Factor: 1				
Sulfate		Work Order #: EJ3E81AA		MB Lot-Sample #:	F1I050000-336	
	ND	5.0	mg/kg	MCAWW 300.0A	09/05/01	1248336
		Dilution Factor: 1				
Total Cyanide		Work Order #: EJ4D51AA		MB Lot-Sample #:	F1I060000-192	
	ND	0.50	mg/kg	SW846 9010A	09/05/01	1249192
		Dilution Factor: 1				
Total Organic Carbon		Work Order #: EKRTN1AA		MB Lot-Sample #:	F1I190000-471	
	ND	25.0	mg/kg	SW846 9060	09/19/01	1262471
		Dilution Factor: 1				

NOTE(S):

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

SEVERN TRENT SERVICES

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel 314 298 8566
Fax 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 200-TW-1&2SOIL

B01-058

Lot #: F2B160152
SDG #: W03587A

Joan Kessner

Bechtel Hanford, Inc.
3190 George Washington Way
Richland, WA 99352

SEVERN TRENT LABORATORIES, INC.

MWard

MARTI WARD
Project Manager

February 22, 2002

RECEIVED
FEB 2002

STL St. Louis is a part of Severn Trent Laboratories, Inc.

SEVERN TRENT SERVICES

CASE NARRATIVE

STL St. Louis

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

February 22, 2002

Attention: Joan Kessner

Project Number	:	43018
SAF	:	B01-058
SDG	:	W03587A
Number of Samples	:	six
Sample Matrix	:	soil
Data Deliverable	:	Summary
Date SDG Closed	:	September 13, 2001

II. Introduction

Between September 29 and 31, 2001, six (6) "solid" samples were received by STL--St. Louis for chemical analysis. The samples were received at the St. Louis lab outside temperature criteria. See the COC and CUR forms for details of sample condition and temperature. See the attached Sample Summary form for the Lab ID's and corresponding Client Ids. On February14, 2002, the client requested additional analysis. This report contains the results for the additional analysis.

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. This report is not complete without the Case Narrative. Results are reported "as received"; i.e. wet weight, unless otherwise noted on the data sheets.

Analyses requested: see the attached methods summary sheet

Deviation from Request: The metals were done using method 6010B in place of 6010A.

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.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

SEVERN TRENT SERVICES

STL St. Louis

Bechtel Hanford Incorporated
February 22, 2002
Project Number: 43018
SDG: W03587A

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.

TCLP Metals: The TCLP metals analysis was requested after the TCLP leach holding time had expired.

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 MS/MSD were not run on a sample in this SDG. The data for the "batch" QC is included at the back of the data report. Recoveries were in control.

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:

Marti Ward

Marti Ward
St. Louis Project Manager

SAMPLE SUMMARY

F2B160152

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
ET8X2	001	B12C89-B	08/23/01	
ET9DX	002	B12DC1-A	08/24/01	
ET9D2	003	B12ML1-A H-A NAC 2/27/02	08/26/01	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F2B160152

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 1311/3010

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

L St. Louis

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 2/18/02
Page 1 CLIENT ANALYSIS SUMMARY Time: 9:34:32
STL St. Louis User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-2B160152-001
PROJECT #: 200-TW-1&2SOIL WORK ORDER: ET8X2
REPORT TO: Joan Kessner RECEIVING DATE: 2/14/02
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/23/01
SITE: B01-058 ANALYTICAL DUE DATE: 2/22/02N
AMOUNT REC'D: 60G,250G REPORT DUE DATE: 2/25/02
STORAGE LOC: T15 PRIORITY: 08
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME:
MATRIX: SOLID RECEIVING TIME: 16:00
USAF MATRIX:
SAMPLE ID: B12C89-B
QC PACKAGE: Report SDG# : W03587A
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B Trace)	06	2/18/02	2/19/02	8/18/02

TCLP(1311) -> METALS, TOTAL
MT6010TP CR,PB
(A-34-QM-01) ET8X2 Protocol: A QC Program: STANDARD TEST SET

'SL20300 SEVERN TRENT LABORATORIES, INC Run Date: 2/18/02
'age 1 CLIENT ANALYSIS SUMMARY Time: 9:34:32
STL St. Louis User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-2B160152-002
PROJECT #: 200-TW-1&2SOIL WORK ORDER: ET9DX
REPORT TO: Joan Kessner RECEIVING DATE: 2/14/02
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/24/01
SITE: B01-058 ANALYTICAL DUE DATE: 2/22/02N
AMOUNT REC"D: 2X60G,120G,250G REPORT DUE DATE: 2/25/02
STORAGE LOC: T15 PRIORITY: 08
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME:
MATRIX: SOLID RECEIVING TIME: 16:00
USAF MATRIX:
SAMPLE ID: B12DC1-A
QC PACKAGE: Report SDG# : W03587A
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL MT6010TP PB	06	2/18/02	2/20/02	8/19/02

(A-34-QM-01) ET9DX Protocol: A QC Program: STANDARD TEST SET

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 2/18/02
Page 1 CLIENT ANALYSIS SUMMARY Time: 9:34:32
STL St. Louis User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-2B160152-003
PROJECT #: 200-TW-1&2SOIL WORK ORDER: ET9D2
REPORT TO: Joan Kessner RECEIVING DATE: 2/14/02
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/26/01
SITE: B01-058 ANALYTICAL DUE DATE: 2/22/02N
AMOUNT REC'D: 60G,120G REPORT DUE DATE: 2/25/02
STORAGE LOC: T15 PRIORITY: 08
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME:
MATRIX: SOLID RECEIVING TIME: 16:00
USAF MATRIX:
SAMPLE ID: B12ML~~1-4A~~ 4A NAC 2/27/02
QC PACKAGE: Report SDG# : W03587A
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B Trace)	06	2/18/02	2/22/02	8/21/02

TCLP(1311) -> METALS, TOTAL
MT6010TP PB
(A-34-QM-01) ET9D2 Protocol: A QC Program: STANDARD TEST SET

CORRECTION REANALYSIS & SUB-SAMPLE FORM

Request Initiated by: mward
Request Date: 2/14/02
Quote number: 43018

Request is for:
- ____ return to client
- ____ Re-analysis
- ____ Sub-sample
- X additional analysis

SDG W0358MA
Quote 43018
SAF B01-058

Old Lot No.: F1H290206-001,002 F1H310250-002

Sample ID	Shelf Location	Analysis
206-2 B12C89-B 8.23	bins 60G, 250	TCLP Pb; TCLP Cr
206-1 B12DC1-A 8.24	bins 2x60G, 120G, 250G	TCLP Pb
D-002 ~~B12M5-4A~~ 8.26	bins 60G, 120G	TCLP Pb
B12M1H-A		

Receipt Date for new login: 02/14/02

Due Date for new login: 02/25/02

(may exclude the address portion if including Attachment 7 of SOP RPP0051)

Shipping Address: _____

Contact person: _____
Phone number: _____

Signature _____

Completed by: SW Date: 02.16.02

New Login Lot No. F2B160152 (place copy of this form in old file)
Initial that Containers were Re-labeled ____ (place below Lot no.of old label)

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 8/29/01
Time: 13:57:30
User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: 200-TW-1&2SOIL
REPORT TO: Joan Kessner
P.O. NUMBER: MRC-SBB-A-19981
SITE: B01-058
AMOUNT REC"D: 2X60G,120G,250G
STORAGE LOC: S126
LOT COMMENTS: Metals: CRDL standard required +/-25%
MATRIX: SOLID
SAMPLE ID: B12DC1-A Dayes 8/28/02
QC PACKAGE: Report
SAMPLE COMMENTS:
RUN A DUPLICATE ON ALL WET CHEM.
Beginning Depth: .00 **Ending Depth:** .00

QUOTE/SAR #: 43018
LAB ID: F-1H290206-001
WORK ORDER: EJQX8
RECEIVING DATE: 8/29/01
SAMPLING DATE: 8/24/01
ANALYTICAL DUE DATE: 9/28/01N
REPORT DUE DATE: 10/12/01
PRIORITY: 30
SAMPLING TIME: 2:00
RECEIVING TIME: 8:50
SDG# :

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Moisture, Percent (160.3)	06	8/29/01	0/00/00	12/01/01
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(A-88-WM-01) EJQX8-1-AA Protocol: A QC Program: STANDARD TEST SET				
Chloride (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/29/01
LEACHATE, DI (Routine)				
(A-82-CX-01) EJQX8-1-AC Protocol: A QC Program: STANDARD TEST SET				
Fluoride (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/29/01
LEACHATE, DI (Routine)				
(A-82-C8-01) EJQX8-1-AF Protocol: A QC Program: STANDARD TEST SET				
Nitrate as N (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/03/01
LEACHATE, DI (Routine)				
(A-82-C9-01) EJQX8-1-AJ Protocol: A QC Program: STANDARD TEST SET				
Nitrite as N (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/03/01
LEACHATE, DI (Routine)				
(A-82-GO-01) EJQX8-1-AM Protocol: A QC Program: STANDARD TEST SET				
Sulfate (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/29/01
LEACHATE, DI (Routine)				
(A-82-CY-01) EJQX8-1-AQ Protocol: A QC Program: STANDARD TEST SET				
Phosphate as P, Ortho (300.0, Ion Chroma	06	8/29/01	12/01/01	12/03/01
LEACHATE, DI (Routine)				
(A-82-DO-01) EJQX8-1-AU Protocol: A QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B Trace)	06	8/29/01	0/00/00	2/20/02
METALS, TOTAL - Soils				
MT6010_S AG,AL,CA,CD,CR,CU,FE,MG,MN,MO,NI,PB,VX,ZN				
(A-46-QM-01) EJQX8 Protocol: B QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B)	06	8/29/01	0/00/00	2/20/02
METALS, TOTAL - Soils				

St. Louis

M6010_S BI,KX,NA
(A-46-QO-01) EJQX8 Protocol: B QC Program: STANDARD TEST SET

Mercury in Solids by Modified 7470A 06 8/29/01 9/21/01 9/21/01
METALS, TOTAL (Method Exclusive) - Solids
M7470A_S HG
(A-70-0G-01) EJQX8 Protocol: A QC Program: STANDARD TEST SET

Nitrogen, Ammonia (350.1, Automated) 06 8/29/01 0/00/00 9/21/01
LEACHATE, DI (Routine)
(A-82-VM-01) EJQX8-1-A2 Protocol: A QC Program: STANDARD TEST SET

Nitrate-Nitrite (353.1) 06 8/29/01 9/21/01 9/21/01
LEACHATE, DI (Routine) -> REDUCTION
(A-0R-HN-01) EJQX8-1-A5 Protocol: A QC Program: STANDARD TEST SET

Cyanide, Total (9010) 06 8/29/01 0/00/00 9/07/01
DISTILLATION, MICRO/MIDI - Acid
(A-06-RV-01) EJQX8-1-A8 Protocol: A QC Program: STANDARD TEST SET

pH (9045) - Non-Aqueous 06 8/29/01 0/00/00 8/26/01
LEACHATE, DI (Routine)
(A-82-FK-01) EJQX8-1-CC Protocol: A QC Program: STANDARD TEST SET

Carbon, Total Organic "TOC" (9060) 06 8/29/01 0/00/00 9/21/01
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
(A-88-FM-01) EJQX8-1-CF Protocol: A QC Program: STANDARD TEST SET

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 8/29/01
Page 1 CLIENT ANALYSIS SUMMARY Time: 13:57:30
STL St. Louis User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H290206-001-D
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJQX8 MSD
REPORT TO: Joan Kessner RECEIVING DATE: 8/29/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/24/01
SITE: B01-058 ANALYTICAL DUE DATE: 9/28/01N
AMOUNT REC'D: 2X60G,120G,250G REPORT DUE DATE: 10/12/01
STORAGE LOC: S126 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 2:00
MATRIX: SOLID RECEIVING TIME: 8:50
SAMPLE ID: B12DC1-A D Ayers 2/28/02
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:
RUN A DUPLICATE ON ALL WET CHEM.
Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B Trace)	06	8/29/01	0/00/00	2/20/02
METALS, TOTAL - Soils				
MT6010_S AG,AL,CA,CD,CR,CU,FE,MG,MN,MO,NI,PB,VX,ZN				
(A-46-QM-01) EJQX8 Protocol: B QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B)	06	8/29/01	0/00/00	2/20/02
METALS, TOTAL - Soils				
M6010_S BI,KX,NA				
(A-46-QO-01) EJQX8 Protocol: B QC Program: STANDARD TEST SET				
Mercury in Solids by Modified 7470A	06	8/29/01	9/21/01	9/21/01
METALS, TOTAL (Method Exclusive) - Solids				
M7470A_S HG				
(A-70-0G-01) EJQX8 Protocol: A QC Program: STANDARD TEST SET				

St. Louis

'SL20300 SEVERN TRENT LABORATORIES, INC Run Date: 8/29/01
'age 1 CLIENT ANALYSIS SUMMARY Time: 13:57:30
STL St. Louis User Id.: WILSONS

:LIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
'ROJECT MANAGER: MARTI WARD LAB ID: F-1H290206-001-S
'ROJECT #: 200-TW-1&2SOIL WORK ORDER: EJQX8 MS
REPORT TO: Joan Kessner RECEIVING DATE: 8/29/01
'.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/24/01
SITE: B01-058 ANALYTICAL DUE DATE: 9/28/01N
AMOUNT REC"D: 2X60G,120G,250G REPORT DUE DATE: 10/12/01
STORAGE LOC: S126 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 2:00
MATRIX: SOLID RECEIVING TIME: 8:50
SAMPLE ID: B12DC1-A D Cuyes 2/28/02
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:
RUN A DUPLICATE ON ALL WET CHEM.
Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Chloride (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/29/01
LEACHATE, DI (Routine)				
(A-82-CX-01) EJQX8-1-AD Protocol: A QC Program: STANDARD TEST SET				
Fluoride (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/29/01
LEACHATE, DI (Routine)				
(A-82-C8-01) EJQX8-1-AG Protocol: A QC Program: STANDARD TEST SET				
Nitrate as N (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/03/01
LEACHATE, DI (Routine)				
(A-82-C9-01) EJQX8-1-AK Protocol: A QC Program: STANDARD TEST SET				
Nitrite as N (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/03/01
LEACHATE, DI (Routine)				
(A-82-GO-01) EJQX8-1-AN Protocol: A QC Program: STANDARD TEST SET				
Sulfate (300.0, Ion Chromatography)	06	8/29/01	12/01/01	12/29/01
LEACHATE, DI (Routine)				
(A-82-CY-01) EJQX8-1-AR Protocol: A QC Program: STANDARD TEST SET				
Phosphate as P, Ortho (300.0, Ion Chroma	06	8/29/01	12/01/01	12/03/01
LEACHATE, DI (Routine)				
(A-82-DO-01) EJQX8-1-AV Protocol: A QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B Trace)	06	8/29/01	0/00/00	2/20/02
METALS, TOTAL - Soils				
MT6010_S AG,AL,CA,CD,CR,CU,FE,MG,MN,MO,NI,PB,VX,ZN				
(A-46-QM-01) EJQX8 Protocol: B QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B)	06	8/29/01	0/00/00	2/20/02
METALS, TOTAL - Soils				
M6010_S BI,KX,NA				
(A-46-QO-01) EJQX8 Protocol: B QC Program: STANDARD TEST SET				

St. Louis

'SL20300 SEVERN TRENT LABORATORIES, INC Run Date: 8/29/01
'age 2 CLIENT ANALYSIS SUMMARY Time: 13:57:30
STL St. Louis User Id.: WILSONS

:LIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
'ROJECT MANAGER: MARTI WARD LAB ID: F-1H290206-001-S
'ROJECT #: 200-TW-1&2SOIL WORK ORDER: EJQX8 MS
:EPORT TO: Joan Kessner RECEIVING DATE: 8/29/01
'.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/24/01
:ITE: B01-058 ANALYTICAL DUE DATE: 9/28/01N
AMOUNT REC"D: 2X60G,120G,250G REPORT DUE DATE: 10/12/01
:TORAGE LOC: S126 PRIORITY: 30
:OT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 2:00
MATRIX: SOLID RECEIVING TIME: 8:50
:AMPLE ID: B12DC1-A D Ayres 2/28/02
)C PACKAGE: Report SDG# :
:AMPLE COMMENTS:
:UN A DUPLICATE ON ALL WET CHEM.
Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Mercury in Solids by Modified 7470A	06	8/29/01	9/21/01	9/21/01
METALS, TOTAL (Method Exclusive) - Solids				
M7470A_S HG				
(A-70-0G-01) EJQX8 Protocol: A QC Program: STANDARD TEST SET				
Nitrogen, Ammonia (350.1, Automated)	06	8/29/01	0/00/00	9/21/01
LEACHATE, DI (Routine)				
(A-82-VM-01) EJQX8-1-A3 Protocol: A QC Program: STANDARD TEST SET				
Nitrate-Nitrite (353.1)	06	8/29/01	9/21/01	9/21/01
LEACHATE, DI (Routine) -> REDUCTION				
(A-0R-HN-01) EJQX8-1-A6 Protocol: A QC Program: STANDARD TEST SET				
Cyanide, Total (9010)	06	8/29/01	0/00/00	9/07/01
DISTILLATION, MICRO/MIDI - Acid				
(A-06-RV-01) EJQX8-1-A9 Protocol: A QC Program: STANDARD TEST SET				
Carbon, Total Organic "TOC" (9060)	06	8/29/01	0/00/00	9/21/01
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(A-88-FM-01) EJQX8-1-CG Protocol: A QC Program: STANDARD TEST SET				

St. Louis

SL20300 SEVERN TRENT LABORATORIES, INC Run Date: 8/29/01
Page 1 CLIENT ANALYSIS SUMMARY Time: 13:57:30
STL St. Louis User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H290206-002
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJQ4N
REPORT TO: Joan Kessner RECEIVING DATE: 8/29/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/23/01
SITE: B01-058 ANALYTICAL DUE DATE: 9/28/01N
AMOUNT REC"D: 60G,120G,250G REPORT DUE DATE: 10/12/01
STORAGE LOC: S126 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 1:30
MATRIX: SOLID RECEIVING TIME: 8:50
SAMPLE ID: B12C89-B Dayes 2/28/02
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Moisture, Percent (160.3)	06	8/29/01	0/00/00	11/30/01
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(A-88-WM-01) EJQ4N-1-AA Protocol: A QC Program: STANDARD TEST SET				
Inductively Coupled Plasma (6010B)	06	8/29/01	0/00/00	2/19/02
METALS, TOTAL - Soils				
M6010_S AG,CD,CR,CU,NI,PB				
(A-46-QO-01) EJQ4N Protocol: A QC Program: STANDARD TEST SET				
Mercury in Solids by Modified 7470A	06	8/29/01	9/20/01	9/20/01
METALS, TOTAL (Method Exclusive) - Solids				
M7470A_S HG				
(A-70-0G-01) EJQ4N Protocol: A QC Program: STANDARD TEST SET				
Chloride (300.0, Ion Chromatography)	06	8/29/01	11/30/01	12/28/01
LEACHATE, DI (Routine)				
(A-82-CX-01) EJQ4N-1-AJ Protocol: A QC Program: STANDARD TEST SET				
Fluoride (300.0, Ion Chromatography)	06	8/29/01	11/30/01	12/28/01
LEACHATE, DI (Routine)				
(A-82-C8-01) EJQ4N-1-AK Protocol: A QC Program: STANDARD TEST SET				
Nitrate as N (300.0, Ion Chromatography)	06	8/29/01	11/30/01	12/02/01
LEACHATE, DI (Routine)				
(A-82-C9-01) EJQ4N-1-AL Protocol: A QC Program: STANDARD TEST SET				
Nitrite as N (300.0, Ion Chromatography)	06	8/29/01	11/30/01	12/02/01
LEACHATE, DI (Routine)				
(A-82-GO-01) EJQ4N-1-AM Protocol: A QC Program: STANDARD TEST SET				
Sulfate (300.0, Ion Chromatography)	06	8/29/01	11/30/01	12/28/01
LEACHATE, DI (Routine)				
(A-82-CY-01) EJQ4N-1-AN Protocol: A QC Program: STANDARD TEST SET				

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 8/29/01
Page 2 CLIENT ANALYSIS SUMMARY Time: 13:57:30
STL St. Louis User Id.: WILSONS

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H290206-002
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJQ4N
REPORT TO: Joan Kessner RECEIVING DATE: 8/29/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/23/01
SITE: B01-058 ANALYTICAL DUE DATE: 9/28/01N
AMOUNT REC"D: 60G,120G,250G REPORT DUE DATE: 10/12/01
STORAGE LOC: S126 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 1:30
MATRIX: SOLID RECEIVING TIME: 8:50
SAMPLE ID: B12C89-B Dayes 2/28/02
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Phosphate as P, Ortho (300.0, Ion Chroma LEACHATE, DI (Routine) (A-82-DO-01) EJQ4N-1-AP Protocol: A QC Program: STANDARD TEST SET	06	8/29/01	11/30/01	12/02/01
Nitrogen, Ammonia (350.1, Automated) LEACHATE, DI (Routine) (A-82-VM-01) EJQ4N-1-AR Protocol: A QC Program: STANDARD TEST SET	06	8/29/01	0/00/00	9/20/01
Nitrate-Nitrite (353.1) LEACHATE, DI (Routine) -> REDUCTION (A-0R-HN-01) EJQ4N-1-AT Protocol: A QC Program: STANDARD TEST SET	06	8/29/01	9/20/01	9/20/01
Cyanide, Total (9010) DISTILLATION, MICRO/MIDI - Acid (A-06-RV-01) EJQ4N-1-AU Protocol: A QC Program: STANDARD TEST SET	06	8/29/01	0/00/00	9/06/01
pH (9045) - Non-Aqueous LEACHATE, DI (Routine) (A-82-FK-01) EJQ4N-1-AV Protocol: A QC Program: STANDARD TEST SET	06	8/29/01	0/00/00	8/25/01
Carbon, Total Organic "TOC" (9060) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-FM-01) EJQ4N-1-AW Protocol: A QC Program: STANDARD TEST SET	06	8/29/01	0/00/00	9/20/01

RT 8.28.01

St. Louis

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-206	Page 1 of ~~1~~ 2

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	
Ice Chest No.: VIKING SN 08/98 050011	Field Logbook No.: EL-1518-1	COA B20TW2A44C ~~B20PW2674C~~ DT 8/24/01	Method of Shipment: Fed EX
Shipped To: Severn Trent Incorporated St. Louis	Offsite Property No.: RSR 106563		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS
Radiologic. Field Instrument Reading 35MRB 2 mR on bottles. Possible α.

Samples stored in Ref.# Site Trailer at the 3728 Shipping Facility on 8.24.01. Collector not available to relinquish samples on 8.28.01 for shipment. 8.28.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	60mL	60mL	250mL	60mL	250mL	120mL	250mL	60mL		
	Mercury - 7470 - (CV)	Chromium Hex - 7196 DJW 08/15/01	See item (1) in Special Instructions.	VOA - 8260 (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions. DJW 08/15/01	Activity Scan	Tic to	
Sample No.	Matrix *	Sample Date	Sample Time									
B12DC1 -A D Ayres 2/28/02	SOIL	8/24/01	0200	X		X			X			B12MK0

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Greg Thomas	8/24/01 0600	200TW 1&2 Site Trailer	8/24/01 0600
200TW 1&2 Site Trailer	8/28/01 0415	R.T. Thorson	8.28.01 0415
R.T. Thorson	8.28.01 0850	FEDEX	
		[illegible]	8.29.01 0850

SPECIAL INSTRUCTIONS
(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(2) Semi-VOA - 8270A (Add On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D~~ DT 8/24/01
(3) ICP Metals - 6010TR (Client List) (Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc)
~~(4) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~ DJW 08/15/01

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

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

BHI-EE-011 (10/99)

LOT # F2B160152

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-206	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058
Ice Chest No.: VIKING SN 08/98 050011	Field Logbook No.: EL-1518-1	COA B20TW2444 ~~B20TW2674C~~	Method of Shipment: Fed EX
Shipping Container: ~~Sensum Test Incorporated Richland~~ RT 8.28.01 St Louis	Offsite Property No.: PSP 106563 8/24/01		Bill of Lading/Air Bill No.: N/A

Price Code: 8N
Air Quality: ☐
Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS
Radological Field Instruments Reading 35mrB 2mrγ on bottles. Pass ok

Samples stored in Ref.# Site Trailer at the 3728 Shipping Facility on 8.24.01. Collector not available to relinquish samples on 8.28.01 RT 8.28.01 for shipment.

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None		
Type of Container	sG	sG	sG	sG	sG	sG	~~sG~~	sG		
No. of Container(s)	1	1	1	1	1	1	~~1~~	1		
Volume	60mL	60mL	250mL	60mL	250mL	120mL	~~250mL~~	60mL		
	~~Mercury - 7470 - (CV)~~	Chromium Hex - 7196	See Item (1) in Special Instructions.	VOA - 8260A (TCL)	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	Activity Scan		
Sample No.	Matrix*	Sample Date	Sample Time							
B12DC1 - A Dayer 8/28/01	SOIL	8/24/01	0200		X				X	X	B12MK0

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas/Bryan Thomas	0600 8/24/01	200TW1&2 Site Trailer	0600 8/24/01
Relinquished By/Removed From: 200TW1&2 Site Trailer	0415 8.28.01	Received By/Stored In: R. Thore	0415 8.28.01
Relinquished By/Removed From: R. Thore	0450 8.28.01	Received By/Stored In: FEDEX	
Relinquished By/Removed From		Received By/Stored In: [illegible]	8.29.01 0850
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen-in-Nitrate, Nitrogen-in-Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(2) ~~Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH Diesel Range - WTPH-D~~
(3) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-228, Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=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)

FL St. Louis

13

SAF#: AUG 30 '01 02:05PM BHI S&D MANAGEMENT 509 372 9487
VIKING CONTAINER: S/N 09/08/05001
MEDIA: SOLID

SAMPLE ACTIVITY HAVE

SAMPLE#: B12MK0
SAMPLE VOLUME: 40 grams
PACKAGE MASS: 502 grams

Radscreen Results

HAVE	Pci/sample	Pci/gram	Ci/gram	Ci/pkg	TBq/pkg	MBq/pkg
Cs-137	1.60E+06	4.00E+04	4.00E-08	2.01E-05	7.43E-07	7.43E-01
Th-234	6.30E+04	1.58E+03	1.58E-09	7.91E-07	2.93E-08	2.93E-02
Pu-239	8.00E+04	2.00E+03	2.00E-09	1.00E-06	3.71E-08	3.71E-02
Am-241	1.60E+04	4.00E+02	4.00E-10	2.01E-07	7.43E-09	7.43E-03
Sr-90	1.80E+06	4.50E+04	4.50E-08	2.26E-05	8.36E-07	8.36E-01
TOTALS:	3.56E+06	8.90E+04	8.90E-08	4.47E-05	1.65E-06	1.65

