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

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG JP0802 SAF-RC-189

Sample Location: 100-N-82

Date: 2 June 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-82
Subject: Radiochemistry - Data Package No. JP0802-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0802 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
J1TL89	5/16/14	Soil	C	See note 1
J1TL90	5/16/14	Soil	C	See note 1
J1TL91	5/16/14	Soil	C	See note 1
J1TL92	5/16/14	Soil	C	See note 1
J1TL93	5/16/14	Soil	C	See note 1
J1TL94	5/16/14	Soil	C	See note 1
J1TL95	5/16/14	Soil	C	See note 1
J1TL96	5/16/14	Soil	C	See note 1
J1TL97	5/16/14	Soil	C	See note 1
J1TL98	5/16/14	Soil	C	See note 1
J1TL99	5/16/14	Soil	C	See note 1
J1TLC0	5/16/14	Soil	C	See note 1
J1TLC1	5/16/14	Soil	C	See note 1

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

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

No equipment blanks were submitted for analysis.

Accuracy

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of an LCS analysis, all plutonium-238, thorium-228, thorium-232 and uranium-235 results were qualified as estimates and flagged "J".

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 (J1TL96/J1TLC1) 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. Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. JP0802 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of an LCS analysis, all plutonium-238, thorium-228, thorium-232 and uranium-235 results were qualified as estimates and flagged "J".

- 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.

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.

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: JP0802	**REVIEWER: ELR**	**Project: 100-N-82**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
plutonium-238 thorium-228 thorium-232 uranium-235	J	All	No LCS analysis
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: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 **SDG No:** JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140031 PUISO_PLATE_AEA									
J1TL89									
	M3R6N1AF	Pu-238	-6.02E-04 +- 3.0E-02	U J	pCi/g	95%	5.47E-02	1.00E+00	
		PU239/40	-6.02E-04 +- 3.0E-02	U	pCi/g	95%	5.47E-02	1.00E+00	
J1TL89 DUP									
	M3R6N1AK	Pu-238	3.34E-02 +- 4.9E-02	U	pCi/g	81%	6.20E-02	1.00E+00	207.3
		PU239/40	-1.36E-03 +- 3.4E-02	U	pCi/g	81%	6.86E-02	1.00E+00	-77.5
J1TL90									
	M3R6Q1AF	Pu-238	-5.58E-04 +- 2.8E-02	U J	pCi/g	98%	5.08E-02	1.00E+00	
		PU239/40	-2.79E-03 +- 2.8E-02	U	pCi/g	98%	6.68E-02	1.00E+00	
J1TL91									
	M3R6R1AF	Pu-238	-7.35E-04 +- 3.7E-02	U J	pCi/g	73%	6.68E-02	1.00E+00	
		PU239/40	-7.34E-04 +- 3.7E-02	U	pCi/g	73%	6.68E-02	1.00E+00	
J1TL92									
	M3R6T1AF	Pu-238	-6.82E-04 +- 3.4E-02	U J	pCi/g	82%	6.20E-02	1.00E+00	
		PU239/40	-1.36E-03 +- 3.4E-02	U	pCi/g	82%	6.86E-02	1.00E+00	
J1TL93									
	M3R6V1AF	Pu-238	-2.70E-03 +- 3.4E-02	U J	pCi/g	87%	7.71E-02	1.00E+00	
		PU239/40	-1.35E-03 +- 3.4E-02	U	pCi/g	87%	6.79E-02	1.00E+00	
J1TL94									
	M3R6W1AF	Pu-238	-1.22E-03 +- 3.0E-02	U J	pCi/g	88%	6.12E-02	1.00E+00	
		PU239/40	-1.22E-03 +- 3.0E-02	U	pCi/g	88%	6.12E-02	1.00E+00	
J1TL95									
	M3R6X1AF	Pu-238	1.31E-02 +- 3.5E-02	U J	pCi/g	81%	8.59E-02	1.00E+00	
		PU239/40	-1.38E-03 +- 3.4E-02	U	pCi/g	81%	6.93E-02	1.00E+00	
J1TL96									
	M3R601AF	Pu-238	-5.71E-03 +- 2.9E-02	U J	pCi/g	100%	8.07E-02	1.00E+00	
		PU239/40	-2.28E-03 +- 2.9E-02	U	pCi/g	100%	6.52E-02	1.00E+00	
J1TL97									
	M3R611AF	Pu-238	-8.22E-03 +- 3.0E-02	U J	pCi/g	96%	9.09E-02	1.00E+00	
		PU239/40	-5.87E-04 +- 2.9E-02	U	pCi/g	96%	5.34E-02	1.00E+00	
J1TL98									
	M3R621AF	Pu-238	-2.59E-03 +- 3.2E-02	U J	pCi/g	90%	7.40E-02	1.00E+00	
		PU239/40	-6.47E-04 +- 3.2E-02	U	pCi/g	90%	5.89E-02	1.00E+00	
J1TL99									
	M3R631AF	Pu-238	2.95E-02 +- 5.0E-02	U J	pCi/g	86%	9.39E-02	1.00E+00	
		PU239/40	3.30E-02 +- 5.0E-02	U	pCi/g	86%	7.59E-02	1.00E+00	
J1TLC0									
	M3R641AF	Pu-238	-5.03E-03 +- 3.2E-02	U J	pCi/g	87%	8.39E-02	1.00E+00	

TestAmerica Inc

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RPD - Relative Percent Difference.

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

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 **SDG No:** JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140031 PUISO_PLATE_AEA									
J1TLC0									
	M3R641AF	PU239/40	-1.26E-03 +- 3.1E-02	U	pCi/g	87%	6.32E-02	1.00E+00	
J1TLC1									
	M3R651AF	Pu-238	-4.67E-03 +- 2.9E-02	U J	pCi/g	95%	7.79E-02	1.00E+00	
		PU239/40	1.34E-02 +- 2.9E-02	U	pCi/g	95%	5.87E-02	1.00E+00	
4140029 THISO_IE_PLATE_AEA									
J1TL89									
	M3R6N1AG	Th-228	3.75E-01 +- 1.8E-01	J	pCi/g	87%	8.58E-02	1.00E+00	
		Th-230	2.74E-01 +- 1.5E-01		pCi/g	87%	7.94E-02	1.00E+00	
		Th-232	6.10E-01 +- 2.4E-01	J	pCi/g	87%	7.18E-02	1.00E+00	
J1TL90									
	M3R6Q1AG	Th-228	5.83E-01 +- 2.2E-01	J	pCi/g	89%	7.13E-02	1.00E+00	
		Th-230	2.80E-01 +- 1.5E-01		pCi/g	89%	7.08E-02	1.00E+00	
		Th-232	5.80E-01 +- 2.2E-01	J	pCi/g	89%	6.40E-02	1.00E+00	
J1TL91									
	M3R6R1AG	Th-228	3.05E-01 +- 1.5E-01	J	pCi/g	96%	9.50E-02	1.00E+00	
		Th-230	3.94E-01 +- 1.8E-01		pCi/g	96%	6.25E-02	1.00E+00	
		Th-232	3.43E-01 +- 1.6E-01	J	pCi/g	96%	6.25E-02	1.00E+00	
J1TL91 DUP									
	M3R6R1AK	Th-228	3.31E-01 +- 1.4E-01		pCi/g	90%	4.83E-02	1.00E+00	8.3
		Th-230	2.63E-01 +- 1.2E-01		pCi/g	90%	5.31E-02	1.00E+00	40.1
		Th-232	2.24E-01 +- 1.1E-01		pCi/g	90%	4.80E-02	1.00E+00	42.1
J1TL92									
	M3R6T1AG	Th-228	4.80E-01 +- 1.9E-01	J	pCi/g	98%	6.25E-02	1.00E+00	
		Th-230	2.45E-01 +- 1.3E-01		pCi/g	98%	6.21E-02	1.00E+00	
		Th-232	4.16E-01 +- 1.7E-01	J	pCi/g	98%	5.61E-02	1.00E+00	
J1TL93									
	M3R6V1AG	Th-228	4.11E-01 +- 1.7E-01	J	pCi/g	94%	6.74E-02	1.00E+00	
		Th-230	3.36E-01 +- 1.5E-01		pCi/g	94%	5.33E-02	1.00E+00	
		Th-232	4.24E-01 +- 1.7E-01	J	pCi/g	94%	5.33E-02	1.00E+00	
J1TL94									
	M3R6W1AG	Th-228	3.52E-01 +- 1.5E-01	J	pCi/g	99%	5.99E-02	1.00E+00	
		Th-230	3.12E-01 +- 1.4E-01		pCi/g	99%	5.24E-02	1.00E+00	
		Th-232	3.64E-01 +- 1.5E-01	J	pCi/g	99%	4.74E-02	1.00E+00	
J1TL95									
	M3R6X1AG	Th-228	4.46E-01 +- 1.9E-01	J	pCi/g	100%	9.33E-02	1.00E+00	
		Th-230	1.79E-01 +- 1.2E-01		pCi/g	100%	6.53E-02	1.00E+00	
		Th-232	4.12E-01 +- 1.8E-01	J	pCi/g	100%	6.53E-02	1.00E+00	

TestAmerica Inc

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RPD - Relative Percent Difference.

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

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 — 5/31/14 — SDG No: JP0802

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140029 THISO_IE_PLATE_AEA									
	J1TL96								
	M3R601AG	Th-228	3.35E-01 +- 1.5E-01	J	pCi/g	102%	6.06E-02	1.00E+00	
		Th-230	1.39E-01 +- 9.1E-02		pCi/g	102%	5.07E-02	1.00E+00	
		Th-232	3.34E-01 +- 1.5E-01	J	pCi/g	102%	3.77E-02	1.00E+00	
	J1TL97								
	M3R611AG	Th-228	3.19E-01 +- 1.5E-01	J	pCi/g	100%	5.82E-02	1.00E+00	
		Th-230	2.36E-01 +- 1.3E-01		pCi/g	100%	6.86E-02	1.00E+00	
		Th-232	4.76E-01 +- 1.9E-01	J	pCi/g	100%	5.78E-02	1.00E+00	
	J1TL98								
	M3R621AG	Th-228	2.61E-01 +- 1.3E-01	J	pCi/g	98%	6.33E-02	1.00E+00	
		Th-230	2.59E-01 +- 1.3E-01		pCi/g	98%	6.29E-02	1.00E+00	
		Th-232	2.04E-01 +- 1.1E-01	J	pCi/g	98%	6.29E-02	1.00E+00	
	J1TL99								
	M3R631AG	Th-228	4.98E-01 +- 1.8E-01	J	pCi/g	95%	6.85E-02	1.00E+00	
		Th-230	2.83E-01 +- 1.3E-01		pCi/g	95%	5.72E-02	1.00E+00	
		Th-232	2.69E-01 +- 1.3E-01	J	pCi/g	95%	5.72E-02	1.00E+00	
	J1TLC0								
	M3R641AG	Th-228	4.36E-01 +- 1.7E-01	J	pCi/g	91%	7.35E-02	1.00E+00	
		Th-230	2.72E-01 +- 1.3E-01		pCi/g	91%	5.90E-02	1.00E+00	
		Th-232	2.18E-01 +- 1.1E-01	J	pCi/g	91%	4.97E-02	1.00E+00	
	J1TLC1								
	M3R651AG	Th-228	3.41E-01 +- 1.5E-01	J	pCi/g	103%	6.54E-02	1.00E+00	
		Th-230	3.97E-01 +- 1.6E-01		pCi/g	103%	5.72E-02	1.00E+00	
		Th-232	5.40E-01 +- 1.9E-01	J	pCi/g	103%	5.18E-02	1.00E+00	
4140030 UISO_IE_PLATE_AEA									
	J1TL89								
	M3R6N1AC	U-234	1.38E-01 +- 8.9E-02		pCi/g	86%	6.65E-02	1.00E+00	
		U-235	-5.15E-04 +- 2.6E-02	U J	pCi/g	86%	4.68E-02	1.00E+00	
		U-238	1.66E-01 +- 9.7E-02		pCi/g	86%	5.56E-02	1.00E+00	
	J1TL90								
	M3R6Q1AC	U-234	1.81E-01 +- 1.2E-01		pCi/g	70%	9.37E-02	1.00E+00	
		U-235	-6.81E-04 +- 3.4E-02	U J	pCi/g	70%	6.20E-02	1.00E+00	
		U-238	1.17E-01 +- 9.3E-02		pCi/g	70%	7.36E-02	1.00E+00	
	J1TL90 DUP								
	M3R6Q1AK	U-234	2.34E-01 +- 1.2E-01		pCi/g	80%	9.69E-02	1.00E+00	25.6
		U-235	9.31E-03 +- 2.8E-02	U	pCi/g	80%	7.32E-02	1.00E+00	231.6
		U-238	1.62E-01 +- 1.0E-01		pCi/g	80%	1.06E-01	1.00E+00	32.2
	J1TL91								

TestAmerica Inc

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RPD - Relative Percent Difference.

