0070359

SAF-RC-048
100 Area and 300 Area Component of the RCBRA Water Sampling
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Jill Thomson	H0-23	KW 7/24/06 INITIAL/DATE
Jeanette Duncan	H9-02	KW 7/24/06 INITIAL/DATE

RECEIVED
AUG 07 2006
EDMC

COMMENTS:

SDG J00079 SAF-RC-048

Rad only X Chem only Rad & Chem

X Complete Partial

Waste Site: **199-N-80**
199-N-70
199-F7-2
199-F7-3

Analytical Data Package Prepared For

Washington Closure Hanford

RECEIVED
JUL 2006

Radiochemical Analysis By

STL Richland

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

Assigned Laboratory Code: STLRL

Data Package Contains 26 Pages

Report No.: 32734

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
J00079	RC-048	J12689	J6F070346-3	H6XGT1AA	9H6XGT10	6159204
		J12690	J6F070346-4	H6XGX1AA	9H6XGX10	6159204
		J12693	J6F070346-1	H6XGD1AA	9H6XGD10	6159204
		J12694	J6F070346-2	H6XGR1AA	9H6XGR10	6159204

SEVERN TRENT STL

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Washington Closure Hanford
3190 George Washington Way
Richland, WA 99354

July 20, 2006

Attention: Joan Kessner

SAF Number	:	RC-048
Date SDG Closed	:	June 7, 2006
Number of Samples	:	Four (4)
Sample Type	:	Water
SDG Number	:	J00079
Data Deliverable	:	45 – Day / Summary

CASE NARRATIVE

I. Introduction

On June 7, 2006, four soil samples were received at STL Richland (STLR) for wet chemistry analysis. Upon receipt, the samples were assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	STLR ID#	MATRIX	DATE OF RECEIPT
J12693	H6XGD	WATER	6/07/06
J12694	H6XGR	WATER	6/07/06
J12689	H6XGT	WATER	6/07/06
J12690	H6XGX	WATER	6/07/06

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

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:

The LCS, batch blank, sample, sample matrix spike (J12693), matrix spike duplicate (J12693) and sample duplicate (J12693) 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

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 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL 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 = 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/vn), 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 STL Richland.
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) ***u_c - Combined Uncertainty.***	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, ***u_c the combined uncertainty.*** 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 STL Richland "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 STL Richland 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

STL Richland STLRL

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

Date: 20-Jul-06

Report No. : 32734

SDG No: J00079

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
6159204	7196_CR6								
J12689									
	H6XGT1AA	HEXCHROME	2.00E-03 +- 4.00E-03	U	mg/L	N/A	2.00E-03	2.00E-03	
J12690									
	H6XGX1AA	HEXCHROME	2.00E-03 +- 4.00E-03	U	mg/L	N/A	2.00E-03	2.00E-03	
J12693									
	H6XGD1AA	HEXCHROME	1.75E-01 +- 4.00E-03		mg/L	N/A	2.00E-03	2.00E-03	
	H6XGD1AE	HEXCHROME	1.78E-01 +- 4.00E-03		mg/L	N/A	2.00E-03	2.00E-03	1.7
J12694									
	H6XGR1AA	HEXCHROME	2.00E-03 +- 4.00E-03	U	mg/L	N/A	2.00E-03	2.00E-03	

No. of Results: 5

STL Richland

rptSTLRchSaSummary2 V4.15.0 A97

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
STL Richland STLRL

Ordered by Method, Batch No, QC Type,.