SAMPLE #: B12MJ6
SAMPLE VOLUME: 35 grams
PACKAGE MASS: 485 grams

Radscreen results

HAVE	Pci/sample	Pci/gram	Ci/gram	Ci/pkg	TBq/pkg	MBq/pkg
Cs-137	1.30E+06	3.71E+04	3.71E-08	1.80E-05	6.67E-07	6.67E-01
Pu-239	2.00E+05	5.71E+03	5.71E-09	2.77E-06	1.03E-07	1.03E-01
Am-241	4.80E+04	1.37E+03	1.37E-09	6.65E-07	2.46E-08	2.46E-02
Sr-90	1.50E+06	4.29E+04	4.29E-08	2.08E-05	7.69E-07	7.69E-01
TOTALS:	3.05E+06	8.71E+04	8.71E-08	4.22E-05	1.56E-06	1.56

ACCUMULATED ACTIVITY FOR ENTIRE PACKAGE

HAVE	Ci/pkg	TBq/pkg	MBq/pkg
Cs-137	3.81E-05	1.41E-06	1.41E+00
Th-234	7.91E-07	2.93E-08	2.93E-02
Pu-239	3.78E-06	1.40E-07	1.40E-01
Am-241	8.66E-07	3.20E-08	3.20E-02
Sr-90	4.34E-05	1.60E-06	1.60E+00
Totals:	8.69E-05	3.22E-06	3.22

ON RSR

LIMITED QUANTITY SHIPMENT (TBq/PKG)

HAVE	TBq/pkg	A2 VALUES	LTD.QTY A2(10-3) solid normal form	Derived Value Have/A2 Values	
Cs-137	1.41E-06	0.5	5.00E-04	2.82E-03	0.00
Th-234	2.93E-08	0.2	2.00E-04	1.46E-04	0.00
Pu-239	1.40E-07	2.00E-04	2.00E-07	6.98E-01	0.70
Am-241	3.20E-08	2.00E-04	2.00E-07	1.60E-01	0.16
Sr-90	1.60E-06	0.1	1.00E-04	1.60E-02	0.02
			UNITY TOTAL:	8.78E-01	0.88

Radioactive material, excepted package, limited quantity of material
UN2910
No RQ
Fissile Excepted

Kessner, Joan H

From: mward@stl-inc.com
Sent: Thursday, August 30, 2001 11:36 AM
To: jhkessne@mail.bhi-erc.com; jwaddell@stl-inc.com
Subject: Cr6+ for SAF B01-058
Importance: High

These samples have not yet been shipped to Richland. After re-packaging them in the container, the rad readings indicated that it needed to be sent back as a "white-1". We are going to hold them one more day to make sure that we send them correctly.

Joan: The rad screening info sent with the COC lists the unit activity as "each" instead of pc/g. Is there any way for you to know which of the bottles was used to determine the ativity levels. Our RSO said that that info would be useful to him in making his determination.

I will let you both know when these get shipped.

to -> marti ward
fax -> (314) 298-8757
from -> joan kessner

marti —
this should help
joan

8/30/01

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9604 **Sample Date & Time** 8/23/01 0130

Project ID: 200E B-7A **SAF Number:** B01-058 **Date Analyzed** 8/24/01 10:32

Sample ID: B12MJ8

Gamma Energy Analysis

Nuclide		Activity (pCi/g) EA		Error (pCi/g) EA	MDC (pCi/g) EA
K-40	<	2.2E+03			2.2E+03
Co-60	<	5.0E+02			5.0E+02
Cs-137		1.3E+06	+/-	2.7E+05	1.7E+03
Eu-152	<	5.6E+03			5.6E+03
Eu-155	<	5.9E+03			5.9E+03
Tl-208	<	3.9E+03			3.9E+03
Pb-212	<	2.3E+04			2.3E+04
Bi-214	<	3.9E+03			3.9E+03
Pb-214	<	4.1E+03			4.1E+03
Ra-226	<	4.3E+04			4.3E+04
Ac-228	<	2.4E+03			2.4E+03
Pa-234	<	4.8E+03			4.8E+03
Th-234	<	2.3E+04			2.3E+04
U-235	<	1.1E+04			1.1E+04
Am-241		4.8E+04	+/-	6.2E+03	4.5E+03

$Sr^{90} = 1.5 \times 10^6$

QUALITATIVE ONLY
DUE TO HIGH DEAD TIME
13.3%. COUNTED
2" ABOVE DETECTOR
GH

$Pa = 2 \times 10^5$

Total GEA (pCi/g) EA	1.3E+06	+/-	2.8E+05

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

TIE TO B12C89

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst G. L. Hastings 8/24/01

Report To	Fax
CS Cearlock	372-9292
SJ Trent	372-9292
Joan Kessner	372-9487

Report Printed: Friday, August 24, 2001

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9606 Sample Date & Time 8/24/01 0200

Project ID: 200E B-7A SAF Number: B01-058 Date Analyzed 8/24/01 1:32:1

Sample ID: B12MK0

Gamma Energy Analysis

Nuclide		Activity (pCi/g) EA		Error (pCi/g) EA	MDC (pCi/g) EA	
K-40	<	3.0E+03			3.0E+03	
Co-60	<	6.7E+02			6.7E+02	5E-70
Cs-137		1.6E+06	+/-	2.7E+05	7.0E+03	1.8 X10^6
Eu-152	<	6.6E+03			6.6E+03	
Eu-154	<	1.9E+03			1.9E+03	
Eu-155	<	6.8E+03			6.8E+03	
Tl-208	<	4.6E+03			4.6E+03	
Pb-212	<	2.7E+04			2.7E+04	
Bi-214	<	5.2E+03			5.2E+03	
Pb-214	<	4.8E+03			4.8E+03	
Ra-226	<	4.8E+04			4.8E+04	
Ac-228	<	3.1E+03			3.1E+03	
Pa-234	<	5.6E+03			5.6E+03	
Th-234		6.3E+04	+/-	2.3E+04	3.7E+04	Pa
U-235	<	1.3E+04			1.3E+04	
Am-241		1.6E+04	+/-	3.8E+03	5.3E+03	8 X10^4

QUALITATIVE ONLY DUE TO HIGH DEAD TIME COUNTED SAMPLE 1.25" ABOVE DETECTOR.

NOTE: DUE TO THE HIGH DOSE NO GAB WAS AVAILABLE TO HELP WITH THE IDENTIFICATION OF THE TH-234 AND AM-241 ACTIVITY. BOTH ACTIVITIES REPORTED.

GH 8/24/01

Total GEA (pCi/g) EA	1.7E+06	+/-	3.0E+05

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

TIC TO B12DC1

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst G. J. Hastings 8/24/01

Report To	Fax
CS Cearlock	372-9292
SJ Trent	372-9292
Joan Kessner	372-9487

Report Printed: Friday, August 24, 2001

St. Louis

RADIOACTIVE SHIPMENT RECORD

106563 3.
Page 1 of 2

1. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company: BHI HANFORD
Address: 3728 BUILDING / 300 AREA
City, State, Zip: RICHLAND, WA 99352
Contact: RIKKI THOREN
Phone: (509)521-8003

Ship ☑ Prepaid ☐ Collect 4.

Via ☐ Motor ☑ Air Pagr. ☐ UPS ☐ Rail ☑ Air Cargo ☐ Site Carrier

SHIPMENT AUTHORIZATION NUMBER

2. SHIP TO
Company: SEVERN TRENT INC.
Address: 13715 RIDER TRAIL NORTH
City, State, Zip: EARTH CITY, MO 63045
Attention: MARTI WARD
Phone: (314) 298-8566

Markings Applied 6.
- Radioactive - LSA ☐
- Radioactive - SCO ☐
- Type A N/A ☐
- Type B with Uranium foil ☐

LSA Description 8.
- LSA-I ☐
- LSA-II ☐
- LSA-III N/A ☐
- SCO-I ☐
- SCO-II ☐

Labels Applied 10.
- Empty ☐
- Radioactive White - I ☐
- Radioactive Yellow - II ☐
- Radioactive Yellow - III ☐
- Subsidiary Hazard ☐

For Normal Form only 7.
Identify
Physical Form: ☐ Liquid ☐ Gas ☑ Solid
Chemical Form: ☑ Elemental ☐ Metal ☐ Nitrate ☐ Oxide ☐ Mixture ☐ Other

EMERGENCY RESPONSE 9.
Telephone: 1-888-7666-0771
Emergency Response Guide(s): 161

Highway Route Controlled Quantity ☐
Exclusive Use Shipment with Instructions ☐
Placards Applied ☐
If Rail Specify:
Fissile Excepted, Grams 215g ☑
Excepted Package Statement ☑

5. HM Proper Shipping Name: _____ Radioactive Material,

	excepted package - empty packaging	7	UN2910
	excepted package - instruments or articles	7	UN2910
✓	excepted package - limited quantity of material	7	UN2910
	excepted package - articles manufactured from natural or depleted uranium or natural thorium	7	UN2910
	Special Form, n.o.s.	7	UN2974
	Low Specific Activity, n.o.s.	7	UN2912
	n.o.s.	7	UN2982
	Fissile, n.o.s.	7	UN2918
	Surface Contaminated Object	7	UN2913

Warning – Fissile Material Controlled Shipment. Do Not Load More Than _____ Packages Per Vehicle. In Loading and Storage Areas, Keep at Least 20 Feet From Other Packages Bearing Radioactive Labels.

11.

No. Pkg.	Model Package	CDC/Spec.	Serial No.	Seal No.	Isotopes	T.I.	Bq/Package	Gr. Wt. Kg
1	PLASTIC BOX VIKING	4HZV	SN05/98050001	TAPE	Pu-239, Am241	N/A	3.22E+06	56 Kg
	982 g Solid, Dry Powder Packaged in Foam Inserts with Blue Ice Pkg in Viking							
(Shipper may describe package in detail on one of the unused lines above)			301-058		TOTALS	N/A	3.22E+06	56 Kg

12. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
Certifier's Signature: [signature] On behalf of DOE-RL | Date: 8-28-01 | Organization: 1521-HFS | Complete Cost Code (Inc. End Function): B20TW02A44C

13. Surface Dose Rate of Package: ☑ <0.005 or _____ mSv/hr; <0.5 or _____ mrem/hr (N+β γ)
Dose Rate @ 1 Meter from Surface of Package: ☑ <0.005 or _____ mSv/hr; <0.5 or _____ mrem/hr (N+β γ)
Smears of Outer Container: ☑ <0.41 Bq (22 dpm) β γ /cm²; ☑ <0.04 Bq (2.2 dpm) α /cm²; ☑ <Tbl. 2-2 HSRCM Onsite Limits
TRUCK LOAD OR EXCLUSIVE USE: Surface ☑ <2 mSv/hr (200 mrem/hr); @ 2 meters ☑ <0.1 mSv/hr (10 mrem/hr); @ Cab or sleeper ☑ <0.02 mSv/hr (2 mrem/hr) (Using N+β γ)
Additional Data and Instructions (inc. Readings on Internal Packaging)
Signature - Radiation Monitoring: Terry Duffey | Bldg. 3728 | Survey No. RCF-01-0325 | Date 8-28-01

14. TRANSPORTER: Vehicle Number 161-D6052 | DRIVER SIGNATURE: [signature]
RECEIVER: RECEIVER SIGNATURE | Date

15. OFFSITE AUTHORIZATION
Shipment has been inspected and verified to be in compliance with DOT regulations.
Authorized Signature: [signature] | Printed Name: Keith R. Smith | Date 8-28-01

16. AUTHORIZATION FOR SHIPMENT
AIR TRANSPORT CERTIFICATION: ☐ N/A
CARGO AIRCRAFT: ☐ Cargo Aircraft Only Labels Applied
PASSENGER AIRCRAFT: ☑ Ltd Qty ☐ <3 T.I. ☐ Research/Medical Diagnosis ☐ Human Medical Research
Pkg. Dimensions (cm)

17. OFFSITE AUTHORIZATION

Tracking No.	Date Shipped	Routing	ETA
RMBH-4709	8-28-01	FedEx	8-29-01
Surveyed By: [signature]	Date 8-28-01	Approved for Shipment Offsite: [signature]	Date 8-28-01

54-6000-088 (06/97)

Priority overnight - WEDNESDAY Delivery

23

Excepted PKG 10^{-3} A2 TBq 1 TBq = 27 Ci

	A2	=	10^{-3} A2
Cs137a	Ø.6 = 16.2 Ci	=	16.2 mCi
Pu239	Ø.001 = Ø.027 Ci = 27 mCi		27 μCi
Am241	Ø.001 = Ø.027 Ci = 27 mCi		27 μCi
Sr90a	Ø.3 = 8.1 Ci		8.1 mCi
Th234a	Ø.3 = 8.1 Ci		8.1 mCi

a = and daughter products

Sample 1 X10g

Cs137 1.6 μCi/gr

Th234 Ø.0063 μCi

Am241 Ø.0016 μCi

Sr90 1.8 μCi

Sample 42 X35g

Cs 1.3 μCi

Pu Ø.020 μCi

Am Ø.0048 μCi

Sr90 1.5 μCi

Sum Sample #1 + #2 < 10^{-3} A2

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-058-166 | Page ~~1 of 1~~ 8-28-01

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058
Ice Chest No.: VIKING Sn 08/98 050011	Field Logbook No.: EL-1518-1	COA: B20TW2 A44C ~~B20TW2674C~~ GT 8/23/01	Method of Shipment: Fed EX
Shipped To: ~~TMA/RECRA~~ SEVERN TRENT	Offsite Property No.: RSR 106563		Bill of Lading/Air Bill No.: NA

Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

Radiological Field Instrument Readings on bottles ranged from 1.5MR B/<.5MR γ to 3.0MR B/1.3MR γ. Possible α 600ml (mercury) of this sample

Sample originally sent to RCF for on site analysis. Page 2 of 2 represents custody transfer to RCF. The sample was picked up from RCF and re-[illegible] for off-site analysis. ~~A new COC was generated for appropriate off site custody transfer.~~ Page 1 of 2 represents custody transfer to offsite laboratory for directed analysis.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	60mL	[illegible]	120mL	250mL	[illegible]mL	250mL			
	Chromium Hex - 7196	Mercury - 7470 - (CV)	VOA - 8260A (TCL)	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time									Tie to
B12C89 - B Dayres 2/28/02	SOIL	8-23-01	0130	X	X		X	X				~~B12C89-A~~ B12MJ8

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Greg Thomas/Greg Thomas	0815 8/23/01	stored in 200 TW 1 & 2 site Trailer	0815 8/23/01
200 TW 1 & 2 Trailer Site	0415 8-28-01	R. Thoren	0415 8-28-01
R. Thoren	0450 8-28-01	FED EX	
		[illegible] 8-29-01	0850

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D~~
~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90~~

Samples stored in Ref.# site Trailer at the 3728 Shipping Facility on 8/28/01. Collector not available to relinquish samples on 8/28/01 for shipment.

