

**SAF-RC-108**  
**100-H Remaining Sites Burial Grounds –**  
**Other**  
**FINAL VALIDATION PACKAGE**

**COMPLETE COPY OF VALIDATION PACKAGE TO:**

No Distribution Required

KW 10/27/15  
INITIAL/DATE

**COMMENTS:**

**JP0982**

**SAF-RC-108**

**WASTE SITE: 100-H-36**

Date: 26 October 2015  
To: Washington Closure Hanford Inc. (technical representative)  
From: ELR Consulting  
Project: 100-H Remaining Sites Burial Grounds – Other - Waste Site 100-H-36  
Subject: Inorganic - Data Package No. JP0982-TAL

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. JP0982 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.

<b>Sample ID</b>	<b>Sample Date</b>	<b>Media</b>	<b>Validation</b>	<b>Analyte</b>
J1V7W3	7/27/15	Soil	C	See note 1
J1V7W4	7/27/15	Soil	C	See note 1
J1V7W5	7/27/15	Soil	C	See note 1
J1V7W6	7/27/15	Soil	C	See note 1
J1V7W7	7/27/15	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 magnesium and calcium results in sample J1V7W7 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

### Field (Equipment) Blank

One field blank (J1V7W7) was submitted for analysis. Fourteen 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 (27%) and silicon (18%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (9%) 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 (J1V7W4/J1V7W6) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for copper (41%) and silver (184%) were outside QC limits. Under the WCH statement of work no qualification is required. All other field other 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. JP0982 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 magnesium and calcium results in sample J1V7W7 were qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (27%) and silicon (18%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (9%) 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\***

<b>SDG: JP0982</b>	<b>REVIEWER: ELR</b>	<b>Project: 100-H-36</b>	<b>PAGE <u>1</u> OF <u>1</u></b>
<b>COMPOUND</b>	<b>QUALIFIER</b>	<b>SAMPLES AFFECTED</b>	<b>REASON</b>
Calcium Magnesium	UJ	J1V7W7	Method blank contamination
Antimony Silicon	J	All	MS recovery
Silicon	J	All	LCS 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: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W3

Lab Sample ID: 280-72306-1  
Client Matrix: Solid

Date Sampled: 07/27/2015 0850  
Date Received: 07/28/2015 0930

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-288418      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26A072915D.asc  
Dilution: 1.0  
Analysis Date: 07/29/2015 2044      *W 10/24/15*      Initial Weight/Volume: 1.12 g  
Prep Date: 07/29/2015 0800      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		11100		1.4	4.5
Antimony		0.73	J	0.34	0.54
Arsenic		5.0		0.59	0.89
Barium		110		0.068	0.45
Beryllium		0.52		0.029	0.18
Boron		4.8		0.88	1.8
Cadmium		0.24	M	0.037	0.18
Chromium		20.7		0.052	0.18
Cobalt		19.1	X	0.089	0.89
Copper		122		0.19	0.89
Lead		7.6		0.24	0.45
Magnesium		5250	X	3.3	17.9
Manganese		356		0.089	0.89
Molybdenum		2.7		0.23	1.8
Nickel		37.9	X	0.11	3.6
Potassium		1670		36.6	268
Silicon		129	N J	5.1	8.9
Silver		0.31		0.14	0.18
Sodium		1720		52.7	107
Vanadium		50.8		0.084	1.8

Analysis Method: 6010B      Analysis Batch: 280-288592      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26a073015ab.asc  
Dilution: 1.0  
Analysis Date: 07/30/2015 1355      Initial Weight/Volume: 1.12 g  
Prep Date: 07/29/2015 0800      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Iron		38000		3.4	4.5
Selenium		0.77	U	0.77	0.89

Analysis Method: 6010B      Analysis Batch: 280-289068      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288598      Lab File ID: 26a080315a.asc  
Dilution: 1.0  
Analysis Date: 08/03/2015 1846      Initial Weight/Volume: 1.18 g  
Prep Date: 07/31/2015 1445      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Calcium		48900	X	11.9	42.4
Zinc		87.1	X	0.34	0.85

**7471A Mercury (CVAA)**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W3

Lab Sample ID: 280-72306-1  
Client Matrix: Solid

Date Sampled: 07/27/2015 0850  
Date Received: 07/28/2015 0930

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**7471A Mercury (CVAA)**

Analysis Method: 7471A  
Prep Method: 7471A  
Dilution: 1.0  
Analysis Date: 07/31/2015 2107  
Prep Date: 07/31/2015 1100

Analysis Batch: 280-288790  
Prep Batch: 280-288194

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.60 g  
Final Weight/Volume: 50 mL

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

*10/25/15*

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W4

Lab Sample ID: 280-72306-2  
Client Matrix: Solid

Date Sampled: 07/27/2015 0925  
Date Received: 07/28/2015 0930

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-288418      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26A072915D.asc  
Dilution: 1.0  
Analysis Date: 07/29/2015 2056      *M 10/24/15*      Initial Weight/Volume: 1.12 g  
Prep Date: 07/29/2015 0800      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		12400		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		3.1		0.59	0.89
Barium		126		0.068	0.45
Beryllium		0.61		0.029	0.18
Boron		5.6		0.88	1.8
Cadmium		0.27		0.037	0.18
Chromium		16.5		0.052	0.18
Cobalt		8.3	X	0.089	0.89
Copper		32.3		0.19	0.89
Lead		8.4		0.24	0.45
Magnesium		5540	X	3.3	17.9
Manganese		284		0.089	0.89
Molybdenum		1.1	B	0.23	1.8
Nickel		16.3	X	0.11	3.6
Potassium		2070		36.6	268
Selenium		0.77	U	0.77	0.89
Silicon		128	N J	5.1	8.9
Silver		0.17	B	0.14	0.18
Sodium		1850		52.7	107
Vanadium		55.5		0.084	1.8

