

**SAF-RC-210**  
**100-IU-2 & 100-IU-6 Miscellaneous**  
**Restoration Sites Near 100F - Soil Full**  
**Protocol**  
**FINAL VALIDATION PACKAGE**

**COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:**

Kathy Wendt

**COMMENTS:**

**SDG J01517**

**SAF-RC-210**

**Sample Location: 600-300**

Date: 30 July 2012  
 To: Washington Closure Hanford Inc. (technical representative)  
 From: ELR Consulting  
 Project: 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 100F – Soil Full Protocol - Waste Site 600-300  
 Subject: Pesticides/PCBs - Data Package No. J01517-TAL

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. J01517 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

<b>Sample ID</b>	<b>Sample Date</b>	<b>Media</b>	<b>Validation</b>	<b>Analyte</b>
J1P8F2	5/21/12	Soil	C	See note 1
J1P8F3	5/21/12	Soil	C	See note 1
J1P8F4	5/21/12	Soil	C	See note 1
J1P8F5	5/21/12	Soil	C	See note 1

1 – PCBs by 8082 and pesticides by 8081A.

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

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

## **DATA QUALITY OBJECTIVES**

### **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Pesticides must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction. Holding times are not applicable for PCB analysis.

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 Blank**

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

All method blank results were acceptable.

### Field Blanks

No field blanks were submitted for analysis.

### **Accuracy**

#### Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to a matrix spike recovery outside QC limits, all endrin aldehyde (7%) results were qualified as estimates and flagged "J".

Due to matrix spike duplicate recoveries outside QC limits, all endosulfan II (24%), endosulfan sulfate (18%), endrin aldehyde (35%), endrin ketone(42%) and methoxychlor (22%) results were qualified as estimates and flagged "J".

Due to the lack of a matrix spike, matrix spike and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

### Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

### **Precision**

#### Matrix Spike/Matrix Spike Duplicate Samples

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

Due to RPDs outside QC limits, all 4,4-DDD (37%), 4,4-DDT (43%), endosulfan II (109%), endosulfan sulfate (130%), endrin aldehyde (133%), endrin ketone (65%) and methoxychlor (121%) results were qualified as estimates and flagged "J".

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

All other precision results were acceptable.

#### Field Duplicate Samples

No field duplicates were submitted for analysis.

## **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. J01517 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 a matrix spike recovery outside QC limits, all endrin aldehyde (7%) results were qualified as estimates and flagged "J".
- Due to matrix spike duplicate recoveries outside QC limits, all endosulfan II (24%), endosulfan sulfate (18%), endrin aldehyde (35%), endrin ketone (42%) and methoxychlor (22%) results were qualified as estimates and flagged "J".
- Due to RPDs outside QC limits, all 4,4-DDD (37%), 4,4-DDT (43%), endosulfan II (109%), endosulfan sulfate (130%), endrin aldehyde (133%), endrin ketone (65%) and methoxychlor (121%) results were qualified as estimates and flagged "J".
- Due to the lack of a matrix spike, matrix spike and LCS analysis, all toxaphene 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 #S00W307A09 (March 2008), *Data Validation Services*, March 2008.

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

**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

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

**Appendix 2**  
**Summary of Data Qualification**

PESTICIDE/PCBDATA QUALIFICATION SUMMARY\*

<b>SDG: J01517</b>	<b>REVIEWER: ELR</b>	<b>Project: 600-300</b>	<b>PAGE 1 OF 1</b>
<b>COMPOUND</b>	<b>QUALIFIER</b>	<b>SAMPLES AFFECTED</b>	<b>REASON</b>
Endrin aldehyde	J	All	MS recovery
4,4-DDD 4,4-DDT endosulfan II endosulfan sulfate endrin aldehyde endrin ketone methoxychlor	J	All	RPD
endosulfan II endosulfan sulfate endrin aldehyde endrin ketone methoxychlor	J	All	MSD recovery
Toxaphene	J	All	No MS, MSD or LCS analysis.

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

**Appendix 3**  
**Annotated Laboratory Reports**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F2

Lab Sample ID: 280-29179-1

Date Sampled: 05/21/2012 0750

Client Matrix: Solid

% Moisture: 4.0

Date Received: 05/23/2012 0915

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

Analysis Method: 8082	Analysis Batch: 280-122738	Instrument ID: GCS_W
Prep Method: 3550C	Prep Batch: 280-122156	Initial Weight/Volume: 32.6 g
Dilution: 1.0		Final Weight/Volume: 5000 uL
Analysis Date: 06/05/2012 1400		Injection Volume: 1 uL
Prep Date: 06/01/2012 1600		Result Type: PRIMARY

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

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	78		59 - 130
Tetrachloro-m-xylene	70		53 - 128

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**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F3

Lab Sample ID: 280-29179-2

Date Sampled: 05/21/2012 0800

Client Matrix: Solid

% Moisture: 4.6

Date Received: 05/23/2012 0915

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

Analysis Method:	8082	Analysis Batch:	280-122738	Instrument ID:	GCS_W
Prep Method:	3550C	Prep Batch:	280-122156	Initial Weight/Volume:	30.3 g
Dilution:	1.0			Final Weight/Volume:	5000 uL
Analysis Date:	06/05/2012 1423			Injection Volume:	1 uL
Prep Date:	06/01/2012 1600			Result Type:	PRIMARY

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

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	71		59 - 130
Tetrachloro-m-xylene	69		53 - 128

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Analytical Data

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F4

Lab Sample ID: 280-29179-3  
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 05/21/2012 0810  
Date Received: 05/23/2012 0915

8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082	Analysis Batch:	280-122738	Instrument ID:	GCS_W
Prep Method:	3550C	Prep Batch:	280-122156	Initial Weight/Volume:	31.7 g
Dilution:	1.0			Final Weight/Volume:	5000 uL
Analysis Date:	06/05/2012 1446			Injection Volume:	1 uL
Prep Date:	06/01/2012 1600			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.1	U	8.1	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		2.6	U	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	72		59 - 130
Tetrachloro-m-xylene	70		53 - 128

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**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F5

Lab Sample ID: 280-29179-4

Date Sampled: 05/21/2012 0818

Client Matrix: Solid

% Moisture: 3.4

Date Received: 05/23/2012 0915

**8082 Polychlorinated Biphenyls (PCBs) by Gas Chromatography**

Analysis Method:	8082	Analysis Batch:	280-122738	Instrument ID:	GCS_W
Prep Method:	3550C	Prep Batch:	280-122156	Initial Weight/Volume:	30.5 g
Dilution:	1.0			Final Weight/Volume:	5000 uL
Analysis Date:	06/05/2012 1532			Injection Volume:	1 uL
Prep Date:	06/01/2012 1600			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Aroclor 1016		2.8	U	2.8	10
Aroclor 1221		8.2	U	8.2	17
Aroclor 1232		2.0	U	2.0	10
Aroclor 1242		4.7	U	4.7	10
Aroclor 1248		4.7	U	4.7	10
Aroclor 1254		2.6	U	2.6	10
Aroclor 1260		9.7	J	2.6	10

Surrogate	%Rec	Qualifier	Acceptance Limits
Decachlorobiphenyl	74		59 - 130
Tetrachloro-m-xylene	68		53 - 128

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7/29/12

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F2

Lab Sample ID: 280-29179-1

Date Sampled: 05/21/2012 0750

Client Matrix: Solid

% Moisture: 4.0

Date Received: 05/23/2012 0915

**8081A Organochlorine Pesticides (GC)**

Analysis Method: 8081A  
 Prep Method: 3550C  
 Dilution: 1.0  
 Analysis Date: 05/30/2012 2016  
 Prep Date: 05/23/2012 2200

Analysis Batch: 280-121932  
 Prep Batch: 280-121123

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Instrument ID: GCS\_P1  
 Initial Weight/Volume: 31.7 g  
 Final Weight/Volume: 10000 uL  
 Injection Volume: 1 uL  
 Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.54	U J	0.54	1.7
4,4'-DDE		1.1	J	0.23	1.7
4,4'-DDT		0.58	U J	0.58	1.7
Aldrin		0.25	U	0.25	1.6
alpha-BHC		0.21	U	0.21	1.6
beta-BHC		0.65	U	0.65	1.6
delta-BHC		0.40	U	0.40	1.6
gamma-BHC (Lindane)		0.46	U	0.46	1.6
Heptachlor		0.21	U	0.21	1.6
Heptachlor epoxide		0.42	U	0.42	1.6
Endosulfan I		0.17	U	0.17	1.6
Endosulfan II		0.28	U	0.28	1.7
Endosulfan sulfate		0.27	U	0.27	1.7
Endrin		0.30	U	0.30	1.7
Endrin aldehyde		0.17	U	0.17	1.7
Endrin ketone		0.48	U	0.48	1.7
gamma-Chlordane		0.26	U	0.26	1.7
Methoxychlor		0.44	U	0.44	3.3
alpha-Chlordane		0.32	U	0.32	1.7
Dieldrin		0.21	U	0.21	1.7
Toxaphene		16	U	16	160

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	68		59 - 115
Decachlorobiphenyl	85		63 - 124

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F3

Lab Sample ID: 280-29179-2

Date Sampled: 05/21/2012 0800

Client Matrix: Solid

% Moisture: 4.6

Date Received: 05/23/2012 0915

**8081A Organochlorine Pesticides (GC)**

Analysis Method: 8081A  
Prep Method: 3550C  
Dilution: 1.0  
Analysis Date: 05/30/2012 2034  
Prep Date: 05/23/2012 2200

