

**SAF-RC-030**  
**Remaining Sites Confirmation Sampling -**  
**Other Solid**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt H4-21

KW 2/28/2008  
INITIAL/DATE

**COMMENTS:**

**SDG J00161**

**SAF-RC-030**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Waste Site: 100-F-51**

**RECEIVED**  
MAR 03 2008

**EDMC**

Analytical Data Package Prepared For  
**Washington Closure Hanford**



Radiochemical Analysis By

**TAL Richland**

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

Assigned Laboratory Code: STLRL

Data Package Contains 29 Pages

Report No.: 38458

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
J00161	RC-030	J169K0	J8B200216-1	KHDGP1AA	9KHDGP10	8051365
		J16B16	J8B200340-1	KHEJV1AA	9KHEJV10	8052168

## Certificate of Analysis

Washington Hanford Closure  
2620 Fermi Avenue  
Richland, WA 99354

February 28, 2008

Attention: Joan Kessner

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SAF Number	:	RC-030
Date SDG Closed	:	February 20, 2008
Number of Samples	:	Two (2)
Sample Type	:	Other Solid
SDG Number	:	J00161
Data Deliverable	:	15 Day

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### CASE NARRATIVE

#### I. Introduction

On February 20, 2008 two water samples were received at STL Richland (STLR) for chemical analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

<u>WCH ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J169K0	KHDGP	Other Solid	2/20/08
J16B16	KHEJV	Other Solid	2/20/08

#### I. 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

**IV. Quality Control**

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

QC and sample results are reported in the same units.

**V. Comments**

**Chemical Analysis**

**Hexavalent Chromium by EPA method 7196A:**

**Batch 8051365:**

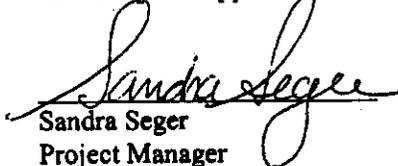
The insoluble MS recovered at 54.5% and the MS recovery was at 7.5%. A subsequent PDMS recovered at 75.1%. The sample contained much iron and/or magnetite. (As indicated by the mass of magnetic materials clinging to the mag stir bars.) These facts imply wither interference from iron or a reducing medium. Except as noted, the LCS, batch blank, sample and sample duplicate (J169K0) results are within contractual requirements.

**Batch 8052168:**

The insoluble MS recovered at 66.8%. A subsequent PDMS recovered at 82.6%. The sample contained much iron and/or magnetite. (As indicated by the mass of magnetic materials clinging to the mag stir bars.) These facts imply wither interference from iron or a reducing medium. Except as noted, the LCS, batch blank, sample and sample duplicate (J16B16) 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:

  
Sandra Seger  
Project Manager

## Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 00-02	Gross Alpha (Coprecipitation)	RICH-RC-5021
EPA 903.0	Total Alpha Radium (Ra-226)	RICH-RC-5027
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr-89/90	RICH-RC-5006
ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007

## Uncertainty Estimation

Test America 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,  $R = \text{constants} * f(x,y,z, \dots)$ . 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

<b>Action Lev</b>	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.
<b>Batch</b>	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
<b>Bias</b>	Defined by the equation $(\text{Result}/\text{Expected})-1$ as defined by ANSI N13.30.
<b>COC No</b>	Chain of Custody Number assigned by the Client or STL Richland.
<b>Count Error (#s)</b>	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.
<b>Total Uncert (#s) <i>u<sub>c</sub></i> - Combined Uncertainty.</b>	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<sub>c</sub></i> the combined uncertainty. The uncertainty is absolute and in the same units as the result.
<b>(#s), Coverage Factor</b>	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
<b>CRDL (RL)</b>	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
<b>Lc</b>	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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . 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.
<b>Lot-Sample No</b>	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.
<b>MDC MDA</b>	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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgndCnt}/\text{BkgndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol})) * \text{IngrFct}$ . For LSC methods the batch blank is used as a measure of the background variability.
<b>Primary Detector</b>	The instrument identifier associated with the analysis of the sample aliquot.
<b>Ratio U-234/U-238</b>	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.
<b>Rst/MDC</b>	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.
<b>Rst/TotUcert</b>	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.
<b>Report DB No</b>	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
<b>RER</b>	The equation Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{TPUs}^2 + \text{TPUd}^2)]$ 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.
<b>SDG</b>	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
<b>Sum Rpt Alpha Spec Rst(s)</b>	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.
<b>Work Order</b>	The LIMS software assign test specific identifier.
<b>Yield</b>	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: 28-Feb-08

