SAF-RC-107
100-H Remaining Sites Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG JP0904 SAF-RC-107

Waste Site: 100-H-51:2

Date: 9 March 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-51:2
Subject: Inorganic - Data Package No. JP0904-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0904 prepared by TestAmerica Laboratories (TAL). 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	Analyte
J1V430	2/5/15	Soil	C	See note 1
J1V431	2/5/15	Soil	C	See note 1
J1V432	2/5/15	Soil	C	See note 1
J1V433	2/5/15	Soil	C	See note 1
J1V434	2/5/15	Soil	C	See note 1
J1V435	2/5/15	Soil	C	See note 1
J1V436	2/5/15	Soil	C	See note 1
J1V437	2/5/15	Soil	C	See note 1
J1V438	2/5/15	Soil	C	See note 1
J1V439	2/5/15	Soil	C	See note 1
J1V440	2/5/15	Soil	C	See note 1
J1V441	2/5/15	Soil	C	See note 1
J1V442	2/5/15	Soil	C	See note 1
J1V443	2/5/15	Soil	C	See note 1
J1V444	2/5/15	Soil	C	See note 1

1 - ICP metals (6010B) & mercury by 7471A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to method blank contamination, the calcium and magnesium result in sample J1V444 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1V444) was submitted for analysis. Thirteen analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Due to matrix spike recoveries outside QC limits, all antimony (61%) and silicon (28%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (12%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1V437/J1V443) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. JP0904 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

The following minor deficiencies were noted:

- Due to method blank contamination, the calcium and magnesium result in sample J1V444 were qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (61%) and silicon (28%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (12%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

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

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0904	**REVIEWER: ELR**	**Project: 100-H-51:2**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Magnesium	UJ	J1V444	Method blank contamination
Silicon	J	All	LCS recovery
Antimony Silicon	J	All	MS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V430

Lab Sample ID: 280-65149-1
Client Matrix: Solid

% Moisture: 3.9

Date Sampled: 02/05/2015 0931
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	02/10/2015 2332			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

r 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5270		1.6	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		2.1	M	0.66	1.0
Barium		66.6	X	0.076	0.50
Beryllium		0.070	B M	0.033	0.20
Boron		0.98	U	0.98	2.0
Cadmium		0.058	B M	0.041	0.20
Calcium		5840	X	14.1	50.0
Chromium		7.4	X	0.058	0.20
Cobalt		6.3	X	0.10	1.0
Copper		13.7		0.22	1.0
Iron		19200	X	3.8	5.0
Lead		2.4		0.27	0.50
Magnesium		3760	X	3.7	20.0
Manganese		244	X	0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		9.7		0.12	4.0
Potassium		687		41.0	300
Selenium		0.86	U	0.86	1.0
Silicon		184	J	5.7	10.0
Silver		0.16	U	0.16	0.20
Sodium		264		59.1	120
Vanadium		50.1	X	0.094	2.0
Zinc		37.2		0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.65 g
Analysis Date:	02/09/2015 1644			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0053	U	0.0053	0.016

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V431

Lab Sample ID: 280-65149-2
Client Matrix: Solid
% Moisture: 5.7

Date Sampled: 02/05/2015 0943
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	02/10/2015 2342			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7240		1.5	4.8
Antimony		0.37	U J	0.37	0.58
Arsenic		4.3		0.64	0.96
Barium		59.4	X	0.073	0.48
Beryllium		0.18	B	0.032	0.19
Boron		1.1	B	0.95	1.9
Cadmium		0.040	U	0.040	0.19
Calcium		9550	X	13.6	48.2
Chromium		11.7	X	0.056	0.19
Cobalt		5.9	X	0.096	0.96
Copper		10.6		0.21	0.96
Iron		16900	X	3.7	4.8
Lead		4.1		0.26	0.48
Magnesium		5160	X	3.6	19.3
Manganese		299	X	0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		10.9		0.12	3.9
Potassium		1370		39.5	289
Selenium		0.83	U	0.83	0.96
Silicon		331	J	5.5	9.6
Silver		0.15	U	0.15	0.19
Sodium		190		56.9	116
Vanadium		35.9	X	0.091	1.9
Zinc		36.9		0.38	0.96

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Analysis Date:	02/09/2015 1651			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0058	U	0.0058	0.018

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V432**

Lab Sample ID: 280-65149-3
Client Matrix: Solid
% Moisture: 4.3

Date Sampled: 02/05/2015 0925
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	02/10/2015 2345			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

✓ 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5600		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		2.2		0.59	0.89
Barium		39.3	X	0.068	0.45
Beryllium		0.13	B	0.029	0.18
Boron		0.88	U	0.88	1.8
Cadmium		0.039	B	0.037	0.18
Calcium		3750	X	12.6	44.7
Chromium		9.2	X	0.052	0.18
Cobalt		4.5	X	0.089	0.89
Copper		11.6		0.19	0.89
Iron		13200	X	3.4	4.5
Lead		2.7		0.24	0.45
Magnesium		3660	X	3.3	17.9
Manganese		214	X	0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		9.4		0.11	3.6
Potassium		734		36.6	268
Selenium		0.77	U	0.77	0.89
Silicon		218	J	5.1	8.9
Silver		0.14	U	0.14	0.18
Sodium		147		52.7	107
Vanadium		34.1	X	0.084	1.8
Zinc		27.9		0.36	0.89

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	02/09/2015 1653			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0056	U	0.0056	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V433

Lab Sample ID: 280-65149-4
Client Matrix: Solid
% Moisture: 11.3

Date Sampled: 02/05/2015 0918
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	02/10/2015 2348			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/6/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7140		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		3.0		0.66	1.0
Barium		67.8	X	0.076	0.50
Beryllium		0.16	B	0.033	0.20
Boron		1.1	B	0.98	2.0
Cadmium		0.061	B	0.041	0.20
Calcium		4300	X	14.1	49.9
Chromium		10.2	X	0.058	0.20
Cobalt		6.0	X	0.10	1.0
Copper		11.7		0.22	1.0
Iron		16900	X	3.8	5.0
Lead		4.1		0.27	0.50
Magnesium		3940	X	3.7	20.0
Manganese		269	X	0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		10.7		0.12	4.0
Potassium		1310		40.9	299
Selenium		0.86	U	0.86	1.0
Silicon		339	J	5.6	10
Silver		0.16	U	0.16	0.20
Sodium		198		58.9	120
Vanadium		36.8	X	0.094	2.0
Zinc		34.2		0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.69 g
Analysis Date:	02/09/2015 1655			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V434**

Lab Sample ID: 280-65149-5
Client Matrix: Solid
% Moisture: 5.9

Date Sampled: 02/05/2015 0912
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	02/10/2015 2350			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

✓ 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6060		1.6	5.2
Antimony		0.40	U J	0.40	0.62
Arsenic		3.6		0.69	1.0
Barium		47.1	X	0.079	0.52
Beryllium		0.12	B	0.034	0.21
Boron		1.0	U	1.0	2.1
Cadmium		0.044	B	0.043	0.21
Calcium		6250	X	14.7	52.1
Chromium		9.7	X	0.060	0.21
Cobalt		5.5	X	0.10	1.0
Copper		12.6		0.23	1.0
Iron		15400	X	4.0	5.2
Lead		3.1		0.28	0.52
Magnesium		4150	X	3.9	20.8
Manganese		255	X	0.10	1.0
Molybdenum		0.27	U	0.27	2.1
Nickel		11.0		0.13	4.2
Potassium		823		42.7	312
Selenium		0.90	U	0.90	1.0
Silicon		225	J	5.9	10.4
Silver		0.17	U	0.17	0.21
Sodium		179		61.4	125
Vanadium		40.2	X	0.098	2.1
Zinc		33.7		0.41	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	02/09/2015 1657			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.017

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V435**

Lab Sample ID: 280-65149-6
Client Matrix: Solid
% Moisture: 5.6

Date Sampled: 02/05/2015 0905
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	02/11/2015 0003			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5700		1.5	4.9
Antimony		0.38	U J	0.38	0.59
Arsenic		2.9		0.65	0.99
Barium		57.9	X	0.075	0.49
Beryllium		0.11	B	0.033	0.20
Boron		0.97	U	0.97	2.0
Cadmium		0.071	B	0.041	0.20
Calcium		5260	X	14.0	49.5
Chromium		8.7	X	0.057	0.20
Cobalt		5.8	X	0.099	0.99
Copper		13.9		0.21	0.99
Iron		16500	X	3.8	4.9
Lead		2.7		0.27	0.49
Magnesium		4000	X	3.7	19.8
Manganese		238	X	0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		9.9		0.12	4.0
Potassium		781		40.6	297
Selenium		0.85	U	0.85	0.99
Silicon		277	J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		185		58.4	119
Vanadium		41.5	X	0.093	2.0
Zinc		34.2		0.39	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.65 g
Analysis Date:	02/09/2015 1700			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V436

Lab Sample ID: 280-65149-7
Client Matrix: Solid

% Moisture: 5.3

Date Sampled: 02/05/2015 0900
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	02/11/2015 0006			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

V 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5540		1.4	4.6
Antimony		0.35	U J	0.35	0.55
Arsenic		3.0		0.60	0.91
Barium		41.0	X	0.069	0.46
Beryllium		0.12	B	0.030	0.18
Boron		0.89	U	0.89	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		4740	X	12.8	45.5
Chromium		7.5	X	0.053	0.18
Cobalt		5.1	X	0.091	0.91
Copper		11.6		0.20	0.91
Iron		14700	X	3.5	4.6
Lead		3.3		0.25	0.46
Magnesium		3710	X	3.4	18.2
Manganese		238	X	0.091	0.91
Molybdenum		0.24	U	0.24	1.8
Nickel		8.9		0.11	3.6
Potassium		860		37.3	273
Selenium		0.78	U	0.78	0.91
Silicon		268	J	5.2	9.1
Silver		0.15	U	0.15	0.18
Sodium		173		53.7	109
Vanadium		36.7	X	0.086	1.8
Zinc		32.9		0.36	0.91

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.64 g
Analysis Date:	02/09/2015 1707			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0055	U	0.0055	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V437

Lab Sample ID: 280-65149-8
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 02/05/2015 0813
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	02/11/2015 0008			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

✓ 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6520		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		4.7		0.66	0.99
Barium		78.0	X	0.075	0.50
Beryllium		0.17	B	0.033	0.20
Boron		0.97	U	0.97	2.0
Cadmium		0.054	B	0.041	0.20
Calcium		8040	X	14.0	49.6
Chromium		9.8	X	0.058	0.20
Cobalt		6.0	X	0.099	0.99
Copper		12.5		0.22	0.99
Iron		17800	X	3.8	5.0
Lead		4.7		0.27	0.50
Magnesium		4690	X	3.7	19.9
Manganese		295	X	0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		10.3		0.12	4.0
Potassium		1360		40.7	298
Selenium		0.85	U	0.85	0.99
Silicon		304	J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		176		58.6	119
Vanadium		40.7	X	0.093	2.0
Zinc		37.1		0.40	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.67 g
Analysis Date:	02/09/2015 1709			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0053	U	0.0053	0.016

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V438**

Lab Sample ID: 280-65149-9
Client Matrix: Solid
% Moisture: 6.5

Date Sampled: 02/05/2015 0820
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	02/11/2015 0011			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

✓ 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6520		1.6	5.0
Antimony		0.38	U J	0.38	0.61
Arsenic		3.8		0.67	1.0
Barium		60.0	X	0.077	0.50
Beryllium		0.15	B	0.033	0.20
Boron		0.99	U	0.99	2.0
Cadmium		0.045	B	0.041	0.20
Calcium		8000	X	14.2	50.5
Chromium		11.1	X	0.059	0.20
Cobalt		6.1	X	0.10	1.0
Copper		11.7		0.22	1.0
Iron		17500	X	3.8	5.0
Lead		7.0		0.27	0.50
Magnesium		4750	X	3.7	20.2
Manganese		283	X	0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		12.5		0.12	4.0
Potassium		1080		41.4	303
Selenium		0.87	U	0.87	1.0
Silicon		281	J	5.7	10.1
Silver		0.16	U	0.16	0.20
Sodium		191		59.6	121
Vanadium		43.0	X	0.095	2.0
Zinc		36.8		0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.67 g
Analysis Date:	02/09/2015 1711			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	B	0.0053	0.016

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V439**

Lab Sample ID: 280-65149-10
Client Matrix: Solid
% Moisture: 6.4

Date Sampled: 02/05/2015 0830
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.10 g
Analysis Date:	02/11/2015 0013			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/18/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5590		1.5	4.9
Antimony		0.37	U J	0.37	0.58
Arsenic		4.6		0.64	0.97
Barium		49.3	X	0.074	0.49
Beryllium		0.11	B	0.032	0.19
Boron		1.1	B	0.95	1.9
Cadmium		0.040	U	0.040	0.19
Calcium		6810	X	13.7	48.5
Chromium		9.5	X	0.056	0.19
Cobalt		5.7	X	0.097	0.97
Copper		11.8		0.21	0.97
Iron		16200	X	3.7	4.9
Lead		9.0		0.26	0.49
Magnesium		4020	X	3.6	19.4
Manganese		259	X	0.097	0.97
Molybdenum		0.25	U	0.25	1.9
Nickel		9.9		0.12	3.9
Potassium		855		39.8	291
Selenium		0.84	U	0.84	0.97
Silicon		230	J	5.5	9.7
Silver		0.16	U	0.16	0.19
Sodium		218		57.3	117
Vanadium		40.3	X	0.091	1.9
Zinc		34.0		0.39	0.97