Analysis Batch: 280-121932  
Prep Batch: 280-121123

Instrument ID: GCS\_P1  
Initial Weight/Volume: 30.5 g  
Final Weight/Volume: 10000 uL  
Injection Volume: 1 uL  
Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.56	U J	0.56	1.8
4,4'-DDE		0.25	U	0.25	1.8
4,4'-DDT		0.61	U J	0.61	1.8
Aldrin		0.26	U	0.26	1.7
alpha-BHC		0.22	U	0.22	1.7
beta-BHC		0.68	U	0.68	1.7
delta-BHC		0.41	U	0.41	1.7
gamma-BHC (Lindane)		0.48	U	0.48	1.7
Heptachlor		0.22	U	0.22	1.7
Heptachlor epoxide		0.44	U	0.44	1.7
Endosulfan I		0.18	U	0.18	1.7
Endosulfan II		0.30	UN J	0.30	1.8
Endosulfan sulfate		0.28	UN J	0.28	1.8
Endrin		0.32	U	0.32	1.8
Endrin aldehyde		0.18	UN J	0.18	1.8
Endrin ketone		0.50	UN J	0.50	1.8
gamma-Chlordane		0.27	U	0.27	1.8
Methoxychlor		0.46	UN J	0.46	3.4
alpha-Chlordane		0.33	U	0.33	1.8
Dieldrin		0.22	U	0.22	1.8
Toxaphene		16	U J	16	170
Surrogate		%Rec	Qualifier	Acceptance Limits	
Tetrachloro-m-xylene		74		59 - 115	
Decachlorobiphenyl		86		63 - 124	

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**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F4

Lab Sample ID: 280-29179-3

Date Sampled: 05/21/2012 0810

Client Matrix: Solid

% Moisture: 5.9

Date Received: 05/23/2012 0915

**8081A Organochlorine Pesticides (GC)**

Analysis Method: 8081A

Analysis Batch: 280-121932

Instrument ID: GCS\_P1

Prep Method: 3550C

Prep Batch: 280-121123

Initial Weight/Volume: 31.7 g

Dilution: 1.0

Final Weight/Volume: 10000 uL

Analysis Date: 05/30/2012 2125

Injection Volume: 1 uL

Prep Date: 05/23/2012 2200

Result Type: PRIMARY

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Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.55	U J	0.55	1.7
4,4'-DDE		0.24	U	0.24	1.7
4,4'-DDT		0.59	U J	0.59	1.7
Aldrin		0.25	U	0.25	1.7
alpha-BHC		0.22	U	0.22	1.7
beta-BHC		0.67	U	0.67	1.7
delta-BHC		0.40	U	0.40	1.7
gamma-BHC (Lindane)		0.47	U	0.47	1.7
Heptachlor		0.22	U	0.22	1.7
Heptachlor epoxide		0.43	U	0.43	1.7
Endosulfan I		0.18	U	0.18	1.7
Endosulfan II		0.29	U J	0.29	1.7
Endosulfan sulfate		0.28	U J	0.28	1.7
Endrin		0.31	U	0.31	1.7
Endrin aldehyde		0.17	U J	0.17	1.7
Endrin ketone		0.49	U J	0.49	1.7
gamma-Chlordane		0.27	U	0.27	1.7
Methoxychlor		0.45	U J	0.45	3.3
alpha-Chlordane		0.32	U	0.32	1.7
Dieldrin		0.21	U	0.21	1.7
Toxaphene		16	U J	16	170

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	77		59 - 115
Decachlorobiphenyl	105		63 - 124

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F5

Lab Sample ID: 280-29179-4

Date Sampled: 05/21/2012 0818

Client Matrix: Solid

% Moisture: 3.4

Date Received: 05/23/2012 0915

**8081A Organochlorine Pesticides (GC)**

Analysis Method:	8081A	Analysis Batch:	280-121932	Instrument ID:	GCS_P1
Prep Method:	3550C	Prep Batch:	280-121123	Initial Weight/Volume:	30.1 g
Dilution:	1.0			Final Weight/Volume:	10000 uL
Analysis Date:	05/30/2012 2142			Injection Volume:	1 uL
Prep Date:	05/23/2012 2200			Result Type:	PRIMARY

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Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
4,4'-DDD		0.56	U J	0.56	1.8
4,4'-DDE		0.28	J	0.25	1.8
4,4'-DDT		0.61	U J	0.61	1.8
Aldrin		0.26	U	0.26	1.7
alpha-BHC		0.22	U	0.22	1.7
beta-BHC		0.68	U	0.68	1.7
delta-BHC		0.41	U	0.41	1.7
gamma-BHC (Lindane)		0.48	U	0.48	1.7
Heptachlor		0.22	U	0.22	1.7
Heptachlor epoxide		0.44	U	0.44	1.7
Endosulfan I		0.18	U	0.18	1.7
Endosulfan II		0.30	U J	0.30	1.8
Endosulfan sulfate		0.28	U J	0.28	1.8
Endrin		0.32	U	0.32	1.8
Endrin aldehyde		0.18	U J	0.18	1.8
Endrin ketone		0.50	U J	0.50	1.8
gamma-Chlordane		0.27	U	0.27	1.8
Methoxychlor		0.46	U J	0.46	3.4
alpha-Chlordane		0.33	U	0.33	1.8
Dieldrin		0.22	U	0.22	1.8
Toxaphene		16	U J	16	170

Surrogate	%Rec	Qualifier	Acceptance Limits
Tetrachloro-m-xylene	82		59 - 115
Decachlorobiphenyl	100		63 - 124

**Appendix 4**

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

## CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-29179-1

SDG #: J01517

SAF#: RC-210

Date SDG Closed: May 23, 2012

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1P8F2	280-29179-1	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F3	280-29179-2	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F4	280-29179-3	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F5	280-29179-4	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A

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

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

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

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

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

### RECEIPT

The samples were received on 5/23/2012 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° C.

Samples requesting TCLP Metals 1311/6010B/7470A analysis were leached and placed on hold, as instructed on the chain-of-custody.

### GC SEMIVOLATILES - SW846 8081A - PESTICIDES

The MS/MSD performed on sample J1P8F3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

### GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

### GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in sample J1P8F2. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

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

Serial dilution of a digestate in batch 280-121104 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

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 J1P8F2; therefore, control limits are not applicable.

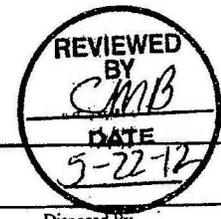
The duplicate analysis of sample J1P8F2 exhibited RPD data outside the control limits for Mercury, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

4-3 / Al 505123

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-210-037		Page 1 of 1																																																																									
Collector MOORE, BR		Company Contact Joan Kessner		Telephone No. (509) 375-4688		Project Coordinator KESSNER, JH		Price Code 8C 8D		Data Turnaround 15 Days 21 Days																																																																									
Project Designation 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 1		Sampling Location 600-300		SAF No. RC-210																																																																															
Ice Chest No. RCC-07-005		Field Logbook No. EL-1651-03		COA 0603002000		Method of Shipment FedEx																																																																													
Shipped To TestAmerica Incorporated, Richland (Denver)		Offsite Property No. A110379		Bill of Lading/Air Bill No. See OSPC																																																																															
POSSIBLE SAMPLE HAZARDS/REMARKS None  Special Handling and/or Storage Cool 4C				Preservation		Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C																																																																								
				Type of Container		G/P	G/P	G	aG	aG	aG																																																																								
				No. of Container(s)		1	1	1	1	0	0																																																																								
				Volume		60mL	120mL	120mL	120mL 50mL	120mL	120mL																																																																								
SAMPLE ANALYSIS				See item (1) in Special Instructions.		See item (2) in Special Instructions.		TPH-Diesel Range - WTPH-D +	PAHs - 8310	PCBs - 8082	Pesticides - 8081																																																																								
22																																																																																			
<table border="1"> <thead> <tr> <th>Sample No.</th> <th>Matrix *</th> <th>Sample Date</th> <th>Sample Time</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>J1P8F2</td> <td>SOIL</td> <td>5-21-12</td> <td>0750</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>:6</td> </tr> <tr> <td>J1P8F3</td> <td>SOIL</td> <td>5-21-12</td> <td>0800</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>:7</td> </tr> <tr> <td>J1P8F4</td> <td>SOIL</td> <td>5-21-12</td> <td>0810</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>:8</td> </tr> <tr> <td>J1P8F5</td> <td>SOIL</td> <td>5-21-12</td> <td>0818</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>:4</td> </tr> <tr> <td><del>J1P8F6</del></td> <td><del>SOIL</del></td> <td></td> </tr> </tbody> </table>												Sample No.	Matrix *	Sample Date	Sample Time									J1P8F2	SOIL	5-21-12	0750	X	X	X	X	X	X		:6	J1P8F3	SOIL	5-21-12	0800	X	X	X	X	X	X		:7	J1P8F4	SOIL	5-21-12	0810	X	X	X	X	X	X		:8	J1P8F5	SOIL	5-21-12	0818	X	X	X	X	X	X		:4	<del>J1P8F6</del>	<del>SOIL</del>										
Sample No.	Matrix *	Sample Date	Sample Time																																																																																
J1P8F2	SOIL	5-21-12	0750	X	X	X	X	X	X		:6																																																																								
J1P8F3	SOIL	5-21-12	0800	X	X	X	X	X	X		:7																																																																								
J1P8F4	SOIL	5-21-12	0810	X	X	X	X	X	X		:8																																																																								
J1P8F5	SOIL	5-21-12	0818	X	X	X	X	X	X		:4																																																																								
<del>J1P8F6</del>	<del>SOIL</del>																																																																																		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *																																																																							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Please teach and hold TCLP metals, per Joan Kessner  (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470 (Mercury)				S=Soil SB=Settlement SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dross Solids DL=Dross Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other																																																																							
Brad Moore		5-21-12 0900		Ken Russell		5-21-12 0900																																																																													
Ken Russell		5-21-12 1430		A. Freier		5-21-12 1430																																																																													
A. Freier		5-22-12 1000		Fed Ex																																																																															
J.P. Paul		5/23/12 0915																																																																																	
LABORATORY SECTION		Received By		Title				Date/Time																																																																											
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time																																																																											