**TAL Richland STLRL**

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

Report No. : 38458

SDG No: J00161

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Tracer Yield	MDC or MDA	CRDL	RPD
8051365	7196_CR6								
	J169K0								
	KHDGP1AA	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A		3.50E-01	
	J169K0 DUP								
	KHDGP1AE	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A			0.0
8052168	7196_CR6								
	J16B16								
	KHEJV1AA	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A		3.50E-01	
	J16B16 DUP								
	KHEJV1AE	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A			0.0
No. of Results: 4									

TAL Richland  
rptSTLRchSaSum  
mary2 V5.1.5  
A2002

RPD - Relative Percent Difference.

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

**QC Results Summary**  
**TAL Richland STLRL**  
 Ordered by Method, Batch No, QC Type,.

Date: 28-Feb-08

Report No. : 38458

SDG No.: J00161

Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDC MDA
<b>7196_CR6</b>									
3052168	LCS,								
	KHE761AC	HEXCHROME	1.84E+01 +/- 0.00E+00		mg/kg	N/A	92%	-0.1	
3052168	MATRIX SPIKE, J16B16 MS								
	KHEJV1AC	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A	4%	-1.0	
<b>7196_CR6</b>									
8051385	BLANK QC,								
	KHECA1AA	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A			
8051365	LCS,								
	KHECA1AC	HEXCHROME	1.62E+01 +/- 0.00E+00		mg/kg	N/A	81%	-0.2	
8051365	MATRIX SPIKE, J169K0 MS								
	KHDGP1AC	HEXCHROME	8.30E-01 +/- 0.00E+00		mg/kg	N/A	8%	-0.9	
<b>7196_CR6</b>									
8052168	BLANK QC,								
	KHE761AA	HEXCHROME	3.50E-01 +/- 0.00E+00	U	mg/kg	N/A			

No. of Results: 6

TAL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 rptSTLRchQcSummary V5.1.5 A2002 U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM I

Date: 28-Feb-08

SAMPLE RESULTS

Lab Name: TA Richland  
 Lot-Sample No.: J8B200216-1  
 Client Sample ID: J169K0

SDG: J00161  
 Report No. : 38458  
 COC No. : RC-030-071

Collection Date: 2/20/2008 9:00:00 AM  
 Received Date: 2/20/2008 11:10:00 AM  
 Matrix: OTHER OTHERSOLID  
 Ordered by Client Sample ID, Batch No.

Parameter	Result	Count Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 8051365	7196_CR6				Work Order: KHDGP1AA		Report DB ID: 9KHDGP10					
HEXCHROME	3.50E-01	U		0.0E+00		mg/kg	N/A	N/A	2/20/08		2.5054	
							3.50E-01	N/A			G	

No. of Results: 1      Comments:

FORM I

Date: 28-Feb-08

SAMPLE RESULTS

Lab Name: TA Richland  
 Lot-Sample No.: J8B200340-1  
 Client Sample ID: J16B16

SDG: J00161  
 Report No.: 38458  
 COC No.: RC-030-077

Collection Date: 2/20/2008 1:45:00 PM  
 Received Date: 2/20/2008 3:35:00 PM  
 Matrix: OTHER OTHERSOLID  
 Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 8052168	7196_CR6				Work Order: KHEJV1AA		Report DB ID: 9KHEJV10					
HEXCHROME	3.50E-01	U		0.0E+00		mg/kg	N/A	N/A	2/21/08		2.5623	
							3.50E-01	N/A			G	

No. of Results: 1      Comments:

FORM II

Date: 28-Feb-08

DUPLICATE RESULTS

Lab Name: TA Richland  
 Lot-Sample No.: J8B200216-1  
 Client Sample ID: J169K0 DUP

SDG: J00161  
 Report No.: 38458  
 COC No.: RC-030-071

Collection Date: 2/20/2008 9:00:00 AM  
 Received Date: 2/20/2008 11:10:00 AM  
 Matrix: OTHER OTHERSOLID