Analysis Method: 6010B      Analysis Batch: 280-288592      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26a073015ab.asc  
Dilution: 1.0  
Analysis Date: 07/30/2015 1406      Initial Weight/Volume: 1.12 g  
Prep Date: 07/29/2015 0800      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Iron		19400		3.4	4.5

Analysis Method: 6010B      Analysis Batch: 280-289068      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288598      Lab File ID: 26a080315a.asc  
Dilution: 1.0  
Analysis Date: 08/03/2015 1858      Initial Weight/Volume: 1.05 g  
Prep Date: 07/31/2015 1445      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Calcium		54300	X	13.4	47.6
Zinc		110	X	0.38	0.95

**7471A Mercury (CVAA)**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W4

Lab Sample ID: 280-72306-2  
Client Matrix: Solid

Date Sampled: 07/27/2015 0925  
Date Received: 07/28/2015 0930

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**7471A Mercury (CVAA)**

Analysis Method: 7471A  
Prep Method: 7471A  
Dilution: 1.0  
Analysis Date: 07/31/2015 2114  
Prep Date: 07/31/2015 1100

Analysis Batch: 280-288790  
Prep Batch: 280-288194

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.55 g  
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0060	U	0.0060	0.019

*10/24/11*

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W5

Lab Sample ID: 280-72306-3  
Client Matrix: Solid

Date Sampled: 07/27/2015 0945  
Date Received: 07/28/2015 0930

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-288418      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26A072915D.asc  
Dilution: 1.0      Initial Weight/Volume: 1.11 g  
Analysis Date: 07/29/2015 2059      Final Weight/Volume: 100 mL  
Prep Date: 07/29/2015 0800

*Y 10/24/15*

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		11900		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		2.9		0.59	0.90
Barium		120		0.068	0.45
Beryllium		0.64		0.030	0.18
Boron		4.7		0.88	1.8
Cadmium		0.10	B	0.037	0.18
Chromium		11.6		0.052	0.18
Cobalt		8.5	X	0.090	0.90
Copper		19.4		0.20	0.90
Lead		7.8		0.24	0.45
Magnesium		5420	X	3.3	18.0
Manganese		260		0.090	0.90
Molybdenum		0.53	B	0.23	1.8
Nickel		11.4	X	0.11	3.6
Potassium		1920		36.9	270
Selenium		0.77	U	0.77	0.90
Silicon		132	N J	5.1	9.0
Silver		0.14	U	0.14	0.18
Sodium		1900		53.2	108
Vanadium		59.1		0.085	1.8

Analysis Method: 6010B      Analysis Batch: 280-288592      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26a073015ab.asc  
Dilution: 1.0      Initial Weight/Volume: 1.11 g  
Analysis Date: 07/30/2015 1409      Final Weight/Volume: 100 mL  
Prep Date: 07/29/2015 0800

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Iron		20700		3.4	4.5

Analysis Method: 6010B      Analysis Batch: 280-289068      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288598      Lab File ID: 26a080315a.asc  
Dilution: 1.0      Initial Weight/Volume: 1.18 g  
Analysis Date: 08/03/2015 1901      Final Weight/Volume: 100 mL  
Prep Date: 07/31/2015 1445

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Calcium		46700	X	11.9	42.4
Zinc		87.7	X	0.34	0.85

**7471A Mercury (CVAA)**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W5

Lab Sample ID: 280-72306-3  
Client Matrix: Solid

Date Sampled: 07/27/2015 0945  
Date Received: 07/28/2015 0930

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**7471A Mercury (CVAA)**

Analysis Method: 7471A  
Prep Method: 7471A  
Dilution: 1.0  
Analysis Date: 07/31/2015 2116  
Prep Date: 07/31/2015 1100

Analysis Batch: 280-288790  
Prep Batch: 280-288194

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.53 g  
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0063	U	0.0063	0.019

*n*  
*col/24/15*

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W6

Lab Sample ID: 280-72306-4  
Client Matrix: Solid

Date Sampled: 07/27/2015 0925  
Date Received: 07/28/2015 0930

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-288418      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26A072915D.asc  
Dilution: 1.0  
Analysis Date: 07/29/2015 2102      *10/24/15*      Initial Weight/Volume: 1.10 g  
Prep Date: 07/29/2015 0800      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		11900		1.4	4.5
Antimony		0.35	U J	0.35	0.55
Arsenic		3.2		0.60	0.91
Barium		125		0.069	0.45
Beryllium		0.61		0.030	0.18
Boron		5.4		0.89	1.8
Cadmium		1.4		0.037	0.18
Chromium		14.8		0.053	0.18
Cobalt		8.2	X	0.091	0.91
Copper		21.3		0.20	0.91
Lead		8.2		0.25	0.45
Magnesium		5260	X	3.4	18.2
Manganese		268		0.091	0.91
Molybdenum		0.75	B	0.24	1.8
Nickel		13.7	X	0.11	3.6
Potassium		1940		37.3	273
Selenium		0.78	U J	0.78	0.91
Silicon		116	N	5.1	9.1
Silver		4.2		0.15	0.18
Sodium		1790		53.6	109
Vanadium		55.6		0.085	1.8

