

SAF-RC-074
100-D/DR Burial Grounds & Remaining
Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt

H4-21

KW 4/3/14
INITIAL/DATE

COMMENTS:

SDG J02127

SAF RC-074

Rad only

Chem only

Rad & Chem

Complete

Partial

Waste Site: 100-D-100 (ACL and/or LDR stockpile footprint)

Analytical Data Package Prepared For
Washington Closure Hanford

Radiochemical Analysis By
TestAmerica Inc

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: TARL

Data Package Contains 19 Pages

Report No.: 59474

Results in this report relate only to the sample(s) analyzed.

| SDG No. | Order No. | Client Sample ID (List Order) | Lot-Sa No. | Work Order | Report DB ID | Batch No. |
|---------|-----------|-------------------------------|-------------|------------|--------------|-----------|
| J02127 | RC-074 | J1TH89 | J4D010406-1 | M3DH91AA | 9M3DH910 | 4091042 |
| | | J1TH90 | J4D010406-2 | M3DJA1AA | 9M3DJA10 | 4091042 |
| | | J1TH91 | J4D010406-3 | M3DJC1AA | 9M3DJC10 | 4091042 |

Certificate of Analysis

Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

April 2, 2014

Attention: Joan Kessner

| | | |
|-------------------|---|----------------------|
| SAF Number | : | RC-074 |
| Date SDG Closed | : | April 1, 2014 |
| Number of Samples | : | Three (3) |
| Sample Type | : | Soil |
| SDG Number | : | J02127 |
| Data Deliverable | : | Quick Turn / Summary |

CASE NARRATIVE

I. Introduction

On April 1, 2014, three soil samples were received at TestAmerica for chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID;

| <u>WCH ID#</u> | <u>TARL ID#</u> | <u>MATRIX</u> | <u>DATE OF RECEIPT</u> |
|----------------|-----------------|---------------|------------------------|
| J1TH89 | M3DH9 | SOIL | 4/01/14 |
| J1TH90 | M3DJA | SOIL | 4/01/14 |
| J1TH91 | M3DJC | SOIL | 4/01/14 |

II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Chemical Analysis
Hexavalent Chromium by EPA method 7196A

Washington Closure Hanford
April 2, 2014

IV. Quality Control

This SDG includes a minimum of one Laboratory Control Samples (LCS), one method (reagent) blank, a duplicate sample, matrix spike sample and a matrix spike duplicate sample. Any exceptions have been noted in the "Comments" section.

Blanks and LCS are reported in mg/L units, other QC and sample results are reported in the same units.

V. Comments

Chemical Analysis

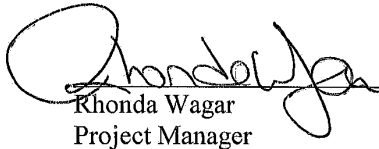
Hexavalent Chromium by EPA method 7196A

Batch 4091042:

The LCS, batch blank, samples, sample duplicate (J1TH89) and sample matrix spike (J1TH89) results are within contractual requirements.

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

Reviewed and approved:


Rhonda Wagar
Project Manager

Drinking Water Method Cross References

| DRINKING WATER ASTM METHOD CROSS REFERENCES | | |
|---|-------------------------------|--------------------------------|
| Referenced Method | Isotope(s) | TestAmerica Richland's SOP No. |
| EPA 901.1 | Cs-134, I-131 | RL-GAM-001 |
| EPA 900.0 | Alpha & Beta | RL-GPC-001 |
| EPA 00-02 | Gross Alpha (Coprecipitation) | RL-GPC-002 |
| EPA 903.0 | Total Alpha Radium (Ra-226) | RL-RA-002 |
| EPA 903.1 | Ra-226 | RL-RA-001 |
| EPA 904.0 | Ra-228 | RL-RA-001 |
| EPA 905.0 | Sr-89/90 | RL-GPC-003 |
| ASTM D5174 | Uranium | RL-KPA-003 |
| EPA 906.0 | Tritium | RL-LSC-005 |
| | | |
| | | |

