

SAF-RC-232
100-IU-2 & 100-IU-6 Remaining
Waste Sites – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt

H4-21

KW 4/15/15
INITIAL/DATE

COMMENTS:

SDG JP0915

SAF-RC-232

Sample Location: 600-20

Date: 14 April 2015
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-1 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-20
Subject: Diesel Range Organic - Data Package No. JP0915-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0915 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
J1V4N5	3/9/15	Soil	C	See note 1
J1V4N6	3/9/15	Soil	C	See note 1
J1V4N7	3/9/15	Soil	C	See note 1
J1V4N8	3/9/15	Soil	C	See note 1
J1V4N9	3/9/15	Soil	C	See note 1
J1V4P0	3/9/15	Soil	C	See note 1
J1V4P1	3/9/15	Soil	C	See note 1
J1V4P2	3/9/15	Soil	C	See note 1
J1V4P3	3/9/15	Soil	C	See note 1
J1V4P4	3/9/15	Soil	C	See note 1
J1V4P5	3/9/15	Soil	C	See note 1
J1V4P6	3/9/15	Soil	C	See note 1
J1V4P7	3/9/15	Soil	C	See note 1

1 – Diesel range organics by 8015B.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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 blank analyses are conducted 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. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blank was submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in

duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

• **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V4N5/J1V4P7) were submitted for analysis. Laboratory 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 (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. JP0915 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DIESEL RANGE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0915	REVIEWER: ELR	Project: 600-20	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N5

Lab Sample ID: 280-66218-1

Date Sampled: 03/09/2015 0820

Client Matrix: Solid

% Moisture: 3.2

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120007.D
Dilution:	1.0			Initial Weight/Volume:	32.9 g
Analysis Date:	03/12/2015 1356			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		11000		940	3800
C10-C28		5900		640	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	83		49 - 115

Handwritten signature/initials

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4N6

Lab Sample ID: 280-66218-2

Date Sampled: 03/09/2015 0854

Client Matrix: Solid

% Moisture: 1.5

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120010.D
Dilution:	1.0			Initial Weight/Volume:	32.3 g
Analysis Date:	03/12/2015 1522			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C38		1600	J	940	3800
C10-C28		1800	J	640	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	82		49 - 115

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4/14/15*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N7

Lab Sample ID: 280-66218-3

Date Sampled: 03/09/2015 0852

Client Matrix: Solid

% Moisture: 1.9

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120011.D
Dilution:	1.0			Initial Weight/Volume:	32.5 g
Analysis Date:	03/12/2015 1551			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1600	J	940	3800
C10-C28		1900	J	640	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	87		49 - 115

Handwritten: ✓ 4/10/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N8

Lab Sample ID: 280-66218-4
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 03/09/2015 0849
Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120012.D
Dilution:	1.0			Initial Weight/Volume:	32.9 g
Analysis Date:	03/12/2015 1619			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1700	J	920	3700
C10-C28		2000	J	630	3700

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	83		49 - 115

Handwritten signature/initials

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N9

Lab Sample ID: 280-66218-5

Client Matrix: Solid

% Moisture: 2.9

Date Sampled: 03/09/2015 0903

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120013.D
Dilution:	1.0			Initial Weight/Volume:	32.2 g
Analysis Date:	03/12/2015 1647			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1500	J	960	3800
C10-C28		1900	J	650	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	78		49 - 115

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4/14/15*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P0

Lab Sample ID: 280-66218-6

Client Matrix: Solid

% Moisture: 2.8

Date Sampled: 03/09/2015 0846

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120015.D
Dilution:	1.0			Initial Weight/Volume:	32.5 g
Analysis Date:	03/12/2015 1744			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		4700		950	3800
C10-C28		3500	J	640	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	76		49 - 115

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P1

Lab Sample ID: 280-66218-7
Client Matrix: Solid

% Moisture: 0.9

Date Sampled: 03/09/2015 0844
Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120016.D
Dilution:	1.0			Initial Weight/Volume:	31.7 g
Analysis Date:	03/12/2015 1813			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1700	J	950	3800
C10-C28		1900	J	650	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	87		49 - 115

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P2

Lab Sample ID: 280-66218-8

Client Matrix: Solid

% Moisture: 2.4

Date Sampled: 03/09/2015 0842

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120017.D
Dilution:	1.0			Initial Weight/Volume:	31.3 g
Analysis Date:	03/12/2015 1841			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1500	J	980	3900
C10-C28		1900	J	670	3900

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	80		49 - 115

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P3

Lab Sample ID: 280-66218-9

Date Sampled: 03/09/2015 0831

Client Matrix: Solid

% Moisture: 1.5

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120018.D
Dilution:	1.0			Initial Weight/Volume:	31.5 g
Analysis Date:	03/12/2015 1909			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		8600		960	3900
C10-C28		4100		660	3900

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	86		49 - 115

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4/14/15*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P4

Lab Sample ID: 280-66218-10

Date Sampled: 03/09/2015 0900

Client Matrix: Solid

% Moisture: 2.1

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120019.D
Dilution:	1.0			Initial Weight/Volume:	32.1 g
Analysis Date:	03/12/2015 1937			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		5500		950	3800
C10-C28		4200		650	3800

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	82		49 - 115

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4/1/15*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P5

Lab Sample ID: 280-66218-11

Date Sampled: 03/09/2015 0857

Client Matrix: Solid

% Moisture: 1.7

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120020.D
Dilution:	1.0			Initial Weight/Volume:	33.0 g
Analysis Date:	03/12/2015 2005			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		1500	J	920	3700
C10-C28		1800	J	630	3700

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	80		49 - 115

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P6

Lab Sample ID: 280-66218-12
Client Matrix: Solid

% Moisture: 2.1

Date Sampled: 03/09/2015 0839
Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120021.D
Dilution:	1.0			Initial Weight/Volume:	33.0 g
Analysis Date:	03/12/2015 2033			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		9900		930	3700
C10-C28		4300		630	3700

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	83		49 - 115

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P7

Lab Sample ID: 280-66218-13

Date Sampled: 03/09/2015 0820

Client Matrix: Solid

% Moisture: 2.4

Date Received: 03/10/2015 1310

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-267715	Instrument ID:	SGC_U
Prep Method:	3550C	Prep Batch:	280-267448	Lab File ID:	03120022.D
Dilution:	1.0			Initial Weight/Volume:	31.9 g
Analysis Date:	03/12/2015 2101			Final Weight/Volume:	1 mL
Prep Date:	03/10/2015 2208			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		11000		960	3900
C10-C28		6100		650	3900

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	85		49 - 115

4/14/15

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-66218-1

SDG #: JP0915

SAF#: RC-232

Date SDG Closed: March 10, 2015

Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1V4N5	280-66218-1	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N6	280-66218-2	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N7	280-66218-3	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N8	280-66218-4	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N9	280-66218-5	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P0	280-66218-6	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P1	280-66218-7	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P2	280-66218-8	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P3	280-66218-9	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P4	280-66218-10	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4O5	280-66218-11	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P6	280-66218-12	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P7	280-66218-13	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310

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 3/10/2015 1:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.0° C.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

No anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-267503 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Sample J1V4N6 required a 5x dilution, and samples J1V4N7, J1V4P0, J1V4P1, J1V4P2 and J1V4P5 required a 2X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead, Magnesium, Vanadium and Zinc to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-267503. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-267503, and the associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4N5; therefore, control limits are not applicable.

No other anomalies were encountered.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-089

Page 1 of 3

Collector
STOME OG

Company Contact
Joan Kessner

Telephone No.
375-4688

Project Coordinator
KESSNER, JH

Price Code
8B

Method of Shipment
Commercial Carrier

SAF No.
RC-232

Data Turnaround
7 days

Project Designation
100-IU-2 & 100-IU-6 Remaining Waste Sites

Sampling Location
600-20 (excavation, verification)

Field Logbook No.
EL-1667-02

COA
0600202000

Method of Shipment
Commercial Carrier

SAF No.
RC-232

Data Turnaround
7 days

Ice Sheet No.
WCH-08-007

Field Logbook No.
EL-1667-02

COA
0600202000

Method of Shipment
Commercial Carrier

SAF No.
RC-232

Data Turnaround
7 days

Shipped To
TestAmerica Denver

Other Labs Shipped To
N/A

Office Property No.
A131330

Method of Shipment
Commercial Carrier

SAF No.
RC-232

Data Turnaround
7 days

Other Labs Shipped To
N/A

Method of Shipment
Commercial Carrier

SAF No.
RC-232

Method of Shipment
Commercial Carrier

SAF No.
RC-232

Data Turnaround
7 days

Other Labs Shipped To
N/A

Method of Shipment
Commercial Carrier

SAF No.
RC-232

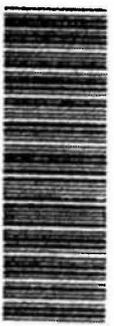
Method of Shipment
Commercial Carrier

SAF No.
RC-232

Data Turnaround
7 days

POSSIBLE SAMPLE HAZARDS/REMARKS

280-66218 Chain of Custody



Special Handling and/or Storage

Cool 4C

Sample No.