RT 8-28-01

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, D=Liquid, V=Vegetation, X=Other

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

SHI-EE-011 (10/98)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-238	Page ~~1 of 1~~ RT 8-28-01
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 24 Hours
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.	Field Logbook No.: EL-1518-1	COA: B20TW2A44C ~~B20TW2674C~~ JT 8/23/01	Method of Shipment: Fed EX	
Shipped To: Radiological Counting Facility	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radiological Field Instrument Readings on bottles were 70 MR B/<.5 MR γ on 125 mL and 3.0 MR B/<.5 MR γ on 60 mL. Possible α
Special Handling and/or Storage

Preservation	None	Cool 4°C ~~None~~ JT 8/23/01									
Type of Container	P	AG									
No. of Container(s)	1	1									
Volume	125mL	60mL									
SAMPLE ANALYSIS	~~Rad Screen~~ GEA	~~Rad Screen~~ GEA	JT 8/23/01	RCF						Tie to	1

Sample No.	Matrix *	Sample Date	Sample Time									
~~B12MJ8~~	~~SOIL~~	~~8-23-01~~	~~0130~~	~~X~~			~~9604~~	RT	8.28	07		B12C89
B12C89-A B	Soil	8-23-01	0130	X	X		9605					
Dayne				JT 8/23/01								
2/28/02												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Greg Thomas/Greg Thomas	Date/Time: 0915 8/23/01	Received By/Stored In: J Duffey J Duffey	Date/Time: 0915 8-23-01
Relinquished By/Removed From: J Duffey J Duffey	Date/Time: 0750 8-27-01	Received By/Stored In: Greg Thomas/Greg Thomas	Date/Time: 0750 8/27/01
Relinquished By/Removed From: Greg Thomas/Greg Thomas	Date/Time: 0810 8/27/01	Received By/Stored In: Ref 3C	Date/Time: 0810 8/27/01
Relinquished By/Removed From: Ref 3C	Date/Time: 0230 8.28.01	Received By/Stored In: R Thorer	Date/Time: 0230 8.28.01
Relinquished By/Removed From	Date/Time	Received By/Stored In: ~~[illegible] 8.29.01~~	Date/Time: ~~850~~
Relinquished By/Removed From	Date/Time	Received By/Stored In: Sol 8.29.01	Date/Time

SPECIAL INSTRUCTIONS

ample originally sent to RCF for on site analysis.
age 2 of 2 represents custody transfer to RCF.
he sample was picked up from RCF and re-labeled
r off-site analysis. ~~A new COC was generated for appropriate off-site custody transfer.~~ RT 8.28.01 Page 1 of 2
epresents custody transfer to offsite laboratory for
irected analysis.

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=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)

SEVERN TRENT SERVICES

Lot No.: F1H290206
W03587

Condition Upon Receipt Form
St. Louis Laboratory

Client: Fluor Hanford
Quote No: 43018
Shipper/No: FedX 4476 5461 26

Date: 8.29.01 Time: 0850
Initiated by: SJ
COC/RFA Numbers: B01-058-206, 166, 238

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	Y N	Sample received in undamaged condition.	5.	Y N	Sample volume sufficient for analysis.
2.	Y N	Sample received within 4°C ± 2°C*	6.	Y N	Sample received with Chain of Custody.
		Record temperature: 17	7.	Y N	Chain of Custody matches sample IDs on containers.
3.	Y N	Sample received with proper pH**. Soil N/A	8.	Y N	Custody seal received intact and tamper evident on cooler.
4.	Y N	Sample received in proper containers.	9.	Y N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes: Blue ice melted - not enough to cool samples. All jars contaminated on outside with radioactive soil granules. We used Contrad solution to clean the outside of the jars. All jars were swiped as well as the inside of the cooler. After swiping found no contamination.
Also, shipping container is expired and should not be used. Mfg. date is 1998

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: [signature] Date: 8.29.01

Project Management Review: [signature] Date: 8.29.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

SL-ADMIN-0004, Revised 5/08/01
\\Qstlmo05\QA\FORMS\ST-LOUIS\ADMIN\Admin004_rev_5_8_01.doc

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/04/01
Page 1 CLIENT ANALYSIS SUMMARY Time: 8:50:22
STL St. Louis User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H310250-001
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJXPC
REPORT TO: Joan Kessner RECEIVING DATE: 8/31/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/28/01
SITE: B01-058 ANALYTICAL DUE DATE: 10/01/01N
AMOUNT REC"D: 60G,120G,250G REPORT DUE DATE: 10/15/01
STORAGE LOC: S137 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 1:00
MATRIX: SOLID RECEIVING TIME: 9:20
SAMPLE ID: B12ML7
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Chloride (300.0, Ion Chromatography)	06	8/31/01	12/05/01	1/02/02
LEACHATE, DI (Routine)				
(A-82-CX-01) EJXPC-1-AC Protocol: A QC Program: STANDARD TEST SET				
Moisture, Percent (160.3)	06	8/31/01	0/00/00	12/05/01
NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION				
(A-88-WM-01) EJXPC-1-AA Protocol: A QC Program: STANDARD TEST SET				
Fluoride (300.0, Ion Chromatography)	06	8/31/01	12/05/01	1/02/02
LEACHATE, DI (Routine)				
(A-82-C8-01) EJXPC-1-AD Protocol: A QC Program: STANDARD TEST SET				
Nitrate as N (300.0, Ion Chromatography)	06	8/31/01	12/05/01	12/07/01
LEACHATE, DI (Routine)				
(A-82-C9-01) EJXPC-1-AE Protocol: A QC Program: STANDARD TEST SET				
Nitrite as N (300.0, Ion Chromatography)	06	8/31/01	12/05/01	12/07/01
LEACHATE, DI (Routine)				
(A-82-GO-01) EJXPC-1-AF Protocol: A QC Program: STANDARD TEST SET				
Sulfate (300.0, Ion Chromatography)	06	8/31/01	12/05/01	1/02/02
LEACHATE, DI (Routine)				
(A-82-CY-01) EJXPC-1-AG Protocol: A QC Program: STANDARD TEST SET				
Phosphate as P, Ortho (300.0, Ion Chroma	06	8/31/01	12/05/01	12/07/01
LEACHATE, DI (Routine)				
(A-82-DO-01) EJXPC-1-AH Protocol: A QC Program: STANDARD TEST SET				
Nitrogen, Ammonia (350.1, Automated)	06	8/31/01	0/00/00	9/25/01
LEACHATE, DI (Routine)				
(A-82-VM-01) EJXPC-1-AJ Protocol: A QC Program: STANDARD TEST SET				
Nitrate-Nitrite (353.1)	06	8/31/01	9/25/01	9/25/01
LEACHATE, DI (Routine) -> REDUCTION				
(A-0R-HN-01) EJXPC-1-AK Protocol: A QC Program: STANDARD TEST SET				

PSL20300
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SEVERN TRENT LABORATORIES, INC
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 9/04/01
Time: 8:50:22
User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: 200-TW-1&2SOIL
REPORT TO: Joan Kessner
P.O. NUMBER: MRC-SBB-A-19981
SITE: B01-058
AMOUNT REC"D: 60G,120G,250G
STORAGE LOC: S137
LOT COMMENTS: Metals: CRDL standard required +/-25%
MATRIX: SOLID
SAMPLE ID: B12ML7
QC PACKAGE: Report
SAMPLE COMMENTS:

QUOTE/SAR #: 43018
LAB ID: F-1H310250-001
WORK ORDER: EJXPC
RECEIVING DATE: 8/31/01
SAMPLING DATE: 8/28/01
ANALYTICAL DUE DATE: 10/01/01N
REPORT DUE DATE: 10/15/01
PRIORITY: 30
SAMPLING TIME: 1:00
RECEIVING TIME: 9:20
SDG# :

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Cyanide, Total (9010) DISTILLATION, MICRO/MIDI - Acid (A-06-RV-01) EJXPC-1-AL Protocol: A QC Program: STANDARD TEST SET	06	8/31/01	0/00/00	9/11/01
pH (9045) - Non-Aqueous LEACHATE, DI (Routine) (A-82-FK-01) EJXPC-1-AM Protocol: A QC Program: STANDARD TEST SET	06	8/31/01	0/00/00	8/30/01
Carbon, Total Organic "TOC" (9060) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-FM-01) EJXPC-1-AN Protocol: A QC Program: STANDARD TEST SET	06	8/31/01	0/00/00	9/25/01
Inductively Coupled Plasma (6010B) METALS, TOTAL - Soils M6010_S AG,CD,CR,CU,NI,PB (A-46-QO-01) EJXPC Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	2/24/02
Mercury in Solids by Modified 7470A METALS, TOTAL (Method Exclusive) - Solids M7470A_S HG (A-70-0G-01) EJXPC Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/25/01	9/25/01

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 9/04/01
Time: 8:50:22
User Id.: WARDM

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: 200-TW-1&2SOIL
REPORT TO: Joan Kessner
P.O. NUMBER: MRC-SBB-A-19981
SITE: B01-058
AMOUNT REC"D: 60G,120G,250G
STORAGE LOC: S137
LOT COMMENTS: Metals: CRDL standard required +/-25%
MATRIX: SOLID
SAMPLE ID: B12ML4-A NC 2/27/02
QC PACKAGE: Report
SAMPLE COMMENTS:

QUOTE/SAR #: 43018
LAB ID: F-1H310250-002
WORK ORDER: EJXPV
RECEIVING DATE: 8/31/01
SAMPLING DATE: 8/26/01
ANALYTICAL DUE DATE: 10/01/01N
REPORT DUE DATE: 10/15/01
PRIORITY: 30
SAMPLING TIME: 23:45
RECEIVING TIME: 9:20
SDG# :

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B) METALS, TOTAL - Soils M6010_S AG,CD,CR,CU,NI,PB (A-46-QO-01) EJXPV Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	2/22/02
Mercury in Solids by Modified 7470A METALS, TOTAL (Method Exclusive) - Solids M7470A_S HG (A-70-0G-01) EJXPV Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/23/01	9/23/01
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EJXPV-1-AM Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	12/03/01
Chloride (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-CX-01) EJXPV-1-AN Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/03/01	12/31/01
Fluoride (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-C8-01) EJXPV-1-AP Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/03/01	12/31/01
Nitrate as N (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-C9-01) EJXPV-1-AQ Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/03/01	12/05/01
Nitrite as N (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-GO-01) EJXPV-1-AR Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/03/01	12/05/01
Sulfate (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-CY-01) EJXPV-1-AT Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/03/01	12/31/01

St. Louis

SEVERN TRENT LABORATORIES, INC
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 9/04/01
Time: 8:50:22
User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: 200-TW-1&2SOIL
REPORT TO: Joan Kessner
P.O. NUMBER: MRC-SBB-A-19981
SITE: B01-058
AMOUNT REC"D: 60G,120G,250G
STORAGE LOC: S137
LOT COMMENTS: Metals: CRDL standard required +/-25%
MATRIX: SOLID
SAMPLE ID: B12ML4-A 2/27/02
QC PACKAGE: Report
SAMPLE COMMENTS:

QUOTE/SAR #: 43018
LAB ID: F-1H310250-002
WORK ORDER: EJXPV
RECEIVING DATE: 8/31/01
SAMPLING DATE: 8/26/01
ANALYTICAL DUE DATE: 10/01/01N
REPORT DUE DATE: 10/15/01
PRIORITY: 30
SAMPLING TIME: 23:45
RECEIVING TIME: 9:20
SDG# :

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Phosphate as P, Ortho (300.0, Ion Chroma LEACHATE, DI (Routine) (A-82-DO-01) EJXPV-1-AU Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/03/01	12/05/01
Nitrogen, Ammonia (350.1, Automated) LEACHATE, DI (Routine) (A-82-VM-01) EJXPV-1-AV Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/23/01
Nitrate-Nitrite (353.1) LEACHATE, DI (Routine) -> REDUCTION (A-0R-HN-01) EJXPV-1-AW Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/23/01	9/23/01
Cyanide, Total (9010) DISTILLATION, MICRO/MIDI - Acid (A-06-RV-01) EJXPV-1-AX Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/09/01
pH (9045) - Non-Aqueous LEACHATE, DI (Routine) (A-82-FK-01) EJXPV-1-A0 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	8/28/01
Carbon, Total Organic "TOC" (9060) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-FM-01) EJXPV-1-A1 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/23/01

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/04/01
Page 1 CLIENT ANALYSIS SUMMARY Time: 8:50:22
STL St. Louis User Id.: WARDM

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H310250-003
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJXP7
REPORT TO: Joan Kessner RECEIVING DATE: 8/31/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/27/01
SITE: B01-058 ANALYTICAL DUE DATE: 10/01/01N
AMOUNT REC"D: 60G,120G,250G REPORT DUE DATE: 10/15/01
STORAGE LOC: S137 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 1:15
MATRIX: SOLID RECEIVING TIME: 9:20
SAMPLE ID: B12ML5-A D Ayres
QC PACKAGE: Report 2/28/02 SDG# :
SAMPLE COMMENTS:

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B) METALS, TOTAL - Soils M6010_S AG,CD,CR,CU,NI,PB (A-46-QO-01) EJXP7 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	2/23/02
Mercury in Solids by Modified 7470A METALS, TOTAL (Method Exclusive) - Solids M7470A_S HG (A-70-0G-01) EJXP7 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/24/01	9/24/01
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EJXP7-1-AM Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	12/04/01
Chloride (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-CX-01) EJXP7-1-AN Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	1/01/02
Fluoride (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-C8-01) EJXP7-1-AP Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	1/01/02
Nitrate as N (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-C9-01) EJXP7-1-AQ Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	12/06/01
Nitrite as N (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-GO-01) EJXP7-1-AR Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	12/06/01
Sulfate (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-CY-01) EJXP7-1-AT Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	1/01/02

St. Louis

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/04/01
Page 2 CLIENT ANALYSIS SUMMARY Time: 8:50:22
STL St. Louis User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H310250-003
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJXP7
REPORT TO: Joan Kessner RECEIVING DATE: 8/31/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/27/01
SITE: B01-058 ANALYTICAL DUE DATE: 10/01/01N
AMOUNT REC"D: 60G,120G,250G REPORT DUE DATE: 10/15/01
STORAGE LOC: S137 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 1:15
MATRIX: SOLID RECEIVING TIME: 9:20
SAMPLE ID: B12MLS-A D Hayes 02/28/02
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Phosphate as P, Ortho (300.0, Ion Chroma LEACHATE, DI (Routine) (A-82-DO-01) EJXP7-1-AU Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	12/06/01
Nitrogen, Ammonia (350.1, Automated) LEACHATE, DI (Routine) (A-82-VM-01) EJXP7-1-AV Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/24/01
Nitrate-Nitrite (353.1) LEACHATE, DI (Routine) -> REDUCTION (A-0R-HN-01) EJXP7-1-AW Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/24/01	9/24/01
Cyanide, Total (9010) DISTILLATION, MICRO/MIDI - Acid (A-06-RV-01) EJXP7-1-AX Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/10/01
pH (9045) - Non-Aqueous LEACHATE, DI (Routine) (A-82-FK-01) EJXP7-1-A0 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	8/29/01
Carbon, Total Organic "TOC" (9060) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-FM-01) EJXP7-1-A1 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/24/01

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 9/04/01
Time: 8:50:22
User Id.: WARDM

CLIENT: 127642 BECHTEL HANFORD, INC.
PROJECT MANAGER: MARTI WARD
PROJECT #: 200-TW-1&2SOIL
REPORT TO: Joan Kessner
P.O. NUMBER: MRC-SBB-A-19981
SITE: B01-058
AMOUNT REC"D: 60G,120G,250G
STORAGE LOC: S137
LOT COMMENTS: Metals: CRDL standard required +/-25%
MATRIX: SOLID
SAMPLE ID: B12ML6-A
QC PACKAGE: Report
SAMPLE COMMENTS:

QUOTE/SAR #: 43018
LAB ID: F-1H310250-004
WORK ORDER: EJXQC
RECEIVING DATE: 8/31/01
SAMPLING DATE: 8/27/01
ANALYTICAL DUE DATE: 10/01/01N
REPORT DUE DATE: 10/15/01
PRIORITY: 30
SAMPLING TIME: 4:30
RECEIVING TIME: 9:20
SDG# :

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Inductively Coupled Plasma (6010B) METALS, TOTAL - Soils M6010_S AG,CD,CR,CU,NI,PB (A-46-QO-01) EJXQC Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	2/23/02
Mercury in Solids by Modified 7470A METALS, TOTAL (Method Exclusive) - Solids M7470A_S HG (A-70-0G-01) EJXQC Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/24/01	9/24/01
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EJXQC-1-AM Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	12/04/01
Chloride (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-CX-01) EJXQC-1-AN Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	1/01/02
Fluoride (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-C8-01) EJXQC-1-AP Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	1/01/02
Nitrate as N (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-C9-01) EJXQC-1-AQ Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	12/06/01
Nitrite as N (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-GO-01) EJXQC-1-AR Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	12/06/01
Sulfate (300.0, Ion Chromatography) LEACHATE, DI (Routine) (A-82-CY-01) EJXQC-1-AT Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	1/01/02

PSL20300 SEVERN TRENT LABORATORIES, INC Run Date: 9/04/01
Page 2 CLIENT ANALYSIS SUMMARY Time: 8:50:22
STL St. Louis User Id.: CLARKEJ

CLIENT: 127642 BECHTEL HANFORD, INC. QUOTE/SAR #: 43018
PROJECT MANAGER: MARTI WARD LAB ID: F-1H310250-004
PROJECT #: 200-TW-1&2SOIL WORK ORDER: EJXQC
REPORT TO: Joan Kessner RECEIVING DATE: 8/31/01
P.O. NUMBER: MRC-SBB-A-19981 SAMPLING DATE: 8/27/01
SITE: B01-058 ANALYTICAL DUE DATE: 10/01/01N
AMOUNT REC"D: 60G,120G,250G REPORT DUE DATE: 10/15/01
STORAGE LOC: S137 PRIORITY: 30
LOT COMMENTS: Metals: CRDL standard required +/-25% SAMPLING TIME: 4:30
MATRIX: SOLID RECEIVING TIME: 9:20
SAMPLE ID: B12ML6-A
QC PACKAGE: Report SDG# :
SAMPLE COMMENTS:

DAyes 2/28/02

Beginning Depth: .00 **Ending Depth:** .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Phosphate as P, Ortho (300.0, Ion Chroma LEACHATE, DI (Routine) (A-82-DO-01) EJXQC-1-AU Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	12/04/01	12/06/01
Nitrogen, Ammonia (350.1, Automated) LEACHATE, DI (Routine) (A-82-VM-01) EJXQC-1-AV Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/24/01
Nitrate-Nitrite (353.1) LEACHATE, DI (Routine) -> REDUCTION (A-0R-HN-01) EJXQC-1-AW Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	9/24/01	9/24/01
Cyanide, Total (9010) DISTILLATION, MICRO/MIDI - Acid (A-06-RV-01) EJXQC-1-AX Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/10/01
pH (9045) - Non-Aqueous LEACHATE, DI (Routine) (A-82-FK-01) EJXQC-1-A0 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	8/29/01
Carbon, Total Organic "TOC" (9060) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-FM-01) EJXQC-1-A1 Protocol: A QC Program: STANDARD TEST SET	06	9/04/01	0/00/00	9/24/01

L St. Louis

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-058-252	Page 1 of 1

Collector: Thomas G./Watson D.	Company Contact: Todd, M.E. — Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E	SAF No.: B01-058	Air Quality ☐
Ice Chest No.: ERC-01-026	Field Logbook No.: EL-1518-1 — COA: B20TW2A44C ~~B20TW2674C~~ JT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: A010288 8/28/01	Bill of Lading/Air Bill No.: 42357954 6965	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radiological. Field Instruments Reading background
Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196 DJW 08/28/01	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions. DJW 08/28/01	See item (4) in Special Instructions.	Activity Scan DJW 08/28/01	ME TO	
Sample No. / Matrix * / Sample Date / Sample Time										
B12ML7 / SOIL / 08/28/01 / 0100	X	X		X					B12MK4	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Greg Thomas / Greg Thomas	0500 8/28/01	Ref 1B 3728 8/28/01	0500
Ref 1B 3728 8:30 01	0930	R Thoro 8-30-01	0930
R Thoro 8:30 01	0930	FED EX	
FED EX			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH Diesel Range - WTPH-D
(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 – Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 8/28/01. Collector not available to relinquish samples on 8/30/01 for shipment.

Matrix *: S=Soil; SS=Sediment; SO=Solid; SL=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: [signature]	Title: RT 8.30.01	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

OT # F2B160152

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9635 Sample Date & Time 8/28/01 0100

Project ID: 200E B-7A SAF Number: B01-058 Date Analyzed 8/29/01 8:49:3

Sample ID: B12MK4

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)	MDC (pCi/g)
K-40		2.5E+01	+/-	9.2E+00	5.9E+00
Co-60	<	5.3E-01			5.3E-01
Cs-137		1.4E+01	+/-	2.6E+00	6.4E-01
Eu-152	<	1.8E+00			1.8E+00
Eu-154	<	2.1E+00			2.1E+00
Eu-155	<	1.6E+00			1.6E+00
Tl-208	<	1.5E+00			1.5E+00
Pb-212	<	6.7E+00			6.7E+00
Bi-214		4.4E+00	+/-	2.4E+00	3.1E+00
Pb-214		4.4E+00	+/-	1.3E+00	1.4E+00
Ra-226	<	8.4E+00			8.4E+00
Ac-228	<	1.7E+00			1.7E+00
Pa-234	<	1.1E+00			1.1E+00
Th-234	<	6.7E+00			6.7E+00
U-235		2.8E+00	+/-	1.8E+00	2.8E+00
Am-241	<	9.2E-01			9.2E-01

TIETO
B12MC

Total GEA (pCi/g)	5.1E+01	+/-	1.7E+01

	Activity (pCi/g)		Error (pCi/g)	Alpha MDC (pCi/g)	Beta MDC (pCi/g)
Gross Alpha**	1.8E+00	+/-	5.7E-01	7.7E-01	
Gross Beta	5.6E+01	+/-	2.7E+00		3.0E+01

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDC = Less than detection limit.
All GEA results reported as "<" for the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDC GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst C. W. Landes 8/29/01

Report To	Fax
CS Cearlock	372-9292
SJ Tiese	372-9292
Joan Kessner	372-9487

Report Printed: Wednesday, August 29, 2001

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-249	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	
Ice Chest No.: VIKING S/N 08/98050012	Field Logbook No.: EL-1518-1	COA: B20TW2A44C ~~B20TW2674C~~ GT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 107053 8/27/01		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

1500mR β, 800cpm γ, 100mR β } ON CONTACT

Samples stored in Ref. #TW1 at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8.30.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan		
			05W 08/15/01			05W 08/15/01		05W 08/15/01	Tie to	

Sample No.	Matrix *	Sample Date	Sample Time									
B12ML4 - A Dayres 2/28/02	SOIL	8/26/01	2345	X	X		X					B12MK1

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: DJ WATSON/[signature]	Date/Time: 08/27/01 0645	Received By/Stored In: REF. TW1&2	Date/Time: 08/27/01 0645
Relinquished By/Removed From: Ref TW1&2	Date/Time: 0330 8.30.01	Received By/Stored In: K M Thorer	Date/Time: 0330 8.30.01
Relinquished By/Removed From: K M Thorer	Date/Time: 0500 8.30.01	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add-On) {Thiodyl phosphate}; TPH Diesel Range - WTPH-D~~
~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H2; Isotopic Uranium~~

07 08/15/01

Matrix *: S=Soil; SB=Sediment; SO=Solid; SL=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: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

(2)

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9609

Sample Date & Time 8/26/01 2345

Project ID: 200E B-7A **SAF Number:** B01-058 **Date Analyzed** 8/27/01 11:44:

Sample ID: B12MK1

Gamma Energy Analysis

Nuclide		Activity (pCi/g) EA		Error (pCi/g) EA	MDC (pCi/g) EA
K-40	<	2.0E+03			2.0E+03
Co-60	<	2.7E+02			2.7E+02
Cs-137		5.7E+05	+/-	1.1E+05	1.1E+03
Eu-152	<	3.8E+03			3.8E+03
Eu-154	<	7.6E+02			7.6E+02
Eu-155	<	6.1E+03			6.1E+03
Tl-208	<	2.5E+03			2.5E+03
Pb-212	<	1.7E+04			1.7E+04
Bi-214	<	2.4E+03			2.4E+03
Pb-214	<	2.7E+03			2.7E+03
Ra-226	<	3.5E+04			3.5E+04
Ac-228	<	1.4E+03			1.4E+03
Pa-234	<	5.1E+03			5.1E+03
Th-234	<	3.4E+04			3.4E+04
U-235	<	1.1E+04			1.1E+04
Am-241	<	4.0E+03			4.0E+03

QUALITATIVE ONLY
DUE TO HIGH DEAD TIME
SAMPLE COUNTED
3" ABOVE DETECTOR

GH
8/28/01

TIE TO B12MC4

ADD ON:
Am = 4X10^3
Pu239 = 1X10^4 EA
Sr-90 = 6X10^5

Total GEA (pCi/g)		5.7E+05	+/-	1.1E+05

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = L
All GEA results reported as "<" list the Minimum Dete
Rounding error may result in the reported total GEA ac

For soils and natural samples, the following ap

The analysis of U-238 is based on the activity of Pa-23
The analysis of Np-237 is based on the activity of Pa-2
U-238dau is the activity of Pb-214 and Bi-214, short li
probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-20
products may not exist in disturbed materials.
Other samples, not containing natural materials, may h
must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass ab
No peaks for this radionuclide were visible above bac

SAMPLE VOLUME
40g

pCi/g
Conversion

Cs-137 = 1.4E+04 pCi/g
Am-241 = 1.0E+02 pCi/g
Pu239 = 2.5E+02 pCi/g
Sr90 = 1.5E+04 pCi/g

Analyst G. L. Hastings

Report Printed: Tuesday, August 28, 2001

SJ Trent 372-9292
Joan Kasmer 372-9487

St. Louis

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-250	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	Air Quality ☐
Ice Chest No.: VIKING S/N 08 98 050012	Field Logbook No.: EL-1518-1	COA: B20TW2A44C ~~B20TW2674C~~ AT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 10705 8/27/01		Bill of Lading/Air Bill No.: NA	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD RADIOLOGICAL INSTRUMENTS INDICATE
100 cpm α
20 mR β } ON CONTACT
<0.5 mR γ