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.64 g
Analysis Date:	02/09/2015 1714			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0055	U	0.0055	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V440**

Lab Sample ID: 280-65149-11
Client Matrix: Solid

% Moisture: 8.0

Date Sampled: 02/05/2015 0839
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.14 g
Analysis Date:	02/11/2015 0016			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5540		1.5	4.8
Antimony		0.36	U J	0.36	0.57
Arsenic		3.2		0.63	0.95
Barium		63.1	X	0.072	0.48
Beryllium		0.12	B	0.031	0.19
Boron		2.5		0.93	1.9
Cadmium		0.051	B	0.039	0.19
Calcium		5680	X	13.4	47.7
Chromium		9.2	X	0.055	0.19
Cobalt		6.4	X	0.095	0.95
Copper		14.2		0.21	0.95
Iron		15300	X	3.6	4.8
Lead		7.4		0.26	0.48
Magnesium		3800	X	3.5	19.1
Manganese		229	X	0.095	0.95
Molybdenum		0.25	U	0.25	1.9
Nickel		9.3		0.12	3.8
Potassium		773		39.1	286
Selenium		0.82	U J	0.82	0.95
Silicon		249		5.4	9.5
Silver		0.15	U	0.15	0.19
Sodium		242		56.3	114
Vanadium		40.6	X	0.090	1.9
Zinc		32.2		0.38	0.95

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	02/09/2015 1716			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.018

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V441**

Lab Sample ID: 280-65149-12
Client Matrix: Solid
% Moisture: 5.7

Date Sampled: 02/05/2015 0846
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	02/11/2015 0018			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

r 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5960		1.6	5.1
Antimony		0.39	U J	0.39	0.61
Arsenic		4.1		0.67	1.0
Barium		53.6	X	0.078	0.51
Beryllium		0.13	B	0.034	0.20
Boron		1.0	U	1.0	2.0
Cadmium		0.042	U	0.042	0.20
Calcium		7330	X	14.4	51.0
Chromium		9.5	X	0.059	0.20
Cobalt		5.9	X	0.10	1.0
Copper		13.4		0.22	1.0
Iron		16200	X	3.9	5.1
Lead		8.3		0.28	0.51
Magnesium		4090	X	3.8	20.4
Manganese		252	X	0.10	1.0
Molybdenum		0.27	U	0.27	2.0
Nickel		10.7		0.13	4.1
Potassium		896		41.8	306
Selenium		0.88	U	0.88	1.0
Silicon		251	J	5.8	10.2
Silver		0.16	U	0.16	0.20
Sodium		217		60.2	122
Vanadium		40.9	X	0.096	2.0
Zinc		36.0		0.41	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	02/09/2015 1718			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V442

Lab Sample ID: 280-65149-13
Client Matrix: Solid
% Moisture: 5.8

Date Sampled: 02/05/2015 0854
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	02/11/2015 0021			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/2/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5770		1.5	4.9
Antimony		0.37	U J	0.37	0.59
Arsenic		5.1		0.65	0.98
Barium		44.2	X	0.075	0.49
Beryllium		0.11	B	0.032	0.20
Boron		0.96	U	0.96	2.0
Cadmium		0.040	U	0.040	0.20
Calcium		7600	X	13.9	49.2
Chromium		10.4	X	0.057	0.20
Cobalt		5.8	X	0.098	0.98
Copper		12.9		0.21	0.98
Iron		16000	X	3.7	4.9
Lead		6.2		0.27	0.49
Magnesium		4050	X	3.6	19.7
Manganese		251	X	0.098	0.98
Molybdenum		0.26	U	0.26	2.0
Nickel		10.6		0.12	3.9
Potassium		859		40.3	295
Selenium		0.85	U	0.85	0.98
Silicon		251	J	5.6	9.8
Silver		0.16	U	0.16	0.20
Sodium		199		58.0	118
Vanadium		42.1	X	0.092	2.0
Zinc		36.0		0.39	0.98

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	02/09/2015 1721			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0056	U	0.0056	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V443

Lab Sample ID: 280-65149-14
Client Matrix: Solid
% Moisture: 5.9

Date Sampled: 02/05/2015 0813
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	02/11/2015 0023			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

r 3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6940		1.4	4.5
Antimony		0.35	U J	0.35	0.55
Arsenic		3.9		0.60	0.91
Barium		73.3	X	0.069	0.45
Beryllium		0.17	B	0.030	0.18
Boron		0.89	U	0.89	1.8
Cadmium		0.046	B	0.037	0.18
Calcium		8480	X	12.8	45.4
Chromium		11.1	X	0.053	0.18
Cobalt		6.3	X	0.091	0.91
Copper		11.9		0.20	0.91
Iron		18100	X	3.5	4.5
Lead		4.4		0.25	0.45
Magnesium		5110	X	3.4	18.2
Manganese		319	X	0.091	0.91
Molybdenum		0.24	U	0.24	1.8
Nickel		12.2		0.11	3.6
Potassium		1330		37.2	273
Selenium		0.78	U	0.78	0.91
Silicon		275	J	5.1	9.1
Silver		0.15	U	0.15	0.18
Sodium		176		53.6	109
Vanadium		40.7	X	0.085	1.8
Zinc		37.1		0.36	0.91

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.62 g
Analysis Date:	02/09/2015 1723			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0057	U	0.0057	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V444

Lab Sample ID: 280-65149-15
Client Matrix: Solid

% Moisture: 0.1

Date Sampled: 02/05/2015 0809
Date Received: 02/06/2015 0950

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-263887	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0			Initial Weight/Volume:	1.12 g
Analysis Date:	02/11/2015 0026			Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				

3/8/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		127		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		0.59	B	0.59	0.89
Barium		1.3	X	0.068	0.45
Beryllium		0.029	U	0.029	0.18
Boron		0.88	U	0.88	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		37.5	B C X UJ	12.6	44.7
Chromium		0.14	B X	0.052	0.18
Cobalt		0.13	B X	0.089	0.89
Copper		0.36	B	0.19	0.89
Iron		177	X	3.4	4.5
Lead		0.24	U	0.24	0.45
Magnesium		19.0	C X UJ	3.3	17.9
Manganese		3.0	X	0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		0.20	B	0.11	3.6
Potassium		48.9	B	36.6	268
Selenium		0.77	U J	0.77	0.89
Silicon		95.1		5.1	8.9
Silver		0.14	U	0.14	0.18
Sodium		52.7	U	52.7	107
Vanadium		0.22	B X	0.084	1.8
Zinc		1.1		0.36	0.89

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	02/09/2015 1725			Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0053	U	0.0053	0.016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-65149-1

SDG #: JP0904
SAF#: RC-107

Date SDG Closed: February 6, 2015
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V430	280-65149-1	6010/7471/8082	6010B/7471A/8082
J1V431	280-65149-2	6010/7471/8082	6010B/7471A/8082
J1V432	280-65149-3	6010/7471/8082	6010B/7471A/8082
J1V433	280-65149-4	6010/7471/8082	6010B/7471A/8082
J1V434	280-65149-5	6010/7471/8082	6010B/7471A/8082
J1V435	*280-65149-6*	*6010/7471/8082*	*6010B/7471A/8082*
J1V436	280-65149-7	6010/7471/8082	6010B/7471A/8082
J1V437	280-65149-8	6010/7471/8082	6010B/7471A/8082
J1V438	280-65149-9	6010/7471/8082	6010B/7471A/8082
J1V439	280-65149-10	6010/7471/8082	6010B/7471A/8082
J1V440	280-65149-11	6010/7471/8082	6010B/7471A/8082
J1V441	280-65149-12	6010/7471/8082	6010B/7471A/8082
J1V442	280-65149-13	6010/7471/8082	6010B/7471A/8082
J1V443	280-65149-14	6010/7471/8082	6010B/7471A/8082
J1V444	280-65149-15	6010/7471	6010B/7471A

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. 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 signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 2/6/2015 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.2° C and 4.5° C.

GC SEMIVOLATILES - SW846 8082 - PCBs
No anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-263465 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Aluminum, Barium, Calcium, Magnesium and Manganese are present in the method blank associated with batch 280-263465. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-263465. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V430; therefore, control limits are not applicable.

The duplicate analysis of sample J1V430 exhibited RPD data outside the control limits for Arsenic, Beryllium and Cadmium, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: RCC-08-016	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Commercial Carrier \ Fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131321		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C	Cool 4C
Type of Container	G/P	aG
No. of Container(s)	1	1
Volume	250mL	250mL
Sample Analysis	See item (1) in Special Instructions	PCBs - 8082

280-65149 Chain of Custody

REVIEWED BY [signature] DATE 02/05/15

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 cmb

NA

Special Handling and/or Storage

Cool 4C

Sample No.	Matrix	Sample Date	Sample Time		
J1V430	SOIL	02\5\15	0931	X	X
J1V431	SOIL	02\5\15	0943	X	X
J1V432	SOIL	02\5\15	0925	X	X
J1V433	SOIL	02\5\15	0918	X	X
J1V434	SOIL	02\5\15	0912	X	X

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe [signature]	2-5-15 0951	C. Martinez/C. Martinez 2/5/15	0951
C. Martinez/C. Martinez	2/5/15 1215	C. Bingham [signature]	2-5-15 1215
C. Bingham WCH [signature]	2-5-15 1220	Fed EX	2-5-15
		[signature]	0950 06Feb15

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

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

2.7.4.0 1025+0.5 06Feb15
Transferred by [initials]

JP0904

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 83	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: RCC-08-016	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Commercial Carrier \ Fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131321		Bill of Lading/Air Bill No.: See OSRC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 cmB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
Sample Analysis	See item (1) in Special Instructions	PCBs - 8082										

REVIEWED BY AS DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V435	SOIL	02/5/15	0905	X	X								
J1V436	SOIL	02/5/15	0900	X	X								
J1V437	SOIL	02/5/15	0813	X	X								
J1V438	SOIL	02/5/15	0820	X	X								
J1V439	SOIL	02/5/15	0830	X	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Quincy Stowe	2-5-15 0951	Received By/Stored In: C. Martinez/C. Martinez	2/5/15 0951
Relinquished By/Removed From: C. Martinez/C. Martinez	02/05/15 1215	Received By/Stored In: C. Bingham Cmb	2-5-15 1215
Relinquished By/Removed From: C. Bingham Cmb WCH	2-5-15 1220	Received By/Stored In: Fed Ex	2-5-15
Relinquished By/Removed From:		Received By/Stored In: AS	06Feb15 0950
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

JP0904

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: RCC-08-016	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Commercial Carrier \Fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131321		Bill of Lading/Air Bill No.: See OSPC

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
Sample Analysis	See item (1) in Special Instructions	PCBs - 8082										

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 cmB

NA

Special Handling and/or Storage

Cool 4C

REVIEWED BY DAS DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V440	SOIL	02/5/15	0839	X	X								
J1V441	SOIL	02/5/15	0846	X	X								
J1V442	SOIL	02/5/15	0854	X	X								
J1V443	SOIL	02/5/15	0813	X	X								
J1V444	SOIL	02/05/15	0809	X	N/A								

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	2-5-15 0951	C. Martinez/C. Martinez	0951 2/5/15
C. Martinez/C. Martinez	2/5/15 1215	C. Bingham	2-5-15 1215
C. Bingham WCH	2-5-15 1220	Fed Ex	2-5-15
			0850 06FEB15

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

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

JP0904

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-H-S1:2			DATA PACKAGE: JP0904		
VALIDATOR: ECR		LAB: TAL		DATE: 3/6/15	
			SDG: JP0904		

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX					
J1V430	J1V431	J1V432	J1V433	J1V434	J1V435
J1V436	J1V437	J1V438	J1V439	J1V440	J1V441
J1V442	J1V443	J1V444			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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: Calcium - UJ 44

magnesium - UJ 44

~~Manganese - UJ 44~~ 3/7/15

FB ~13 detects

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: LCS - silicon (12%) - J all

MS antimony (61%) silicon (28%) - J all

no PAS

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:

37/43

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: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Method Blank - Batch: 280-263465

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-263465/1-A	Analysis Batch:	280-263887	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	02/10/2015 2327	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	2.42	B	1.6	5.0
Antimony	0.38	U	0.38	0.60
Arsenic	0.66	U	0.66	1.0
Barium	0.223	B	0.076	0.50
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.041	U	0.041	0.20
Calcium	22.98	B	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Iron	5.84		3.8	5.0
Lead	0.27	U	0.27	0.50
Magnesium	7.36	B	3.7	20.0
Manganese	0.125	B	0.10	1.0
Molybdenum	0.26	U	0.26	2.0
Nickel	0.12	U	0.12	4.0
Potassium	41.0	U	41.0	300
Selenium	0.86	U	0.86	1.0
Silicon	5.7	U	5.7	10.0
Silver	0.16	U	0.16	0.20
Sodium	59.0	U	59.0	120
Vanadium	0.094	U	0.094	2.0
Zinc	0.40	U	0.40	1.0

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Lab Control Sample - Batch: 280-263465