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SDG# J01517  
 5/23/12

**Appendix 5**

**Data Validation Supporting Documentation**

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	600-300		DATA PACKAGE: J01517		
VALIDATOR:	ELR	LAB:	TAL	DATE: 7/28/12	
			SDG:	J01517	
ANALYSES PERFORMED					
<b>SW-846 8081</b>	SW-846 8081 (TCLP)	<b>SW-846 8082</b>	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
JIP8F2	JIP8F3	JIP8F4	JIP8F5		
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

Initial calibrations acceptable? ..... Yes No  N/A  
 Continuing calibrations acceptable? ..... Yes No  N/A  
 Standards traceable? ..... Yes No  N/A  
 Standards expired? ..... Yes No  N/A  
 Calculation check acceptable? ..... Yes No  N/A  
 DDT and endrin breakdowns acceptable? ..... Yes No  N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: No PB

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

Surrogates analyzed? ..... Yes No N/A

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

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

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

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

Comments: MS - endrin old by (7%) - J all

MSD - endosulfan II endosulfan sulfate endrin old by - J all

NO 50% LCS/MS/MSD - J all endrin ketone marker

No PAS

PCB DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? ..... Yes  No  N/A
- Duplicate results acceptable? ..... Yes  No  N/A
- MS/MSD standards NIST traceable? (Levels D, E) ..... Yes  No  N/A
- MS/MSD standards expired? (Levels D, E) ..... Yes  No  N/A
- Field duplicate RPD values acceptable? ..... Yes  No  N/A
- Field split RPD values acceptable? ..... Yes  No  N/A
- Transcription/calculation errors? (Levels D, E) ..... Yes  No  N/A

Comments: pest - 11/11 - July  
tox - no ms/msd - July

6. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? ..... Yes  No  N/A
- Positive results resolved acceptably? ..... Yes  No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. HOLDING TIMES (all levels)

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PCB DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**9. SAMPLE CLEANUP (Levels D and E)**

Fluoracil ® (or other absorbent) cleanup performed? .....	Yes	No	N/A
Lot check performed? .....	Yes	No	N/A
Check recoveries acceptable? .....	Yes	No	N/A
GPC cleanup performed? .....	Yes	No	N/A
GPC check performed? .....	Yes	No	N/A
GPC check recoveries acceptable? .....	Yes	No	N/A
GPC calibration performed? .....	Yes	No	N/A
GPC calibration check performed? .....	Yes	No	N/A
GPC calibration check retention times acceptable? .....	Yes	No	N/A
Check/calibration materials traceable? .....	Yes	No	N/A
Check/calibration materials Expired? .....	Yes	No	N/A
Analytical batch QC given similar cleanup? .....	Yes	No	N/A
Transcription/Calculation Errors? .....	Yes	No	N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Appendix 6**

**Additional Documentation Requested by Client**

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Method Blank - Batch: 280-122156**

**Method: 8082**  
**Preparation: 3550C**

Lab Sample ID: MB 280-122156/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 1313  
Prep Date: 06/01/2012 1600  
Leach Date: N/A

Analysis Batch: 280-122738  
Prep Batch: 280-122156  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: GCS\_W  
Lab File ID: 009F0901.D  
Initial Weight/Volume: 30.7 g  
Final Weight/Volume: 5000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Aroclor 1016	2.7	U	2.7	9.8
Aroclor 1221	7.8	U	7.8	16
Aroclor 1232	2.0	U	2.0	9.8
Aroclor 1242	4.6	U	4.6	9.8
Aroclor 1248	4.6	U	4.6	9.8
Aroclor 1254	2.5	U	2.5	9.8
Aroclor 1260	2.5	U	2.5	9.8

Surrogate	% Rec	Acceptance Limits
Decachlorobiphenyl	79	59 - 130
Tetrachloro-m-xylene	72	53 - 128

**Lab Control Sample - Batch: 280-122156**

**Method: 8082**  
**Preparation: 3550C**

Lab Sample ID: LCS 280-122156/2-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 1336  
Prep Date: 06/01/2012 1600  
Leach Date: N/A

Analysis Batch: 280-122738  
Prep Batch: 280-122156  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: GCS\_W  
Lab File ID: 010F1001.D  
Initial Weight/Volume: 32.0 g  
Final Weight/Volume: 5000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aroclor 1016	31.3	25.9	83	54 - 132	
Aroclor 1260	31.3	27.9	89	62 - 129	

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

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Matrix Spike/  
Matrix Spike Duplicate Recovery Report - Batch: 280-122156**

**Method: 8082  
Preparation: 3550C**

MS Lab Sample ID: 280-29179-4  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 1555  
Prep Date: 06/01/2012 1600  
Leach Date: N/A

Analysis Batch: 280-122738  
Prep Batch: 280-122156  
Leach Batch: N/A

Instrument ID: GCS\_W  
Lab File ID: 016F1601.D  
Initial Weight/Volume: 30.5 g  
Final Weight/Volume: 5000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

MSD Lab Sample ID: 280-29179-4  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 1618  
Prep Date: 06/01/2012 1600  
Leach Date: N/A

Analysis Batch: 280-122738  
Prep Batch: 280-122156  
Leach Batch: N/A

Instrument ID: GCS\_W  
Lab File ID: 017F1701.D  
Initial Weight/Volume: 30.7 g  
Final Weight/Volume: 5000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aroclor 1016	81	81	54 - 132	1	26		
Aroclor 1260	86	78	62 - 129	7	26		
Surrogate		MS % Rec	MSD % Rec			Acceptance Limits	
Decachlorobiphenyl		76	75			59 - 130	
Tetrachloro-m-xylene		76	76			53 - 128	

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Method Blank - Batch: 280-121123**

**Method: 8081A  
Preparation: 3550C**

Lab Sample ID: MB 280-121123/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/30/2012 2159  
Prep Date: 05/23/2012 2200  
Leach Date: N/A

Analysis Batch: 280-121932  
Prep Batch: 280-121123  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: GCS\_P1  
Lab File ID: 05300046.D  
Initial Weight/Volume: 31.5 g  
Final Weight/Volume: 10000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
4,4'-DDD	0.52	U	0.52	1.6
4,4'-DDE	0.23	U	0.23	1.6
4,4'-DDT	0.56	U	0.56	1.6
Aldrin	0.24	U	0.24	1.6
alpha-BHC	0.20	U	0.20	1.6
beta-BHC	0.63	U	0.63	1.6
delta-BHC	0.38	U	0.38	1.6
gamma-BHC (Lindane)	0.44	U	0.44	1.6
Heptachlor	0.20	U	0.20	1.6
Heptachlor epoxide	0.41	U	0.41	1.6
Endosulfan I	0.17	U	0.17	1.6
Endosulfan II	0.27	U	0.27	1.6
Endosulfan sulfate	0.26	U	0.26	1.6
Endrin	0.29	U	0.29	1.6
Endrin aldehyde	0.16	U	0.16	1.6
Endrin ketone	0.47	U	0.47	1.6
gamma-Chlordane	0.25	U	0.25	1.6
Methoxychlor	0.43	U	0.43	3.1
alpha-Chlordane	0.31	U	0.31	1.6
Dieldrin	0.20	U	0.20	1.6
Toxaphene	15	U	15	160
Surrogate	% Rec	Acceptance Limits		
Tetrachloro-m-xylene	72	59 - 115		
Decachlorobiphenyl	87	63 - 124		

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Lab Control Sample - Batch: 280-121123**

**Method: 8081A  
Preparation: 3550C**

Lab Sample ID:	LCS 280-121123/2-A	Analysis Batch:	280-121932	Instrument ID:	GCS_P1
Client Matrix:	Solid	Prep Batch:	280-121123	Lab File ID:	05300039.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	31.6 g
Analysis Date:	05/30/2012 1959	Units:	ug/Kg	Final Weight/Volume:	10000 uL
Prep Date:	05/23/2012 2200			Injection Volume:	1 uL
Leach Date:	N/A			Column ID:	PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
4,4'-DDD	15.8	14.4	91	54 - 130	
4,4'-DDE	15.8	12.5	79	58 - 121	
4,4'-DDT	15.8	13.3	84	57 - 133	
Aldrin	15.8	11.4	72	63 - 115	
alpha-BHC	15.8	11.1	70	64 - 116	
beta-BHC	15.8	11.3	72	67 - 115	
delta-BHC	15.8	11.9	75	67 - 115	
gamma-BHC (Lindane)	15.8	11.2	71	63 - 118	
Heptachlor	15.8	11.5	73	68 - 115	
Heptachlor epoxide	15.8	12.0	76	66 - 117	
Endosulfan I	15.8	11.9	75	65 - 118	
Endosulfan II	15.8	12.3	78	71 - 118	
Endosulfan sulfate	15.8	12.8	81	67 - 123	
Endrin	15.8	15.0	95	77 - 134	
Endrin aldehyde	15.8	10.7	68	47 - 115	
Endrin ketone	15.8	13.0	82	62 - 115	
gamma-Chlordane	15.8	11.9	75	65 - 117	
Methoxychlor	15.8	14.0	89	67 - 130	
alpha-Chlordane	15.8	12.1	76	63 - 120	
Dieldrin	15.8	12.7	80	65 - 127	
Surrogate		% Rec		Acceptance Limits	
Tetrachloro-m-xylene		70		59 - 115	
Decachlorobiphenyl		87		63 - 124	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Matrix Spike/  
Matrix Spike Duplicate Recovery Report - Batch: 280-121123**

