SAF-RC-189
100N Field Remediation –
Soil Full Protocol
FINAL VALIDATION PACKAGE

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COMMENTS:

SDG JP1043 SAF-RC-189

Sample Location: 100-N-83

Date: 22 May 2016
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-83
Subject: Inorganics - Data Package No. JP1043-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1043 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
J1V8V8	4/26/16	Soil	C	See note 1
J1V8V9	4/26/16	Soil	C	See note 1
J1V8W0	4/26/16	Soil	C	See note 1
J1V8W1	4/26/16	Soil	C	See note 1
J1V8W2	4/26/16	Soil	C	See note 1
J1V8W3	4/26/16	Soil	C	See note 1
J1V8W4	4/26/16	Soil	C	See note 1
J1V8W5	4/26/16	Soil	C	See note 1
J1V8W6	4/26/16	Soil	C	See note 1
J1V8W7	4/26/16	Soil	C	See note 1
J1V8W8	4/26/16	Soil	C	See note 1
J1V8W9	4/26/16	Soil	C	See note 1
J1V8X0	4/26/16	Soil	C	See note 1
J1V8X1	4/26/16	Soil	C	See note 1
J1V8X2	4/26/16	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). 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 chromium result in sample J1V8X2 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1V8X2) 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 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.

Due to a matrix spike recovery outside QC limits, all antimony (57%) and silicon (-12%) results were qualified as an estimate and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (15%) 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 (J1V8W4/J1V8X1) was 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. JP1043 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 chromium result in sample J1V8X2 was qualified as an estimate and flagged "UJ".
- Due to a matrix spike recovery outside QC limits, all antimony (57%) and silicon (-12%) results were qualified as an estimate and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (15%) 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-2005-92, Rev. 0, 100-N *Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

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

INORGANICS DATA QUALIFICATION SUMMARY*

SDG: JP1043	**REVIEWER: ELR**	**Project: 100-N-83**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium	UJ	J1V8X2	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

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8V8**

Lab Sample ID: 280-82479-1
Client Matrix: Solid
% Moisture: 1.5

Date Sampled: 04/26/2016 0810
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.351 g
Analysis Date:	04/30/2016 0130			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6720		1.2	3.8
Antimony		0.29	U J	0.29	0.45
Arsenic		2.9	M	0.50	0.75
Barium		58.5		0.057	0.38
Boron		1.2	B M	0.74	1.5
Cadmium		0.16		0.031	0.15
Calcium		7850		10.6	37.6
Chromium		9.1		0.044	0.15
Copper		14.9	X	0.16	0.75
Lead		4.1		0.20	0.38
Magnesium		4650		2.8	15.0
Manganese		288	X	0.075	0.75
Molybdenum		0.20	U	0.20	1.5
Nickel		10		0.092	3.0
Potassium		1350		30.8	225
Selenium		0.65	U	0.65	0.75
Silicon		1760	X N J	4.3	7.5
Silver		0.12	U	0.12	0.15
Sodium		366		44.3	90.2
Vanadium		51.0		0.071	1.5
Zinc		39.3	X	0.30	0.75

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	5.0			Initial Weight/Volume:	1.351 g
Analysis Date:	05/02/2016 2057			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.47	B	0.12	0.75
Cobalt		8.2		0.38	3.8
Iron		26000		14.3	18.8

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.594 g
Analysis Date:	05/02/2016 1753			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

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

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8V9

Lab Sample ID: 280-82479-2
Client Matrix: Solid

% Moisture: 2.1

Date Sampled: 04/26/2016 0937
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.211 g
Analysis Date:	04/30/2016 0140			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

5/22/4

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6580		1.3	4.2
Antimony		0.32	U J	0.32	0.51
Arsenic		2.6		0.56	0.84
Barium		53.1		0.064	0.42
Boron		1.1	B	0.83	1.7
Cadmium		0.15	B	0.035	0.17
Calcium		6620		11.9	42.2
Chromium		9.2		0.049	0.17
Copper		13.3	X	0.18	0.84
Lead		4.0		0.23	0.42
Magnesium		4580		3.1	16.9
Manganese		268	X	0.084	0.84
Molybdenum		0.22	U	0.22	1.7
Nickel		10.1		0.10	3.4
Potassium		1280		34.6	253
Selenium		0.73	U	0.73	0.84
Silicon		1520	X J	4.8	8.4
Silver		0.13	U	0.13	0.17
Sodium		332		49.8	101
Vanadium		42.5		0.079	1.7
Zinc		34.5	X	0.34	0.84

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.211 g
Analysis Date:	05/02/2016 2107			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.42		0.056	0.34
Cobalt		7.5		0.17	1.7
Iron		22100		6.4	8.4

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.545 g
Analysis Date:	05/02/2016 1800			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0062	U	0.0062	0.019

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8W0

Lab Sample ID: 280-82479-3
Client Matrix: Solid
% Moisture: 2.4

Date Sampled: 04/26/2016 0830
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.216 g
Analysis Date:	04/30/2016 0142			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7560		1.3	4.2
Antimony		0.47	B J	0.32	0.51
Arsenic		3.7		0.56	0.84
Barium		54.6		0.064	0.42
Boron		1.6	B	0.83	1.7
Cadmium		0.17		0.035	0.17
Calcium		8930		11.9	42.1
Chromium		11.5		0.049	0.17
Copper		15.2	X	0.18	0.84
Lead		5.1		0.23	0.42
Magnesium		5050		3.1	16.9
Manganese		296	X	0.084	0.84
Molybdenum		0.22	U	0.22	1.7
Nickel		11.8		0.10	3.4
Potassium		1750		34.5	253
Selenium		0.72	U	0.72	0.84
Silicon		2170	X J	4.8	8.4
Silver		0.13	U	0.13	0.17
Sodium		324		49.7	101
Vanadium		47.1		0.079	1.7
Zinc		39.0	X	0.34	0.84

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.216 g
Analysis Date:	05/02/2016 2110			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.47		0.056	0.34
Cobalt		7.0		0.17	1.7
Iron		22900		6.4	8.4

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.512 g
Analysis Date:	05/02/2016 1802			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0066	U	0.0066	0.020

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W1**

Lab Sample ID: 280-82479-4
Client Matrix: Solid
% Moisture: 1.2

Date Sampled: 04/26/2016 0850
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.295 g
Analysis Date:	04/30/2016 0145			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

5/22/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7040		1.2	3.9
Antimony		0.30	U J	0.30	0.47
Arsenic		2.8		0.52	0.78
Barium		53.1		0.059	0.39
Beryllium		0.21		0.026	0.16
Boron		1.2	B	0.77	1.6
Cadmium		0.14	B	0.032	0.16
Calcium		3580		11.0	39.1
Chromium		14.6		0.045	0.16
Cobalt		5.9		0.078	0.78
Copper		9.8	X	0.17	0.78
Iron		14600		3.0	3.9
Lead		4.1		0.21	0.39
Magnesium		4050		2.9	15.6
Manganese		210	X	0.078	0.78
Molybdenum		0.20	U	0.20	1.6
Nickel		13.2		0.096	3.1
Potassium		1570		32.0	234
Selenium		0.67	U	0.67	0.78
Silicon		951	X J	4.4	7.8
Silver		0.13	U	0.13	0.16
Sodium		167		46.1	93.8
Vanadium		30.8		0.073	1.6
Zinc		30.0	X	0.31	0.78

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.506 g
Analysis Date:	05/02/2016 1805			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0066	U	0.0066	0.020

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8W2

Lab Sample ID: 280-82479-5
Client Matrix: Solid
% Moisture: 2.0

Date Sampled: 04/26/2016 1045
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.411 g
Analysis Date:	04/30/2016 0148			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

✓ 5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8470		1.1	3.6
Antimony		0.27	U J	0.27	0.43
Arsenic		2.3		0.48	0.72
Barium		84.5		0.055	0.36
Boron		2.1		0.71	1.4
Cadmium		0.24		0.030	0.14
Calcium		3480		10.2	36.2
Chromium		12.5		0.042	0.14
Copper		12.5	X	0.16	0.72
Lead		5.3		0.20	0.36
Magnesium		3730		2.7	14.5
Manganese		312	X	0.072	0.72
Molybdenum		0.19	U	0.19	1.4
Nickel		11.2		0.089	2.9
Potassium		2440		29.7	217
Selenium		0.62	U	0.62	0.72
Silicon		1360	X J	4.1	7.2
Silver		0.12	U	0.12	0.14
Sodium		219		42.7	86.8
Vanadium		40.6		0.068	1.4
Zinc		37.1	X	0.29	0.72

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.411 g
Analysis Date:	05/02/2016 2112			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.44		0.048	0.29
Cobalt		6.0		0.14	1.4
Iron		20700		5.5	7.2

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.544 g
Analysis Date:	05/02/2016 1807			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0062	U	0.0062	0.019

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W3**

Lab Sample ID: 280-82479-6
Client Matrix: Solid
% Moisture: 2.1

Date Sampled: 04/26/2016 1100
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.255 g
Analysis Date:	04/30/2016 0201			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

✓ 5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9600		1.3	4.1
Antimony		0.31	U J	0.31	0.49
Arsenic		2.6		0.54	0.81
Barium		88.5		0.062	0.41
Boron		2.1		0.80	1.6
Cadmium		0.21		0.033	0.16
Calcium		3570		11.5	40.7
Chromium		14.5		0.047	0.16
Copper		14.0	X	0.18	0.81
Lead		5.6		0.22	0.41
Magnesium		3870		3.0	16.3
Manganese		342	X	0.081	0.81
Molybdenum		0.21	U	0.21	1.6
Nickel		12.4		0.10	3.3
Potassium		2430		33.4	244
Selenium		0.70	U	0.70	0.81
Silicon		1470	X J	4.6	8.1
Silver		0.13	U	0.13	0.16
Vanadium		40.8		0.076	1.6
Zinc		40.6	X	0.32	0.81

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0			Initial Weight/Volume:	1.255 g
Analysis Date:	05/02/2016 2202			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		191		48.0	97.6

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.255 g
Analysis Date:	05/02/2016 2115			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.48		0.054	0.33
Cobalt		6.8		0.16	1.6
Iron		22000		6.2	8.1

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W3**

Lab Sample ID: 280-82479-6
Client Matrix: Solid

% Moisture: 2.1

Date Sampled: 04/26/2016 1100
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.577 g
Analysis Date:	05/02/2016 1809			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0068	B	0.0059	0.018

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8W4

Lab Sample ID: 280-82479-7
Client Matrix: Solid
% Moisture: 5.8

Date Sampled: 04/26/2016 1125
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 04/30/2016 0203
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323288
Prep Batch: 280-323098

✓ 5/22/16

Instrument ID: MT_026
Lab File ID: 26C042916.asc
Initial Weight/Volume: 1.108 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9000		1.5	4.8
Antimony		0.36	U J	0.36	0.58
Arsenic		2.7		0.63	0.96
Barium		92.3		0.073	0.48
Boron		1.7	B	0.94	1.9
Cadmium		0.18	B	0.039	0.19
Calcium		3530		13.5	47.9
Chromium		13.5		0.056	0.19
Copper		12.6	X	0.21	0.96
Lead		4.7		0.26	0.48
Magnesium		3980		3.5	19.2
Manganese		332	X	0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		11.7		0.12	3.8
Potassium		2270		39.3	288
Selenium		0.82	U	0.82	0.96
Silicon		1850	X J	5.4	9.6
Silver		0.15	U	0.15	0.19
Vanadium		39.2		0.090	1.9
Zinc		35.1	X	0.38	0.96

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/02/2016 2205
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.108 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		166		56.5	115

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 05/02/2016 2128
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.108 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.45		0.063	0.38
Cobalt		6.1		0.19	1.9
Iron		20900		7.3	9.6

7471A Mercury (CVAA)

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W4**

Lab Sample ID: 280-82479-7
Client Matrix: Solid

% Moisture: 5.8

Date Sampled: 04/26/2016 1125
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.519 g
Analysis Date:	05/02/2016 1812			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0068	U	0.0068	0.021

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8W5

Lab Sample ID: 280-82479-8
Client Matrix: Solid

% Moisture: 1.3

Date Sampled: 04/26/2016 1115
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.289 g
Analysis Date:	04/30/2016 0206			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10800		1.2	3.9
Antimony		0.30	U J	0.30	0.47
Arsenic		2.3		0.52	0.79
Barium		89.2		0.060	0.39
Boron		2.0		0.77	1.6
Cadmium		0.20		0.032	0.16
Calcium		3480		11.1	39.3
Chromium		14.6		0.046	0.16
Copper		13.7	X	0.17	0.79
Lead		5.4		0.21	0.39
Magnesium		3940		2.9	15.7
Manganese		365	X	0.079	0.79
Molybdenum		0.20	U	0.20	1.6
Nickel		11.7		0.097	3.1
Potassium		2470		32.2	236
Selenium		0.68	U	0.68	0.79
Silicon		1830	X J	4.4	7.9
Silver		0.13	U	0.13	0.16
Vanadium		44.2		0.074	1.6
Zinc		40.6	X	0.31	0.79

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0			Initial Weight/Volume:	1.289 g
Analysis Date:	05/02/2016 2207			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		188		46.4	94.3

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.289 g
Analysis Date:	05/02/2016 2131			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.52		0.052	0.31
Cobalt		7.2		0.16	1.6
Iron		23700		6.0	7.9

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W5**

Lab Sample ID: 280-82479-8
Client Matrix: Solid

% Moisture: 1.3

Date Sampled: 04/26/2016 1115
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.589 g
Analysis Date:	05/02/2016 1814			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

✓ 5/22/16

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

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W6**

Lab Sample ID: 280-82479-9
Client Matrix: Solid

% Moisture: 1.8

Date Sampled: 04/26/2016 1145
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.165 g
Analysis Date:	04/30/2016 0208			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8960		1.4	4.4
Antimony		0.33	U J	0.33	0.52
Arsenic		2.9		0.58	0.87
Barium		88.5		0.066	0.44
Boron		1.9		0.86	1.7
Cadmium		0.24		0.036	0.17
Calcium		3410		12.3	43.7
Chromium		13.0		0.051	0.17
Copper		13.1	X	0.19	0.87
Lead		5.0		0.24	0.44
Magnesium		3780		3.2	17.5
Manganese		323	X	0.087	0.87
Molybdenum		0.23	U	0.23	1.7
Nickel		11.2		0.11	3.5
Potassium		2450		35.8	262
Selenium		0.75	U	0.75	0.87
Silicon		1890	X J	4.9	8.7
Silver		0.14	U	0.14	0.17
Vanadium		39.2		0.082	1.7
Zinc		36.8	X	0.35	0.87

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0			Initial Weight/Volume:	1.165 g
Analysis Date:	05/02/2016 2210			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		171		51.6	105

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.165 g
Analysis Date:	05/02/2016 2133			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.42		0.058	0.35
Cobalt		6.4		0.17	1.7
Iron		21000		6.6	8.7