Matrix

Sample Date

Sample Time

Sample Analysis

See Item (1) in Special Instructions

TPH, Diesel Range - WTPHD

PAHs - B010

Other

Other

Other

Other

Other

Sample No.	Matrix	Sample Date	Sample Time	Sample Analysis	See Item (1) in Special Instructions	TPH, Diesel Range - WTPHD	PAHs - B010	Other	Other	Other	Other	Other	Other
J1V405	SOIL	3/9/15	0820	X	X	X	X						
J1V406	SOIL	3/9/15	0854	X	X	X	X						
J1V407	SOIL	3/9/15	0852	X	X	X	X						
J1V408	SOIL	3/9/15	0849	X	X	X	X						
J1V409	SOIL	3/9/15	0905	X	X	X	X						

CHAIN OF POSSESSION

Received By/Store In

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)

3, 8 IRS to J
Transfired by me 3/10/15



JP0915

WCH/EE-011

Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-232-089	Page 2 of 3
Collector STOWE, QG	Company Contact Joan Kessler	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 2 days		
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-20 (excavation, verification)	SAF No. RC-232	Method of Shipment Commercial Carrier Fed Ex				
Ice Chest No. WCH-08-067	Field Logbook No. EL-1667-02	COA 0600202000	Bill of Lading/Air Bill No. See OSEP				
Shipped To TestAmerica Denver	Offsite Property No. A131330						

Other Labs Shipped To N/A	Preservation	Cool 4C	Cool 4C	Cool 4C						
	Type of Container	GP	2G	2G						
	No. of Container(s)	1	1	1						
	Volume	250mL	125mL	250mL						
	Sample Analysis	See Item (1) in Special Instructions	TPH-Diesel Range - WTPHD+	PAHs - 8310						

Sample No.	Matrix	Sample Date	Sample Time							
J1V4P0	SOIL	3/9/15	0846	X	X	X				
J1V4P1	SOIL	3/9/15	0844	X	X	X				
J1V4P2	SOIL	3/9/15	0842	X	X	X				
J1V4P3	SOIL	3/9/15	0831	X	X	X				
J1V4P4	SOIL	3/9/15	0900	X	X	X				

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From Joan Kessler	Date/Time 3-9-15 0925	Received By/Stored In C. Bingham	Date/Time 3-9-15 1100
Relinquished By/Removed From C. Bingham	Date/Time 3-9-15 1115	Received By/Stored In Fed Ex	Date/Time 3-9-15
Relinquished By/Removed From	Date/Time	Received By/Stored In C. Bingham	Date/Time 3-10-15 1310
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SPECIAL INSTRUCTIONS
 (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)

REVIEWED BY
 D. St. John
DATE
 3/9/15

JP0915

RC-232-089

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Washington Closure Hamford

Project Designation
100-IJ-2 & 100-IJ-6 Remaining Waste Sites

Company Contact
Joan Kessner

Telephone No.
375-4688

Project Coordinator
KESSNER, JH

Price Code
BB

SAF No.
RC-232

Method of Shipment
Commercial Carrier

Bill of Lading/Air Bill No.
500 05PO

Sampling Location
600-20 (excavation, verification)

Field Logbook No.
EL-1667-02

COA
0900202000

Offsite Property No.
A131330

Shipped To
TestAmerica Denver

Other Labs Shipped To

N/A

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Cool AC

Matrix

Sample No.

Sample Date

Matrix

Sample Time

Preservation

Type of Container

No. of Container(s)

Volume

Sample Analysis

Cool AC

Sign/Print Names

Received By/Removed From

Final Sample Disposition

Disposal Method

Special Instructions

Reviewed By

Date

Disposal Method

Appendix 5
Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-20		DATA PACKAGE: JP0915		
VALIDATOR:	ELR	LAB: TAL	DATE: 4/13/15		
		SDG: JP0915			
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J1V4N5 J1V4N6 J1V4N7 J1V4N8 J1V4N9					
J1V4P0 J1V4P1 J1V4P2 J1V4P3 J1V4P4					
J1V4P5 J1V4P6 J1V4P7					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? Yes No **N/A**
 Continuing calibrations acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: no Pb

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

Surrogates/system monitoring compounds analyzed? Yes No N/A
 Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
 Surrogates traceable? (Levels D, E) Yes No N/A
 Surrogates expired? (Levels D, E) Yes No N/A
 MS/MSD samples analyzed? Yes No N/A
 MS/MSD results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A

Comments: _____

no PA

GENERAL ORGANIC 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 ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbant) cleanup performed?..... Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable?..... Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired?..... Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Method Blank - Batch: 280-267448

**Method: NWTPH-Dx
Preparation: 3550C**

Lab Sample ID: MB 280-267448/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1259
Prep Date: 03/10/2015 2208
Leach Date: N/A

Analysis Batch: 280-267715
Prep Batch: 280-267448
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_U
Lab File ID: 03120005.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

Analyte	Result	Qual	MDL	RL
C10-C36	1000	U	1000	4000
C10-C28	680	U	680	4000

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	80	49 - 115

Lab Control Sample - Batch: 280-267448

**Method: NWTPH-Dx
Preparation: 3550C**

Lab Sample ID: LCS 280-267448/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1328
Prep Date: 03/10/2015 2208
Leach Date: N/A

Analysis Batch: 280-267715
Prep Batch: 280-267448
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_U
Lab File ID: 03120006.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
C10-C36	66700	39000	58	57 - 115	
C10-C28	66700	38200	57	53 - 115	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	58	49 - 115

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-267448**

**Method: NWTPH-Dx
Preparation: 3550C**

MS Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1425
Prep Date: 03/10/2015 2208
Leach Date: N/A

Analysis Batch: 280-267715
Prep Batch: 280-267448
Leach Batch: N/A

Instrument ID: SGC_U
Lab File ID: 03120008.D
Initial Weight/Volume: 32.5 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

MSD Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1453
Prep Date: 03/10/2015 2208
Leach Date: N/A

Analysis Batch: 280-267715
Prep Batch: 280-267448
Leach Batch: N/A

Instrument ID: SGC_U
Lab File ID: 03120009.D
Initial Weight/Volume: 31.3 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
C10-C36	78	82	57 - 115	7	23		
C10-C28	79	83	56 - 115	8	23		
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
o-Terphenyl	83		88	49 - 115			

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-267448**

**Method: NWTPH-Dx
Preparation: 3550C**

MS Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1425
Prep Date: 03/10/2015 2208
Leach Date: N/A

Units: ug/Kg

MSD Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1453
Prep Date: 03/10/2015 2208
Leach Date: N/A

Analyte	Sample	MS Spike	MSD Spike	MS	MSD
	Result/Qual	Amount	Amount	Result/Qual	Result/Qual
C10-C36	11000	63600	66000	60900	65700
C10-C28	5900	63600	66000	55900	60800

Date: 14 April 2015
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-IU-1 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-20
 Subject: Polyaromatic Hydrocarbon - Data Package No. JP0915-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0915 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
J1V4N5	3/9/15	Soil	C	See note 1
J1V4N6	3/9/15	Soil	C	See note 1
J1V4N7	3/9/15	Soil	C	See note 1
J1V4N8	3/9/15	Soil	C	See note 1
J1V4N9	3/9/15	Soil	C	See note 1
J1V4P0	3/9/15	Soil	C	See note 1
J1V4P1	3/9/15	Soil	C	See note 1
J1V4P2	3/9/15	Soil	C	See note 1
J1V4P3	3/9/15	Soil	C	See note 1
J1V4P4	3/9/15	Soil	C	See note 1
J1V4P5	3/9/15	Soil	C	See note 1
J1V4P6	3/9/15	Soil	C	See note 1
J1V4P7	3/9/15	Soil	C	See note 1

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

· Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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 blank analyses are conducted 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. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blank was submitted for analysis.

· Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in

duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

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

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1V4N5/J1K4P7) were submitted for analysis. Laboratory 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 (RQL's)* to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. JP0915 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the 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 same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: JP0915	REVIEWER: ELR	Project: 600-20	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N5

Lab Sample ID: 280-66218-1

Date Sampled: 03/09/2015 0820

Client Matrix: Solid

% Moisture: 3.2

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.1 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 0631		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.0	U	9.0	100
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.4	U	6.4	15
Benzo[b]fluoranthene		4.2	U	4.2	15
Benzo[g,h,i]perylene		7.2	U	7.2	30
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	40
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	40
Fluorene		5.3	U	5.3	30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	40
Pyrene		12	U	12	40

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	93		72 - 115

*W
4/14/15*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4N6

Lab Sample ID: 280-66218-2

Date Sampled: 03/09/2015 0854

Client Matrix: Solid

% Moisture: 1.5

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.2 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 0803		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.8	U	9.8	98
Acenaphthylene		8.8	U	8.8	98
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.0	U	7.0	29
Benzo[k]fluoranthene		3.8	U	3.8	15
Chrysene		4.7	U	4.7	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.2	U	5.2	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	98
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	87		72 - 115

W
4/14/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N7

Lab Sample ID: 280-66218-3

Date Sampled: 03/09/2015 0852

Client Matrix: Solid

% Moisture: 1.9

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method:	8310	Analysis Batch:	280-267925	Instrument ID:	CHHPLC_G
Prep Method:	3550C	Prep Batch:	280-267438	Initial Weight/Volume:	31.2 g
Dilution:	1.0			Final Weight/Volume:	4 mL
Analysis Date:	03/14/2015 0834			Injection Volume:	20 uL
Prep Date:	03/10/2015 2117			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.8	U	9.8	98
Acenaphthylene		8.8	U	8.8	98
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.1	U	7.1	29
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.7	U	4.7	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.2	U	5.2	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	98
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		91		72 - 115	

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N8

Lab Sample ID: 280-66218-4

Date Sampled: 03/09/2015 0849

Client Matrix: Solid

% Moisture: 1.7

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 30.6 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 0904		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryVM Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.0	U	9.0	100
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.4	U	6.4	15
Benzo[b]fluoranthene		4.2	U	4.2	15
Benzo[g,h,i]perylene		7.2	U	7.2	30
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	40
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	40
Fluorene		5.3	U	5.3	30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	40
Pyrene		12	U	12	40

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	94		72 - 115

W
4/14/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N9

Lab Sample ID: 280-66218-5

Date Sampled: 03/09/2015 0903

Client Matrix: Solid

% Moisture: 2.9

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.8 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 0935		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.7	U	9.7	97
Acenaphthylene		8.7	U	8.7	97
Anthracene		3.0	U	3.0	19
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.2	U	6.2	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.0	U	7.0	29
Benzo[k]fluoranthene		3.8	U	3.8	15
Chrysene		4.7	U	4.7	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.1	U	5.1	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	97
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	90		72 - 115