Samples stored in Ref.# TW1&2 at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8.30.01 SIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196 DJW 08/15/01	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions. DJW 08/26/01	See item (4) in Special Instructions.	Activity Scan DJW 08/15/01	Tic to	

Sample No.	Matrix *	Sample Date	Sample Time										
(3) B12ML5 - A	SOIL	8/27/01	0115	X	X		X					B12MK2	
Dayres													
2/28/02													

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: DS WATSON / [signature]	Date/Time: 08/27/01 0645	Received By/Stored In: REF. TW1&2	Date/Time: 08/27/01 0645
Relinquished By/Removed From: Ref TW1&2	Date/Time: 0330 8.30.01	Received By/Stored In: R Thorell	Date/Time: 0330 8.30.01
Relinquished By/Removed From: R Thorell	Date/Time: 0500 8.30.01	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH Diesel Range - WTPH-D~~
~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium, Isotopic Thorium {Thorium-232}, Americium-241; Carbon-14, Neptunium-237, Nickel-63, Strontium-89,90 - Total Sr, Technetium-99, Total Uranium, Tritium - H2; Isotopic Uranium~~ DJW 08/15/01

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=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: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

ERC Radiological Counting Facility Analysis Report

(3)

RCF Number RCF9610 Sample Date & Time 8/27/01 0115

Project ID: 200E B-7A SAF Number: B01-058 Date Analyzed 8/28/01 8:33:2

Sample ID: B12MK2

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)	MDC (pCi/g)
K-40		9.6E+02	+/-	4.3E+02	3.7E+02
Co-60	<	6.0E+01			6.0E+01
Cs-137		2.7E+05	+/-	4.6E+04	2.2E+02
Eu-152	<	9.0E+02			9.0E+02
Eu-154	<	1.7E+02			1.7E+02
Eu-155	<	1.1E+03			1.1E+03
Tl-208	<	6.3E+02			6.3E+02
Pb-212	<	3.7E+03			3.7E+03
Bi-214	<	5.6E+02			5.6E+02
Pb-214	<	6.5E+02			6.5E+02
Ra-226	<	6.9E+03			6.9E+03
Ac-228	<	3.8E+02			3.8E+02
Pa-234	<	8.7E+02			8.7E+02
Th-234	<	7.4E+03			7.4E+03
U-235	<	1.9E+03			1.9E+03
Am-241		1.2E+03	+/-	4.6E+02	7.3E+02

ADD ON:
Sr^{90} - 3 X 10^5

Pa^{239} = 6 X 10^3

TIETO

B12MLS

Total GEA (pCi/g)	2.7E+05	+/-	4.7E+04

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
† No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst [signature] 8/28/01
G. L. Hastings

Report Printed: Tuesday, August 28, 2001

Report To	Fax
CS Cearlock	372-9292
SJ Trent	372-9292
Joan Kessner	372-9487

LOT # F2B160152

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-058-251	Page 1 of 1
Collector: Thomas G./Watson D.	Company Contact: Todd, M.E.	Telephone No.: (509) 372-9631	Project Coordinator: TRENT, SJ	Price Code: 8N; Air Quality ☐; Data Turnaround: 45 Days
Project Designation: 200-TW-1 & 2 - Soil Sampling	Sampling Location: B-7A/200 E		SAF No.: B01-058	
Ice Chest No.: Viking S/N 08/98 0500	Field Logbook No.: EL-1518-1	COA: B20TW2A44C ~~B20TW2674C~~ KT	Method of Shipment: Fed EX	
Shipped To: Severn Trent Incorporated - ST. LOUIS	Offsite Property No.: RSR 107053 8/27/01		Bill of Lading/Air Bill No.: WA	

POSSIBLE SAMPLE HAZARDS/REMARKS
FIELD RADIOLOGICAL INSTRUMENTS INDICATE
20cpm/d
1mR/d } ON CONTACT
<0.5mR/d

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 8/30/01 for shipment. RT 8.30.01

SAMPLE ANALYSIS

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	60mL	60mL	250mL	60mL	250mL	250mL	60mL		
	See item (1) in Special Instructions.	Mercury - 7470 - (CV)	Chromium Hex - 7196	See item (2) in Special Instructions.	VOA - 8260A (TCL)	See item (3) in Special Instructions.	See item (4) in Special Instructions.	Activity Scan	TIE	TO

Sample No.	Matrix *	Sample Date	Sample Time										
B12ML6 - A Dayer 2/28/02	SOIL	8/27/01	0430	X	X		X					B12MK3	

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: DB WATSON/[signature]	Date/Time: 08/27/01 0745	Received By/Stored In: REF. 1B	Date/Time: 08/27/01 0745
Relinquished By/Removed From: Ref 1B 3728	Date/Time: 0430 8.30.01	Received By/Stored In: R. Thorer	Date/Time: 0430 8.30.01
Relinquished By/Removed From: R. Thorer	Date/Time: 0500 8.30.01	Received By/Stored In: FED EX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Lead}
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D~~
~~(4) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

10/5/01 [initials]

Matrix *
S=Soil
SD=Sediment
SO=Solid
SI=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: [signature]	Title	Date/Time: 08-31-01 / 0920
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

ERC Radiological Counting Facility Analysis Report

RCF Number RCF9611

Sample Date & Time 8/27/01 0430

Project ID: 200E B-7A SAF Number: B01-058

Date Analyzed 8/27/01 12:42:

Sample ID: B12MK3

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)	MDC (pCi/g)
K-40		1.1E+01	+/-	1.0E+01	9.0E+00
Co-60	<	9.5E-01			9.5E-01
Cs-137		9.0E+03	+/-	1.5E+03	5.1E+00
Eu-152	<	2.5E+01			2.5E+01
Eu-154	<	3.5E+00			3.5E+00
Eu-155	<	1.3E+01			1.3E+01
Tl-208	<	1.5E+01			1.5E+01
Pb-212	<	9.5E+01			9.5E+01
Pb-214	<	1.8E+01			1.8E+01
Bi-214	<	7.5E+00			7.5E+00
Pa-234	<	1.1E+01			1.1E+01
Th-234	<	6.4E+01			6.4E+01
U-235	<	3.2E+01			3.2E+01
Am-241	<	8.6E+00			8.6E+00

ADDON

Sr 90 1.2 X 10^4

TIETO

B12MC6

Total GEA (pCi/g)	9.0E+03	+/-	1.5E+03

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	3.9E+01	+/-	2.2E+00
Gross Beta	2.5E+03	+/-	4.6E+01

Alpha MDC (pCi/g)	Beta MDC (pCi/g)
1.4E+01	1.3E+03

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDC = Less than detection limit.
All GEA results reported as "<" list the Minimum Detectable Concentration (MDC) value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDC GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion
No peaks for this radionuclide were visible above background in the spectrum. The result was reported as less than MDC.

Analyst [signature] 8/28/01
G.L. Hastings

Report To	Fax
CS Cearlock	372-9292
SJ Treat	372-9292
Joan Kessner	372-9487

Report Printed: Tuesday, August 28, 2001

SEVERN TRENT SERVICES

Lot No.:_____

Condition Upon Receipt Form
St. Louis Laboratory

Client: Bechtel Hanford

Date: 08-31-01 Time: 0920

Quote No: 43018

Initiated by: [signature]

Shipper/No: FedEx 4235 7954 6965

COC/RFA Numbers: B01-058-252

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	Y N	Sample received in undamaged condition.	5.	Y N	Sample volume sufficient for analysis.
2.	Y N	Sample received within 4°C ± 2°C*	6.	Y N	Sample received with Chain of Custody.
		Record temperature: 5	7.	Y N	Chain of Custody matches sample IDs on containers.
3.	Y N N/A	Sample received with proper pH**.	8.	Y N	Custody seal received intact and tamper evident on cooler.
4.	Y N	Sample received in proper containers.	9.	Y N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Tinet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes:

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: [signature] Date: 08-31-01

Project Management Review: [signature] Date: 9.4.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

SEVERN TRENT SERVICES

Lot No.: F1H310250

Condition Upon Receipt Form
St. Louis Laboratory

Client: Hanford

Date: 083101 Time: 0920

Quote No: 43018

Initiated by: [illegible]

Shipper/No: 4476546152 Fed Ex

COC/RFA Numbers: BOI-058-249 -250 -251

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1.	Y N	Sample received in undamaged condition.	5.	Y N	Sample volume sufficient for analysis.
2.	Y N	Sample received within 4°C ± 2°C*	6.	Y N	Sample received with Chain of Custody.
		Record temperature: 18°	7.	Y N	Chain of Custody matches sample IDs on containers.
3.	Y N N/A	Sample received with proper pH**.	8.	Y N	Custody seal received intact and tamper evident on cooler.
4.	Y N	Sample received in proper containers.	9.	Y N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Tinet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes:

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: Jill Clarke Date: 083101

Project Management Review: MWard Date: 9.4.01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM

METALS

BECHTEL HANFORD, INC.

Client Sample ID: B12C89-B

TCLP Metals

Lot-Sample #...: F2B160152-001 **Matrix.....:** SOLID
Date Sampled...: 08/23/01 **Date Received..:** 02/14/02
Leach Date.....: 02/19/02 **Leach Batch #..:** P205011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2051346						
Chromium	23.8 B	250	ug/L	SW846 6010B	02/20-02/21/02	ET8X21AA
		Dilution Factor: 2.5		MDL.....: 0.33		
Lead	79.6 B,J	250	ug/L	SW846 6010B	02/20-02/21/02	ET8X21AC
		Dilution Factor: 2.5		MDL.....: 1.6		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B *Estimated result. Result is less than RL.*

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BECHTEL HANFORD, INC.

Client Sample ID: B12DC1-A

TCLP Metals

Lot-Sample #...: F2B160152-002 Matrix.....: SOLID
Date Sampled...: 08/24/01 Date Received..: 02/14/02
Leach Date.....: 02/19/02 Leach Batch #..: P205011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2051346						
Lead	23.0 B,J	250	ug/L	SW846 6010B	02/20-02/21/02	ET9DX1AA
		Dilution Factor: 2.5		MDL.....: 1.6		

NOTE(S):

Analysis performed in accordance with USEPA Toxicky Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

BECHTEL HANFORD, INC.

Client Sample ID: B12ML~~1-4A~~ 4-A Dayes 2/27/02

TCLP Metals

Lot-Sample #...: F2B160152-003 Matrix.....: SOLID
Date Sampled...: 08/26/01 Date Received..: 02/14/02
Leach Date.....: 02/19/02 Leach Batch #..: P205011

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2051346						
Lead	46.1 B,J	250	ug/L	SW846 6010B	02/20-02/21/02	ET9D21AA
		Dilution Factor: 2.5		MDL.....: 1.6		

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

METHOD BLANK REPORT

TCLP Metals

Client Lot #...: F2B160152 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: F2B190000-315 **Prep Batch #...:** 2051346						
Leach Date.....: 02/19/02 **Leach Batch #..:** P205011						
Chromium	ND	250	ug/L	SW846 6010B	02/20-02/21/02	EVA361AF
		Dilution Factor: 2.5				
Lead	**27.0 B**	**250**	**ug/L**	**SW846 6010B**	**02/20-02/21/02**	**EVA361AG**
		Dilution Factor: 2.5				

NOTE(S):

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

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

TCLP Metals

Client Lot #...: F2B160152 **Matrix.....:** SOLID

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: F2B200000-346 **Prep Batch #...:** 2051346							
Chromium	2500	2430	ug/L	97	SW846 6010B	02/20-02/21/02	EVDHT1AE
			Dilution Factor: 2.5				
Lead	2500	2540	ug/L	102	SW846 6010B	02/20-02/21/02	EVDHT1AF
			Dilution Factor: 2.5				

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

TCLP Metals

Client Lot #...: F2B160152 **Matrix.....:** SOLID
Date Sampled...: 02/14/02 **Date Received..:** 02/15/02

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F2B180140-001 **Prep Batch #...:** 2051346									
Leach Date.....: 02/19/02 **Leach Batch #..:** P205011									
Chromium									
	1.3	12500	11200	ug/L	90		SW846 6010B	02/20-02/21/02	ET9NA1AV
	1.3	12500	11400	ug/L	91	1.7	SW846 6010B	02/20-02/21/02	ET9NA1AW
			Dilution Factor: 2.5						
Lead									
	29.9	12500	11900	ug/L	95		SW846 6010B	02/20-02/21/02	ET9NA1AX
	29.9	12500	12100	ug/L	97	1.8	SW846 6010B	02/20-02/21/02	ET9NA1A0
			Dilution Factor: 2.5						

NOTE(S):

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

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	**4. Page**
200-TW 1&2	Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No.: H03587	200 TW-1&2 - Soil Sampling	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional) — Date — Reviewer/Point of Contact — Author/Originator

Date 02/11/02 — 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	General Chemistry, page 21 and Inorganic Page 27, CoC for sample B12C89A is for Radiological Counting Facility samples not Severn Trent.		✓ ~~correct~~ correct	
2	General Chemistry Page 28 and Inorganic Page 35, Lab's CUR indicates that there was problems with the custody seals upon receipt at the lab. The validation report should describe the problem and what effect it will have on the validity of the associated data.		~~Wrong correct~~ (corrected per RW instruction) correct	✓
3	Inorganic: Page 01 indicates that all samples were analyzed for metals specified by Note 1; whereas, page 10 and lab results indicate 5 of the 6 samples were analyzed per note 2 only. Also Page 01 indicates none of the samples were analyzed for TCLP lead; whereas, page 11 and lab results indicate samples B12C89-B, B12DC1-A, and B12ML4-A were analyzed for TCLP lead.		~~Correct~~ pg 01 indicates sa B12C89-B was analyzed per Note 1 whereas, page 10 & lab indicates Note 2 only. 2/11/02	
4	General Chemistry and Inorganic Page 2, Holding Time section heading should be titled Holding Time/Preservation, since it also addresses the preservation problem.		✓ Inorganic - correct; wet chem - correct	
5	Inorganic: Page 03, Precision needs to designate that matrix spike duplicate RPD for Cr exceeded the 35% limit for samples B12C89-B and B12DC1-A. Page 46(7) indicates the RPD for Cr was 51% for prep batch 1247187.		✓ correct	

MAR 21 '02 03:21PM BHI S&D MANAGEMENT 509 372 9487 P.3/5

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	**4. Page**
200-TW 1&2	Page 2 of 2

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
6	General Chemistry: Page 11, sample B12ML4-A, TOC indicates result to be 30.5; however, the lab results show 541.	✓	Corrected	
7	General Chemistry: Precision , bottom of paragraph indicates aqueous RPD to be <35%. This should be <20%; although, aqueous samples should not be addressed since all the samples are nonaqueous.	✓	Corrected	
8	Radiochemistry: Page 10 should have the TDL for Cr-VI, 0.5, and designate that the units are mg/kg.	✓	Corrected	
9	Radiochemistry: This package also contains results for Cr-VI. The narratives for the *various* sections, i.e., holding times, need to address the Cr-VI.	✓	Corrected	

FAX: (509) 372-9487

facsimile transmittal

To: Bruce Christian Fax:

From: Jeanette Duncan Date: 04-09-02

Re: W03587 Pages:

CC:

Bruce -

Still have the attached comments to disposition on W03587. Claude is still not happy with item 3 and Rich's email is attached explaining his open issue. Please disposition these open items.