Date: 20-Jul-06

Report No. : 32734

SDG No.: J00079

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
7196_CR6								
6159204 MATRIX SPIKE								
H6XGD1AC	HEXCHROME	5.54E-01 +- 4.00E-03		mg/L	N/A	105%	0.1	2.00E-03
H6XGD1AD	HEXCHROME	5.53E-01 +- 4.00E-03		mg/L	N/A	105%	0.1	2.00E-03
6159204 LCS								
H60LD1AC	HEXCHROME	5.21E-01 +- 4.00E-03		mg/L	N/A	104%	0.0	2.00E-03
6159204 BLANK QC								
H60LD1AA	HEXCHROME	2.00E-03 +- 4.00E-03	U	mg/L	N/A			2.00E-03

No. of Results: 4

STL Richland
rptSTLRchQcSummary V4.15.0 A97

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

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

SAMPLE RESULTS

Date: 20-Jul-06

Lab Name:	STL Richland	**SDG:**	J00079	**Collection Date:**	6/7/2006 12:31:00 PM
Lot-Sample No.:	J6F070346-3	**Report No. :**	32734	**Received Date:**	6/7/2006 3:15:00 PM
Client Sample ID:	J12689	**COC No. :**	RC-048-402	**Matrix:**	WATER

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: 6159204	7196_CR6			**Work Order:**	H6XGT1AA		**Report DB ID:**	9H6XGT10				
HEXCHROME	***2.00E-03***	U		4.0E-03	2.00E-03	mg/L	N/A	*1.*	6/8/06		100.0	
							2.00E-03	*1.*			ML	

No. of Results: 1 **Comments:**

STL Richland
rptSTLRchSample
V4.15.0 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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.

STL RICHLAND

FORM I

SAMPLE RESULTS

Date: 20-Jul-06

Lab Name:	**STL Richland**	**SDG:**	J00079	**Collection Date:**	6/7/2006 11:11:00 AM
Lot-Sample No.:	**J6F070346-4**	**Report No. :**	32734	**Received Date:**	6/7/2006 3:15:00 PM
Client Sample ID:	**J12690**	**COC No. :**	RC-048-403	**Matrix:**	WATER

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: 6159204	7196_CR6			**Work Order:**	H6XGX1AA		**Report DB ID:**	9H6XGX10				
HEXCHROME	***2.00E-03***	U		4.0E-03	2.00E-03	mg/L	N/A	*1.*	6/8/06		100.0	
							2.00E-03	*1.*			ML	

No. of Results: 1 **Comments:**

STL Richland
rptSTLRchSample
V4.15.0 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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

SAMPLE RESULTS

Date: 20-Jul-06

Lab Name:	STL Richland	**SDG:**	J00079	**Collection Date:**	6/7/2006 10:32:00 AM
Lot-Sample No.:	J6F070346-1	**Report No. :**	32734	**Received Date:**	6/7/2006 3:15:00 PM
Client Sample ID:	J12693	**COC No. :**	RC-048-406	**Matrix:**	WATER

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: 6159204	7196_CR6			**Work Order:**	H6XGD1AA		**Report DB ID:**	9H6XGD10				
HEXCHROME	***1.75E-01***			4.0E-03	2.00E-03	mg/L	N/A	*(87.5)*	6/8/06		100.0	
							2.00E-03	*(87.5)*			ML	

No. of Results: 1 **Comments:**

STL Richland
rptSTLRchSample
V4.15.0 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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

SAMPLE RESULTS

Date: 20-Jul-06

Lab Name:	STL Richland	SDG:	J00079	Collection Date:	6/7/2006 12:04:00 PM
Lot-Sample No.:	J6F070346-2	Report No. :	32734	Received Date:	6/7/2006 3:15:00 PM
Client Sample ID:	J12694	COC No. :	RC-048-407	Matrix:	WATER

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: 6159204	7196_CR6			Work Order:	H6XGR1AA		Report DB ID:	9H6XGR10				
HEXCHROME	***2.00E-03***	U		4.0E-03	2.00E-03	mg/L	N/A	*1.*	6/8/06		100.0	
							2.00E-03	*1.*			ML	

No. of Results: 1 Comments:

STL Richland
rptSTLRchSample
V4.15.0 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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: 20-Jul-06

DUPLICATE RESULTS

Lab Name:	**STL Richland**	**SDG:**	J00079	**Collection Date:**	6/7/2006 10:32:00 AM
Lot-Sample No.:	**J6F070346-1**	**Report No. :**	32734	**Received Date:**	6/7/2006 3:15:00 PM
Client Sample ID:	**J12693**	**COC No. :**	RC-048-406	**Matrix:**	WATER