4/10/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P0

Lab Sample ID: 280-66218-6

Date Sampled: 03/09/2015 0846

Client Matrix: Solid

% Moisture: 2.8

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 32.7 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1005		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.4	U	9.4	94
Acenaphthylene		8.5	U	8.5	94
Anthracene		2.9	U	2.9	19
Benzo[a]anthracene		3.0	U	3.0	14
Benzo[a]pyrene		6.0	U	6.0	14
Benzo[b]fluoranthene		4.0	U	4.0	14
Benzo[g,h,i]perylene		6.8	U	6.8	28
Benzo[k]fluoranthene		3.7	U	3.7	14
Chrysene		4.6	U	4.6	38
Dibenzo(a,h)anthracene		10	U	10	28
Fluoranthene		12	U	12	38
Fluorene		5.0	U	5.0	28
Indeno[1,2,3-cd]pyrene		11	U	11	28
Naphthalene		11	U	11	94
Phenanthrene		11	U	11	38
Pyrene		11	U	11	38
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		90		72 - 115	

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P1

Lab Sample ID: 280-66218-7

Date Sampled: 03/09/2015 0844

Client Matrix: Solid

% Moisture: 0.9

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method:	8310	Analysis Batch:	280-268088	Instrument ID:	CHHPLC_G
Prep Method:	3550C	Prep Batch:	280-267438	Initial Weight/Volume:	31.6 g
Dilution:	1.0			Final Weight/Volume:	4 mL
Analysis Date:	03/16/2015 0823			Injection Volume:	20 uL
Prep Date:	03/10/2015 2117			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.6	U	9.6	96
Acenaphthylene		8.6	U	8.6	96
Anthracene		2.9	U	2.9	19
Benzo[a]anthracene		3.1	U	3.1	14
Benzo[a]pyrene		6.1	U	6.1	14
Benzo[b]fluoranthene		4.0	U	4.0	14
Benzo[g,h,i]perylene		6.9	U	6.9	29
Benzo[k]fluoranthene		3.8	U	3.8	14
Chrysene		4.6	U	4.6	38
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		12	U	12	38
Fluorene		5.1	U	5.1	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	96
Phenanthrene		12	U	12	38
Pyrene		12	U	12	38

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	87		72 - 115

4/14/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P2

Lab Sample ID: 280-66218-8

Date Sampled: 03/09/2015 0842

Client Matrix: Solid

% Moisture: 2.4

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.3 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1106		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.8	U	9.8	98
Acenaphthylene		8.8	U	8.8	98
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.1	U	7.1	29
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.2	U	5.2	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	98
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		89		72 - 115	

M
4/14/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P3

Lab Sample ID: 280-66218-9

Date Sampled: 03/09/2015 0831

Client Matrix: Solid

% Moisture: 1.5

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 32.5 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1137		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.4	U	9.4	94
Acenaphthylene		8.4	U	8.4	94
Anthracene		2.9	U	2.9	19
Benzo[a]anthracene		3.0	U	3.0	14
Benzo[a]pyrene		6.0	U	6.0	14
Benzo[b]fluoranthene		3.9	U	3.9	14
Benzo[g,h,i]perylene		6.7	U	6.7	28
Benzo[k]fluoranthene		3.7	U	3.7	14
Chrysene		4.5	U	4.5	37
Dibenzo(a,h)anthracene		10	U	10	28
Fluoranthene		12	U	12	37
Fluorene		4.9	U	4.9	28
Indeno[1,2,3-cd]pyrene		11	U	11	28
Naphthalene		11	U	11	94
Phenanthrene		11	U	11	37
Pyrene		11	U	11	37
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		93		72 - 115	

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P4

Lab Sample ID: 280-66218-10

Date Sampled: 03/09/2015 0900

Client Matrix: Solid

% Moisture: 2.1

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.2 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1207		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.8	U	9.8	98
Acenaphthylene		8.8	U	8.8	98
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.1	U	7.1	29
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.2	U	5.2	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	98
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		91		72 - 115	

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9/10/15*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P5

Lab Sample ID: 280-66218-11

Date Sampled: 03/09/2015 0857

Client Matrix: Solid

% Moisture: 1.7

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.1 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1238		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.8	U	9.8	98
Acenaphthylene		8.8	U	8.8	98
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.1	U	3.1	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.1	U	4.1	15
Benzo[g,h,i]perylene		7.1	U	7.1	29
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	39
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		13	U	13	39
Fluorene		5.2	U	5.2	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	98
Phenanthrene		12	U	12	39
Pyrene		12	U	12	39
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		88		72 - 115	

W
4/14/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P6

Lab Sample ID: 280-66218-12

Date Sampled: 03/09/2015 0839

Client Matrix: Solid

% Moisture: 2.1

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 31.0 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1308		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.9	U	9.9	99
Acenaphthylene		8.9	U	8.9	99
Anthracene		3.0	U	3.0	20
Benzo[a]anthracene		3.2	U	3.2	15
Benzo[a]pyrene		6.3	U	6.3	15
Benzo[b]fluoranthene		4.2	U	4.2	15
Benzo[g,h,i]perylene		7.1	U	7.1	30
Benzo[k]fluoranthene		3.9	U	3.9	15
Chrysene		4.8	U	4.8	40
Dibenzo(a,h)anthracene		11	U	11	30
Fluoranthene		13	U	13	40
Fluorene		5.2	U	5.2	30
Indeno[1,2,3-cd]pyrene		12	U	12	30
Naphthalene		12	U	12	99
Phenanthrene		12	U	12	40
Pyrene		12	U	12	40

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	90		72 - 115

W
4/4/15

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P7

Lab Sample ID: 280-66218-13

Date Sampled: 03/09/2015 0820

Client Matrix: Solid

% Moisture: 2.4

Date Received: 03/10/2015 1310

8310 PAHs (HPLC)

Analysis Method: 8310	Analysis Batch: 280-267925	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-267438	Initial Weight/Volume: 30.0 g
Dilution: 1.0		Final Weight/Volume: 4 mL
Analysis Date: 03/14/2015 1339		Injection Volume: 20 uL
Prep Date: 03/10/2015 2117		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.2	U	9.2	100
Anthracene		3.1	U	3.1	20
Benzo[a]anthracene		3.3	U	3.3	15
Benzo[a]pyrene		6.6	U	6.6	15
Benzo[b]fluoranthene		4.3	U	4.3	15
Benzo[g,h,i]perylene		7.4	U	7.4	31
Benzo[k]fluoranthene		4.0	U	4.0	15
Chrysene		5.0	U	5.0	41
Dibenzo(a,h)anthracene		11	U	11	31
Fluoranthene		13	U	13	41
Fluorene		5.4	U	5.4	31
Indeno[1,2,3-cd]pyrene		12	U	12	31
Naphthalene		12	U	12	100
Phenanthrene		12	U	12	41
Pyrene		12	U	12	41
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		93		72 - 115	

Handwritten signature and date: 4/14/15

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-66218-1

SDG #: JP0915

SAF#: RC-232

Date SDG Closed: March 10, 2015

Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1V4N5	280-66218-1	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N6	280-66218-2	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N7	280-66218-3	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N8	280-66218-4	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N9	280-66218-5	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P0	280-66218-6	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P1	280-66218-7	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P2	280-66218-8	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P3	280-66218-9	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P4	280-66218-10	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4O5	280-66218-11	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P6	280-66218-12	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P7	280-66218-13	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310

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 3/10/2015 1:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.0° C.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

No anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-267503 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Sample J1V4N6 required a 5x dilution, and samples J1V4N7, J1V4P0, J1V4P1, J1V4P2 and J1V4P5 required a 2X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead, Magnesium, Vanadium and Zinc to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-267503. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-267503, and the associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4N5; therefore, control limits are not applicable.

No other anomalies were encountered.

Washington Closure Hanford **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** RC-232-089 Page 1 of 3

Collector STOWE_QG	Company Contact Joan Kassner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 7 days
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-20 (excavation, verification)	SAF No. RC-232			
Ice Chest No. WCH-08-067	Field Logbook No. EL-1667-02	COA 0600202000	Method of Shipment Commercial Carrier	1 Fed Ex	
Shipped To TestAmerica Denver	Offsite Property No. A131330	Bill of Lading/Air Bill No. See ASPC			

Other Label Shipped To N/A	Preservation	Cool AC	Cool AC	Cool AC					
	Type of Container	G/P	g/G	g/G					
	No. of Container(s)	1	1	1					
	Volume	250mL	125mL	250mL					
POSSIBLE SAMPLE HAZARDS/REMARKS N/A	Sample Analysis	See Item (1) in Special Instructions	TPH-Diesel Range - WTPH-D -	PAHs - 8310					



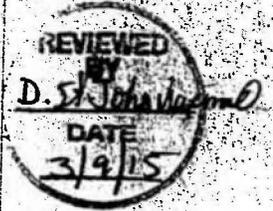
Sample No.	Matrix	Sample Date	Sample Time						
J1V4N6	SOIL	3/9/15	0820	X	X	X			
J1V4N6	SOIL	3/9/15	0854	X	X	X			
J1V4N7	SOIL	3/9/15	0852	X	X	X			
J1V4N8	SOIL	3/9/15	0849	X	X	X			
J1V4N9	SOIL	3/9/15	0905	X	X	X			