**Method: 8081A  
Preparation: 3550C**

MS Lab Sample ID: 280-29179-2  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/30/2012 2051  
Prep Date: 05/23/2012 2200  
Leach Date: N/A

Analysis Batch: 280-121932  
Prep Batch: 280-121123  
Leach Batch: N/A

Instrument ID: GCS\_P1  
Lab File ID: 05300042.D  
Initial Weight/Volume: 30.5 g  
Final Weight/Volume: 10000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

MSD Lab Sample ID: 280-29179-2  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/30/2012 2108  
Prep Date: 05/23/2012 2200  
Leach Date: N/A

Analysis Batch: 280-121932  
Prep Batch: 280-121123  
Leach Batch: N/A

Instrument ID: GCS\_P1  
Lab File ID: 05300043.D  
Initial Weight/Volume: 31.0 g  
Final Weight/Volume: 10000 uL  
Injection Volume: 1 uL  
Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
4,4'-DDD	96	67	54 - 130	37	20		*
4,4'-DDE	81	78	58 - 121	5	15		
4,4'-DDT	87	57	57 - 133	43	29		*
Aldrin	77	78	63 - 115	1	50		
alpha-BHC	80	78	64 - 116	5	17		
beta-BHC	97	81	67 - 115	4	17		
delta-BHC	96	71	67 - 115	13	19		
gamma-BHC (Lindane)	78	77	63 - 118	2	24		
Heptachlor	80	78	68 - 115	3	18		
Heptachlor epoxide	80	77	66 - 117	6	18		
Endosulfan I	78	73	65 - 118	9	26		
Endosulfan II	79	24	71 - 118	109	20		N *
Endosulfan sulfate	85	18	67 - 123	130	22		N *
Endrin	100	88	77 - 134	14	30		
Endrin aldehyde	7	35	47 - 115	133	29	JN	N *
Endrin ketone	82	42	62 - 115	65	20		N *
gamma-Chlordane	79	78	65 - 117	3	21		
Methoxychlor	89	22	67 - 130	121	23		N *
alpha-Chlordane	80	80	63 - 120	2	18		
Dieldrin	82	78	65 - 127	6	25		
Surrogate		MS % Rec	MSD % Rec	Acceptance Limits			
Tetrachloro-m-xylene		76	77	59 - 115			
Decachlorobiphenyl		105	90	63 - 124			

Date: 30 July 2012  
 To: Washington Closure Hanford Inc. (technical representative)  
 From: ELR Consulting  
 Project: 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 100F – Soil Full Protocol - Waste Site 600-300  
 Subject: Diesel Range Organics - Data Package No. J01517-TAL

**INTRODUCTION**

This memo presents the results of data validation on Data Package No. J01517 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
J1P8F2	5/21/12	Soil	C	See note 1
J1P8F3	5/21/12	Soil	C	See note 1
J1P8F4	5/21/12	Soil	C	See note 1
J1P8F5	5/21/12	Soil	C	See note 1

1 – Diesel range organics by NWTPH-D.

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: Analytes 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 (equipment) Blanks

No field blanks were 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

No field duplicates were submitted for analysis.

## **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. J01517 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 ORGANICS DATA QUALIFICATION SUMMARY\*

SDG: J01517	REVIEWER: ELR	Project: 600-300	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: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F2

Lab Sample ID: 280-29179-1  
Client Matrix: Solid

% Moisture: 4.0

Date Sampled: 05/21/2012 0750  
Date Received: 05/23/2012 0915

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

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-122918	Instrument ID:	GCS_U2
Prep Method:	3550C	Prep Batch:	280-121120	Lab File ID:	079B3101.D
Dilution:	1.0			Initial Weight/Volume:	30.0 g
Analysis Date:	06/05/2012 0224			Final Weight/Volume:	1000 uL
Prep Date:	05/23/2012 2315			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		27000		1000	4200
C10-C28		6500		710	4200

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	73		49 - 115

*W*  
*7/28/12*

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F3

Lab Sample ID: 280-29179-2  
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 05/21/2012 0800  
Date Received: 05/23/2012 0915

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

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-122918	Instrument ID:	GCS_U2
Prep Method:	3550C	Prep Batch:	280-121120	Lab File ID:	080B3201.D
Dilution:	1.0			Initial Weight/Volume:	32.6 g
Analysis Date:	06/05/2012 0248			Final Weight/Volume:	1000 uL
Prep Date:	05/23/2012 2315			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		3900		960	3900
C10-C28		1700	J	650	3900

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	74		49 - 115

*✓*  
*7/28/12*

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F4

Lab Sample ID: 280-29179-3  
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 05/21/2012 0810  
Date Received: 05/23/2012 0915

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

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-122918	Instrument ID:	GCS_U2
Prep Method:	3550C	Prep Batch:	280-121120	Lab File ID:	081B3301.D
Dilution:	1.0			Initial Weight/Volume:	30.7 g
Analysis Date:	06/05/2012 0312			Final Weight/Volume:	1000 uL
Prep Date:	05/23/2012 2315			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		6400		1000	4200
C10-C28		1900	J	700	4200

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	77		49 - 115

*W*  
*7/28/12*

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F5

Lab Sample ID: 280-29179-4  
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 05/21/2012 0818  
Date Received: 05/23/2012 0915

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

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-122918	Instrument ID:	GCS_U2
Prep Method:	3550C	Prep Batch:	280-121120	Lab File ID:	084B3601.D
Dilution:	1.0			Initial Weight/Volume:	31.5 g
Analysis Date:	06/05/2012 0425			Final Weight/Volume:	1000 uL
Prep Date:	05/23/2012 2315			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		5300		980	3900
C10-C28		2800	J	670	3900

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

*W*  
*7/28/12*

**Appendix 4**

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

## CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-29179-1

SDG #: J01517

SAF#: RC-210

Date SDG Closed: May 23, 2012

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1P8F2	280-29179-1	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F3	280-29179-2	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F4	280-29179-3	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F5	280-29179-4	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A

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

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

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

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

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

### RECEIPT

The samples were received on 5/23/2012 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° C.

Samples requesting TCLP Metals 1311/6010B/7470A analysis were leached and placed on hold, as instructed on the chain-of-custody.

### GC SEMIVOLATILES - SW846 8081A - PESTICIDES

The MS/MSD performed on sample J1P8F3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

### GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

### GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in sample J1P8F2. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

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

Serial dilution of a digestate in batch 280-121104 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

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 J1P8F2; therefore, control limits are not applicable.

The duplicate analysis of sample J1P8F2 exhibited RPD data outside the control limits for Mercury, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

4-3 / (11 505123)

Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							RC-210-037		Page 1 of 1		
Collector MOORE, BR			Company Contact Joan Kessner			Telephone No. (509) 375-4688		Project Coordinator KESSNER, JH		Price Code JR 5/17/12 8E 8D		Data Turnaround JR 5/17/12 15 Days 21 Days		
Project Designation 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 1			Sampling Location 600-300			SAF No. RC-210		Method of Shipment FedEx						
Ice Chest No. RCC-07-005			Field Logbook No. EL-1651-03		COA 0603002000		Bill of Lading/Air Bill No. See OSPC							
Shipped To TestAmerica Incorporated, Richland (Denver)			Offsite Property No. A110379											
POSSIBLE SAMPLE HAZARDS/REMARKS None  Special Handling and/or Storage Cool 4C				Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
				Type of Container	G/P	G/P	G	aG	aG	aG				
				No. of Container(s)	1	1	1	1	D	D				
				Volume	60mL	120mL	120mL	120mL 500mL	120mL	120mL				
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PAHs - 8310	PCBs - 8082	Pesticides - 8081					
				Sample No.	Matrix *	Sample Date	Sample Time							
				J1P8F2	SOIL	5-21-12	0750	X	X	X	X	X	:6	
				J1P8F3	SOIL	5-21-12	0800	X	X	X	X	X	:7	
				J1P8F4	SOIL	5-21-12	0810	X	X	X	X	X	:8	
				J1P8F5	SOIL	5-21-12	0818	X	X	X	X	X	:4	
				J1P8F6	SOIL									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix * S=Soil SE=Sediment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wl=Wipe L=Liquid V=Vegetation X=Other		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Please leach and hold TCLP metals, per Joan Kessner						
Brandt Moore		5-21-12 0900		Jen Russell		5-21-12 0900		(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)						
Jen Russell		5-21-12 1430		A. Freier		5-21-12 1430		(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470 (Mercury)						
WCH		0840		Fed Ex										
A. Freier		5-22-12 1060												
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		 SDG# J01517 14 5/23/12						
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								
LABORATORY SECTION		Received By		Title				Date/Time						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time						