7471A Mercury (CVAA)

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W6**

Lab Sample ID: 280-82479-9
Client Matrix: Solid

% Moisture: 1.8

Date Sampled: 04/26/2016 1145
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.554 g
Analysis Date:	05/02/2016 1821			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0061	U	0.0061	0.019

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W7**

Lab Sample ID: 280-82479-10
Client Matrix: Solid
% Moisture: 4.0

Date Sampled: 04/26/2016 1130
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.101 g
Analysis Date:	04/30/2016 0211			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10400		1.5	4.7
Antimony		0.36	U J	0.36	0.57
Arsenic		2.4		0.62	0.95
Barium		97.7		0.072	0.47
Boron		1.7	B	0.93	1.9
Cadmium		0.24		0.039	0.19
Calcium		3520		13.3	47.3
Chromium		14.3		0.055	0.19
Copper		14.9	X	0.21	0.95
Lead		6.1		0.26	0.47
Magnesium		4170		3.5	18.9
Manganese		392	X	0.095	0.95
Molybdenum		0.25	U	0.25	1.9
Nickel		12.8		0.12	3.8
Potassium		2480		38.8	284
Selenium		0.81	U	0.81	0.95
Silicon		1930	X J	5.4	9.5
Silver		0.15	U	0.15	0.19
Vanadium		45.0		0.089	1.9
Zinc		41.3	X	0.38	0.95

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0			Initial Weight/Volume:	1.101 g
Analysis Date:	05/02/2016 2212			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		169		55.8	113

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.101 g
Analysis Date:	05/02/2016 2136			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.54		0.062	0.38
Cobalt		8.0		0.19	1.9
Iron		24600		7.2	9.5

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W7**

Lab Sample ID: 280-82479-10
Client Matrix: Solid

% Moisture: 4.0

Date Sampled: 04/26/2016 1130
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.537 g
Analysis Date:	05/02/2016 1823			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

✓ 5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0094	B	0.0064	0.020

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8W8

Lab Sample ID: 280-82479-11
Client Matrix: Solid
% Moisture: 8.8

Date Sampled: 04/26/2016 1200
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 04/30/2016 0214
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323288
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26C042916.asc
Initial Weight/Volume: 1.228 g
Final Weight/Volume: 100 mL

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9390		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		3.0		0.59	0.89
Barium		98.7		0.068	0.45
Boron		2.3		0.88	1.8
Cadmium		0.26		0.037	0.18
Calcium		3920		12.6	44.7
Chromium		12.6		0.052	0.18
Copper		12.2	X	0.19	0.89
Lead		5.8		0.24	0.45
Magnesium		3870		3.3	17.9
Manganese		322	X	0.089	0.89
Molybdenum		0.23	U	0.23	1.8
Nickel		11.2		0.11	3.6
Potassium		2430		36.6	268
Selenium		0.77	U	0.77	0.89
Silicon		1520	X J	5.1	8.9
Silver		0.14	U	0.14	0.18
Vanadium		42.4		0.084	1.8
Zinc		39.5	X	0.36	0.89

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/02/2016 2215
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.228 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		250		52.7	107

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 05/02/2016 2138
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.228 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.47		0.059	0.36
Cobalt		6.4		0.18	1.8
Iron		21500		6.8	8.9

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W8**

Lab Sample ID: 280-82479-11
Client Matrix: Solid

% Moisture: 8.8

Date Sampled: 04/26/2016 1200
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.536 g
Analysis Date:	05/02/2016 1826			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0075	B	0.0068	0.021

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8W9

Lab Sample ID: 280-82479-12
Client Matrix: Solid
% Moisture: 2.9

Date Sampled: 04/26/2016 1220
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.174 g
Analysis Date:	04/30/2016 0216			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

5/2/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8980		1.4	4.4
Antimony		0.33	U J	0.33	0.53
Arsenic		2.6		0.58	0.88
Barium		86.6		0.067	0.44
Boron		1.9		0.86	1.8
Cadmium		0.23		0.036	0.18
Calcium		3500		12.4	43.9
Chromium		13.3		0.051	0.18
Copper		13.5	X	0.19	0.88
Lead		6.4		0.24	0.44
Magnesium		3810		3.2	17.5
Manganese		331	X	0.088	0.88
Molybdenum		0.23	U	0.23	1.8
Nickel		12.3		0.11	3.5
Potassium		2480		36.0	263
Selenium		0.75	U	0.75	0.88
Silicon		1400	X J	5.0	8.8
Silver		0.14	U	0.14	0.18
Vanadium		43.9		0.082	1.8
Zinc		39.6	X	0.35	0.88

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0			Initial Weight/Volume:	1.174 g
Analysis Date:	05/02/2016 2218			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		186		51.7	105

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	2.0			Initial Weight/Volume:	1.174 g
Analysis Date:	05/02/2016 2141			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.47		0.058	0.35
Cobalt		6.5		0.18	1.8
Iron		22400		6.7	8.8

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8W9**

Lab Sample ID: 280-82479-12
Client Matrix: Solid

% Moisture: 2.9

Date Sampled: 04/26/2016 1220
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.570 g
Analysis Date:	05/02/2016 1828			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

✓ 5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0076	B	0.0060	0.018

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8X0

Lab Sample ID: 280-82479-13
Client Matrix: Solid
% Moisture: 2.9

Date Sampled: 04/26/2016 0915
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-323288	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0			Initial Weight/Volume:	1.456 g
Analysis Date:	04/30/2016 0219			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9440		1.1	3.5
Antimony		0.75 J		0.27	0.42
Arsenic		2.6		0.47	0.71
Barium		79.8		0.054	0.35
Boron		1.5		0.69	1.4
Cadmium		0.21		0.029	0.14
Calcium		3700		10	35.4
Chromium		15.0		0.041	0.14
Copper		14.1	X	0.15	0.71
Lead		4.9		0.19	0.35
Magnesium		3740		2.6	14.2
Manganese		353	X	0.071	0.71
Molybdenum		0.18	U	0.18	1.4
Nickel		11.5		0.087	2.8
Potassium		2280		29.0	212
Selenium		0.61	U	0.61	0.71
Silicon		1440	X J	4.0	7.1
Silver		0.11	U	0.11	0.14
Vanadium		48.6		0.067	1.4
Zinc		39.4	X	0.28	0.71

Analysis Method:	6010B	Analysis Batch:	280-323611	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0			Initial Weight/Volume:	1.456 g
Analysis Date:	05/02/2016 2220			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		22500		2.7	3.5
Sodium		286		41.7	84.9

Analysis Method:	6010B	Analysis Batch:	280-323859	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-323098	Lab File ID:	25Z050416.asc
Dilution:	1.0			Initial Weight/Volume:	1.456 g
Analysis Date:	05/04/2016 1114			Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.34		0.023	0.14
Cobalt		9.3		0.071	0.71

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8X0**

Lab Sample ID: 280-82479-13
Client Matrix: Solid

% Moisture: 2.9

Date Sampled: 04/26/2016 0915
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.554 g
Analysis Date:	05/02/2016 1830			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0062	U	0.0062	0.019

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8X1

Lab Sample ID: 280-82479-14
Client Matrix: Solid

% Moisture: 5.6

Date Sampled: 04/26/2016 1025
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 04/30/2016 0221
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323288
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26C042916.asc
Initial Weight/Volume: 1.401 g
Final Weight/Volume: 100 mL

✓ 5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8760		1.2	3.8
Antimony		0.29	U J	0.29	0.45
Arsenic		2.6		0.50	0.76
Barium		87.4		0.057	0.38
Boron		1.5		0.74	1.5
Cadmium		0.20		0.031	0.15
Calcium		3460		10.7	37.8
Chromium		13.2		0.044	0.15
Copper		12.6	X	0.16	0.76
Lead		4.7		0.20	0.38
Magnesium		3870		2.8	15.1
Manganese		309	X	0.076	0.76
Molybdenum		0.20	U	0.20	1.5
Nickel		11.2		0.093	3.0
Potassium		2200		31.0	227
Selenium		0.65	U	0.65	0.76
Silicon		1220	X J	4.3	7.6
Silver		0.12	U	0.12	0.15
Vanadium		39.3		0.071	1.5
Zinc		35.5	X	0.30	0.76

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/02/2016 2223
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.401 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Sodium		168		44.6	90.7

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 2.0
Analysis Date: 05/02/2016 2146
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.401 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Beryllium		0.44		0.050	0.30
Cobalt		6.1		0.15	1.5
Iron		20800		5.7	7.6

7471A Mercury (CVAA)

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: **J1V8X1**

Lab Sample ID: 280-82479-14
Client Matrix: Solid

% Moisture: 5.6

Date Sampled: 04/26/2016 1025
Date Received: 04/28/2016 0940

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0			Initial Weight/Volume:	0.576 g
Analysis Date:	05/02/2016 1833			Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				

5/12/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0061	U	0.0061	0.019

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Client Sample ID: J1V8X2

Lab Sample ID: 280-82479-15
Client Matrix: Solid
% Moisture: 0.0

Date Sampled: 04/26/2016 0740
Date Received: 04/28/2016 0940

6010B Metals (ICP)

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 04/30/2016 0224
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323288
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26C042916.asc
Initial Weight/Volume: 1.430 g
Final Weight/Volume: 100 mL

5/22/16

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		171		1.1	3.5
Antimony		0.27	U J	0.27	0.42
Arsenic		0.68	B	0.46	0.70
Barium		1.8		0.053	0.35
Beryllium		0.023	B	0.023	0.14
Boron		0.69	U	0.69	1.4
Cadmium		0.029	U	0.029	0.14
Calcium		28.7	B	9.9	35.0
Chromium		0.17	C UJ	0.041	0.14
Cobalt		0.070	U	0.070	0.70
Copper		0.15	U X	0.15	0.70
Lead		0.28	B	0.19	0.35
Magnesium		19.9		2.6	14.0
Manganese		5.1	X	0.070	0.70
Molybdenum		0.18	U	0.18	1.4
Nickel		0.086	U	0.086	2.8
Potassium		49.0	B	28.7	210
Selenium		0.60	U	0.60	0.70
Silicon		134	X J	4.0	7.0
Silver		0.11	U	0.11	0.14
Vanadium		0.25	B	0.066	1.4
Zinc		0.69	B X	0.28	0.70

Analysis Method: 6010B
Prep Method: 3050B
Dilution: 1.0
Analysis Date: 05/02/2016 2159
Prep Date: 04/29/2016 1425

Analysis Batch: 280-323611
Prep Batch: 280-323098

Instrument ID: MT_026
Lab File ID: 26A050216.asc
Initial Weight/Volume: 1.430 g
Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		247		2.7	3.5
Sodium		41.3	U	41.3	83.9

7471A Mercury (CVAA)

Analysis Method: 7471A
Prep Method: 7471A
Dilution: 1.0
Analysis Date: 05/02/2016 1835
Prep Date: 05/02/2016 1250

Analysis Batch: 280-323619
Prep Batch: 280-323465

Instrument ID: MT_034
Lab File ID: 160502ba.txt
Initial Weight/Volume: 0.555 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0060	U	0.0060	0.018

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-82479-1

SDG #: JP1043
SAF#: RC-189

Date SDG Closed: April 28, 2016
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V8V8	280-82479-1	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8V9	280-82479-2	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W0	280-82479-3	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W1	280-82479-4	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W2	280-82479-5	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W3	280-82479-6	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W4	280-82479-7	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W5	280-82479-8	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W6	280-82479-9	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W7	280-82479-10	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W8	280-82479-11	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W9	280-82479-12	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8X0	280-82479-13	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8X1	280-82479-14	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8X2	280-82479-15	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C

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 4/28/2016 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-323098 indicates that physical and chemical interferences are present for Copper, Manganese, Silicon and Zinc. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Samples J1V8V8, J1V8V9, J1V8W0, J1V8W2, J1V8W3, J1V8W4, J1V8W5, J1V8W6, J1V8W7, J1V8W8, J1V8W9 and J1V8X1 required dilutions prior to the analysis of Beryllium, Cobalt and Iron to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilutions required.

Low levels of Chromium are present in the method blank associated with batch 280-323098. Because the concentration in the method blank is not present at a level greater than half the reporting limit, 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 J1V8V8; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1V8V8, and the associated sample result has been flagged "N". 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.

The duplicate analysis of sample J1V8V8 exhibited RPD data outside the control limits for Arsenic and Boron, 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.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the instrument blank (CCB) associated with sample J1V8W1 in analysis batch 280-323288. As the associated sample amount is greater than twenty times the CCB concentration, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N
No anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS
The Matrix Spike performed on sample J1V8V8 exhibited percent recoveries outside the control limits for Chloride, Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The Matrix Spike performed on sample J1V8W4 exhibited percent recoveries outside the control limits for Chloride and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The Orthophosphate as P duplicate analysis of sample J1V8W4 exceeded the RPD limit, 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.