Analysis Method: 6010B      Analysis Batch: 280-288592      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26a073015ab.asc  
Dilution: 1.0  
Analysis Date: 07/30/2015 1412      Initial Weight/Volume: 1.10 g  
Prep Date: 07/29/2015 0800      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Iron		19000		3.5	4.5

Analysis Method: 6010B      Analysis Batch: 280-289068      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288598      Lab File ID: 26a080315a.asc  
Dilution: 1.0  
Analysis Date: 08/03/2015 1903      Initial Weight/Volume: 1.19 g  
Prep Date: 07/31/2015 1445      Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Calcium		53900	X	11.8	42.0
Zinc		94.8	X	0.33	0.84

**7471A Mercury (CVAA)**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W6

Lab Sample ID: 280-72306-4  
Client Matrix: Solid

Date Sampled: 07/27/2015 0925  
Date Received: 07/28/2015 0930

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**7471A Mercury (CVAA)**

Analysis Method: 7471A  
Prep Method: 7471A  
Dilution: 1.0  
Analysis Date: 07/31/2015 2118  
Prep Date: 07/31/2015 1100

Analysis Batch: 280-288790  
Prep Batch: 280-288194

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.52 g  
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0064	U	0.0064	0.020

*✓*  
*10/24/15*

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W7

Lab Sample ID: 280-72306-5  
Client Matrix: Solid

Date Sampled: 07/27/2015 0900  
Date Received: 07/28/2015 0930

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-288418      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26A072915D.asc  
Dilution: 1.0      Initial Weight/Volume: 1.07 g  
Analysis Date: 07/29/2015 2105      Final Weight/Volume: 100 mL  
Prep Date: 07/29/2015 0800

*Y 10/24/15*

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		129		1.4	4.7
Antimony		0.36	U J	0.36	0.56
Arsenic		0.62	U	0.62	0.93
Barium		1.6		0.071	0.47
Beryllium		0.033	B	0.031	0.19
Boron		0.92	U	0.92	1.9
Cadmium		0.038	U	0.038	0.19
Chromium		0.17	B	0.054	0.19
Cobalt		0.093	U X	0.093	0.93
Copper		0.39	B	0.20	0.93
Lead		0.38	B	0.25	0.47
Magnesium		24.0	C X U J	3.5	18.7
Manganese		3.5		0.093	0.93
Molybdenum		0.24	U	0.24	1.9
Nickel		0.17	B X	0.11	3.7
Potassium		57.8	B	38.3	280
Selenium		0.80	U	0.80	0.93
Silicon		84.4	N J	5.3	9.3
Silver		0.15	U	0.15	0.19
Sodium		55.1	U	55.1	112
Vanadium		0.43	B	0.088	1.9

Analysis Method: 6010B      Analysis Batch: 280-288592      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288139      Lab File ID: 26a073015ab.asc  
Dilution: 1.0      Initial Weight/Volume: 1.07 g  
Analysis Date: 07/30/2015 1415      Final Weight/Volume: 100 mL  
Prep Date: 07/29/2015 0800

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Iron		281		3.6	4.7

Analysis Method: 6010B      Analysis Batch: 280-289068      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-288598      Lab File ID: 26a080315a.asc  
Dilution: 1.0      Initial Weight/Volume: 1.07 g  
Analysis Date: 08/03/2015 1906      Final Weight/Volume: 100 mL  
Prep Date: 07/31/2015 1445

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	MDL	RL
Calcium		51.5	C X U J	13.2	46.7
Zinc		0.59	B X	0.37	0.93

**7471A Mercury (CVAA)**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

Client Sample ID: J1V7W7

Lab Sample ID: 280-72306-5  
Client Matrix: Solid

Date Sampled: 07/27/2015 0900  
Date Received: 07/28/2015 0930

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**7471A Mercury (CVAA)**

Analysis Method: 7471A  
Prep Method: 7471A  
Dilution: 1.0  
Analysis Date: 07/31/2015 2120  
Prep Date: 07/31/2015 1100

Analysis Batch: 280-288790  
Prep Batch: 280-288194

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.57 g  
Final Weight/Volume: 50 mL

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

*✓*  
*10/24/15*

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

## CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-72306-1

SDG #: JP0982

SAF#: RC-108

Date SDG Closed: July 28, 2015  
Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1V7W3	280-72306-1	6010/7471	6010B/7471A
J1V7W4	280-72306-2	6010/7471	6010B/7471A
J1V7W5	280-72306-3	6010/7471	6010B/7471A
J1V7W6	280-72306-4	6010/7471	6010B/7471A
J1V7W7	280-72306-5	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.

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 7/28/2015 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.3° C.

### TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-288139 indicates that physical and chemical interferences are present for Cobalt, Magnesium and Nickel. Serial dilution of a digestate in batch 280-288598 indicates that physical and chemical interferences are present for Calcium and Zinc. Results have been flagged with an "X".

Low levels of Magnesium and Iron are present in the method blank associated with batch 280-288139. Because the concentrations in the method blank are not present at levels greater than half the reporting limit or the associated sample amounts are greater than twenty times the method blank concentration, corrective action is deemed unnecessary.

Low Levels of Calcium are present in the method blank associated with batch 280-288598 at 25.17 mg/kg, which is greater than half the reporting limit of 50 mg/kg. With the exception of 'blank' sample J1V7W7, the associated sample amounts are greater than twenty times the method blank concentration; therefore, corrective action is not initiated and data are reported as is.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-288139 and in the Matrix Spike performed on sample J1V7W3 in batch 280-288139. The associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Calcium, Copper, Iron and Manganese in the Matrix Spike performed on sample J1V7W3; therefore, control limits are not applicable.