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From <i>River stone</i>	Date/Time 3-9-15 0925	Received By/Stored In <i>Christina de la Cruz</i>	Date/Time 3-9-15 0905
Relinquished By/Removed From <i>Christina de la Cruz</i>	Date/Time 3-9-15 1100	Received By/Stored In <i>C. B. Johnson</i>	Date/Time 3-9-15 1100
Relinquished By/Removed From <i>E. Johnson</i>	Date/Time 3-9-15 1115	Received By/Stored In <i>Fed Ex</i>	Date/Time 3-9-15 1100
Relinquished By/Removed From	Date/Time	Received By/Stored In <i>SWA</i>	Date/Time 3/10/15 1310
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(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)

3, 8 IRS 40.2
Transferred By AS 3/10/15



FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time
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JP0915

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-089

Page 2 of 3

Collector: STOWNE, OG
 Project Designation: 100-U-2 & 100-U-6 Remaining Waste Sites
 Ice Chest No.: WCH-08-063
 Shipped To: TestAmerica Denver
 Other Labels Shipped To: N/A

Company Contact: Joan Kessler
 Telephone No.: 375-4688
 Sampling Location: 600-20 (excavation, verification)
 Field Logbook No.: EI-1967-02
 COA: 0600202000
 Onsite Property No.: A131330
 Project Coordinator: KESSNER, JH
 Price Code: 8B
 SAF No.: RC-232
 Method of Shipment: Commercial Carrier
 Bill of Lading/Air Bill No.: See OSEP

Preservation	Type of Container	No. of Container(s)	Volume	Coal 4C	Coal 4C	Coal 4C	TPH-Diesel Range WPH-D *	PAHs - 6810
				See Item (1) in Special Instructions				
	GP	1	250mL	X	X	X		
		1	125mL	X	X	X		
		1	250mL	X	X	X		

Sample No.	Matrix	Sample Date	Sample Time	Coal 4C	Coal 4C	Coal 4C	TPH-Diesel Range WPH-D *	PAHs - 6810
J1V4P0	SOIL	3/9/15	0846	X	X	X		
J1B4P1	SOIL	3/9/15	0844	X	X	X		
J1B4P2	SOIL	3/9/15	0842	X	X	X		
J1V4P3	SOIL	3/9/15	0831	X	X	X		
J1V4P4	SOIL	3/9/15	0900	X	X	X		

Requisitioned By/Removed From	Date/Time	Received By/Stored In	Date/Time
Alamy, Stone	3-9-15 1000	C. B. Kingston	3-9-15 1100
C. Kingston	3-9-15 1115	F. D. EX	3-9-15 1310

SPECIAL INSTRUCTIONS:
 (1) ICF: Arsenic, Barium, Beryllium, Boron, Cadmium, Cobalt, Chromium, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc

REVIEWED BY: [Signature]
 DATE: 3/9/15

JP0915

WCH-EE-011

RC-232-089

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Washington Closure Hanford

Collector: STOWE, GG
 Project Designation: 100-IJ-2 & 100-IJ-6 Remaining Waste Sites
 Ice Chest No: WCH-08-067
 Company Contact: Joan Kessner
 Telephone No: 375-4888
 Sampling Location: 600-20 (excavation, verification)
 Field Logbook No: EL-1667-02
 GOA: 0600202000
 Project Coordinator: KESSNER, JH
 Price Code: BB
 SAF No: RC-232
 Method of Shipment: 1 Pad Ex
 Commercial Carrier: See OSPO
 Bill of Lading/Air Bill No: A131330

7 Adams
 3-9-15 emb

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C
J1V4P5	SOIL	3/9/15	0857		X	X	X
J1V4P6	SOIL	3/9/15	0839		X	X	X
J1V4P7	SOIL	3/9/15	0820		X	X	X

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A

Special Handling and/or Storage

Cool 4C

Sample No.	Matrix	Sample Date	Sample Time	Sign/Print Names
J1V4P5	SOIL	3/9/15	0857	Received By: [Signature] Date/Time: 0925 Released By: [Signature] Date/Time: 0915
J1V4P6	SOIL	3/9/15	0839	Received By: [Signature] Date/Time: 1100 Released By: [Signature] Date/Time: 3-9-15
J1V4P7	SOIL	3/9/15	0820	Received By: [Signature] Date/Time: 1310 Released By: [Signature] Date/Time: 3/10/15

CHAIN OF POSSESSION

Reacquired By/Removed From: [Signature] Date/Time: 0925
 Reacquired By/Removed From: [Signature] Date/Time: 3-9-15
 Reacquired By/Removed From: [Signature] Date/Time: 1100
 Reacquired By/Removed From: [Signature] Date/Time: 3-9-15
 Reacquired By/Removed From: [Signature] Date/Time: 1310

FINAL SAMPLE DISPOSITION

Disposal Method: [Signature]

Disposed By: [Signature]

Date/Time: [Signature]

SPECIAL INSTRUCTIONS

(1) ICP Metals - 401GTR (Close-out Lab) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc)



JPO915

Appendix 5
Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-20		DATA PACKAGE: JPO915		
VALIDATOR:	ELK	LAB: TAL	DATE: 4/14/15		
			SDG: JPO915		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J1U4N5 J1U4N6 J1U4N7 J1U4N8 J1U4N9					
J1U4P0 J1U4P1 J1U4P2 J1U4P3 J1U4P4					
J1U4P6 J1U4P5 J1U4P7					
5 of 1					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? Yes No **N/A**
 Continuing calibrations acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: _____

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

Surrogates/system monitoring compounds analyzed? Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
Surrogates traceable? (Levels D, E) Yes No N/A
Surrogates expired? (Levels D, E) Yes No N/A
MS/MSD samples analyzed? Yes No N/A
MS/MSD results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A

Comments: _____
_____ NO PAS

GENERAL ORGANIC 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 ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoridil ® (or other aborbant) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Method Blank - Batch: 280-267438

Method: 8310
Preparation: 3550C

Lab Sample ID: MB 280-267438/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/14/2015 0530
Prep Date: 03/10/2015 2117
Leach Date: N/A

Analysis Batch: 280-267925
Prep Batch: 280-267438
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0313038.D
Initial Weight/Volume: 30 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	10	U	10	100
Acenaphthylene	9.0	U	9.0	100
Anthracene	3.1	U	3.1	20
Benzo[a]anthracene	3.2	U	3.2	15
Benzo[a]pyrene	6.4	U	6.4	15
Benzo[b]fluoranthene	4.2	U	4.2	15
Benzo[g,h,i]perylene	7.2	U	7.2	30
Benzo[k]fluoranthene	3.9	U	3.9	15
Chrysene	4.8	U	4.8	40
Dibenzo(a,h)anthracene	11	U	11	30
Fluoranthene	13	U	13	40
Fluorene	5.3	U	5.3	30
Indeno[1,2,3-cd]pyrene	12	U	12	30
Naphthalene	12	U	12	100
Phenanthrene	12	U	12	40
Pyrene	12	U	12	40

Surrogate	% Rec	Acceptance Limits
Terphenyl-d14 (SUR)	97	72 - 115

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Lab Control Sample - Batch: 280-267438

**Method: 8310
Preparation: 3550C**

Lab Sample ID:	LCS 280-267438/2-A	Analysis Batch:	280-267925	Instrument ID:	CHHPLC_G
Client Matrix:	Solid	Prep Batch:	280-267438	Lab File ID:	G0313039:D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	30 g
Analysis Date:	03/14/2015 0601	Units:	ug/Kg	Final Weight/Volume:	4 mL
Prep Date:	03/10/2015 2117			Injection Volume:	20 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	2000	1710	85	78 - 116	
Acenaphthylene	2000	1670	84	66 - 115	
Anthracene	2000	1610	81	74 - 115	
Benzo[a]anthracene	2000	1750	88	77 - 120	
Benzo[a]pyrene	2000	1680	84	74 - 115	
Benzo[b]fluoranthene	2000	1720	86	56 - 115	
Benzo[g,h,i]perylene	2000	1920	96	72 - 120	
Benzo[k]fluoranthene	2000	1780	89	76 - 115	
Chrysene	2000	1730	86	79 - 115	
Dibenzo(a,h)anthracene	2000	1700	85	72 - 115	
Fluoranthene	2000	1740	87	77 - 115	
Fluorene	2000	1800	90	80 - 115	
Indeno[1,2,3-cd]pyrene	2000	1750	87	78 - 115	
Naphthalene	2000	1670	84	68 - 120	
Phenanthrene	2000	1690	84	80 - 115	
Pyrene	2000	1830	91	75 - 115	
Surrogate			% Rec	Acceptance Limits	
Terphenyl-d14 (SUR)			88	72 - 115	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-267438**

**Method: 8310
Preparation: 3550C**

MS Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/14/2015 0702
Prep Date: 03/10/2015 2117
Leach Date: N/A

Analysis Batch: 280-267925
Prep Batch: 280-267438
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0313041.D
Initial Weight/Volume: 30.8 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/14/2015 0732
Prep Date: 03/10/2015 2117
Leach Date: N/A

Analysis Batch: 280-267925
Prep Batch: 280-267438
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0313042.D
Initial Weight/Volume: 32.4 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acenaphthene	78	87	78 - 116	5	20		
Acenaphthylene	81	90	66 - 115	5	20		
Anthracene	79	89	74 - 115	6	20		
Benzo[a]anthracene	85	96	77 - 120	7	20		
Benzo[a]pyrene	80	91	74 - 115	8	20		
Benzo[b]fluoranthene	83	91	56 - 115	5	20		
Benzo[g,h,i]perylene	93	105	72 - 120	7	20		
Benzo[k]fluoranthene	85	97	76 - 115	9	20		
Chrysene	84	96	79 - 115	9	20		
Dibenzo(a,h)anthracene	80	92	72 - 115	8	20		
Fluoranthene	85	95	77 - 115	6	20		
Fluorene	87	97	80 - 115	5	20		
Indeno[1,2,3-cd]pyrene	85	103	78 - 115	14	20		
Naphthalene	81	89	68 - 120	5	20		
Phenanthrene	82	91	80 - 115	6	20		
Pyrene	89	99	75 - 115	6	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
Terphenyl-d14 (SUR)	86	95	72 - 115