GENERAL CHEMISTRY - SW846 9045C - PH
SU = standard units

No anomalies were encountered.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-314	Page 1 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1652-12	COA: 000N832000	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A13H482		Bill of Lading/Air Bill No.: SEE OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool as required

Preservation	Cool <=6C	Cool <=6C									
Type of Container	G/P	G/P									
No. of Container(s)	1	1									
Volume	250mL	250mL									
Sample Analysis	See Item (1) in Special Instructions	IC Anions - 9056 Modified; NO2/NO3 - 353.2; pH (Soil) - 9045									

280-82479 Chain of Custody

Sample No.	Matrix	Sample Date	Sample Time									
J1V8V8	SOIL	4-26-16	0810	✓	✓							
J1V8V9	SOIL	4-26-16	0937	✓	✓							
J1V8W0	SOIL	4-26-16	0830	✓	✓							
J1V8W1	SOIL	4-26-16	0850	✓	✓							
J1V8W2	SOIL	4-26-16	1045	✓	✓							

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26 Apr 2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
T.R. Edmundson T.R. Edmundson	4-27-16 1500	Fed Ex	4-27-16 —
		[signature]	0940 28 Apr 16

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)

1.01R7-0.2 28Apr16
Transfer [illegible]

REVIEWED BY KWpestile
DATE 4-27-16

JP1043

WCH-EE-011

Page 7 of 15

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-314	Page 2 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1652-12	COA: 000N832000	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131482		Bill of Lading/Air Bill No.: SEE OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool as required

Preservation	Cool <=6C	Cool <=6C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	250mL	250mL										
Sample Analysis	See Item (1) in Special Instructions	IC Anions - 9056 Modified; NO2/NO3 - 353.2; pH (Soil) - 9045										

Sample No.	Matrix	Sample Date	Sample Time										
J1V8W3	SOIL	4-26-16	1100	✓	✓								
J1V8W4	SOIL	4-26-16	1025	✓	✓								
J1V8W5	SOIL	4-26-16	1115	✓	✓								
J1V8W6	SOIL	4-26-16	1145	✓	✓								
J1V8W7	SOIL	4-26-16	1130	✓	✓								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26 Apr 2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1830	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
WCH T.R. Edmundson T.R. Edmundson	4-27-16 1500	Fed EX	4-27-16 —
		[illegible]	0940 28 Apr 16

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)

REVIEWED BY Rw Portela DATE 4-27-16

JP1043

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-314	Page 3 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling	SAF No.: RC-189	
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1652-12	COA: 000N832000	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A1A1482 13 FRE 4-27-16		Bill of Lading/Air Bill No.: SEE OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool as required

Preservation	Cool <=6C	Cool <=6C									
Type of Container	G/P	G/P									
No. of Container(s)	1	1									
Volume	250mL	250mL									
Sample Analysis	See item (1) in Special Instructions	IC Anions - 9056 Modified; NO2/NO3 - 353.2; pH (Soil - 9045									

Sample No.	Matrix	Sample Date	Sample Time									
J1V8W8	SOIL	4-26-16	1200	✓	✓							
J1V8W9	SOIL	4-26-16	1220	✓	✓							
J1V8X0	SOIL	4-26-16	0915	✓	✓							
J1V8X1	SOIL	4-26-16	1025	✓	✓							
J1V8X2	SOIL	4-26-16	0740	✓	✓							

Page 7 of 9

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26 Apr 2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
T.R. Edmundson T.R. Edmundson WEH	4-27-16 1500	Fed Ex	4-27-16 —
		0940	28 Apr 16

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)

REVIEWED BY Kwestel DATE 4-27-16

JP1043

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-N-83			DATA PACKAGE: JP1043		
VALIDATOR: ELR		LAB: TAL		DATE: 5/2/16	
			SDG: JP1043		

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

SAMPLES/MATRIX				
J1V8V8	J1V8V9	J1V8W0	J1V8W1	J1V8W2
J1V8W3	J1V8W4	J1V8W5	J1V8W6	J1V8W7
J1V8W8	J1V8W9	J1V8X0	J1V8X1	J1V8X2
				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: Chromium - U1 all

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 152 - J all

MS - antimony (57%) silicon - (-12%) - J all

no Pb

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:

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

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Method Blank - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-323098/1-A	Analysis Batch:	280-323288	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	04/30/2016 0125	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
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
Calcium	14.1	U	14.1	50.0
Chromium	0.0730	B	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	3.7	U	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
Zinc	0.40	U	0.40	1.0

Method Blank - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-323098/1-A	Analysis Batch:	280-323611	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/02/2016 2051	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Iron	3.8	U	3.8	5.0

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Lab Control Sample - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-323098/2-A	Analysis Batch:	280-323288	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	04/30/2016 0127	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	53.12	106	82 - 110	
Arsenic	100	102.3	102	85 - 110	
Barium	200	204.8	102	87 - 112	
Beryllium	5.00	4.78	96	84 - 114	
Boron	100	105.2	105	80 - 120	
Cadmium	10.0	10.72	107	87 - 110	
Calcium	5000	4699	94	82 - 114	
Chromium	20.0	19.29	96	84 - 114	
Cobalt	50.0	51.38	103	87 - 110	
Copper	25.0	24.27	97	88 - 110	
Lead	50.0	51.60	103	86 - 110	
Magnesium	5000	4509	90	90 - 110	
Manganese	50.0	46.01	92	88 - 110	
Molybdenum	100	108.4	108	86 - 110	
Nickel	50.0	49.70	99	87 - 110	
Potassium	5000	5248	105	89 - 110	
Selenium	200	198.3	99	83 - 110	
Silicon	1000	145.8	15	10 - 70	
Silver	5.00	4.69	94	87 - 114	
Sodium	5000	5326	107	90 - 112	
Vanadium	50.0	44.82	90	88 - 110	
Zinc	50.0	43.74	87	76 - 114	

Lab Control Sample - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-323098/2-A	Analysis Batch:	280-323611	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/02/2016 2054	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	190.7	95	82 - 116	
Iron	100	97.09	97	87 - 120	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Matrix Spike - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323288	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.009 g
Analysis Date:	04/30/2016 0137	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	6720		201	9615	1436	50 - 200	4
Antimony	0.29	U	50.3	28.80	57	20 - 200	
Arsenic	2.9		101	90.18	87	76 - 111	
Barium	58.5		201	244.0	92	52 - 159	
Boron	1.2	B	101	88.99	87	80 - 120	
Cadmium	0.16		10.1	9.49	93	40 - 130	
Calcium	7850		5030	13180	106	43 - 165	
Chromium	9.1		20.1	29.44	101	70 - 200	
Copper	14.9		25.2	37.69	90	37 - 187	
Lead	4.1		50.3	47.04	85	70 - 200	
Magnesium	4650		5030	8948	85	64 - 145	
Manganese	288		50.3	358.3	140	40 - 200	4
Molybdenum	0.20	U	101	90.70	90	75 - 103	
Nickel	10		50.3	52.17	84	61 - 126	
Potassium	1350		5030	6574	104	56 - 172	
Selenium	0.65	U	201	168.1	84	76 - 104	
Silicon	1760		1010	1637	-12	20 - 200	N
Silver	0.12	U	5.03	3.91	78	75 - 141	
Sodium	366		5030	5303	98	78 - 111	
Vanadium	51.0		50.3	97.50	92	50 - 169	
Zinc	39.3		50.3	77.22	75	70 - 200	

Matrix Spike - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323611	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	5.0	Leach Batch:	N/A	Initial Weight/Volume:	1.009 g
Analysis Date:	05/02/2016 2104	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Beryllium	0.47	B	5.03	5.15	93	72 - 105	
Cobalt	8.2		50.3	52.61	88	72 - 106	
Iron	26000		101	28440	2395	70 - 200	4

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Duplicate - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323288	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26C042916.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.461 g
Analysis Date:	04/30/2016 0135	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	6720		5462	21	40	
Antimony	0.29	U	0.26	NC	40	U
Arsenic	2.9		1.95	38	30	M
Barium	58.5		43.93	28	30	
Boron	1.2	B	0.833	39	30	B M
Cadmium	0.16		0.151	6	30	
Calcium	7850		6416	20	30	
Chromium	9.1		7.73	16	40	
Copper	14.9		14.22	5	30	
Lead	4.1		3.39	18	40	
Magnesium	4650		3822	20	30	
Manganese	288		247.9	15	40	
Molybdenum	0.20	U	0.18	NC	30	U
Nickel	10		8.45	17	30	
Potassium	1350		1099	21	40	
Selenium	0.65	U	0.60	NC	30	U
Silicon	1760		1642	7	40	
Silver	0.12	U	0.11	NC	30	U
Sodium	366		306.0	18	30	
Vanadium	51.0		41.97	19	30	
Zinc	39.3		31.43	22	40	

Duplicate - Batch: 280-323098

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323611	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-323098	Lab File ID:	26A050216.asc
Dilution:	5.0	Leach Batch:	N/A	Initial Weight/Volume:	1.461 g
Analysis Date:	05/02/2016 2102	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	04/29/2016 1425				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Beryllium	0.47	B	0.396	18	30	B
Cobalt	8.2		7.12	14	30	
Iron	26000		22600	14	40	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Method Blank - Batch: 280-323465

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-323465/1-A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.6 g
Analysis Date:	05/02/2016 1744	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-323465

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-323465/2-A	Analysis Batch:	280-323619	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.6 g
Analysis Date:	05/02/2016 1746	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.443	106	87 - 111	

Matrix Spike - Batch: 280-323465

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323619	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.526 g
Analysis Date:	05/02/2016 1758	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0057	U	0.483	0.500	104	87 - 111	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Duplicate - Batch: 280-323465

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323619	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-323465	Lab File ID:	160502ba.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.569 g
Analysis Date:	05/02/2016 1756	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/02/2016 1250				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0057	U	0.0059	NC	20	U

Date: 22 May 2016
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-83
Subject: Radiochemistry - Data Package No. JP1043-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1043 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
J1V8V8	4/26/16	Soil	C	See note 1
J1V8V9	4/26/16	Soil	C	See note 1
J1V8W0	4/26/16	Soil	C	See note 1
J1V8W1	4/26/16	Soil	C	See note 1
J1V8W2	4/26/16	Soil	C	See note 1
J1V8W3	4/26/16	Soil	C	See note 1
J1V8W4	4/26/16	Soil	C	See note 1
J1V8W5	4/26/16	Soil	C	See note 1
J1V8W6	4/26/16	Soil	C	See note 1
J1V8W7	4/26/16	Soil	C	See note 1
J1V8W8	4/26/16	Soil	C	See note 1
J1V8W9	4/26/16	Soil	C	See note 1
J1V8X0	4/26/16	Soil	C	See note 1
J1V8X1	4/26/16	Soil	C	See note 1
J1V8X2	4/26/16	Soil	C	See note 1

1 – Gamma spectroscopy, alpha spectroscopy, tritium, nickel-63 & total strontium.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). 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

One equipment blank (J1V8X2) was submitted for analysis. Four analytes were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

· 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 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of a matrix spike analysis, all 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 (J1V8W4/J1V8X1) 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. One analyte exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. JP1043 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 a matrix spike analysis, all 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.

One analyte exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

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

DOE/RL-2005-92, Rev. 0, 100-N *Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

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: JP1043	**REVIEWER: ELR**	**Project: 100-N-83**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Tritium	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

Date: 17-May-16

TestAmerica Inc TARL

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

Report No. : 68605

5/20/14

SDG No: JP1043

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119023	PUISO_IE_PRECIP_AEA								
	J1V8V8								
	M8J581AD	PU-238	-2.80E-03 +- 3.5E-02	U	pCi/g	83%	7.08E-02	1.00E+00	
		PU239/40	-6.99E-04 +- 3.5E-02	U	pCi/g	83%	5.91E-02	1.00E+00	
	J1V8V8 DUP								
	M8J581AG	PU-238	-2.04E-03 +- 3.4E-02	U	pCi/g	87%	6.57E-02	1.00E+00	-31.5
		PU239/40	1.70E-02 +- 3.4E-02	U	pCi/g	87%	5.73E-02	1.00E+00	217.2
	J1V8V9								
	M8J591AD	PU-238	9.66E-03 +- 3.0E-02	U	pCi/g	104%	6.83E-02	1.00E+00	
		PU239/40	2.84E-02 +- 4.3E-02	U	pCi/g	104%	5.60E-02	1.00E+00	
	J1V8W0								
	M8J6A1AD	PU-238	-3.43E-03 +- 2.9E-02	U	pCi/g	105%	5.89E-02	1.00E+00	
		PU239/40	5.42E-02 +- 5.8E-02	U	pCi/g	105%	5.70E-02	1.00E+00	
	J1V8W1								
	M8J6C1AD	PU-238	1.14E-02 +- 3.0E-02	U	pCi/g	96%	6.54E-02	1.00E+00	
		PU239/40	3.00E-02 +- 4.3E-02	U	pCi/g	96%	5.08E-02	1.00E+00	
	J1V8W2								
	M8J6D1AD	PU-238	-2.90E-03 +- 2.9E-02	U	pCi/g	99%	6.11E-02	1.00E+00	
		PU239/40	-1.74E-03 +- 2.9E-02	U	pCi/g	99%	5.62E-02	1.00E+00	
	J1V8W3								
	M8J6E1AD	PU-238	-5.76E-03 +- 2.9E-02	U	pCi/g	92%	6.95E-02	1.00E+00	
		PU239/40	-5.75E-04 +- 2.9E-02	U	pCi/g	92%	4.86E-02	1.00E+00	
	J1V8W4								
	M8J6F1AD	PU-238	-3.30E-03 +- 2.8E-02	U	pCi/g	102%	5.87E-02	1.00E+00	
		PU239/40	-5.50E-04 +- 2.8E-02	U	pCi/g	102%	4.56E-02	1.00E+00	
	J1V8W5								
	M8J6G1AD	PU-238	1.32E-02 +- 3.2E-02	U	pCi/g	96%	6.39E-02	1.00E+00	
		PU239/40	-1.89E-03 +- 3.2E-02	U	pCi/g	96%	6.10E-02	1.00E+00	
	J1V8W6								
	M8J6H1AD	PU-238	1.15E-02 +- 3.1E-02	U	pCi/g	88%	6.61E-02	1.00E+00	
		PU239/40	4.31E-02 +- 5.3E-02	U	pCi/g	88%	6.15E-02	1.00E+00	
	J1V8W7								
	M8J6J1AD	PU-238	1.46E-02 +- 3.0E-02	U	pCi/g	108%	4.76E-02	1.00E+00	
		PU239/40	4.37E-02 +- 5.3E-02	U	pCi/g	108%	5.45E-02	1.00E+00	
	J1V8W8								
	M8J6K1AD	PU-238	0.00E+00 +- 3.0E-02	U	pCi/g	91%	5.14E-02	1.00E+00	
		PU239/40	2.92E-02 +- 4.3E-02	U	pCi/g	91%	5.56E-02	1.00E+00	
	J1V8W9								
	M8J6L1AD	PU-238	1.50E-02 +- 3.1E-02	U	pCi/g	95%	5.28E-02	1.00E+00	

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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.