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

**GENERAL ORGANIC DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	600-300		DATA PACKAGE: J01517		
VALIDATOR:	ELR	LAB:	600500 TAL	DATE:	7/28/12
			SDG:	J01517	
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	<b>WTPH-D</b>	
SAMPLES/MATRIX:					
JIP8F2		JIP8F3		JIP8F4	
				JIP8F5	
					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 FB

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**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 PAJ

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**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)**

Fluorocil ® (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: 280-29179-1  
Sdg Number: J01517

**Method Blank - Batch: 280-121120**

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

Lab Sample ID: MB 280-121120/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 0135  
Prep Date: 05/23/2012 2315  
Leach Date: N/A

Analysis Batch: 280-122918  
Prep Batch: 280-121120  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: GCS\_U2  
Lab File ID: 077B2901.D  
Initial Weight/Volume: 31.0 g  
Final Weight/Volume: 1000 uL  
Injection Volume: 1 uL

Analyte	Result	Qual	MDL	RL
C10-C36	960	U	960	3900
C10-C28	660	U	660	3900
Surrogate	% Rec		Acceptance Limits	
o-Terphenyl	77		49 - 115	

**Lab Control Sample - Batch: 280-121120**

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

Lab Sample ID: LCS 280-121120/2-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 0200  
Prep Date: 05/23/2012 2315  
Leach Date: N/A

Analysis Batch: 280-122918  
Prep Batch: 280-121120  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: GCS\_U2  
Lab File ID: 078B3001.D  
Initial Weight/Volume: 31.5 g  
Final Weight/Volume: 1000 uL  
Injection Volume: 1 uL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
C10-C36	63500	69500	109	57 - 115	
C10-C28	63500	69500	109	53 - 115	
Surrogate	% Rec			Acceptance Limits	
o-Terphenyl		88		49 - 115	

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Matrix Spike/  
Matrix Spike Duplicate Recovery Report - Batch: 280-121120**

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

MS Lab Sample ID: 280-29179-3  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 0337  
Prep Date: 05/23/2012 2315  
Leach Date: N/A

Analysis Batch: 280-122918  
Prep Batch: 280-121120  
Leach Batch: N/A

Instrument ID: GCS\_U2  
Lab File ID: 082B3401.D  
Initial Weight/Volume: 32.9 g  
Final Weight/Volume: 1000 uL  
Injection Volume: 1 uL

MSD Lab Sample ID: 280-29179-3  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/05/2012 0401  
Prep Date: 05/23/2012 2315  
Leach Date: N/A

Analysis Batch: 280-122918  
Prep Batch: 280-121120  
Leach Batch: N/A

Instrument ID: GCS\_U2  
Lab File ID: 083B3501.D  
Initial Weight/Volume: 30.1 g  
Final Weight/Volume: 1000 uL  
Injection Volume: 1 uL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
C10-C36	102	101	57 - 115	7	23		
C10-C28	100	100	56 - 115	9	23		
Surrogate		MS % Rec	MSD % Rec			Acceptance Limits	
o-Terphenyl		79	83			49 - 115	

Date: 30 July 2012  
 To: Washington Closure Hanford Inc. (technical representative)  
 From: ELR Consulting  
 Project: 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 100F – Soil Full Protocol - Waste Site 600-300  
 Subject: Inorganics - Data Package No. J01517-TAL

**INTRODUCTION**

This memo presents the results of data validation on Data Package No. J01517 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
J1P8F2	5/21/12	Soil	C	See note 1
J1P8F3	5/21/12	Soil	C	See note 1
J1P8F4	5/21/12	Soil	C	See note 1
J1P8F5	5/21/12	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 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 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, all antimony (47%) and silicon (23%) results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, all silicon (15%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable

### **Precision**

#### Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

#### Field Duplicate

No field duplicates were submitted for analysis.

### **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. J01517 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 (47%) and silicon (23%) results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits, all silicon (15%) results were qualified as estimates and flagged "J".

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

## **REFERENCES**

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

DOE/RL-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**

**INORGANICS DATA QUALIFICATION SUMMARY\***

<b>SDG: J01517</b>	<b>REVIEWER: ELR</b>	<b>Project: 600-300</b>	<b>PAGE <u>1</u> OF <u>1</u></b>
<b>COMPOUND</b>	<b>QUALIFIER</b>	<b>SAMPLES AFFECTED</b>	<b>REASON</b>
Antimony Silicon	J	All	MS recovery
Silicon	J	All	LCS recovery

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

**Appendix 3**  
**Annotated Laboratory Reports**

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F2

Lab Sample ID: 280-29179-1  
Client Matrix: Solid

% Moisture: 4.0

Date Sampled: 05/21/2012 0750  
Date Received: 05/23/2012 0915

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-122488      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-121104      Lab File ID: 26a060412.asc  
Dilution: 1.0  
Analysis Date: 06/04/2012 1452      Initial Weight/Volume: 1.02 g  
Prep Date: 06/01/2012 1400      Final Weight/Volume: 100 mL

*Handwritten:* ✓ 7/28/12

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8910		1.6	5.1
Antimony		0.48	B J	0.39	0.61
Arsenic		2.9		0.67	1.0
Barium		81.6		0.078	0.51
Beryllium		0.22		0.034	0.20
Boron		4.3		1.0	2.0
Cadmium		0.19	B	0.042	0.20
Calcium		5060		14.4	51.1
Chromium		12.1	X	0.059	0.20
Cobalt		6.2	X	0.10	1.0
Copper		13.1	X	0.22	1.0
Iron		17200		3.9	5.1
Lead		25.0	X	0.28	0.51
Magnesium		4070		3.8	20.4
Manganese		302		0.10	1.0
Molybdenum		0.30	B	0.27	2.0
Nickel		11.2	X	0.13	4.1
Potassium		1890		41.9	306
Selenium		0.88	U	0.88	1.0
Silicon		514	X J	5.8	10.2
Silver		0.16	U	0.16	0.20
Sodium		236		60.3	123
Vanadium		39.0		0.096	2.0
Zinc		53.4	X	0.41	1.0

**7471A Mercury (CVAA)**

Analysis Method: 7471A      Analysis Batch: 280-121649      Instrument ID: MT\_033  
Prep Method: 7471A      Prep Batch: 280-121137      Lab File ID: 120525aa3.txt  
Dilution: 1.0  
Analysis Date: 05/25/2012 1846      Initial Weight/Volume: 0.53 g  
Prep Date: 05/25/2012 1235      Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.016	B M	0.0065	0.020

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F3

Lab Sample ID: 280-29179-2  
Client Matrix: Solid

% Moisture: 4.6

Date Sampled: 05/21/2012 0800  
Date Received: 05/23/2012 0915

**6010B Metals (ICP)**

Analysis Method: 6010B      Analysis Batch: 280-122488      Instrument ID: MT\_026  
Prep Method: 3050B      Prep Batch: 280-121104      Lab File ID: 26a060412.asc  
Dilution: 1.0  
Analysis Date: 06/04/2012 1501      Initial Weight/Volume: 1.05 g  
Prep Date: 06/01/2012 1400      Final Weight/Volume: 100 mL

*Handwritten:* ✓ 7/28/12

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10700		1.5	5.0
Antimony		0.40	B J	0.38	0.60
Arsenic		3.0		0.66	1.0
Barium		91.8		0.076	0.50
Beryllium		0.28		0.033	0.20
Boron		2.3		0.98	2.0
Cadmium		0.14	B	0.041	0.20
Calcium		3710		14.1	49.9
Chromium		12.3	X	0.058	0.20
Cobalt		7.4	X	0.10	1.0
Copper		14.3	X	0.22	1.0
Iron		19900		3.8	5.0
Lead		6.2	X	0.27	0.50
Magnesium		4540		3.7	20.0
Manganese		349		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		12.7	X	0.12	4.0
Potassium		2310		40.9	300
Selenium		0.86	U	0.86	1.0
Silicon		610	X J	5.7	10
Silver		0.16	U	0.16	0.20
Sodium		237		58.9	120
Vanadium		41.4		0.094	2.0
Zinc		42.2	X	0.40	1.0

**7471A Mercury (CVAA)**

Analysis Method: 7471A      Analysis Batch: 280-121649      Instrument ID: MT\_033  
Prep Method: 7471A      Prep Batch: 280-121137      Lab File ID: 120525aa3.bt  
Dilution: 1.0  
Analysis Date: 05/25/2012 1853      Initial Weight/Volume: 0.65 g  
Prep Date: 05/25/2012 1235      Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.016