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-267438**

**Method: 8310
Preparation: 3550C**

MS Lab Sample ID: 280-66218-1 Units: ug/Kg
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/14/2015 0702
Prep Date: 03/10/2015 2117
Leach Date: N/A

MSD Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/14/2015 0732
Prep Date: 03/10/2015 2117
Leach Date: N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Acenaphthene	10 U	2010	1910	1570	1660
Acenaphthylene	9.0 U	2010	1910	1640	1720
Anthracene	3.0 U	2010	1910	1590	1700
Benzo[a]anthracene	3.2 U	2010	1910	1720	1830
Benzo[a]pyrene	6.4 U	2010	1910	1610	1740
Benzo[b]fluoranthene	4.2 U	2010	1910	1660	1750
Benzo[g,h,i]perylene	7.2 U	2010	1910	1860	2010
Benzo[k]fluoranthene	3.9 U	2010	1910	1700	1860
Chrysene	4.8 U	2010	1910	1690	1840
Dibenzo(a,h)anthracene	11 U	2010	1910	1620	1750
Fluoranthene	13 U	2010	1910	1710	1820
Fluorene	5.3 U	2010	1910	1760	1850
Indeno[1,2,3-cd]pyrene	12 U	2010	1910	1720	1970
Naphthalene	12 U	2010	1910	1630	1710
Phenanthrene	12 U	2010	1910	1650	1750
Pyrene	12 U	2010	1910	1790	1900

Date: 14 April 2015
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: 100-IU-1 & 100-IU-6 Remaining Waste Sites – Soil Full Protocol - Waste Site 600-20
 Subject: Inorganic - Data Package No. JP0915-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0915 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
J1V4N5	3/9/15	Soil	C	See note 1
J1V4N6	3/9/15	Soil	C	See note 1
J1V4N7	3/9/15	Soil	C	See note 1
J1V4N8	3/9/15	Soil	C	See note 1
J1V4N9	3/9/15	Soil	C	See note 1
J1V4P0	3/9/15	Soil	C	See note 1
J1V4P1	3/9/15	Soil	C	See note 1
J1V4P2	3/9/15	Soil	C	See note 1
J1V4P3	3/9/15	Soil	C	See note 1
J1V4P4	3/9/15	Soil	C	See note 1
J1V4P5	3/9/15	Soil	C	See note 1
J1V4P6	3/9/15	Soil	C	See note 1
J1V4P7	3/9/15	Soil	C	See note 1

1 - ICP metals (6010B).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, September 2009). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

· Holding Times

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

All holding times were acceptable.

· Preparation (Method) Blanks

Preparation Blanks

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

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 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 (53%), calcium (136) and silicon (20%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (6%) 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 (J1V4N5/J1V4P7) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

· **Analytical Detection Levels**

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

Completeness

Data package No. JP0904 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all antimony (53%), calcium (136) and silicon (20%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (6%) results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

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

Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: JP0915	REVIEWER: ELR	Project: 600-20	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silicon	J	All	LCS recovery
Antimony Calcium Silicon	J	All	MS recovery

Calcium

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

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4N5

Lab Sample ID: 280-66218-1

Date Sampled: 03/09/2015 0820

Client Matrix: Solid

% Moisture: 3.2

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-267674	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25B031115.asc
Dilution: 1.0		Initial Weight/Volume: 1.03 g
Analysis Date: 03/12/2015 0004	<i>W 4/14/15</i>	Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5810	X	1.6	5.0
Arsenic		2.6		0.66	1.0
Barium		48.9	X	0.076	0.50
Beryllium		0.15	B	0.033	0.20
Boron		0.98	U	0.98	2.0
Calcium		6160	X J	14.1	50.2
Chromium		9.1		0.058	0.20
Copper		11.7		0.22	1.0
Iron		15300		3.8	5.0
Lead		3.2		0.27	0.50
Magnesium		4460		3.7	20.1
Manganese		276		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		9.5	X	0.12	4.0
Potassium		792		41.1	301
Selenium		0.86	U	0.86	1.0
Silicon		165	N J	5.7	10.0
Sodium		189		59.2	120
Vanadium		42.0	X	0.094	2.0
Zinc		35.1		0.40	1.0

Analysis Method: 6010B	Analysis Batch: 280-267866	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 26a031215a.asc
Dilution: 1.0		Initial Weight/Volume: 1.03 g
Analysis Date: 03/12/2015 1513		Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.38	U J	0.38	0.60
Cadmium		0.14	B	0.041	0.20
Cobalt		5.2		0.10	1.0
Silver		0.16	U	0.16	0.20

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4N6

Lab Sample ID: 280-66218-2

Date Sampled: 03/09/2015 0854

Client Matrix: Solid

% Moisture: 1.5

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-267674	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	03/12/2015 0016			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

4/14/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3900	X	1.5	4.7
Arsenic		1.3		0.63	0.95
Barium		50.3	X	0.072	0.47
Boron		0.93	U	0.93	1.9
Calcium		4830	X J	13.4	47.5
Chromium		5.6		0.055	0.19
Iron		23000		3.6	4.7
Manganese		305		0.095	0.95
Molybdenum		0.25	U	0.25	1.9
Nickel		9.2	X	0.12	3.8
Potassium		418		38.9	285
Selenium		0.82	U	0.82	0.95
Silicon		90.7	N J	5.4	9.5
Sodium		270		56.0	114

Analysis Method:	6010B	Analysis Batch:	280-268097	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25A031315.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	03/13/2015 1247			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.14	B	0.039	0.19
Silver		0.15	U	0.15	0.19

Analysis Method:	6010B	Analysis Batch:	280-267866	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	26a031215a.asc
Dilution:	5.0			Initial Weight/Volume:	1.07 g
Analysis Date:	03/12/2015 1523			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		1.8	U J	1.8	2.8
Beryllium		0.16	U	0.16	0.95
Cobalt		8.6		0.47	4.7
Copper		15.4		1.0	4.7
Lead		2.6		1.3	2.4
Magnesium		4600		17.6	94.9
Vanadium		71.9	X	0.45	9.5
Zinc		45.7		1.9	4.7

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N7

Lab Sample ID: 280-66218-3
Client Matrix: Solid

% Moisture: 1.9

Date Sampled: 03/09/2015 0852
Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B Analysis Batch: 280-267674 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-267503 Lab File ID: 25B031115.asc
Dilution: 1.0
Analysis Date: 03/12/2015 0019 *re 4/14/15* Initial Weight/Volume: 1.06 g
Prep Date: 03/11/2015 1345 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4430	X	1.5	4.8
Arsenic		1.5		0.63	0.96
Barium		59.6	X	0.073	0.48
Boron		0.94	U	0.94	1.9
Calcium		4380	X J	13.6	48.1
Chromium		5.4		0.056	0.19
Iron		23800		3.7	4.8
Manganese		316		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		8.5	X	0.12	3.8
Potassium		481		39.4	288
Selenium		0.83	U	0.83	0.96
Silicon		100	N J	5.4	9.6
Sodium		307		56.7	115

Analysis Method: 6010B Analysis Batch: 280-268097 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-267503 Lab File ID: 25A031315.asc
Dilution: 1.0
Analysis Date: 03/13/2015 1250 Initial Weight/Volume: 1.06 g
Prep Date: 03/11/2015 1345 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.16	B	0.039	0.19
Silver		0.15	U	0.15	0.19

Analysis Method: 6010B Analysis Batch: 280-267866 Instrument ID: MT_025
Prep Method: 3050B Prep Batch: 280-267503 Lab File ID: 26A031215a.asc
Dilution: 2.0
Analysis Date: 03/12/2015 1526 Initial Weight/Volume: 1.06 g
Prep Date: 03/11/2015 1345 Final Weight/Volume: 100 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.73	U J	0.73	1.2
Beryllium		0.15	B	0.063	0.38
Cobalt		8.5		0.19	1.9
Copper		15.1		0.42	1.9
Lead		2.2		0.52	0.96
Magnesium		4470		7.1	38.5
Vanadium		76.5	X	0.18	3.8
Zinc		47.3		0.77	1.9

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N8

Lab Sample ID: 280-66218-4
Client Matrix: Solid

% Moisture: 1.7

Date Sampled: 03/09/2015 0849
Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-267674	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/12/2015 0022			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4960	X	1.5	4.8
Arsenic		1.8		0.63	0.96
Barium		45.9	X	0.073	0.48
Beryllium		0.11	B	0.032	0.19
Boron		0.94	U	0.94	1.9
Calcium		4090	X J	13.5	48.0
Chromium		7.5		0.056	0.19
Copper		11.9		0.21	0.96
Iron		18600		3.6	4.8
Lead		2.4		0.26	0.48
Magnesium		4720		3.6	19.2
Manganese		276		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		11.3	X	0.12	3.8
Potassium		582		39.3	288
Selenium		0.83	U	0.83	0.96
Silicon		120	N J	5.4	9.6
Sodium		215		56.6	115
Vanadium		55.2	X	0.090	1.9
Zinc		37.7		0.38	0.96

Analysis Method:	6010B	Analysis Batch:	280-267866	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	26a031215a.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/12/2015 1528			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.36	U J	0.36	0.58
Cadmium		0.12	B	0.039	0.19
Cobalt		6.2		0.096	0.96
Silver		0.15	U	0.15	0.19

