

SAF-RC-190
100N Field Remediation – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21

KW 3/15/12
INITIAL/DATE

COMMENTS:

SDG JP0366

SAF-RC-190

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location: 120-N-3

ANALYTICAL REPORT

Job Number: 280-26366-1

SDG Number: JP0366

Job Description: SAF# RC-190

For:

Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

Attention: Joan H Kessner



Approved for release.
Kae E Yoder
Project Manager II
3/14/2012 2:14 PM

Kae E Yoder
Project Manager II
kae.yoder@testamericainc.com
03/14/2012

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is E87667.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-26366-1

SDG #: JP0366

SAF#: RC-190

Date SDG Closed: March 8, 2012

Data Deliverable: 7 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1NLK1	280-26366-1	6010/7471/WTPH-D+/8310	6010B/7471A/NWTPH-Dx/8310

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

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

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

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

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

RECEIPT

The sample was received on 3/8/2012; the sample arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 1.8 C.

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 J1NLK1. 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".

Surrogate Terphenyl-d14 was recovered outside the control limits, biased high, in sample J1NLK1. Surrogate Terphenyl-d14 was also recovered outside the control limits, biased high, in the MS/MSD performed on sample J1NLK1, demonstrating that this anomaly is most likely due to matrix interference; therefore, corrective action is deemed unnecessary. The laboratory noted that the chromatograms show obvious evidence of matrix interference.

The MS/MSD performed on sample J1NLK1 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". In addition, surrogate Terphenyl-d14 failed the recovery criteria high in both the MS and MSD. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

Continuing Calibration Verification (CCV) standards exhibited %Difference (%D) values >15%, biased high, on the confirmation column for Benzo[a]anthracene (+15.9%), Benzo[a]pyrene (+24.7%, +21.1%), Benzo [g,h,i]perylene (+24.8%, +19.7%), Dibenzo(a,h)anthracene (+16.9%, +16.6%) and Pyrene (+15.9%). The results were reported from the primary column where all compounds were within limits.

No other anomalies were encountered.

TOTAL METALS - SW846 6010B/7471A

Serial dilution of a digestate in batch 280-110931 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

Arsenic is present in the method blank associated with batch 280-110931 at 0.720 mg/kg, which is greater than half the project specific reporting limit (PSRL) of 1.0 mg/kg. TestAmerica's practical quantitation limit (PQL) for Arsenic is 2.0 mg/kg. The laboratory cannot maintain system cleanliness at this low level; therefore, corrective action is not initiated. It can be noted that the concentration found in the method blank is less than half of the laboratory standard PQL.

Low levels of Selenium are present at a level greater than half the reporting limit in the method blank associated with batch 280-110931. As no detectable concentrations of Selenium are present in the associated sample, corrective action is deemed unnecessary.

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Iron and Manganese in the Matrix Spike performed on sample J1NLK1; therefore, control limits are not applicable.

The duplicate analysis of sample J1NLK1 exhibited RPD data outside the control limits for Calcium and Mercury, and the associated sample results have been flagged "M". There is no indication that the analytical systems were operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

DATA REPORTING QUALIFIERS

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Lab Section	Qualifier	Description
GC Semi VOA		
	U	Analyzed for but not detected.
Metals		
	U	Analyzed for but not detected.
	B	Estimated result. Result is less than the RL, but greater than MDL
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	M	Sample duplicate precision not met.
	X	Serial dilution in the analytical batch indicates that physical and chemical interferences are present.
	C	The analyte was detected in both the sample and the associated QC blank, and the sample concentration was \leq 5X the blank concentration.
HPLC/IC		
	U	Analyzed for but not detected.
	X	More than 40% difference between columns, lower result reported.
	N	MS, MSD: Spike recovery exceeds upper or lower control limits.
	*	Surrogate exceeds the control limit