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Sample Results Summary

Date: 17-May-16

TestAmerica Inc TARL

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

Report No. : 68605 5/22/14 **SDG No:** JP1043

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119023 PUISO_IE_PRECIP_AEA									
J1V8W9									
	M8J6L1AD	PU239/40	-1.25E-03 +- 3.1E-02	U	pCi/g	95%	5.71E-02	1.00E+00	
J1V8X0									
	M8J6M1AD	PU-238	-1.31E-03 +- 3.3E-02	U	pCi/g	88%	5.99E-02	1.00E+00	
		PU239/40	1.51E-02 +- 3.3E-02	U	pCi/g	88%	5.99E-02	1.00E+00	
J1V8X1									
	M8J6N1AD	PU-238	-5.70E-04 +- 2.9E-02	U	pCi/g	97%	4.82E-02	1.00E+00	
		PU239/40	1.37E-02 +- 2.9E-02	U	pCi/g	97%	4.82E-02	1.00E+00	
J1V8X2									
	M8J6P1AD	PU-238	-1.14E-03 +- 2.8E-02	U	pCi/g	100%	5.20E-02	1.00E+00	
		PU239/40	1.34E+00 +- 3.6E-01		pCi/g	100%	4.81E-02	1.00E+00	
6119022 GAMMA_GS									
J1V8V8									
	M8J581AF	AMERICIUM 241	3.08E-02 +- 1.0E-01	U	pCi/g		1.76E-01		
		CO-60	1.43E-02 +- 1.4E-02	U	pCi/g		2.71E-02	5.00E-02	
		CS-137	1.41E-01 +- 3.1E-02		pCi/g		2.36E-02	1.00E-01	
		EU-152	2.20E-02 +- 3.3E-02	U	pCi/g		5.79E-02	1.00E-01	
		EU-154	-3.50E-02 +- 4.5E-02	U	pCi/g		7.41E-02	1.00E-01	
		EU-155	6.45E-02 +- 4.3E-02	U	pCi/g		7.39E-02	1.00E-01	
		K-40	1.41E+01 +- 1.7E+00		pCi/g		2.02E-01		
		RA-226	5.04E-01 +- 8.2E-02		pCi/g		3.84E-02		
J1V8V9									
	M8J591AF	AMERICIUM 241	3.39E-03 +- 1.8E-02	U	pCi/g		3.00E-02		
		CO-60	1.74E-02 +- 1.6E-02	U	pCi/g		3.11E-02	5.00E-02	
		CS-137	2.51E-01 +- 4.0E-02		pCi/g		2.49E-02	1.00E-01	
		EU-152	-4.63E-03 +- 2.9E-02	U	pCi/g		4.89E-02	1.00E-01	
		EU-154	3.10E-03 +- 5.0E-02	U	pCi/g		8.81E-02	1.00E-01	
		EU-155	5.97E-02 +- 2.7E-02	U	pCi/g		4.61E-02	1.00E-01	
		K-40	1.38E+01 +- 1.6E+00		pCi/g		2.42E-01		
		RA-226	4.94E-01 +- 8.1E-02		pCi/g		4.15E-02		
J1V8W0									
	M8J6A1AF	AMERICIUM 241	1.62E-04 +- 1.5E-02	U	pCi/g		2.56E-02		
		CO-60	1.16E-02 +- 1.5E-02	U	pCi/g		2.85E-02	5.00E-02	
		CS-137	1.10E-01 +- 3.2E-02		pCi/g		2.25E-02	1.00E-01	
		EU-152	3.30E-03 +- 2.8E-02	U	pCi/g		4.94E-02	1.00E-01	
		EU-154	8.00E-03 +- 4.8E-02	U	pCi/g		8.39E-02	1.00E-01	
		EU-155	2.35E-02 +- 2.5E-02	U	pCi/g		4.27E-02	1.00E-01	
		K-40	1.41E+01 +- 1.7E+00		pCi/g		2.36E-01		

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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: 17-May-16

TestAmerica Inc TARL

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

Report No. : 68605 ✓ 5/22/16 **SDG No:** JP1043

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119022 GAMMA_GS									
J1V8W0									
	M8J6A1AF	RA-226	5.02E-01 +- 9.0E-02		pCi/g		3.66E-02		
J1V8W1									
	M8J6C1AF	AMERICIUM 241	-8.17E-03 +- 2.1E-02	U	pCi/g		3.50E-02		
		CO-60	4.04E-03 +- 1.7E-02	U	pCi/g		3.03E-02	5.00E-02	
		CS-137	7.01E-03 +- 1.5E-02	U	pCi/g		2.69E-02	1.00E-01	
		EU-152	-4.44E-02 +- 2.9E-02	U	pCi/g		4.61E-02	1.00E-01	
		EU-154	4.24E-03 +- 5.1E-02	U	pCi/g		9.05E-02	1.00E-01	
		EU-155	4.12E-02 +- 2.9E-02	U	pCi/g		5.14E-02	1.00E-01	
		K-40	1.76E+01 +- 2.1E+00		pCi/g		2.04E-01		
		RA-226	6.29E-01 +- 9.9E-02		pCi/g		4.00E-02		
J1V8W1 DUP									
	M8J6C1AG	AMERICIUM 241	8.78E-03 +- 2.1E-02	U	pCi/g		3.54E-02		5638.7
		CO-60	-9.55E-03 +- 1.5E-02	U	pCi/g		2.48E-02	5.00E-02	-493.8
		CS-137	4.63E-02 +- 1.8E-02	U	pCi/g		3.21E-02	1.00E-01	147.3
		EU-152	1.00E-02 +- 3.0E-02	U	pCi/g		5.30E-02	1.00E-01	-316.9
		EU-154	3.54E-03 +- 5.1E-02	U	pCi/g		8.86E-02	1.00E-01	18.0
		EU-155	6.14E-02 +- 3.1E-02	U	pCi/g		5.27E-02	1.00E-01	39.4
		K-40	1.75E+01 +- 2.0E+00		pCi/g		1.91E-01		0.9
		RA-226	6.18E-01 +- 9.6E-02		pCi/g		4.04E-02		1.8
J1V8W2									
	M8J6D1AF	AMERICIUM 241	9.50E-03 +- 1.1E-01	U	pCi/g		1.91E-01		
		CO-60	3.03E-03 +- 1.5E-02	U	pCi/g		2.67E-02	5.00E-02	
		CS-137	1.63E-01 +- 3.6E-02		pCi/g		2.48E-02	1.00E-01	
		EU-152	-2.10E-02 +- 3.6E-02	U	pCi/g		5.88E-02	1.00E-01	
		EU-154	-6.78E-03 +- 4.7E-02	U	pCi/g		8.24E-02	1.00E-01	
		EU-155	8.06E-02 +- 4.6E-02	U	pCi/g		7.88E-02	1.00E-01	
		K-40	1.62E+01 +- 2.0E+00		pCi/g		2.39E-01		
		RA-226	6.59E-01 +- 9.7E-02		pCi/g		4.14E-02		
J1V8W3									
	M8J6E1AF	AMERICIUM 241	8.77E-03 +- 2.1E-02	U	pCi/g		3.41E-02		
		CO-60	1.81E-02 +- 1.8E-02	U	pCi/g		3.37E-02	5.00E-02	
		CS-137	3.94E-01 +- 6.1E-02		pCi/g		2.65E-02	1.00E-01	
		EU-152	-2.65E-02 +- 3.2E-02	U	pCi/g		5.18E-02	1.00E-01	
		EU-154	-3.34E-02 +- 5.2E-02	U	pCi/g		8.76E-02	1.00E-01	
		EU-155	3.38E-02 +- 2.8E-02	U	pCi/g		4.84E-02	1.00E-01	
		K-40	1.46E+01 +- 1.7E+00		pCi/g		2.68E-01		
		RA-226	6.27E-01 +- 9.5E-02		pCi/g		4.57E-02		

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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.

Sample Results Summary

Date: 17-May-16

TestAmerica Inc TARL

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

Report No. : 68605

5/22/16

SDG No: JP1043

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119022 GAMMA_GS									
J1V8W4									
	M8J6F1AF	AMERICIUM 241	-3.78E-03 +- 1.6E-02	U	pCi/g		2.78E-02		
		CO-60	-8.54E-03 +- 1.5E-02	U	pCi/g		2.61E-02	5.00E-02	
		CS-137	4.05E-02 +- 2.5E-02		pCi/g		2.35E-02	1.00E-01	
		EU-152	1.84E-02 +- 2.7E-02	U	pCi/g		4.88E-02	1.00E-01	
		EU-154	-2.19E-02 +- 4.6E-02	U	pCi/g		7.74E-02	1.00E-01	
		EU-155	2.53E-02 +- 2.5E-02	U	pCi/g		4.40E-02	1.00E-01	
		K-40	1.47E+01 +- 1.7E+00		pCi/g		2.53E-01		
		RA-226	5.96E-01 +- 9.9E-02		pCi/g		4.07E-02		
J1V8W5									
	M8J6G1AF	AMERICIUM 241	5.16E-03 +- 2.0E-02	U	pCi/g		3.42E-02		
		CO-60	3.78E-03 +- 1.4E-02	U	pCi/g		2.48E-02	5.00E-02	
		CS-137	2.33E-02 +- 1.4E-02	U	pCi/g		2.51E-02	1.00E-01	
		EU-152	-9.83E-03 +- 3.0E-02	U	pCi/g		5.15E-02	1.00E-01	
		EU-154	9.47E-03 +- 4.6E-02	U	pCi/g		8.20E-02	1.00E-01	
		EU-155	4.52E-02 +- 2.8E-02	U	pCi/g		4.94E-02	1.00E-01	
		K-40	1.44E+01 +- 1.7E+00		pCi/g		2.16E-01		
		RA-226	5.99E-01 +- 9.2E-02		pCi/g		4.07E-02		
J1V8W6									
	M8J6H1AF	AMERICIUM 241	8.85E-03 +- 2.2E-02	U	pCi/g		3.73E-02		
		CO-60	-5.70E-03 +- 1.5E-02	U	pCi/g		2.58E-02	5.00E-02	
		CS-137	4.33E-02 +- 1.8E-02	U	pCi/g		3.25E-02	1.00E-01	
		EU-152	-5.46E-04 +- 3.1E-02	U	pCi/g		5.28E-02	1.00E-01	
		EU-154	2.65E-02 +- 5.3E-02	U	pCi/g		9.49E-02	1.00E-01	
		EU-155	4.79E-02 +- 4.6E-02	U	pCi/g		5.42E-02	1.00E-01	
		K-40	1.51E+01 +- 1.8E+00		pCi/g		2.10E-01		
		RA-226	6.95E-01 +- 1.1E-01		pCi/g		4.31E-02		
J1V8W7									
	M8J6J1AF	AMERICIUM 241	-8.29E-02 +- 1.1E-01	U	pCi/g		1.81E-01		
		CO-60	3.90E-03 +- 1.5E-02	U	pCi/g		2.74E-02	5.00E-02	
		CS-137	1.50E-01 +- 3.4E-02		pCi/g		2.40E-02	1.00E-01	
		EU-152	-3.16E-02 +- 3.8E-02	U	pCi/g		6.07E-02	1.00E-01	
		EU-154	1.55E-02 +- 4.4E-02	U	pCi/g		8.06E-02	1.00E-01	
		EU-155	6.56E-02 +- 4.7E-02	U	pCi/g		7.97E-02	1.00E-01	
		K-40	1.48E+01 +- 1.8E+00		pCi/g		2.10E-01		
		RA-226	5.93E-01 +- 9.3E-02		pCi/g		4.82E-02		
J1V8W8									
	M8J6K1AF	AMERICIUM 241	-5.23E-03 +- 2.3E-02	U	pCi/g		3.77E-02		

TestAmerica Inc

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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.

13

Date: 17-May-16

Sample Results Summary

TestAmerica Inc TARL

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

5/22/16

Report No. : 68605

SDG No: JP1043

Batch	Client Id / Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119022	GAMMA_GS								
	J1V8W8								
	M8J6K1AF	CO-60	9.64E-02 +- 3.2E-02	U	pCi/g		4.88E-02	5.00E-02	
		CS-137	4.30E-01 +- 6.6E-02		pCi/g		3.01E-02	1.00E-01	
		EU-152	-7.29E-03 +- 3.7E-02	U	pCi/g		6.19E-02	1.00E-01	
		EU-154	8.57E-03 +- 5.9E-02	U	pCi/g		1.05E-01	1.00E-01	
		EU-155	5.10E-02 +- 3.2E-02	U	pCi/g		5.54E-02	1.00E-01	
		K-40	1.44E+01 +- 1.7E+00		pCi/g		2.42E-01		
		RA-226	7.34E-01 +- 1.2E-01		pCi/g		4.79E-02		
	J1V8W9								
	M8J6L1AF	AMERICIUM 241	3.07E-03 +- 1.6E-02	U	pCi/g		2.82E-02		
		CO-60	7.65E-03 +- 1.5E-02	U	pCi/g		2.84E-02	5.00E-02	
		CS-137	3.58E-02 +- 1.7E-02	U	pCi/g		3.02E-02	1.00E-01	
		EU-152	-3.84E-03 +- 2.8E-02	U	pCi/g		4.78E-02	1.00E-01	
		EU-154	1.37E-02 +- 4.7E-02	U	pCi/g		8.44E-02	1.00E-01	
		EU-155	1.10E-02 +- 2.5E-02	U	pCi/g		4.31E-02	1.00E-01	
		K-40	1.50E+01 +- 1.8E+00		pCi/g		1.97E-01		
		RA-226	6.73E-01 +- 1.0E-01		pCi/g		4.01E-02		
	J1V8X0								
	M8J6M1AF	AMERICIUM 241	3.79E-03 +- 2.3E-02	U	pCi/g		3.94E-02		
		CO-60	1.56E-01 +- 3.5E-02		pCi/g		2.63E-02	5.00E-02	
		CS-137	4.16E+00 +- 4.9E-01		pCi/g		2.65E-02	1.00E-01	
		EU-152	7.29E-03 +- 4.1E-02	U	pCi/g		7.04E-02	1.00E-01	
		EU-154	-3.88E-02 +- 5.1E-02	U	pCi/g		8.49E-02	1.00E-01	
		EU-155	4.76E-02 +- 3.4E-02	U	pCi/g		5.96E-02	1.00E-01	
		K-40	1.52E+01 +- 1.8E+00		pCi/g		1.99E-01		
		RA-226	7.21E-01 +- 1.1E-01		pCi/g		4.80E-02		
	J1V8X1								
	M8J6N1AF	AMERICIUM 241	6.44E-03 +- 2.0E-02	U	pCi/g		3.37E-02		
		CO-60	6.99E-03 +- 1.4E-02	U	pCi/g		2.63E-02	5.00E-02	
		CS-137	6.34E-02 +- 2.3E-02		pCi/g		2.40E-02	1.00E-01	
		EU-152	-8.80E-03 +- 2.8E-02	U	pCi/g		4.78E-02	1.00E-01	
		EU-154	3.89E-02 +- 4.4E-02	U	pCi/g		8.26E-02	1.00E-01	
		EU-155	3.85E-02 +- 2.9E-02	U	pCi/g		5.02E-02	1.00E-01	
		K-40	1.41E+01 +- 1.7E+00		pCi/g		2.01E-01		
		RA-226	6.50E-01 +- 1.0E-01		pCi/g		3.78E-02		
	J1V8X2								
	M8J6P1AF	AMERICIUM 241	1.02E-02 +- 6.6E-02	U	pCi/g		1.16E-01		
		CO-60	-5.50E-04 +- 8.7E-03	U	pCi/g		1.59E-02	5.00E-02	

TestAmerica Inc

rptTALRchSaSummary2 V5.5.1 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: 17-May-16