## Analytical Data

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F4

Lab Sample ID: 280-29179-3  
Client Matrix: Solid

% Moisture: 5.9

Date Sampled: 05/21/2012 0810  
Date Received: 05/23/2012 0915

### 6010B Metals (ICP)

Analysis Method: 6010B	Analysis Batch: 280-122488	Instrument ID: MT_026
Prep Method: 3050B	Prep Batch: 280-121104	Lab File ID: 26a060412.asc
Dilution: 1.0		Initial Weight/Volume: 1.00 g
Analysis Date: 06/04/2012 1504	<i>M 7/28/12</i>	Final Weight/Volume: 100 mL
Prep Date: 06/01/2012 1400		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10800		1.6	5.3
Antimony		0.40	U J	0.40	0.64
Arsenic		2.9		0.70	1.1
Barium		96.6		0.081	0.53
Beryllium		0.29		0.035	0.21
Boron		2.2		1.0	2.1
Cadmium		0.18	B	0.044	0.21
Calcium		3670		15.0	53.1
Chromium		12.0	X	0.062	0.21
Cobalt		7.5	X	0.11	1.1
Copper		13.9	X	0.23	1.1
Iron		20300		4.0	5.3
Lead		8.4	X	0.29	0.53
Magnesium		4880		3.9	21.2
Manganese		360		0.11	1.1
Molybdenum		0.28	U	0.28	2.1
Nickel		11.9	X	0.13	4.2
Potassium		2210		43.6	319
Selenium		0.91	U	0.91	1.1
Silicon		791	X J	6.0	10.6
Silver		0.17	U	0.17	0.21
Sodium		267		62.7	127
Vanadium		41.4		0.10	2.1
Zinc		45.6	X	0.42	1.1

### 7471A Mercury (CVAA)

Analysis Method: 7471A	Analysis Batch: 280-121649	Instrument ID: MT_033
Prep Method: 7471A	Prep Batch: 280-121137	Lab File ID: 120525aa3.bt
Dilution: 1.0		Initial Weight/Volume: 0.69 g
Analysis Date: 05/25/2012 1855		Final Weight/Volume: 50 mL
Prep Date: 05/25/2012 1235		

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

### Analytical Data

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F5

Lab Sample ID: 280-29179-4

Date Sampled: 05/21/2012 0818

Client Matrix: Solid

% Moisture: 3.4

Date Received: 05/23/2012 0915

#### 6010B Metals (ICP)

Analysis Method: 6010B

Analysis Batch: 280-122488

Instrument ID: MT\_026

Prep Method: 3050B

Prep Batch: 280-121104

Lab File ID: 26a060412.asc

Dilution: 1.0

Initial Weight/Volume: 1.03 g

Analysis Date: 06/04/2012 1506

*✓ 7/28/12*

Final Weight/Volume: 100 mL

Prep Date: 06/01/2012 1400

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6580		1.6	5.0
Antimony		0.38	U J	0.38	0.60
Arsenic		1.8		0.66	1.0
Barium		57.6		0.076	0.50
Beryllium		0.11	B	0.033	0.20
Boron		1.3	B	0.98	2.0
Cadmium		0.15	B	0.041	0.20
Calcium		3860		14.2	50.2
Chromium		8.3	X	0.058	0.20
Cobalt		6.7	X	0.10	1.0
Copper		11.9	X	0.22	1.0
Iron		18600		3.8	5.0
Lead		4.8	X	0.27	0.50
Magnesium		4000		3.7	20.1
Manganese		288		0.10	1.0
Molybdenum		0.26	U	0.26	2.0
Nickel		9.6	X	0.12	4.0
Potassium		1370		41.2	301
Selenium		0.86	U	0.86	1.0
Silicon		429	X J	5.7	10.0
Silver		0.16	U	0.16	0.20
Sodium		197		59.3	121
Vanadium		47.5		0.094	2.0
Zinc		42.4	X	0.40	1.0

#### 7471A Mercury (CVAA)

Analysis Method: 7471A

Analysis Batch: 280-121649

Instrument ID: MT\_033

Prep Method: 7471A

Prep Batch: 280-121137

Lab File ID: 120525aa3.txt

Dilution: 1.0

Initial Weight/Volume: 0.64 g

Analysis Date: 05/25/2012 1858

Final Weight/Volume: 50 mL

Prep Date: 05/25/2012 1235

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0054	U	0.0054	0.016

**Appendix 4**

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

## CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-29179-1

SDG #: J01517

SAF#: RC-210

Date SDG Closed: May 23, 2012

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1P8F2	280-29179-1	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F3	280-29179-2	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F4	280-29179-3	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F5	280-29179-4	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A

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

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

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

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

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

### RECEIPT

The samples were received on 5/23/2012 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° C.

Samples requesting TCLP Metals 1311/6010B/7470A analysis were leached and placed on hold, as instructed on the chain-of-custody.

### GC SEMIVOLATILES - SW846 8081A - PESTICIDES

The MS/MSD performed on sample J1P8F3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

### GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

### GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in sample J1P8F2. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

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

Serial dilution of a digestate in batch 280-121104 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

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 J1P8F2; therefore, control limits are not applicable.

The duplicate analysis of sample J1P8F2 exhibited RPD data outside the control limits for Mercury, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.



**Appendix 5**

**Data Validation Supporting Documentation**

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	600-300		DATA PACKAGE: J01517		
VALIDATOR:	ELR	LAB:	TAL	DATE: 7/28/12	
			SDG:	J01517	
ANALYSES PERFORMED					
<b>SW-846/ICP</b>	SW-846/GFAA	<b>SW-846/Hg</b>	SW-846 Cyanide		
SAMPLES/MATRIX					
JIP8F2		JIP8F3		JIP8F4	
				JIP8F5	
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 FR

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**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 - silica - July  
MS - antimony (47%) silica (23%) - July

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no FR

### INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? .....  Yes No N/A
- Duplicate results acceptable? .....  Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No  N/A
- MS/MSD standards expired? (Levels D, E) ..... Yes No  N/A
- Field duplicate RPD values acceptable? ..... Yes No  N/A
- Field split RPD values acceptable? ..... Yes No  N/A
- Transcription/calculation errors? (Levels D, E) ..... Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. ICP QUALITY CONTROL (Levels D and E)**

- ICP serial dilution samples analyzed? ..... Yes No  N/A
- ICP serial dilution %D values acceptable? ..... Yes No  N/A
- ICP post digestion spike required? ..... Yes No  N/A
- ICP post digestion spike values acceptable? ..... Yes No  N/A
- Standards traceable? ..... Yes No  N/A
- Standards expired? ..... Yes No  N/A
- Transcription/calculation errors? ..... Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**8. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**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: 280-29179-1

Sdg Number: J01517

**Method Blank - Batch: 280-121104**

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

Lab Sample ID: MB 280-121104/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/04/2012 1447  
Prep Date: 06/01/2012 1400  
Leach Date: N/A

Analysis Batch: 280-122488  
Prep Batch: 280-121104  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26a060412.asc  
Initial Weight/Volume: 1 g  
Final Weight/Volume: 100 mL

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

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Lab Control Sample - Batch: 280-121104

Method: 6010B

Preparation: 3050B

Lab Sample ID: LCS 280-121104/2-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/04/2012 1449  
Prep Date: 06/01/2012 1400  
Leach Date: N/A

Analysis Batch: 280-122488  
Prep Batch: 280-121104  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26a060412.asc  
Initial Weight/Volume: 1 g  
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	208.7	104	82 - 116	
Antimony	50.0	50.51	101	82 - 110	
Arsenic	100	102.4	102	85 - 110	
Barium	200	203.2	102	87 - 112	
Beryllium	5.00	5.00	100	84 - 114	
Boron	100	102.3	102	81 - 110	
Cadmium	10.0	10.53	105	87 - 110	
Calcium	5000	5019	100	82 - 114	
Chromium	20.0	20.45	102	84 - 114	
Cobalt	50.0	50.44	101	87 - 110	
Copper	25.0	25.58	102	88 - 110	
Iron	100	102.6	103	87 - 120	
Lead	50.0	50.08	100	86 - 110	
Magnesium	5000	5079	102	90 - 110	
Manganese	50.0	50.72	101	88 - 110	
Molybdenum	100	102.2	102	86 - 110	
Nickel	50.0	50.41	101	87 - 110	
Potassium	5000	5107	102	89 - 110	
Selenium	200	206.2	103	83 - 110	
Silicon	1000	149.7	15	10 - 70	
Silver	5.00	5.15	103	87 - 114	
Sodium	5000	5190	104	90 - 112	
Vanadium	50.0	51.77	104	88 - 110	
Zinc	50.0	51.05	102	76 - 114	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

**Matrix Spike - Batch: 280-121104**

**Method: 6010B**

**Preparation: 3050B**

Lab Sample ID:	280-29179-1	Analysis Batch:	280-122488	Instrument ID:	MT_026
Client Matrix:	Solid	Prep Batch:	280-121104	Lab File ID:	26a060412.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.03 g
Analysis Date:	06/04/2012 1459	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	06/01/2012 1400				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	8910	202	11580	1321	50 - 200	4
Antimony	0.48 B	50.6	24.50	47	20 - 200	
Arsenic	2.9	101	95.09	91	76 - 111	
Barium	81.6	202	274.4	95	52 - 159	
Beryllium	0.22	5.06	4.77	90	72 - 105	
Boron	4.3	101	94.29	89	75 - 107	
Cadmium	0.19 B	10.1	9.78	95	40 - 130	
Calcium	5060	5060	10490	107	43 - 165	
Chromium	12.1	20.2	31.58	96	70 - 200	
Cobalt	6.2	50.6	51.40	89	72 - 106	
Copper	13.1	25.3	36.59	93	37 - 187	
Iron	17200	101	18120	923	70 - 200	4
Lead	25.0	50.6	65.75	81	70 - 200	
Magnesium	4070	5060	9224	102	64 - 145	
Manganese	302	50.6	364.8	124	40 - 200	4
Molybdenum	0.30 B	101	89.68	88	75 - 103	
Nickel	11.2	50.6	56.09	89	61 - 126	
Potassium	1890	5060	6913	99	56 - 172	
Selenium	0.88 U	202	185.2	92	76 - 104	
Silicon	514	1010	748.0	23	20 - 200	
Silver	0.16 U	5.06	4.77	94	75 - 141	
Sodium	236	5060	5178	98	78 - 111	
Vanadium	39.0	50.6	90.63	102	50 - 169	
Zinc	53.4	50.6	99.01	90	70 - 200	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Duplicate - Batch: 280-121104**