METHOD SUMMARY

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Northwest - Semi-Volatile Petroleum Products (GC)	TAL DEN	NWTPH NWTPH-Dx	
Ultrasonic Extraction	TAL DEN		SW846 3550C
PAHs (HPLC)	TAL DEN	SW846 8310	
Ultrasonic Extraction	TAL DEN		SW846 3550C
Metals (ICP)	TAL DEN	SW846 6010B	
Preparation, Metals	TAL DEN		SW846 3050B
Mercury (CVAA)	TAL DEN	SW846 7471A	
Preparation, Mercury	TAL DEN		SW846 7471A
ASTM D-2216	TAL DEN	ASTM D-2216	

Lab References:

TAL DEN = TestAmerica Denver

Method References:

ASTM = ASTM International

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Method	Analyst	Analyst ID
NWTPH NWTPH-Dx	Hall, Koley J	KJH
SW846 6010B	Bowen, Heidi E	HEB
SW846 7471A	Ivey, Crystal L	CLI
ASTM D-2216	Berry III, Paul B	PBB
SW846 8310	Fiedler, Heather K	HKF

SAMPLE SUMMARY

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-26366-1	J1NLK1	Solid	03/07/2012 0900	03/08/2012 0930

SAMPLE RESULTS

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Client Sample ID: J1NLK1

Lab Sample ID: 280-26366-1

Date Sampled: 03/07/2012 0900

Client Matrix: Solid

% Moisture: 6.4

Date Received: 03/08/2012 0930

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

Analysis Method:	NWTPH-Dx	Analysis Batch:	280-111335	Instrument ID:	GCS_U
Prep Method:	3550C	Prep Batch:	280-110952	Lab File ID:	053B5301.D
Dilution:	1.0			Initial Weight/Volume:	30.3 g
Analysis Date:	03/09/2012 1706			Final Weight/Volume:	1000 uL
Prep Date:	03/08/2012 1715			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
C10-C36		13000		1100	4200
C10-C28		10000		720	4200

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	109		49 - 115

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Client Sample ID: J1NLK1

Lab Sample ID: 280-26366-1

Date Sampled: 03/07/2012 0900

Client Matrix: Solid

% Moisture: 6.4

Date Received: 03/08/2012 0930

8310 PAHs (HPLC)

Analysis Method:	8310	Analysis Batch:	280-111289	Instrument ID:	CHHPLC_G
Prep Method:	3550C	Prep Batch:	280-110911	Initial Weight/Volume:	31.9 g
Dilution:	1.0			Final Weight/Volume:	4000 uL
Analysis Date:	03/12/2012 1424			Injection Volume:	20 uL
Prep Date:	03/08/2012 1610			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		10	U	10	100
Acenaphthylene		9.0	U	9.0	100
Anthracene		430		3.1	20
Benzo[a]anthracene		1000	N X	3.2	15
Benzo[a]pyrene		490		6.4	15
Benzo[b]fluoranthene		480	X	4.2	15
Benzo[g,h,i]perylene		130		7.2	30
Benzo[k]fluoranthene		230		4.0	15
Chrysene		810	N	4.9	40
Dibenzo(a,h)anthracene		48	X	11	30
Fluoranthene		1800	N	13	40
Fluorene		160		5.3	30
Indeno[1,2,3-cd]pyrene		180		12	30
Naphthalene		12	U	12	100
Phenanthrene		790	N	12	40
Pyrene		2200	N	12	40
Surrogate		%Rec	Qualifier	Acceptance Limits	
Terphenyl-d14 (SUR)		203	*	72 - 115	