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

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360

5/31/14

SDG No: JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140030 UISO_IE_PLATE_AEA									
J1TL91									
	M3R6R1AC	U-234	2.94E-01 +- 1.6E-01		pCi/g	63%	1.28E-01	1.00E+00	
		U-235	1.31E-02 +- 3.9E-02	U J	pCi/g	63%	1.03E-01	1.00E+00	
		U-238	4.02E-01 +- 1.9E-01		pCi/g	63%	8.81E-02	1.00E+00	
J1TL92									
	M3R6T1AC	U-234	2.22E-01 +- 1.1E-01		pCi/g	96%	6.14E-02	1.00E+00	
		U-235	8.54E-03 +- 2.4E-02	U J	pCi/g	96%	6.14E-02	1.00E+00	
		U-238	1.98E-01 +- 1.0E-01		pCi/g	96%	6.34E-02	1.00E+00	
J1TL93									
	M3R6V1AC	U-234	1.78E-01 +- 1.0E-01		pCi/g	93%	5.54E-02	1.00E+00	
		U-235	1.28E-02 +- 2.6E-02	U J	pCi/g	93%	3.48E-02	1.00E+00	
		U-238	1.61E-01 +- 9.7E-02		pCi/g	93%	7.44E-02	1.00E+00	
J1TL94									
	M3R6W1AC	U-234	1.34E-01 +- 8.8E-02		pCi/g	89%	5.42E-02	1.00E+00	
		U-235	2.58E-02 +- 3.8E-02	U J	pCi/g	89%	5.42E-02	1.00E+00	
		U-238	2.27E-01 +- 1.2E-01		pCi/g	89%	6.15E-02	1.00E+00	
J1TL95									
	M3R6X1AC	U-234	2.18E-01 +- 1.2E-01		pCi/g	81%	7.35E-02	1.00E+00	
		U-235	1.41E-02 +- 3.0E-02	U J	pCi/g	81%	5.37E-02	1.00E+00	
		U-238	2.90E-01 +- 1.4E-01		pCi/g	81%	7.87E-02	1.00E+00	
J1TL96									
	M3R601AC	U-234	9.24E-02 +- 6.8E-02		pCi/g	93%	5.07E-02	1.00E+00	
		U-235	1.17E-02 +- 2.4E-02	U J	pCi/g	93%	3.18E-02	1.00E+00	
		U-238	1.61E-01 +- 9.2E-02		pCi/g	93%	5.85E-02	1.00E+00	
J1TL97									
	M3R611AC	U-234	1.47E-01 +- 9.8E-02		pCi/g	87%	7.17E-02	1.00E+00	
		U-235	0.00E+00 +- 3.0E-02	U J	pCi/g	87%	4.05E-02	1.00E+00	
		U-238	2.24E-01 +- 1.2E-01		pCi/g	87%	5.45E-02	1.00E+00	
J1TL98									
	M3R621AC	U-234	2.01E-01 +- 1.2E-01		pCi/g	80%	5.65E-02	1.00E+00	
		U-235	-6.21E-04 +- 3.1E-02	U J	pCi/g	80%	5.65E-02	1.00E+00	
		U-238	9.12E-02 +- 7.8E-02		pCi/g	80%	6.70E-02	1.00E+00	
J1TL99									
	M3R631AC	U-234	1.92E-01 +- 1.1E-01		pCi/g	87%	7.73E-02	1.00E+00	
		U-235	-1.69E-03 +- 2.8E-02	U J	pCi/g	87%	6.07E-02	1.00E+00	
		U-238	2.49E-01 +- 1.3E-01		pCi/g	87%	7.27E-02	1.00E+00	
J1TLC0									
	M3R641AC	U-234	1.58E-01 +- 1.1E-01		pCi/g	79%	7.73E-02	1.00E+00	

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Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 **SDG No:** JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140030 UISO_IE_PLATE_AEA									
J1TLC0									
	M3R641AC	U-235	3.10E-02 +- 4.6E-02	U J	pCi/g	79%	6.50E-02	1.00E+00	
		U-238	1.92E-01 +- 1.2E-01		pCi/g	79%	6.50E-02	1.00E+00	
J1TLC1									
	M3R651AC	U-234	1.44E-01 +- 9.8E-02		pCi/g	91%	8.45E-02	1.00E+00	
		U-235	-2.40E-03 +- 3.0E-02	U J	pCi/g	91%	6.84E-02	1.00E+00	
		U-238	1.75E-01 +- 1.1E-01		pCi/g	91%	7.74E-02	1.00E+00	
4140024 GAMMA_GS									
J1TL89									
	M3R6N1AJ	AMERICIUM 241	-4.01E-02 +- 7.9E-02	U	pCi/g		1.28E-01		
		CO-60	3.50E-03 +- 2.1E-02	U	pCi/g		3.86E-02	5.00E-02	
		CS-137	2.56E-01 +- 5.6E-02		pCi/g		4.08E-02	1.00E-01	
		EU-152	4.82E-03 +- 6.3E-02	U	pCi/g		1.00E-01	1.00E-01	
		EU-154	-2.89E-03 +- 6.8E-02	U	pCi/g		1.19E-01	1.00E-01	
		EU-155	2.83E-02 +- 5.7E-02	U	pCi/g		9.89E-02	1.00E-01	
		K-40	1.52E+01 +- 2.0E+00		pCi/g		3.55E-01		
		RA-226	7.11E-01 +- 1.2E-01		pCi/g		6.99E-02		
J1TL90									
	M3R6Q1AJ	AMERICIUM 241	-4.42E-02 +- 8.8E-02	U	pCi/g		1.43E-01		
		CO-60	3.42E-03 +- 1.6E-02	U	pCi/g		2.89E-02	5.00E-02	
		CS-137	4.13E-02 +- 1.9E-02	U	pCi/g		3.48E-02	1.00E-01	
		EU-152	3.65E-02 +- 1.3E-01	U	pCi/g		8.49E-02	1.00E-01	
		EU-154	-1.20E-02 +- 5.3E-02	U	pCi/g		9.06E-02	1.00E-01	
		EU-155	-1.81E-04 +- 6.1E-02	U	pCi/g		1.03E-01	1.00E-01	
		K-40	1.46E+01 +- 1.8E+00		pCi/g		2.15E-01		
		RA-226	5.97E-01 +- 9.7E-02		pCi/g		5.43E-02		
J1TL91									
	M3R6R1AJ	AMERICIUM 241	-4.08E-02 +- 1.0E-01	U	pCi/g		1.63E-01		
		CO-60	9.27E-03 +- 1.6E-02	U	pCi/g		2.85E-02	5.00E-02	
		CS-137	2.74E-03 +- 1.5E-02	U	pCi/g		2.55E-02	1.00E-01	
		EU-152	7.91E-03 +- 3.6E-02	U	pCi/g		6.15E-02	1.00E-01	
		EU-154	-1.85E-02 +- 4.7E-02	U	pCi/g		8.02E-02	1.00E-01	
		EU-155	3.20E-02 +- 4.1E-02	U	pCi/g		7.03E-02	1.00E-01	
		K-40	1.26E+01 +- 1.6E+00		pCi/g		2.10E-01		
		RA-226	3.72E-01 +- 7.6E-02		pCi/g		4.29E-02		
J1TL92									
	M3R6T1AJ	AMERICIUM 241	-1.77E-02 +- 2.4E-02	U	pCi/g		3.82E-02		
		CO-60	-2.17E-03 +- 1.4E-02	U	pCi/g		2.49E-02	5.00E-02	

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Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 **SDG No:** JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140024 GAMMA_GS									
J1TL92									
	M3R6T1AJ	CS-137	2.26E-04 +- 1.4E-02	U	pCi/g		2.46E-02	1.00E-01	
		EU-152	-3.58E-03 +- 3.7E-02	U	pCi/g		6.08E-02	1.00E-01	
		EU-154	6.33E-03 +- 4.9E-02	U	pCi/g		8.69E-02	1.00E-01	
		EU-155	2.89E-02 +- 3.6E-02	U	pCi/g		6.00E-02	1.00E-01	
		K-40	1.33E+01 +- 1.6E+00		pCi/g		1.91E-01		
		RA-226	4.49E-01 +- 8.0E-02		pCi/g		4.24E-02		
J1TL93									
	M3R6V1AJ	AMERICIUM 241	1.20E-03 +- 1.9E-02	U	pCi/g		3.20E-02		
		CO-60	1.06E-02 +- 1.5E-02	U	pCi/g		2.78E-02	5.00E-02	
		CS-137	5.01E-02 +- 3.0E-02		pCi/g		2.44E-02	1.00E-01	
		EU-152	-5.39E-04 +- 3.1E-02	U	pCi/g		5.21E-02	1.00E-01	
		EU-154	3.38E-02 +- 5.0E-02	U	pCi/g		9.26E-02	1.00E-01	
		EU-155	3.68E-02 +- 3.3E-02	U	pCi/g		4.45E-02	1.00E-01	
		K-40	1.40E+01 +- 1.7E+00		pCi/g		2.56E-01		
		RA-226	5.66E-01 +- 9.9E-02		pCi/g		4.15E-02		
J1TL94									
	M3R6W1AJ	AMERICIUM 241	7.55E-03 +- 1.6E-02	U	pCi/g		2.72E-02		
		CO-60	-3.69E-03 +- 1.1E-02	U	pCi/g		1.99E-02	5.00E-02	
		CS-137	-9.25E-03 +- 1.1E-02	U	pCi/g		1.68E-02	1.00E-01	
		EU-152	-1.24E-02 +- 2.7E-02	U	pCi/g		4.16E-02	1.00E-01	
		EU-154	2.76E-03 +- 3.7E-02	U	pCi/g		6.63E-02	1.00E-01	
		EU-155	3.52E-02 +- 4.4E-02	U	pCi/g		3.83E-02	1.00E-01	
		K-40	1.22E+01 +- 1.5E+00		pCi/g		1.92E-01		
		RA-226	3.67E-01 +- 6.6E-02		pCi/g		3.24E-02		
J1TL95									
	M3R6X1AJ	AMERICIUM 241	6.03E-03 +- 1.9E-02	U	pCi/g		3.28E-02		
		CO-60	2.16E-03 +- 1.5E-02	U	pCi/g		2.72E-02	5.00E-02	
		CS-137	1.81E-02 +- 1.6E-02	U	pCi/g		2.83E-02	1.00E-01	
		EU-152	9.98E-03 +- 3.0E-02	U	pCi/g		5.31E-02	1.00E-01	
		EU-154	-3.05E-02 +- 4.7E-02	U	pCi/g		7.74E-02	1.00E-01	
		EU-155	5.00E-02 +- 2.9E-02	U	pCi/g		4.97E-02	1.00E-01	
		K-40	1.51E+01 +- 1.8E+00		pCi/g		2.31E-01		
		RA-226	6.26E-01 +- 9.2E-02		pCi/g		3.96E-02		
J1TL95 DUP									
	M3R6X1AK	AMERICIUM 241	-5.20E-02 +- 7.8E-02	U	pCi/g		1.27E-01		-252.4
		CO-60	1.90E-02 +- 2.4E-02	U	pCi/g		4.47E-02	5.00E-02	159.1
		CS-137	2.53E-02 +- 2.5E-02	U	pCi/g		4.61E-02	1.00E-01	33.1

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Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 **SDG No:** JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140024 GAMMA_GS									
J1TL95 DUP									
	M3R6X1AK	EU-152	-4.78E-02 +- 6.4E-02	U	pCi/g		9.86E-02	1.00E-01	-305.5
		EU-154	4.32E-02 +- 7.4E-02	U	pCi/g		1.36E-01	1.00E-01	1158.3
		EU-155	3.20E-02 +- 5.9E-02	U	pCi/g		1.02E-01	1.00E-01	43.8
		K-40	1.61E+01 +- 2.1E+00		pCi/g		2.67E-01		6.1
		RA-226	6.29E-01 +- 1.2E-01	U	pCi/g		1.57E-01		0.4
J1TL96									
	M3R601AJ	AMERICIUM 241	8.63E-03 +- 1.7E-02	U	pCi/g		2.72E-02		
		CO-60	2.40E-02 +- 1.4E-02	U	pCi/g		2.81E-02	5.00E-02	
		CS-137	9.21E-02 +- 2.5E-02		pCi/g		2.03E-02	1.00E-01	
		EU-152	-2.91E-03 +- 2.5E-02	U	pCi/g		4.33E-02	1.00E-01	
		EU-154	3.34E-02 +- 4.3E-02	U	pCi/g		7.85E-02	1.00E-01	
		EU-155	-2.34E-02 +- 2.4E-02	U	pCi/g		3.88E-02	1.00E-01	
		K-40	1.08E+01 +- 1.3E+00		pCi/g		1.99E-01		
		RA-226	3.75E-01 +- 7.2E-02		pCi/g		3.47E-02		
J1TL97									
	M3R611AJ	AMERICIUM 241	-1.06E-01 +- 7.2E-02	U	pCi/g		1.16E-01		
		CO-60	-1.26E-03 +- 1.4E-02	U	pCi/g		2.48E-02	5.00E-02	
		CS-137	3.41E-04 +- 1.4E-02	U	pCi/g		2.46E-02	1.00E-01	
		EU-152	1.45E-02 +- 8.8E-02	U	pCi/g		6.94E-02	1.00E-01	
		EU-154	-4.07E-02 +- 5.0E-02	U	pCi/g		8.11E-02	1.00E-01	
		EU-155	-7.52E-03 +- 5.3E-02	U	pCi/g		8.88E-02	1.00E-01	
		K-40	1.25E+01 +- 1.6E+00		pCi/g		1.98E-01		
		RA-226	4.27E-01 +- 7.3E-02		pCi/g		4.72E-02		
J1TL98									
	M3R621AJ	AMERICIUM 241	5.65E-04 +- 8.2E-02	U	pCi/g		1.38E-01		
		CO-60	2.87E-03 +- 1.4E-02	U	pCi/g		2.56E-02	5.00E-02	
		CS-137	-1.10E-03 +- 1.3E-02	U	pCi/g		2.17E-02	1.00E-01	
		EU-152	5.23E-03 +- 3.2E-02	U	pCi/g		5.41E-02	1.00E-01	
		EU-154	-3.69E-02 +- 4.5E-02	U	pCi/g		7.25E-02	1.00E-01	
		EU-155	4.01E-02 +- 3.5E-02	U	pCi/g		6.22E-02	1.00E-01	
		K-40	9.51E+00 +- 1.2E+00		pCi/g		2.22E-01		
		RA-226	3.51E-01 +- 6.6E-02		pCi/g		3.80E-02		
J1TL99									
	M3R631AJ	AMERICIUM 241	2.39E-02 +- 2.4E-02	U	pCi/g		4.04E-02		
		CO-60	5.54E-03 +- 1.5E-02	U	pCi/g		2.71E-02	5.00E-02	
		CS-137	9.08E-03 +- 1.4E-02	U	pCi/g		2.54E-02	1.00E-01	
		EU-152	2.14E-03 +- 3.8E-02	U	pCi/g		6.19E-02	1.00E-01	