The duplicate analysis of sample J1V7W3 exhibited RPD data outside the control limits for Cadmium, and the associated sample result has 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-108-057      Page 1 of 1

Collector <b>F. Farinola</b>	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code <b>9B</b>	Data Turnaround <b>7 days</b>
Project Designation 100-H Field Remediation	Sampling Location 100-H-36 (concrete scabbling)	SAF No. RC-108	Commercial Carrier <b>1 Fed Ex</b>		
Ice Chest No. <b>RCC-08-022</b>	Field Logbook No. EL-1627-09	COA 010H366000	Method of Shipment <b>1 Fed Ex</b>		
Shipped To <b>TestAmerica Denver</b>	Offsite Property No. <b>A131440</b>	Bill of Lading/Air Bill No. <b>See OSPC</b>			

Other Labs Shipped To TestAmerica Richland	Preservation Cool 4C	Type of Container G/P	No. of Container(s) 1	Volume 1000mL	Sample Analysis See item (1) in Special Instructions
POSSIBLE SAMPLE HAZARDS/REMARKS N/A		 280-72306 Chain of Custody			
Special Handling and/or Storage Cooling as required					

Sample No.	Matrix	Sample Date	Sample Time						
J1V7W3	OTHER	7/27/15	0850	X					
J1V7W4	OTHER	7/27/15	0925	X					
J1V7W5	OTHER	7/27/15	0945	X					
J1V7W6	OTHER	7/27/15	0925	X					
J1V7W7	other	7/27/15	0900	X					

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From <b>FRANK FARINOLA</b>	Date/Time <b>7/27/15 10:00</b>	Received By/Stored In <b>C. Bingham</b>	Date/Time <b>7-27-15 1135</b>
Relinquished By/Removed From <b>C. Bingham</b>	Date/Time <b>7-27-15 1140</b>	Received By/Stored In <b>fed ex</b>	Date/Time <b>7-27-15</b>
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

**SPECIAL INSTRUCTIONS**

Please Turn Sr-90 analysis from material in GSA container. **7/27/15**

(1) ICP Metals - 6010TR (Client 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}

**REVIEWED BY**  
**K. Woodhaemel**  
**DATE**  
**7-27-15**

**JP0982**

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time
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**Appendix 5**  
**Data Validation Supporting Documentation**

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	100-H-36		DATA PACKAGE: JP0982		
VALIDATOR:	ELR	LAB: TAL	DATE: 10/23/15		
			SDG: JP0982		
ANALYSES PERFORMED					
<b>SW-846/ICP</b>	SW-846/GFAA	<b>SW-846/Hg</b>	SW-846 Cyanide		
SAMPLES/MATRIX					
J1V7W3		J1V7W4		J1V7W5	
				J1V7W6	
				J1V7W7	
				Other	

**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: Magnesium - wt UJ  
Calcium - wt UJ  
FB - ~~14~~ 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 (99%) - Jell  
MS - antimony (27%) silicon (18%) - Jell  
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: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

W4/W4 - copper 4/70  
Silver 18470

**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: \_\_\_\_\_

\_\_\_\_\_

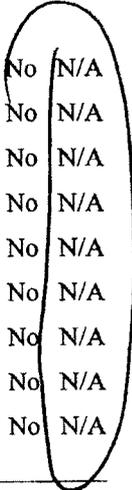
\_\_\_\_\_

\_\_\_\_\_

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

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

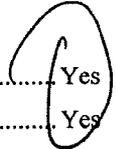
Duplicate injections performed as required? .....	Yes	No	N/A
Duplicate injection %RSD values acceptable? .....	Yes	No	N/A
Analytical spikes performed as required? .....	Yes	No	N/A
Analytical spike recoveries acceptable? .....	Yes	No	N/A
Standards traceable? .....	Yes	No	N/A
Standards expired? .....	Yes	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: 280-72306-1  
Sdg Number: JP0982

**Method Blank - Batch: 280-288139**

**Method: 6010B  
Preparation: 3050B**

Lab Sample ID: MB 280-288139/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/29/2015 2039  
Prep Date: 07/29/2015 0800  
Leach Date: N/A

Analysis Batch: 280-288418  
Prep Batch: 280-288139  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26A072915D.asc  
Initial Weight/Volume: 1 g  
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	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
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Lead	0.27	U	0.27	0.50
Magnesium	7.42	B	3.7	20.0
Manganese	0.10	U	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

**Method Blank - Batch: 280-288139**

**Method: 6010B  
Preparation: 3050B**

Lab Sample ID: MB 280-288139/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/30/2015 1350  
Prep Date: 07/29/2015 0800  
Leach Date: N/A

Analysis Batch: 280-288592  
Prep Batch: 280-288139  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26a073015ab.asc  
Initial Weight/Volume: 1 g  
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Iron	4.12	B	3.8	5.0