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

Lab Sample ID: 280-29179-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/04/2012 1457  
Prep Date: 06/01/2012 1400  
Leach Date: N/A

Analysis Batch: 280-122488  
Prep Batch: 280-121104  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_026  
Lab File ID: 26a060412.asc  
Initial Weight/Volume: 1.02 g  
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	8910	8687	3	40	
Antimony	0.48 B	0.39	NC	40	U
Arsenic	2.9	2.81	2	30	
Barium	81.6	84.86	4	30	
Beryllium	0.22	0.210	7	30	
Boron	4.3	4.20	3	30	
Cadmium	0.19 B	0.169	12	30	B
Calcium	5060	4761	6	30	
Chromium	12.1	10.93	10	40	
Cobalt	6.2	6.03	3	30	
Copper	13.1	12.98	0.9	30	
Iron	17200	17000	1	40	
Lead	25.0	24.55	2	40	
Magnesium	4070	3967	2	30	
Manganese	302	296.7	2	40	
Molybdenum	0.30 B	0.27	NC	30	U
Nickel	11.2	10.32	8	30	
Potassium	1890	1885	0.4	40	
Selenium	0.88 U	0.88	NC	30	U
Silicon	514	528.6	3	40	
Silver	0.16 U	0.16	NC	30	U
Sodium	236	215.9	9	30	
Vanadium	39.0	38.54	1	30	
Zinc	53.4	52.41	2	40	

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Method Blank - Batch: 280-121137**

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

Lab Sample ID: MB 280-121137/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/25/2012 1837  
Prep Date: 05/25/2012 1235  
Leach Date: N/A

Analysis Batch: 280-121649  
Prep Batch: 280-121137  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 120525aa3.txt  
Initial Weight/Volume: 0.6 g  
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

**Lab Control Sample - Batch: 280-121137**

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

Lab Sample ID: LCS 280-121137/2-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/25/2012 1839  
Prep Date: 05/25/2012 1235  
Leach Date: N/A

Analysis Batch: 280-121649  
Prep Batch: 280-121137  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 120525aa3.txt  
Initial Weight/Volume: 0.6 g  
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.412	99	87 - 111	

**Matrix Spike - Batch: 280-121137**

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

Lab Sample ID: 280-29179-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/25/2012 1851  
Prep Date: 05/25/2012 1235  
Leach Date: N/A

Analysis Batch: 280-121649  
Prep Batch: 280-121137  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 120525aa3.txt  
Initial Weight/Volume: 0.51 g  
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.016 B	0.511	0.505	96	87 - 111	

## Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Duplicate - Batch: 280-121137**

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

Lab Sample ID: 280-29179-1  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 05/25/2012 1848  
Prep Date: 05/25/2012 1235  
Leach Date: N/A

Analysis Batch: 280-121649  
Prep Batch: 280-121137  
Leach Batch: N/A  
Units: mg/Kg

Instrument ID: MT\_033  
Lab File ID: 120525aa3.bt  
Initial Weight/Volume: 0.51 g  
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.016 B	0.0120	28	20	B M

Date: 30 July 2012  
 To: Washington Closure Hanford Inc. (technical representative)  
 From: ELR Consulting  
 Project: 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 100F – Soil Full Protocol - Waste Site 600-300  
 Subject: Polyaromatic Hydrocarbons - Data Package No. J01517-TAL

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. J01517 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
J1P8F2	5/21/12	Soil	C	See note 1
J1P8F3	5/21/12	Soil	C	See note 1
J1P8F4	5/21/12	Soil	C	See note 1
J1P8F5	5/21/12	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 blanks were 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

No field duplicates were submitted for analysis.

### **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. J01517 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: J01517	REVIEWER: ELR	Project: 600-300	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: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F2  
Lab Sample ID: 280-29179-1  
Client Matrix: Solid

% Moisture: 4.0

Date Sampled: 05/21/2012 0750  
Date Received: 05/23/2012 0915

*Handwritten:* 7/28/12

**8310 PAHs (HPLC)**

Analysis Method: 8310	Analysis Batch: 280-121929	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-121122	Initial Weight/Volume: 32.5 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 06/01/2012 0129		Injection Volume: 20 uL
Prep Date: 05/23/2012 2200		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		9.6	U	9.6	96
Acenaphthylene		8.7	U	8.7	96
Anthracene		2.9	U	2.9	19
Benzo[a]anthracene		3.8	JX	3.1	14
Benzo[a]pyrene		21		6.2	14
Benzo[b]fluoranthene		12	JX	4.0	14
Benzo[g,h,i]perylene		15	JX	6.9	29
Benzo[k]fluoranthene		3.8	U	3.8	14
Chrysene		6.6	JX	4.7	38
Dibenzo(a,h)anthracene		11	U	11	29
Fluoranthene		17	J	13	38
Fluorene		5.1	U	5.1	29
Indeno[1,2,3-cd]pyrene		12	U	12	29
Naphthalene		12	U	12	96
Phenanthrene		25	J	12	38
Pyrene		13	J	12	38
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		81		72 - 115	

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

Client Sample ID: J1P8F3

*7/28/12*

Lab Sample ID: 280-29179-2

Date Sampled: 05/21/2012 0800

Client Matrix: Solid

% Moisture: 4.6

Date Received: 05/23/2012 0915

**8310 PAHs (HPLC)**

Analysis Method: 8310	Analysis Batch: 280-121929	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-121122	Initial Weight/Volume: 30.1 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 06/01/2012 0300		Injection Volume: 20 uL
Prep Date: 05/23/2012 2200		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.4	U	9.4	100
Anthracene		3.2	U	3.2	21
Benzo[a]anthracene		3.3	U	3.3	16
Benzo[a]pyrene		6.7	U	6.7	16
Benzo[b]fluoranthene		4.4	U	4.4	16
Benzo[g,h,i]perylene		7.5	U	7.5	31
Benzo[k]fluoranthene		4.1	U	4.1	16
Chrysene		5.1	U	5.1	42
Dibenzo(a,h)anthracene		11	U	11	31
Fluoranthene		14	U	14	42
Fluorene		5.5	U	5.5	31
Indeno[1,2,3-cd]pyrene		13	U	13	31
Naphthalene		13	U	13	100
Phenanthrene		13	U	13	42
Pyrene		13	U	13	42

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (SUR)	84		72 - 115

**Analytical Data**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

✓  
7/28/12

Client Sample ID: J1P8F4

Lab Sample ID: 280-29179-3

Date Sampled: 05/21/2012 0810

Client Matrix: Solid

% Moisture: 5.9

Date Received: 05/23/2012 0915

**8310 PAHs (HPLC)**

Analysis Method: 8310	Analysis Batch: 280-121929	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-121122	Initial Weight/Volume: 30.4 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 06/01/2012 0331		Injection Volume: 20 uL
Prep Date: 05/23/2012 2200		Result Type: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.4	U	9.4	100
Anthracene		3.2	U	3.2	21
Benzo[a]anthracene		3.3	U	3.3	16
Benzo[a]pyrene		6.7	U	6.7	16
Benzo[b]fluoranthene		4.4	U	4.4	16
Benzo[g,h,i]perylene		7.5	U	7.5	31
Benzo[k]fluoranthene		4.1	U	4.1	16
Chrysene		5.1	U	5.1	42
Dibenzo(a,h)anthracene		12	U	12	31
Fluoranthene		14	U	14	42
Fluorene		5.5	U	5.5	31
Indeno[1,2,3-cd]pyrene		13	U	13	31
Naphthalene		13	U	13	100
Phenanthrene		13	U	13	42
Pyrene		13	U	13	42
<hr/>					
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		85		72 - 115	

**Analytical Data**

Client: Washington Closure Hanford

*Handwritten:* 7/28/12

Job Number: 280-29179-1  
Sdg Number: J01517

Client Sample ID: J1P8F5  
Lab Sample ID: 280-29179-4  
Client Matrix: Solid

% Moisture: 3.4

Date Sampled: 05/21/2012 0818  
Date Received: 05/23/2012 0915

**8310 PAHs (HPLC)**

Analysis Method: 8310	Analysis Batch: 280-121929	Instrument ID: CHHPLC_G
Prep Method: 3550C	Prep Batch: 280-121122	Initial Weight/Volume: 30.5 g
Dilution: 1.0		Final Weight/Volume: 4000 uL
Analysis Date: 06/01/2012 0402		Injection Volume: 20 uL
Prep Date: 05/23/2012 2200		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		3.2	U	3.2	15
Benzo[a]pyrene		6.5	U	6.5	15
Benzo[b]fluoranthene		6.4	J	4.3	15
Benzo[g,h,i]perylene		7.3	U	7.3	31
Benzo[k]fluoranthene		4.0	U	4.0	15
Chrysene		4.9	U	4.9	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)		85		72 - 115	

**Appendix 4**

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

## CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-29179-1

SDG #: J01517

SAF#: RC-210

Date SDG Closed: May 23, 2012

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1P8F2	280-29179-1	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F3	280-29179-2	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F4	280-29179-3	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A
J1P8F5	280-29179-4	6010B/7471/1311-6010-7470/WTPH-D+/ 8310/8082/8081	6010B/7471A/1311/NWTPH-Dx/ 8310/8082/8081A

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

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

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

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

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

### RECEIPT

The samples were received on 5/23/2012 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° C.