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-263465/2-A	Analysis Batch:	280-263887	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	02/10/2015 2330	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	205.4	103	82 - 116	
Antimony	50.0	48.87	98	82 - 110	
Arsenic	100	95.77	96	85 - 110	
Barium	200	195.5	98	87 - 112	
Beryllium	5.00	4.95	99	84 - 114	
Boron	100	95.18	95	80 - 120	
Cadmium	10.0	8.88	89	87 - 110	
Calcium	5000	5034	101	82 - 114	
Chromium	20.0	20.35	102	84 - 114	
Cobalt	50.0	49.79	100	87 - 110	
Copper	25.0	23.95	96	88 - 110	
Iron	100	98.07	98	87 - 120	
Lead	50.0	50.05	100	86 - 110	
Magnesium	5000	4950	99	90 - 110	
Manganese	50.0	49.26	99	88 - 110	
Molybdenum	100	101.4	101	86 - 110	
Nickel	50.0	49.03	98	87 - 110	
Potassium	5000	5139	103	89 - 110	
Selenium	200	192.4	96	83 - 110	
Silicon	1000	120.5	12	10 - 70	
Silver	5.00	5.09	102	87 - 114	
Sodium	5000	4926	99	90 - 112	
Vanadium	50.0	49.11	98	88 - 110	
Zinc	50.0	50.62	101	76 - 114	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Matrix Spike - Batch: 280-263465

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-65149-1	Analysis Batch:	280-263887	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.03 g
Analysis Date:	02/10/2015 2340	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	5270		202	7094	904	50 - 200	4
Antimony	0.38	U	50.5	30.97	61	20 - 200	
Arsenic	2.1		101	92.59	90	76 - 111	
Barium	66.6		202	235.4	84	52 - 159	
Beryllium	0.070	B	5.05	4.54	88	72 - 105	
Boron	0.98	U	101	82.55	82	80 - 120	
Cadmium	0.058	B	10.1	8.09	80	40 - 130	
Calcium	5840		5050	10680	96	43 - 165	
Chromium	7.4		20.2	31.76	121	70 - 200	
Cobalt	6.3		50.5	51.64	90	72 - 106	
Copper	13.7		25.3	37.26	93	37 - 187	
Iron	19200		101	20890	1642	70 - 200	4
Lead	2.4		50.5	47.12	88	70 - 200	
Magnesium	3760		5050	8785	99	64 - 145	
Manganese	244		50.5	327.5	164	40 - 200	4
Molybdenum	0.26	U	101	89.29	88	75 - 103	
Nickel	9.7		50.5	54.61	89	61 - 126	
Potassium	687		5050	5548	96	56 - 172	
Selenium	0.86	U	202	169.6	84	76 - 104	
Silicon	184		1010	467.2	28	20 - 200	
Silver	0.16	U	5.05	4.63	92	75 - 141	
Sodium	264		5050	4921	92	78 - 111	
Vanadium	50.1		50.5	104.9	108	50 - 169	
Zinc	37.2		50.5	84.10	93	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Duplicate - Batch: 280-263465

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-65149-1	Analysis Batch:	280-263887	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-263465	Lab File ID:	26a121015d.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.05 g
Analysis Date:	02/10/2015 2337	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	02/10/2015 0800				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	5270		5683	8	40	
Antimony	0.38	U	0.38	NC	40	U
Arsenic	2.1		3.21	41	30	M
Barium	66.6		50.27	28	30	
Beryllium	0.070	B	0.107	42	30	B M
Boron	0.98	U	0.97	NC	30	U
Cadmium	0.058	B	0.0853	38	30	B M
Calcium	5840		4763	20	30	
Chromium	7.4		8.56	15	40	
Cobalt	6.3		6.43	2	30	
Copper	13.7		14.04	2	30	
Iron	19200		18340	5	40	
Lead	2.4		3.21	27	40	
Magnesium	3760		3959	5	30	
Manganese	244		254.2	4	40	
Molybdenum	0.26	U	0.26	NC	30	U
Nickel	9.7		9.53	2	30	
Potassium	687		726.6	6	40	
Selenium	0.86	U	0.85	NC	30	U
Silicon	184		229.7	22	40	
Silver	0.16	U	0.16	NC	30	U
Sodium	264		233.2	12	30	
Vanadium	50.1		47.84	5	30	
Zinc	37.2		36.81	1	40	

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Method Blank - Batch: 280-263508

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-263508/1-A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	02/09/2015 1639	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-263508

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-263508/2-A	Analysis Batch:	280-263739	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	02/09/2015 1641	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.446	107	87 - 111	

Matrix Spike - Batch: 280-263508

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-65149-1	Analysis Batch:	280-263739	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.64 g
Analysis Date:	02/09/2015 1648	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0053	U	0.407	0.438	108	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Duplicate - Batch: 280-263508

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-65149-1	Analysis Batch:	280-263739	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-263508	Lab File ID:	150209aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	02/09/2015 1646	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	02/09/2015 1320				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0053	U	0.0058	NC	20	U

Date: 9 March 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-51:2
Subject: Radiochemistry - Data Package No. JP0904-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0904 prepared by TestAmerica Laboratories (TAL). 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	Analyte
J1V430	2/5/15	Soil	C	See note 1
J1V431	2/5/15	Soil	C	See note 1
J1V432	2/5/15	Soil	C	See note 1
J1V433	2/5/15	Soil	C	See note 1
J1V434	2/5/15	Soil	C	See note 1
J1V435	2/5/15	Soil	C	See note 1
J1V436	2/5/15	Soil	C	See note 1
J1V437	2/5/15	Soil	C	See note 1
J1V438	2/5/15	Soil	C	See note 1
J1V439	2/5/15	Soil	C	See note 1
J1V440	2/5/15	Soil	C	See note 1
J1V441	2/5/15	Soil	C	See note 1
J1V442	2/5/15	Soil	C	See note 1
J1V443	2/5/15	Soil	C	See note 1

1 – Gamma spectroscopy, alpha spectroscopy, carbon-14, strontium, tritium.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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. 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.

All holding times were acceptable.

· Preparation (Method) Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the 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 laboratory blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

· Accuracy

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS 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% and tracer recoveries of less than 5%.

Due to the lack of an LCS analysis, all plutonium-238 and uranium-235 results were qualified as estimates and flagged "J".

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

All other accuracy results were acceptable.

- **Laboratory Duplicates.**

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 contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J1V437/J1V443) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. JP0904 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

The following minor deficiencies were noted:

- Due to the lack of an LCS analysis, all plutonium-238 and uranium-235 results were qualified as estimates and flagged "J".

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

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP0904	**REVIEWER: ELR**	**Project: 100-H-51:2**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Plutonium-238 Uranium-235	J	All	No LCS analysis
Tritium Carbon-14	J	All	No MS analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 11-Feb-15

Report No. : 64654

3/8/15

SDG No: JP0904

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036049 C14_CHEM_LSC									
	J1V430								
	M543Q1AH	C-14	-2.53E-01 +- 2.0E-01	U J	pCi/g	100%	4.88E-01	1.00E+00	
	J1V431								
	M543W1AH	C-14	-1.33E-02 +- 2.1E-01	U J	pCi/g	100%	4.88E-01	1.00E+00	
	J1V431 DUP								
	M543W1AJ	C-14	-7.09E-03 +- 2.1E-01	U	pCi/g	100%	4.85E-01	1.00E+00	-61.2
	J1V432								
	M54301AH	C-14	8.89E-02 +- 2.2E-01	U J	pCi/g	100%	4.83E-01	1.00E+00	
	J1V433								
	M54321AH	C-14	-2.60E-01 +- 2.0E-01	U	pCi/g	100%	4.85E-01	1.00E+00	
	J1V434								
	M54351AH	C-14	-9.01E-02 +- 2.1E-01	U	pCi/g	100%	4.83E-01	1.00E+00	
	J1V435								
	M54371AH	C-14	-6.34E-02 +- 2.1E-01	U	pCi/g	100%	4.88E-01	1.00E+00	
	J1V436								
	M54391AH	C-14	-1.25E-01 +- 2.1E-01	U	pCi/g	100%	4.84E-01	1.00E+00	
	J1V437								
	M544D1AH	C-14	-1.40E-01 +- 2.1E-01	U	pCi/g	100%	4.81E-01	1.00E+00	
	J1V438								
	M544F1AH	C-14	-6.18E-02 +- 2.1E-01	U	pCi/g	100%	4.81E-01	1.00E+00	
	J1V439								
	M544H1AH	C-14	-1.76E-01 +- 2.0E-01	U	pCi/g	100%	4.77E-01	1.00E+00	
	J1V440								
	M544L1AH	C-14	-2.86E-02 +- 2.1E-01	U	pCi/g	100%	4.83E-01	1.00E+00	
	J1V441								
	M544N1AH	C-14	-1.26E-02 +- 2.1E-01	U	pCi/g	100%	4.85E-01	1.00E+00	
	J1V442								
	M544Q1AH	C-14	6.73E-03 +- 2.1E-01	U	pCi/g	100%	4.83E-01	1.00E+00	
	J1V443								
	M544T1AH	C-14	-1.42E-01 +- 2.0E-01	U	pCi/g	100%	4.79E-01	1.00E+00	
5036055 PUISO_PLATE_AEA									
	J1V430								
	M543Q1AE	Pu-238	6.59E-02 +- 7.2E-02	U J	pCi/g	100%	1.11E-01	1.00E+00	
		PU239/40	1.06E+01 +- 2.0E+00		pCi/g	100%	7.59E-02	1.00E+00	
	J1V430 DUP								
	M543Q1AK	Pu-238	1.90E-01 +- 1.1E-01		pCi/g	100%	9.13E-02	1.00E+00	96.9
		PU239/40	1.24E+01 +- 2.3E+00		pCi/g	100%	5.17E-02	1.00E+00	16.0
	J1V431								

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.6

A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 11-Feb-15

Report No. : 64654

r 3/18/15

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036055 PUISO_PLATE_AEA									
J1V431									
	M543W1AE	Pu-238	1.79E-02 +- 4.1E-02	U J	pCi/g	100%	9.75E-02	1.00E+00	
		PU239/40	3.80E+00 +- 8.2E-01		pCi/g	100%	5.80E-02	1.00E+00	
J1V432									
	M54301AE	Pu-238	9.52E-03 +- 3.0E-02	U J	pCi/g	100%	8.18E-02	1.00E+00	
		PU239/40	1.29E+00 +- 3.6E-01		pCi/g	100%	6.43E-02	1.00E+00	
J1V433									
	M54321AE	Pu-238	3.48E-02 +- 5.2E-02	U J	pCi/g	100%	9.48E-02	1.00E+00	
		PU239/40	8.98E-01 +- 2.8E-01		pCi/g	100%	6.37E-02	1.00E+00	
J1V434									
	M54351AE	Pu-238	-9.92E-03 +- 3.0E-02	U J	pCi/g	100%	9.55E-02	1.00E+00	
		PU239/40	2.17E-01 +- 1.2E-01		pCi/g	100%	6.30E-02	1.00E+00	
J1V435									
	M54371AE	Pu-238	3.58E-02 +- 5.5E-02	U J	pCi/g	90%	1.05E-01	1.00E+00	
		PU239/40	3.29E-01 +- 1.6E-01		pCi/g	90%	6.32E-02	1.00E+00	
J1V436									
	M54391AE	Pu-238	1.77E-02 +- 4.1E-02	U J	pCi/g	100%	9.67E-02	1.00E+00	
		PU239/40	3.86E-01 +- 1.6E-01		pCi/g	100%	5.21E-02	1.00E+00	
J1V437									
	M544D1AE	Pu-238	5.34E-03 +- 3.0E-02	U J	pCi/g	96%	9.54E-02	1.00E+00	
		PU239/40	1.02E-01 +- 8.1E-02		pCi/g	96%	6.78E-02	1.00E+00	
J1V438									
	M544F1AE	Pu-238	5.58E-03 +- 2.8E-02	U J	pCi/g	100%	8.80E-02	1.00E+00	
		PU239/40	3.19E-01 +- 1.4E-01		pCi/g	100%	5.61E-02	1.00E+00	
J1V439									
	M544H1AE	Pu-238	1.25E-02 +- 3.0E-02	U J	pCi/g	98%	6.82E-02	1.00E+00	
		PU239/40	2.21E-01 +- 1.2E-01		pCi/g	98%	6.82E-02	1.00E+00	
J1V440									
	M544L1AE	Pu-238	-1.76E-03 +- 2.9E-02	U J	pCi/g	100%	6.35E-02	1.00E+00	
		PU239/40	1.24E-02 +- 3.0E-02	U	pCi/g	100%	6.72E-02	1.00E+00	
J1V441									
	M544N1AE	Pu-238	-5.54E-04 +- 2.8E-02	U J	pCi/g	100%	5.04E-02	1.00E+00	
		PU239/40	1.08E-01 +- 8.1E-02		pCi/g	100%	6.63E-02	1.00E+00	
J1V442									
	M544Q1AE	Pu-238	-4.93E-03 +- 2.8E-02	U J	pCi/g	100%	7.53E-02	1.00E+00	
		PU239/40	1.77E-01 +- 1.0E-01		pCi/g	100%	4.98E-02	1.00E+00	
J1V443									
	M544T1AE	Pu-238	-3.85E-03 +- 3.2E-02	U J	pCi/g	89%	8.00E-02	1.00E+00	

TestAmerica Inc

rptTALRchSaSummary2 V6.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 11-Feb-15