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 8051365	7196_CR6				Work Order: KHDGP1AE	Report DB ID: KHDGP1ER			Orig Sa DB ID: 9KHDGP10			
HEXCHROME	3.50E-01	U		0.0E+00		mg/kg	N/A	N/A	2/20/08		2.5075	
	3.50E-01	U	RPD 0.0					N/A			G	

No. of Results: 1      Comments:

TAL Richland      RPD - Relative Percent Difference.  
 rptSTLRchDupV5.1      MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 .5 A2002      U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

Date: 28-Feb-08

DUPLICATE RESULTS

Lab Name: TA Richland  
 Lot-Sample No.: J8B200340-1  
 Client Sample ID: J16B16 DUP

SDG: J00161  
 Report No.: 38458  
 COC No.: RC-030-077

Collection Date: 2/20/2008 1:45:00 PM  
 Received Date: 2/20/2008 3:35:00 PM  
 Matrix: OTHER OTHERSOLID

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 8052168	7196_CR6				Work Order: KHEJV1AE				Report DB ID: KHEJV1ER			
HEXCHROME	3.50E-01	U		0.0E+00		mg/kg	N/A	N/A	2/21/08		2.6135	
	3.50E-01	U		RPD 0.0				N/A			G	

No. of Results: 1      Comments:

FORM II  
BLANK RESULTS

Date: 28-Feb-08

Lab Name: TA Richland

SDG: J00161

Matrix: OTHER

Report No. : 38458

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 8051365	7196_CR6				Work Order: KHECA1AA		Report DB ID: KHECA1AB					
HEXCHROME	3.50E-01	U		0.0E+00		mg/kg	N/A	N/A	2/20/08		2.5	
						3.50E-01		N/A			G	
Batch: 8052168	7196_CR6				Work Order: KHE761AA		Report DB ID: KHE761AB					
HEXCHROME	3.50E-01	U		0.0E+00		mg/kg	N/A	N/A	2/21/08		2.5	
						3.50E-01		N/A			G	

No. of Results: 2      Comments:

FORM II  
LCS RESULTS

Date: 28-Feb-08

Lab Name: TA Richland  
Matrix: OTHER

SDG: J00161  
Report No.: 38458

Parameter	Result	Count Qual	Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 3052168	7196_CR6			Work Order: KHE761AC			Report DB ID: KHE761AC						
HEXCHROME	1.84E+01			0.0E+00		mg/kg	N/A	2.00E+01		92%	2/21/08	25	
							Rec Limits:	80	120	-0.1		G	
Batch: 8051365	7196_CR6			Work Order: KHECA1AC			Report DB ID: KHECA1AC						
HEXCHROME	1.62E+01			0.0E+00		mg/kg	N/A	2.00E+01		81%	2/20/08	25	
							Rec Limits:	80	120	-0.2		G	
No. of Results: 2		Comments:											

FORM II

Date: 28-Feb-08

MATRIX SPIKE RESULTS

Lab Name: TA Richland

SDG: J00161

Lot-Sample No.: J8B200216-1, J169K0 MS

Report No. : 38458

Matrix: OTHER OTHERSOLID

Parameter	SpikeResult, Orig Rst	Count Qual Error (2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rec- overy	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 8051365	Work Order: KHDGP1AC	Report DB ID: KHDGP1AW	Orig Sa DB ID: 9KHDGP10									
HEXCHROME	8.30E-01		0.0E+00		mg/kg	N/A	7.56%	1.10E+01		2/20/08	2.5621	7196_CR6
	0.00E+00										G	

Number of Results: 1

Comments:

FORM II  
**MATRIX SPIKE RESULTS**

Date: 28-Feb-08

Lab Name: TA Richland

SDG: J00161

Lot-Sample No.: J8B200340-1, J16B16 MS

Report No. : 38458

Matrix: OTHER OTHERSOLID

Parameter	SpikeResult, Orig Rst	Count Qual Error ( 2 s)	Total Uncert( 2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Rec- overy	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3052168	Work Order: KHEJV1AC	Report DB ID: KHEJV1AW	Orig Sa DB ID: 9KHEJV10									
HEXCHROME	3.50E-01	U	0.0E+00		mg/kg	N/A	3.56%	9.84E+00		2/21/08	2.574	7196_CR6
	0.00E+00										G	

Number of Results: 1

Comments:

Batch Number(s): 8051365				
Lab Sample Numbers or SDG: J00161				
Method/Test/Parameter: Cr+6 in SOLID / RICH-WC-51005, Rev 8				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>A. Initial Calibration</b>	✓			/
1. Performed at required frequency with required number of levels?	✓			/
2. Correlation coefficient within QC limits?	✓			/
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			/
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			/
<b>B. Continuing Calibration</b>	✓			/
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			/
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			/
<b>C. Sample Analysis</b>	✓			/
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?	✓			/
2. Were all sample holding times met?	✓			/
<b>D. QC Samples</b>	✓			/
1. All results for the preparation blank below limits?	✓			/
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?		✓		/
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			/
4. Analytical spikes within QC limits where applicable?			✓	/
5. ICP only: One serial dilution performed per SDG?			✓	/
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	/
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	/

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>E. Other</b>	✓			
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: \_\_\_\_\_ The insoluble MS recovered low at 54.5% and the MS recovered at 7.5%. Subsequent PDMS gave a yield of only 75.1%. See NCM

Analyst: Heidi E. Melendy

Date: 2/26/08

Second-Level Review: Sanjiv Singh

Date: 2/28/08

# Clouseau Nonconformance Memo



NCM #: <b>10-11904</b> NCM Initiated By: <b>Steven Wheland</b> Date Opened: <b>02/26/2008</b> Date Closed:	Classification: <b>Anomaly</b> Status: <b>QAREVIEW</b> Production Area: <b>Classical Chemistry</b> Tests: <b>7196A</b> Lot #'s (Sample #'s): <b>J8B200000 (365), J8B200216 (1),</b> QC Batches: <b>8051365.</b>
Nonconformance: <b>Other (describe in detail)</b> Subcategory: <b>Other (explanation required)</b>	

### Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Steven Wheland	02/26/2008	The insoluble MS recovered at 54.5% and the MS recovered at 7.5%. A subsequent PDMS recovered at 75.1%. The sample contained much iron and/or magnetite. (As indicated by the mass of magnetic materials clinging to the mag stir bars.) These facts imply either interference from iron or a reducing medium.

### Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Steven Wheland	02/26/2008	report data

### Client Notification Summary

<u>Client</u>	<u>Project Manager</u>	<u>Notified</u>	<u>Response</u>	<u>How Notified</u>	<u>Note</u>
			<u>Response</u>		<u>Response Note</u>

### Quality Assurance Verification

<u>Verified By</u>	<u>Due Date</u>	<u>Status</u>	<u>Notes</u>
		This section not yet completed by QA.	

### Approval History

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>
----------------------	--------------------	-----------------

Batch Number(s): 8052168				
Lab Sample Numbers or SDG: J00161				
Method/Test/Parameter: Cr+6 in SOLID / RICH-WC-5005, Rev 8				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>A. Initial Calibration</b>	✓			/
1. Performed at required frequency with required number of levels?	✓			/
2. Correlation coefficient within QC limits?	✓			/
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			/
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			/
<b>B. Continuing Calibration</b>	✓			/
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			/
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			/
<b>C. Sample Analysis</b>	✓			/
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?	✓			/
2. Were all sample holding times met?	✓			/
<b>D. QC Samples</b>	✓			/
1. All results for the preparation blank below limits?		✓		/
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?	✓			/
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?			✓	/
4. Analytical spikes within QC limits where applicable?			✓	/
5. ICP only: One serial dilution performed per SDG?			✓	/
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	/
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	/

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>E. Other</b>	✓			
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: \_\_\_\_\_ The insoluble MS recovered low at 66%. The subsequent PDMS gave a yield of only 82.56% See NCM

Analyst: *Alvin E. Johnson*  
 Second-Level Review: *Sandra Segue*

Date: 2/26/08

Date: 2/28/08

# Clouseau Nonconformance Memo



NCM #: <b>10-11902</b> NCM Initiated By: <b>Steven Wheland</b> Date Opened: <b>02/26/2008</b> Date Closed:	Classification: <b>Anomaly</b> Status: <b>QAREVIEW</b> Production Area: <b>Classical Chemistry</b> Tests: <b>7196A</b> Lot #'s (Sample #'s): <b>J8B200340 (1), J8B210000 (168).</b> QC Batches: <b>8052168,</b>
Nonconformance: <b>Other (describe in detail)</b> Subcategory: <b>Other (explanation required)</b>	

### Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Steven Wheland	02/26/2008	The insoluble MS recovered low at 66.8%. A subsequent PDMS recovered at 82.6%. The sample contained much iron in the form of metal and magnilite. (As indicated by the mass of magnetic material clinging to the mag. stir bars.) These facts imply either interference from iron or a redcing medium.

### Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Steven Wheland	02/26/2008	report data

### Client Notification Summary

<u>Client</u>	<u>Project Manager</u>	<u>Notified</u>	<u>Response</u>	<u>How Notified</u>	<u>Note</u>
			<u>Response</u>		<u>Response Note</u>

### Quality Assurance Verification

<u>Verified By</u>	<u>Due Date</u>	<u>Status</u>	<u>Notes</u>
		This section not yet completed by QA.	

### Approval History

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>
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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-030-071		Page 1 of 1			
Collector Welch-Koelling		Company Contact Matt Perrott		Telephone No. 372-9088		Project Coordinator KESSNER, JH		Price Code 9C Data Turnaround <b>15 Days</b>			
Project Designation Remaining Sites Confirmation Sampling - Other Solid		Sampling Location 100-F-3751		SAF No. RC-030							
Ice Chest No.		Field Logbook No. EL-1601-2		COA <del>CCCF51A000</del> C00F57A000		Method of Shipment					
Shipped To TestAmerica Incorporated, Richland		Offsite Property No.		Bill of Lading/Air Bill No.							
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation		Cool 4C							
		Type of Container		G/P							
		No. of Container(s)		1							
		Volume		60mL							
Special Handling and/or Storage		Chromium Hex - 7196									
		SAMPLE ANALYSIS									
		Sample No.		Matrix *		Sample Date		Sample Time			
		J169K0		OTHER SOLID		2/20/08		0900		X	
<del>J169K1</del>		OTHER SOLID									
<del>J169K2</del>		OTHER SOLID									
<del>J169K3</del>		OTHER SOLID									
<del>J169K4</del> BA 2/20/08		OTHER SOLID									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time 10/5		Received By/Stored In		Date/Time 10/5		J8B200216 J00161 DUE 3-7-08 KHDGP 6 RW 2/20/08			
Bill Hudson		2-20-08		Bill Hudson		2/20/08					
Relinquished By/Removed From		Date/Time 1/10		Received By/Stored In		Date/Time 1/10					
Bill Hudson		2-20-08		Bill Hudson		2-20-08					
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					
LABORATORY SECTION		Received By				Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time	

- Matrix \*
- S=Soil
  - SE=Substrate
  - SO=Solid
  - SL=Sludge
  - W=Water
  - D=Oil
  - A=Air
  - DS=Drum Spill
  - DL=Drum Leaked
  - T=Trace
  - WI=Wipe
  - L=Liquid
  - V=Vaporizer
  - X=Other



# Sample Check-in List

DUE 3-7-08

Date/Time Received: Z-20-08 1110 GM Screen Result 0.2 K

Client: WCH SDG #: J00161 NA [ ] SAF #: RC-030 NA [ ]

Work Order Number: 18B200216 Chain of Custody # RC-030-071

Shipping Container ID: \_\_\_\_\_ Air Bill # \_\_\_\_\_

- 1. Custody Seals on shipping container intact? NA [ ] Yes  No [ ]
- 2. Custody Seals dated and signed? NA [ ] Yes  No [ ]
- 3. Chain of Custody record present? NA [ ] Yes  No [ ]
- 4. Cooler Temperature: \_\_\_\_\_ NA  5. Vermiculite/packing materials is NA  Wet [ ] Dry [ ]
- 6. Number of samples in shipping container: 1
- 7. Sample holding times exceeded? NA  Yes [ ] No [ ]
- 8. Samples have:
  - Tape
  - Custody Seals
  - Hazard Labels
  - Appropriate Sample Labels
- 9. Samples are:
  - In Good Condition
  - Broken
  - Leaking
  - Have Air Bubbles

*OTHER SOLID*  
(Only for samples requiring no head space.)
- 10. Sample pH taken? NA  pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount HNO<sub>3</sub> Added \_\_\_\_\_
- 11. Sample Location, Sample Collector Listed? \*  
\*For documentation only. No corrective action needed.
- 12. Were any anomalies identified in sample receipt? Yes [ ] No
- 13. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian: *[Signature]* Date: Z-20-08

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on \_\_\_\_\_ by \_\_\_\_\_ Person Contacted \_\_\_\_\_

[ ] No action necessary; process as is.