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Client Sample ID: J1NLK1

Lab Sample ID: 280-26366-1

Date Sampled: 03/07/2012 0900

Client Matrix: Solid

% Moisture: 6.4

Date Received: 03/08/2012 0930

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-111401	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-110931	Lab File ID:	26a031212.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	03/12/2012 1614			Final Weight/Volume:	100 mL
Prep Date:	03/12/2012 0700				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5610	X	1.4	4.5
Antimony		1.2		0.34	0.54
Arsenic		1.9	C	0.60	0.91
Barium		47.8	X	0.069	0.45
Beryllium		0.13	B	0.030	0.18
Boron		0.89	U	0.89	1.8
Cadmium		0.12	B	0.037	0.18
Calcium		6640	X M	12.8	45.3
Chromium		5.8	X	0.053	0.18
Cobalt		8.3	X	0.091	0.91
Copper		16.9	X	0.20	0.91
Iron		21000	X	3.4	4.5
Lead		4.6		0.24	0.45
Magnesium		4280	X	3.4	18.1
Manganese		280	X	0.091	0.91
Molybdenum		0.25	B	0.24	1.8
Nickel		9.8	X	0.11	3.6
Potassium		822		37.1	272
Selenium		0.78	U	0.78	0.91
Silicon		324	X	5.1	9.1
Silver		0.14	U	0.14	0.18
Sodium		573		53.4	109
Vanadium		52.3	X	0.085	1.8
Zinc		42.8	X	0.36	0.91

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-111384	Instrument ID:	MT_033
Prep Method:	7471A	Prep Batch:	280-110992	Lab File ID:	120312aa.txt
Dilution:	1.0			Initial Weight/Volume:	0.63 g
Analysis Date:	03/12/2012 1329			Final Weight/Volume:	50 mL
Prep Date:	03/12/2012 0920				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.049	M	0.0056	0.017

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

General Chemistry

Client Sample ID: J1NLK1

Lab Sample ID: 280-26366-1

Date Sampled: 03/07/2012 0900

Client Matrix: Solid

Date Received: 03/08/2012 0930

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	6.4		%	0.10	0.10	1.0	D-2216
	Analysis Batch: 280-110883		Analysis Date: 03/08/2012 1227				DryWt Corrected: N

QUALITY CONTROL RESULTS

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC Semi VOA					
Prep Batch: 280-110952					
LCS 280-110952/2-A	Lab Control Sample	T	Solid	3550C	
MB 280-110952/1-A	Method Blank	T	Solid	3550C	
280-26366-1	J1NLK1	T	Solid	3550C	
280-26366-1MS	Matrix Spike	T	Solid	3550C	
280-26366-1MSD	Matrix Spike Duplicate	T	Solid	3550C	
Analysis Batch:280-111335					
LCS 280-110952/2-A	Lab Control Sample	T	Solid	NWTPH-Dx	280-110952
MB 280-110952/1-A	Method Blank	T	Solid	NWTPH-Dx	280-110952
280-26366-1	J1NLK1	T	Solid	NWTPH-Dx	280-110952
280-26366-1MS	Matrix Spike	T	Solid	NWTPH-Dx	280-110952
280-26366-1MSD	Matrix Spike Duplicate	T	Solid	NWTPH-Dx	280-110952

Report Basis

T = Total

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 280-110931					
LCS 280-110931/2-A	Lab Control Sample	T	Solid	3050B	
MB 280-110931/1-A	Method Blank	T	Solid	3050B	
280-26366-1	J1NLK1	T	Solid	3050B	
280-26366-1DU	Duplicate	T	Solid	3050B	
280-26366-1MS	Matrix Spike	T	Solid	3050B	
Prep Batch: 280-110992					
LCS 280-110992/2-A	Lab Control Sample	T	Solid	7471A	
MB 280-110992/1-A	Method Blank	T	Solid	7471A	
280-26366-1	J1NLK1	T	Solid	7471A	
280-26366-1DU	Duplicate	T	Solid	7471A	
280-26366-1MS	Matrix Spike	T	Solid	7471A	
Analysis Batch:280-111384					
LCS 280-110992/2-A	Lab Control Sample	T	Solid	7471A	280-110992
MB 280-110992/1-A	Method Blank	T	Solid	7471A	280-110992
280-26366-1	J1NLK1	T	Solid	7471A	280-110992
280-26366-1DU	Duplicate	T	Solid	7471A	280-110992
280-26366-1MS	Matrix Spike	T	Solid	7471A	280-110992
Analysis Batch:280-111401					
LCS 280-110931/2-A	Lab Control Sample	T	Solid	6010B	280-110931
MB 280-110931/1-A	Method Blank	T	Solid	6010B	280-110931
280-26366-1	J1NLK1	T	Solid	6010B	280-110931
280-26366-1DU	Duplicate	T	Solid	6010B	280-110931
280-26366-1MS	Matrix Spike	T	Solid	6010B	280-110931