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

| | |
|---|--|
| Action Lev | An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit. |
| Batch | The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together. |
| Bias | Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30. |
| COC No | Chain of Custody Number assigned by the Client or TestAmerica. |
| Count Error (#s) | Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background. |
| Total Uncert (#s) <i>u_c Combined Uncertainty.</i> | All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined uncertainty</i> . The uncertainty is absolute and in the same units as the result. |
| (#s), Coverage Factor | The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations. |
| CRDL (RL) | Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL) |
| Lc | Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \sqrt{2 * (BkgrndCnt / BkgrndCntMin) / SCntMin}) * (ConvFct / (Eff * Yld * Abn * Vol)) * IngrFct$. For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero. |
| Lot-Sample No | The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot. |
| MDC MDA | Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \sqrt{(BkgrndCnt / BkgrndCntMin) / SCntMin} + 2.71 / SCntMin) * (ConvFct / (Eff * Yld * Abn * Vol)) * IngrFct$. For LSC methods the batch blank is used as a measure of the background variability. |
| Primary Detector | The instrument identifier associated with the analysis of the sample aliquot. |
| Ratio U-234/U-238 | The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038. |
| Rst/MDC | Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result. |
| Rst/TotUcert | Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result. |
| Report DB No | Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number. |
| RER | The equation Replicate Error Ratio = $(S-D) / [\sqrt{(TPUs^2 + TPUD^2)}]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUD is the total uncertainty of the duplicate sample. |
| SDG | Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt. |
| Sum Rpt Alpha Spec Rst(s) | The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units. |
| Work Order | The LIMS software assign test specific identifier. |
| Yield | The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method. |

Sample Results Summary

Date: 02-Apr-14

TestAmerica Inc TARL

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

Report No. : 59474

SDG No: J02127

| Client Id | | Parameter | Result +/- Uncertainty (2s) | Qual | Units | Tracer Yield | MDL | CRDL | RPD |
|-------------------|------------|-----------|------------------------------|------|-------|--------------|----------|----------|------|
| Batch | Work Order | | | | | | | | |
| 4091042 7196_CR6 | | | | | | | | | |
| J1TH89 | | | | | | | | | |
| | M3DH91AA | HEXCHROME | 5.26E-01 +/- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| | M3DH91AD | HEXCHROME | 6.85E-01 +/- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | 26.3 |
| J1TH90 | | | | | | | | | |
| | M3DJA1AA | HEXCHROME | 7.92E-01 +/- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| J1TH91 | | | | | | | | | |
| | M3DJC1AA | HEXCHROME | 3.67E-01 +/- 0.0E+00 | | mg/kg | N/A | 1.55E-01 | 1.55E-01 | |
| No. of Results: 4 | | | | | | | | | |

TestAmerica Inc RPD - Relative Percent Difference.

rptTALRchSaSum
mary2 V5.3.2
A2002

QC Results Summary

Date: 02-Apr-14

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 59474

SDG No.: J02127

| Batch | Work Order | Parameter | Result +- Uncertainty (2s) | Qual | Units | Tracer Yield | LCS Recovery | Bias | MDL |
|-------------------|----------------------|-----------|-----------------------------|------|-------|--------------|--------------|------|----------|
| 7196_CR6 | | | | | | | | | |
| 4091042 | MATRIX SPIKE, J1TH89 | | | | | | | | |
| | M3DH91AC | HEXCHROME | 2.80E+01 +- 0.0E+00 | | mg/kg | N/A | 92% | -0.1 | 1.55E-01 |
| 4091042 | LCS, | | | | | | | | |
| | M3DJ11AC | HEXCHROME | 1.82E+01 +- 0.0E+00 | | mg/kg | N/A | 96% | 0.0 | 1.55E-01 |
| 4091042 | BLANK QC, | | | | | | | | |
| | M3DJ11AA | HEXCHROME | 1.55E-01 +- 0.0E+00 | U | mg/kg | N/A | | | 1.55E-01 |
| No. of Results: 3 | | | | | | | | | |

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

rptSTLRchQcSummary V5.3.2 A2002 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM I