Sample Results Summary

TestAmerica Inc TARL

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

Report No. : 68605

5/22/16 SDG No: JP1043

Batch	Client Id / Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119022 GAMMA_GS									
	J1V8X2								
	M8J6P1AF	CS-137	-7.24E-03 +- 8.6E-03	U	pCi/g		1.38E-02	1.00E-01	
		EU-152	-3.49E-03 +- 2.3E-02	U	pCi/g		3.83E-02	1.00E-01	
		EU-154	-2.18E-02 +- 2.8E-02	U	pCi/g		4.64E-02	1.00E-01	
		EU-155	4.41E-02 +- 2.6E-02	U	pCi/g		4.72E-02	1.00E-01	
		K-40	3.61E+00 +- 5.5E-01		pCi/g		1.11E-01		
		RA-226	1.91E-01 +- 4.2E-02		pCi/g		2.88E-02		
6119026 SRTOT_SEP_PRECIP_GPC									
	J1V8V8								
	M8J581AA	STRONTIUM	8.28E+00 +- 2.0E+00		pCi/g	77%	3.99E-01	1.00E+00	
	J1V8V9								
	M8J591AA	STRONTIUM	1.23E-01 +- 2.3E-01	U	pCi/g	78%	3.92E-01	1.00E+00	
	J1V8W0								
	M8J6A1AA	STRONTIUM	6.43E-01 +- 3.5E-01		pCi/g	69%	4.41E-01	1.00E+00	
	J1V8W1								
	M8J6C1AA	STRONTIUM	7.69E-02 +- 2.6E-01	U	pCi/g	75%	4.45E-01	1.00E+00	
	J1V8W2								
	M8J6D1AA	STRONTIUM	2.10E-01 +- 2.6E-01	U	pCi/g	74%	4.10E-01	1.00E+00	
	J1V8W2 DUP								
	M8J6D1AG	STRONTIUM	2.07E-01 +- 2.6E-01	U	pCi/g	71%	4.27E-01	1.00E+00	1.6
	J1V8W3								
	M8J6E1AA	STRONTIUM	3.30E-01 +- 2.6E-01	U	pCi/g	79%	3.83E-01	1.00E+00	
	J1V8W4								
	M8J6F1AA	STRONTIUM	-6.86E-03 +- 2.4E-01	U	pCi/g	77%	4.36E-01	1.00E+00	
	J1V8W5								
	M8J6G1AA	STRONTIUM	8.90E+00 +- 2.2E+00		pCi/g	76%	4.03E-01	1.00E+00	
	J1V8W6								
	M8J6H1AA	STRONTIUM	1.20E+00 +- 4.2E-01		pCi/g	79%	3.61E-01	1.00E+00	
	J1V8W7								
	M8J6J1AA	STRONTIUM	3.29E-01 +- 2.6E-01	U	pCi/g	77%	3.82E-01	1.00E+00	
	J1V8W8								
	M8J6K1AA	STRONTIUM	1.84E-01 +- 2.6E-01	U	pCi/g	75%	4.33E-01	1.00E+00	
	J1V8W9								
	M8J6L1AA	STRONTIUM	8.48E-01 +- 3.6E-01		pCi/g	79%	3.82E-01	1.00E+00	
	J1V8X0								
	M8J6M1AA	STRONTIUM	2.21E-01 +- 2.4E-01	U	pCi/g	77%	3.78E-01	1.00E+00	
	J1V8X1								
	M8J6N1AA	STRONTIUM	1.52E+00 +- 4.8E-01		pCi/g	83%	3.46E-01	1.00E+00	

TestAmerica Inc

rptTALRchSaSummary2 V5.5.1
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: 17-May-16

TestAmerica Inc TARL

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

Report No. : 68605 5/22/14 **SDG No:** JP1043

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119026 SRTOT_SEP_PRECIP_GPC									
J1V8X2									
	M8J6P1AA	STRONTIUM	5.15E-01 +- 3.1E-01		pCi/g	76%	4.26E-01	1.00E+00	
6119024 NI63_LSC									
J1V8V8									
	M8J581AC	NI-63	4.56E-01 +- 5.7E+00	U	pCi/g	96%	6.86E+00	3.00E+01	
J1V8V9									
	M8J591AC	NI-63	1.93E-01 +- 3.9E+00	U	pCi/g	95%	6.50E+00	3.00E+01	
J1V8V9 DUP									
	M8J591AG	NI-63	5.69E-02 +- 7.9E+00	U	pCi/g	84%	7.92E+00	3.00E+01	108.8
J1V8W0									
	M8J6A1AC	NI-63	1.97E-01 +- 5.1E+00	U	pCi/g	83%	7.29E+00	3.00E+01	
J1V8W1									
	M8J6C1AC	NI-63	-2.09E+00 +- 4.8E+00	U	pCi/g	99%	6.47E+00	3.00E+01	
J1V8W2									
	M8J6D1AC	NI-63	-4.52E-01 +- 5.2E+00	U	pCi/g	92%	6.70E+00	3.00E+01	
J1V8W3									
	M8J6E1AC	NI-63	1.06E+01 +- 2.0E+01		pCi/g	98%	6.42E+00	3.00E+01	
J1V8W4									
	M8J6F1AC	NI-63	1.61E+00 +- 4.5E+00	U	pCi/g	94%	6.68E+00	3.00E+01	
J1V8W5									
	M8J6G1AC	NI-63	4.17E-01 +- 3.0E+00	U	pCi/g	100%	6.05E+00	3.00E+01	
J1V8W6									
	M8J6H1AC	NI-63	1.33E+00 +- 5.8E+00	U	pCi/g	99%	6.82E+00	3.00E+01	
J1V8W7									
	M8J6J1AC	NI-63	4.78E-01 +- 6.5E+00	U	pCi/g	100%	6.02E+00	3.00E+01	
J1V8W8									
	M8J6K1AC	NI-63	1.06E+00 +- 4.5E+00	U	pCi/g	97%	6.46E+00	3.00E+01	
J1V8W9									
	M8J6L1AC	NI-63	-2.68E+00 +- 5.0E+00	U	pCi/g	92%	7.42E+00	3.00E+01	
J1V8X0									
	M8J6M1AC	NI-63	1.02E+00 +- 3.8E+00	U	pCi/g	98%	6.31E+00	3.00E+01	
J1V8X1									
	M8J6N1AC	NI-63	7.32E-01 +- 6.8E+00	U	pCi/g	91%	7.52E+00	3.00E+01	
J1V8X2									
	M8J6P1AC	NI-63	6.94E-01 +- 3.3E+00	U	pCi/g	91%	6.66E+00	3.00E+01	
6119025 TRITIUM_DIST_LSC									
J1V8V8									
	M8J581AE	H-3	6.60E-03 +- 1.2E-01	U J	pCi/g	100%	2.95E-01	1.00E+01	
J1V8V9									

TestAmerica Inc

rptTALRchSaSummary2 V6.5.1
A2002

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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: 17-May-16

Report No. : 68605

5/22/16

SDG No: JP1043

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6119025 TRITIUM_DIST_LSC									
J1V8V9									
	M8J591AE	H-3	1.51E-01 +- 1.4E-01	U J	pCi/g	100%	3.04E-01	1.00E+01	
J1V8W0									
	M8J6A1AE	H-3	-5.37E-02 +- 1.3E-01	U J	pCi/g	100%	3.21E-01	1.00E+01	
J1V8W0 DUP									
	M8J6A1AG	H-3	-5.13E-02 +- 1.3E-01	U	pCi/g	100%	3.22E-01	1.00E+01	-4.5
J1V8W1									
	M8J6C1AE	H-3	8.81E-02 +- 1.4E-01	U J	pCi/g	100%	3.25E-01	1.00E+01	
J1V8W2									
	M8J6D1AE	H-3	1.71E-01 +- 1.5E-01	U	pCi/g	100%	3.23E-01	1.00E+01	
J1V8W3									
	M8J6E1AE	H-3	6.61E-02 +- 1.4E-01	U	pCi/g	100%	3.21E-01	1.00E+01	
J1V8W4									
	M8J6F1AE	H-3	1.05E-01 +- 1.6E-01	U	pCi/g	100%	3.68E-01	1.00E+01	
J1V8W5									
	M8J6G1AE	H-3	-1.05E-01 +- 1.3E-01	U	pCi/g	100%	3.39E-01	1.00E+01	
J1V8W6									
	M8J6H1AE	H-3	4.01E-02 +- 1.4E-01	U	pCi/g	100%	3.31E-01	1.00E+01	
J1V8W7									
	M8J6J1AE	H-3	-3.88E-02 +- 1.4E-01	U	pCi/g	100%	3.53E-01	1.00E+01	
J1V8W8									
	M8J6K1AE	H-3	2.24E-01 +- 1.8E-01	U	pCi/g	100%	3.81E-01	1.00E+01	
J1V8W9									
	M8J6L1AE	H-3	1.77E-01 +- 1.5E-01	U	pCi/g	100%	3.33E-01	1.00E+01	
J1V8X0									
	M8J6M1AE	H-3	7.74E-02 +- 1.5E-01	U	pCi/g	100%	3.44E-01	1.00E+01	
J1V8X1									
	M8J6N1AE	H-3	1.41E-01 +- 1.6E-01	U	pCi/g	100%	3.53E-01	1.00E+01	
J1V8X2									
	M8J6P1AE	H-3	5.34E-02 +- 1.2E-01	U	pCi/g	100%	2.82E-01	1.00E+01	

No. of Results: 208

TestAmerica Inc

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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

May 17, 2016

Attention: Joan Kessner

SAF Number	:	RC-189
Date SDG Closed	:	April 27, 2016
Number of Samples	:	Fifteen (15)
Sample Type	:	Soil
SDG Number	:	JP1043
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On April 27, 2016, fifteen soil 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:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1V8V8	M8J58	SOIL	4/27/16
J1V8V9	M8J59	SOIL	4/27/16
J1V8W0	M8J6A	SOIL	4/27/16
J1V8W1	M8J6C	SOIL	4/27/16
J1V8W2	M8J6D	SOIL	4/27/16
J1V8W3	M8J6E	SOIL	4/27/16
J1V8W4	M8J6F	SOIL	4/27/16
J1V8W5	M8J6G	SOIL	4/27/16
J1V8W6	M8J6H	SOIL	4/27/16
J1V8W7	M8J6J	SOIL	4/27/16
J1V8W8	M8J6K	SOIL	4/27/16
J1V8W9	M8J6L	SOIL	4/27/16
J1V8X0	M8J6M	SOIL	4/27/16
J1V8X1	M8J6N	SOIL	4/27/16
J1V8X2	M8J6P	SOIL	4/27/16

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
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-002
Nickel-63 by method RL-LCS-017

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 (J1V8V8) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, samples and sample duplicate (J1V8W2) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The LCS, batch blank, samples and sample duplicate (J1V8W1) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-002:
The LCS, batch blank, samples and sample duplicate (J1V8W0) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:
The LCS, batch blank, samples and sample duplicate (J1V8V9) 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-189-314 | Page 1 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: TNU-052	Field Logbook No.: EL-1652-12	COA: 000N832000	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: N/A

Special Handling and/or Storage: Cool as required

Preservation	Cool <=6C	None	None	None	None	None	None				
Type of Container	G/P	G/P	G/P	G/P	G/P	G					
No. of Container(s)	1	1	1	1	1	1					
Volume	125mL	1000mL	~~125mL~~ ~~60mL~~	125mL ~~60mL~~ TRE 4-26-16	125mL ~~60mL~~	60mL					
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	Isotopic Plutonium	Strontium-89,90 – Total Sr	Nickel-63	Tritium - H3 Low Level Soil					

Sample No.	Matrix	Sample Date	Sample Time										
J1V8V8 M8J58	SOIL	4-26-16	0810	✓	✓	✓	✓	✓	✓				
J1V8V9 M8J59	SOIL	4-26-16	0937	✓	✓	✓	✓	✓	✓				
J1V8W0 M8J6A	SOIL	4-26-16	0830	✓	✓	✓	✓	✓	✓				
J1V8W1 M8J6C	SOIL	4-26-16	0850	✓	✓	✓	✓	✓	✓				
J1V8W2 M8J6D	SOIL	4-26-16	1045	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	26 Apr 2016 1230	T.R. Edmundson J.R. Ellenbecker	4-26-16 1230
T.R. Edmundson J.R. Ellenbecker	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson J.R. Ellenbecker	4-27-16 1000
~~T.R. Edmundson J.R. Ellenbecker~~	~~4-27-16 1500~~	~~Fed Ex~~	~~4-27-16~~
T.R. Edmundson J.R. Ellenbecker	WCH 4-27-16 1430	R. Anderson, EARL K. Anderson	4/27/16 1430

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, Radium-226}

J6D270416
JP1043
Due 5-4-16

TRE 4-27-16

#2923

JP1043

300-2923 CO

REVIEWED BY K.W. Pertel DATE 4-27-16

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-314	Page 2 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: TNU-052	Field Logbook No.: EL-1652-12	COA: 000N832000	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
N/A

Special Handling and/or Storage
Cool as required

Preservation	Cool <=6C	None	None	None	None	None	None				
Type of Container	G/P	G/P	G/P	G/P	G/P	G					
No. of Container(s)	1	1	1	1	1	1					
Volume	125mL	1000mL	~~125mL 60mL~~	~~125mL 60mL~~ TRE 4-26-16	~~125mL 60mL~~	60mL					
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	Isotopic Plutonium	Strontium-89,90 – Total Sr	Nickel-63	Tritium - H3 Low Level Soil					

Sample No.	Matrix	Sample Date	Sample Time										
J1V8W3 m8J6E	SOIL	4-26-16	1100	✓	✓	✓	✓	✓	✓				
J1V8W4 m8J6F	SOIL	4-26-16	1025	✓	✓	✓	✓	✓	✓				
J1V8W5 m8J6G	SOIL	4-26-16	1115	✓	✓	✓	✓	✓	✓				
J1V8W6 m8J6H	SOIL	4-26-16	1145	✓	✓	✓	✓	✓	✓				
J1V8W7 m8J6J	SOIL	4-26-16	1130	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26 Apr 2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
~~T.R. Edmundson T.R. Edmundson~~ WCH	~~4-27-16 1500~~	~~Fed Ex~~	~~4-27-16~~ —
T.R. Edmundson T.R. Edmundson WCH	4-27-16 1430	[illegible] TARL	4/27/16 1430
		J. Anderson	

SPECIAL INSTRUCTIONS
(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226}

#2923

JL6D270414
Due 5-4-16

TRE 4-27-16

REVIEWED BY KWpatel DATE 4-27-16

JP1043

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

TestAmerica Laboratories, Inc.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-314	Page 3 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: TNU-052	Field Logbook No.: EL-1652-12	COA: 000N832000	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
N/A

Special Handling and/or Storage
Cool as required

Preservation	Cool <=6C	None	None	None	None	None	None				
Type of Container	G/P	G/P	G/P	G/P	G/P	G					
No. of Container(s)	1	1	1	1	1	1					
Volume	125mL	1000mL	125mL ~~60mL~~	125mL ~~60mL~~ TRE 4-26-16	125mL ~~60mL~~	60mL					
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	Isotopic Plutonium	Strontium-89,90 – Total Sr	Nickel-63	Tritium - H3 Low Level Soil					