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Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 SDG No: JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140024 GAMMA_GS									
J1TL99									
	M3R631AJ	EU-154	3.33E-02 +- 4.8E-02	U	pCi/g		8.77E-02	1.00E-01	
		EU-155	3.00E-02 +- 3.6E-02	U	pCi/g		5.94E-02	1.00E-01	
		K-40	1.16E+01 +- 1.4E+00		pCi/g		1.92E-01		
		RA-226	4.46E-01 +- 7.7E-02		pCi/g		4.12E-02		
J1TLC0									
	M3R641AJ	AMERICIUM 241	4.81E-02 +- 8.4E-02	U	pCi/g		1.45E-01		
		CO-60	-3.40E-03 +- 1.4E-02	U	pCi/g		2.39E-02	5.00E-02	
		CS-137	2.59E-02 +- 1.4E-02	U	pCi/g		2.59E-02	1.00E-01	
		EU-152	1.87E-02 +- 3.3E-02	U	pCi/g		5.63E-02	1.00E-01	
		EU-154	3.03E-04 +- 4.2E-02	U	pCi/g		7.35E-02	1.00E-01	
		EU-155	1.83E-02 +- 3.8E-02	U	pCi/g		6.54E-02	1.00E-01	
		K-40	1.13E+01 +- 1.4E+00		pCi/g		1.87E-01		
		RA-226	4.12E-01 +- 7.4E-02		pCi/g		3.98E-02		
J1TLC1									
	M3R651AJ	AMERICIUM 241	-7.30E-03 +- 2.4E-02	U	pCi/g		4.08E-02		
		CO-60	4.80E-02 +- 1.9E-02	U	pCi/g		3.72E-02	5.00E-02	
		CS-137	8.51E-02 +- 2.9E-02		pCi/g		2.78E-02	1.00E-01	
		EU-152	3.58E-04 +- 3.9E-02	U	pCi/g		6.39E-02	1.00E-01	
		EU-154	-8.83E-03 +- 5.0E-02	U	pCi/g		8.60E-02	1.00E-01	
		EU-155	2.58E-02 +- 3.8E-02	U	pCi/g		6.32E-02	1.00E-01	
		K-40	1.16E+01 +- 1.4E+00		pCi/g		2.29E-01		
		RA-226	4.05E-01 +- 7.5E-02		pCi/g		4.64E-02		
4140025 SRTOT_SEP_PRECIP_GPC									
J1TL91									
	M3R6R1AD	STRONTIUM	4.91E-02 +- 1.5E-01	U	pCi/g	96%	3.50E-01		
J1TL92									
	M3R6T1AD	STRONTIUM	-1.35E-02 +- 1.3E-01	U	pCi/g	97%	3.18E-01		
J1TL93									
	M3R6V1AD	STRONTIUM	8.24E-02 +- 1.5E-01	U	pCi/g	94%	3.27E-01		
J1TL94									
	M3R6W1AD	STRONTIUM	1.53E-01 +- 1.8E-01	U	pCi/g	89%	3.72E-01		
J1TL94 DUP									
	M3R6W1AK	STRONTIUM	9.91E-02 +- 1.6E-01	U	pCi/g	89%	3.53E-01		42.9
J1TL95									
	M3R6X1AD	STRONTIUM	8.75E-02 +- 1.7E-01	U	pCi/g	85%	3.63E-01		
J1TL96									
	M3R601AD	STRONTIUM	1.41E-01 +- 1.7E-01	U	pCi/g	97%	3.46E-01		

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Sample Results Summary

TestAmerica Inc TARL

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

Date: 27-May-14

Report No. : 60360

5/31/14

SDG No: JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140025 SRTOT_SEP_PRECIP_GPC									
J1TL97									
	M3R611AD	STRONTIUM	3.26E-02 +- 1.4E-01	U	pCi/g	93%	3.30E-01		
J1TL98									
	M3R621AD	STRONTIUM	8.83E-02 +- 1.5E-01	U	pCi/g	97%	3.14E-01		
J1TL99									
	M3R631AD	STRONTIUM	2.03E-01 +- 1.7E-01	U	pCi/g	97%	3.39E-01		
J1TLC0									
	M3R641AD	STRONTIUM	1.33E-01 +- 1.5E-01	U	pCi/g	99%	3.19E-01		
J1TLC1									
	M3R651AD	STRONTIUM	9.83E-02 +- 1.5E-01	U	pCi/g	94%	3.32E-01		
4142031 SRTOT_SEP_PRECIP_GPC									
J1TL89									
	M3R6N2AD	STRONTIUM	2.98E-01 +- 2.2E-01	U	pCi/g	88%	4.02E-01		
J1TL90									
	M3R6Q2AD	STRONTIUM	1.52E-01 +- 1.6E-01	U	pCi/g	91%	3.35E-01		
4140027 TRITIUM_DIST_LSC									
J1TL89									
	M3R6N1AH	H-3	2.55E-02 +- 3.7E-02	U J	pCi/g	100%	8.50E-02	1.00E+01	
J1TL90									
	M3R6Q1AH	H-3	1.28E-02 +- 2.2E-02	U J	pCi/g	100%	6.01E-02	1.00E+01	
J1TL91									
	M3R6R1AH	H-3	-1.28E-02 +- 2.4E-02	U J	pCi/g	100%	6.16E-02	1.00E+01	
J1TL92									
	M3R6T1AH	H-3	1.73E-02 +- 2.6E-02	U J	pCi/g	100%	6.01E-02	1.00E+01	
J1TL93									
	M3R6V1AH	H-3	6.53E-03 +- 2.8E-02	U J	pCi/g	100%	6.68E-02	1.00E+01	
J1TL93 DUP									
	M3R6V1AK	H-3	3.25E-02 +- 2.9E-02	U	pCi/g	100%	6.24E-02	1.00E+01	133.1
J1TL94									
	M3R6W1AH	H-3	3.25E-02 +- 3.1E-02	U J	pCi/g	100%	6.89E-02	1.00E+01	
J1TL95									
	M3R6X1AH	H-3	6.73E-02 +- 3.5E-02	U J	pCi/g	100%	7.14E-02	1.00E+01	
J1TL96									
	M3R601AH	H-3	-4.07E-03 +- 1.7E-02	U J	pCi/g	100%	4.12E-02	1.00E+01	
J1TL97									
	M3R611AH	H-3	-7.57E-04 +- 3.1E-02	U J	pCi/g	100%	7.61E-02	1.00E+01	
J1TL98									
	M3R621AH	H-3	-1.49E-02 +- 2.5E-02	U J	pCi/g	100%	6.47E-02	1.00E+01	
J1TL99									

TestAmerica Inc

rptTALRchSaSummary2 V5.3.2 A2002

RPD - Relative Percent Difference.

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

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360 5/31/14 **SDG No:** JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140027 TRITIUM_DIST_LSC									
	J1TL99								
	M3R631AH	H-3	3.14E-02 +- 2.2E-02	U J	pCi/g	100%	4.65E-02	1.00E+01	
	J1TLC0								
	M3R641AH	H-3	2.80E-02 +- 3.0E-02	U J	pCi/g	100%	6.60E-02	1.00E+01	
	J1TLC1								
	M3R651AH	H-3	1.93E-02 +- 2.5E-02	U J	pCi/g	100%	5.75E-02	1.00E+01	
4140028 NI63_LSC									
	J1TL89								
	M3R6N1AE	NI-63	-3.64E-01 +- 2.4E+00	U	pCi/g	97%	5.26E+00	3.00E+01	
	J1TL90								
	M3R6Q1AE	NI-63	-5.09E-01 +- 2.4E+00	U	pCi/g	97%	5.25E+00	3.00E+01	
	J1TL91								
	M3R6R1AE	NI-63	6.65E-01 +- 2.3E+00	U	pCi/g	97%	5.02E+00	3.00E+01	
	J1TL92								
	M3R6T1AE	NI-63	-3.85E-01 +- 2.3E+00	U	pCi/g	87%	5.22E+00	3.00E+01	
	J1TL92 DUP								
	M3R6T1AK	NI-63	2.24E+00 +- 2.7E+00	U	pCi/g	90%	5.67E+00	3.00E+01	283.2
	J1TL93								
	M3R6V1AE	NI-63	9.69E-01 +- 2.4E+00	U	pCi/g	97%	5.01E+00	3.00E+01	
	J1TL94								
	M3R6W1AE	NI-63	1.79E-01 +- 2.4E+00	U	pCi/g	93%	5.25E+00	3.00E+01	
	J1TL95								
	M3R6X1AE	NI-63	1.55E+00 +- 2.4E+00	U	pCi/g	99%	5.06E+00	3.00E+01	
	J1TL96								
	M3R601AE	NI-63	2.43E+00 +- 2.4E+00	U	pCi/g	99%	4.78E+00	3.00E+01	
	J1TL97								
	M3R611AE	NI-63	-8.92E-01 +- 2.4E+00	U	pCi/g	94%	5.45E+00	3.00E+01	
	J1TL98								
	M3R621AE	NI-63	2.48E+00 +- 2.6E+00	U	pCi/g	95%	5.25E+00	3.00E+01	
	J1TL99								
	M3R631AE	NI-63	6.80E-01 +- 2.4E+00	U	pCi/g	99%	5.17E+00	3.00E+01	
	J1TLC0								
	M3R641AE	NI-63	1.92E+00 +- 2.4E+00	U	pCi/g	100%	4.89E+00	3.00E+01	
	J1TLC1								
	M3R651AE	NI-63	5.54E+00 +- 2.7E+00		pCi/g	99%	5.04E+00	3.00E+01	
4140058 7196_CR6									
	J1TL89								
	~~M3R6N1AA~~	~~HEXCHROME~~	~~1.55E-01 +- 0.0E+00~~	~~U~~ 5/29/14	~~mg/kg~~	~~N/A~~	~~1.55E-01~~	~~1.55E-01~~	
	M3R6N1AM	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	3.50E-01	0.0

TestAmerica Inc

rptTALRchSaSum mary2 V5.3.2 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, 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 27, 2014

Attention: Joan Kessner

SAF Number	:	RC-189
Date SDG Closed	:	May 19, 2014
Number of Samples	:	Thirteen (13)
Sample Type	:	Soil
SDG Number	:	JP0802
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On May 19, 2014, thirteen 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
J1TL89	M3R6N	SOIL	5/19/14
J1TL90	M3R6Q	SOIL	5/19/14
J1TL91	M3R6R	SOIL	5/19/14
J1TL92	M3R6T	SOIL	5/19/14
J1TL93	M3R6V	SOIL	5/19/14
J1TL94	M3R6W	SOIL	5/19/14
J1TL95	M3R6X	SOIL	5/19/14
J1TL96	M3R60	SOIL	5/19/14
J1TL97	M3R61	SOIL	5/19/14
J1TL98	M3R62	SOIL	5/19/14
J1TL99	M3R63	SOIL	5/19/14
J1TLC0	M3R64	SOIL	5/19/14
J1TLC1	M3R65	SOIL	5/19/14

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-002
Thorium-228,230,232 by method RL-ALP-005
Uranium 234, 235 and 238 by method RL-ALP-015
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005
Nickel-63 by method RL-LCS-017
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002:
The LCS, batch blank, samples and sample duplicate (J1TL89) results are within contractual requirements.

Thorium-228,230,232 by method RL-ALP-005:
The LCS, batch blank, samples and sample duplicate (J1TL91) results are within contractual requirements.

Uranium 234, 235 and 238 by method RL-ALP-015:
The LCS, batch blank, samples and sample duplicate (J1TL90) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
Samples J1TL89 and J1TL90 were inadvertently poured together during separations. They were reanalyzed in batch 4142031 for acceptable results. Except as noted; the LCS, batch blank, samples and sample duplicate (J1TL94) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The CRDL was not met for some of the analytes. Except as noted, the LCS, batch blank, samples and sample duplicate (J1TL95) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-005:
The LCS, batch blank, samples and sample duplicate (J1TL93) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:
The LCS, batch blank, samples and sample duplicate (J1TL92) results are within contractual requirements.

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The matrix spike recovered low at 70%. The post digestive matrix spike recovered at 88% and the insoluble matrix spike recovered at 97%. This implies a reducing capacity in the sample, but not enough to exhaust the more copious insoluble matrix spike. Except as noted; the LCS, batch blank, samples, sample duplicate (J1TL89) and sample matrix spike (J1TL89) 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

Clouseau
Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: 10-27099
NCM Initiated By: Tom Mcginnis
Date Opened: 05/27/2014
Date Closed:

Classification: Deficiency
Status: [illegible]
Production Area: Environmental - Sep
Tests: SrTot by GPC
Lot #'s (Sample #'s): J4E190420 (1,2), J4E220000 (31),
QC Batches: 4142031,

Nonconformance: Other (describe in detail)
Subcategory: Other (explanation required)

Problem Description / Root Cause

Name	Date	Description
Tom Mcginnis	05/27/2014	Samples J4E190420-1 and 2 were cross contaminated during initial analysis batch 4140025. Samples were reanalyzed as batch 4142031. All final results meet acceptance criteria.

Corrective Action

Name	Date	Corrective Action
Tom Mcginnis	05/27/2014	The PM was notified of the batch issues.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note
	Response	Response Note			

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

Date Printed: 5/27/2014

Page 1 of 1

Clouseau
Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: 10-27107
NCM Initiated By: Hooshang Rahavi
Date Opened: 05/27/2014
Date Closed:

Classification: Anomaly
Status: [redacted]
Production Area: Classical Chemistry
Tests: None
Lot #'s (Sample #'s): J4E190420 (1),
QC Batches: None.,

Nonconformance: QC data exceeded criteria
Subcategory: MS/MSD accuracy and/or precision out of control

Problem Description / Root Cause

Name	Date	Description
Hooshang Rahavi	05/27/2014	The MS recovered low at 69.9%. The insoluble MS recovered within limits at 97.1%. PDMS recovered at limit 88.3%.