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: 6159204	7196_CR6			**Work Order:** H6XGD1AE		**Report DB ID:** H6XGD1ER			**Orig Sa DB ID:** 9H6XGD10			
HEXCHROME	1.78E-01			4.0E-03	2.00E-03	mg/L	N/A	(89.)	6/8/06		100.0	
	1.75E-01		**RPD 1.7**			2.00E-03		(89.)			ML	

No. of Results: 1 **Comments:**

STL Richland **RPD** - Relative Percent Difference.

rptSTLRchDupV4.1 5.0 A97 **MDC|MDA,Lc** - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

BLANK RESULTS

Date: 20-Jul-06

Lab Name: STL Richland

SDG: J00079

Matrix: WATER

Report No. : 32734

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: 6159204	7196_CR6			Work Order:	H60LD1AA		Report DB ID:	H60LD1AB				
HEXCHROME	2.00E-03	U		4.0E-03	2.00E-03	mg/L	N/A	1.	6/8/06		100.0	
						2.00E-03		1.			ML	

No. of Results: 1 Comments:

STL Richland
rptSTLRchBlank
V4.15.0 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
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

LCS RESULTS

Date: 20-Jul-06

Lab Name: STL Richland

SDG: J00079

Matrix: WATER

Report No. : 32734

Parameter	Result	Qual	Count 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: 6159204	7196_CR6			Work Order:	H60LD1AC		Report DB ID:	H60LD1AS					
HEXCHROME	5.21E-01			4.0E-03	2.00E-03	mg/L	N/A	5.00E-01		104%	6/8/06	100.0	
							Rec Limits:	85	115	0.0		ML	

No. of Results: 1 Comments:

STL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchLcs
V4.15.0 A97

FORM II

MATRIX SPIKE RESULTS

Date: 20-Jul-06

Lab Name: STL Richland **SDG:** J00079

Lot-Sample No.: J6F070346-1 **Report No. :** 32734 **Matrix:** WATER

Parameter	SpikeResult, Orig Rst	Qual	Count 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: 6159204	Work Order:	H6XGD1AC		Report DB ID:	H6XGD1CW		Orig Sa DB ID:	9H6XGD10					
HEXCHROME	5.54E-01			4.0E-03	2.00E-03	mg/L	N/A	105.32%	5.26E-01		6/8/06	100.0	7196_CR6
	1.75E-01											ML	
Batch: 6159204	Work Order:	H6XGD1AD		Report DB ID:	H6XGD1DW		Orig Sa DB ID:	H6XGD1CW					
HEXCHROME	5.53E-01			4.0E-03	2.00E-03	mg/L	N/A	105.13%	5.26E-01		6/8/06	100.0	7196_CR6
	5.54E-01											ML	

Number of Results: 2

Comments:

STL Richland
rptSTLRchMs
V4.15.0 A97

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 20-Jul-06

MATRIX SPIKE DUPLICATE RESULTS

Lab Name: STL Richland **SDG:** J00079

Lot-Sample No.: J6F070346-1 **Report No. :** 32734 **Matrix:** WATER

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Exp-ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 6159204	7196_CR6			Work Order:	H6XGD1AC		Report DB ID:	H6XGD1CW		Orig Sa DB ID:	H6XGD1DW		
HEXCHROME	5.54E-01			4.0E-03	2.00E-03	mg/L	N/A	105.32%	5.26E-01		6/8/06	100.0	
	5.53E-01	*RPD*	0.2									ML	
Batch: 6159204	7196_CR6			Work Order:	H6XGD1AD		Report DB ID:	H6XGD1DW		Orig Sa DB ID:	H6XGD1CW		
HEXCHROME	5.53E-01			4.0E-03	2.00E-03	mg/L	N/A	105.13%	5.26E-01		6/8/06	100.0	
	5.54E-01	*RPD*	0.2									ML	

No. of Results: 2 Comments:

STL Richland RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICP T BDA.
rptSTLRchMsDup2 Bias - (Result/Expected)-1 as defined by ANSI N13.30.
V4.15.0 A97