Sample No.	Matrix	Sample Date	Sample Time										
J1V8W8 m8J6K	SOIL	4-26-16	1200	✓	✓	✓	✓	✓	✓				
J1V8W9 m8J6L	SOIL	4-26-16	1220	✓	✓	✓	✓	✓	✓				
J1V8X0 m8J6m	SOIL	4-26-16	0915	✓	✓	✓	✓	✓	✓				
J1V8X1 m8J6N	SOIL	4-26-16	1025	✓	✓	✓	✓	✓	✓				
J1V8X2 m8J6P	SOIL	4-26-16	0740	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: Ed Marchand	Date/Time: 1230 26 Apr 2016	Received By/Stored In: T.R. Edmundson J.R. Blandford	Date/Time: 4-26-16 1230
Relinquished By/Removed From: T.R. Edmundson J.R. Blandford	Date/Time: 4-26-16 1330	Received By/Stored In: 1060 Refer #3	Date/Time: 4-26-16 1330
Relinquished By/Removed From: 1060 Refer #3	Date/Time: 4-27-16 1000	Received By/Stored In: T.R. Edmundson J.R. Blandford	Date/Time: 4-27-16 1000
Relinquished By/Removed From: WXH T.R. Edmundson J.R. Blandford	Date/Time: 4-27-16 1500	Received By/Stored In: Fred Cox	Date/Time: 4-27-16 —
Relinquished By/Removed From: WXH T.R. Edmundson J.R. Blandford	Date/Time: 4-27-16 1430	Received By/Stored In: ANDERSON, EARL J. Anderson	Date/Time: 4/27/16 1430
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, Radium-226}

TRE 4-27-16

#2923

JED270416
Due 5-4-16

REVIEWED BY KWperter DATE 4-27-16

JP1043

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-N-83			DATA PACKAGE: JP1043		
VALIDATOR: BLR		LAB: TAL		DATE: 5/21/14	
			SDG: JP1043		

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

SAMPLES/MATRIX				
J1V8V8	J1V8V1	J1V8W0	J1V8W7	J1V8W2
J1V8W3	J1V8W4	J1V8W5	J1V8W6	J1V8W7
J1V8W8	J1V8W9	J1V8X0	J1V8X1	J1V8X2
				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:

N2- PU 239/40 K40 RA226 SR

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:

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~~ no 3rd ms – Jell

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:

w4 | y4

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:

FD - 1 one (449) 5/7/14

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: I am RQL

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

Date: 17-May-16

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 68605

SDG No.: JP1043

Batch Work Order	Parameter	Result +- CSU (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
PUISO_IE_PRECIP_AEA								
6119023 BLANK QC,								
M8J9R1AA	PU-238	-2.72E-03 +- 2.7E-02	U	pCi/g	112%			5.11E-02
	PU239/40	7.59E-03 +- 2.7E-02	U	pCi/g	112%			5.99E-02
6119023 LCS,								
M8J9R1AC	PU239/40	4.18E+00 +- 9.8E-01		pCi/g	86%	91%	-0.1	7.64E-02
GAMMA_GS								
6119022 BLANK QC,								
M8J9Q1AA	AMERICIUM 241	-3.64E-03 +- 7.1E-03	U	pCi/g				1.20E-02
	CO-60	-1.75E-03 +- 8.3E-03	U	pCi/g				1.54E-02
	CS-137	-3.44E-03 +- 8.0E-03	U	pCi/g				1.25E-02
	EU-152	-9.14E-03 +- 1.7E-02	U	pCi/g				2.86E-02
	EU-154	1.28E-02 +- 2.3E-02	U	pCi/g				4.64E-02
	EU-155	-1.46E-02 +- 1.3E-02	U	pCi/g				1.86E-02
	K-40	-4.30E-02 +- 1.5E-01	U	pCi/g				3.08E-01
	RA-226	6.56E-02 +- 3.3E-02	U	pCi/g				4.44E-02
6119022 LCS,								
M8J9Q1AC	CS-137	9.22E-01 +- 1.2E-01		pCi/g		98%	0.0	2.50E-02
	RA-226	9.05E-01 +- 1.3E-01		pCi/g		80%	-0.2	3.63E-02
SRTOT_SEP_PRECIP_GPC								
6119026 BLANK QC,								
M8J9W1AA	STRONTIUM	-8.10E-02 +- 2.1E-01	U	pCi/g	77%			3.99E-01
6119026 LCS,								
M8J9W1AC	STRONTIUM	3.62E+00 +- 9.4E-01		pCi/g	82%	107%	0.1	3.25E-01
NI63_LSC								
6119024 BLANK QC,								
M8J9T1AA	NI-63	1.77E+00 +- 6.4E+00	U	pCi/g	87%			7.06E+00
6119024 LCS,								
M8J9T1AC	NI-63	2.68E+02 +- 3.8E+02		pCi/g	86%	83%	-0.2	8.08E+00
TRITIUM_DIST_LSC								
6119025 BLANK QC,								
M8J9V1AA	H-3	-3.11E-02 +- 7.6E-02	U	pCi/g	100%			1.90E-01
6119025 LCS,								
M8J9V1AC	H-3	8.21E-01 +- 1.3E-01		pCi/g	100%	101%	0.0	1.92E-01

No. of Results: 19

TestAmerica Inc
rptSTLRchQcSummary V5.5.1 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: 22 May 2016
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-83
Subject: Wet Chemistry - Data Package No. JP1043-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP1043 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
J1V8V8	4/26/16	Soil	C	See note 1
J1V8V9	4/26/16	Soil	C	See note 1
J1V8W0	4/26/16	Soil	C	See note 1
J1V8W1	4/26/16	Soil	C	See note 1
J1V8W2	4/26/16	Soil	C	See note 1
J1V8W3	4/26/16	Soil	C	See note 1
J1V8W4	4/26/16	Soil	C	See note 1
J1V8W5	4/26/16	Soil	C	See note 1
J1V8W6	4/26/16	Soil	C	See note 1
J1V8W7	4/26/16	Soil	C	See note 1
J1V8W8	4/26/16	Soil	C	See note 1
J1V8W9	4/26/16	Soil	C	See note 1
J1V1X0	4/26/16	Soil	C	See note 1
J1V8X1	4/26/16	Soil	C	See note 1
J1V8X2	4/26/16	Soil	C	See note 2

1 - Chromium VI by 7196A, IC anions by 300.0, nitrate/nitrite by 353.2, pH by 9045C.
2 - IC anions by 300.0, nitrate/nitrite by 353.2, pH by 9045C

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). 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: 30 days for chromium VI; 28 days for nitrate/nitrite, chloride, fluoride, bromide, sulfate; 48 hours for nitrate, nitrite and orthophosphate; and immediate (24 hours) for pH.

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

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

Due to the holding time being exceeded by less than twice the limit, all nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".

Due to the samples not being properly preserved (>6 degrees centigrade), all chromium VI results were qualified as estimates and flagged "J".

All other holding times and sample preservation results 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

One field blank (J1V8X2) was submitted for analysis. Chloride, sulfate and pH 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 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 (J1V8W4/J1V8X1) was 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 JP1043 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 holding time being exceeded by greater than twice the limit, all pH results were qualified as estimates and flagged "J".
- Due to the holding time being exceeded by less than twice the limit, all nitrate, nitrite and orthophosphate results were qualified as estimates and flagged "J".
- Due to the samples not being properly preserved (>6 degrees centigrade), all chromium VI 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-2005-92, Rev. 0, 100-N *Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

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: JP1043	**REVIEWER: ELR**	**Project: 100-N-83**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH Nitrate Nitrite Orthophosphate	J	All	Hold time
Chromium VI	J	All	Sample preservation (cooler temperature)

* - 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

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

V 5/22/16

Client Sample ID: **J1V8V8**

Lab Sample ID: 280-82479-1
Client Matrix: Solid

% Moisture: 1.5

Date Sampled: 04/26/2016 0810
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	1.7		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1446						DryWt Corrected: Y
Chloride-Soluble	7.2	N	mg/Kg	1.9	4.8	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y
Nitrate as N-Soluble	1.8	B J	mg/Kg	0.30	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	1.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U J	mg/Kg	0.33	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.4	B J	mg/Kg	1.2	4.8	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y
Sulfate-Soluble	12.7	N	mg/Kg	1.6	4.8	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y
Fluoride-Soluble	0.79	U N	mg/Kg	0.79	4.8	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1619						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.72	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	1.5		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

5/22/16

Client Sample ID: **J1V8V9**

Lab Sample ID: 280-82479-2
Client Matrix: Solid

% Moisture: 2.1

Date Sampled: 04/26/2016 0937
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	3.5		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1448						DryWt Corrected: Y
Chloride-Soluble	6.8		mg/Kg	1.9	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y
Nitrate as N-Soluble	3.8	J	mg/Kg	0.31	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	1.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U J	mg/Kg	0.33	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.9	B J	mg/Kg	1.2	4.9	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y
Sulfate-Soluble	8.7		mg/Kg	1.7	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y
Fluoride-Soluble	0.80	U	mg/Kg	0.80	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1718						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.67	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	2.1		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

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Client Sample ID: **J1V8W0**

Lab Sample ID: 280-82479-3
Client Matrix: Solid

% Moisture: 2.4

Date Sampled: 04/26/2016 0830
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	8.8		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1450						DryWt Corrected: Y
Chloride-Soluble	7.4		mg/Kg	2.0	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y
Nitrate as N-Soluble	8.5	J	mg/Kg	0.31	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U J	mg/Kg	0.33	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.4	B J	mg/Kg	1.2	4.9	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y
Sulfate-Soluble	7.4		mg/Kg	1.7	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y
Fluoride-Soluble	0.81	B	mg/Kg	0.80	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1738						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.24	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	2.4		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8W1**

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Lab Sample ID: 280-82479-4
Client Matrix: Solid

% Moisture: 1.2

Date Sampled: 04/26/2016 0850
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	2.8		mg/Kg	0.36	0.75	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1452						DryWt Corrected: Y
Chloride-Soluble	6.1		mg/Kg	1.9	4.7	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y
Nitrate as N-Soluble	2.2	B J	mg/Kg	0.30	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y
Bromide-Soluble	0.37	U	mg/Kg	0.37	1.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y
Nitrite as N-Soluble	0.32	U J	mg/Kg	0.32	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.8	B J	mg/Kg	1.2	4.7	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y
Sulfate-Soluble	5.5		mg/Kg	1.6	4.7	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y
Fluoride-Soluble	0.78	U	mg/Kg	0.78	4.7	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1758						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.34	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	1.2		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8W2**

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Lab Sample ID: 280-82479-5
Client Matrix: Solid

% Moisture: 2.0

Date Sampled: 04/26/2016 1045
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	4.7		mg/Kg	0.36	0.75	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1512						DryWt Corrected: Y
Chloride-Soluble	6.4		mg/Kg	2.0	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y
Nitrate as N-Soluble	3.6	J	mg/Kg	0.32	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U J	mg/Kg	0.34	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.8	B J	mg/Kg	1.2	5.0	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y
Sulfate-Soluble	5.7		mg/Kg	1.7	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y
Fluoride-Soluble	0.83	U	mg/Kg	0.83	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1818						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.35	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	2.0		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

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Client Sample ID: **J1V8W3**

Lab Sample ID: 280-82479-6
Client Matrix: Solid

% Moisture: 2.1

Date Sampled: 04/26/2016 1100
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	8.4		mg/Kg	0.37	0.77	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1514						DryWt Corrected: Y
Chloride-Soluble	6.9		mg/Kg	2.0	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y
Nitrate as N-Soluble	5.8	J	mg/Kg	0.31	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U J	mg/Kg	0.33	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y
Orthophosphate as P-Soluble	3.2	B J	mg/Kg	1.2	5.0	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y
Sulfate-Soluble	7.0		mg/Kg	1.7	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y
Fluoride-Soluble	0.82	U	mg/Kg	0.82	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1838						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.35	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	2.1		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

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Client Sample ID: **J1V8W4**

Lab Sample ID: 280-82479-7
Client Matrix: Solid

% Moisture: 5.8

Date Sampled: 04/26/2016 1125
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	2.1		mg/Kg	0.38	0.79	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1516						DryWt Corrected: Y
Chloride-Soluble	6.8	N	mg/Kg	2.1	5.2	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y
Nitrate as N-Soluble	1.4	B J	mg/Kg	0.33	2.6	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y
Bromide-Soluble	0.41	U	mg/Kg	0.41	2.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y
Nitrite as N-Soluble	0.35	U J	mg/Kg	0.35	2.6	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.8	B MJ	mg/Kg	1.3	5.2	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y
Sulfate-Soluble	4.9	B	mg/Kg	1.8	5.2	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y
Fluoride-Soluble	0.86	U N	mg/Kg	0.86	5.2	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 1938						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.54	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	5.8		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8W5**

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Lab Sample ID: 280-82479-8
Client Matrix: Solid

% Moisture: 1.3

Date Sampled: 04/26/2016 1115
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	4.6		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1518						DryWt Corrected: Y
Chloride-Soluble	7.2		mg/Kg	2.0	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y
Nitrate as N-Soluble	3.0	J	mg/Kg	0.32	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U J	mg/Kg	0.34	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.6	B J	mg/Kg	1.2	5.0	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y
Sulfate-Soluble	6.0		mg/Kg	1.7	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y
Fluoride-Soluble	0.89	B	mg/Kg	0.83	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2037						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.19	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	1.3		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

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Client Sample ID: **J1V8W6**

Lab Sample ID: 280-82479-9
Client Matrix: Solid
% Moisture: 1.8

Date Sampled: 04/26/2016 1145
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	1.4		mg/Kg	0.36	0.78	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1520						DryWt Corrected: Y
Chloride-Soluble	6.6		mg/Kg	2.0	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y
Nitrate as N-Soluble	1.4	B J	mg/Kg	0.31	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U J	mg/Kg	0.33	2.4	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.6	B J	mg/Kg	1.2	4.9	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y
Sulfate-Soluble	6.5		mg/Kg	1.7	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y
Fluoride-Soluble	0.80	U	mg/Kg	0.80	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2057						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.43	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	1.8		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8W7**

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Lab Sample ID: 280-82479-10
Client Matrix: Solid
% Moisture: 4.0

Date Sampled: 04/26/2016 1130
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	5.9		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1522						DryWt Corrected: Y
Chloride-Soluble	7.2		mg/Kg	2.1	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y
Nitrate as N-Soluble	4.6	J	mg/Kg	0.32	2.6	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y
Bromide-Soluble	0.40	U	mg/Kg	0.40	2.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y
Nitrite as N-Soluble	0.35	U J	mg/Kg	0.35	2.6	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.4	B J	mg/Kg	1.3	5.1	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y
Sulfate-Soluble	6.7		mg/Kg	1.7	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y
Fluoride-Soluble	0.84	U	mg/Kg	0.84	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2117						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.10	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	4.0		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

5/22/14

Client Sample ID: **J1V8W8**

Lab Sample ID: 280-82479-11
Client Matrix: Solid
% Moisture: 8.8

Date Sampled: 04/26/2016 1200
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	3.4		mg/Kg	0.39	0.82	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1524						DryWt Corrected: Y
Chloride-Soluble	7.3		mg/Kg	2.1	5.2	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y
Nitrate as N-Soluble	3.1	J	mg/Kg	0.33	2.6	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y
Bromide-Soluble	0.40	U	mg/Kg	0.40	2.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y
Nitrite as N-Soluble	0.35	U J	mg/Kg	0.35	2.6	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.7	B J	mg/Kg	1.3	5.2	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y
Sulfate-Soluble	5.9		mg/Kg	1.8	5.2	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y
Fluoride-Soluble	0.85	U	mg/Kg	0.85	5.2	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2137						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.90	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	8.8		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8W9**