Report No. : 64654

✓ 3/8/15

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036055 PUISO_PLATE_AEA									
J1V443									
	M544T1AE	PU239/40	3.01E-02 +- 4.6E-02	U	pCi/g	89%	6.93E-02	1.00E+00	
5036054 UISO_IE_PLATE_AEA									
J1V430									
	M543Q1AC	U-234	1.32E-01 +- 9.7E-02		pCi/g	82%	4.49E-02	1.00E+00	
		U-235	1.66E-02 +- 3.3E-02	U J	pCi/g	82%	4.49E-02	1.00E+00	
		U-238	9.54E-02 +- 8.3E-02		pCi/g	82%	8.26E-02	1.00E+00	
J1V431									
	M543W1AC	U-234	7.93E-02 +- 8.2E-02		pCi/g	64%	7.29E-02	1.00E+00	
		U-235	3.93E-02 +- 5.7E-02	U J	pCi/g	64%	7.29E-02	1.00E+00	
		U-238	1.39E-01 +- 1.1E-01		pCi/g	64%	7.29E-02	1.00E+00	
J1V431 DUP									
	M543W1AK	U-234	1.99E-01 +- 1.3E-01		pCi/g	77%	6.61E-02	1.00E+00	86.0
		U-235	1.82E-02 +- 3.7E-02	U	pCi/g	77%	4.92E-02	1.00E+00	73.5
		U-238	2.54E-01 +- 1.4E-01		pCi/g	77%	4.92E-02	1.00E+00	58.3
J1V432									
	M54301AC	U-234	2.33E-01 +- 1.3E-01		pCi/g	85%	5.66E-02	1.00E+00	
		U-235	-6.22E-04 +- 3.1E-02	U J	pCi/g	85%	5.66E-02	1.00E+00	
		U-238	2.49E-01 +- 1.3E-01		pCi/g	85%	4.22E-02	1.00E+00	
J1V433									
	M54321AC	U-234	1.54E-01 +- 1.1E-01		pCi/g	78%	4.63E-02	1.00E+00	
		U-235	1.71E-02 +- 3.4E-02	U J	pCi/g	78%	4.63E-02	1.00E+00	
		U-238	1.02E-01 +- 8.6E-02		pCi/g	78%	6.22E-02	1.00E+00	
J1V434									
	M54351AC	U-234	3.42E-01 +- 1.6E-01		pCi/g	88%	5.43E-02	1.00E+00	
		U-235	0.00E+00 +- 3.0E-02	U J	pCi/g	88%	4.04E-02	1.00E+00	
		U-238	2.82E-01 +- 1.4E-01		pCi/g	88%	6.00E-02	1.00E+00	
J1V435									
	M54371AC	U-234	6.19E-02 +- 7.5E-02	U	pCi/g	58%	9.28E-02	1.00E+00	
		U-235	0.00E+00 +- 4.3E-02	U J	pCi/g	58%	5.82E-02	1.00E+00	
		U-238	1.50E-01 +- 1.2E-01		pCi/g	58%	5.82E-02	1.00E+00	
J1V436									
	M54391AC	U-234	1.18E-01 +- 9.2E-02		pCi/g	78%	4.58E-02	1.00E+00	
		U-235	0.00E+00 +- 3.4E-02	U J	pCi/g	78%	4.58E-02	1.00E+00	
		U-238	2.02E-01 +- 1.2E-01		pCi/g	78%	6.15E-02	1.00E+00	
J1V437									
	M544D1AC	U-234	2.88E-01 +- 1.4E-01		pCi/g	88%	4.11E-02	1.00E+00	
		U-235	1.52E-02 +- 3.0E-02	U J	pCi/g	88%	4.11E-02	1.00E+00	

TestAmerica Inc

rptTALRchSaSummary2 V6.3.6.6
A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 11-Feb-15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 64654

K 3/8/15

SDG No: JP0904

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036054 UISO_IE_PLATE_AEA									
J1V437									
	M544D1AC	U-238	2.11E-01 +- 1.2E-01		pCi/g	88%	6.11E-02	1.00E+00	
J1V438									
	M544F1AC	U-234	4.46E-02 +- 6.5E-02	U	pCi/g	57%	8.28E-02	1.00E+00	
		U-235	2.27E-02 +- 4.6E-02	U J	pCi/g	57%	6.16E-02	1.00E+00	
		U-238	1.82E-01 +- 1.3E-01		pCi/g	57%	6.16E-02	1.00E+00	
J1V439									
	M544H1AC	U-234	1.96E-01 +- 1.3E-01		pCi/g	74%	8.26E-02	1.00E+00	
		U-235	1.81E-02 +- 3.6E-02	U J	pCi/g	74%	4.90E-02	1.00E+00	
		U-238	1.08E-01 +- 9.1E-02		pCi/g	74%	4.90E-02	1.00E+00	
J1V440									
	M544L1AC	U-234	1.78E-01 +- 1.0E-01		pCi/g	105%	3.70E-02	1.00E+00	
		U-235	0.00E+00 +- 2.7E-02	U J	pCi/g	105%	3.70E-02	1.00E+00	
		U-238	2.05E-01 +- 1.1E-01		pCi/g	105%	3.70E-02	1.00E+00	
J1V441									
	M544N1AC	U-234	1.28E-01 +- 1.0E-01		pCi/g	72%	8.54E-02	1.00E+00	
		U-235	-7.47E-04 +- 3.7E-02	U J	pCi/g	72%	6.80E-02	1.00E+00	
		U-238	2.05E-01 +- 1.3E-01		pCi/g	72%	6.80E-02	1.00E+00	
J1V442									
	M544Q1AC	U-234	2.06E-01 +- 1.1E-01		pCi/g	88%	3.73E-02	1.00E+00	
		U-235	-5.50E-04 +- 2.8E-02	U J	pCi/g	88%	5.01E-02	1.00E+00	
		U-238	2.61E-01 +- 1.3E-01		pCi/g	88%	3.73E-02	1.00E+00	
J1V443									
	M544T1AC	U-234	2.36E-01 +- 1.4E-01		pCi/g	74%	6.64E-02	1.00E+00	
		U-235	1.82E-02 +- 3.7E-02	U J	pCi/g	74%	4.94E-02	1.00E+00	
		U-238	1.09E-01 +- 9.2E-02		pCi/g	74%	4.94E-02	1.00E+00	
5036052 GAMMA_GS									
J1V430									
	M543Q1AG	AMERICIUM 241	-2.35E-02 +- 5.8E-02	U	pCi/g		9.95E-02		
		CO-60	-5.06E-03 +- 1.9E-02	U	pCi/g		3.29E-02	5.00E-02	
		CS-137	-1.65E-02 +- 1.9E-02	U	pCi/g		3.09E-02	1.00E-01	
		EU-152	-1.89E-02 +- 4.8E-02	U	pCi/g		8.11E-02	1.00E-01	
		EU-154	2.57E-02 +- 6.7E-02	U	pCi/g		1.20E-01	1.00E-01	
		EU-155	3.83E-02 +- 4.6E-02	U	pCi/g		7.91E-02	1.00E-01	
		K-40	1.28E+01 +- 1.7E+00		pCi/g		2.62E-01		
J1V431									
	M543W1AG	AMERICIUM 241	-1.08E-01 +- 9.4E-02	U	pCi/g		1.52E-01		
		CO-60	6.29E-03 +- 1.6E-02	U	pCi/g		2.86E-02	5.00E-02	

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 11-Feb-15

Report No. : 64654

3/8/15

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)		Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036052 GAMMA_GS										
J1V431										
	M543W1AG	CS-137	8.40E-03	+- 1.8E-02	U	pCi/g		3.13E-02	1.00E-01	
		EU-152	-1.27E-02	+- 1.4E-01	U	pCi/g		8.52E-02	1.00E-01	
		EU-154	-1.18E-02	+- 5.6E-02	U	pCi/g		9.60E-02	1.00E-01	
		EU-155	1.53E-02	+- 6.6E-02	U	pCi/g		1.10E-01	1.00E-01	
		K-40	*1.69E+01*	*+- 2.1E+00*		*pCi/g*		*2.21E-01*		
J1V432										
	M54301AG	AMERICIUM 241	2.71E-03	+- 1.8E-02	U	pCi/g		3.04E-02		
		CO-60	-6.47E-03	+- 1.6E-02	U	pCi/g		2.78E-02	5.00E-02	
		CS-137	-8.70E-03	+- 1.3E-02	U	pCi/g		2.17E-02	1.00E-01	
		EU-152	-6.16E-03	+- 2.8E-02	U	pCi/g		4.69E-02	1.00E-01	
		EU-154	1.25E-02	+- 5.2E-02	U	pCi/g		9.27E-02	1.00E-01	
		EU-155	4.61E-02	+- 2.5E-02	U	pCi/g		4.42E-02	1.00E-01	
		K-40	1.61E+01	+- 1.9E+00		pCi/g		2.87E-01		
J1V432 DUP										
	M54301AJ	AMERICIUM 241	5.11E-03	+- 1.9E-02	U	pCi/g		3.15E-02		61.4
		CO-60	-4.87E-03	+- 1.4E-02	U	pCi/g		2.33E-02	5.00E-02	-28.2
		CS-137	1.01E-04	+- 1.2E-02	U	pCi/g		2.06E-02	1.00E-01	-204.7
		EU-152	4.23E-03	+- 3.1E-02	U	pCi/g		4.73E-02	1.00E-01	-1077.9
		EU-154	2.39E-02	+- 4.8E-02	U	pCi/g		8.66E-02	1.00E-01	62.4
		EU-155	4.79E-02	+- 4.9E-02		pCi/g		4.09E-02	1.00E-01	3.8
		K-40	1.55E+01	+- 1.8E+00		pCi/g		2.14E-01		3.4
J1V433										
	M54321AG	AMERICIUM 241	-1.57E-03	+- 2.2E-02	U	pCi/g		3.71E-02		
		CO-60	-5.03E-03	+- 1.6E-02	U	pCi/g		2.76E-02	5.00E-02	
		CS-137	-6.76E-03	+- 1.4E-02	U	pCi/g		2.37E-02	1.00E-01	
		EU-152	2.36E-02	+- 3.2E-02	U	pCi/g		5.51E-02	1.00E-01	
		EU-154	-2.82E-02	+- 5.1E-02	U	pCi/g		8.50E-02	1.00E-01	
		EU-155	2.53E-02	+- 3.0E-02	U	pCi/g		5.24E-02	1.00E-01	
		K-40	1.57E+01	+- 1.9E+00		pCi/g		2.29E-01		
J1V434										
	M54351AG	AMERICIUM 241	4.07E-03	+- 1.9E-02	U	pCi/g		3.17E-02		
		CO-60	-1.78E-04	+- 1.4E-02	U	pCi/g		2.45E-02	5.00E-02	
		CS-137	-9.12E-06	+- 1.3E-02	U	pCi/g		2.26E-02	1.00E-01	
		EU-152	-1.48E-02	+- 3.0E-02	U	pCi/g		4.90E-02	1.00E-01	
		EU-154	-1.34E-02	+- 4.8E-02	U	pCi/g		8.12E-02	1.00E-01	
		EU-155	4.39E-02	+- 2.7E-02	U	pCi/g		4.74E-02	1.00E-01	
		K-40	1.50E+01	+- 1.8E+00		pCi/g		2.00E-01		

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 11-Feb-15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 64654

3/18/15

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036052 GAMMA_GS									
J1V435									
	M54371AG	AMERICIUM 241	5.29E-03 +- 5.9E-02	U	pCi/g		1.02E-01		
		CO-60	1.89E-02 +- 2.1E-02	U	pCi/g		4.06E-02	5.00E-02	
		CS-137	-1.20E-02 +- 1.9E-02	U	pCi/g		3.17E-02	1.00E-01	
		EU-152	-1.98E-02 +- 5.4E-02	U	pCi/g		8.71E-02	1.00E-01	
		EU-154	-6.56E-03 +- 7.1E-02	U	pCi/g		1.22E-01	1.00E-01	
		EU-155	6.50E-02 +- 4.9E-02	U	pCi/g		8.54E-02	1.00E-01	
		K-40	1.41E+01 +- 1.9E+00		pCi/g		3.33E-01		
J1V436									
	M54391AG	AMERICIUM 241	-1.31E-01 +- 9.2E-02	U	pCi/g		1.46E-01		
		CO-60	-3.42E-03 +- 1.6E-02	U	pCi/g		2.76E-02	5.00E-02	
		CS-137	-1.08E-03 +- 1.7E-02	U	pCi/g		2.97E-02	1.00E-01	
		EU-152	-1.63E-02 +- 9.1E-02	U	pCi/g		8.43E-02	1.00E-01	
		EU-154	4.25E-02 +- 5.4E-02	U	pCi/g		9.89E-02	1.00E-01	
		EU-155	-1.66E-02 +- 6.4E-02	U	pCi/g		1.06E-01	1.00E-01	
		K-40	1.52E+01 +- 1.9E+00		pCi/g		2.20E-01		
J1V437									
	M544D1AG	AMERICIUM 241	1.10E-02 +- 1.8E-02	U	pCi/g		3.11E-02		
		CO-60	-9.01E-03 +- 1.5E-02	U	pCi/g		2.50E-02	5.00E-02	
		CS-137	-1.39E-02 +- 1.4E-02	U	pCi/g		2.16E-02	1.00E-01	
		EU-152	6.95E-03 +- 2.7E-02	U	pCi/g		4.64E-02	1.00E-01	
		EU-154	-2.38E-02 +- 4.5E-02	U	pCi/g		7.57E-02	1.00E-01	
		EU-155	2.89E-02 +- 2.6E-02	U	pCi/g		4.54E-02	1.00E-01	
		K-40	1.55E+01 +- 1.8E+00		pCi/g		2.04E-01		
J1V438									
	M544F1AG	AMERICIUM 241	-9.65E-03 +- 1.8E-02	U	pCi/g		2.90E-02		
		CO-60	-5.46E-03 +- 1.4E-02	U	pCi/g		2.36E-02	5.00E-02	
		CS-137	1.21E-02 +- 1.4E-02	U	pCi/g		2.52E-02	1.00E-01	
		EU-152	-9.26E-03 +- 2.8E-02	U	pCi/g		4.73E-02	1.00E-01	
		EU-154	-5.56E-02 +- 5.3E-02	U	pCi/g		8.54E-02	1.00E-01	
		EU-155	2.41E-02 +- 2.6E-02	U	pCi/g		4.41E-02	1.00E-01	
		K-40	1.42E+01 +- 1.7E+00		pCi/g		2.73E-01		
J1V439									
	M544H1AG	AMERICIUM 241	-4.50E-03 +- 1.8E-02	U	pCi/g		3.02E-02		
		CO-60	6.27E-03 +- 1.3E-02	U	pCi/g		2.50E-02	5.00E-02	
		CS-137	2.39E-02 +- 1.5E-02	U	pCi/g		2.66E-02	1.00E-01	
		EU-152	-2.95E-02 +- 2.8E-02	U	pCi/g		4.39E-02	1.00E-01	
		EU-154	-2.32E-02 +- 4.7E-02	U	pCi/g		7.88E-02	1.00E-01	