Report Basis

T = Total

General Chemistry

Analysis Batch:280-110883					
280-26366-1	J1NLK1	T	Solid	D-2216	
280-26366-1DU	Duplicate	T	Solid	D-2216	

Report Basis

T = Total

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
HPLC/IC					
Prep Batch: 280-110911					
LCS 280-110911/2-A	Lab Control Sample	T	Solid	3550C	
MB 280-110911/1-A	Method Blank	T	Solid	3550C	
280-26366-1	J1NLK1	T	Solid	3550C	
280-26366-1MS	Matrix Spike	T	Solid	3550C	
280-26366-1MSD	Matrix Spike Duplicate	T	Solid	3550C	
Analysis Batch:280-111289					
LCS 280-110911/2-A	Lab Control Sample	T	Solid	8310	280-110911
MB 280-110911/1-A	Method Blank	T	Solid	8310	280-110911
280-26366-1	J1NLK1	T	Solid	8310	280-110911
280-26366-1MS	Matrix Spike	T	Solid	8310	280-110911
280-26366-1MSD	Matrix Spike Duplicate	T	Solid	8310	280-110911

Report Basis

T = Total

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Method Blank - Batch: 280-110952

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

Lab Sample ID: MB 280-110952/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/09/2012 1608
Prep Date: 03/08/2012 1715
Leach Date: N/A

Analysis Batch: 280-111335
Prep Batch: 280-110952
Leach Batch: N/A
Units: ug/Kg

Instrument ID: GCS_U
Lab File ID: 051B5101.D
Initial Weight/Volume: 30.7 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

Analyte	Result	Qual	MDL	RL
C10-C36	970	U	970	3900
C10-C28	660	U	660	3900
Surrogate	% Rec	Acceptance Limits		
o-Terphenyl	104	49 - 115		

Lab Control Sample - Batch: 280-110952

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

Lab Sample ID: LCS 280-110952/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/09/2012 1637
Prep Date: 03/08/2012 1715
Leach Date: N/A

Analysis Batch: 280-111335
Prep Batch: 280-110952
Leach Batch: N/A
Units: ug/Kg

Instrument ID: GCS_U
Lab File ID: 052B5201.D
Initial Weight/Volume: 31.9 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
C10-C36	62700	60800	97	57 - 115	
C10-C28	62700	60700	97	53 - 115	
Surrogate	% Rec	Acceptance Limits			
o-Terphenyl	75	49 - 115			

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-110952**

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

MS Lab Sample ID: 280-26366-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/09/2012 1735
Prep Date: 03/08/2012 1715
Leach Date: N/A

Analysis Batch: 280-111335
Prep Batch: 280-110952
Leach Batch: N/A

Instrument ID: GCS_U
Lab File ID: 054B5401.D
Initial Weight/Volume: 32.0 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

MSD Lab Sample ID: 280-26366-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/09/2012 1804
Prep Date: 03/08/2012 1715
Leach Date: N/A

Analysis Batch: 280-111335
Prep Batch: 280-110952
Leach Batch: N/A

Instrument ID: GCS_U
Lab File ID: 055B5501.D
Initial Weight/Volume: 31.2 g
Final Weight/Volume: 1000 uL
Injection Volume: 1 uL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
C10-C36	91	98	57 - 115	9	23		
C10-C28	92	98	56 - 115	7	23		
Surrogate	MS % Rec		MSD % Rec	Acceptance Limits			
o-Terphenyl	81		84	49 - 115			

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Method Blank - Batch: 280-110911

**Method: 8310
Preparation: 3550C**

Lab Sample ID: MB 280-110911/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2012 1323
Prep Date: 03/08/2012 1610
Leach Date: N/A