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

**Lab Control Sample - Batch: 280-288139**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID:	LCS 280-288139/2-A	Analysis Batch:	280-288418	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-288139	Lab File ID:	26A072915D.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	07/29/2015 2042	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	07/29/2015 0800				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	204.5	102	82 - 116	
Antimony	50.0	50.17	100	82 - 110	
Arsenic	100	104.6	105	85 - 110	
Barium	200	210.1	105	87 - 112	
Beryllium	5.00	5.12	102	84 - 114	
Boron	100	102.9	103	80 - 120	
Cadmium	10.0	10.79	108	87 - 110	
Chromium	20.0	20.95	105	84 - 114	
Cobalt	50.0	52.05	104	87 - 110	
Copper	25.0	26.43	106	88 - 110	
Lead	50.0	51.64	103	86 - 110	
Magnesium	5000	5148	103	90 - 110	
Manganese	50.0	52.07	104	88 - 110	
Molybdenum	100	109.0	109	86 - 110	
Nickel	50.0	51.73	103	87 - 110	
Potassium	5000	5336	107	89 - 110	
Selenium	200	207.4	104	83 - 110	
Silicon	1000	93.63	9	10 - 70	N
Silver	5.00	5.09	102	87 - 114	
Sodium	5000	5529	111	90 - 112	
Vanadium	50.0	53.43	107	88 - 110	

**Lab Control Sample - Batch: 280-288139**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID:	LCS 280-288139/2-A	Analysis Batch:	280-288592	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-288139	Lab File ID:	26a073015ab.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	07/30/2015 1352	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	07/29/2015 0800				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Iron	100	111.0	111	87 - 120	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

**Matrix Spike - Batch: 280-288139**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: 280-72306-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/29/2015 2053  
Prep Date: 07/29/2015 0800  
Leach Date: N/A

Analysis Batch: 280-288418  
Prep Batch: 280-288139  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26A072915D.asc  
Initial Weight/Volume: 1.15 g  
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	11100	174	12740	939	50 - 200	4
Antimony	0.73	43.5	12.38	27	20 - 200	
Arsenic	5.0	87.0	89.72	97	76 - 111	
Barium	110	174	287.0	102	52 - 159	
Beryllium	0.52	4.35	4.53	92	72 - 105	
Boron	4.8	87.0	81.82	89	80 - 120	
Cadmium	0.24	8.70	8.99	101	40 - 130	
Chromium	20.7	17.4	37.62	97	70 - 200	
Cobalt	19.1	43.5	58.91	92	72 - 106	
Copper	122	21.7	152.8	143	37 - 187	4
Lead	7.6	43.5	46.02	88	70 - 200	
Magnesium	5250	4350	9898	107	64 - 145	
Manganese	356	43.5	469.0	260	40 - 200	4
Molybdenum	2.7	87.0	85.24	95	75 - 103	
Nickel	37.9	43.5	80.29	98	61 - 126	
Potassium	1670	4350	6233	105	56 - 172	
Silicon	129	870	287.6	18	20 - 200	N
Silver	0.31	4.35	4.66	100	75 - 141	
Sodium	1720	4350	6352	106	78 - 111	
Vanadium	50.8	43.5	99.50	112	50 - 169	

**Matrix Spike - Batch: 280-288139**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: 280-72306-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/30/2015 1403  
Prep Date: 07/29/2015 0800  
Leach Date: N/A

Analysis Batch: 280-288592  
Prep Batch: 280-288139  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26a073015ab.asc  
Initial Weight/Volume: 1.15 g  
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Iron	38000	87.0	45700	8823	70 - 200	4
Selenium	0.77 U	174	164.1	94	76 - 104	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

**Duplicate - Batch: 280-288139**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: 280-72306-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/29/2015 2050  
Prep Date: 07/29/2015 0800  
Leach Date: N/A

Analysis Batch: 280-288418  
Prep Batch: 280-288139  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26A072915D.asc  
Initial Weight/Volume: 1.16 g  
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	11100	10800	3	40	
Antimony	0.73	0.33	NC	40	U
Arsenic	5.0	4.27	16	30	
Barium	110	109.1	0.9	30	
Beryllium	0.52	0.503	4	30	
Boron	4.8	4.64	4	30	
Cadmium	0.24	0.175	31	30	M
Chromium	20.7	19.11	8	40	
Cobalt	19.1	17.66	8	30	
Copper	122	92.70	27	30	
Lead	7.6	7.40	3	40	
Magnesium	5250	5130	2	30	
Manganese	356	340.4	4	40	
Molybdenum	2.7	2.01	30	30	
Nickel	37.9	32.92	14	30	
Potassium	1670	1667	0.4	40	
Silicon	129	117.0	9	40	N
Silver	0.31	0.14	NC	30	U
Sodium	1720	1710	0.7	30	
Vanadium	50.8	49.24	3	30	

**Duplicate - Batch: 280-288139**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: 280-72306-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/30/2015 1400  
Prep Date: 07/29/2015 0800  
Leach Date: N/A

Analysis Batch: 280-288592  
Prep Batch: 280-288139  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26a073015ab.asc  
Initial Weight/Volume: 1.16 g  
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Iron	38000	34030	11	40	
Selenium	0.77 U	0.74	NC	30	U

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

**Method Blank - Batch: 280-288598**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: MB 280-288598/1-A	Analysis Batch: 280-289068	Instrument ID: MT_026
Client Matrix: Solid	Prep Batch: 280-288598	Lab File ID: 26a080315a.asc
Dilution: 1.0	Leach Batch: N/A	Initial Weight/Volume: 1 g
Analysis Date: 08/03/2015 1841	Units: mg/Kg	Final Weight/Volume: 100 mL
Prep Date: 07/31/2015 1445		
Leach Date: N/A		