Jeanette

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	**4. Page**
200-TW 1&2	Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No.: H03587	200 TW-1&2 - Soil Sampling	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	General Chemistry, page 21 and Inorganic Page 27, CoC for sample B12C89A is for Radiological Counting Facility samples not Severn Trent.		✓ ~~correct~~ correct	
2	General Chemistry Page 28 and Inorganic Page 35, Lab's CUR indicates that there was problems with the custody seals upon receipt at the lab. The validation report should describe the problem and what effect it will have on the validity of the associated data.		~~Wrong correct~~ (Corrected per RW instructions) correct	✓
3	Inorganic: Page 01 indicates that all samples were analyzed for metals specified by Note 1; whereas, page 10 and lab results indicate 5 of the 6 samples were analyzed per note 2 only. Also Page 01 indicates none of the samples were analyzed for TCLP lead; whereas, page 11 and lab results indicate samples B12C89-B, B12DC1-A, and B12ML4-A were analyzed for TCLP lead.		Correct — pg 01 indicates sa B12C89-B was analyzed per Note whereas, page 10 & lab indicates Note 2 only.	
4	General Chemistry and Inorganic Page 2, Holding Time section heading should be titled Holding Time/Preservation, since it also addresses the preservation problem.		✓ Inorganic - correct; Wet chem - correct	
5	Inorganic: Page 03, Precision needs to designate that matrix spike duplicate RPD for Cr exceeded the 35% limit for samples B12C89-B and B12DC1-A. Page 46(7) indicates the RPD for Cr was 51% for prep batch 1247187.		✓ Correct	

MAR 21 '02 03:21PM BHI S&D MANAGEMENT 509 372 9487 P.3/5

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	**4. Page**
200-TW 1&2	Page 2 of 2

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
6	General Chemistry: Page 11, sample B12ML4-A, TOC indicates result to be 30.5; however, the lab results show 54).	✓	Corrected	
7	General Chemistry: Precision , bottom of paragraph indicates aqueous RPD to be <35%. This should be <20%; although, aqueous samples should not be addressed since all the samples are nonaqueous.	✓	Corrected	
8	Radiochemistry: Page 10 should have the TDL for Cr-VI, 0.5, and designate that the units are mg/kg.	✓	Corrected	
9	Radiochemistry: This package also contains results for Cr-VI. The narratives for the various sections, i.e., holding times, need to address the Cr-VI.	✓	Corrected	

Duncan, Jeanette M

From: Fukumoto, Joyce A
Sent: Thursday, April 04, 2002 12:40 PM
To: Duncan, Jeanette M
Subject: FW: Validation Package SDG W03587 Validator Response

-----Original Message-----
From: Weiss, Richard L
Sent: Thursday, April 04, 2002 11:58 AM
To: Fukumoto, Joyce A
Subject: RE: Validation Package SDG W03587 Validator Response

Joyce,

The validator response to bullets 1 & 3 below are acceptable. Regarding bullet 2 (bolded), the SDR directs the validator to apply a "J" qualifier to all nitrate, nitrite, and phosphate results. This was not done for Nitrite analyses. It the validator needs to discuss this, have him call me please.

Rich

-----Original Message-----
From: **Weiss, Richard L**
Sent: Wednesday, March 20, 2002 2:28 PM
To: Fukumoto, Joyce A
Subject: Validation Package Comments for SDG W03587

Joyce,

Here are my comments from review of the validation packages for SDG W03587:

Radiochemistry - No Comments

- Inorganic - Due to an oversight, The MS/MSD data for prep batch 1254213 was not provided initially. The prep batch date has been obtained and transmitted to the validator. Please revise validation using provided information.
- **Wet chem - Validation direction from the SAF regarding short hold-time analytes determined using IC method 300.0 is being revised. An SDR is being generated and will be provided to the validator on issuance. Please revise validation documentation based on direction in the SDR.**
- Pg 3, 4, 9 & 11; Matrix spike recoveries below 30% require application of "R" qualifier to any non-detect results. Total cyanide result (ND) was incorrectly qualified (J) for sample B12ML4-A. Revise validation documentation to reflect application of "R" qualifier to this sample analyte.

Let me know if you have any questions.

Rich

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Wednesday, April 10, 2002 9:58 AM
To: 'bchristian@techlawinc.com'
Cc: Duncan, Jeanette M
Subject: Clarification for Valdation of Anions for SDG W03587

Bruce,

This is clarification for the SDR (B02-084)generated for the anion validation for SDG W03587. Do not validate the results for Nitrate, Nitrite, and Phosphate analyzed by method 300.0. Apply a "J" qualifier to those results and note actual analytical hold-times achieved by the laboratory in the validation case narrative.

Let me know if you need anything else.

Rich

FAX: (509) 372-9487

facsimile transmittal

To: Bruce Christian Fax:

From: Joyce Fukumoto Date: 3-21-02

Re: W03587 Pages: 4

CC:

Fukumoto, Joyce A

From: Weiss, Richard L
Sent: Wednesday, March 20, 2002 2:28 PM
To: Fukumoto, Joyce A
Subject: Validation Package Comments for SDG W03587

Joyce,

Here are my comments from review of the validation packages for SDG W03587:

Radiochemistry - No Comments

Inorganic - Due to an oversight, The MS/MSD data for prep batch 1254213 was not provided initially. The prep batch date has been obtained and transmitted to the validator. Please revise validation using provided information.

Wet chem - Validation direction from the SAF regarding short hold-time analytes determined using IC method 300.0 is being revised. An SDR is being generated and will be provided to the validator on issuance. Please revise validation documentation based on direction in the SDR.

Pg 3, 4, 9 & 11; Matrix spike recoveries below 30% require application of "R" qualifier to any non-detect results. Total cyanide result (ND) was incorrectly qualified (J) for sample B12ML4-A. Revise validation documentation to reflect application of "R" qualifier to this sample analyte.

Let me know if you have any questions.

Rich

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	4. Page
200-TW 1&2	Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No.: H03587	200 TW-1&2 - Soil Sampling	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	General Chemistry, page 21 and Inorganic Page 27, CoC for sample B12C89A is for Radiological Counting Facility samples not Severn Trent.			
2	General Chemistry Page 28 and Inorganic Page 35, Lab's CUR indicates that there was problems with the custody seals upon receipt at the lab. The validation report should describe the problem and what effect it will have on the validity of the associated data.			
3	Inorganic: Page 01 indicates that all samples were analyzed for metals specified by Note 1; whereas, page 10 and lab results indicate 5 of the 6 samples were analyzed per note 2 only. Also Page 01 indicates none of the samples were analyzed for TCLP lead; whereas, page 11 and lab results indicate samples B12C89-B, B12DC1-A, and B12ML4-A were analyzed for TCLP lead.			
4	General Chemistry and Inorganic Page 2, Holding Time section heading should be titled Holding Time/Preservation, since it also addresses the preservation problem.			
5	Inorganic: Page 03, Precision needs to designate that matrix spike duplicate RPD for Cr exceeded the 35% limit for samples B12C89-B and B12DC1-A. Page 46(?) indicates the RPD for Cr was 51% for prep batch 1247187.			

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	4. Page
200-TW 1&2	Page 2 of 2

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
6	General Chemistry: Page 11, sample B12ML4-A, TOC indicates result to be 30.5; however, the lab results show 541.			
7	General Chemistry: Precision , bottom of paragraph indicates aqueous RPD to be <35%. This should be <20%; although, aqueous samples should not be addressed since all the samples are nonaqueous.			
8	Radiochemistry: Page 10 should have the TDL for Cr-VI, 0.5, and designate that the units are mg/kg.			
9	Radiochemistry: This package also contains results for Cr-VI. The narratives for the various sections, i.e., holding times, need to address the Cr-VI.			

SDR # B02-084
Revision #: 0
Date Initiated: 3/20/02

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200-TW-1 & 2 - Soil
Task ID: 1
Sampling Event: 100 B/C Effluent Pipeline & Proximity Site Remediation Activities – Other Solid

Laboratory: Severn Trent Laboratory - St. Louis

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: ~~7~~ 6 3/21/02
ID Numbers: B12C89-B, B12DC1-A, B12ML4-A, B12ML5-A, B12ML6-A, B12ML7
Matrix: Soil
Collection Date: 08/23/01 – 08/28/01

Issue Background:
Class: ☐ Project Data Use ☐ General Laboratory Direction ☒ Validation Direction ☐ Sample Management Direction

Type: Clarification of Direction

Description: Clarification of Direction For Validation of Short Holding-Time Analytes Performed by EPA Method 300.0

Disposition:

Description: The Sampling Authorization Form currently directs the data validator to not validate Nitrate results analyzed using EPA Method 300.0. This is inappropriate for the project and does not address other short hold-time analytes analyzed by Method 300.0 (Nitrite, Phosphate). Revised direction to the data validator shall be, "Due to the radiological characteristics of the samples, short hold-times for Nitrate, Nitrite, and Phosphate analysis via IC Method 300.0 cannot be met. Apply a 'J' qualifier to these results and note actual hold-time achieved in the validation case narrative."

Justification: Applied "J" qualifiers are much more appropriate for the Nitrate, Nitrite, and Phosphate results for soil samples from this project.

Approval Signatures:

S. J. Trent — 3/21/02
Project Coordinator (Print/Sign Name) — Date

M.E. Todd — 3/21/02
Task Manager (Print/Sign Name) — Date

BHI-EE-109 (02/99)

Fukumoto, Joyce A

From: Weiss, Richard L
Sent: Wednesday, March 20, 2002 2:28 PM
To: Fukumoto, Joyce A
Subject: Validation Package Comments for SDG W03587

Joyce,

Here are my comments from review of the validation packages for SDG W03587:

Radiochemistry - No Comments

report revised

Inorganic - Due to an oversight, The MS/MSD data for prep batch 1254213 was not provided initially. The prep batch date has been obtained and transmitted to the validator. Please revise validation using provided information.

Wet chem - Validation direction from the SAF regarding short hold-time analytes determined using IC method 300.0 is being revised. An SDR is being generated and will be provided to the validator on issuance. Please revise validation documentation based on direction in the SDR.

Pg 3, 4, 9 & 11; Matrix spike recoveries below 30% require application of "R" qualifier to any non-detect results. Total cyanide result (ND) was incorrectly qualified (J) for sample B12ML4-A. Revise validation documentation to reflect application of "R" qualifier to this sample analyte.

Let me know if you have any questions.

Rich

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	**4. Page**
200-TW 1&2	Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No.: H03587	200 TW-1&2 - Soil Sampling	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

Date

Reviewer/Point of Contact

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	General Chemistry, page 21 and Inorganic Page 27, CoC for sample B12C89A is for Radiological Counting Facility samples not Severn Trent.		correct [illegible] correct [illegible]	
2	General Chemistry Page 28 and Inorganic Page 35, Lab's CUR indicates that there was problems with the custody seals upon receipt at the lab. The validation report should describe the problem and what effect it will have on the validity of the associated data.		~~Inorg correct [illegible]~~ (corrected per RW instructions) correct [illegible]	✓
3	Inorganic: Page 01 indicates that all samples were analyzed for metals specified by Note 1; whereas, page 10 and lab results indicate 5 of the 6 samples were analyzed per note 2 only. Also Page 01 indicates none of the samples were analyzed for TCLP lead; whereas, page 11 and lab results indicate samples B12C89-B, B12DC1-A, and B12ML4-A were analyzed for TCLP lead.		Correct [illegible]	
4	General Chemistry and Inorganic Page 2, Holding Time section heading should be titled Holding Time/Preservation, since it also addresses the preservation problem.		Inorganic - correct [illegible] Wetch - correct [illegible]	
5	Inorganic: Page 03, Precision needs to designate that matrix spike duplicate RPD for Cr exceeded the 35% limit for samples B12C89-B and B12DC1-A. Page 46(?) indicates the RPD for Cr was 51% for prep batch 1247187.		Correct [illegible]	

Review Comment Record (RCR)

1. Date	2. Review No.
03/20/02	BHI/QA2007
3. Project	**4. Page**
200-TW 1&2	Page 2 of 2

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
6	General Chemistry: Page 11, sample B12ML4-A, TOC indicates result to be 30.5; however, the lab results show 541.		Corrected	
7	General Chemistry: Precision , bottom of paragraph indicates aqueous RPD to be <35%. *This should* be <20%; although, aqueous samples should not be addressed since all the samples are nonaqueous.		Corrected	
8	Radiochemistry: Page 10 should have the TDL for Cr-VI, 0.5, and designate that the units are mg/kg.		Corrected	
9	Radiochemistry: This package also contains results for Cr-VI. The narratives for the various sections, i.e., holding times, need to address the Cr-VI.		Corrected	

SDR # B02-084
Revision #: 0
Date Initiated: 3/20/02

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200-TW-1 & 2 - Soil
Task ID: 1
Sampling Event: 100 B/C Effluent Pipeline & Proximity Site Remediation Activities – Other Solid

Laboratory: Severn Trent Laboratory - St. Louis

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: ~~7~~ 6 3/21/02
ID Numbers: B12C89-B, B12DC1-A, B12ML4-A, B12ML5-A, B12ML6-A, B12ML7
Matrix: Soil
Collection Date: 08/23/01 – 08/28/01

Issue Background:
Class: ☐ Project Data Use ☐ General Laboratory Direction ☒ Validation Direction ☐ Sample Management Direction

Type: Clarification of Direction

Description: Clarification of Direction For Validation of Short Holding-Time Analytes Performed by EPA Method 300.0

Disposition:

Description: The Sampling Authorization Form currently directs the data validator to not validate Nitrate results analyzed using EPA Method 300.0. This is inappropriate for the project and does not address other short hold-time analytes analyzed by Method 300.0 (Nitrite, Phosphate). Revised direction to the data validator shall be, "Due to the radiological characteristics of the samples, short hold-times for Nitrate, Nitrite, and Phosphate analysis via IC Method 300.0 cannot be met. Apply a 'J' qualifier to these results and note actual hold-time achieved in the validation case narrative."