Corrective Action

Name	Date	Corrective Action
Hooshang Rahavi	05/27/2014	Suspect reducing capacity in the sample, but not enough to exhaust the more copious insoluble MS.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

Date Printed: 5/27/2014

Page 1 of 1

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-290

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: N/A	Field Logbook No.: EL-1652-~~11~~ 12 5/16/14	COA: 000N822000	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 4C

Preservation	Cool 4C	None	None	None	None	None	None	None	None		
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	125mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL			
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Nickel-63	Strontium-89,90 -- Total Sr	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Tritium - H3 Low Level Soil			

Sample No.	Matrix	Sample Date	Sample Time										
J1TL89 M3R16N	SOIL	5-16-14	0727	X	X	X	X	X	X	X	X		
J1TL90 M3R16Q	SOIL	5-16-14	0736	X	X	X	X	X	X	X	X		
J1TL91 M3R16R	SOIL	5-16-14	0743	X	X	X	X	X	X	X	X		
J1TL92 M3R16T	SOIL	5-16-14	0750	X	X	X	X	X	X	X	X		
J1TL93 M3R16V	SOIL	5-16-14	0755	X	X	X	X	X	X	X	X		

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWShea DWSHEA	5/16/14 1141
DWShea DWSHEA	5/16/14 1324	Fedex 3C 4x60 Bubble	5/16/14 1324
Fedex 3C 4x60 Bubble	5/19/14 0958	DWShea DWSHEA	5/19/14 0958
DWShea DWSHEA	5/19/14 1006	SM Saxon	5/19/14 1006
SM Saxon	5/19/14 1340	J. Cook TAUL	5-19-14 1340

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

SPECIAL INSTRUCTIONS
(2) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}

J4E190420

Due 5-27-14

REVIEWED BY Kwood VTS CRAI DATE 5/19/14

JP0802

J4E190420

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 2 of 3
Collector: O. Stowe	Company Contact: Joan Kessner; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7days; Data Turnaround
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)	SAF No.: RC-189	
Ice Chest No.	Field Logbook No.: DWSHEA EL-1652-1/12 5/16/14; COA: 000N822000	Method of Shipment: Local Delivery	
Shipped To: TestAmerica Richland	Offsite Property No.	Bill of Lading/Air Bill No.	
Other Labs Shipped To: TestAmerica Denver			

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	None	None	None	None	None	None	None	None		
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	125mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL			
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Nickel-63	Strontium-89,90 -- Total Sr	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Tritium - H3 Low Level Soil			
Sample No.	Matrix	Sample Date	Sample Time								
J1TL94 M3R60	SOIL	5-16-14	0803	X	X	X	X	X	X	X	X
J1TL95 M3R61	SOIL	5-16-14	0810	X	X	X	X	X	X	X	X
J1TL96 M3R60	SOIL	5-16-14	0819	X	X	X	X	X	X	X	X
J1TL97 M3R61	SOIL	5-16-14	0834	X	X	X	X	X	X	X	X
J1TL98 M3R62	SOIL	5-16-14	0842	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Chinoy Stowe 5-16-14 1141	Received By/Stored In: DWSHEA DWSHEA 5/16/14 1141
Relinquished By/Removed From: DWSHEA DWSHEA 5/16/14 1324	Received By/Stored In: 1060 Battelle Fridge 3C 5/16/14 1324
Relinquished By/Removed From: Fridge 3C 1060 Battelle 5/19/14 0958	Received By/Stored In: DWSHEA DWSHEA 5/19/14 0958
Relinquished By/Removed From: DWSHEA DWSHEA 5/19/14 1006	Received By/Stored In: SM Sexton 1006 5/19/14
Relinquished By/Removed From: SM Sexton 5/19/14 1340	Received By/Stored In: JBOCK JBOCK TALL 5/19/14 1340
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)

JYE190420
Due 5-22-14

REVIEWED BY K. Wood
DATE 5/19/14

JP0802

WCH-EE-011

TestAmerica Laboratories, Inc.

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Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-290 | Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.	Field Logbook No.: EL-1652-1/12 DWShea 5/16/14	COA: 000N822000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.		Bill of Lading/Air Bill No.
Other Labs Shipped To: TestAmerica Denver			

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	None	None	None	None	None	None	None		
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	125mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL		
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Nickel-63	Strontium-89,90 – Total Sr	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Tritium - H3 Low Level Soil		

Sample No.	Matrix	Sample Date	Sample Time										
J1TL99 m3RL03	SOIL	5-16-14	0848	X	X	X	X	X	X	X	X		
J1TLC0 m3RL04	SOIL	5-16-14	0854	X	X	X	X	X	X	X	X		
J1TLC1 m3RL05	SOIL	5-16-14	~~0829~~ 0819	X	X	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWShea DWSHEA	5/16/14 1141
DWShea DWSHEA	5/16/14 1324	Fridge 3 1060 Bldg 16	5/16/14 1324
Fridge 3 1060 Bldg 16	5/19/14 0955	DWShea DWShea	5/19/14 0955
DWShea DWSHEA	5/19/14 1006	SM Sexton	5/19/14 1006
SM Sexton WCH	5/19/14 1340	JBock JBock WCH	5-19-14 1340

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)

J4E190420

Due 5-27-14

REVIEWED BY K. [illegible] DATE 5/19/14

JP0802

WCH-EE-011

TestAmerica Laboratories, Inc.

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Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-N-82		DATA PACKAGE:	JP0802	
VALIDATOR:	ELR	LAB: TAL		DATE: 5/30/4	
			SDG: JP0802		
ANALYSES PERFORMED					
☐ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☒ Tritium	Xn4-63		
SAMPLES/MATRIX					
J1FL89	J1FL90	J1FL91	J1FL92	J1FL93	
J1FL94	J1FL95	J1FL96	J1FL97	J1FL98	
J1FL99	J1FL00	J1FL01			
					Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments: no - PU238, th228, th232, U235 - fail LCS

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 ms -3H - J alf

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Comments: No FS or PAS

12. Holding Times (All levels)

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

Comments: _____

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

Results reported for all required sample analyses? Yes No N/A

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

Results Acceptable? (Levels D, E) Yes No N/A

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

MDA's meet required detection limits? Yes No N/A

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

Comments:

MDA – ~~[illegible]~~ 11 are

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 27-May-14

Report No. : 60360

SDG No.: JP0802

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
PUISO_PLATE_AEA								
4140031 BLANK QC,								
M3TAX1AA	Pu-238	2.33E-02 +- 4.2E-02	U	pCi/g	96%			8.24E-02
	PU239/40	1.40E-02 +- 2.9E-02	U	pCi/g	96%			5.31E-02
4140031 LCS,								
M3TAX1AC	PU239/40	7.52E+00 +- 1.5E+00		pCi/g	87%	109%	0.1	7.08E-02
THISO_IE_PLATE_AEA								
4140029 BLANK QC,								
M3TAV1AA	Th-228	5.12E-02 +- 5.3E-02	U	pCi/g	100%			5.26E-02
	Th-230	0.00E+00 +- 2.6E-02	U	pCi/g	100%			3.51E-02
	Th-232	0.00E+00 +- 2.6E-02	U	pCi/g	100%			3.51E-02
4140029 LCS,								
M3TAV1AC	Th-230	2.48E+00 +- 5.7E-01		pCi/g	86%	109%	0.1	6.49E-02
UISO_IE_PLATE_AEA								
4140030 BLANK QC,								
M3TAW1AA	U-234	2.68E-02 +- 4.0E-02	U	pCi/g	93%			5.62E-02
	U-235	0.00E+00 +- 2.8E-02	U	pCi/g	93%			3.78E-02
	U-238	-1.12E-03 +- 2.8E-02	U	pCi/g	93%			5.62E-02
4140030 LCS,								
M3TAW1AC	U-234	2.89E+00 +- 6.7E-01		pCi/g	85%	87%	-0.1	7.96E-02
	U-238	2.86E+00 +- 6.6E-01		pCi/g	85%	82%	-0.2	8.22E-02
GAMMA_GS								
4140024 BLANK QC,								
M3TAM1AA	AMERICIUM 241	-2.27E-02 +- 4.8E-02	U	pCi/g				7.67E-02
	CO-60	9.47E-03 +- 1.5E-02	U	pCi/g				3.02E-02
	CS-137	-7.87E-03 +- 1.5E-02	U	pCi/g				2.57E-02
	EU-152	-8.32E-04 +- 4.8E-02	U	pCi/g				7.32E-02
	EU-154	-1.22E-02 +- 4.9E-02	U	pCi/g				8.64E-02
	EU-155	-1.86E-02 +- 3.5E-02	U	pCi/g				5.91E-02
	K-40	1.01E-01 +- 3.4E-01	U	pCi/g				7.10E-01
	RA-226	1.15E-01 +- 5.6E-02	U	pCi/g				8.30E-02
4140024 LCS,								
M3TAM1AC	CS-137	9.44E-01 +- 1.2E-01		pCi/g		94%	-0.1	2.86E-02
	RA-226	8.79E-01 +- 1.3E-01		pCi/g		77%	-0.2	5.83E-02
SRTOT_SEP_PRECIP_GPC								
4140025 BLANK QC,								
M3TAP1AA	STRONTIUM	7.84E-02 +- 1.6E-01	U	pCi/g	93%			3.55E-01
4140025 LCS,								
M3TAP1AC	STRONTIUM	3.65E+00 +- 9.1E-01		pCi/g	96%	110%	0.1	3.11E-01
SRTOT_SEP_PRECIP_GPC								
4142031 BLANK QC,								
M3T7G1AA	STRONTIUM	5.09E-02 +- 1.6E-01	U	pCi/g	93%			3.63E-01

TestAmerica Inc rptSTLRchQcSummary V5.3.2 A2002

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

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

QC Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 27-May-14

Report No. : 60360

SDG No.: JP0802

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
4142031 LCS,								
M3T7G1AC	STRONTIUM	3.49E+00 +- 9.2E-01		pCi/g	90%	106%	0.1	3.89E-01
TRITIUM_DIST_LSC								
4140027 BLANK QC,								
M3TAR1AA	H-3	1.93E-02 +- 4.0E-02	U	pCi/g	100%			9.15E-02
4140027 LCS,								
M3TAR1AC	H-3	3.30E-01 +- 5.7E-02		pCi/g	100%	95%	0.0	8.25E-02
NI63_LSC								
4140028 BLANK QC,								
M3TAT1AA	Ni-63	8.00E-01 +- 2.4E+00	U	pCi/g	97%			5.04E+00
4140028 LCS,								
M3TAT1AC	Ni-63	2.11E+02 +- 1.6E+01		pCi/g	100%	85%	-0.1	4.89E+00
7196_CR6								
4140058 MATRIX SPIKE, J1TL89								
M3R6N1AL	HEXCHROME	2.14E+01 +- 0.0E+00		mg/kg	N/A	70%	-0.3	1.55E-01
4140058 LCS,								
M3TDF1AC	HEXCHROME	1.77E+01 +- 0.0E+00		mg/kg	N/A	88%	-0.1	1.55E-01
4140058 BLANK QC,								
M3TDF1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 33

TestAmerica Inc
rptSTLRchQcSummary V6.3.2 A2002

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

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

Date: 2 June 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-82
Subject: Inorganics - Data Package No. JP0802-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0802 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
J1TL89	5/16/14	Soil	C	See note 1
J1TL90	5/16/14	Soil	C	See note 1
J1TL91	5/16/14	Soil	C	See note 1
J1TL92	5/16/14	Soil	C	See note 1
J1TL93	5/16/14	Soil	C	See note 1
J1TL94	5/16/14	Soil	C	See note 1
J1TL95	5/16/14	Soil	C	See note 1
J1TL96	5/16/14	Soil	C	See note 1
J1TL97	5/16/14	Soil	C	See note 1
J1TL98	5/16/14	Soil	C	See note 1
J1TL99	5/16/14	Soil	C	See note 1
J1TLC0	5/16/14	Soil	C	See note 1
J1TLC1	5/16/14	Soil	C	See note 1
J1tLC2	5/16/14	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-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.

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.

All preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1TLC2) was submitted for analysis. Ten analytes were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

Due to matrix spike recoveries outside QC limits, all antimony (52%) and silicon (7%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (25%) 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 (J1TL96/J1TLC1) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. JP0802 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 matrix spike recoveries outside QC limits, all antimony (52%) and silicon (7%) results were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits, all silicon (25%) 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: JP0802	**REVIEWER: ELR**	**Project: 100-N-82**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
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: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL89

Lab Sample ID: 280-55619-1
Client Matrix: Solid
% Moisture: 2.2

Date Sampled: 05/16/2014 0727
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.14 g
Analysis Date:	05/22/2014 0105			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

V 5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		9140		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		2.6		0.59	0.90
Barium		78.4		0.068	0.45
Beryllium		0.35		0.030	0.18
Boron		1.6	B	0.88	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		4010		12.6	44.8
Chromium		11.0		0.052	0.18
Cobalt		7.5	X	0.090	0.90
Copper		16.1		0.19	0.90
Iron		20200		3.4	4.5
Lead		4.7		0.24	0.45
Magnesium		4430		3.3	17.9
Manganese		354		0.090	0.90
Molybdenum		0.28	B	0.23	1.8
Nickel		12.0	X	0.11	3.6
Potassium		1870		36.8	269
Selenium		0.77	U	0.77	0.90
Silicon		441	N X J	5.1	9.0
Silver		0.14	U	0.14	0.18
Sodium		293		52.9	108
Vanadium		46.7		0.084	1.8
Zinc		42.4	X	0.36	0.90

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.54 g
Analysis Date:	05/22/2014 1944			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL90

Lab Sample ID: 280-55619-2
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 0736
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.11 g
Analysis Date:	05/22/2014 0113			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7580		1.4	4.6
Antimony		0.35	U J	0.35	0.55
Arsenic		2.6		0.61	0.92
Barium		46.9		0.070	0.46
Beryllium		0.31		0.031	0.18
Boron		1.0	B	0.91	1.8
Cadmium		0.038	U	0.038	0.18
Calcium		4490		13.0	46.2
Chromium		7.9		0.054	0.18
Cobalt		7.3	X	0.092	0.92
Copper		24.3		0.20	0.92
Iron		19400		3.5	4.6
Lead		4.0		0.25	0.46
Magnesium		5080		3.4	18.5
Manganese		349		0.092	0.92
Molybdenum		0.24	U	0.24	1.8
Nickel		12.1	X	0.11	3.7
Potassium		962		37.9	277
Selenium		0.80	U	0.80	0.92
Silicon		264	X J	5.2	9.2
Silver		0.15	U	0.15	0.18
Sodium		148		54.5	111
Vanadium		39.6		0.087	1.8
Zinc		39.4	X	0.37	0.92