Analyte	Result	Qual	MDL	RL
Calcium	25.17	B	14.1	50.0
Zinc	0.40	U	0.40	1.0

**Lab Control Sample - Batch: 280-288598**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: LCS 280-288598/2-A	Analysis Batch: 280-289068	Instrument ID: MT_026
Client Matrix: Solid	Prep Batch: 280-288598	Lab File ID: 26a080315a.asc
Dilution: 1.0	Leach Batch: N/A	Initial Weight/Volume: 1 g
Analysis Date: 08/03/2015 1844	Units: mg/Kg	Final Weight/Volume: 100 mL
Prep Date: 07/31/2015 1445		
Leach Date: N/A		

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Calcium	5000	4529	91	82 - 114	
Zinc	50.0	47.85	96	76 - 114	

**Matrix Spike - Batch: 280-288598**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID: 280-72306-1	Analysis Batch: 280-289068	Instrument ID: MT_026
Client Matrix: Solid	Prep Batch: 280-288598	Lab File ID: 26a080315a.asc
Dilution: 1.0	Leach Batch: N/A	Initial Weight/Volume: 1.13 g
Analysis Date: 08/03/2015 1855	Units: mg/Kg	Final Weight/Volume: 100 mL
Prep Date: 07/31/2015 1445		
Leach Date: N/A		

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Calcium	48900	4420	54130	119	43 - 165	4
Zinc	87.1	44.2	125.2	86	70 - 200	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

**Duplicate - Batch: 280-288598**

**Method: 6010B**  
**Preparation: 3050B**

Lab Sample ID:	280-72306-1	Analysis Batch:	280-289068	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-288598	Lab File ID:	26a080315a.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.05 g
Analysis Date:	08/03/2015 1852	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	07/31/2015 1445				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Calcium	48900	49840	2	30	
Zinc	87.1	86.78	0.4	40	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-72306-1

Sdg Number: JP0982

**Method Blank - Batch: 280-288194**

**Method: 7471A**  
**Preparation: 7471A**

Lab Sample ID: MB 280-288194/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/31/2015 2102  
Prep Date: 07/31/2015 1100  
Leach Date: N/A

Analysis Batch: 280-288790  
Prep Batch: 280-288194  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.60 g  
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

**Lab Control Sample - Batch: 280-288194**

**Method: 7471A**  
**Preparation: 7471A**

Lab Sample ID: LCS 280-288194/2-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/31/2015 2104  
Prep Date: 07/31/2015 1100  
Leach Date: N/A

Analysis Batch: 280-288790  
Prep Batch: 280-288194  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.60 g  
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.414	99	87 - 111	

**Matrix Spike - Batch: 280-288194**

**Method: 7471A**  
**Preparation: 7471A**

Lab Sample ID: 280-72306-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 07/31/2015 2111  
Prep Date: 07/31/2015 1100  
Leach Date: N/A

Analysis Batch: 280-288790  
Prep Batch: 280-288194  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 150730ab.txt  
Initial Weight/Volume: 0.57 g  
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0055 U	0.439	0.443	101	87 - 111	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-72306-1  
Sdg Number: JP0982

**Duplicate - Batch: 280-288194**

**Method: 7471A**  
**Preparation: 7471A**

Lab Sample ID:	280-72306-1	Analysis Batch:	280-288790	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-288194	Lab File ID:	150730ab.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.54 g
Analysis Date:	07/31/2015 2109	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	07/31/2015 1100				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.0055 U	0.0061	NC	20	U

Date: 26 October 2015  
To: Washington Closure Hanford Inc. (technical representative)  
From: ELR Consulting  
Project: 100-H Remaining Sites Burial Grounds – Other - Waste Site 100-H-36  
Subject: Radiochemistry - Data Package No. JP0982-TAL

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. JP0982 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.

<b>Sample ID</b>	<b>Sample Date</b>	<b>Media</b>	<b>Validation</b>	<b>Analyte</b>
J1V7W3	7/27/15	Soil	C	See note 1
J1V7W4	7/27/15	Soil	C	See note 1
J1V7W5	7/27/15	Soil	C	See note 1
J1V7W6	7/27/15	Soil	C	See note 1

1 – Gamma spectroscopy, strontium.

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%.

All 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 (J1V7W4/J1V7W6) 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. Sixteen analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

#### · **Completeness**

Data package No. JP0982 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 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\*

<b>SDG: JP0982</b>	<b>REVIEWER: ELR</b>	<b>Project: 100-H-36</b>	<b>PAGE <u>1</u> OF <u>1</u></b>
<b>COMMENTS: No qualifiers assigned</b>			