Analysis Batch: 280-111289
Prep Batch: 280-110911
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0312008.D
Initial Weight/Volume: 32.5 g
Final Weight/Volume: 4000 uL
Injection Volume: 20 uL
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Acenaphthene	9.2	U	9.2	92
Acenaphthylene	8.3	U	8.3	92
Anthracene	2.8	U	2.8	18
Benzo[a]anthracene	2.9	U	2.9	14
Benzo[a]pyrene	5.9	U	5.9	14
Benzo[b]fluoranthene	3.9	U	3.9	14
Benzo[g,h,i]perylene	6.6	U	6.6	28
Benzo[k]fluoranthene	3.6	U	3.6	14
Chrysene	4.5	U	4.5	37
Dibenzo(a,h)anthracene	10	U	10	28
Fluoranthene	12	U	12	37
Fluorene	4.9	U	4.9	28
Indeno[1,2,3-cd]pyrene	11	U	11	28
Naphthalene	11	U	11	92
Phenanthrene	11	U	11	37
Pyrene	11	U	11	37
Surrogate	% Rec		Acceptance Limits	
Terphenyl-d14 (SUR)	96		72 - 115	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Lab Control Sample - Batch: 280-110911

Method: 8310

Preparation: 3550C

Lab Sample ID: LCS 280-110911/2-A	Analysis Batch: 280-111289	Instrument ID: CHHPLC_G
Client Matrix: Solid	Prep Batch: 280-110911	Lab File ID: G0312009.D
Dilution: 1.0	Leach Batch: N/A	Initial Weight/Volume: 33.0 g
Analysis Date: 03/12/2012 1354	Units: ug/Kg	Final Weight/Volume: 4000 uL
Prep Date: 03/08/2012 1610		Injection Volume: 20 uL
Leach Date: N/A		Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1820	1730	95	78 - 116	
Acenaphthylene	1820	1720	95	76 - 115	
Anthracene	1820	1860	102	74 - 115	
Benzo[a]anthracene	1820	1940	107	85 - 120	
Benzo[a]pyrene	1820	1900	104	74 - 121	
Benzo[b]fluoranthene	1820	1890	104	85 - 115	
Benzo[g,h,i]perylene	1820	2000	110	85 - 120	
Benzo[k]fluoranthene	1820	1830	101	85 - 115	
Chrysene	1820	1820	100	83 - 115	
Dibenzo(a,h)anthracene	1820	1880	104	83 - 115	
Fluoranthene	1820	1870	103	83 - 115	
Fluorene	1820	1800	99	80 - 115	
Indeno[1,2,3-cd]pyrene	1820	1940	107	85 - 123	
Naphthalene	1820	1760	97	80 - 121	
Phenanthrene	1820	1820	100	80 - 115	
Pyrene	1820	1860	102	75 - 116	
Surrogate		% Rec		Acceptance Limits	
Terphenyl-d14 (SUR)		94		72 - 115	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-110911**

**Method: 8310
Preparation: 3550C**

MS Lab Sample ID: 280-26366-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2012 1455
Prep Date: 03/08/2012 1610
Leach Date: N/A

Analysis Batch: 280-111289
Prep Batch: 280-110911
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0312011.D
Initial Weight/Volume: 32.4 g
Final Weight/Volume: 4000 uL
Injection Volume: 20 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-26366-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2012 1525
Prep Date: 03/08/2012 1610
Leach Date: N/A

Analysis Batch: 280-111289
Prep Batch: 280-110911
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0312012.D
Initial Weight/Volume: 30.1 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	104	98	78 - 116	1	20		
Acenaphthylene	93	92	76 - 115	5	21		
Anthracene	91	86	74 - 115	1	20		
Benzo[a]anthracene	68	67	85 - 120	3	20	N	N
Benzo[a]pyrene	94	89	74 - 121	2	20		
Benzo[b]fluoranthene	89	86	85 - 115	3	20		
Benzo[g,h,i]perylene	109	107	85 - 120	5	20		
Benzo[k]fluoranthene	96	94	85 - 115	5	20		
Chrysene	71	70	83 - 115	4	20	N	N
Dibenzo(a,h)anthracene	91	102	83 - 115	19	20		
Fluoranthene	46	36	83 - 115	5	20	N	N
Fluorene	95	91	80 - 115	3	20		
Indeno[1,2,3-cd]pyrene	103	101	85 - 123	5	20		
Naphthalene	99	96	80 - 121	4	20		
Phenanthrene	82	73	80 - 115	3	20		N
Pyrene	32	21	75 - 116	7	20	N	N
Surrogate	MS % Rec		MSD % Rec		Acceptance Limits		
Terphenyl-d14 (SUR)	127	*	116	*	72 - 115		