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.56 g
Analysis Date:	05/22/2014 1951			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: **J1TL91**

Lab Sample ID: 280-55619-3
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 0743
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	05/22/2014 0115			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5980		1.5	4.8
Antimony		0.36	U J	0.36	0.57
Arsenic		2.4		0.63	0.95
Barium		38.7		0.072	0.48
Beryllium		0.25		0.031	0.19
Boron		0.93	U	0.93	1.9
Cadmium		0.039	U	0.039	0.19
Calcium		6070		13.4	47.5
Chromium		11.2		0.055	0.19
Cobalt		6.4	X	0.095	0.95
Copper		18.0		0.21	0.95
Iron		18000		3.6	4.8
Lead		2.8		0.26	0.48
Magnesium		4540		3.5	19.0
Manganese		258		0.095	0.95
Molybdenum		0.25	U	0.25	1.9
Nickel		13.9	X	0.12	3.8
Potassium		865		39.0	285
Selenium		0.82	U	0.82	0.95
Silicon		263	X J	5.4	9.5
Silver		0.15	U	0.15	0.19
Sodium		220		56.1	114
Vanadium		51.0		0.089	1.9
Zinc		36.5	X	0.38	0.95

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.64 g
Analysis Date:	05/22/2014 1953			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0055	B	0.0053	0.016

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL92

Lab Sample ID: 280-55619-4
Client Matrix: Solid
% Moisture: 2.4

Date Sampled: 05/16/2014 0750
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	05/22/2014 0118			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7000		1.4	4.4
Antimony		0.34	U J	0.34	0.53
Arsenic		2.4		0.58	0.88
Barium		62.9		0.067	0.44
Beryllium		0.27		0.029	0.18
Boron		0.87	U	0.87	1.8
Cadmium		0.036	U	0.036	0.18
Calcium		8530		12.5	44.2
Chromium		10.3		0.051	0.18
Cobalt		5.9	X	0.088	0.88
Copper		15.4		0.19	0.88
Iron		18300		3.4	4.4
Lead		3.3		0.24	0.44
Magnesium		4480		3.3	17.7
Manganese		257		0.088	0.88
Molybdenum		0.23	U	0.23	1.8
Nickel		9.6	X	0.11	3.5
Potassium		1030		36.2	265
Selenium		0.76	U	0.76	0.88
Silicon		220	X J	5.0	8.8
Silver		0.14	U	0.14	0.18
Sodium		406		52.1	106
Vanadium		46.1		0.083	1.8
Zinc		34.7	X	0.35	0.88

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.71 g
Analysis Date:	05/22/2014 2000			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0048	U	0.0048	0.015

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL93

Lab Sample ID: 280-55619-5
Client Matrix: Solid

% Moisture: 2.8

Date Sampled: 05/16/2014 0755
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	05/22/2014 0129			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8480		1.4	4.4
Antimony		0.33	U J	0.33	0.53
Arsenic		2.5		0.58	0.88
Barium		72.4		0.067	0.44
Beryllium		0.35		0.029	0.18
Boron		1.3	B	0.86	1.8
Cadmium		0.036	U	0.036	0.18
Calcium		3850		12.4	44.0
Chromium		10.6		0.051	0.18
Cobalt		7.0	X	0.088	0.88
Copper		15.2		0.19	0.88
Iron		19400		3.3	4.4
Lead		4.8		0.24	0.44
Magnesium		4180		3.3	17.6
Manganese		340		0.088	0.88
Molybdenum		0.26	B	0.23	1.8
Nickel		12.1	X	0.11	3.5
Potassium		1790		36.0	264
Selenium		0.76	U	0.76	0.88
Silicon		329	X J	5.0	8.8
Silver		0.14	U	0.14	0.18
Sodium		265		51.9	106
Vanadium		46.7		0.083	1.8
Zinc		40.7	X	0.35	0.88

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.65 g
Analysis Date:	05/22/2014 2002			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0058	B	0.0053	0.016

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL94

Lab Sample ID: 280-55619-6
Client Matrix: Solid
% Moisture: 4.4

Date Sampled: 05/16/2014 0803
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	05/22/2014 0131			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

✓ 5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5550		1.5	4.8
Antimony		0.36	U J	0.36	0.58
Arsenic		2.0		0.63	0.96
Barium		47.5		0.073	0.48
Beryllium		0.24		0.032	0.19
Boron		0.94	U	0.94	1.9
Cadmium		0.039	U	0.039	0.19
Calcium		3990		13.5	48.0
Chromium		9.0		0.056	0.19
Cobalt		6.2	X	0.096	0.96
Copper		16.3		0.21	0.96
Iron		17300		3.6	4.8
Lead		2.9		0.26	0.48
Magnesium		4090		3.6	19.2
Manganese		242		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		9.2	X	0.12	3.8
Potassium		836		39.3	288
Selenium		0.83	U	0.83	0.96
Silicon		240	X J	5.4	9.6
Silver		0.15	U	0.15	0.19
Sodium		193		56.6	115
Vanadium		47.1		0.090	1.9
Zinc		37.0	X	0.38	0.96

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.54 g
Analysis Date:	05/22/2014 2005			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL95

Lab Sample ID: 280-55619-7
Client Matrix: Solid
% Moisture: 2.2

Date Sampled: 05/16/2014 0810
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.03 g
Analysis Date:	05/22/2014 0133			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7040		1.5	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		2.2		0.66	0.99
Barium		70.5		0.075	0.50
Beryllium		0.29		0.033	0.20
Boron		1.2	B	0.97	2.0
Cadmium		0.041	U	0.041	0.20
Calcium		3730		14.0	49.6
Chromium		9.2		0.058	0.20
Cobalt		6.8	X	0.099	0.99
Copper		14.7		0.22	0.99
Iron		16600		3.8	5.0
Lead		3.9		0.27	0.50
Magnesium		3630		3.7	19.9
Manganese		268		0.099	0.99
Molybdenum		0.26	U	0.26	2.0
Nickel		9.4	X	0.12	4.0
Potassium		1430		40.7	298
Selenium		0.85	U	0.85	0.99
Silicon		386	X J	5.6	9.9
Silver		0.16	U	0.16	0.20
Sodium		195		58.6	119
Vanadium		39.5		0.093	2.0
Zinc		34.4	X	0.40	0.99

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.60 g
Analysis Date:	05/22/2014 2007			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL96

Lab Sample ID: 280-55619-8
Client Matrix: Solid

% Moisture: 1.9

Date Sampled: 05/16/2014 0819
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	05/22/2014 0135			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

✓ 5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6610		1.4	4.7
Antimony		0.36	U J	0.36	0.56
Arsenic		2.6		0.62	0.94
Barium		65.6		0.071	0.47
Beryllium		0.31		0.031	0.19
Boron		1.1	B	0.92	1.9
Cadmium		0.038	U	0.038	0.19
Calcium		6460		13.2	46.8
Chromium		7.2		0.054	0.19
Cobalt		7.9	X	0.094	0.94
Copper		18.8		0.20	0.94
Iron		22400		3.6	4.7
Lead		3.6		0.25	0.47
Magnesium		4470		3.5	18.7
Manganese		308		0.094	0.94
Molybdenum		0.24	U	0.24	1.9
Nickel		10.1	X	0.12	3.7
Potassium		1140		38.3	281
Selenium		0.80	U	0.80	0.94
Silicon		361	X J	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		313		55.2	112
Vanadium		57.4		0.088	1.9
Zinc		43.6	X	0.37	0.94

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.66 g
Analysis Date:	05/22/2014 2009			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0051	U	0.0051	0.016

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL97

Lab Sample ID: 280-55619-9
Client Matrix: Solid
% Moisture: 3.1

Date Sampled: 05/16/2014 0834
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.14 g
Analysis Date:	05/22/2014 0137			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/30/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5840		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		3.1		0.60	0.90
Barium		29.9		0.069	0.45
Beryllium		0.23		0.030	0.18
Boron		0.89	U	0.89	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		10900		12.8	45.2
Chromium		8.7		0.052	0.18
Cobalt		6.2	X	0.090	0.90
Copper		15.9		0.20	0.90
Iron		17600		3.4	4.5
Lead		2.7		0.24	0.45
Magnesium		4370		3.3	18.1
Manganese		249		0.090	0.90
Molybdenum		0.24	U	0.24	1.8
Nickel		9.8	X	0.11	3.6
Potassium		770		37.1	271
Selenium		0.78	U	0.78	0.90
Silicon		179	X J	5.1	9.0
Silver		0.14	U	0.14	0.18
Sodium		280		53.4	109
Vanadium		46.8		0.085	1.8
Zinc		34.2	X	0.36	0.90

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.62 g
Analysis Date:	05/22/2014 2012			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL98

Lab Sample ID: 280-55619-10
Client Matrix: Solid
% Moisture: 1.4

Date Sampled: 05/16/2014 0842
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.13 g
Analysis Date:	05/22/2014 0140			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4310		1.4	4.5
Antimony		0.34	U J	0.34	0.54
Arsenic		1.6		0.59	0.90
Barium		34.6		0.068	0.45
Beryllium		0.21		0.030	0.18
Boron		0.88	U	0.88	1.8
Cadmium		0.037	U	0.037	0.18
Calcium		6100		12.7	44.9
Chromium		6.0		0.052	0.18
Cobalt		6.3	X	0.090	0.90
Copper		18.5		0.19	0.90
Iron		17900		3.4	4.5
Lead		2.2		0.24	0.45
Magnesium		3670		3.3	18.0
Manganese		237		0.090	0.90
Molybdenum		0.24	B	0.23	1.8
Nickel		7.6	X	0.11	3.6
Potassium		751		36.8	269
Selenium		0.77	U	0.77	0.90
Silicon		217	X J	5.1	9.0
Silver		0.14	U	0.14	0.18
Sodium		258		53.0	108
Vanadium		43.4		0.084	1.8
Zinc		30.7	X	0.36	0.90

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.61 g
Analysis Date:	05/22/2014 2014			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TL99

Lab Sample ID: 280-55619-11
Client Matrix: Solid
% Moisture: 1.8

Date Sampled: 05/16/2014 0848
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.16 g
Analysis Date:	05/22/2014 0142			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6280		1.4	4.4
Antimony		0.33	U J	0.33	0.53
Arsenic		2.3		0.58	0.88
Barium		52.7		0.067	0.44
Beryllium		0.27		0.029	0.18
Boron		0.86	U	0.86	1.8
Cadmium		0.036	U	0.036	0.18
Calcium		5780		12.4	43.9
Chromium		8.2		0.051	0.18
Cobalt		6.5	X	0.088	0.88
Copper		15.8		0.19	0.88
Iron		18900		3.3	4.4
Lead		3.6		0.24	0.44
Magnesium		4000		3.2	17.6
Manganese		279		0.088	0.88
Molybdenum		0.23	U	0.23	1.8
Nickel		8.8	X	0.11	3.5
Potassium		1040		36.0	263
Selenium		0.76	U	0.76	0.88
Silicon		288	X J	5.0	8.8
Silver		0.14	U	0.14	0.18
Sodium		258		51.8	105
Vanadium		49.4		0.083	1.8
Zinc		38.9	X	0.35	0.88

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.59 g
Analysis Date:	05/22/2014 2016			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TLC0

Lab Sample ID: 280-55619-12
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 0854
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.01 g
Analysis Date:	05/22/2014 0144			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7310		1.6	5.1
Antimony		0.39	U J	0.39	0.61
Arsenic		2.7		0.67	1.0
Barium		52.3		0.077	0.51
Beryllium		0.32		0.034	0.20
Boron		1.0	U	1.0	2.0
Cadmium		0.042	U	0.042	0.20
Calcium		7620		14.3	50.8
Chromium		8.7		0.059	0.20
Cobalt		7.5	X	0.10	1.0
Copper		18.6		0.22	1.0
Iron		20900		3.9	5.1
Lead		3.7		0.27	0.51
Magnesium		4750		3.8	20.3
Manganese		301		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		10.3	X	0.13	4.1
Potassium		1100		41.7	305
Selenium		0.87	U	0.87	1.0
Silicon		323	X J	5.8	10.2
Silver		0.16	U	0.16	0.20
Sodium		321		60.0	122
Vanadium		52.0		0.096	2.0
Zinc		40.4	X	0.40	1.0

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.64 g
Analysis Date:	05/22/2014 2018			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0056	B	0.0053	0.016

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TLC1

Lab Sample ID: 280-55619-13
Client Matrix: Solid
% Moisture: 1.7

Date Sampled: 05/16/2014 0819
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	05/22/2014 0146			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6890		1.5	4.8
Antimony		0.36	U J	0.36	0.58
Arsenic		2.4		0.63	0.96
Barium		65.5		0.073	0.48
Beryllium		0.33		0.032	0.19
Boron		1.2	B	0.94	1.9
Cadmium		0.039	U	0.039	0.19
Calcium		7340		13.5	48.0
Chromium		8.5		0.056	0.19
Cobalt		7.0	X	0.096	0.96
Copper		16.5		0.21	0.96
Iron		20800		3.6	4.8
Lead		3.7		0.26	0.48
Magnesium		4300		3.5	19.2
Manganese		312		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		9.4	X	0.12	3.8
Potassium		1250		39.3	288
Selenium		0.83	U	0.83	0.96
Silicon		427	X J	5.4	9.6
Silver		0.15	U	0.15	0.19
Sodium		276		56.6	115
Vanadium		51.4		0.090	1.9
Zinc		41.7	X	0.38	0.96

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.70 g
Analysis Date:	05/22/2014 2021			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0062	B	0.0048	0.015

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Client Sample ID: J1TLC2

Lab Sample ID: 280-55619-14
Client Matrix: Solid
% Moisture: 0.0

Date Sampled: 05/16/2014 0724
Date Received: 05/20/2014 0940

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-226977	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	05/22/2014 0148			Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				