\* - 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

Date: 31-Jul-15

TestAmerica Inc TARL

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

Report No. : 66783

*W 10/24/15*

SDG No: JP0982

Batch	Client Id Work Order	Parameter	Result +- CSU ( 2 s)	Qual	Units	Tracer Yield	MDL	GRDL	RPD
6208041	GAMMA_GS								
	J1V7W3								
	M7CND1AC	AMERICIUM 241	-8.36E-02 +- 1.4E-01	U	pCi/g		2.35E-01		
		CO-60	6.04E-03 +- 4.6E-02	U	pCi/g		8.37E-02	5.00E-02	
		CS-137	4.24E-02 +- 4.7E-02	U	pCi/g		8.72E-02	1.00E-01	
		EU-152	-3.92E-01 +- 1.8E-01	U	pCi/g		1.98E-01	1.00E-01	
		EU-154	8.25E-02 +- 1.4E-01	U	pCi/g		2.56E-01	1.00E-01	
		EU-155	-2.75E-02 +- 1.0E-01	U	pCi/g		1.73E-01	1.00E-01	
		K-40	1.27E+01 +- 2.0E+00		pCi/g		6.47E-01		
	J1V7W3 DUP								
	M7CND1AD	AMERICIUM 241	-5.11E-03 +- 2.4E-02	U	pCi/g		4.26E-02		-177.0
		CO-60	-2.45E-03 +- 3.3E-02	U	pCi/g		6.17E-02	5.00E-02	473.7
		CS-137	-1.64E-03 +- 3.3E-02	U	pCi/g		5.80E-02	1.00E-01	216.1
		EU-152	-7.21E-02 +- 9.2E-02	U	pCi/g		1.23E-01	1.00E-01	-137.8
		EU-154	1.64E-03 +- 1.2E-01	U	pCi/g		2.16E-01	1.00E-01	192.2
		EU-155	-3.05E-02 +- 4.9E-02	U	pCi/g		7.96E-02	1.00E-01	-10.3
		K-40	4.62E+00 +- 1.2E+00	U	pCi/g		2.29E+00		93.5
	J1V7W4								
	M7CNG1AC	AMERICIUM 241	2.64E-02 +- 2.8E-02	U	pCi/g		4.90E-02		
		CO-60	7.40E-02 +- 4.8E-02	U	pCi/g		9.70E-02	5.00E-02	
		CS-137	7.40E-02 +- 3.7E-02	U	pCi/g		7.24E-02	1.00E-01	
		EU-152	1.08E+00 +- 1.9E-01		pCi/g		1.20E-01	1.00E-01	
		EU-154	9.52E-02 +- 1.2E-01	U	pCi/g		2.27E-01	1.00E-01	
		EU-155	1.69E-02 +- 5.0E-02	U	pCi/g		8.69E-02	1.00E-01	
		K-40	9.56E+00 +- 1.8E+00		pCi/g		6.99E-01		
	J1V7W5								
	M7CNH1AC	AMERICIUM 241	-6.74E-03 +- 2.9E-02	U	pCi/g		5.05E-02		
		CO-60	9.79E-02 +- 5.2E-02	U	pCi/g		1.07E-01	5.00E-02	
		CS-137	4.76E-02 +- 3.9E-02	U	pCi/g		7.22E-02	1.00E-01	
		EU-152	5.92E-01 +- 1.6E-01		pCi/g		1.38E-01	1.00E-01	
		EU-154	6.15E-02 +- 1.2E-01	U	pCi/g		2.21E-01	1.00E-01	
		EU-155	4.51E-02 +- 5.7E-02	U	pCi/g		9.87E-02	1.00E-01	
		K-40	1.05E+01 +- 2.0E+00		pCi/g		5.72E-01		
	J1V7W6								
	M7CNJ1AC	AMERICIUM 241	1.43E-02 +- 1.2E-01	U	pCi/g		2.08E-01		
		CO-60	1.06E-01 +- 6.3E-02	U	pCi/g		1.30E-01	5.00E-02	
		CS-137	4.85E-02 +- 5.5E-02	U	pCi/g		1.01E-01	1.00E-01	
		EU-152	7.35E-01 +- 2.2E-01	U	pCi/g		3.14E-01	1.00E-01	
		EU-154	3.54E-02 +- 1.6E-01	U	pCi/g		2.96E-01	1.00E-01	

TestAmerica Inc  
rptTALRchSaSummary2 V5.3.8  
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

Date: 31-Jul-15

TestAmerica Inc TARK

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

Report No. : 66783

*10/24/15*

SDG No: JP0982

Batch	Client Id Work Order	Parameter	Result +- CSU ( 2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5208041	GAMMA_GS								
	J1V7W6								
	M7CNJ1AC	EU-155	-2.21E-02 +- 1.0E-01	U	pCi/g		1.75E-01	1.00E-01	
		K-40	8.84E+00 +- 2.2E+00		pCi/g		8.04E-01		
5208042	SRTOT_SEP_PRECIP_GPC								
	J1V7W3								
	M7CND1AA	STRONTIUM	1.58E-01 +- 2.3E-01	U	pCi/g	83%	4.85E-01	1.00E+00	
	J1V7W4								
	M7CNG1AA	STRONTIUM	3.69E-01 +- 2.6E-01	U	pCi/g	79%	4.70E-01	1.00E+00	
	J1V7W4 DUP								
	M7CNG1AD	STRONTIUM	5.77E-02 +- 2.0E-01	U	pCi/g	85%	4.53E-01	1.00E+00	145.9
	J1V7W5								
	M7CNH1AA	STRONTIUM	6.48E-02 +- 2.2E-01	U	pCi/g	80%	4.90E-01	1.00E+00	
	J1V7W6								
	M7CNJ1AA	STRONTIUM	-5.51E-02 +- 2.2E-01	U	pCi/g	77%	5.41E-01	1.00E+00	
	No. of Results: 40								

TestAmerica Inc rptTALRchSaSummary2 V5.3.8 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**

**Certificate of Analysis**

Washington Hanford Closure  
 2620 Fermi Avenue  
 Richland, WA 99354

July 31, 2015

Attention: Joan Kessner

---

SAF Number	:	RC-108
Date SDG Closed	:	July 27, 2015
Number of Samples	:	Four (4)
Sample Type	:	Other
SDG Number	:	JP0982
Data Deliverable	:	7- Day / Summary

---

**CASE NARRATIVE**

**I. Introduction**

On July 27, 2015, four other samples were received at TestAmerica for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>TARL ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J1V7W3	M7CND	OTHER	7/27/15
J1V7W4	M7CNG	OTHER	7/27/15
J1V7W5	M7CNH	OTHER	7/27/15
J1V7W6	M7CNJ	OTHER	7/27/15

**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:

**Gas Proportional Counting**  
 Strontium-90 by method RL-GPC-010

Washington Closure Hanford  
July 31, 2015

---

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

**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**

**Gas Proportional Counting**

Strontium-90 by method RL-GPC-010:

The LCS, batch blank, samples and sample duplicate (J1V7W4) results are within contractual requirements.