SEVERN TRENT STL

Richland Laboratory
Data Review Check List
Hexavalent Chromium

Work Order Number(s): **H6XGD, H6XGR, H6XGT, H6XGX**

Lab Sample Numbers or SDG: **J00079**

Method/Test/Parameter: **Cr+6 in Water / RICH-WC-5003, Rev 7** Batch 6159204 Due 7/24

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 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. Continuing Calibration 1. CCV analyzed at required frequency and all parameters within QC limits?	✓			
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			
C. Sample Analysis 1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?			✓	
2. Were all sample holding times met?	✓			
D. QC Samples 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 (✓)	2nd Level Review (✓)
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:

Analyst: Debbie Marris Date: 6/8/06

Second-Level Review: [illegible] Date: 6/9/06

J00079 J6F070346 Due ~~6/28/06~~ SR 5/19/06 7/24/06

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-048-406	Page 1 of 1
Collector: D. Parchen	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7N
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-N-80		SAF No.: RC-048	Air Quality ☐
Ice Chest No.: SMC-311	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: GOV. VEHICLE	Data Turnaround: 45 Days
Shipped To: Severn Trent Incorporated, Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

Special Handling and/or Storage

COOL 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	500mL										
SAMPLE ANALYSIS	Chromium Hex - 7196										
Sample No. / Matrix * / Sample Date / Sample Time											
J12693 / WATER / 6/7/06 / 1032	X			H6X	GD						

R. Wall 6/7/06

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: D. Parchen	6/7/06 1515	Received By/Stored In: S. Welch	6.7.06 15.15
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

STL RICHLAND

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J00079 JGF070346

STL RICHLAND

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-407	Page 1 of 1

Collector: D. Parchen	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 7N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-N-70		SAF No.: RC-048
Ice Chest No.: SML-311	Field Logbook No.: EL-1592	COA: BESRAS6520	Method of Shipment: GOV. VEHICLE
Shipped To: Severn Trent Incorporated, Richland	Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

Special Handling and/or Storage

COOL 4C

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	500mL											
SAMPLE ANALYSIS	Chromium Hex - 7196											

Sample No.	Matrix *	Sample Date	Sample Time										
J12694	WATER	6/7/06	1204	X			HG	XGR					

R. Wall 6/7/06

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: D. Parchen	Date/Time: 6/7/06 1515	Received By/Stored In: S. Wehle	Date/Time: 6/7/06 1515
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

SPECIAL INSTRUCTIONS

Matrix *

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

J00079 JEF070346

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-402	Page 1 of 1
Collector: L.J. YOUNG	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 7N; Data Turnaround: 45 Days
Project Designation: 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location: 199-F7-2	SAF No.: RC-048	Air Quality ☐
Ice Chest No.: AFS-04-120	Field Logbook No.: EL-1592; COA: BESRAS6520	Method of Shipment: GOV. VEHICLE	
Shipped To: Severn Trent Incorporated, Richland	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

Special Handling and/or Storage

COOL 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	500mL										
SAMPLE ANALYSIS	Chromium Hex - 7196										
Sample No. / Matrix * / Sample Date / Sample Time											
J12689 / WATER / 6-2-06 / 1231	X			H6	XGT						

CHAIN OF POSSESSION	Date/Time	Received By/Stored In	Date/Time
L.J. YOUNG	6-7-06 1515	S. Welch	6-7-06 15:15
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

STL RICHLAND

21

J00079 J6F070346

STL RICHLAND

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-048-403	Page 1 of 1

Collector K.J. YOUNG	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 7N	Data Turnaround 45 Days
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location 199-F7-3		SAF No. RC-048	Air Quality ☐	
Ice Chest No. ERL-02-506	Field Logbook No. EL-1592	COA BESRAS6520	Method of Shipment GOV. VEHICLE		
Shipped To Severn Trent Incorporated, Richland	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A		