5/31/14

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		96.9		1.5	4.7
Antimony		0.36	U J	0.36	0.57
Arsenic		0.62	U	0.62	0.94
Barium		1.1		0.072	0.47
Beryllium		0.031	U	0.031	0.19
Boron		0.92	U	0.92	1.9
Cadmium		0.039	U	0.039	0.19
Calcium		20.1	B	13.3	47.2
Chromium		0.13	B	0.055	0.19
Cobalt		0.094	U X	0.094	0.94
Copper		0.20	U	0.20	0.94
Iron		135		3.6	4.7
Lead		0.25	U	0.25	0.47
Magnesium		10.9	B	3.5	18.9
Manganese		2.8		0.094	0.94
Molybdenum		0.25	U	0.25	1.9
Nickel		0.12	U X	0.12	3.8
Potassium		38.7	U	38.7	283
Selenium		0.81	U	0.81	0.94
Silicon		105	X J	5.3	9.4
Silver		0.15	U	0.15	0.19
Sodium		55.7	U	55.7	113
Vanadium		0.22	B	0.089	1.9
Zinc		0.46	B X	0.38	0.94

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0			Initial Weight/Volume:	.55 g
Analysis Date:	05/22/2014 2028			Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-55619-1

SDG #: JP0802
SAF#: RC-189

Date SDG Closed: May 20, 2014
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1TL89	280-55619-1	6010/7471/353.2	6010B/7471A/353.2
J1TL90	280-55619-2	6010/7471/353.2	6010B/7471A/353.2
J1TL91	280-55619-3	6010/7471/353.2	6010B/7471A/353.2
J1TL92	280-55619-4	6010/7471/353.2	6010B/7471A/353.2
J1TL93	280-55619-5	6010/7471/353.2	6010B/7471A/353.2
J1TL94	280-55619-6	6010/7471/353.2	6010B/7471A/353.2
J1TL95	280-55619-7	6010/7471/353.2	6010B/7471A/353.2
J1TL96	280-55619-8	6010/7471/353.2	6010B/7471A/353.2
J1TL97	280-55619-9	6010/7471/353.2	6010B/7471A/353.2
J1TL98	280-55619-10	6010/7471/353.2	6010B/7471A/353.2
J1TL99	280-55619-11	6010/7471/353.2	6010B/7471A/353.2
J1TLC0	280-55619-12	6010/7471/353.2	6010B/7471A/353.2
J1TLC1	280-55619-13	6010/7471/353.2	6010B/7471A/353.2
J1TLC2	280-55619-14	6010/7471	6010B/7471A

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

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

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

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

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

RECEIPT
The samples were received on 5/20/2014 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-226664 indicates that physical and chemical interferences are present for Cobalt, Nickel, Silicon and Zinc. Results have been flagged with an "X".

Low levels of Aluminum are present in the method blank associated with batch 280-226664. 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 J1TL89; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1TL89, 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.

No other anomalies were encountered.

GENERAL CHEMISTRY - MCAWW 353.2 - NITRATE NITRITE as N

No anomalies were encountered.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 1 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-08-063	Field Logbook No.: EL-1652-11 12 DWS 5/16/14	COA: 000N822000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A/3/143		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 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	125mL	125mL										
Sample Analysis	See Item (1) in Special Instructions	NO2/NO3-353.2										
Sample No.	Matrix	Sample Date	Sample Time									
J1TL89	SOIL	5-16-14	0727	X	X							
J1TL90	SOIL	5-16-14	0736	X	X							
J1TL91	SOIL	5-16-14	0743	X	X							
J1TL92	SOIL	5-16-14	0750	X	X							
J1TL93	SOIL	5-16-14	0755	X	X							

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: Quincy Stowe	Received By/Stored In: DWSHEA DWSHEA	5-16-14 1141 / 5/16/14 1141
Relinquished By/Removed From: DWSHEA DWSHEA	Received By/Stored In: Fridge 3C 1060 Battelle	5/16/14 1324 / 5/16/14 1324
Relinquished By/Removed From: Fridge 3C 1060 Battelle	Received By/Stored In: DWSHEA DWSHEA	5/19/14 1005 / 5/19/14 1005
Relinquished By/Removed From: DWSHEA DWSHEA	Received By/Stored In: Fed Ex	5/19/14 1024
Relinquished By/Removed From:	Received By/Stored In:	5/20/14 9:40
Relinquished By/Removed From:	Received By/Stored In:	
Relinquished By/Removed From:	Received By/Stored In:	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By / Date/Time

SPECIAL INSTRUCTIONS

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

2.9 IR 4 1.5
MSD 5/20/14

REVIEWED BY SMS
DATE 5/19/14

JP0802

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 2 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-08-063	Field Logbook No.: EL-1652-1 DWS 12 5/16/14	COA: 000N822000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A131143		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 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	125mL	125mL										
Sample Analysis	See item (1) in Special Instructions	NO2/NO3 - 353.2										

Sample No.	Matrix	Sample Date	Sample Time										
J1TL94	SOIL	5-16-14	0803	X	X								
J1TL95	SOIL	5-16-14	0810	X	X								
J1TL96	SOIL	5-16-14	0819	X	X								
J1TL97	SOIL	5-16-14	0834	X	X								
J1TL98	SOIL	5-16-14	0842	X	X								

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: Quincy Stowe	Received By/Stored In: DWSHEA DWSHEA	5-16-14 1141
Relinquished By/Removed From: DWSHEA DWSHEA	Received By/Stored In: Fridge 3C 1060 Battelle	5/16/14 1324
Relinquished By/Removed From: Fridge 3C 1060 Battelle	Received By/Stored In: DWSHEA DWSHEA	5/16/14 1005
Relinquished By/Removed From: DWSHEA DWSHEA	Received By/Stored In: Fed Ex	5/19/14 1024
Relinquished By/Removed From:	Received By/Stored In:	5/20/14 9:40
Relinquished By/Removed From:	Received By/Stored In:	
Relinquished By/Removed From:	Received By/Stored In:	

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

SPECIAL INSTRUCTIONS

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

REVIEWED BY SMS DATE 5/19/14

JP0802

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Date Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-08-063	Field Logbook No.: DWS EL-1652-1/12 5/16/14	COA: 000N822000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A13/143		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 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	125mL	125mL										
Sample Analysis	See item (1) in Special Instructions	NO2/NO3 - 353.2										

Sample No.	Matrix	Sample Date	Sample Time										
J1TL99	SOIL	5-16-14	0848	X	X								
J1TLC0	SOIL	5-16-14	0854	X	X								
J1TLC1	SOIL	5-16-14	0819	X	X								
J1TLC2	SOIL	5-16-14	0724	X	— DWS 5/16/14								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA DWSHEA	5/16/14 1141
DWSHEA DWSHEA	5/16/14 1324	Fridge 3C 1029 Bathelle	5/16/14 1324
Fridge 3C 1029 Bathelle	5/19/14 1005	DWSHEA DWSHEA	5/19/14 1005
DWSHEA DWSHEA	5/19/14 1024	Fed Ex	
			5/19/14 9:40
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 SMS DATE 5/17/14

JP0802

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-N-82			DATA PACKAGE: JP0802		
VALIDATOR: FLR		LAB: TAL		DATE: 5/30/4	
			SDG: JP0802		

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

SAMPLES/MATRIX			
J1TL89	J1TL90	J1TL91	J1TL92
J1TL93	J1TL94	J1TL95	J1TL96
J1TL97	J1TL98	J1TL99	J1TC00
J1TLC1	J1TLC2		
			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:

FB – 10 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 (25%) – J all

MS – antimony (52%) silicon (7%) – J all

no PN

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: 280-55619-1
Sdg Number: JP0802

Method Blank - Batch: 280-226664

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-226664/1-A	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/22/2014 0100	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	1.99	B	1.6	5.0
Antimony	0.38	U	0.38	0.60
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	0.076	0.50
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.041	U	0.041	0.20
Calcium	14.1	U	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Iron	3.8	U	3.8	5.0
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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Lab Control Sample - Batch: 280-226664

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-226664/2-A	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	05/22/2014 0102	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	193.2	97	82 - 116	
Antimony	50.0	49.47	99	82 - 110	
Arsenic	100	99.75	100	85 - 110	
Barium	200	199.6	100	87 - 112	
Beryllium	5.00	4.93	99	84 - 114	
Boron	100	95.47	95	80 - 120	
Cadmium	10.0	10.11	101	87 - 110	
Calcium	5000	4920	98	82 - 114	
Chromium	20.0	20.71	104	84 - 114	
Cobalt	50.0	50.35	101	87 - 110	
Copper	25.0	25.05	100	88 - 110	
Iron	100	99.42	99	87 - 120	
Lead	50.0	49.61	99	86 - 110	
Magnesium	5000	5006	100	90 - 110	
Manganese	50.0	49.48	99	88 - 110	
Molybdenum	100	100.9	101	86 - 110	
Nickel	50.0	50.35	101	87 - 110	
Potassium	5000	5079	102	89 - 110	
Selenium	200	190.4	95	83 - 110	
Silicon	1000	250.9	25	10 - 70	
Silver	5.00	4.92	98	87 - 114	
Sodium	5000	5290	106	90 - 112	
Vanadium	50.0	50.45	101	88 - 110	
Zinc	50.0	48.46	97	76 - 114	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Matrix Spike - Batch: 280-226664

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-55619-1	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.03 g
Analysis Date:	05/22/2014 0111	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	9140		198	12080	1483	50 - 200	4
Antimony	0.34	U	49.6	25.80	52	20 - 200	
Arsenic	2.6		99.2	91.88	90	76 - 111	
Barium	78.4		198	265.1	94	52 - 159	
Beryllium	0.35		4.96	4.74	88	72 - 105	
Boron	1.6	B	99.2	84.58	84	80 - 120	
Cadmium	0.037	U	9.92	9.13	92	40 - 130	
Calcium	4010		4960	9244	106	43 - 165	
Chromium	11.0		19.8	31.40	103	70 - 200	
Cobalt	7.5		49.6	51.58	89	72 - 106	
Copper	16.1		24.8	41.21	101	37 - 187	
Iron	20200		99.2	21750	1555	70 - 200	4
Lead	4.7		49.6	47.71	87	70 - 200	
Magnesium	4430		4960	9490	102	64 - 145	
Manganese	354		49.6	431.8	157	40 - 200	4
Molybdenum	0.28	B	99.2	88.00	88	75 - 103	
Nickel	12.0		49.6	56.40	89	61 - 126	
Potassium	1870		4960	6770	99	56 - 172	
Selenium	0.77	U	198	169.0	85	76 - 104	
Silicon	441		992	508.3	7	20 - 200	N
Silver	0.14	U	4.96	4.59	92	75 - 141	
Sodium	293		4960	5234	100	78 - 111	
Vanadium	46.7		49.6	100.8	109	50 - 169	
Zinc	42.4		49.6	88.33	92	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Duplicate - Batch: 280-226664

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-55619-1	Analysis Batch:	280-226977	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-226664	Lab File ID:	25A3052114.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.15 g
Analysis Date:	05/22/2014 0109	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	05/21/2014 0825				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	9140		9323	2	40	
Antimony	0.34	U	0.34	NC	40	U
Arsenic	2.6		2.45	7	30	
Barium	78.4		78.69	0.3	30	
Beryllium	0.35		0.365	4	30	
Boron	1.6	B	1.63	4	30	B
Cadmium	0.037	U	0.036	NC	30	U
Calcium	4010		4718	16	30	
Chromium	11.0		12.11	9	40	
Cobalt	7.5		7.40	0.9	30	
Copper	16.1		16.60	3	30	
Iron	20200		20390	0.9	40	
Lead	4.7		5.04	7	40	
Magnesium	4430		4503	2	30	
Manganese	354		368.1	4	40	
Molybdenum	0.28	B	0.23	NC	30	U
Nickel	12.0		12.67	5	30	
Potassium	1870		1933	3	40	
Selenium	0.77	U	0.76	NC	30	U
Silicon	441		397.7	10	40	
Silver	0.14	U	0.14	NC	30	U
Sodium	293		231.3	23	30	
Vanadium	46.7		47.08	0.8	30	
Zinc	42.4		42.88	1	40	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Method Blank - Batch: 280-226958

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-226958/1-A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	05/22/2014 1939	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-226958

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-226958/2-A	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.6 g
Analysis Date:	05/22/2014 2038	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.402	96	87 - 111	

Matrix Spike - Batch: 280-226958

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-55619-1	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.57 g
Analysis Date:	05/22/2014 1948	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.0063	U	0.448	0.429	96	87 - 111	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Duplicate - Batch: 280-226958

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-55619-1	Analysis Batch:	280-227155	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-226958	Lab File ID:	140522baa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	.55 g
Analysis Date:	05/22/2014 1946	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	05/22/2014 1230				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	0.0063	U	0.0062	NC	20	U

Date: 2 June 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-82
Subject: Wet Chemistry - Data Package No. JP0802-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0802 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
J1TL89	5/16/14	Soil	C	See note 1
J1TL90	5/16/14	Soil	C	See note 1
J1TL91	5/16/14	Soil	C	See note 1
J1TL92	5/16/14	Soil	C	See note 1
J1TL93	5/16/14	Soil	C	See note 1
J1TL94	5/16/14	Soil	C	See note 1
J1TL95	5/16/14	Soil	C	See note 1
J1TL96	5/16/14	Soil	C	See note 1
J1TL97	5/16/14	Soil	C	See note 1
J1TL98	5/16/14	Soil	C	See note 1
J1TL99	5/16/14	Soil	C	See note 1
J1TLC0	5/16/14	Soil	C	See note 1
J1TLC1	5/16/14	Soil	C	See note 1

1 – Chromium VI by 7196A & nitrate/nitrite by 353.2.

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

and 28 days for nitrate/nitrite.