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 11-Feb-15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 64654

3/8/15

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036052 GAMMA_GS									
J1V439									
	M544H1AG	EU-155	1.41E-02 +- 2.7E-02	U	pCi/g		4.51E-02	1.00E-01	
		K-40	1.49E+01 +- 1.8E+00		pCi/g		2.09E-01		
J1V440									
	M544L1AG	AMERICIUM 241	-1.91E-03 +- 1.7E-02	U	pCi/g		2.86E-02		
		CO-60	-1.09E-02 +- 1.4E-02	U	pCi/g		2.19E-02	5.00E-02	
		CS-137	2.43E-02 +- 1.6E-02	U	pCi/g		2.58E-02	1.00E-01	
		EU-152	-1.66E-03 +- 2.6E-02	U	pCi/g		4.50E-02	1.00E-01	
		EU-154	-6.59E-03 +- 4.5E-02	U	pCi/g		7.60E-02	1.00E-01	
		EU-155	4.08E-02 +- 2.4E-02	U	pCi/g		4.22E-02	1.00E-01	
		K-40	1.45E+01 +- 1.7E+00		pCi/g		2.14E-01		
J1V441									
	M544N1AG	AMERICIUM 241	1.02E-02 +- 2.1E-02	U	pCi/g		3.06E-02		
		CO-60	-7.92E-03 +- 1.3E-02	U	pCi/g		2.15E-02	5.00E-02	
		CS-137	4.53E-02 +- 2.0E-02		pCi/g		2.14E-02	1.00E-01	
		EU-152	2.65E-04 +- 2.7E-02	U	pCi/g		4.63E-02	1.00E-01	
		EU-154	6.84E-03 +- 4.4E-02	U	pCi/g		7.83E-02	1.00E-01	
		EU-155	3.30E-02 +- 2.6E-02	U	pCi/g		4.48E-02	1.00E-01	
		K-40	1.44E+01 +- 1.7E+00		pCi/g		1.86E-01		
J1V442									
	M544Q1AG	AMERICIUM 241	5.46E-03 +- 1.7E-02	U	pCi/g		2.98E-02		
		CO-60	-3.56E-04 +- 1.4E-02	U	pCi/g		2.47E-02	5.00E-02	
		CS-137	1.02E-02 +- 1.4E-02	U	pCi/g		2.44E-02	1.00E-01	
		EU-152	-1.97E-03 +- 2.8E-02	U	pCi/g		4.66E-02	1.00E-01	
		EU-154	1.37E-02 +- 4.2E-02	U	pCi/g		7.46E-02	1.00E-01	
		EU-155	2.43E-02 +- 2.6E-02	U	pCi/g		4.41E-02	1.00E-01	
		K-40	1.44E+01 +- 1.7E+00		pCi/g		1.98E-01		
J1V443									
	M544T1AG	AMERICIUM 241	-2.41E-02 +- 9.1E-02	U	pCi/g		1.51E-01		
		CO-60	4.13E-03 +- 1.6E-02	U	pCi/g		2.80E-02	5.00E-02	
		CS-137	-6.48E-03 +- 1.8E-02	U	pCi/g		3.01E-02	1.00E-01	
		EU-152	-1.18E-02 +- 9.9E-02	U	pCi/g		8.34E-02	1.00E-01	
		EU-154	-2.53E-02 +- 5.7E-02	U	pCi/g		9.60E-02	1.00E-01	
		EU-155	-1.10E-02 +- 6.4E-02	U	pCi/g		1.06E-01	1.00E-01	
		K-40	1.57E+01 +- 1.9E+00		pCi/g		2.41E-01		
5036053 SRTOT_SEP_PRECIP_GPC									
J1V430									
	M543Q1AD	STRONTIUM	1.14E-01 +- 1.4E-01	U	pCi/g	97%	2.82E-01	1.00E+00	

TestAmerica Inc

rptTALRchSaSummary2 V6.3.6.6
A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 11-Feb-15

Report No. : 64654

3/18/15

SDG No: JP0904

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036053 SRTOT_SEP_PRECIP_GPC									
	J1V431								
	M543W1AD	STRONTIUM	-2.10E-02 +- 1.2E-01	U	pCi/g	99%	2.59E-01	1.00E+00	
	J1V432								
	M54301AD	STRONTIUM	1.34E-01 +- 1.4E-01	U	pCi/g	96%	2.78E-01	1.00E+00	
	J1V433								
	M54321AD	STRONTIUM	4.15E-02 +- 1.2E-01	U	pCi/g	98%	2.61E-01	1.00E+00	
	J1V433 DUP								
	M54321AJ	STRONTIUM	4.98E-02 +- 1.4E-01	U	pCi/g	97%	3.02E-01	1.00E+00	18.3
	J1V434								
	M54351AD	STRONTIUM	-4.47E-02 +- 1.1E-01	U	pCi/g	99%	2.58E-01	1.00E+00	
	J1V435								
	M54371AD	STRONTIUM	-2.20E-02 +- 1.3E-01	U	pCi/g	96%	2.86E-01	1.00E+00	
	J1V436								
	M54391AD	STRONTIUM	1.25E-01 +- 1.7E-01	U	pCi/g	88%	3.35E-01	1.00E+00	
	J1V437								
	M544D1AD	STRONTIUM	-4.04E-02 +- 1.2E-01	U	pCi/g	95%	2.75E-01	1.00E+00	
	J1V438								
	M544F1AD	STRONTIUM	5.52E-02 +- 1.2E-01	U	pCi/g	97%	2.48E-01	1.00E+00	
	J1V439								
	M544H1AD	STRONTIUM	9.71E-02 +- 1.2E-01	U	pCi/g	97%	2.52E-01	1.00E+00	
	J1V440								
	M544L1AD	STRONTIUM	-1.42E-03 +- 1.3E-01	U	pCi/g	88%	2.77E-01	1.00E+00	
	J1V441								
	M544N1AD	STRONTIUM	-2.02E-02 +- 1.2E-01	U	pCi/g	99%	2.75E-01	1.00E+00	
	J1V442								
	M544Q1AD	STRONTIUM	-1.92E-02 +- 1.2E-01	U	pCi/g	98%	2.58E-01	1.00E+00	
	J1V443								
	M544T1AD	STRONTIUM	7.36E-02 +- 1.3E-01	U	pCi/g	95%	2.73E-01	1.00E+00	
5036060 TRITIUM_DIST_LSC									
	J1V430								
	M543Q1AF	H-3	1.36E-02 +- 2.6E-02	U J	pCi/g	100%	5.89E-02	1.00E+01	
	J1V430 DUP								
	M543Q1AJ	H-3	-2.44E-02 +- 2.1E-02	U	pCi/g	100%	5.29E-02	1.00E+01	-701.3
	J1V431								
	M543W1AF	H-3	1.25E-02 +- 2.8E-02	U J	pCi/g	100%	6.22E-02	1.00E+01	
	J1V432								
	M54301AF	H-3	-9.04E-03 +- 2.5E-02	U J	pCi/g	100%	6.00E-02	1.00E+01	
	J1V433								
	M54321AF	H-3	3.15E-02 +- 7.9E-02	U J	pCi/g	100%	1.80E-01	1.00E+01	

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 11-Feb-15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 64654

SDG No: JP0904

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036050 TRITIUM_DIST_LSC									
	J1V434								
	M54351AF	H-3	3.46E-04 +- 2.5E-02	U J	pCi/g	100%	5.86E-02	1.00E+01	
	J1V435								
	M54371AF	H-3	3.11E-03 +- 2.4E-02	U	pCi/g	100%	5.65E-02	1.00E+01	
	J1V436								
	M54391AF	H-3	1.56E-02 +- 3.4E-02	U	pCi/g	100%	7.66E-02	1.00E+01	
	J1V437								
	M544D1AF	H-3	2.22E-02 +- 4.9E-02	U	pCi/g	100%	1.10E-01	1.00E+01	
	J1V438								
	M544F1AF	H-3	-3.00E-02 +- 2.4E-02	U	pCi/g	100%	6.06E-02	1.00E+01	
	J1V439								
	M544H1AF	H-3	-4.10E-03 +- 2.7E-02	U	pCi/g	100%	6.34E-02	1.00E+01	
	J1V440								
	M544L1AF	H-3	-1.11E-02 +- 3.4E-02	U	pCi/g	100%	8.12E-02	1.00E+01	
	J1V441								
	M544N1AF	H-3	4.35E-02 +- 4.1E-02	U	pCi/g	100%	8.95E-02	1.00E+01	
	J1V442								
	M544Q1AF	H-3	-1.19E-02 +- 2.8E-02	U	pCi/g	100%	6.66E-02	1.00E+01	
	J1V443								
	M544T1AF	H-3	3.05E-03 +- 2.6E-02	U	pCi/g	100%	6.07E-02	1.00E+01	
5037010 7196_CR6									
	J1V430								
	M543Q1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	M543Q1AM	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	0.0
	J1V431								
	M543W1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V432								
	M54301AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V433								
	M54321AA	HEXCHROME	1.99E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1V434								
	M54351AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V435								
	M54371AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V436								
	M54391AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V437								
	M544D1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V438								

N 3/4/15

TestAmerica Inc
rptTALRchSaSummary2 V5.3.6.6
A2002

RPD - Relative Percent Difference.
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

February 11, 2015

Attention: Joan Kessner

SAF Number	:	RC-107
Date SDG Closed	:	February 5, 2015
Number of Samples	:	Fourteen (14)
Sample Type	:	Soil
SDG Number	:	JP0904
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On February 5, 2015, fourteen soil samples were received at TestAmerica for radiochemical and chemistry analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1V430	M543Q	SOIL	2/05/15
J1V431	M543W	SOIL	2/05/15
J1V432	M5430	SOIL	2/05/15
J1V433	M5432	SOIL	2/05/15
J1V434	M5435	SOIL	2/05/15
J1V435	M5437	SOIL	2/05/15
J1V436	M5439	SOIL	2/05/15
J1V437	M544D	SOIL	2/05/15
J1V438	M544F	SOIL	2/05/15
J1V439	M544H	SOIL	2/05/15
J1V440	M544L	SOIL	2/05/15
J1V441	M544N	SOIL	2/05/15
J1V442	M544Q	SOIL	2/05/15
J1V443	M544T	SOIL	2/05/15

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. 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
Plutonium-238, -239/240 by method RL-ALP-001
Uranium 234, 235 and 238 by method RL-ALP-015
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005
Carbon-14 by method RL-LSC-008
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed includes 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.

V. Comments

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-001:
The LCS, batch blank, samples and sample duplicate (J1V430) results are within contractual requirements.

Uranium 234, 235 and 238 by method RL-ALP-015:
The LCS, batch blank, samples and sample duplicate (J1V431) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1V433) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:

The CRDL was not met for some of the analytes. Except as noted; the LCS, batch blank, samples and sample duplicate (J1V432) results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RL-LSC-005:

The LCS, batch blank, samples and sample duplicate (J1V430) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:

The LCS, batch blank, samples and sample duplicate (J1V431) results are within contractual requirements.

Chemical Analysis

Hexavalent Chromium by EPA method 7196A

The LCS, batch blank, samples, sample duplicate (J1V430) and sample matrix spike (J1V430) 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:

Rhonda Wagar
Project Manager

TestAmerica Laboratories, Inc.