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4N9

Lab Sample ID: 280-66218-5

Date Sampled: 03/09/2015 0903

Client Matrix: Solid

% Moisture: 2.9

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-267674	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25B031115.asc
Dilution: 1.0		Initial Weight/Volume: 1.00 g
Analysis Date: 03/12/2015 0025		Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5520	X	1.6	5.1
Arsenic		2.0		0.68	1.0
Barium		58.0	X	0.078	0.51
Beryllium		0.12	B	0.034	0.21
Boron		1.0	U	1.0	2.1
Calcium		3810	X J	14.5	51.5
Chromium		7.3		0.060	0.21
Copper		12.8		0.22	1.0
Iron		20600		3.9	5.1
Lead		2.9		0.28	0.51
Magnesium		5100		3.8	20.6
Manganese		298		0.10	1.0
Molybdenum		0.27	U	0.27	2.1
Nickel		13.6	X	0.13	4.1
Potassium		573		42.2	309
Selenium		0.89	U	0.89	1.0
Silicon		133	N J	5.8	10.3
Sodium		211		60.8	124
Vanadium		61.4	X	0.097	2.1
Zinc		41.0		0.41	1.0

Analysis Method: 6010B	Analysis Batch: 280-267866	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 26a031215a.asc
Dilution: 1.0		Initial Weight/Volume: 1.00 g
Analysis Date: 03/12/2015 1531		Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.39	U J	0.39	0.62
Cadmium		0.11	B	0.042	0.21
Cobalt		6.7		0.10	1.0
Silver		0.16	U	0.16	0.21

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P0

Lab Sample ID: 280-66218-6

Date Sampled: 03/09/2015 0846

Client Matrix: Solid

% Moisture: 2.8

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-267674	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0			Initial Weight/Volume:	1.12 g
Analysis Date:	03/12/2015 0040			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5720	X	1.4	4.6
Arsenic		3.0		0.61	0.92
Barium		60.4	X	0.070	0.46
Boron		0.90	U	0.90	1.8
Calcium		4570	X <i>J</i>	12.9	45.9
Chromium		8.5		0.053	0.18
Iron		22600		3.5	4.6
Manganese		339		0.092	0.92
Molybdenum		0.24	U	0.24	1.8
Nickel		14.3	X	0.11	3.7
Potassium		679		37.7	275
Selenium		0.79	U	0.79	0.92
Silicon		144	N <i>J</i>	5.2	9.2
Sodium		260		54.2	110

Analysis Method:	6010B	Analysis Batch:	280-268097	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25A031315.asc
Dilution:	1.0			Initial Weight/Volume:	1.12 g
Analysis Date:	03/13/2015 1253			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.082	B	0.038	0.18
Silver		0.15	U	0.15	0.18

Analysis Method:	6010B	Analysis Batch:	280-267866	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	26a031215a.asc
Dilution:	2.0			Initial Weight/Volume:	1.12 g
Analysis Date:	03/12/2015 1544			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.70	U <i>J</i>	0.70	1.1
Beryllium		0.20	B	0.061	0.37
Cobalt		8.1		0.18	1.8
Copper		14.8		0.40	1.8
Lead		2.8		0.50	0.92
Magnesium		5210		6.8	36.7
Vanadium		69.7	X	0.17	3.7
Zinc		46.9		0.73	1.8

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P1

Lab Sample ID: 280-66218-7

Date Sampled: 03/09/2015 0844

Client Matrix: Solid

% Moisture: 0.9

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-267674	Instrument ID: MT_025	
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25B031115.asc	
Dilution: 1.0		Initial Weight/Volume: 1.10 g	
Analysis Date: 03/12/2015 0043	<i>✓ 4/14/15</i>	Final Weight/Volume: 100 mL	
Prep Date: 03/11/2015 1345			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4340	X	1.4	4.6
Arsenic		1.4		0.61	0.92
Barium		56.7	X	0.070	0.46
Boron		0.90	U	0.90	1.8
Calcium		4550	X <i>J</i>	12.9	45.9
Chromium		6.2		0.053	0.18
Iron		23800		3.5	4.6
Manganese		306		0.092	0.92
Molybdenum		0.24	U	0.24	1.8
Nickel		9.6	X	0.11	3.7
Potassium		528		37.6	275
Selenium		0.79	U	0.79	0.92
Silicon		123	N <i>J</i>	5.2	9.2
Sodium		290		54.1	110

Analysis Method: 6010B	Analysis Batch: 280-268097	Instrument ID: MT_025	
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25A031315.asc	
Dilution: 1.0		Initial Weight/Volume: 1.10 g	
Analysis Date: 03/13/2015 1255		Final Weight/Volume: 100 mL	
Prep Date: 03/11/2015 1345			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.15	B	0.038	0.18
Silver		0.15	U	0.15	0.18

Analysis Method: 6010B	Analysis Batch: 280-267866	Instrument ID: MT_025	
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 26a031215a.asc	
Dilution: 2.0		Initial Weight/Volume: 1.10 g	
Analysis Date: 03/12/2015 1546		Final Weight/Volume: 100 mL	
Prep Date: 03/11/2015 1345			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.70	U <i>J</i>	0.70	1.1
Beryllium		0.13	B	0.061	0.37
Cobalt		8.5		0.18	1.8
Copper		14.7		0.40	1.8
Lead		2.6		0.50	0.92
Magnesium		4590		6.8	36.7
Vanadium		75.9	X	0.17	3.7
Zinc		46.3		0.73	1.8

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P2

Lab Sample ID: 280-66218-8

Date Sampled: 03/09/2015 0842

Client Matrix: Solid

% Moisture: 2.4

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-267674	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	03/12/2015 0046			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

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Analyte	DryWT Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5280	X	1.5	4.9
Arsenic		2.2		0.65	0.98
Barium		69.4	X	0.075	0.49
Boron		0.97	U	0.97	2.0
Calcium		4210	X J	13.9	49.2
Chromium		6.7		0.057	0.20
Iron		23500		3.7	4.9
Manganese		317		0.098	0.98
Molybdenum		0.26	U	0.26	2.0
Nickel		11.7	X	0.12	3.9
Potassium		693		40.4	295
Selenium		0.85	U	0.85	0.98
Silicon		154	N J	5.6	9.8
Sodium		240		58.1	118

Analysis Method:	6010B	Analysis Batch:	280-268097	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25A031315.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	03/13/2015 1258			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWT Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.15	B	0.040	0.20
Silver		0.16	U	0.16	0.20

Analysis Method:	6010B	Analysis Batch:	280-267866	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	26A031215a.asc
Dilution:	2.0			Initial Weight/Volume:	1.04 g
Analysis Date:	03/12/2015 1549			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWT Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.75	U J	0.75	1.2
Beryllium		0.18	B	0.065	0.39
Cobalt		8.2		0.20	2.0
Copper		15.5		0.43	2.0
Lead		3.1		0.53	0.98
Magnesium		4930		7.3	39.4
Vanadium		71.5	X	0.19	3.9
Zinc		46.9		0.78	2.0

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P3

Lab Sample ID: 280-66218-9

Date Sampled: 03/09/2015 0831

Client Matrix: Solid

% Moisture: 1.5

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-267674	Instrument ID: MT_025	
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25B031115.asc	
Dilution: 1.0		Initial Weight/Volume: 1.15 g	
Analysis Date: 03/12/2015 0049	<i>4/4/15</i>	Final Weight/Volume: 100 mL	
Prep Date: 03/11/2015 1345			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5260	X	1.4	4.4
Arsenic		1.9		0.58	0.88
Barium		71.4	X	0.067	0.44
Beryllium		0.12	B	0.029	0.18
Boron		0.87	U	0.87	1.8
Calcium		4610	X J	12.4	44.1
Chromium		7.6		0.051	0.18
Copper		14.4		0.19	0.88
Iron		21600		3.4	4.4
Lead		3.9		0.24	0.44
Magnesium		4720		3.3	17.7
Manganese		310		0.088	0.88
Molybdenum		0.23	U	0.23	1.8
Nickel		10.3	X	0.11	3.5
Potassium		712		36.2	265
Selenium		0.76	U	0.76	0.88
Silicon		165	N J	5.0	8.8
Sodium		240		52.1	106
Vanadium		62.6	X	0.083	1.8
Zinc		46.4		0.35	0.88

Analysis Method: 6010B	Analysis Batch: 280-267866	Instrument ID: MT_025	
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 26a031215a.asc	
Dilution: 1.0		Initial Weight/Volume: 1.15 g	
Analysis Date: 03/12/2015 1551		Final Weight/Volume: 100 mL	
Prep Date: 03/11/2015 1345			

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.34	U J	0.34	0.53
Cadmium		0.13	B	0.036	0.18
Cobalt		7.4		0.088	0.88
Silver		0.14	U	0.14	0.18

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P4

Lab Sample ID: 280-66218-10

Date Sampled: 03/09/2015 0900

Client Matrix: Solid

% Moisture: 2.1

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-267674	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/12/2015 0052			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

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Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5900	X	1.5	4.8
Arsenic		2.9		0.64	0.96
Barium		57.9	X	0.073	0.48
Beryllium		0.14	B	0.032	0.19
Boron		0.94	U	0.94	1.9
Calcium		5120	X J	13.6	48.2
Chromium		8.8		0.056	0.19
Copper		15.5		0.21	0.96
Iron		20600		3.7	4.8
Lead		3.1		0.26	0.48
Magnesium		4960		3.6	19.3
Manganese		313		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		11.3	X	0.12	3.9
Potassium		779		39.5	289
Selenium		0.83	U	0.83	0.96
Silicon		166	N J	5.5	9.6
Sodium		249		56.9	116
Vanadium		59.4	X	0.091	1.9
Zinc		41.8		0.38	0.96

Analysis Method:	6010B	Analysis Batch:	280-267866	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	26a031215a.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/12/2015 1554			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.37	U J	0.37	0.58
Cadmium		0.13	B	0.040	0.19
Cobalt		6.9		0.096	0.96
Silver		0.15	U	0.15	0.19

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P5

Lab Sample ID: 280-66218-11

Date Sampled: 03/09/2015 0857

Client Matrix: Solid

% Moisture: 1.7

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-267674	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/12/2015 0055			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