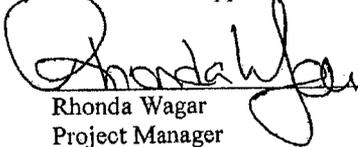
**Gamma Spectroscopy**

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 (J1V7W3) 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-108-057		Page 1 of 1		
Collector <i>F. Farinola</i>		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 9.8		
Project Designation 100-H Field Remediation		Sampling Location 100-H-36 (concrete scabbling)		SAF No. RC-108		Data Turnaround <i>7 days</i>				
Ice Chest No. <i>WCH-12-008</i>		Field Logbook No. EL-1627-09		COA 010H366000		Method of Shipment Local Delivery		<i>@ 7/27/15</i>		
Shipped To TestAmerica Richland		Offsite Property No. <i>N/A</i>		Bill of Lading/Air Bill No. <i>N/A</i>						
Other Labs Shipped To TestAmerica Denver		Preservation		None						
		Type of Container		G/P						
POSSIBLE SAMPLE HAZARDS/REMARKS <i>N/A</i>		No. of Container(s)		1						
		Volume		1000mL						
Special Handling and/or Storage <i>Cooling as required</i>		Sample Analysis		See item (2) in Special Instructions		Strontium-89,90 - Total Sr				
Sample No.	Matrix	Sample Date	Sample Time							
<i>J1V7W3 m7CND</i>	OTHER	<i>7/27/15</i>	<i>0850</i>	<i>X</i>	<i>X</i>					
<i>J1V7W4 m7CND</i>	OTHER	<i>7/27/15</i>	<i>0925</i>	<i>X</i>	<i>X</i>					
<i>J1V7W5 m7CND</i>	OTHER	<i>7/27/15</i>	<i>0945</i>	<i>X</i>	<i>X</i>					
<i>J1V7W6 m7CND</i>	OTHER	<i>7/27/15</i>	<i>0925</i>	<i>X</i>	<i>X</i>					
<i>31V7W7</i>	<i>Other</i>	<i>7/27/15</i>								
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS					
Relinquished By/Removed From <i>FRANK FARINOLA</i>		Date/Time <i>7/27/15 10:00</i>		Received By/Stored In <i>C. Martinez</i>		Please run Sr-90 analysis from material in GEA container.				
Relinquished By/Removed From <i>C. Martinez</i>		Date/Time <i>7/27/15 11:35</i>		Received By/Stored In <i>C. Bingham</i>		(2) Gamma Spec (Client List) (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)				
Relinquished By/Removed From <i>C. Bingham</i>		Date/Time <i>7-27-15 1310</i>		Received By/Stored In <i>J. Friesz, TARI</i>						
Relinquished By/Removed From		Date/Time		Received By/Stored In						
Relinquished By/Removed From		Date/Time		Received By/Stored In						
Relinquished By/Removed From		Date/Time		Received By/Stored In						
Relinquished By/Removed From		Date/Time		Received By/Stored In						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		DATE <i>7-27-15</i>				

WCH-EE-011



*J5G270409*  
*Due 8-3-15*

JP0982

**Appendix 5**  
**Data Validation Supporting Documentation**



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

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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: \_\_\_\_\_

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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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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: NO FS or PAS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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: ↓ over-

+ 8 - 16 over

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**Appendix 6**  
**Additional Documentation Requested by Client**

QC Results Summary

Date: 31-Jul-15

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 66783

SDG No.: JP0982

Batch	Work Order	Parameter	Result +- CSU ( 2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
GAMMA_GS									
5208041 BLANK QC,									
	M7CPF1AA	AMERICIUM 241	7.14E-03 +- 1.4E-02	U	pCi/g				2.64E-02
		CO-60	-1.71E-03 +- 2.7E-02	U	pCi/g				5.13E-02
		CS-137	-1.66E-02 +- 2.0E-02	U	pCi/g				3.30E-02
		EU-152	-1.13E-02 +- 4.5E-02	U	pCi/g				7.85E-02
		EU-164	3.17E-02 +- 7.5E-02	U	pCi/g				1.52E-01
		EU-155	3.23E-02 +- 2.6E-02	U	pCi/g				4.99E-02
		K-40	1.26E-02 +- 4.0E-01	U	pCi/g				8.47E-01
5208041 LCS,									
	M7CPF1AC	AMERICIUM 241	3.31E+01 +- 3.7E+00		pCi/g		83%	-0.2	1.28E-01
		CO-60	9.82E+00 +- 1.2E+00		pCi/g		88%	-0.1	7.01E-02
		CS-137	3.59E+01 +- 4.3E+00		pCi/g		90%	-0.1	8.41E-02
SRTOT_SEP_PRECIP_GPC									
5208042 BLANK QC,									
	M7CPG1AA	STRONTIUM	1.19E-01 +- 2.0E-01	U	pCi/g	82%			4.43E-01
5208042 LCS,									
	M7CPG1AC	STRONTIUM	3.75E+00 +- 9.8E-01		pCi/g	79%	114%	0.1	4.83E-01
No. of Results: 12									

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 rptSTLRchQcSummary V5.3.8 A2002 U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.