23

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8 B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: n/A		Bill of Lading/Air Bill No.: n/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive; less than DOT limits~~ 2-5-15 CMB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	None	None	None	
Type of Container	G/P	G/P	G/P	G/P	G/P	
No. of Container(s)	1	1	1	1	1	
Volume	125mL	125mL	125mL	1000mL	~~[illegible]~~ 125 mL 02/05/15	
Sample Analysis	Chromium Hex - 7196	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 – Total Sr	See item (2) in Special Instructions	Carbon-14 Low Level; Tritium - H3 Low Level Soil	

REVIEWED BY DAS DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time					
J1V430 M5439	SOIL	02/5/15	0931	X	X	X	X	X
J1V431 M5434	SOIL	02/5/15	0943	X	X	X	X	X
J1V432 M5430	SOIL	02/5/15	0925	X	X	X	X	X
J1V433 M5432	SOIL	02/5/15	0918	X	X	X	X	X
J1V434 M5435	SOIL	02/5/15	0912	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Quincy Stowe, Date/Time: 2-5-15 0951	Received By/Stored In: C. Martinez/C. Martinez, Date/Time: 2/5/15 0951
Relinquished By/Removed From: C. Martinez/C. Martinez, Date/Time: 2/5/15 1215	Received By/Stored In: C. Bingham, Date/Time: 2-5-15 1215
Relinquished By/Removed From: C. Bingham, Date/Time: 2-5-15 1440	Received By/Stored In: J. Bock, TARI, Date/Time: 2-5-15 1440
Relinquished By/Removed From: 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:
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:

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

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

J5B050413

Due 2-12-15

J5B050413

SDG: JP0904

WCH-EE-011

TestAmerica Laboratories, Inc.

24

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-107-127	Page 2 of 3

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 CMB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	None	None	None	None	
Type of Container	G/P	G/P	G/P	G/P	G/P		
No. of Container(s)	1	1	1	1	1		
Volume	125mL	125mL	125mL	1000mL	125 mL 02/05/15		
Sample Analysis	Chromium Hex - 7196	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 – Total Sr	See Item (2) in Special Instructions	Carbon-14 Low Level; Tritium - H3 Low Level Soil		

REVIEWED BY DKB DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time									
J1V435 M5437	SOIL	02/5/15	0905	X	X	X	X	X				
J1V436 M5439	SOIL	02/5/15	0900	X	X	X	X	X				
J1V437 M544D	SOIL	02/5/15	0813	X	X	X	X	X				
J1V438 M544F	SOIL	02/5/15	0820	X	X	X	X	X				
J1V439 M544H	SOIL	02/5/15	0830	X	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	0951 2-5-15	C. Martinez/C. Martinez	0951 2/5/15
C. Martinez/C. Martinez	1215 2/5/15	C. Bingham CMB	1215 2-5-15
C. Bingham CMB WCH	1440 2-5-15	J. Bock, TARL	1440 2-5-15

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

JSB050413
Due 2-12-15

SDG:
JB0904

WCH-EE-011

TestAmerica Laboratories, Inc.

25

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: n/a		Bill of Lading/Air Bill No.: n/a

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive; less than DOT limits~~ 2-5-15 cmB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	None	None	None						
Type of Container	G/P	G/P	G/P	G/P	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	125mL	125mL	125mL	1000mL	~~60mL~~ 125mL	02/05/15					
Sample Analysis	Chromium Hex - 7196	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 -- Total Sr	See item (2) in Special Instructions	Carbon-14 Low Level; Tritium - H3 Low Level Soil						

REVIEWED BY DAB DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V440 M544L	SOIL	02/5/15	0839	X	X	X	X	X					
J1V441 M544N	SOIL	02/5/15	0846	X	X	X	X	X					
J1V442 M544Q	SOIL	02/5/15	0854	X	X	X	X	X					
J1V443 M544T	SOIL	02/5/15	0813	X	X	X	X	X					
~~J1V444~~ 02/5/15	~~SOIL~~												

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Quincy Stowe	2-5-15 0951	Received By/Stored In: C Martinez/C Martinez	2/5/15 0951
Relinquished By/Removed From: C Martinez/C Martinez	2/5/15 1215	Received By/Stored In: C Bingham	2-5-15 1215
Relinquished By/Removed From: C Bingham	2-5-15 1440	Received By/Stored In: J. Bock, TARL	2-5-15 1440
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	

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

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

JSB050413
Due 2.12-15

JP0904

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-H-51:2			DATA PACKAGE: JP0904		
VALIDATOR: ELR		LAB: TAL		DATE: 3/6/13	
			SDG: JP0904		

ANALYSES PERFORMED					
☐ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☒ Tritium	X C14	X SH 3/6/13	

SAMPLES/MATRIX					
J1U430	J1U431	J1U432	J1U433	J1U434	J1U435
J1U436	J1U437	J1U438	J1U439	J1U440	J1U441
J1U442	J1U443				
					soil

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

Method blank analyzed within required frequency? ..... Yes No N/A

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

Analytes detected in method blank? ..... Yes No N/A

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

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

Analytes detected in field blank(s)? ..... Yes No N/A

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

Comments: no FB

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

LCS /BSS analyzed within required frequency? ..... Yes No N/A

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

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

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

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

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

Comments: no pu238 or U233 LCS - Jeff

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

Chemical carrier added? ..... Yes No N/A

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: No 3H or C14 mg — Jall

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Comments: 37/43 no FS or DAJ

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: 5 over

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 11-Feb-15

Report No. : 64654

SDG No.: JP0904

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_CHEM_LSC								
5036049 BLANK QC, M54441AA	C-14	-1.44E-01 +- 2.0E-01	U	pCi/g	100%			4.80E-01
5036049 LCS, M54441AC	C-14	6.85E+00 +- 5.9E-01		pCi/g	100%	95%	0.0	4.86E-01
PUISO_PLATE_AEA								
5036055 BLANK QC, M545D1AA	Pu-238	-1.54E-03 +- 3.8E-02	U	pCi/g	72%			7.73E-02
	PU239/40	3.61E-02 +- 5.5E-02	U	pCi/g	72%			8.30E-02
5036055 LCS, M545D1AC	PU239/40	7.39E+00 +- 1.7E+00		pCi/g	63%	100%	0.0	8.89E-02
UISO_IE_PLATE_AEA								
5036054 BLANK QC, M545C1AA	U-234	1.56E-02 +- 3.3E-02	U	pCi/g	74%			5.90E-02
	U-235	-6.48E-04 +- 3.2E-02	U	pCi/g	74%			5.90E-02
	U-238	1.62E-02 +- 3.3E-02	U	pCi/g	74%			4.39E-02
5036054 LCS, M545C1AC	U-234	2.98E+00 +- 6.9E-01		pCi/g	77%	99%	0.0	5.59E-02
	U-238	3.32E+00 +- 7.6E-01		pCi/g	77%	106%	0.1	5.59E-02
GAMMA_GS								
5036052 BLANK QC, M54471AA	AMERICIUM 241	1.94E-04 +- 8.9E-03	U	pCi/g				1.55E-02
	CO-60	-1.34E-03 +- 8.3E-03	U	pCi/g				1.50E-02
	CS-137	-2.34E-03 +- 8.5E-03	U	pCi/g				1.40E-02
	EU-152	1.20E-02 +- 1.8E-02	U	pCi/g				3.30E-02
	EU-154	1.84E-02 +- 2.1E-02	U	pCi/g				4.53E-02
	EU-155	8.52E-03 +- 1.4E-02	U	pCi/g				2.45E-02
	K-40	-2.42E-01 +- 2.2E-01	U	pCi/g				4.56E-01
5036052 LCS, M54471AC	CS-137	9.70E-01 +- 1.3E-01		pCi/g		98%	0.0	2.56E-02
	RA-226	9.46E-01 +- 1.4E-01		pCi/g		83%	-0.2	3.59E-02
	RA-228	6.39E-01 +- 1.2E-01		pCi/g		108%	0.1	7.84E-02
	U-238	9.71E-01 +- 1.2E-01		pCi/g		81%	-0.2	3.99E-02
SRTOT_SEP_PRECIP_GPC								
5036053 BLANK QC, M545A1AA	STRONTIUM	1.20E-01 +- 1.5E-01	U	pCi/g	90%			3.06E-01
5036053 LCS, M545A1AC	STRONTIUM	3.65E+00 +- 9.1E-01		pCi/g	75%	110%	0.1	3.43E-01
TRITIUM_DIST_LSC								
5036050 BLANK QC, M54451AA	H-3	-2.91E-02 +- 3.0E-02	U	pCi/g	100%			7.34E-02
5036050 LCS,								

TestAmerica Inc
rptSTLRchQcSummary V5.3.6.6
A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 11-Feb-15

Report No. : 64654

SDG No.: JP0904

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
M54451AC	H-3	3.86E-01 +- 5.5E-02		pCi/g	100%	74%	-0.3	8.21E-02
7196_CR6								
5037010 MATRIX SPIKE, J1V430								
M543Q1AL	HEXCHROME	3.00E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
5037010 LCS,								
M547R1AC	HEXCHROME	1.93E+01 +- 0.0E+00		mg/kg	N/A	97%	0.0	1.55E-01
5037010 BLANK QC,								
M547R1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 28

TestAmerica Inc
rptSTLRchQcSummary V5.3.6.6
A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 9 March 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-51:2
Subject: PCB - Data Package No. JP0904-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0904 prepared by TestAmerica Laboratories (TAL). 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	Analyte
J1V430	2/5/15	Soil	C	See note 1
J1V431	2/5/15	Soil	C	See note 1
J1V432	2/5/15	Soil	C	See note 1
J1V433	2/5/15	Soil	C	See note 1
J1V434	2/5/15	Soil	C	See note 1
J1V435	2/5/15	Soil	C	See note 1
J1V436	2/5/15	Soil	C	See note 1
J1V437	2/5/15	Soil	C	See note 1
J1V438	2/5/15	Soil	C	See note 1
J1V439	2/5/15	Soil	C	See note 1
J1V440	2/5/15	Soil	C	See note 1
J1V441	2/5/15	Soil	C	See note 1
J1V442	2/5/15	Soil	C	See note 1
J1V443	2/5/15	Soil	C	See note 1

1 – PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times**

Holding times are not applicable for PCB analysis.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the

unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V437/J1V443) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data Package No. JP0904 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

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein 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 quantitation limit is an estimate.

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

PCB DATA QUALIFICATION SUMMARY*

SDG: JP0904	REVIEWER: ELR	Project: 100-H-51:2	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V430**

Lab Sample ID: 280-65149-1
Client Matrix: Solid

% Moisture: 3.9

Date Sampled: 02/05/2015 0931
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	30.6 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 0911			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.2	U	8.2	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.8	U	4.8	10
Aroclor 1248		4.8	U	4.8	10
Aroclor 1254		2.7	U	2.7	10
Aroclor 1260		2.7	U	2.7	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	79		59 - 130
Tetrachloro-m-xylene	74		53 - 128

3/4/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V431**

Lab Sample ID: 280-65149-2
Client Matrix: Solid

% Moisture: 5.7

Date Sampled: 02/05/2015 0943
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	31.0 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1020			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.2	U	8.2	17
Aroclor 1232		2.1	U	2.1	10
Aroclor 1242		4.8	U	4.8	10
Aroclor 1248		4.8	U	4.8	10
Aroclor 1254		2.7	U	2.7	10
Aroclor 1260		2.7	U	2.7	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	82		59 - 130
Tetrachloro-m-xylene	78		53 - 128

3/18/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V432**

Lab Sample ID: 280-65149-3
Client Matrix: Solid
% Moisture: 4.3

Date Sampled: 02/05/2015 0925
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	30.3 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1044			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.9	U	2.9	10
Aroclor 1221		8.3	U	8.3	17
Aroclor 1232		2.1	U	2.1	10
Aroclor 1242		4.8	U	4.8	10
Aroclor 1248		4.8	U	4.8	10
Aroclor 1254		2.7	U	2.7	10
Aroclor 1260		2.7	U	2.7	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	86		59 - 130
Tetrachloro-m-xylene	80		53 - 128

3/4/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V433

Lab Sample ID: 280-65149-4
Client Matrix: Solid

% Moisture: 11.3

Date Sampled: 02/05/2015 0918
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	31.3 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1107			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		3.0	U	3.0	11
Aroclor 1221		8.7	U	8.7	18
Aroclor 1232		2.2	U	2.2	11
Aroclor 1242		5.0	U	5.0	11
Aroclor 1248		5.0	U	5.0	11
Aroclor 1254		2.8	U	2.8	11
Aroclor 1260		2.8	U	2.8	11

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	82		59 - 130
Tetrachloro-m-xylene	75		53 - 128

3/8/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V434**

Lab Sample ID: 280-65149-5
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 02/05/2015 0912
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	31.2 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1130			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.2	U	8.2	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.8	U	4.8	10
Aroclor 1248		4.8	U	4.8	10
Aroclor 1254		2.7	U	2.7	10
Aroclor 1260		2.7	U	2.7	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	82		59 - 130
Tetrachloro-m-xylene	78		53 - 128

3/8/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V435**

Lab Sample ID: 280-65149-6
Client Matrix: Solid

% Moisture: 5.6

Date Sampled: 02/05/2015 0905
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	32.2 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1153			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.7	U	2.7	9.9
Aroclor 1221		7.9	U	7.9	16
Aroclor 1232		2.0	U	2.0	9.9
Aroclor 1242		4.6	U	4.6	9.9
Aroclor 1248		4.6	U	4.6	9.9
Aroclor 1254		2.6	U	2.6	9.9
Aroclor 1260		2.6	U	2.6	9.9