M 4/14/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4150	X	1.5	4.8
Arsenic		1.5		0.63	0.96
Barium		72.2	X	0.073	0.48
Boron		0.94	U	0.94	1.9
Calcium		4330	X J	13.5	48.0
Chromium		6.1		0.056	0.19
Iron		23100		3.6	4.8
Manganese		300		0.096	0.96
Molybdenum		0.25	U	0.25	1.9
Nickel		9.8	X	0.12	3.8
Potassium		478		39.4	288
Selenium		0.83	U	0.83	0.96
Silicon		96.0	N J	5.4	9.6
Sodium		289		56.6	115

Analysis Method:	6010B	Analysis Batch:	280-268097	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	25A031315.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/13/2015 1301			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.13	B	0.039	0.19
Silver		0.15	U	0.15	0.19

Analysis Method:	6010B	Analysis Batch:	280-267866	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-267503	Lab File ID:	26a031215a.asc
Dilution:	2.0			Initial Weight/Volume:	1.06 g
Analysis Date:	03/12/2015 1557			Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.73	U J	0.73	1.2
Beryllium		0.16	B	0.063	0.38
Cobalt		8.1		0.19	1.9
Copper		14.1		0.42	1.9
Lead		2.4		0.52	0.96
Magnesium		4570		7.1	38.4
Vanadium		70.1	X	0.18	3.8
Zinc		45.9		0.76	1.9

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Client Sample ID: J1V4P6

Lab Sample ID: 280-66218-12

Date Sampled: 03/09/2015 0839

Client Matrix: Solid

% Moisture: 2.1

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-267674	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25B031115.asc
Dilution: 1.0		Initial Weight/Volume: 1.01 g
Analysis Date: 03/12/2015 0058		Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

u 4/14/15

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5680	X	1.6	5.1
Arsenic		3.2		0.67	1.0
Barium		78.5	X	0.077	0.51
Beryllium		0.14	B	0.033	0.20
Boron		0.99	U	0.99	2.0
Calcium		5220	X J	14.3	50.6
Chromium		10.2		0.059	0.20
Copper		13.1		0.22	1.0
Iron		17100		3.8	5.1
Lead		4.5		0.27	0.51
Magnesium		4440		3.7	20.2
Manganese		372		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		10.7	X	0.12	4.0
Potassium		854		41.5	303
Selenium		0.87	U	0.87	1.0
Silicon		185	N J	5.7	10.1
Sodium		160		59.7	121
Vanadium		45.1	X	0.095	2.0
Zinc		35.3		0.40	1.0

Analysis Method: 6010B	Analysis Batch: 280-267866	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 26a031215a.asc
Dilution: 1.0		Initial Weight/Volume: 1.01 g
Analysis Date: 03/12/2015 1559		Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.38	U J	0.38	0.61
Cadmium		0.14	B	0.041	0.20
Cobalt		6.2		0.10	1.0
Silver		0.16	U	0.16	0.20

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-66218-1

Sdg Number: JP0915

Client Sample ID: J1V4P7

Lab Sample ID: 280-66218-13

Date Sampled: 03/09/2015 0820

Client Matrix: Solid

% Moisture: 2.4

Date Received: 03/10/2015 1310

6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-267674	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 25B031115.asc
Dilution: 1.0		Initial Weight/Volume: 1.05 g
Analysis Date: 03/12/2015 0101	<i>M 4/4/15</i>	Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6100	X	1.5	4.9
Arsenic		2.7		0.64	0.98
Barium		56.6	X	0.074	0.49
Beryllium		0.15	B	0.032	0.20
Boron		0.96	U	0.96	2.0
Calcium		6480	X J	13.8	48.8
Chromium		9.7		0.057	0.20
Copper		12.7		0.21	0.98
Iron		16000		3.7	4.9
Lead		3.1		0.26	0.49
Magnesium		4750		3.6	19.5
Manganese		270		0.098	0.98
Molybdenum		0.25	U	0.25	2.0
Nickel		10	X	0.12	3.9
Potassium		781		40.0	293
Selenium		0.84	U	0.84	0.98
Silicon		184	N J	5.5	9.8
Sodium		191		57.6	117
Vanadium		41.7	X	0.092	2.0
Zinc		35.4		0.39	0.98

Analysis Method: 6010B	Analysis Batch: 280-267866	Instrument ID: MT_025
Prep Method: 3050B	Prep Batch: 280-267503	Lab File ID: 28a031215a.asc
Dilution: 1.0		Initial Weight/Volume: 1.05 g
Analysis Date: 03/12/2015 1602		Final Weight/Volume: 100 mL
Prep Date: 03/11/2015 1345		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Antimony		0.37	U J	0.37	0.59
Cadmium		0.11	B	0.040	0.20
Cobalt		5.3		0.098	0.98
Silver		0.16	U	0.16	0.20

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Job Number: 280-66218-1

SDG #: JP0915

SAF#: RC-232

Date SDG Closed: March 10, 2015

Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1V4N5	280-66218-1	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N6	280-66218-2	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N7	280-66218-3	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N8	280-66218-4	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4N9	280-66218-5	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P0	280-66218-6	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P1	280-66218-7	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P2	280-66218-8	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P3	280-66218-9	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P4	280-66218-10	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4O5	280-66218-11	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P6	280-66218-12	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310
J1V4P7	280-66218-13	6010/WTPH-D+/8310	6010B/NWTPH-Dx/8310

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 3/10/2015 1:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.0° C.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

No anomalies were encountered.

TOTAL METALS - SW846 6010B

Serial dilution of a digestate in batch 280-267503 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Each sample is analyzed to achieve the lowest possible reporting limits within the constraints of the methods. Sample J1V4N6 required a 5x dilution, and samples J1V4N7, J1V4P0, J1V4P1, J1V4P2 and J1V4P5 required a 2X dilution prior to the analysis of Antimony, Beryllium, Cobalt, Copper, Lead, Magnesium, Vanadium and Zinc to minimize the interference caused by Titanium concentrations greater than the linear range. The reporting limits have been adjusted relative to the dilution required.

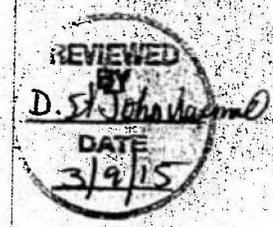
Low levels of Barium, Calcium and Magnesium are present in the method blank associated with batch 280-267503. Because the concentrations in the method blank are not present at levels greater than half the reporting limit, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS associated with batch 280-267503, and the associated sample results have been flagged "N". Silicon has been identified as a poor performing element when analyzed using this method and has a history of reacting inconsistently; therefore, corrective action is not initiated. Data are reported as is.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1V4N5; therefore, control limits are not applicable.

No other anomalies were encountered.

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-232-089	Page 1 of 3	
Collector STOWE, OG		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 7 days
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites		Sampling Location 600-20 (excavation, verification)		SAF No. RC-232				
Ice Chest No. WCH-08-067		Field Logbook No. EL-1667-02		COA 0600202000		Method of Shipment Commercial Carrier		1 Fed Ex
Shipped To TestAmerica Denver.		Offsite Property No. A131330		Bill of Lading/Air Bill No. See OSPC				
Other Labs Shipped To N/A		Preservation	Cool 4C	Cool 4C	Cool 4C			
		Type of Container	GP	#G	#G			
POSSIBLE SAMPLE HAZARDS/REMARKS N/A		No. of Container(s)	1	1	1			
		Volume	250mL	125mL	250mL			
Special Handling and/or Storage Cool 4C		Sample Analysis	See Item (1) in Special Instructions	TPH-Diesel Range - WTPH-D+	PAHs - 8310			
Sample No.	Matrix	Sample Date	Sample Time					
J1V4N5	SOIL	3/9/15	0820	X	X	X		
J1V4N6	SOIL	3/9/15	0854	X	X	X		
J1V4N7	SOIL	3/9/15	0852	X	X	X		
J1V4N8	SOIL	3/9/15	0849	X	X	X		
J1V4N9	SOIL	3/9/15	0903	X	X	X		
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS		
Relinquished By/Removed From Ruiny stone		Date/Time 3-9-15 0925	Received By/Stored In C. B. Ingram		Date/Time 3-9-15 1100	(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} 3.8 IRS +0.2 Transferred By M4 3/10/15 REVIEWED BY D. St. John DATE 3/9/15		
Relinquished By/Removed From C. B. Ingram		Date/Time 3-9-15 1115	Received By/Stored In Fed Ex		Date/Time 3-9-15			
Relinquished By/Removed From WCH		Date/Time 3-9-15	Received By/Stored In WCH		Date/Time 3/10/15 13:10			
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time		JP0915			



Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-089

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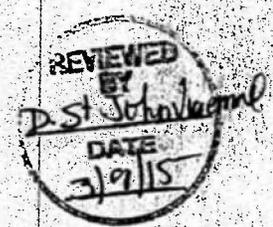
Collector STOWE, QG	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 2 days
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-20 (excavation, verification)	SAF No. RC-232			
Ice Chest No. WCH-08-067	Field Logbook No. EL-1667-02	COA 0600202000	Method of Shipment Commercial Carrier	Fed Ex	
Shipped To TestAmerica Denver	Offsite Property No. A131330	Bill of Lading/Air Bill No. See OSPC			

Other Labs Shipped To N/A	Preservation	Cool 4C	Cool 4C	Cool 4C						
	Type of Container	G/P	aG	aG						
	No. of Container(s)	1	1	1						
	Volume	250mL	125mL	250mL						
	Sample Analysis	See Item (1) in Special Instructions	TPH-Diesel Range - WTPH-D +	PAHs - 8310						