Date: 02-Apr-14

SAMPLE RESULTS

Lab Name: TestAmerica Inc

SDG: J02127

Collection Date: 3/31/2014 1:16:00 PM

Lot-Sample No.: J4D010406-1

Report No.: 59474

Received Date: 4/1/2014 10:50:00 AM

Client Sample ID: J1TH89

COC No.: RC-074-649

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDL, Action Lev | Rpt Unit, Lc | Yield CRDL(RL) | Rst/MDL, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|----------|------|-------------------|-------------------|-----------------|--------------|----------------|------------------------|---------------------|---------------|--------------|------------------|
| Batch: 4091042 | 7196_CR6 | | | | M3DH91AA | | | Report DB ID: 9M3DH910 | | | | |
| HEXCHROME | 5.26E-01 | | | 0.0E+00 | 1.55E-01 mg/kg | | N/A | (3.4) | 4/1/14 04:11 p | | 2.5018 | |
| | | | | | | | 1.55E-01 | N/A | | | 9 | |

No. of Results: 1 Comments:

TestAmerica Inc MDC:jMDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchSample U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdi, Total Uncert, CRDL, RDL or not identified by gamma scan software.
 V5.3.2 A2002

FORM I

Date: 02-Apr-14

SAMPLE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J4D010406-2
Client Sample ID: J1TH90
SDG: J02127
Report No.: 59474
COC No.: RC-074-649
Collection Date: 3/31/2014 1:21:00 PM
Received Date: 4/1/2014 10:50:00 AM
Matrix: SOIL

Ordered by Client Sample ID, Batch No.

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDL, Action Lev | Rpt Unit, Lc | Yield CRDL(RL) | Rst/MDL, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|----------|------|-------------------|-------------------|-----------------|--------------|----------------|-------------------------|---------------------|---------------|--------------|------------------|
| Batch: 4091042 | 7196_CR6 | | | | M3DJJA1AA | | | Report DB ID: 9M3DJJA10 | | | | |
| HEXCHROME | 7.92E-01 | | | 0.0E+00 | 1.55E-01 mg/kg | | N/A | (5.1) | 4/1/14 04:11 p | | 2.5066 | |
| | | | | | | | 1.55E-01 | N/A | | | 9 | |

No. of Results: 1 Comments:

TestAmerica Inc MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rpt\$TLRchSample U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.
 V5.3.2 AZ002

FORM I

Date: 02-Apr-14

SAMPLE RESULTS

Lab Name: TestAmerica Inc

SDG: J02127

Collection Date: 3/31/2014 1:26:00 PM

Lot-Sample No.: J4D010406-3

Report No.: 59474

Received Date: 4/1/2014 10:50:00 AM

Client Sample ID: J1TH91

COC No.: RC-074-649

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDL, Action Lev | Rpt Unit, Lc | Yield CRDL(RL) | Rst/MDL, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|---|----------|------|--------------------|--------------------|-----------------|--------------|----------------|-----------------------|---------------------|---------------|--------------|------------------|
| Batch: 4091042 | 7196_CR6 | | | | | | | | | | | |
| HEXCHROME | 3.67E-01 | | | 0.0E+00 | 1.55E-01 mg/kg | | N/A | (2.4) | 4/1/14 04:11 p | | 2.5065 | |
| | | | | | | | 1.55E-01 | N/A | | | g | |
| Work Order: M3DJC1AA Report DB ID: 9M3DJC10 | | | | | | | | | | | | |

No. of Results: 1 Comments:

FORM II

Date: 02-Apr-14

DUPLICATE RESULTS

Lab Name: TestAmerica Inc
 Lot-Sample No.: J4D010406-1
 Client Sample ID: J1TH89
 SDG: J02127
 Report No.: 59474
 COC No.: RC-074-649
 Matrix: SOIL
 Collection Date: 3/31/2014 1:16:00 PM
 Received Date: 4/1/2014 10:50:00 AM

| Parameter | Result, Orig Rst | Qual | Count Error (2 s) | Total Uncert(2 s) | MDL, Action Lev | Rpt Unit, CRDL | Yield | Rst/MDL, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|------------------|------|-------------------|----------------------|-----------------|----------------|-------|-----------------------|-------------------------|---------------|--------------|------------------|
| Batch: 4091042 | 7196_CR6 | | | | | | | | Orig Sa DB ID: 9M3DH910 | | | |
| HEXCHROME | 6.85E-01 | | | Work Order: M3DH91AD | 1.55E-01 | mg/kg | N/A | (4.4) | 4/1/14 04:11 p | | 2.506 | |
| | 5.26E-01 | | RPD 26.3 | | | 1.55E-01 | | N/A | | | 9 | |