Samples requesting TCLP Metals 1311/6010B/7470A analysis were leached and placed on hold, as instructed on the chain-of-custody.

### GC SEMIVOLATILES - SW846 8081A - PESTICIDES

The MS/MSD performed on sample J1P8F3 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

### GC SEMIVOLATILES - SW846 8082 - PCBs

No anomalies were encountered.

### GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

**HPLC - SW846 8310 - PAHs**

The RPD between the primary and confirmation columns exceeded 40% for analytes in sample J1P8F2. The lower of the two values has been reported, as matrix interference is evident on both columns. Associated results have been flagged with an "X".

No other anomalies were encountered.

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

Serial dilution of a digestate in batch 280-121104 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

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 J1P8F2; therefore, control limits are not applicable.

The duplicate analysis of sample J1P8F2 exhibited RPD data outside the control limits for Mercury, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

4-3 / M 505123

<b>Washington Closure Hanford</b>				<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>						RC-210-037		Page 1 of 1				
Collector MOORE, BR				Company Contact Joan Kessner		Telephone No. (509) 375-4688		Project Coordinator KESSNER, JH		Price Code 8E 8D		JR 5/17/12 Data Turnaround 15 Days 21 Days				
Project Designation 100-IU-2 & 100-IU-6 Miscellaneous Restoration Sites Near 1				Sampling Location 600-300		SAF No. RC-210										
Ice Chest No. <u>RCC-07-005</u>				Field Logbook No. EL-1651-03		COA 0603002000		Method of Shipment FedEx								
Shipped To TestAmerica Incorporated, Richland <u>Denver</u>				Offsite Property No. <u>A110379</u>		Bill of Lading/Air Bill No. See OSPC										
POSSIBLE SAMPLE HAZARDS/REMARKS  None  Special Handling and/or Storage Cool 4C				Preservation		Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
				Type of Container		G/P	G/P	G	aG	aG	aG					
				No. of Container(s)		1	1	1	1	D	D					
				Volume		60mL	120mL	120mL	<del>120mL</del> 500mL	120mL	120mL					
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PAHs - 8310	PCBs - 8082	Pesticides - 8081							
Sample No.		Matrix *	Sample Date	Sample Time												
J1P8F2		SOIL	5-21-12	0750	X	X	X	X	X	X			:6			
J1P8F3		SOIL	5-21-12	0800	X	X	X	X	X	X			:7			
J1P8F4		SOIL	5-21-12	0810	X	X	X	X	X	X			:8			
J1P8F5		SOIL	5-21-12	0818	X	X	X	X	X	X			:4			
<del>J1P8F6</del>		<del>SOIL</del>														
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Please leach and hold TCLP metals, per Joan Kessner  (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury) (2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470 (Mercury)				S=Soil SE=Sediment SO=Solid SL=Sledge W=Water O=Oil A=Air DS=Dry Solids DL=Drown Liquids T=Traces WL=Wipe L=Liquid V=Vegetation X=Other				
Brandt Moore		5-21-12 0900		Jan Russell		5-21-12 0900										
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time										
Jan Russell		5-21-12 1430		A. Freier		5-21-12 1430										
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time										
A. Freier		5-22-12 1060		Fed Ex												
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		REVIEWED BY CMB DATE 5-22-12 SDG# J01517 14 5/22/12								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time										
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time										
LABORATORY SECTION		Received By		Title		Date/Time										
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time										

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

**GENERAL ORGANIC DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	600-300		DATA PACKAGE: JO1517		
VALIDATOR:	ELR	LAB: JAL	DATE: 7/28/12		
		SDG: JO1517			
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	<u>8310</u>
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
JIP8F2		JIP8F3		JIP8F4	
				801	

**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)**

- Fluorocil ® (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: 280-29179-1  
Sdg Number: J01517

**Method Blank - Batch: 280-121122**

**Method: 8310  
Preparation: 3550C**

Lab Sample ID: MB 280-121122/1-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/01/2012 0028  
Prep Date: 05/23/2012 2200  
Leach Date: N/A

Analysis Batch: 280-121929  
Prep Batch: 280-121122  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: CHHPLC\_G  
Lab File ID: G0531029.D  
Initial Weight/Volume: 30.5 g  
Final Weight/Volume: 4000 uL  
Injection Volume: 20 uL  
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	9.8	U	9.8	98
Acenaphthylene	8.9	U	8.9	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	30
Benzo[k]fluoranthene	3.9	U	3.9	15
Chrysene	4.8	U	4.8	39
Dibenzo(a,h)anthracene	11	U	11	30
Fluoranthene	13	U	13	39
Fluorene	5.2	U	5.2	30
Indeno[1,2,3-cd]pyrene	12	U	12	30
Naphthalene	12	U	12	98
Phenanthrene	12	U	12	39
Pyrene	12	U	12	39
Surrogate	% Rec		Acceptance Limits	
Terphenyl-d14 (SUR)	88		72 - 115	

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1  
Sdg Number: J01517

**Lab Control Sample - Batch: 280-121122**

**Method: 8310**  
**Preparation: 3550C**

Lab Sample ID: LCS 280-121122/2-A  
Client Matrix: Solid  
Dilution: 1.0  
Analysis Date: 06/01/2012 0058  
Prep Date: 05/23/2012 2200  
Leach Date: N/A

Analysis Batch: 280-121929  
Prep Batch: 280-121122  
Leach Batch: N/A  
Units: ug/Kg

Instrument ID: CHHPLC\_G  
Lab File ID: G0531030.D  
Initial Weight/Volume: 30.0 g  
Final Weight/Volume: 4000 uL  
Injection Volume: 20 uL  
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	2000	1930	97	78 - 116	
Acenaphthylene	2000	1840	92	76 - 115	
Anthracene	2000	1950	98	74 - 115	
Benzo[a]anthracene	2000	2080	104	85 - 120	
Benzo[a]pyrene	2000	1910	96	74 - 121	
Benzo[b]fluoranthene	2000	2120	106	85 - 115	
Benzo[g,h,i]perylene	2000	2020	101	85 - 120	
Benzo[k]fluoranthene	2000	2030	102	85 - 115	
Chrysene	2000	2060	103	83 - 115	
Dibenzo(a,h)anthracene	2000	2060	103	83 - 115	
Fluoranthene	2000	2080	104	83 - 115	
Fluorene	2000	1920	96	80 - 115	
Indeno[1,2,3-cd]pyrene	2000	2140	107	85 - 123	
Naphthalene	2000	1840	92	80 - 121	
Phenanthrene	2000	1970	99	80 - 115	
Pyrene	2000	2050	102	75 - 116	
Surrogate		% Rec		Acceptance Limits	
Terphenyl-d14 (SUR)		90		72 - 115	

**Quality Control Results**

Client: Washington Closure Hanford

Job Number: 280-29179-1

Sdg Number: J01517

**Matrix Spike/**

**Method: 8310**

**Matrix Spike Duplicate Recovery Report - Batch: 280-121122**

**Preparation: 3550C**

MS Lab Sample ID: 280-29179-1  
 Client Matrix: Solid  
 Dilution: 1.0  
 Analysis Date: 06/01/2012 0159  
 Prep Date: 05/23/2012 2200  
 Leach Date: N/A

Analysis Batch: 280-121929  
 Prep Batch: 280-121122  
 Leach Batch: N/A

Instrument ID: CHHPLC\_G  
 Lab File ID: G0531032.D  
 Initial Weight/Volume: 30.9 g  
 Final Weight/Volume: 4000 uL  
 Injection Volume: 20 uL  
 Column ID: PRIMARY

MSD Lab Sample ID: 280-29179-1  
 Client Matrix: Solid  
 Dilution: 1.0  
 Analysis Date: 06/01/2012 0230  
 Prep Date: 05/23/2012 2200  
 Leach Date: N/A

Analysis Batch: 280-121929  
 Prep Batch: 280-121122  
 Leach Batch: N/A

Instrument ID: CHHPLC\_G  
 Lab File ID: G0531033.D  
 Initial Weight/Volume: 31.6 g  
 Final Weight/Volume: 4000 uL  
 Injection Volume: 20 uL  
 Column ID: PRIMARY

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Acenaphthene	94	96	78 - 116	0	20		
Acenaphthylene	93	95	76 - 115	0	21		
Anthracene	96	100	74 - 115	2	20		
Benzo[a]anthracene	98	101	85 - 120	1	20		
Benzo[a]pyrene	92	97	74 - 121	3	20		
Benzo[b]fluoranthene	100	103	85 - 115	1	20		
Benzo[g,h,i]perylene	92	87	85 - 120	7	20		
Benzo[k]fluoranthene	100	103	85 - 115	1	20		
Chrysene	100	105	83 - 115	2	20		
Dibenzo(a,h)anthracene	96	102	83 - 115	5	20		
Fluoranthene	101	105	83 - 115	2	20		
Fluorene	99	102	80 - 115	1	20		
Indeno[1,2,3-cd]pyrene	101	108	85 - 123	4	20		
Naphthalene	90	90	80 - 121	2	20		
Phenanthrene	98	102	80 - 115	2	20		
Pyrene	99	105	75 - 116	3	20		
Surrogate		MS % Rec	MSD % Rec	Acceptance Limits			
Terphenyl-d14 (SUR)		93	94	72 - 115			