5/22/16

Lab Sample ID: 280-82479-12
Client Matrix: Solid

% Moisture: 2.9

Date Sampled: 04/26/2016 1220
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	9.9		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1526						DryWt Corrected: Y
Chloride-Soluble	6.8		mg/Kg	2.0	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y
Nitrate as N-Soluble	4.8	J	mg/Kg	0.32	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y
Bromide-Soluble	0.40	U	mg/Kg	0.40	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U J	mg/Kg	0.34	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y
Orthophosphate as P-Soluble	3.1	B J	mg/Kg	1.3	5.1	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y
Sulfate-Soluble	5.1		mg/Kg	1.7	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y
Fluoride-Soluble	0.83	U	mg/Kg	0.83	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2157						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.09	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	2.9		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8X0**

5/22/14

Lab Sample ID: 280-82479-13
Client Matrix: Solid

% Moisture: 2.9

Date Sampled: 04/26/2016 0915
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	4.2		mg/Kg	0.36	0.76	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1528						DryWt Corrected: Y
Chloride-Soluble	7.1		mg/Kg	2.0	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y
Nitrate as N-Soluble	3.2	J	mg/Kg	0.31	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U J	mg/Kg	0.34	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.9	B J	mg/Kg	1.2	5.0	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y
Sulfate-Soluble	13.9		mg/Kg	1.7	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y
Fluoride-Soluble	1.5	B	mg/Kg	0.82	5.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2217						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	8.68	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1409						DryWt Corrected: N
Percent Moisture	2.9		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8X1**

5/22/16

Lab Sample ID: 280-82479-14
Client Matrix: Solid

% Moisture: 5.6

Date Sampled: 04/26/2016 1025
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	2.4		mg/Kg	0.37	0.78	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1530						DryWt Corrected: Y
Chloride-Soluble	6.8		mg/Kg	2.0	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y
Nitrate as N-Soluble	1.6	B J	mg/Kg	0.32	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y
Bromide-Soluble	0.39	U	mg/Kg	0.39	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y
Nitrite as N-Soluble	0.34	U J	mg/Kg	0.34	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y
Orthophosphate as P-Soluble	2.2	B J	mg/Kg	1.3	5.1	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y
Sulfate-Soluble	5.4		mg/Kg	1.7	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y
Fluoride-Soluble	0.83	U	mg/Kg	0.83	5.1	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2237						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	7.34	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1707						DryWt Corrected: N
Percent Moisture	5.6		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

General Chemistry

Client Sample ID: **J1V8X2**

Lab Sample ID: 280-82479-15
Client Matrix: Solid

% Moisture: 0.0

Date Sampled: 04/26/2016 0740
Date Received: 04/28/2016 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	0.36	U	mg/Kg	0.36	0.74	1.0	353.2
Analysis Batch: 280-323977	Analysis Date: 05/04/2016 1544						DryWt Corrected: Y
Chloride-Soluble	7.4		mg/Kg	2.0	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y
Nitrate as N-Soluble	0.31	U J	mg/Kg	0.31	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y
Bromide-Soluble	0.38	U	mg/Kg	0.38	2.0	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y
Nitrite as N-Soluble	0.33	U J	mg/Kg	0.33	2.5	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y
Orthophosphate as P-Soluble	1.2	U J	mg/Kg	1.2	4.9	1.0	9056M
Analysis Batch: 280-323171	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y
Sulfate-Soluble	4.4	B	mg/Kg	1.7	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y
Fluoride-Soluble	0.80	U	mg/Kg	0.80	4.9	1.0	9056M
Analysis Batch: 280-323172	Analysis Date: 04/29/2016 2337						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH adj. to 25 deg C-Soluble	6.79	J	SU	0.100	0.100	1.0	9045C
Analysis Batch: 280-323227	Analysis Date: 04/29/2016 1707						DryWt Corrected: N
Percent Moisture	0.10	U	%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-323360	Analysis Date: 04/30/2016 1407						DryWt Corrected: N

Client Sample Results

Client: Washington Closure Hanford
Project/Site: 100N Field Remediation

TestAmerica Job ID: 300-2923-1
SDG: JP1043

Client Sample ID: J1V8V8

Date Collected: 04/26/16 08:10
Date Received: 04/27/16 14:30

✓ 5/22/16

Lab Sample ID: 300-2923-1
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.23	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

6

Client Sample ID: J1V8V9

Date Collected: 04/26/16 09:37
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-2
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.16	U J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W0

Date Collected: 04/26/16 08:30
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-3
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.43	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W1

Date Collected: 04/26/16 08:50
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-4
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.16	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W2

Date Collected: 04/26/16 10:45
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-5
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.27	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W3

Date Collected: 04/26/16 11:00
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-6
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.65	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W4

Date Collected: 04/26/16 10:25
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-7
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.16	U J	2.1	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample Results

Client: Washington Closure Hanford
Project/Site: 100N Field Remediation

TestAmerica Job ID: 300-2923-1
SDG: JP1043

Client Sample ID: J1V8W5

Date Collected: 04/26/16 11:15
Date Received: 04/27/16 14:30

V 5/22/16

Lab Sample ID: 300-2923-8
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.16	U J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

6

Client Sample ID: J1V8W6

Date Collected: 04/26/16 11:45
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-9
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.29	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W7

Date Collected: 04/26/16 11:30
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-10
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.46	B J	2.1	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W8

Date Collected: 04/26/16 12:00
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-11
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.20	B J	2.2	0.17	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8W9

Date Collected: 04/26/16 12:20
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-12
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.39	B J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8X0

Date Collected: 04/26/16 09:15
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-13
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.16	U J	2.0	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample ID: J1V8X1

Date Collected: 04/26/16 10:25
Date Received: 04/27/16 14:30

Lab Sample ID: 300-2923-14
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.16	U J	2.1	0.16	mg/Kg	☼	05/03/16 09:11	05/04/16 10:48	1

Client Sample Results

Client: Washington Closure Hanford
Project/Site: 100N Field Remediation

TestAmerica Job ID: 300-2923-1
SDG: JP1043

Client Sample ID: J1V8X2
Date Collected: 04/26/16 07:40
Date Received: 04/27/16 14:30

5/22/a

Lab Sample ID: 300-2923-15
Matrix: Solid

6

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.15	U	2.0	0.15	mg/Kg	☼	05/05/16 14:02	05/05/16 14:27	1

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Job ID: 300-2923-1

Laboratory: TestAmerica Richland

4

Narrative

Job Narrative
300-2923-1
JP1043 / RC-189

Comments
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.

Receipt
The samples were received on 4/27/2016 2:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.2° C.

General Chemistry
Hexavalent Chromium by EPA method 7196A:
The LCS, batch blank, samples, sample duplicate and sample matrix spike results are within contractual requirements.

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Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-314 | Page 1 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: TNV-052	Field Logbook No.: EL-1652-12	COA: 000N832000	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
N/A

Special Handling and/or Storage
Cool as required

Preservation	Cool <=6C	None	None	None	None	None				
Type of Container	G/P	G/P	G/P	G/P	G/P	G				
No. of Container(s)	1	1	1	1	1	1				
Volume	125mL	1000mL	~~125mL 60mL~~	~~125mL 60mL~~	~~125mL 60mL~~ TRE 4-26-16	60mL				
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	Isotopic Plutonium	Strontium-89,90 – Total Sr	Nickel-63	Tritium - H3 Low Level Soil				

Sample No.	Matrix	Sample Date	Sample Time										
J1V8V8 M8J58	SOIL	4-26-16	0810	✓	✓	✓	✓	✓	✓				
J1V8V9 M8J59	SOIL	4-26-16	0937	✓	✓	✓	✓	✓	✓				
J1V8W0 M8J6A	SOIL	4-26-16	0830	✓	✓	✓	✓	✓	✓				
J1V8W1 M8J6C	SOIL	4-26-16	0850	✓	✓	✓	✓	✓	✓				
J1V8W2 M8J6D	SOIL	4-26-16	1045	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	26 Apr 2016 1230	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
~~T.R. Edmundson~~ WCH T.R. Edmundson	4-27-16 1500	~~Fred Cge~~ TRE	~~4-27-16~~ 4-27-16
T.R. Edmundson WCH T.R. Edmundson	4-27-16 1430	~~ANDERSON, KARL~~ K. Anderson	4/27/16 1430

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, Radium-226}

J6D270416
JP1043
Due 5-4-16

#2923

JP1043

300-2923 CO

REVIEWED BY KWpeterle DATE 4-27-16

WCH-EE-011

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5/17/2016

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Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-314 | Page 2 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: TNU-052	Field Logbook No.: EL-1652-12	COA: 000N832000	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
N/A

Special Handling and/or Storage
Cool as required

Preservation	Cool <=6C	None	None	None	None	None					
Type of Container	G/P	G/P	G/P	G/P	G/P	G					
No. of Container(s)	1	1	1	1	1	1					
Volume	125mL	1000mL	~~60mL~~ 125mL	~~60mL~~ 125mL	~~60mL~~ 125mL	60mL					
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	Isotopic Plutonium	Strontium-89,90 – Total Sr	Nickel-63	Tritium - H3 Low Level Soil					

TRB 4-26-16

Sample No.	Matrix	Sample Date	Sample Time										
J1V8W3 m8J6E	SOIL	4-26-16	1100	✓	✓	✓	✓	✓	✓				
J1V8W4 m8J6F	SOIL	4-26-16	1025	✓	✓	✓	✓	✓	✓				
J1V8W5 m8J6G	SOIL	4-26-16	1115	✓	✓	✓	✓	✓	✓				
J1V8W6 m8J6H	SOIL	4-26-16	1145	✓	✓	✓	✓	✓	✓				
J1V8W7 m8J6J	SOIL	4-26-16	1130	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26 Apr 2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
~~T.R. Edmundson T.R. Edmundson~~ (WCH)	~~4-27-16 1500~~	~~Fed Ex~~	~~4-27-16~~ —
T.R. Edmundson T.R. Edmundson (WCH)	4-27-16 1430	J. Anderson, TARL J. Anderson	4/27/16 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

TRB 4-27-16

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, Radium-226}

JL0270414
Due 5-4-16

REVIEWED BY KWpatel DATE 4-27-16

JP1043

WCH-EE-011

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5/17/2016

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Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-314 | Page 3 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: TNU-052	Field Logbook No.: EL-1652-12	COA: 000N832000	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
N/A

Special Handling and/or Storage
Cool as required

Preservation	Cool <=6C	None	None	None	None	None	None				
Type of Container	G/P	G/P	G/P	G/P	G/P	G					
No. of Container(s)	1	1	1	1	1	1					
Volume	125mL	1000mL	125mL ~~60mL~~	125mL ~~60mL~~ TRE 4-26-16	125mL ~~60mL~~	60mL					
Sample Analysis	Chromium Hex - 7196	See item (2) in Special Instructions	isotopic Plutonium	Strontium-89,90 -- Total Sr	Nickel-63	Tritium - H3 Low Level Soil					

Sample No.	Matrix	Sample Date	Sample Time										
J1V8W8 m8J6K	SOIL	4-26-16	1200	✓	✓	✓	✓	✓	✓				
J1V8W9 m8J6L	SOIL	4-26-16	1220	✓	✓	✓	✓	✓	✓				
J1V8X0 m8J6M	SOIL	4-26-16	0915	✓	✓	✓	✓	✓	✓				
J1V8X1 m8J6N	SOIL	4-26-16	1025	✓	✓	✓	✓	✓	✓				
J1V8X2 m8J6P	SOIL	4-26-16	0740	✓	✓	✓	✓	✓	✓				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26 Apr 2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
WCH T.R. Edmundson T.R. Edmundson	4-27-16 1500	Fed Ex	4-27-16
WCH T.R. Edmundson T.R. Edmundson	4-27-16 1430	LANDSON TARL R. Landson	4/27/16 1430

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, Radium-226}

TRE 4-27-16

JED270416
Due 5-4-16

REVIEWED BY KWPerkel DATE 4-27-16

JP1043

WCH-EE-011

5/17/2016

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CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-82479-1

SDG #: JP1043
SAF#: RC-189

Date SDG Closed: April 28, 2016
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1V8V8	280-82479-1	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8V9	280-82479-2	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W0	280-82479-3	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W1	280-82479-4	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W2	280-82479-5	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W3	280-82479-6	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W4	280-82479-7	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W5	280-82479-8	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W6	280-82479-9	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W7	280-82479-10	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W8	280-82479-11	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8W9	280-82479-12	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8X0	280-82479-13	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8X1	280-82479-14	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C
J1V8X2	280-82479-15	6010/7471/9056M/353.2/9045	6010B/7471A/9056M/353.2/9045C

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 4/28/2016 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-323098 indicates that physical and chemical interferences are present for Copper, Manganese, Silicon and Zinc. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Samples J1V8V8, J1V8V9, J1V8W0, J1V8W2, J1V8W3, J1V8W4, J1V8W5, J1V8W6, J1V8W7, J1V8W8, J1V8W9 and J1V8X1 required dilutions prior to the analysis of Beryllium, Cobalt and Iron to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilutions required.

Low levels of Chromium are present in the method blank associated with batch 280-323098. Because the concentration in the method blank is not present at a level greater than half the reporting limit, 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 J1V8V8; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1V8V8, and the associated sample result has been flagged "N". 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.

The duplicate analysis of sample J1V8V8 exhibited RPD data outside the control limits for Arsenic and Boron, 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.

Iron, a common laboratory contaminant, is present at a level greater than the reporting limit in the instrument blank (CCB) associated with sample J1V8W1 in analysis batch 280-323288. As the associated sample amount is greater than twenty times the CCB concentration, corrective action is deemed unnecessary.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N
No anomalies were encountered.

GENERAL CHEMISTRY - SW846 9056M - ANIONS
The Matrix Spike performed on sample J1V8V8 exhibited percent recoveries outside the control limits for Chloride, Sulfate and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The Matrix Spike performed on sample J1V8W4 exhibited percent recoveries outside the control limits for Chloride and Fluoride, and the associated sample results have been flagged "N". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

The Orthophosphate as P duplicate analysis of sample J1V8W4 exceeded the RPD limit, 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.

GENERAL CHEMISTRY - SW846 9045C - PH
SU = standard units

No anomalies were encountered.