No. of Results: 1 Comments:

TestAmerica Inc RPD - Relative Percent Difference.
 rptSTLRchDupV5. MDC(MDA).Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 3.2 A2002

FORM II

Date: 02-Apr-14

BLANK RESULTS

Lab Name: TestAmerica Inc

SDG: J02127

Matrix: SOIL

Report No.: 59474

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDL, Lc | Rpt Unit, CRDL | Yield | Rst/MDL, Rst/TotUcert | Analysis, Prep Date | Total Sa Size | Aliquot Size | Primary Detector |
|----------------|----------|------|-------------------|--------------------|----------|----------------|-------|-----------------------|---------------------|---------------|--------------|------------------|
| Batch: 4091042 | 7196_CR6 | | | | | | | | | | | |
| HEXCHROME | 1.55E-01 | U | | 0.0E+00 | 1.55E-01 | mg/kg | N/A | 1. | 4/1/14 04:11 p | | 2.5 | |
| | | | | | | 1.55E-01 | | N/A | | | 9 | |

Work Order: M3DJ11AA Report DB ID: M3DJ11AB

No. of Results: 1 Comments:

TestAmerica Inc MDCIMDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchBlank U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.
 V5.3.2 A2002

**FORM II
LCS RESULTS**

Date: 02-Apr-14

Lab Name: TestAmerica Inc

SDG: J02127

Matrix: SOIL

Report No.: 59474

| Parameter | Result | Qual | Count Error (2 s) | Total Uncert(2 s) | MDL | Report Unit | Yield | Expected | Expected Uncert | Recovery, Bias | Analysis, Prep Date | Aliquot Size | Primary Detector |
|---|----------|------|-------------------|-------------------|----------|-------------|-------------|----------|-----------------|----------------|---------------------|--------------|------------------|
| Batch: 4091042 7196_CR6 Work Order: M3DJ11AC Report DB ID: M3DJ11AS | | | | | | | | | | | | | |
| HEXCHROME | 1.82E+01 | | | 0.0E+00 | 1.55E-01 | mg/kg | N/A | 1.90E+01 | | 96% | 4/1/14 04:11 p | 2.5 | |
| | | | | | | | Rec Limits: | 80 | 120 | 0.0 | | g | |

No. of Results: 1 Comments:

FORM II

Date: 02-Apr-14

MATRIX SPIKE RESULTS

Lab Name: TestAmerica Inc SDG: J02127 Matrix: SOIL
 Lot-Sample No.: J4D010406-1, J1TH89 Report No.: 59474

| Parameter | SpikeResult, Orig Rst | Qual | Count Error (2 s) | Total Uncert(2 s) | MDC/MDA | Rpt Unit | Yield | Recovery | Expected, Uncert | Analysis, Prep Date | Aliquot Size | Analy Method, Primary Detector |
|-----------------------------|-----------------------|----------|-------------------|-----------------------------------|----------------------|----------|-------|--------------------|------------------|---------------------|--------------|--------------------------------|
| Batch: 4091042 HEXCHROME | 2.80E+01 5.26E-01 | M3DH91AC | | Report DB ID: M3DH91AC 0.0E+00 | M3DH91CW 1.55E-01 | mg/kg | N/A | 92.40% 9M3DH910 | 3.03E+01 | 4/1/14 04:11 p | 2.503 | 7196_CR6 |
| | | | | | | | | | | | g | |

Number of Results: 1

Comments:

TestAmerica Inc RER - Replicate Error Ratio = $(S-D)/[\sqrt{(\text{sq}(TPUs)+\text{sq}(TPUd))}]$ as defined by ICPT BOA.
 rpt\$TLRchMs Bias - $(\text{Result}/\text{Expected})-1$ as defined by ANSI N13.30.
 V5.3.2 A2002