Justification: Applied "J" qualifiers are much more appropriate for the Nitrate, Nitrite, and Phosphate results for soil samples from this project.

Approval Signatures:

S. J. Trent — 3/21/02
Project Coordinator (Print/Sign Name) — Date

M.E. Todd — 3/21/02
Task Manager (Print/Sign Name) — Date

BHI-EE-109 (02/99)

FAX: (509) 372-9487

Facsimile transmittal

To: Bruce Christian Fax:

From: Joyce Fukumoto Date: 3-21-02

Re: W03587 Pages: 4

CC:

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Wednesday, March 13, 2002 1:14 PM
To: Duncan, Jeanette M
Cc: Kessner, Joan H
Subject: FW: SDG W03587 Rad Validation IR#3

This has since become a non-issue.

Rich

-----Original Message-----

From: Christian, Bruce [mailto:BChristian@TechLawInc.com] <mailto:[mailto:BChristian@TechLawInc.com]>
Sent: Tuesday, March 12, 2002 12:59 PM
To: 'Weiss, Richard L '
Subject: RE: SDG W03587 Rad Validation IR#3

I'll double check the procedure, but under level 'C' I don't calculate or check calculations, checking calculations is level 'D' or 'E'.

-----Original Message-----

From: Weiss, Richard L
To: Duncan, Jeanette M; 'bchristian@techlawinc.com'
Cc: Kessner, Joan H
Sent: 3/12/02 1:08 PM
Subject: SDG W03587 Rad Validation IR#3

Bruce,

This lab requested that they be allowed to report replicate error ratios (RER) in place of RPDs. This was granted and will be incorporated into future revisions of the SOW to the labs. I don't have a plan at this time to revise the validation procedure to incorporate RER, but probably will go that way in a year or so. In the meantime, calculate RPDs as per the validation procedure and proceed with validation. Call me if you have any questions (509-372-9592).

Rich

FAX

TECHLAW, INC.
3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 1 January 1998

Information Request #3

W03587-Radiochemistry

For the majority of the rad analytes, the lab reports a 'replicate error ratio' instead of an RPD. Did the lab calculate an RPD??

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Tuesday, March 12, 2002 10:09 AM
To: Duncan, Jeanette M; 'bchristian@techlawinc.com'
Cc: Kessner, Joan H
Subject: SDG W03587 Rad Validation IR#3

Bruce,

This lab requested that they be allowed to report replicate error ratios (RER) in place of RPDs. This was granted and will be incorporated into future revisions of the SOW to the labs. I don't have a plan at this time to revise the validation procedure to incorporate RER, but probably will go that way in a year or so. In the meantime, calculate RPDs as per the validation procedure and proceed with validation. Call me if you have any questions (509-372-9592).

Rich

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Wednesday, March 13, 2002 1:14 PM
To: Duncan, Jeanette M
Cc: Kessner, Joan H
Subject: FW: SDG W03587 Rad Validation IR#3

This has since become a non-issue.

Rich

-----Original Message-----

From: **Christian, Bruce [mailto:BChristian@TechLawInc.com] <mailto:[mailto:BChristian@TechLawInc.com]>**
Sent: Tuesday, March 12, 2002 12:59 PM
To: 'Weiss, Richard L '
Subject: RE: SDG W03587 Rad Validation IR#3

I'll double check the procedure, but under level 'C' I don't calculate or check calculations, checking calculations is level 'D' or 'E'.

-----Original Message-----

From: **Weiss, Richard L**
To: Duncan, Jeanette M; 'bchristian@techlawinc.com'
Cc: Kessner, Joan H
Sent: 3/12/02 1:08 PM
Subject: SDG W03587 Rad Validation IR#3

Bruce,

This lab requested that they be allowed to report replicate error ratios (RER) in place of RPDs. This was granted and will be incorporated into future revisions of the SOW to the labs. I don't have a plan at this time to revise the validation procedure to incorporate RER, but probably will go that way in a year or so. In the meantime, calculate RPDs as per the validation procedure and proceed with validation. Call me if you have any questions (509-372-9592).

Rich

FAX

TECHLAW, INC.
3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 12 February 2002

Information Request #2

W03587 - Metals

The matrix spike for preparation batch 1254213 is not in the package although the case narrative says that one was run.

Fukumoto, Joyce A

From: Fukumoto, Joyce A
Sent: Tuesday, March 19, 2002 3:47 PM
To: 'BCHRISTIAN@TECHLAWINC.COM'
Subject: FW: Information Needs for SDG W03587 Validation.
Importance: High

Bruce,

If you have any questions, please call.

Thanks
Joyce
372-9262

-----Original Message-----
From: Weiss, Richard L
Sent: Tuesday, March 19, 2002 3:32 PM
To: Fukumoto, Joyce A
Subject: FW: Information Needs for SDG W03587 Validation.
Importance: High

Joyce,

Would you please forward on the attached file (or fax a hardcopy) to Bruce Christian. He will need this information to correct the metals validation package package for this SDG.

Rich

-----Original Message-----
From: Kessner, Joan H
Sent: Monday, March 11, 2002 7:45 AM
To: Weiss, Richard L
Subject: FW: Information Needs for SDG W03587 Validation.
Importance: High

Rich---
Would you please let me know if this address the concern.
Joan

Duncan, Jeanette M

From: Kessner, Joan H
Sent: Wednesday, February 13, 2002 2:35 PM
To: Duncan, Jeanette M
Subject: FW: validation help on W03587 chem
Importance: High

Jeanette—
I sent this to the wrong Bruce and now I noticed that I don't have Bruce's email.....
Please forward this to him.
Thanks,
Joan
-----Original Message-----
From: Kessner, Joan H
Sent: Wednesday, February 13, 2002 9:26 AM
To: Duncan, Jeanette M; 'bruce gillespie'
Subject: FW: validation help on W03587 chem
Importance: High

Does this help at all??
-----Original Message-----
From: mward@stl-inc.com [mailto:mward@stl-inc.com]
Sent: Wednesday, February 13, 2002 9:21 AM
To: JHKessne@mail.bhi-erc.com
Cc: jwaddell@stl-inc.com; jcarnes@stl-inc.com
Subject: RE: validation help on W03587 chem
Importance: High

We reported/invoiced the QC from batch 1247187. We did run another set of (for "batch")QC, but did not report because we only needed 1 set for the SDG. Did your report contain the MS/MSD for batch 124187? Sometimes the copy machine "eats" the data sheets.

-----Original Message-----
From: Kessner, Joan H [mailto:JHKessne@mail.bhi-erc.com]
Sent: Wednesday, February 13, 2002 10:55 AM
To: Waddell, Jackie; Carnes, Jodie; Ward, Marti
Subject: validation help on W03587 chem

Folks---
Have a validator question on SDG W03587 -

W03587 - metals
The matrix spike for preparation batch 1254213 is not in the package
although the case narrative says that one was run.

Would you help fill in the blanks??

Thanks,
Joan

FAX

TECHLAW, INC.
3115 Loma Court
Tenino, WA 98589
509-521-6693

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 10 February 2002

Information Request #1

W03587 - RAD

The case narrative includes sample B12ML5-A in the SDG, but no data is included in the package.

FEB 2002
RECEIVED

ORIGINAL
Dhynes

SDR # B02-041
Revision #: 0
Date Initiated: 08/30/01

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200 TW 1&2
Task ID: 1
Sampling Event: 200-TW-1 & 2 - Soil

Laboratory: Severn Trent, Inc.

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 1
ID Numbers: B12ML5-A
Matrix: SOIL
Collection Date: 08/27/01

Issue Background:

Class: ☒ Project Data Use ☐ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Other

Description: Sample Refused by Laboratory

Disposition:

Description: After performing the radiological screening analysis, the Severn Trent – Richland laboratory determined that the Cr-VI analysis bottle for the listed sample exceeded their radiological sample acceptance criteria. As a result, the Cr-VI sample bottle was returned to the ERC and the Cr-VI analysis was subsequently cancelled (see SDR B02-042) for the listed sample.

Justification: The Cr-VI analysis bottle for the listed sample could not be accepted by either laboratory that performs a Cr-VI analysis method accepted by the ERC.

Approval Signatures:

S. J. Trent — 1/3/02
Project Coordinator (Print/Sign Name) — Date

M. E. Todd — 1/7/02
Task Manager (Print/Sign Name) — Date

ORIGINAL
DHynes

SDR # B02-042
Revision #: 0
Date Initiated: 08/30/01

SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200 TW 1&2
Task ID: 1
Sampling Event: 200-TW-1 & 2 - Soil

Laboratory: Severn Trent, Inc.

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 1
ID Numbers: B12ML5-A
Matrix: SOIL
Collection Date: 08/27/01

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Cancellation of Analyses

Description: Cr-VI Analysis Cancelled

Disposition:

Description: After performing the radiological screening analysis, the Severn Trent – Richland laboratory determined that the Cr-VI analysis bottle for the listed sample exceeded their radiological sample acceptance criteria (see SDR B02-041). As a result, the Cr-VI sample bottle was returned to the ERC and the Cr-VI analysis was subsequently cancelled for the listed sample.

Justification: The Cr-VI analysis was cancelled because neither laboratory that performs a Cr-VI analysis method accepted by the ERC could accept the listed sample.

Approval Signatures:

S. J. Trent — 1/3/02
Project Coordinator (Print/Sign Name) — Date

M. E. Todd — 1/7/02
Task Manager (Print/Sign Name) — Date

ORIGINAL
Daynes

SDR # B01-101
Revision #: 1
Date Initiated: 08/09/01

SAMPLE DISPOSITION RECORD

: B01-058
: 200-TW-1/2
ɔject ID: 200 TW 1&2
ısk ID: 1
ampling Event: 200-TW-1 & 2 - Soil

.aboratory: TMA/RECRA; RCF; Severn Trent, Inc.

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 23
ID Numbers: B12DC0, B12DC1, B12DB8, B12DB9, B12C88, B12C89, B12C63, B12C64, B12ML4, B12ML5, B12ML6, B12DC0-A, B12DC1-A, B12DB8-A, B12DB9-A, B12C88-A, B12C89-A, B12C89-B, B12C63-A, B12C64-A, B12ML4-A, B12ML5-A, B12ML6-A
Matrix: SOIL
Collection Date: 08/03/01 – 08/27/01

Issue Background:

Class: ☐ Project Data Use ☐ General Laboratory Direction ☐ Validation Direction ☒ Sample Management Direction

Type: Other

Description: Samples Directed to Different Laboratory and Relabeled

Disposition:

Description: The chemical analyses for the listed samples were originally intended to be performed at the Lionville Laboratory. However because of the radioactivity associated with the samples, they were directed to the Severn Trent – St. Louis Laboratory. Samples redirec to the Severn Trent – St. Louis Laboratory were relabeled as follows:

Original Sample Number	New Sample Number
B12DC0	B12DC0-A
B12DC1	B12DC1-A
B12DB8	B12DB8-A
B12DB9	B12DB9-A
B12C88	B12C88-A
B12C63	B12C63-A
B12C64	B12C64-A
B12ML4	B12ML4-A

Original Sample Number	New Sample Number
B12ML5	B12ML5-A
B12ML6	B12ML6-A

C Dayes 1/7/02

C Dayes 1/7/02

In addition, for sample number B12~~D~~89, the bottle for Cr-VI analysis was relabeled as B12~~D~~89-A and routed to the RCF for radiological screening analyses. This same bottle was subsequently relabeled as B12~~D~~89-B and routed to the Severn Trent – Richland Laboratory for Cr-VI analysis.

C Dayes 1/7/02

Justification: The listed samples did not meet the sample acceptance criteria at the Lionville Laboratory, requiring that they be redirected to the Severn Trent – St. Louis Laboratory for chemical analysis. In addition, relabeling of the samples was necessary because a sample cannot be assigned to more than one laboratory due to SDT referential integrity rules.

Approval Signatures:

S. J. Trent — 1/3/02
Project Coordinator (Print/Sign Name) — Date

M. E. Todd — 1/7/02
Task Manager (Print/Sign Name) — Date