Project Manager \_\_\_\_\_ Date \_\_\_\_\_

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-030-077		Page 1 of 1		
Collector Etherington		Company Contact Matt Perrot		Telephone No. 372-9088		Project Coordinator KESSNER, JH		Price Code 9C Data Turnaround 15 Days		
Project Designation Remaining Sitcs Confirmation Sampling - Other Solid		Sampling Location 100-F-5152		SAF No. RC-030						
Ice Chest No.		Field Logbook No. EL-1601-2		COA CCOF-52 Acc 0 CO0ES1A000		Method of Shipment				
Shipped To TestAmerica Incorporated, Richland		Offsite Property No. BH 2/20/08		Bill of Lading/Air Bill No.						
POSSIBLE SAMPLE HAZARDS/REMARKS			Preservation	Cool 4C						
Special Handling and/or Storage			Type of Container	G/P						
			No. of Container(s)	1						
			Volume	60mL						
SAMPLE ANALYSIS				Chromium Hex - 7196						
Sample No.	Matrix *	Sample Date	Sample Time							
J16B15 BH 2/20/08	OTHER SOLID									
J16B16	OTHER SOLID	2/20/08	1345	X						
J16B17	OTHER SOLID									
J16B18	OTHER SOLID									
J16B19 BH 2/20/08	OTHER SOLID									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		J8B200340 J001616 DUE 3-7-08 KHEJV BH 2/21/08		S=Soil SE=Soilment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue W1=Wipe L=Liquid V=Vegetation X=Other
Terry Etherington		2-20-08 1445		BHudson		2/20/08 1445				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				
FUDSON		2/20/08 1555		KHEJV		2-20-08				
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			



# Sample Check-in List DUE 3-7-08

Date/Time Received: 2-20-08 1555 GM Screen Result 0.2 K

Client: WCH SDG #: 100161 NA [ ] SAF #: RC-030 NA [ ]

Work Order Number: J8B 200340 Chain of Custody # RC-030-077

Shipping Container ID: \_\_\_\_\_ Air Bill # \_\_\_\_\_

- 1. Custody Seals on shipping container intact? NA [ ] Yes  No [ ]
- 2. Custody Seals dated and signed? NA [ ] Yes  No [ ]
- 3. Chain of Custody record present? NA [ ] Yes  No [ ]
- 4. Cooler Temperature: \_\_\_\_\_ NA  5. Vermiculite/packing materials is NA  Wet [ ] Dry [ ]
- 6. Number of samples in shipping container: 1
- 7. Sample holding times exceeded? NA  Yes [ ] No [ ]
- 8. Samples have:  
 Tape  Hazard Labels  
 Custody Seals  Appropriate Sample Labels
- 9. Samples are:  
 In Good Condition  Leaking  
 Broken  Have Air Bubbles  
(Only for samples requiring no head space.)
- 10. Sample pH taken? NA  pH<2 [ ] pH>2 [ ] pH>9 [ ] Amount HNO<sub>3</sub> Added \_\_\_\_\_  
*SOLID*
- 11. Sample Location, Sample Collector Listed? \*  
\*For documentation only. No corrective action needed.
- 12. Were any anomalies identified in sample receipt? Yes [ ] No
- 13. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian: [Signature] Date: 2-20-08

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on \_\_\_\_\_ by \_\_\_\_\_ Person Contacted \_\_\_\_\_

[ ] No action necessary; process as is.

Project Manager \_\_\_\_\_ Date \_\_\_\_\_

TestAmerica Richland

2/20/2008 3:06:30 PM

Sample Preparation/Analysis

Balance Id:

127642, Washington Closure Hanford  
Bechtel Hanford, Inc.