**Richland Laboratory
Data Review Check List
Hexavalent Chromium**

| Batch Number(s): | 4091042 | Lab Sample Numbers or SDG: | J02127 | |
|--|---------|----------------------------|---------|----------------------------------|
| Method/Test/Parameter: Cr+6 <input type="checkbox"/> RL-WC-003(Aqueous) <input checked="" type="checkbox"/> RL-WC-004(Solid) | | | | |
| Review Item | Yes (✓) | No (✓) | N/A (✓) | 2 nd Level Review (✓) |
| A. Initial Calibration | | | | |
| 1. Performed at required frequency with required number of levels? | ✓ | | | ✓ |
| 2. Correlation coefficient greater than 0.97? | ✓ | | | ✓ |
| 3. Initial calibration verification (ICV) analyzed immediately after calibration and results within 10% of expected? | ✓ | | | ✓ |
| 4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit? | ✓ | | | ✓ |
| B. Continuing Calibration | | | | |
| 1. CCV analyzed at required frequency and all parameters within 10% of expected? | ✓ | | | ✓ |
| 2. CCB analyzed at required frequency and all results ≤ reporting limit? | ✓ | | | ✓ |
| C. Sample Analysis | | | | |
| 1. Were any samples with concentrations above the linear range diluted and reanalyzed? | | | ✓ | ✓ |
| 2. Were all sample holding times met? | ✓ | | | ✓ |
| D. QC Samples | | | | |
| 1. All results for the preparation blank below limits? | ✓ | | | ✓ |
| 2. LCS percent recovery within 85-115% | ✓ | | | ✓ |
| 3. PbCrO ₄ percent recovery within 75-125%? | ✓ | | | ✓ |
| 4. Sample and Duplicate within 20% (aqueous) or 35% (solid) RPD? | ✓ | | | ✓ |
| 5. MS or MS/MSD recoveries within 85-115% (aqueous) or 75-125% (solid)? | ✓ | | | ✓ |
| 6. On MS failure, PDMS within 85-115%? | | | ✓ | ✓ |
| E. Other | | | | |
| 1. Are all nonconformances included and noted? | | | ✓ | ✓ |
| 2. Is the correct date and time of analysis shown? | ✓ | | | ✓ |
| 3. Did the analyst sign and date the front page of the analytical run? | ✓ | | | ✓ |
| 4. Correct methodology used? | ✓ | | | ✓ |
| 5. Transcriptions checked? | ✓ | | | ✓ |
| 6. Calculations checked at minimum frequency? | ✓ | | | ✓ |
| 7. Units checked? | ✓ | | | ✓ |

Comments on any "No" response or list NCM number:

Analyst I. Salifu Date 4/2/14 2nd Review [Signature] Date 4/2/14

1 of 1

Page 2 of 2
SAMS 3-31-14

| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-074-649 | Price Code |
|---|---|--|------------------------------------|-------------------|---------------------------------|------------|------------------------------------|
| Collector H. Weber 3-31-14 | Company Contact Joan Kessner | Telephone No. 375-4688 | Project Coordinator KESSNER, JH | | Data Turnaround SAMS 3-31-14 | | |
| Project Designation 100-D/DR Field Remediation | Sampling Location 100-D-100 (ACL and/or LDR stockpile footprint) | Field Logbook No. EL-1607-24 | | COA OD10032600 | SAF No. RC-074 Q.T. | | |
| Ice Chest No. N/A | Offsite Property No. N/A | Method of Shipment Local Delivery | | | | | Bill of Lading/Air Bill No. N/A |
| Shipped To TestAmerica Richland | Other Labs Shipped To N/A | Preservation Cool 4C | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS N/A | | Type of Container G/P | | | | | |
| Special Handling and/or Storage Cool 4C | | No. of Container(s) 1 | | | | | |
| | | Volume 125mL | | | | | |
| | | Sample Analysis Chromium Hex -7198 - Quick Turn (Hexavalent Chromium) | | | | | |