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	82		59 - 130
Tetrachloro-m-xylene	74		53 - 128

3/18/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V436**

Lab Sample ID: 280-65149-7
Client Matrix: Solid

% Moisture: 5.3

Date Sampled: 02/05/2015 0900
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	32.9 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1240			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.7	U	2.7	9.6
Aroclor 1221		7.7	U	7.7	16
Aroclor 1232		1.9	U	1.9	9.6
Aroclor 1242		4.5	U	4.5	9.6
Aroclor 1248		4.5	U	4.5	9.6
Aroclor 1254		2.5	U	2.5	9.6
Aroclor 1260		2.5	U	2.5	9.6

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	82		59 - 130
Tetrachloro-m-xylene	77		53 - 128

3/18/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V437

Lab Sample ID: 280-65149-8
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 02/05/2015 0813
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	30.5 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1303			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.9	U	2.9	10
Aroclor 1221		8.4	U	8.4	17
Aroclor 1232		2.1	U	2.1	10
Aroclor 1242		4.9	U	4.9	10
Aroclor 1248		4.9	U	4.9	10
Aroclor 1254		2.7	U	2.7	10
Aroclor 1260		2.7	U	2.7	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	83		59 - 130
Tetrachloro-m-xylene	77		53 - 128

3/18/16

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V438**

Lab Sample ID: 280-65149-9
Client Matrix: Solid
% Moisture: 6.5

Date Sampled: 02/05/2015 0820
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	32.2 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1326			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.0	U	8.0	16
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.6	U	4.6	10
Aroclor 1248		4.6	U	4.6	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		13		2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	78		59 - 130
Tetrachloro-m-xylene	76		53 - 128

3/8/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V439**

Lab Sample ID: 280-65149-10
Client Matrix: Solid

% Moisture: 6.4

Date Sampled: 02/05/2015 0830
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	32.0 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1350			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.0	U	8.0	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		13		2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	74		59 - 130
Tetrachloro-m-xylene	78		53 - 128

3/8/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V440

Lab Sample ID: 280-65149-11
Client Matrix: Solid

% Moisture: 8.0

Date Sampled: 02/05/2015 0839
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	32.7 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1413			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.0	U	8.0	16
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.6	U	4.6	10
Aroclor 1248		4.6	U	4.6	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	71		59 - 130
Tetrachloro-m-xylene	74		53 - 128

✓ 3/18/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: **J1V441**

Lab Sample ID: 280-65149-12
Client Matrix: Solid
% Moisture: 5.7

Date Sampled: 02/05/2015 0846
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	31.3 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1436			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.2	U	8.2	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		3.2	J	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	72		59 - 130
Tetrachloro-m-xylene	78		53 - 128

3/8/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V442

Lab Sample ID: 280-65149-13
Client Matrix: Solid

% Moisture: 5.8

Date Sampled: 02/05/2015 0854
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	32.4 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1459			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.7	U	2.7	9.8
Aroclor 1221		7.9	U	7.9	16
Aroclor 1232		2.0	U	2.0	9.8
Aroclor 1242		4.6	U	4.6	9.8
Aroclor 1248		4.6	U	4.6	9.8
Aroclor 1254		2.6	U	2.6	9.8
Aroclor 1260		2.6	U	2.6	9.8

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	82		59 - 130
Tetrachloro-m-xylene	84		53 - 128

3/8/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Client Sample ID: J1V443

Lab Sample ID: 280-65149-14
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 02/05/2015 0813
Date Received: 02/06/2015 0950

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Prep Method:	3550C	Prep Batch:	280-263446	Initial Weight/Volume:	30.1 g
Dilution:	1.0			Final Weight/Volume:	5 mL
Analysis Date:	02/11/2015 1522			Injection Volume:	1 uL
Prep Date:	02/07/2015 1506			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.9	U	2.9	11
Aroclor 1221		8.5	U	8.5	17
Aroclor 1232		2.1	U	2.1	11
Aroclor 1242		4.9	U	4.9	11
Aroclor 1248		4.9	U	4.9	11
Aroclor 1254		2.8	U	2.8	11
Aroclor 1260		2.8	U	2.8	11

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	83		59 - 130
Tetrachloro-m-xylene	79		53 - 128

3/8/15

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-65149-1

SDG #: JP0904
SAF#: RC-107

Date SDG Closed: February 6, 2015
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V430	280-65149-1	6010/7471/8082	6010B/7471A/8082
J1V431	280-65149-2	6010/7471/8082	6010B/7471A/8082
J1V432	280-65149-3	6010/7471/8082	6010B/7471A/8082
J1V433	280-65149-4	6010/7471/8082	6010B/7471A/8082
J1V434	280-65149-5	6010/7471/8082	6010B/7471A/8082
J1V435	280-65149-6	6010/7471/8082	6010B/7471A/8082
J1V436	280-65149-7	6010/7471/8082	6010B/7471A/8082
J1V437	280-65149-8	6010/7471/8082	6010B/7471A/8082
J1V438	280-65149-9	6010/7471/8082	6010B/7471A/8082
J1V439	280-65149-10	6010/7471/8082	6010B/7471A/8082
J1V440	280-65149-11	6010/7471/8082	6010B/7471A/8082
J1V441	280-65149-12	6010/7471/8082	6010B/7471A/8082
J1V442	280-65149-13	6010/7471/8082	6010B/7471A/8082
J1V443	280-65149-14	6010/7471/8082	6010B/7471A/8082
J1V444	280-65149-15	6010/7471	6010B/7471A

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. 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 signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 2/6/2015 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.2° C and 4.5° C.

GC SEMIVOLATILES - SW846 8082 - PCBs
No anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-263465 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Low levels of Aluminum, Barium, Calcium, Magnesium and Manganese are present in the method blank associated with batch 280-263465. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the method blank associated with batch 280-263465. As the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V430; therefore, control limits are not applicable.

The duplicate analysis of sample J1V430 exhibited RPD data outside the control limits for Arsenic, Beryllium and Cadmium, and the associated sample results have been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: RCC-08-016	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Commercial Carrier \ Fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131321		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C	Cool 4C
Type of Container	G/P	aG
No. of Container(s)	1	1
Volume	250mL	250mL
Sample Analysis	See item (1) in Special Instructions	PCBs - 8082

280-65149 Chain of Custody

REVIEWED BY [signature] DATE 02/05/15

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 cmb

NA

Special Handling and/or Storage

Cool 4C

Sample No.	Matrix	Sample Date	Sample Time		
J1V430	SOIL	02/5/15	0931	X	X
J1V431	SOIL	02/5/15	0943	X	X
J1V432	SOIL	02/5/15	0925	X	X
J1V433	SOIL	02/5/15	0918	X	X
J1V434	SOIL	02/5/15	0912	X	X

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe [signature]	2-5-15 0951	2/5/15 c.martinez/c.martinez	0951
c.martinez/c.martinez	2/5/15 1215	c.Bingham [signature]	2-5-15 1215
c.Bingham WCH [signature]	2-5-15 1220	fed EX	2-5-15
		[signature]	0950 06Feb15

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

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

2.7, 4.0 1050 06Feb15
Transferred by [signature]

JP0904

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: RCC-08-016	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Commercial Carrier \ Fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131321		Bill of Lading/Air Bill No.: See OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 cmb

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
Sample Analysis	See Item (1) in Special Instructions	PCBs - 8082										

REVIEWED BY DAG DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V435	SOIL	02/5/15	0905	X	X								
J1V436	SOIL	02/5/15	0900	X	X								
J1V437	SOIL	02/5/15	0813	X	X								
J1V438	SOIL	02/5/15	0820	X	X								
J1V439	SOIL	02/5/15	0830	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	0951 2-5-15	S. Martinez/S. Martinez	0951 2/5/15
S. Martinez/S. Martinez	02/05/15 1215	C. Bingham	2-5-15 1215
C. Bingham	1220 2-5-15	fed Ex	2-5-15

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

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

JP0904

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: RCC-08-016	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Commercial Carrier \Fed Ex
Shipped To: TestAmerica Denver	Offsite Property No.: A131321		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Richland

Preservation	Cool 4C	Cool 4C
Type of Container	G/P	aG
No. of Container(s)	1	1
Volume	250mL	250mL
Sample Analysis	See item (1) in Special Instructions	PCBs - 8082

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 cmB

NA

Special Handling and/or Storage

Cool 4C

REVIEWED BY DAB DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time		
J1V440	SOIL	02\5\15	0839	X	X
J1V441	SOIL	02\5\15	0846	X	X
J1V442	SOIL	02\5\15	0854	X	X
J1V443	SOIL	02\5\15	0813	X	X
J1V444	SOIL	02\05\15	0809	X	NA

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	2-5-15 0951	C. Martinez/C. Martinez	2/5/15 0951
C. Martinez/C. Martinez	2/5/15 1215	C. Bingham	2-5-15 1215
C. Bingham WCH	2-5-15 1220	fed EX	2-5-15
			0950 06Feb15

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

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

JP0904

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-H-S112			DATA PACKAGE: JP0904		
VALIDATOR: BLR		LAB: TAL		DATE: 3/6/15	
			SDG: JP0904		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J1U430	J1U431	J1U432	J1U433	J1U434	J1U435
J1U436	J1U437	J1U438	J1U439	J1U440	J1U441
J1U442	J1U443				
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank 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/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

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

Surrogates analyzed? ..... Yes No N/A
Surrogate recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
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 PA

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

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

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

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

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

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

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Method Blank - Batch: 280-263446

Method: 8082
Preparation: 3550C

Lab Sample ID:	MB 280-263446/1-A	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Client Matrix:	Solid	Prep Batch:	280-263446	Lab File ID:	02111504.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	31.0 g
Analysis Date:	02/11/2015 0825	Units:	ug/Kg	Final Weight/Volume:	5 mL
Prep Date:	02/07/2015 1506			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Result	Qual	MDL	RL
Aroclor 1016	2.7	U	2.7	9.7
Aroclor 1221	7.8	U	7.8	16
Aroclor 1232	1.9	U	1.9	9.7
Aroclor 1242	4.5	U	4.5	9.7
Aroclor 1248	4.5	U	4.5	9.7
Aroclor 1254	2.5	U	2.5	9.7
Aroclor 1260	2.5	U	2.5	9.7

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	86	59 - 130
Tetrachloro-m-xylene	80	53 - 128

Lab Control Sample - Batch: 280-263446

Method: 8082
Preparation: 3550C

Lab Sample ID:	LCS 280-263446/2-A	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Client Matrix:	Solid	Prep Batch:	280-263446	Lab File ID:	02111505.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	32.0 g
Analysis Date:	02/11/2015 0848	Units:	ug/Kg	Final Weight/Volume:	5 mL
Prep Date:	02/07/2015 1506			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aroclor 1016	31.3	24.4	78	54 - 132	
Aroclor 1260	31.3	25.9	83	62 - 129	

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	80	59 - 130
Tetrachloro-m-xylene	76	53 - 128

Client: Washington Closure Hanford

Job Number: 280-65149-1
Sdg Number: JP0904

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-263446

Method: 8082
Preparation: 3550C

MS Lab Sample ID:	280-65149-1	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Client Matrix:	Solid	Prep Batch:	280-263446	Lab File ID:	02111507.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	31.3 g
Analysis Date:	02/11/2015 0934			Final Weight/Volume:	5 mL
Prep Date:	02/07/2015 1506			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

MSD Lab Sample ID:	280-65149-1	Analysis Batch:	280-263831	Instrument ID:	SGC_W
Client Matrix:	Solid	Prep Batch:	280-263446	Lab File ID:	02111508.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30.1 g
Analysis Date:	02/11/2015 0957			Final Weight/Volume:	5 mL
Prep Date:	02/07/2015 1506			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Aroclor 1016	86	80	54 - 132	3	26		
Aroclor 1260	92	86	62 - 129	3	26		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Decachlorobiphenyl	83	78	59 - 130
Tetrachloro-m-xylene	81	76	53 - 128

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-263446

Method: 8082
Preparation: 3550C

MS Lab Sample ID:	280-65149-1	Units:	ug/Kg	MSD Lab Sample ID:	280-65149-1
Client Matrix:	Solid			Client Matrix:	Solid
Dilution:	1.0			Dilution:	1.0
Analysis Date:	02/11/2015 0934			Analysis Date:	02/11/2015 0957
Prep Date:	02/07/2015 1506			Prep Date:	02/07/2015 1506
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Aroclor 1016	2.8	U	33.3	34.6	28.5	27.7
Aroclor 1260	2.7	U	33.3	34.6	30.5	29.7

Date: 9 March 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-H Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-H-51:2
Subject: Wet Chemistry - Data Package No. JP0904-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0904 prepared by TestAmerica Laboratories (TAL). 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	Analyte
J1V430	2/5/15	Soil	C	See note 1
J1V431	2/5/15	Soil	C	See note 1
J1V432	2/5/15	Soil	C	See note 1
J1V433	2/5/15	Soil	C	See note 1
J1V434	2/5/15	Soil	C	See note 1
J1V435	2/5/15	Soil	C	See note 1
J1V436	2/5/15	Soil	C	See note 1
J1V437	2/5/15	Soil	C	See note 1
J1V438	2/5/15	Soil	C	See note 1
J1V439	2/5/15	Soil	C	See note 1
J1V440	2/5/15	Soil	C	See note 1
J1V441	2/5/15	Soil	C	See note 1
J1V442	2/5/15	Soil	C	See note 1
J1V443	2/5/15	Soil	C	See note 1

1 – Chromium VI by 7196.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). 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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 30 days for chromium VI.