Sample No.	Matrix	Sample Date	Sample Time							
J1V4P0	SOIL	3/9/15	0846	X	X	X				
J1V4P1	SOIL	3/9/15	0844	X	X	X				
J1V4P2	SOIL	3/9/15	0842	X	X	X				
J1V4P3	SOIL	3/9/15	0831	X	X	X				
J1V4P4	SOIL	3/9/15	0900	X	X	X				

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From Guiney Stowe	Date/Time 3-9-15 0925	Received By/Stored In C. Bingham	Date/Time 3-9-15 1100
Relinquished By/Removed From C. Bingham	Date/Time 3-9-15 1115	Received By/Stored In Fed Ex	Date/Time 3-9-15
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
(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)



JP0915

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time
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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-232-089	Page 3 of 3
Collector STOWE, QG	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 8B	Data Turnaround 7 days 3-9-15 cmc	
Project Designation 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location 600-20 (excavation, verification)	SAF No. RC-232	Method of Shipment Commercial Carrier Fed Ex			
Ice Chest No. WCH-08-067	Field Logbook No. EL-1667-02	COA 0600202000	Method of Shipment Commercial Carrier Fed Ex			
Shipped To TestAmerica Denver	Offsite Property No. A131330	Bill of Lading/Air Bill No. See OSPO				

Other Labs Shipped To N/A	Preservation	Cool 4C	Cool 4C	Cool 4C					
	Type of Container	GP	ag	ag					
	No. of Container(s)	1	1	1					
	Volume	250mL	125mL	250mL					
	Sample Analysis	See Item (1) in Special Instructions	TPH-Diesel Range - WTPH-D +	PAHs - 8310					

Sample No.	Matrix	Sample Date	Sample Time						
J114P5	SOIL	3/9/15	0857	X	X	X			
J114P6	SOIL	3/9/15	0839	X	X	X			
J114P7	SOIL	3/9/15	0820	X	X	X			

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From Joan Stowe	Date/Time 3-9-15 0925	Received By/Stored In C. Bingham	Date/Time 3-9-15 1100
Relinquished By/Removed From C. Bingham	Date/Time 3-9-15 1115	Received By/Stored In Fed Ex	Date/Time 3-9-15
Relinquished By/Removed From	Date/Time	Received By/Stored In Fed Ex	Date/Time 3/10/15 13:10
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
(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)

JP0915

Appendix 5
Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-20		DATA PACKAGE: JP0915		
VALIDATOR:	ELR	LAB:	TAL	DATE: 4/14/15	
			SDG: JP0915		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J1U4N5 J1U4N6 J1U4N7 J1U4N8 J1U4N9					
J1U4P0 J1U4P1 J1U4P2 J1U4P3 J1U4P4					
J1U4P5 J1U4P6 J1U4P7					
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: NO FB

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 (67%) - J all
MS - Calcium (136%) Silicon (20%) entry (537%) - J all

_____ NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate RPD values acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Duplicate results acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
MS/MSD standards NIST traceable? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
MS/MSD standards expired? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Field duplicate RPD values acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Field split RPD values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
ICP serial dilution %D values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
ICP post digestion spike required?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
ICP post digestion spike values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Standards traceable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Standards expired?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? Yes No N/A
Results supported in the raw data? (Levels D, E)..... Yes No N/A
Samples properly prepared? (Levels D, E)..... Yes No N/A
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Method Blank - Batch: 280-267503

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

Lab Sample ID: MB 280-267503/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/11/2015 2359
Prep Date: 03/11/2015 1345
Leach Date: N/A

Analysis Batch: 280-267674
Prep Batch: 280-267503
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25B031115.asc
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Arsenic	0.66	U	0.66	1.0
Barium	0.0950	B	0.076	0.50
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Calcium	18.63	B	14.1	50.0
Chromium	0.058	U	0.058	0.20
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	6.02	B	3.7	20.0
Manganese	0.10	U	0.10	1.0
Molybdenum	0.28	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
Sodium	59.0	U	59.0	120
Vanadium	0.094	U	0.094	2.0
Zinc	0.40	U	0.40	1.0

Method Blank - Batch: 280-267503

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

Lab Sample ID: MB 280-267503/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1508
Prep Date: 03/11/2015 1345
Leach Date: N/A

Analysis Batch: 280-267866
Prep Batch: 280-267503
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 26a031215a.asc
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Antimony	0.38	U	0.38	0.60
Cadmium	0.041	U	0.041	0.20
Cobalt	0.10	U	0.10	1.0
Silver	0.16	U	0.16	0.20

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Lab Control Sample - Batch: 280-267503

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-267503/2-A	Analysis Batch:	280-267674	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-267503	Lab File ID:	25B031115.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	03/12/2015 0001	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	197.1	99	82 - 116	
Arsenic	100	98.17	98	85 - 110	
Barium	200	180.5	90	87 - 112	
Beryllium	5.00	4.62	92	84 - 114	
Boron	100	102.5	103	80 - 120	
Calcium	5000	4431	89	82 - 114	
Chromium	20.0	18.65	93	84 - 114	
Copper	25.0	25.13	101	88 - 110	
Iron	100	95.03	95	87 - 120	
Lead	50.0	48.64	97	86 - 110	
Magnesium	5000	5239	105	90 - 110	
Manganese	50.0	51.23	102	88 - 110	
Molybdenum	100	101.5	101	86 - 110	
Nickel	50.0	48.31	97	87 - 110	
Potassium	5000	4591	92	89 - 110	
Selenium	200	196.9	98	83 - 110	
Silicon	1000	61.35	6	10 - 70	N
Sodium	5000	4951	99	90 - 112	
Vanadium	50.0	52.84	106	88 - 110	
Zinc	50.0	49.87	100	76 - 114	

Lab Control Sample - Batch: 280-267503

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-267503/2-A	Analysis Batch:	280-267866	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-267503	Lab File ID:	26a031215a.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.00 g
Analysis Date:	03/12/2015 1511	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	03/11/2015 1345				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	51.11	102	82 - 110	
Cadmium	10.0	10.36	104	87 - 110	
Cobalt	50.0	48.79	98	87 - 110	
Silver	5.00	5.36	107	87 - 114	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Matrix Spike - Batch: 280-267503

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 0013
Prep Date: 03/11/2015 1345
Leach Date: N/A

Analysis Batch: 280-267674
Prep Batch: 280-267503
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25B031115.asc
Initial Weight/Volume: 1.04 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	5810	199	8957	1585	50 - 200	4
Arsenic	2.6	99.4	93.55	92	76 - 111	
Barium	48.9	199	230.8	92	52 - 159	
Beryllium	0.15 B	4.97	4.49	87	72 - 106	
Boron	0.98 U	99.4	94.11	95	80 - 120	
Calcium	6160	4970	12930	136	43 - 165	
Chromium	9.1	19.9	29.61	103	70 - 200	
Copper	11.7	24.8	37.61	104	37 - 187	
Iron	15300	99.4	17910	2627	70 - 200	4
Lead	3.2	49.7	47.29	89	70 - 200	
Magnesium	4460	4970	10460	121	64 - 145	
Manganese	276	49.7	364.0	178	40 - 200	4
Molybdenum	0.26 U	99.4	91.53	92	75 - 103	
Nickel	9.5	49.7	54.59	91	61 - 126	
Potassium	792	4970	5403	93	56 - 172	
Selenium	0.86 U	199	182.3	92	76 - 104	
Silicon	165	994	360.9	20	20 - 200	
Sodium	189	4970	5048	98	78 - 111	
Vanadium	42.0	49.7	98.45	114	50 - 169	
Zinc	35.1	49.7	82.15	95	70 - 200	

Matrix Spike - Batch: 280-267503

Method: 6010B
Preparation: 3050B

Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1521
Prep Date: 03/11/2015 1345
Leach Date: N/A

Analysis Batch: 280-267866
Prep Batch: 280-267503
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 26a031215a.asc
Initial Weight/Volume: 1.04 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	0.38 U	49.7	26.23	53	20 - 200	
Cadmium	0.14 B	9.94	9.74	97	40 - 130	
Cobalt	5.2	49.7	50.41	91	72 - 106	
Silver	0.16 U	4.97	5.05	102	75 - 141	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-66218-1
Sdg Number: JP0915

Duplicate - Batch: 280-267503

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

Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 0010
Prep Date: 03/11/2015 1345
Leach Date: N/A

Analysis Batch: 280-267674
Prep Batch: 280-267503
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 25B031115.asc
Initial Weight/Volume: 1.08 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	5810	5818	0.2	40	
Arsenic	2.6	2.45	6	30	
Barium	48.9	47.48	3	30	
Beryllium	0.15 B	0.142	4	30	B
Boron	0.98 U	0.94	NC	30	U
Calcium	6160	6155	0.07	30	
Chromium	9.1	8.55	7	40	
Copper	11.7	11.73	0.2	30	
Iron	15300	15450	1	40	
Lead	3.2	3.00	7	40	
Magnesium	4460	4498	0.8	30	
Manganese	276	264.2	4	40	
Molybdenum	0.26 U	0.25	NC	30	U
Nickel	9.5	9.87	4	30	
Potassium	792	753.3	5	40	
Selenium	0.88 U	0.82	NC	30	U
Silicon	165	173.9	5	40	N
Sodium	189	200.2	6	30	
Vanadium	42.0	41.16	2	30	
Zinc	35.1	33.19	5	40	

Duplicate - Batch: 280-267503

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

Lab Sample ID: 280-66218-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2015 1518
Prep Date: 03/11/2015 1345
Leach Date: N/A

Analysis Batch: 280-267866
Prep Batch: 280-267503
Leach Batch: N/A
Units: mg/Kg

Instrument ID: MT_025
Lab File ID: 26a031215a.asc
Initial Weight/Volume: 1.08 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Antimony	0.38 U	0.38	NC	40	U
Cadmium	0.14 B	0.122	14	30	B
Cobalt	5.2	5.44	4	30	
Silver	0.16 U	0.15	NC	30	U