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1TL96/J1TLC1) 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 JP0802 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

DOE/RL-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: JP0802	REVIEWER: ELR	Project: 100-N-82	PAGE_1_OF_1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360

SDG No: JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140027 TRITIUM_DIST_LSC									
J1TL99									
	M3R631AH	H-3	3.14E-02 +- 2.2E-02	U	pCi/g	100%	4.65E-02	1.00E+01	
J1TLC0									
	M3R641AH	H-3	2.80E-02 +- 3.0E-02	U	pCi/g	100%	6.60E-02	1.00E+01	
J1TLC1									
	M3R651AH	H-3	1.93E-02 +- 2.5E-02	U	pCi/g	100%	5.75E-02	1.00E+01	
4140028 NI63_LSC									
J1TL89									
	M3R6N1AE	NI-63	-3.64E-01 +- 2.4E+00	U	pCi/g	97%	5.26E+00	3.00E+01	
J1TL90									
	M3R6Q1AE	NI-63	-5.09E-01 +- 2.4E+00	U	pCi/g	97%	5.25E+00	3.00E+01	
J1TL91									
	M3R6R1AE	NI-63	6.65E-01 +- 2.3E+00	U	pCi/g	97%	5.02E+00	3.00E+01	
J1TL92									
	M3R6T1AE	NI-63	-3.85E-01 +- 2.3E+00	U	pCi/g	87%	5.22E+00	3.00E+01	
J1TL92 DUP									
	M3R6T1AK	NI-63	2.24E+00 +- 2.7E+00	U	pCi/g	90%	5.67E+00	3.00E+01	283.2
J1TL93									
	M3R6V1AE	NI-63	9.69E-01 +- 2.4E+00	U	pCi/g	97%	5.01E+00	3.00E+01	
J1TL94									
	M3R6W1AE	NI-63	1.79E-01 +- 2.4E+00	U	pCi/g	93%	5.25E+00	3.00E+01	
J1TL95									
	M3R6X1AE	NI-63	1.55E+00 +- 2.4E+00	U	pCi/g	99%	5.06E+00	3.00E+01	
J1TL96									
	M3R601AE	NI-63	2.43E+00 +- 2.4E+00	U	pCi/g	99%	4.78E+00	3.00E+01	
J1TL97									
	M3R611AE	NI-63	-8.92E-01 +- 2.4E+00	U	pCi/g	94%	5.45E+00	3.00E+01	
J1TL98									
	M3R621AE	NI-63	2.48E+00 +- 2.6E+00	U	pCi/g	95%	5.25E+00	3.00E+01	
J1TL99									
	M3R631AE	NI-63	6.80E-01 +- 2.4E+00	U	pCi/g	99%	5.17E+00	3.00E+01	
J1TLC0									
	M3R641AE	NI-63	1.92E+00 +- 2.4E+00	U	pCi/g	100%	4.89E+00	3.00E+01	
J1TLC1									
	M3R651AE	NI-63	5.54E+00 +- 2.7E+00		pCi/g	99%	5.04E+00	3.00E+01	
4140058 7196_CR6									
J1TL89									
	M3R6N1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	M3R6N1AM	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	3.50E-01	0.0

TestAmerica Inc

rptTALRchSaSum mary2 V6.3.2 A2002

RPD - Relative Percent Difference.

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

5/31/14

Sample Results Summary

Date: 27-May-14

TestAmerica Inc TARL

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

Report No. : 60360

SDG No: JP0802

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
4140068	7196_CR6								
	J1TL90								
	M3R6Q1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL91								
	M3R6R1AA	HEXCHROME	1.78E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL92								
	M3R6T1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL93								
	M3R6V1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL94								
	M3R6W1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL95								
	M3R6X1AA	HEXCHROME	2.83E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL96								
	M3R601AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL97								
	M3R611AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL98								
	M3R621AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TL99								
	M3R631AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC0								
	M3R641AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1TLC1								
	M3R651AA	HEXCHROME	2.37E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 280

5/31/14

TestAmerica Inc

rptTALRchSaSummary2 V6.3.2 A2002

RPD - Relative Percent Difference.

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TL89

Lab Sample ID: 280-55619-1
Client Matrix: Solid
% Moisture: 2.2

Date Sampled: 05/16/2014 0727
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	11.1		mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227136 Analysis Date: 05/22/2014 2327 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.2		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TL90

Lab Sample ID: 280-55619-2
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 0736
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	2.1		mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227136 Analysis Date: 05/22/2014 2332 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.6		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TL91

Lab Sample ID: 280-55619-3
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 0743
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	0.86		mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227136 Analysis Date: 05/22/2014 2333 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.6		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: **J1TL92**

Lab Sample ID: 280-55619-4
Client Matrix: Solid
% Moisture: 2.4

Date Sampled: 05/16/2014 0750
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	0.37	U	mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227136 Analysis Date: 05/22/2014 2335 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.4		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TL93

Lab Sample ID: 280-55619-5
Client Matrix: Solid

% Moisture: 2.8

Date Sampled: 05/16/2014 0755
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	5.8		mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227136 Analysis Date: 05/22/2014 2337 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.8		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: **J1TL94**

Lab Sample ID: 280-55619-6
Client Matrix: Solid
% Moisture: 4.4

Date Sampled: 05/16/2014 0803
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	23.9		mg/Kg	0.37	0.78	1.0	353.2

Analysis Batch: 280-227136 Analysis Date: 05/22/2014 2338 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	4.4		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: **J1TL95**

Lab Sample ID: 280-55619-7
Client Matrix: Solid
% Moisture: 2.2

Date Sampled: 05/16/2014 0810
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	3.7		mg/Kg	0.37	0.77	1.0	353.2
Analysis Batch: 280-227334	Analysis Date: 05/24/2014 1426						DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.2		%	0.10	0.10	1.0	D-2216
Analysis Batch: 280-226834	Analysis Date: 05/21/2014 1457						DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: **J1TL96**

Lab Sample ID: 280-55619-8
Client Matrix: Solid
% Moisture: 1.9

Date Sampled: 05/16/2014 0819
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	0.37	B	mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227295 Analysis Date: 05/23/2014 2024 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.9		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: **J1TL97**

Lab Sample ID: 280-55619-9
Client Matrix: Solid
% Moisture: 3.1

Date Sampled: 05/16/2014 0834
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	3.1		mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227295 Analysis Date: 05/23/2014 2138 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	3.1		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TL98

Lab Sample ID: 280-55619-10
Client Matrix: Solid
% Moisture: 1.4

Date Sampled: 05/16/2014 0842
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	1.0		mg/Kg	0.36	0.76	1.0	353.2

Analysis Batch: 280-227295 Analysis Date: 05/23/2014 2031 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.4		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TL99

Lab Sample ID: 280-55619-11
Client Matrix: Solid
% Moisture: 1.8

Date Sampled: 05/16/2014 0848
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	0.36	U	mg/Kg	0.36	0.76	1.0	353.2

Analysis Batch: 280-227295 Analysis Date: 05/23/2014 2033 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.8		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TLC0

Lab Sample ID: 280-55619-12
Client Matrix: Solid
% Moisture: 2.6

Date Sampled: 05/16/2014 0854
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	2.8		mg/Kg	0.37	0.77	1.0	353.2

Analysis Batch: 280-227295 Analysis Date: 05/23/2014 2034 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	2.6		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

General Chemistry

Client Sample ID: J1TLC1

Lab Sample ID: 280-55619-13
Client Matrix: Solid
% Moisture: 1.7

Date Sampled: 05/16/2014 0819
Date Received: 05/20/2014 0940

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate Nitrite as N-Soluble	0.36	U	mg/Kg	0.36	0.76	1.0	353.2

Analysis Batch: 280-227295 Analysis Date: 05/23/2014 2044 DryWt Corrected: Y

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	1.7		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-226834 Analysis Date: 05/21/2014 1457 DryWt Corrected: N

5/31/14

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-55619-1

SDG #: JP0802
SAF#: RC-189

Date SDG Closed: May 20, 2014
Data Deliverable: 7 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1TL89	280-55619-1	6010/7471/353.2	6010B/7471A/353.2
J1TL90	280-55619-2	6010/7471/353.2	6010B/7471A/353.2
J1TL91	280-55619-3	6010/7471/353.2	6010B/7471A/353.2
J1TL92	280-55619-4	6010/7471/353.2	6010B/7471A/353.2
J1TL93	280-55619-5	6010/7471/353.2	6010B/7471A/353.2
J1TL94	280-55619-6	6010/7471/353.2	6010B/7471A/353.2
J1TL95	280-55619-7	6010/7471/353.2	6010B/7471A/353.2
J1TL96	280-55619-8	6010/7471/353.2	6010B/7471A/353.2
J1TL97	280-55619-9	6010/7471/353.2	6010B/7471A/353.2
J1TL98	280-55619-10	6010/7471/353.2	6010B/7471A/353.2
J1TL99	280-55619-11	6010/7471/353.2	6010B/7471A/353.2
J1TLC0	280-55619-12	6010/7471/353.2	6010B/7471A/353.2
J1TLC1	280-55619-13	6010/7471/353.2	6010B/7471A/353.2
J1TLC2	280-55619-14	6010/7471	6010B/7471A

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

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

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

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

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

RECEIPT
The samples were received on 5/20/2014 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-226664 indicates that physical and chemical interferences are present for Cobalt, Nickel, Silicon and Zinc. Results have been flagged with an "X".

Low levels of Aluminum are present in the method blank associated with batch 280-226664. 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 J1TL89; therefore, control limits are not applicable.

Silicon was recovered outside the control limits in the Matrix Spike performed on sample J1TL89, 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.

No other anomalies were encountered.

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 1 of3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-08-063	Field Logbook No.: EL-1652-~~11~~ 12 DWS 5/16/14	COA: 000N822000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: A/3/143		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 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	125mL	125mL										
Sample Analysis	See Item (1) in Special Instructions	NO2/NO3 - 353.2										

Sample No.	Matrix	Sample Date	Sample Time										
J1TL89	SOIL	5-16-14	0727	X	X								
J1TL90	SOIL	5-16-14	0736	X	X								
J1TL91	SOIL	5-16-14	0743	X	X								
J1TL92	SOIL	5-16-14	0750	X	X								
J1TL93	SOIL	5-16-14	0755	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA DWSHEA	5/16/14 1141
DWSHEA DWSHEA	5/16/14 1324	Fridge 3C 1060 Battelle	5/16/14 1324
Fridge 3C 1060 Battelle	5/19/14 1005	DWSHEA DWSHEA	5/19/14 1005
DWSHEA DWSHEA	5/19/14 1024	Fed Ex	
			5/20/14 9:40

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)

2.9IK4 1.5
MSP 5/20/14

REVIEWED BY SMS DATE 5/19/14

JP0802

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 2 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: WCH-08-063	Field Logbook No.: EL-1652-1 DWS 12 5/16/14	COA: 000N822000	Method of Shipment: Commercial Carrier / FED EX
Shipped To: TestAmerica Denver	Offsite Property No.: AB1143		Bill of Lading/Air Bill No.: See OSPC
Other Labs Shipped To: TestAmerica Richland			

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	125mL	125mL										
Sample Analysis	See item (1) in Special Instructions	NO2/NO3 - 353.2										

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

Sample No.	Matrix	Sample Date	Sample Time										
J1TL94	SOIL	5-16-14	0803	X	X								
J1TL95	SOIL	5-16-14	0810	X	X								
J1TL96	SOIL	5-16-14	0819	X	X								
J1TL97	SOIL	5-16-14	0834	X	X								
J1TL98	SOIL	5-16-14	0842	X	X								

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA DWSHEA	5/16/14 1141
DWSHEA DWSHEA	5/16/14 1324	Fridge 3C 1060 Battelle	5/16/14 1324
Fridge 3C 1060 Battelle	5/16/14 1005	DWSHEA DWSHEA	5/16/14 1005 DWS 5/19/14
DWSHEA DWSHEA	5/19/14 1024	Fed Ex	
			5/20/14 9:40

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 SMS DATE 5/19/14

JP0802

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7 days	Data Turnaround
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189		
Ice Chest No.: WCH-08-063	Field Logbook No.: DWS EL-1652-1/12 5/16/14	COA: 000N822000	Method of Shipment: Commercial Carrier / FED EX		
Shipped To: TestAmerica Denver	Offsite Property No.: A13/143		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 4C

Preservation	Cool 4C	Cool 4C										
Type of Container	G/P	G/P										
No. of Container(s)	1	1										
Volume	125mL	125mL										
Sample Analysis	See item (1) in Special Instructions	NO2/NO3 - 353.2										

Sample No.	Matrix	Sample Date	Sample Time										
J1TL99	SOIL	5-16-14	0848	X	X								
J1TLC0	SOIL	5-16-14	0854	X	X								
J1TLC1	SOIL	5-16-14	0819	X	X								
J1TLC2	SOIL	5-16-14	0724	X	—	DWS 5/16/14							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Quincy Stowe — Date/Time: 5-16-14 1141	Received By/Stored In: DWSHEA DWSHEA — Date/Time: 5/16/14 1141
Relinquished By/Removed From: DWSHEA DWSHEA — Date/Time: 5/16/14 1324	Received By/Stored In: Fridge 3C Bethale — Date/Time: 5/16/14 1324
Relinquished By/Removed From: Fridge 3C Bethale — Date/Time: 5/19/14 1005	Received By/Stored In: DWSHEA DWSHEA — Date/Time: 5/19/14 1005
Relinquished By/Removed From: DWSHEA DWSHEA — Date/Time: 5/19/14 1024	Received By/Stored In: Fed Ex — Date/Time:
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time: 5/20/14 9:40
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

(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 SMS DATE 5/17/14

JP0802

WCH-EE-011

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

May 27, 2014

Attention: Joan Kessner

SAF Number	:	RC-189
Date SDG Closed	:	May 19, 2014
Number of Samples	:	Thirteen (13)
Sample Type	:	Soil
SDG Number	:	JP0802
Data Deliverable	:	7– Day / Summary

CASE NARRATIVE

I. Introduction

On May 19, 2014, thirteen 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
J1TL89	M3R6N	SOIL	5/19/14
J1TL90	M3R6Q	SOIL	5/19/14
J1TL91	M3R6R	SOIL	5/19/14
J1TL92	M3R6T	SOIL	5/19/14
J1TL93	M3R6V	SOIL	5/19/14
J1TL94	M3R6W	SOIL	5/19/14
J1TL95	M3R6X	SOIL	5/19/14
J1TL96	M3R60	SOIL	5/19/14
J1TL97	M3R61	SOIL	5/19/14
J1TL98	M3R62	SOIL	5/19/14
J1TL99	M3R63	SOIL	5/19/14
J1TLC0	M3R64	SOIL	5/19/14
J1TLC1	M3R65	SOIL	5/19/14

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-002
Thorium-228,230,232 by method RL-ALP-005
Uranium 234, 235 and 238 by method RL-ALP-015
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001
Liquid Scintillation Counting
Tritium by method RL-LSC-005
Nickel-63 by method RL-LCS-017
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002:
The LCS, batch blank, samples and sample duplicate (J1TL89) results are within contractual requirements.