| CHAIN OF POSSESSION | | | | SPECIAL INSTRUCTIONS | | | |
|---|---------------------------|---|----------------------------|---|--|--|--|
| Relinquished By/Removed From M. Weber | Date/Time 3/31/14 1330 | Received By/Stored In S.M. Sexton | Date/Time 3/31/14 1330 | <p>J4D010406</p> <p>REVIEWED BY K. WOOD/Vicamed</p> <p>DATE 4-1-14</p> <p>J4D010406</p> <p>J4D010406</p> <p>340010406 502120 Due 4-2-14</p> | | | |
| Relinquished By/Removed From S.M. Sexton | Date/Time 3/31/14 1630 | Received By/Stored In C. Bingham | Date/Time 3-31-14 1630 | | | | |
| Relinquished By/Removed From C. Bingham | Date/Time 3-31-14 1631 | Received By/Stored In 1060 Battelle, Bridge | Date/Time 11-14-14 1631 | | | | |
| Relinquished By/Removed From 1060 Battelle, Bridge | Date/Time 4-1-14 0710 | Received By/Stored In C. Bingham | Date/Time 4-1-14 0710 | | | | |
| Relinquished By/Removed From C. Bingham | Date/Time 4-1-14 1050 | Received By/Stored In S. B. S. S. S. S. S. S. S. S. S. | Date/Time 4-1-14 1050 | | | | |
| 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 | | | | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time | | | | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time | | | | |
| FINAL SAMPLE DISPOSITION | | | | Disposal Method | | | |
| WCH-EE-011 | | | | Disposed By | | | |

Sample Check-in List

Date/Time Received: 4-1-14 / 1050 Container GM Screen Result: (Airlock) 40 cpm Initials [B]
Sample GM Screen Result (Sample Receiving) 40 cpm Initials [B]

Client: WCH SDG #: 302127 SAF #: RC-074 NA []

Lot Number: J4D010406

Chain of Custody # RC-074-649

Shipping Container ID or Air Bill Number: handled NA [RW]

Samples received inside shipping container/cooler/box Yes [B] Continue with 1 through 4. Initial appropriate response.
No [] Go to 5, add comment to #16.

- 1. Custody Seals on shipping container intact? Yes [] No [] No Custody Seal [B]
2. Custody Seals dated and signed? Yes [] No [] No Custody Seal [B]
3. Cooler temperature: 9.5 C on NA []
4. Vermiculite/packing materials is NA [B] Wet [] Dry []

- Item 5 through 16 for samples. Initial appropriate response.
5. Chain of Custody record present? Yes [B] No []
6. Number of samples received (Each sample may contain multiple bottles): 3
7. Containers received: 3 x 125 mL

- 8. Sample holding times exceeded? NA [] Yes [] No [B]
9. Samples have: tape hazard labels B custody seals B appropriate sample labels
10. Matrix: B A (FLT, Wipe, Solid, Soil) I (Water) S (Air, Niosh 7400) T (Biological, Ni-63)

- 11. Samples: B are in good condition are leaking are broken
have air bubbles (Only for samples requiring no head space) Other

- 12. Sample pH appropriate for analysis requested Yes [] No [] NA [B]
(If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO3 added and pH after addition on table)
13. Were any anomalies identified in sample receipt? Yes [] No [B]
14. Description of anomalies (include sample numbers): NA [B]

- 15. Sample Location, Sample Collector Listed on COC? * Yes [B] No []
*For documentation only. No corrective action needed.

16. Additional Information: W/A

[] Client/Courier denied temperature check. [] Client/Courier unpack cooler.

Sample Check-in List completed by Sample Custodian:
Signature: [Signature] Date: 4-1-14

Client Notification needed? Yes [] No [X] Date:
By:
Person contacted:

[X] No action necessary; process as is
Project Manager [Signature] Date 4/1/14

4/1/2014 12:13:00 PM **Sample Preparation/Analysis** Balance Id: _____ Pipet #: _____
 127642, Washington Closure Hanford LLC, DW Alkaline Digestion by method 3060A
 Washington Closure Hanford LLC EA Chromium, Hexavalent (7196A)
Analyte Due Date: 04/02/2014 5i CLIENT: HANFORD
Batch: 4091042 SOIL mg/kg PM, Quote: RW2, 88144
 SEQ Batch, Test: None All Tests: 4091042 DWEA, Prep Tech: _____

| Work Ord, Lot, Sample Date | Total Amt/Unit | Total Acidified/Unit | Initial Aliquot Amt/Unit | Adj Aliq Amt (Un-Acidified) | QC Tracer Prep Date | Tracer Yield | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|---|----------------|----------------------|--------------------------|-----------------------------|---------------------|--------------|-----------|-----------------|----------------|-------------|------------------------------|-----------------------|-----------|
| 1 M3DH9-1-AA | | | | | | | | | | | | | |
| J4D010406-1-SAMP 03/31/2014 13:16 | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |
| 2 M3DH9-1-AC-S | | | | | | | | | | | | | |
| J4D010406-1-MS 03/31/2014 13:16 | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |
| 3 M3DH9-1-AD-X | | | | | | | | | | | | | |
| J4D010406-1-DUP 03/31/2014 13:16 | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |
| 4 M3DH9-1-AE-S | | | | | | | | | | | | | |
| J4D010406-1-MS 03/31/2014 13:16 | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |
| 5 M3DJA-1-AA | | | | | | | | | | | | | |
| J4D010406-2-SAMP 03/31/2014 13:21 | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |
| 6 M3DJC-1-AA | | | | | | | | | | | | | |
| J4D010406-3-SAMP 03/31/2014 13:26 | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |
| 7 M3DJ1-1-AA-B | | | | | | | | | | | | | |
| J4D010000-42-BLK 04/01/2014 12:12 pd | | | | | | | | | | | | | |
| #Containers: 1 | | | | | | | | | | | | | |
| Alpha: _____ Beta: _____ | | | | | | | | | | | | | |

TestAmerica Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1
 Richland Wa. pd - Prep Dt, dc - Date Chg, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added
 ISV - Insufficient Volume for Analysis
 WO Cnt: 7
 ICOC v4.8.49

4/1/2014 12:13:00 PM

Sample Preparation/Analysis

Balance Id:

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Pipet #:

AnalytDueDate: 04/02/2014

Sep1 DT/Tm Tech:

Batch: 4091042 mg/kg

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

| Work Ord, Lot, Sample Date | Total Amt/Unit | Total Acidified/Unit | Initial Aliquot Amt/Unit | Adj Aliq Amt (Un-Acidified) | QC Tracer Prep Date | Tracer Yield | Dish Size | Ppt or Geometry | Count Time Min | Detector Id | Count On Off (24hr) Circle | CR Analyst, Init/Date | Comments: |
|----------------------------|----------------|----------------------|--------------------------|-----------------------------|---------------------|--------------|-----------|-----------------|----------------|-------------|------------------------------|-----------------------|-----------|
|----------------------------|----------------|----------------------|--------------------------|-----------------------------|---------------------|--------------|-----------|-----------------|----------------|-------------|------------------------------|-----------------------|-----------|

8 M3DJ1-1AC-C

J4D010000-42-LCS

04/01/2014 12:12 pd
AmtRec: #Containers: 1

Scr:

Alpha:

Beta:

Comments:

All Clients for Batch:

127642, Washington Closure Hanford LLC

Washington Closure Hanford LLC, RW2, 88144

M3DH91AA-SAMP Constituent List:

M3DH91AC-MS Constituent List:

M3DH91AE-MS:

M3DJ11AA-BLK:

M3DJ11AC-ICS:

M3DH91AA-SAMP Calc Info:

Uncert Level (#s):: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M3DH91AC-MS Calc Info:

Uncert Level (#s):: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M3DH91AE-MS:

Uncert Level (#s):: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M3DJ11AA-BLK:

Uncert Level (#s):: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M3DJ11AC-ICS:

Uncert Level (#s):: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

TestAmerica

Richland Wa.

Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2

Page 2

ISV - Insufficient Volume for Analysis

WO Cnt: 8

pd - Prep Dt, dc - Date Chg, r - Reference Dt, ec-Enrichment Cell, cf-Cocktailed Added

ICOC v4.8.49