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".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a 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 recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1V437/J1V443) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package JP0904 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

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services.*

DOE/RL-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP0904	REVIEWER: ELR	Project: 100-H-51:2	PAGE_1_OF_1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Date: 11-Feb-15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 64654

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5036050 TRITIUM_DIST_LSC									
	J1V434								
	M54351AF	H-3	3.46E-04 +- 2.5E-02	U	pCi/g	100%	5.86E-02	1.00E+01	
	J1V435								
	M54371AF	H-3	3.11E-03 +- 2.4E-02	U	pCi/g	100%	5.65E-02	1.00E+01	
	J1V436								
	M54391AF	H-3	1.56E-02 +- 3.4E-02	U	pCi/g	100%	7.66E-02	1.00E+01	
	J1V437								
	M544D1AF	H-3	2.22E-02 +- 4.9E-02	U	pCi/g	100%	1.10E-01	1.00E+01	
	J1V438								
	M544F1AF	H-3	-3.00E-02 +- 2.4E-02	U	pCi/g	100%	6.06E-02	1.00E+01	
	J1V439								
	M544H1AF	H-3	-4.10E-03 +- 2.7E-02	U	pCi/g	100%	6.34E-02	1.00E+01	
	J1V440								
	M544L1AF	H-3	-1.11E-02 +- 3.4E-02	U	pCi/g	100%	8.12E-02	1.00E+01	
	J1V441								
	M544N1AF	H-3	4.35E-02 +- 4.1E-02	U	pCi/g	100%	8.95E-02	1.00E+01	
	J1V442								
	M544Q1AF	H-3	-1.19E-02 +- 2.8E-02	U	pCi/g	100%	6.66E-02	1.00E+01	
	J1V443								
	M544T1AF	H-3	3.05E-03 +- 2.6E-02	U	pCi/g	100%	6.07E-02	1.00E+01	
5037010 7196_CR6									
	J1V430								
	M543Q1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	M543Q1AM	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	0.0
	J1V431								
	M543W1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V432								
	M54301AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V433								
	M54321AA	HEXCHROME	1.99E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1V434								
	M54351AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V435								
	M54371AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V436								
	M54391AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V437								
	M544D1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1V438								

TestAmerica Inc

rptTALRchSaSummary2 V5.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Date: 11-Feb-15

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 64654

SDG No: JP0904

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5037010 7196_CR6									
J1V438									
	M544F1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
J1V439									
	M544H1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
J1V440									
	M544L1AA	HEXCHROME	1.89E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1V441									
	M544N1AA	HEXCHROME	1.87E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1V442									
	M544Q1AA	HEXCHROME	2.28E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
J1V443									
	M544T1AA	HEXCHROME	1.85E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 240

3/4/15

TestAmerica Inc

rptTALRohSaSummary2 V5.3.6.6 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria, Mde/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

February 11, 2015

Attention: Joan Kessner

SAF Number	:	RC-107
Date SDG Closed	:	February 5, 2015
Number of Samples	:	Fourteen (14)
Sample Type	:	Soil
SDG Number	:	JP0904
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On February 5, 2015, fourteen soil samples were received at TestAmerica for radiochemical and chemistry analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1V430	M543Q	SOIL	2/05/15
J1V431	M543W	SOIL	2/05/15
J1V432	M5430	SOIL	2/05/15
J1V433	M5432	SOIL	2/05/15
J1V434	M5435	SOIL	2/05/15
J1V435	M5437	SOIL	2/05/15
J1V436	M5439	SOIL	2/05/15
J1V437	M544D	SOIL	2/05/15
J1V438	M544F	SOIL	2/05/15
J1V439	M544H	SOIL	2/05/15
J1V440	M544L	SOIL	2/05/15
J1V441	M544N	SOIL	2/05/15
J1V442	M544Q	SOIL	2/05/15
J1V443	M544T	SOIL	2/05/15

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. 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
Plutonium-238, -239/240 by method RL-ALP-001
Uranium 234, 235 and 238 by method RL-ALP-015
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005
Carbon-14 by method RL-LSC-008
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed includes 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.

V. Comments

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-001:
The LCS, batch blank, samples and sample duplicate (J1V430) results are within contractual requirements.

Uranium 234, 235 and 238 by method RL-ALP-015:
The LCS, batch blank, samples and sample duplicate (J1V431) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1V433) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:

The CRDL was not met for some of the analytes. Except as noted; the LCS, batch blank, samples and sample duplicate (J1V432) results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RL-LSC-005:

The LCS, batch blank, samples and sample duplicate (J1V430) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:

The LCS, batch blank, samples and sample duplicate (J1V431) results are within contractual requirements.

Chemical Analysis

Hexavalent Chromium by EPA method 7196A

The LCS, batch blank, samples, sample duplicate (J1V430) and sample matrix spike (J1V430) 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:

Rhonda Wagar
Project Manager

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-107-127

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: n/A		Bill of Lading/Air Bill No.: n/A

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 LMB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	None	None	None						
Type of Container	G/P	G/P	G/P	G/P	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	125mL	125mL	125mL	1000mL	~~60mL~~ 125 mL						
Sample Analysis	Chromium Hex - 7196	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 -- Total Sr	See Item (2) in Special Instructions	Carbon-14 Low Level; Tritium - H3 Low Level Soil						

02/05/15

REVIEWED BY DAS DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V430 M5439	SOIL	02/5/15	0931	X	X	X	X	X					
J1V431 M5436	SOIL	02/5/15	0943	X	X	X	X	X					
J1V432 M5430	SOIL	02/5/15	0925	X	X	X	X	X					
J1V433 M5432	SOIL	02/5/15	0918	X	X	X	X	X					
J1V434 M5435	SOIL	02/5/15	0912	X	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	2-5-15 0951	S. Martinez/S. Harding	2/5/15 0951
S. Martinez/S. Harding	2/5/15 1215	C. Bingham	2-5-15 1215
C. Bingham	2-5-15 1440	J. Bock, TARI	2-5-15 1440

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

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

J5B050413

Due 2-12-15

J5B050413

SDG: JP0904

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-107-127	Page 2 of 3

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

Price Code: 8B

Data Turnaround: 7 days

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 CMB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	None	None	None					
Type of Container	G/P	G/P	G/P	G/P	G/P					
No. of Container(s)	1	1	1	1	1					
Volume	125mL	125mL	125mL	1000mL	02/05/15 125 mL					
Sample Analysis	Chromium Hex -7196	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 – Total Sr	See item (2) in Special Instructions	Carbon-14 Low Level; Tritium - H3 Low Level Soil					

REVIEWED BY DKB DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V435 M5437	SOIL	02/5/15	0905	X	X	X	X	X					
J1V436 M5439	SOIL	02/5/15	0900	X	X	X	X	X					
J1V437 M544D	SOIL	02/5/15	0813	X	X	X	X	X					
J1V438 M544F	SOIL	02/5/15	0820	X	X	X	X	X					
J1V439 M544H	SOIL	02/5/15	0830	X	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	2-5-15 0951	C. Martinez/C. Martinez	2/5/15 0951
C. Martinez/C. Martinez	2/5/15 1215	C. Bingham	2-5-15 1215
C. Bingham WCH	2-5-15 1440	J. Bock, TARL	2-5-15 1440

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

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

JSB050413
Due 2-12-15

SDG:
JB904

WCH-EE-011

17

74

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-107-127	Page 3 of 3

Collector: STOWE, QG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 days		
Project Designation: 100-H Field Remediation	Sampling Location: 100H-51:2 subsite (verification)		SAF No.: RC-107
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1627-09	COA: 01H5122000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.: n/a		Bill of Lading/Air Bill No.: n/a

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potentially radioactive, less than DOT limits~~ 2-5-15 CMB

NA

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	None	None	None	None					
Type of Container	G/P	G/P	G/P	G/P	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	125mL	125mL	125mL	1000mL	125mL						
Sample Analysis	Chromium Hex -7196	Isotopic Plutonium; Isotopic Uranium	Strontium-89,90 – Total Sr	See Item (2) in Special Instructions	Carbon-14 Low Level; Tritium - HS Low Level Soil						

02/05/15

REVIEWED BY DH DATE 02/05/15

Sample No.	Matrix	Sample Date	Sample Time										
J1V440 M544L	SOIL	02/5/15	0839	X	X	X	X	X					
J1V441 M544N	SOIL	02/5/15	0846	X	X	X	X	X					
J1V442 M544Q	SOIL	02/5/15	0854	X	X	X	X	X					
J1V443 M544T	SOIL	02/5/15	0813	X	X	X	X	X					
~~J1V444~~ 02/5/15	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	0951 2-5-15	S Martinez/S Martinez	0951 2/5/15
S Martinez/S Martinez	1215 2/5/15	C Bingham	1215 2-5-15
C Bingham	1440 2-5-15	J. Bock, TARL	1440 2-5-15

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

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

JSB050413
Due 2-12-15

JP0904

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-H-5/12			DATA PACKAGE: JP0904		
VALIDATOR:		LAB: TAL		DATE: 3/6/15	
			SDG: JP0904		

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX					
J1V430	J1V431	J1V432	J1V433	J1V434	J1V435
J1V436	J1V437	J1V438	J1V439	J1V440	J1V441
J1V442	J1V443				
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

no DAT

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 11-Feb-15

Report No. : 64654

SDG No.: JP0904

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_CHEM_LSC								
5036049 BLANK QC,								
M54441AA	C-14	-1.44E-01 +- 2.0E-01	U	pCi/g	100%			4.80E-01
5036049 LCS,								
M54441AC	C-14	6.85E+00 +- 5.9E-01		pCi/g	100%	95%	0.0	4.86E-01
PUISO_PLATE_AEA								
5036055 BLANK QC,								
M545D1AA	Pu-238	-1.54E-03 +- 3.8E-02	U	pCi/g	72%			7.73E-02
	PU239/40	3.61E-02 +- 5.5E-02	U	pCi/g	72%			8.30E-02
5036055 LCS,								
M545D1AC	PU239/40	7.39E+00 +- 1.7E+00		pCi/g	63%	100%	0.0	8.89E-02
UISO_IE_PLATE_AEA								
5036054 BLANK QC,								
M545C1AA	U-234	1.56E-02 +- 3.3E-02	U	pCi/g	74%			5.90E-02
	U-235	-6.48E-04 +- 3.2E-02	U	pCi/g	74%			5.90E-02
	U-238	1.62E-02 +- 3.3E-02	U	pCi/g	74%			4.39E-02
5036054 LCS,								
M545C1AC	U-234	2.98E+00 +- 6.9E-01		pCi/g	77%	99%	0.0	5.59E-02
	U-238	3.32E+00 +- 7.6E-01		pCi/g	77%	106%	0.1	5.59E-02
GAMMA_GS								
5036052 BLANK QC,								
M54471AA	AMERICIUM 241	1.94E-04 +- 8.9E-03	U	pCi/g				1.55E-02
	CO-60	-1.34E-03 +- 8.3E-03	U	pCi/g				1.50E-02
	CS-137	-2.34E-03 +- 8.5E-03	U	pCi/g				1.40E-02
	EU-152	1.20E-02 +- 1.8E-02	U	pCi/g				3.30E-02
	EU-154	1.84E-02 +- 2.1E-02	U	pCi/g				4.53E-02
	EU-155	8.52E-03 +- 1.4E-02	U	pCi/g				2.45E-02
	K-40	-2.42E-01 +- 2.2E-01	U	pCi/g				4.56E-01
5036052 LCS,								
M54471AC	CS-137	9.70E-01 +- 1.3E-01		pCi/g		98%	0.0	2.56E-02
	RA-226	9.46E-01 +- 1.4E-01		pCi/g		83%	-0.2	3.59E-02
	RA-228	6.39E-01 +- 1.2E-01		pCi/g		108%	0.1	7.84E-02
	U-238	9.71E-01 +- 1.2E-01		pCi/g		81%	-0.2	3.99E-02
SRTOT_SEP_PRECIP_GPC								
5036053 BLANK QC,								
M545A1AA	STRONTIUM	1.20E-01 +- 1.5E-01	U	pCi/g	90%			3.06E-01
5036053 LCS,								
M545A1AC	STRONTIUM	3.65E+00 +- 9.1E-01		pCi/g	75%	110%	0.1	3.43E-01
TRITIUM_DIST_LSC								
5036050 BLANK QC,								
M54451AA	H-3	-2.91E-02 +- 3.0E-02	U	pCi/g	100%			7.34E-02
5036050 LCS,								

TestAmerica Inc
rptSTLRchQcSummary V5.3.6.6
A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

QC Results Summary

Date: 11-Feb-15

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 64654

SDG No.: JP0904

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
M54451AC	H-3	3.86E-01 +- 5.5E-02		pCi/g	100%	74%	-0.3	8.21E-02
7196_CR6								
5037010 MATRIX SPIKE, J1V430								
M543Q1AL	HEXCHROME	3.00E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	1.55E-01
5037010 LCS,								
M547R1AC	HEXCHROME	1.93E+01 +- 0.0E+00		mg/kg	N/A	97%	0.0	1.55E-01
5037010 BLANK QC,								
M547R1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 28

TestAmerica Inc
rptSTLRchQcSummary V5.3.6.6
A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.