Thorium-228,230,232 by method RL-ALP-005:
The LCS, batch blank, samples and sample duplicate (J1TL91) results are within contractual requirements.

Uranium 234, 235 and 238 by method RL-ALP-015:
The LCS, batch blank, samples and sample duplicate (J1TL90) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
Samples J1TL89 and J1TL90 were inadvertently poured together during separations. They were reanalyzed in batch 4142031 for acceptable results. Except as noted; the LCS, batch blank, samples and sample duplicate (J1TL94) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The CRDL was not met for some of the analytes. Except as noted, the LCS, batch blank, samples and sample duplicate (J1TL95) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-005:
The LCS, batch blank, samples and sample duplicate (J1TL93) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:
The LCS, batch blank, samples and sample duplicate (J1TL92) results are within contractual requirements.

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The matrix spike recovered low at 70%. The post digestive matrix spike recovered at 88% and the insoluble matrix spike recovered at 97%. This implies a reducing capacity in the sample, but not enough to exhaust the more copious insoluble matrix spike. Except as noted; the LCS, batch blank, samples, sample duplicate (J1TL89) and sample matrix spike (J1TL89) 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

Clouseau
Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: 10-27099
NCM Initiated By: Tom Mcginnis
Date Opened: 05/27/2014
Date Closed:

Classification: Deficiency
Status: PMREVIEW
Production Area: Environmental - Sep
Tests: SrTot by GPC
Lot #'s (Sample #'s): J4E190420 (1,2), J4E220000 (31),
QC Batches: 4142031,

Nonconformance: Other (describe in detail)
Subcategory: Other (explanation required)

Problem Description / Root Cause

Name	Date	Description
Tom Mcginnis	05/27/2014	Samples J4E190420-1 and 2 were cross contaminated during initial analysis batch 4140025. Samples were reanalyzed as batch 4142031. All final results meet acceptance criteria.

Corrective Action

Name	Date	Corrective Action
Tom Mcginnis	05/27/2014	The PM was notified of the batch issues.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

Date Printed: 5/27/2014

Page 1 of 1

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-290

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.: N/A	Field Logbook No.: EL-1652-12 (DWSHEA 5/16/14)	COA: 000N822000	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 4C

Preservation	Cool 4C	None	None	None	None	None	None	None			
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	125mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL			
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Nickel-63	Strontium-89,90 – Total Sr	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Tritium - H3 Low Level Soil			
Sample No.	Matrix	Sample Date	Sample Time								
J1TL89 M3RL6N	SOIL	5-16-14	0727	X	X	X	X	X	X	X	X
J1TL90 M3RL6Q	SOIL	5-16-14	0736	X	X	X	X	X	X	X	X
J1TL91 M3RL6R	SOIL	5-16-14	0743	X	X	X	X	X	X	X	X
J1TL92 M3RL6T	SOIL	5-16-14	0750	X	X	X	X	X	X	X	X
J1TL93 M3RL6V	SOIL	5-16-14	0755	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: Quincy Stowe		5-16-14 1141
Received By/Stored In: DWSHEA DWSHEA		5/16/14 1141
Relinquished By/Removed From: DWSHEA DWSHEA		5/16/14 1324
Received By/Stored In: Fedex 3C (Battelle)		5/16/14 1324
Relinquished By/Removed From: Fedex 3C		5/19/14 0958
Received By/Stored In: DWSHEA DWSHEA		5/19/14 0958
Relinquished By/Removed From: DWSHEA DWSHEA		5/19/14 1006
Received By/Stored In: SM Sexton		5/19/14 1006
Relinquished By/Removed From: SM Sexton		5/19/14 1340
Received By/Stored In: J. Lockhart TALL		5-19-14 1340
Relinquished By/Removed From:		
Received By/Stored In:		
Relinquished By/Removed From:		
Received By/Stored In:		

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

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

J4E190420

Due 5-22-14

REVIEWED BY Kimwood Vincent DATE 5/19/14

JP0802

J4E190420

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-290	Page 2 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7days	Data Turnaround		
Project Designation: 190N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.	Field Logbook No.: EL-1652-1/12 DWShea 5/16/14	COA: 000N822000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.		Bill of Lading/Air Bill No.
Other Labs Shipped To: TestAmerica Denver			

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	None	None	None	None	None	None	None			
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G			
No. of Container(s)	1	1	1	1	1	1	1	1			
Volume	125mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL			
Sample Analysis	Chromium Hex -7196	See Item (2) In Special Instructions	Nickel-63	Strontium-89,90 -- Total Sr	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Tritium - H3 Low Level Soil			
Sample No.	Matrix	Sample Date	Sample Time								
J1TL94 M3R60	SOIL	5-16-14	0803	X	X	X	X	X	X	X	X
J1TL95 M3R64	SOIL	5-16-14	0810	X	X	X	X	X	X	X	X
J1TL96 M3R60	SOIL	5-16-14	0819	X	X	X	X	X	X	X	X
J1TL97 M3R61	SOIL	5-16-14	0834	X	X	X	X	X	X	X	X
J1TL98 M3R62	SOIL	5-16-14	0842	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWShea DWSHEA	5/16/14 1141
DWShea DWSHEA	5/16/14 1324	Fridge 3C 1060 Battelle	5/16/14 1324
Fridge 3C 1060 Battelle	5/19/14 0958	DWShea DWSHEA	5/19/14 0958
DWShea DWSHEA	5/19/14 1006	SM Sexton	5/19/14 1006
SM Sexton	5/19/14 1340	J Bell TAL	5/19/14 1340
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)

JYE190420
due 5-22-14

REVIEWED BY K. Wood
DATE 5/19/14

JP0802

WCH-EE-011

TestAmerica Laboratories, Inc.

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-189-290 | Page 3 of 3

Collector: Q. Stowe	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7 days	Data Turnaround		
Project Designation: 100N Field Remediation	Sampling Location: 100-N-82 (verification)		SAF No.: RC-189
Ice Chest No.	Field Logbook No.: EL-1652-1/12 DWSHEA 5/16/14	COA: 000N822000	Method of Shipment: Local Delivery
Shipped To: TestAmerica Richland	Offsite Property No.		Bill of Lading/Air Bill No.

Other Labs Shipped To: TestAmerica Denver

POSSIBLE SAMPLE HAZARDS/REMARKS: N/A

Special Handling and/or Storage: Cool 4C

Preservation	Cool 4C	None	None	None	None	None	None	None	None		
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	125mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL		
Sample Analysis	Chromium Hex - 7196	See Item (2) in Special Instructions	Nickel-63	Strontium-89,90 – Total Sr	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	Tritium - H3 Low Level Soil		

Sample No.	Matrix	Sample Date	Sample Time										
J1TL99 m3R163	SOIL	5-16-14	0848	X	X	X	X	X	X	X	X		
J1TLC0 m3R164	SOIL	5-16-14	0854	X	X	X	X	X	X	X	X		
J1TLC1 m3R165	SOIL	5-16-14	~~0829~~ 0819 DWS 5/19/14	X	X	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	5-16-14 1141	DWSHEA DWSHEA	5/16/14 1141
DWSHEA DWSHEA	5/16/14 1324	Fridge 3C 1060 Bulletin	5/16/14 1324
Fridge 3C 1060 Bulletin	5/19/14 0955	DWSHEA DWSHEA	5/19/14 0955
DWSHEA DWSHEA	5/19/14 1006	SM Sexton	5/19/14 1006
SM Sexton	5/19/14 1340	Stockbridge	5-19-14 1340

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)

J4E190420

Due 5-27-14

REVIEWED BY K. Wilson DATE 5/19/14

JP0802

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-82			DATA PACKAGE: JP0802		
VALIDATOR: ELR		LAB: TAL		DATE: 5/30/14	
			SDG: JP0802		

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			
J1TL89	J1TL90	J1TL91	J1TL92
J1TL93	J1TL94	J1TL95	J1TL96
J1TL97	J1TL98	J1TL99	J1TLC0
J1TLC1			
			Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

no PA's

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

QC Results Summary

Date: 27-May-14

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 60360 **SDG No.:** JP0802

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
4142031 LCS,								
M3T7G1AC	STRONTIUM	3.49E+00 +- 9.2E-01		pCi/g	90%	106%	0.1	3.89E-01
TRITIUM_DIST_LSC								
4140027 BLANK QC,								
M3TAR1AA	H-3	1.93E-02 +- 4.0E-02	U	pCi/g	100%			9.15E-02
4140027 LCS,								
M3TAR1AC	H-3	3.30E-01 +- 5.7E-02		pCi/g	100%	95%	0.0	8.25E-02
NI63_LSC								
4140028 BLANK QC,								
M3TAT1AA	NI-63	8.00E-01 +- 2.4E+00	U	pCi/g	97%			5.04E+00
4140028 LCS,								
M3TAT1AC	NI-63	2.11E+02 +- 1.6E+01		pCi/g	100%	85%	-0.1	4.89E+00
7196_CR6								
4140058 MATRIX SPIKE, J1TL89								
M3R6N1AL	HEXCHROME	2.14E+01 +- 0.0E+00		mg/kg	N/A	70%	-0.3	1.55E-01
4140058 LCS,								
M3TDF1AC	HEXCHROME	1.77E+01 +- 0.0E+00		mg/kg	N/A	88%	-0.1	1.55E-01
4140058 BLANK QC,								
M3TDF1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 33

TestAmerica Inc
rptSTLRchQcSummary V6.3.2 A2002

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

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Method Blank - Batch: 280-227136

Method: 353.2
Preparation: N/A

Lab Sample ID:	MB 280-227110/1-A	Analysis Batch:	280-227136	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0522NXNM.R:
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/22/2014 2323	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

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

Method Reporting Limit Check - Batch: 280-227136

Method: 353.2
Preparation: N/A

Lab Sample ID:	MRL 280-227136/18	Analysis Batch:	280-227136	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0522NXNM.R:
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	05/22/2014 2211	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	0.0708	71	50 - 150	B

Lab Control Sample - Batch: 280-227136

Method: 353.2
Preparation: N/A

Lab Sample ID:	LCS 280-227110/2-A	Analysis Batch:	280-227136	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0522NXNM.R:
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/22/2014 2325	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	50.1	49.76	99	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Matrix Spike - Batch: 280-227136

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-55619-1	Analysis Batch:	280-227136	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0522NXNM.R:
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/22/2014 2330	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	11.1	40.8	53.48	104	90 - 110	

Duplicate - Batch: 280-227136

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-55619-1	Analysis Batch:	280-227136	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0522NXNM.R:
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/22/2014 2328	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	11.1	11.26	2	10	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Method Blank - Batch: 280-227295

Method: 353.2
Preparation: N/A

Lab Sample ID:	MB 280-227110/1-A	Analysis Batch:	280-227295	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0523NXNW.R
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/23/2014 2019	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

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

Method Reporting Limit Check - Batch: 280-227295

Method: 353.2
Preparation: N/A

Lab Sample ID:	MRL 280-227295/18	Analysis Batch:	280-227295	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0523NXNW.R
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	05/23/2014 1828	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	0.104	104	50 - 150	

Lab Control Sample - Batch: 280-227295

Method: 353.2
Preparation: N/A

Lab Sample ID:	LCS 280-227110/2-A	Analysis Batch:	280-227295	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0523NXNW.R
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/23/2014 2021	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	50.1	50.97	102	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Matrix Spike - Batch: 280-227295

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-55619-9	Analysis Batch:	280-227295	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0523NXNW.R
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/23/2014 2141	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	3.1	41.2	44.83	101	90 - 110	

Duplicate - Batch: 280-227295

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-55619-9	Analysis Batch:	280-227295	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0523NXNW.R
Dilution:	1.0	Leach Batch:	280-227110	Initial Weight/Volume:	
Analysis Date:	05/23/2014 2140	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/22/2014 1857				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	3.1	3.18	1	10	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Method Blank - Batch: 280-227334

Method: 353.2
Preparation: N/A

Lab Sample ID:	MB 280-227329/1-A	Analysis Batch:	280-227334	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0524NXNB.R5
Dilution:	1.0	Leach Batch:	280-227329	Initial Weight/Volume:	
Analysis Date:	05/24/2014 1422	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/24/2014 1302				

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

Method Reporting Limit Check - Batch: 280-227334

Method: 353.2
Preparation: N/A

Lab Sample ID:	MRL 280-227334/18	Analysis Batch:	280-227334	Instrument ID:	WC_Alp 2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0524NXNB.R5
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	05/24/2014 1337	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	0.0934	93	50 - 150	B

Lab Control Sample - Batch: 280-227334

Method: 353.2
Preparation: N/A

Lab Sample ID:	LCS 280-227329/2-A	Analysis Batch:	280-227334	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0524NXNB.R5
Dilution:	1.0	Leach Batch:	280-227329	Initial Weight/Volume:	
Analysis Date:	05/24/2014 1424	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/24/2014 1302				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	50.1	51.94	104	90 - 110	

Client: Washington Closure Hanford

Job Number: 280-55619-1
Sdg Number: JP0802

Matrix Spike - Batch: 280-227334

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-55619-7	Analysis Batch:	280-227334	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0524NXNB.RS
Dilution:	1.0	Leach Batch:	280-227329	Initial Weight/Volume:	
Analysis Date:	05/24/2014 1429	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/24/2014 1302				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-Soluble	3.7	40.9	45.30	102	90 - 110	

Duplicate - Batch: 280-227334

Method: 353.2
Preparation: N/A

Lab Sample ID:	280-55619-7	Analysis Batch:	280-227334	Instrument ID:	WC_Alp 2
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\0524NXNB.RS
Dilution:	1.0	Leach Batch:	280-227329	Initial Weight/Volume:	
Analysis Date:	05/24/2014 1427	Units:	mg/Kg	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	05/24/2014 1302				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-Soluble	3.7	3.82	3	10	