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Method Blank - Batch: 280-110931

Method: 6010B

Preparation: 3050B

Lab Sample ID: MB 280-110931/1-A
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 03/12/2012 1609
 Prep Date: 03/12/2012 0700
 Leach Date: N/A

Analysis Batch: 280-111401
 Prep Batch: 280-110931
 Leach Batch: N/A
 Units: mg/Kg

Instrument ID: MT_026
 Lab File ID: 26a031212.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	0.720	B	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	0.942	B	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: 280-26366-1

Sdg Number: JP0366

Lab Control Sample - Batch: 280-110931

Method: 6010B

Preparation: 3050B

Lab Sample ID: LCS 280-110931/2-A
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 03/12/2012 1612
 Prep Date: 03/12/2012 0700
 Leach Date: N/A

Analysis Batch: 280-111401
 Prep Batch: 280-110931
 Leach Batch: N/A
 Units: mg/Kg

Instrument ID: MT_026
 Lab File ID: 26a031212.asc
 Initial Weight/Volume: 1 g
 Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	196.6	98	82 - 116	
Antimony	50.0	47.88	96	82 - 110	
Arsenic	100	97.43	97	85 - 110	
Barium	200	192.9	96	87 - 112	
Beryllium	5.00	4.76	95	84 - 114	
Boron	100	94.49	94	81 - 110	
Cadmium	10.0	9.86	99	87 - 110	
Calcium	5000	4719	94	82 - 114	
Chromium	20.0	19.53	98	84 - 114	
Cobalt	50.0	47.91	96	87 - 110	
Copper	25.0	25.05	100	88 - 110	
Iron	100	95.73	96	87 - 120	
Lead	50.0	47.98	96	86 - 110	
Magnesium	5000	4694	94	90 - 110	
Manganese	50.0	47.59	95	88 - 110	
Molybdenum	100	97.78	98	86 - 110	
Nickel	50.0	49.22	98	87 - 110	
Potassium	5000	4897	98	89 - 110	
Selenium	200	189.4	95	83 - 110	
Silicon	1000	225.6	23	10 - 70	
Silver	5.00	4.93	99	87 - 114	
Sodium	5000	4898	98	90 - 112	
Vanadium	50.0	49.06	98	88 - 110	
Zinc	50.0	46.56	93	76 - 114	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Matrix Spike - Batch: 280-110931

Method: 6010B

Preparation: 3050B

Lab Sample ID: 280-26366-1	Analysis Batch: 280-111401	Instrument ID: MT_026
Client Matrix: Solid	Prep Batch: 280-110931	Lab File ID: 26a031212.asc
Dilution: 1.0	Leach Batch: N/A	Initial Weight/Volume: 1.18 g
Analysis Date: 03/12/2012 1622	Units: mg/Kg	Final Weight/Volume: 100 mL
Prep Date: 03/12/2012 0700		
Leach Date: N/A		

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	5610	181	7380	976	50 - 200	4
Antimony	1.2	45.3	25.89	54	20 - 200	
Arsenic	1.9	90.5	75.27	81	76 - 111	
Barium	47.8	181	208.6	89	52 - 159	
Beryllium	0.13 B	4.53	3.81	81	72 - 105	
Boron	0.89 U	90.5	71.49	79	75 - 107	
Cadmium	0.12 B	9.05	7.82	85	40 - 130	
Calcium	6640	4530	12040	119	43 - 165	
Chromium	5.8	18.1	22.11	90	70 - 200	
Cobalt	8.3	45.3	45.59	82	72 - 106	
Copper	16.9	22.6	36.89	88	37 - 187	
Iron	21000	90.5	24830	4195	70 - 200	4
Lead	4.6	45.3	41.23	81	70 - 200	
Magnesium	4280	4530	8607	96	64 - 145	
Manganese	280	45.3	349.8	155	40 - 200	4
Molybdenum	0.25 B	90.5	73.87	81	75 - 103	
Nickel	9.8	45.3	45.65	79	61 - 126	
Potassium	822	4530	5005	92	56 - 172	
Selenium	0.78 U	181	144.0	79	76 - 104	
Silicon	324	905	534.1	23	20 - 200	
Silver	0.14 U	4.53	3.91	86	75 - 141	
Sodium	573	4530	4705	91	78 - 111	
Vanadium	52.3	45.3	96.72	98	50 - 169	
Zinc	42.8	45.3	80.22	83	70 - 200	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1