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-314

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1652-12	COA: 000N832000	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A13T482		Bill of Lading/Air Bill No.: SEE OSPC
Other Labs Shipped To: TestAmerica Richland			

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool as required

280-82479 Chain of Custody

Preservation			Cool <=6C	Cool <=6C									
Type of Container			G/P	G/P									
No. of Container(s)			1	1									
Volume			250mL	250mL									
Sample Analysis			See Item (1) in Special Instructions	IC Anions - 9056 Modified; NO2/NO3 - 353.2; pH (Soil) - 9045									
Sample No.	Matrix	Sample Date	Sample Time										
J1V8V8	SOIL	4-26-16	0810	✓	✓								
J1V8V9	SOIL	4-26-16	0937	✓	✓								
J1V8W0	SOIL	4-26-16	0830	✓	✓								
J1V8W1	SOIL	4-26-16	0850	✓	✓								
J1V8W2	SOIL	4-26-16	1045	✓	✓								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand Ed Marchand	1230 26Apr2016	T.R. Edmundson T.R. Edmundson	4-26-16 1230
T.R. Edmundson T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson T.R. Edmundson	4-27-16 1000
T.R. Edmundson T.R. Edmundson	4-27-16 1500	Fed Ex	4-27-16 —
		[illegible]	0940 28Apr16

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)

1.0127-0.2 28Apr16 Transfer [illegible]

REVIEWED BY KWpostle DATE 4-27-16

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Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-314

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1652-12	COA: 000N832000	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: A131482		Bill of Lading/Air Bill No.: SRE OSPC

Other Labs Shipped To: TestAmerica Richland

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool as required

Preservation	Cool <=6C	Cool <=6C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	250mL	250mL										
Sample Analysis	See Item (1) in Special Instructions	IC Anions - 9056 Modified; NO2/NO3 - 353.2; pH (Soil) - 9045										

Sample No.	Matrix	Sample Date	Sample Time										
J1V8W3	SOIL	4-26-16	1100	✓	✓								
J1V8W4	SOIL	4-26-16	1025	✓	✓								
J1V8W5	SOIL	4-26-16	1115	✓	✓								
J1V8W6	SOIL	4-26-16	1145	✓	✓								
J1V8W7	SOIL	4-26-16	1130	✓	✓								

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand	26 Apr 2016 1230	T.R. Edmundson / J.R. Blundell	4-26-16 1230
T.R. Edmundson / J.R. Blundell	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson / J.R. Blundell	4-27-16 1000
T.R. Edmundson / J.R. Blundell (WCH)	4-27-16 1500	Fed Exp	4-27-16 —
		[illegible]	0940 28 Apr 16

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)

REVIEWED BY RW Pertel DATE 4-27-16

JP1043

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-314	Page 3 of 3

Collector: MARCHAND, EG	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Day		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-83 Verification Sampling		SAF No.: RC-189
Ice Chest No.: ERC-96-511	Field Logbook No.: EL-1652-12	COA: 000N832000	Method of Shipment: Commercial Carrier
Shipped To: TestAmerica Denver	Offsite Property No.: 13 PRE 4-27-16 A1A1482		Bill of Lading/Air Bill No.: SEE OSPC
Other Labs Shipped To: TestAmerica Richland			

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool as required

Preservation	Cool <=6C	Cool <=6C
Type of Container	G/P	G/P
No. of Container(s)	1	1
Volume	250mL	250mL
Sample Analysis	See Item (1) in Special Instructions	IC Anions - 9056 Modified; NO2/NO3 - 353.2; pH (Soil) - 9045

Sample No.	Matrix	Sample Date	Sample Time		
J1V8W8	SOIL	4-26-16	1200	✓	✓
J1V8W9	SOIL	4-26-16	1220	✓	✓
J1V8X0	SOIL	4-26-16	0915	✓	✓
J1V8X1	SOIL	4-26-16	1025	✓	✓
J1V8X2	SOIL	4-26-16	0740	✓	✓

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Ed Marchand	1230 26APR16	T.R. Edmundson	4-26-16 1230
T.R. Edmundson	4-26-16 1330	1060 Refer #3	4-26-16 1330
1060 Refer #3	4-27-16 1000	T.R. Edmundson	4-27-16 1000
T.R. Edmundson	4-27-16 1500	Fed Ex	4-27-16 —
			0940 28Apr16

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)

REVIEWED BY Kwpertel DATE 4-27-16

JP1043

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-N-83			DATA PACKAGE: JP1043		
VALIDATOR: ELR		LAB: TAL		DATE: 5/21/16	
			SDG: JP1043		

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				
J1V8V8	J1V8V9	J1V8W0	J1V8W1	J1V8W2
J1V8W3	J1V8W4	J1V8W5	J1V8W6	J1V8W7
J1V8W8	J1V8W9	J1V8X0	J1V8X1	J1V8X2
				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:

FB - 3 detects

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 PAS

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: ~~Ortho 529 = J all~~ ~~k~~ s/2n

6. HOLDING TIMES (all levels)

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

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

Comments: pH >2x – J all

nitrate nitrite + ortho – <2x – J all

CR U1 – cooler 7.2°C >6°C – J all

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 Sample Results

Client: Washington Closure Hanford
Project/Site: 100N Field Remediation

TestAmerica Job ID: 300-2923-1
SDG: JP1043

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 300-4000/1-A
Matrix: Solid
Analysis Batch: 4024

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 4000

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.15	U	2.0	0.15	mg/Kg		05/03/16 09:11	05/04/16 10:48	1

Lab Sample ID: LCS 300-4000/2-A
Matrix: Solid
Analysis Batch: 4024

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 4000

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	20.0	18.91		mg/Kg		95	85 - 115

Lab Sample ID: 300-2923-1 MS
Matrix: Solid
Analysis Batch: 4024

Client Sample ID: J1V8V8
Prep Type: Total/NA
Prep Batch: 4000

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	0.23	B	30.3	23.97		mg/Kg	☼	78	75 - 125

Lab Sample ID: 300-2923-1 MSI
Matrix: Solid
Analysis Batch: 4024

Client Sample ID: J1V8V8
Prep Type: Total/NA
Prep Batch: 4000

Analyte	Sample Result	Sample Qualifier	Spike Added	MSI Result	MSI Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	0.23	B	697	733.2		mg/Kg	☼	105	

Lab Sample ID: 300-2923-1 DU
Matrix: Solid
Analysis Batch: 4024

Client Sample ID: J1V8V8
Prep Type: Total/NA
Prep Batch: 4000

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cr (VI)	0.23	B	0.270	B	mg/Kg	☼	18	35

Lab Sample ID: MB 300-4063/1-A
Matrix: Solid
Analysis Batch: 4064

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 4063

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	0.15	U	2.0	0.15	mg/Kg		05/05/16 14:00	05/05/16 14:25	1

Lab Sample ID: LCS 300-4063/2-A
Matrix: Solid
Analysis Batch: 4064

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 4063

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cr (VI)	20.0	19.41		mg/Kg		97	85 - 115

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Method Blank - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	MB 280-323542/3-A	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS
Dilution:	1.0	Leach Batch:	280-323542	Initial Weight/Volume:	100 mL
Analysis Date:	05/04/2016 1444	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	05/02/2016 1444				

Analyte	Result	Qual	MDL	RL
Nitrate Nitrite as N-Soluble	0.36	U	0.36	0.75

Method Reporting Limit Check - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	MRL 280-323977/21	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	05/04/2016 0946	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	0.100	0.0982	98	50 - 150	B

Lab Control Sample - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	LCS 280-323542/1-A	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS
Dilution:	1.0	Leach Batch:	280-323542	Initial Weight/Volume:	100 mL
Analysis Date:	05/04/2016 1440	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	05/02/2016 1444				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	49.6	50.27	101	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Matrix Spike - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-82479-4	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS'
Dilution:	1.0	Leach Batch:	280-323542	Initial Weight/Volume:	5 mL
Analysis Date:	05/04/2016 1456	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	05/02/2016 1444				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	2.8	39.9	40.75	95	90 - 110	

Matrix Spike - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-82479-15	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS'
Dilution:	1.0	Leach Batch:	280-323542	Initial Weight/Volume:	5 mL
Analysis Date:	05/04/2016 1548	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	05/02/2016 1444				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	0.36	U	39.9	39.96	100	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Duplicate - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-82479-4	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS
Dilution:	1.0	Leach Batch:	280-323542	Initial Weight/Volume:	100 mL
Analysis Date:	05/04/2016 1454	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	05/02/2016 1444				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	2.8		2.87	1	10	

Duplicate - Batch: 280-323977

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-82479-15	Analysis Batch:	280-323977	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\050416.RS
Dilution:	1.0	Leach Batch:	280-323542	Initial Weight/Volume:	100 mL
Analysis Date:	05/04/2016 1546	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	05/02/2016 1444				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	0.36	U	0.35	NC	10	U

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Lab Control Sample - Batch: 280-323227

Method: 9045C
Preparation: N/A

Lab Sample ID:	LCS 280-322970/106-A	Analysis Batch:	280-323227	Instrument ID:	No Equipment Assigned
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	280-322970	Initial Weight/Volume:	1 mL
Analysis Date:	04/29/2016 1409	Units:	SU	Final Weight/Volume:	1 mL
Prep Date:	N/A				
Leach Date:	04/28/2016 0839				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH adj. to 25 deg C-Soluble	7.00	6.900	99	97 - 103	

Lab Control Sample - Batch: 280-323227

Method: 9045C
Preparation: N/A

Lab Sample ID:	LCS 280-322970/127-A	Analysis Batch:	280-323227	Instrument ID:	No Equipment Assigned
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	280-322970	Initial Weight/Volume:	1 mL
Analysis Date:	04/29/2016 1409	Units:	SU	Final Weight/Volume:	1 mL
Prep Date:	N/A				
Leach Date:	04/29/2016 0804				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH adj. to 25 deg C-Soluble	7.00	6.890	98	97 - 103	

Duplicate - Batch: 280-323227

Method: 9045C
Preparation: N/A

Lab Sample ID:	280-82479-12	Analysis Batch:	280-323227	Instrument ID:	No Equipment Assigned
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	280-322970	Initial Weight/Volume:	1 mL
Analysis Date:	04/29/2016 1409	Units:	SU	Final Weight/Volume:	1 mL
Prep Date:	N/A				
Leach Date:	04/29/2016 0804				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
pH adj. to 25 deg C-Soluble	7.09	7.150	0.8	5	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Method Blank - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	MB 280-323222/2-A	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0008.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1559	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	04/29/2016 1300				

Analyte	Result	Qual	MDL	RL
Nitrate as N-Soluble	0.31	U	0.31	2.5
Nitrite as N-Soluble	0.33	U	0.33	2.5
Orthophosphate as P-Soluble	1.2	U	1.2	5.0

Method Reporting Limit Check - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	MRL 280-323171/3	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0003.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1305	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	0.200	0.206	103	50 - 150	B
Nitrite as N-Soluble	0.200	0.216	108	50 - 150	B
Orthophosphate as P-Soluble	0.200	0.220	110	50 - 150	B

Lab Control Sample - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	LCS 280-323222/1-A	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0007.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1539	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	04/29/2016 1300				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	50.0	49.17	98	90 - 110	
Nitrite as N-Soluble	50.0	49.70	99	90 - 110	
Orthophosphate as P-Soluble	50.0	52.57	105	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Matrix Spike - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0011.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1658	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	1.8	B	49.0	45.72	90	80 - 120	
Nitrite as N-Soluble	0.33	U	49.0	44.63	91	80 - 120	
Orthophosphate as P-Soluble	1.4	B	49.0	42.33	84	80 - 120	

Matrix Spike - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-7	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0021.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 2017	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N-Soluble	1.4	B	52.4	50.00	93	80 - 120	
Nitrite as N-Soluble	0.35	U	52.4	49.04	94	80 - 120	
Orthophosphate as P-Soluble	1.8	B	52.4	49.11	90	80 - 120	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Duplicate - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0010.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1638	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate as N-Soluble	1.8	B	1.75	4	15	B
Nitrite as N-Soluble	0.33	U	0.33	NC	15	U
Orthophosphate as P-Soluble	1.4	B	1.61	15	15	B

Duplicate - Batch: 280-323171

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-7	Analysis Batch:	280-323171	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0020.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1958	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Nitrate as N-Soluble	1.4	B	1.41	0.5	15	B
Nitrite as N-Soluble	0.35	U	0.35	NC	15	U
Orthophosphate as P-Soluble	1.8	B	2.43	32	15	B M

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Method Blank - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	MB 280-323222/2-A	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0008.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1559	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	04/29/2016 1300				

Analyte	Result	Qual	MDL	RL
Chloride-Soluble	2.0	U	2.0	5.0
Bromide-Soluble	0.39	U	0.39	2.0
Sulfate-Soluble	1.7	U	1.7	5.0
Fluoride-Soluble	0.82	U	0.82	5.0

Method Reporting Limit Check - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	MRL 280-323172/3	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	0003.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1305	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	2.50	2.36	94	50 - 150	B
Bromide-Soluble	0.200	0.224	112	50 - 150	
Sulfate-Soluble	2.50	2.43	97	50 - 150	B
Fluoride-Soluble	0.200	0.223	111	50 - 150	B

Lab Control Sample - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	LCS 280-323222/1-A	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0007.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1539	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	04/29/2016 1300				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	1000	984.2	98	90 - 110	
Bromide-Soluble	50.0	49.88	100	90 - 110	
Sulfate-Soluble	1000	972.0	97	90 - 110	
Fluoride-Soluble	50.0	51.71	103	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Matrix Spike - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0011.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1658	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	7.2		245	188.9	74	80 - 120	N
Bromide-Soluble	0.38	U	49.0	45.26	92	80 - 120	
Sulfate-Soluble	12.7		245	205.8	79	80 - 120	N
Fluoride-Soluble	0.79	U	49.0	37.46	76	80 - 120	N

Matrix Spike - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-7	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0021.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 2017	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Chloride-Soluble	6.8		262	207.3	77	80 - 120	N
Bromide-Soluble	0.41	U	52.4	49.58	95	80 - 120	
Sulfate-Soluble	4.9	B	262	229.3	86	80 - 120	
Fluoride-Soluble	0.86	U	52.4	37.34	71	80 - 120	N

Client: Washington Closure Hanford

Job Number: 280-82479-1
Sdg Number: JP1043

Duplicate - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-1	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0010.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1638	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Chloride-Soluble	7.2		7.23	0.9	10	
Bromide-Soluble	0.38	U	0.38	NC	10	U
Sulfate-Soluble	12.7		12.72	0.6	10	
Fluoride-Soluble	0.79	U	0.80	NC	10	U

Duplicate - Batch: 280-323172

Method: 9056M
Preparation: N/A

Lab Sample ID:	280-82479-7	Analysis Batch:	280-323172	Instrument ID:	WC_IonChrom11
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	0020.d
Dilution:	1.0	Leach Batch:	280-323222	Initial Weight/Volume:	5 mL
Analysis Date:	04/29/2016 1958	Units:	mg/Kg	Final Weight/Volume:	5 mL
Prep Date:	N/A				10 uL
Leach Date:	04/29/2016 1300				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Chloride-Soluble	6.8		6.89	2	10	
Bromide-Soluble	0.41	U	0.41	NC	10	U
Sulfate-Soluble	4.9	B	5.05	3	10	B
Fluoride-Soluble	0.86	U	0.85	NC	10	U