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

PRIORITY

Pipet #:

AnalyDueDate: 03/05/2008

J00161

Sep1 DT/Tm Tech:

Batch: 8051365 SOLID mg/kg

PM, Quote: SS , 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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1 KHDGP-1-AA

J8B200216-1-SAMP

2.5054

02/20/2008 09:00

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

2 KHDGP-1-AC-S

J8B200216-1-MS

2.5621

02/20/2008 09:00

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

3 KHDGP-1-AD-X

J8B200216-1-DUP

2.5075

02/20/2008 09:00

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

4 KHDGP-1-AE-S

J8B200216-1-MS

Relay

11mg

2.5018

02/20/2008 09:00

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

5 KHECA-1-AA-B

J8B200000-365-BLK

02/20/2008 09:00

AmtRec:

#Containers: 1

Scr:

Alpha:

Beta:

6 KHECA-1-AC-C

J8B200000-365-LCS

02/20/2008 09:00

AmtRec:

#Containers: 1

Scr:

Alpha:

Beta:

26

TestAmerica Richland

2/20/2008 3:06:30 PM

**Sample Preparation/Analysis**

Balance Id: \_\_\_\_\_

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

**PRIORITY**

Pipet #: \_\_\_\_\_

AnalyDueDate: 03/05/2008

Sep1 DT/Tm Tech: \_\_\_\_\_

Batch: 8051365 mg/kg  
 SEO Batch, Test: None

Sep2 DT/Tm Tech: \_\_\_\_\_

Prep Tech: \_\_\_\_\_

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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**Comments:**

All Clients for Batch:  
 127642, Washington Closure Hanford      Bechtel Hanford, Inc.      , SS , 27038

KHDGP1AA-SAMP Constituent List:

KHDGP1AC-MS Constituent List:

KHDGP1AE-MS:

KHECA1AA-BLK:

KHECALAC-LCS:

Sample ID	Uncert Level (#s)	Decay to SaDt	Blk Subt.	Sci. Not.	ODRs
KHDGP1AA-SAMP Calc Info:	2	Y	N	Y	B
KHDGP1AC-MS Calc Info:	2	Y	N	Y	B
KHDGP1AE-MS:	2	Y	N	Y	B
KHECA1AA-BLK:	2	Y	N	Y	B
KHECALAC-LCS:	2	Y	N	Y	B

Approved By \_\_\_\_\_ Date: \_\_\_\_\_

27

TestAmerica Richland

2/21/2008 10:41:48 AM

Sample Preparation/Analysis

PRIORITY

Balance Id:

127642, Washington Closure Hanford  
Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A  
EA Chromium, Hexavalent (7196A)

Pipet #:

AnalyDueDate: 03/06/2008

J00161

SI CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 8052168

SOLID

mg/kg

PM, Quote: SS , 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

All Tests: 8052168 DWEA,

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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1 KHEJV-1-AA

J8B200340-1-SAMP

2.5623

02/20/2008 13:45

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

2 KHEJV-1-AC-S

J8B200340-1-MS

2.5740

02/20/2008 13:45

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

3 KHEJV-1-AD-X

J8B200340-1-DUP

2.6135

02/20/2008 13:45

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

4 KHEJV-1-AE-S

J8B200340-1-MS <sup>82CrO4</sup>

11.8 mg

2.5667

02/20/2008 13:45

AmtRec: 60G

#Containers: 1

Scr:

Alpha:

Beta:

5 KHE76-1-AA-B

J8B210000-100-BLK

02/20/2008 13:45

AmtRec:

#Containers: 1

Scr:

Alpha:

Beta:

6 KHE76-1-AC-C

J8B210000-100-LBB

02/20/2008 13:45

AmtRec:

#Containers: 1

Scr:

Alpha:

Beta:

28

TestAmerica Richland

2/21/2008 10:41:48 AM

**Sample Preparation/Analysis**

Balance Id: \_\_\_\_\_

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

**PRIORITY**

Pipet #: \_\_\_\_\_

AnalyDueDate: 03/06/2008

Sep1 DT/Tm Tech: \_\_\_\_\_

Batch: 8052168 mg/kg  
 SEQ Batch, Test: None

Sep2 DT/Tm Tech: \_\_\_\_\_

Prep Tech: \_\_\_\_\_



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

All Clients for Batch:  
 127642, Washington Closure Hanford      Bechtel Hanford, Inc.      , SS , 27038

KHEJV1AA-SAMP Constituent List:

KHEJV1AC-MS Constituent List:

KHEJV1AE-MS:

KHE761AA-BLK:

KHE761AC-LCS:

KHEJV1AA-SAMP Calc Info:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
KHEJV1AC-MS Calc Info:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
KHEJV1AE-MS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
KHE761AA-BLK:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
KHE761AC-LCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B

Approved By \_\_\_\_\_ Date: \_\_\_\_\_

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