Sdg Number: JP0366

Duplicate - Batch: 280-110931

Method: 6010B

Preparation: 3050B

Lab Sample ID: 280-26366-1

Analysis Batch: 280-111401

Instrument ID: MT_026

Client Matrix: Solid

Prep Batch: 280-110931

Lab File ID: 26a031212.asc

Dilution: 1.0

Leach Batch: N/A

Initial Weight/Volume: 1.07 g

Analysis Date: 03/12/2012 1619

Units: mg/Kg

Final Weight/Volume: 100 mL

Prep Date: 03/12/2012 0700

Leach Date: N/A

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	5610	6086	8	40	
Antimony	1.2	0.950	25	40	
Arsenic	1.9	2.19	13	30	
Barium	47.8	49.46	3	30	
Beryllium	0.13 B	0.112	13	30	B
Boron	0.89 U	0.98	NC	30	U
Cadmium	0.12 B	0.119	3	30	B
Calcium	6640	9270	33	30	M
Chromium	5.8	6.22	6	40	
Cobalt	8.3	9.42	13	30	
Copper	16.9	18.75	11	30	
Iron	21000	24310	14	40	
Lead	4.6	5.91	25	40	
Magnesium	4280	4544	6	30	
Manganese	280	295.8	6	40	
Molybdenum	0.25 B	0.26	NC	30	U
Nickel	9.8	9.25	6	30	
Potassium	822	922.2	11	40	
Selenium	0.78 U	1.30	NC	30	
Silicon	324	386.1	17	40	
Silver	0.14 U	0.16	NC	30	U
Sodium	573	585.7	2	30	
Vanadium	52.3	58.81	12	30	
Zinc	42.8	46.56	8	40	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Method Blank - Batch: 280-110992

Lab Sample ID: MB 280-110992/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2012 1324
Prep Date: 03/12/2012 0920
Leach Date: N/A

Analysis Batch: 280-111384
Prep Batch: 280-110992
Leach Batch: N/A
Units: mg/Kg

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

Instrument ID: MT_033
Lab File ID: 120312aa.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: 280-110992

Lab Sample ID: LCS 280-110992/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2012 1326
Prep Date: 03/12/2012 0920
Leach Date: N/A

Analysis Batch: 280-111384
Prep Batch: 280-110992
Leach Batch: N/A
Units: mg/Kg

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

Instrument ID: MT_033
Lab File ID: 120312aa.txt
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.451	108	87 - 111	

Matrix Spike - Batch: 280-110992

Lab Sample ID: 280-26366-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 03/12/2012 1338
Prep Date: 03/12/2012 0920
Leach Date: N/A

Analysis Batch: 280-111384
Prep Batch: 280-110992
Leach Batch: N/A
Units: mg/Kg

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

Instrument ID: MT_033
Lab File ID: 120312aa.txt
Initial Weight/Volume: 0.57 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.049	0.469	0.509	98	87 - 111	

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Duplicate - Batch: 280-110992

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-26366-1	Analysis Batch:	280-111384	Instrument ID:	MT_033
Client Matrix:	Solid	Prep Batch:	280-110992	Lab File ID:	120312aa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	03/12/2012 1335	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	03/12/2012 0920				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.049	0.0297	50	20	M

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-26366-1
Sdg Number: JP0366

Duplicate - Batch: 280-110883

Method: D-2216
Preparation: N/A

Lab Sample ID:	280-26366-1	Analysis Batch:	280-110883	Instrument ID:	No Equipment
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	03/08/2012 1227	Units:	%	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	6.4	5.6	13	20	