POSSIBLE SAMPLE HAZARDS/REMARKS

POTENTIAL RADIOACTIVE

Special Handling and/or Storage

COOL 4C

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	500mL										
SAMPLE ANALYSIS	Chromium Hex - 7196										
Sample No. / Matrix * / Sample Date / Sample Time											
J12690 / WATER / 6-7-06 / 1111	X			H6	XGX						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: K.J. YOUNG	Date/Time 1515 6-7-06	Received By/Stored In: S. Welch	Date/Time 15:15 6-7-06
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

SPECIAL INSTRUCTIONS

Matrix *

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (08/29/2005)

SEVERN TRENT STL

Sample Check-in List

Date/Time Received: 6·7·06 15:15

Client: BHI SDG #: J00079 NA [ ] SAF #: RC-048 NA [ ]

Work Order Number: J6F070346 Chain of Custody # RC-048-406, 407, 402, 403

Shipping Container ID: SML-311, AFS-04-120, ERC-02-506 Air Bill # N/A

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? Yes [✓] No [ ]
4. Cooler temperature: _____ NA [✓] 5. Vermiculite/packing materials is NA [✓] Wet [ ] Dry [ ]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? NA [✓] Yes [ ] No [ ]
8. Samples have:
   - ✓ tape
   - ✓ custody seals
   - ____ hazard labels
   - ✓ appropriate samples labels
9. Samples are:
   - ✓ in good condition
   - ____ broken
   - ____ leaking
   - ____ have air bubbles (Only for samples requiring head space)
10. Sample pH taken? NA [ ] pH<2 [ ] pH>2 [✓] adjusted pH [ ]
11. Sample Location, Sample Collector Listed? * Yes [✓] No [ ]
    *For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
13. Description of anomalies (include sample numbers): N/A

Sample Custodian: S. Webb Date: 6·7·06 15:15

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[ ] No action necessary; process as is.

Project Manager _____ Date _____

LS-023, 12/05, Rev. 6

STL RICHLAND

STL RICHLAND

6/8/2006 8:16:53 AM

Sample Preparation/Analysis

127642, Washington Closure Hanford
Bechtel Hanford, Inc.

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

J00079

AnalyDueDate: 06/27/2006

Batch: 6159204 **WATER** **mg/L**
SEQ Batch, Test: None All Tests: 88EA, 6159204 88EA,

PM, Quote: HC , 27023

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

[redacted]

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 H6XGD-1-AA J6F070346-1-SAMP [redacted] 06/07/2006 10:32		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:
2 H6XGD-1-AC-S J6F070346-1-MS [redacted] 06/07/2006 10:32		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:
3 H6XGD-1-AD-D J6F070346-1-MSD [redacted] 06/07/2006 10:32		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:
4 H6XGD-1-AE-X J6F070346-1-DUP [redacted] 06/07/2006 10:32		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:
5 H6XGR-1-AA J6F070346-2-SAMP [redacted] 06/07/2006 12:04		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:
6 H6XGT-1-AA J6F070346-3-SAMP [redacted] 06/07/2006 12:31		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:
7 H6XGX-1-AA J6F070346-4-SAMP [redacted] 06/07/2006 11:11		AmtRec: 500MLP	#Containers: 1			Scr:	Alpha:	Beta:

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1 ISV - Insufficient Volume for Analysis WO Cnt: 7
Richland Wa. pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added ICOC v4.8.24

STL RICHLAND

6/8/2006 8:16:55 AM

Sample Preparation/Analysis

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

AnalyDueDate: 06/27/2006

Batch: 6159204 mg/L
SEQ Batch, Test: None

[redacted]

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
8 H60LD-1-AA-B J6F080000-204-BLK [redacted] 06/07/2006 10:32	AmtRec:	#Containers: 1				Scr:	Alpha:	Beta:
9 H60LD-1-AC-C J6F080000-204-LCS [redacted] 06/07/2006 10:32	AmtRec:	#Containers: 1				Scr:	Alpha:	Beta:

Comments:

All Clients for Batch:
127642, Washington Closure Hanford Bechtel Hanford, Inc. , HC , 27023

H6XGD1AA-SAMP Constituent List:
HEXCHROME RDL:0.002 mg/L LCL:85 UCL:115 RPD:20
H6XGD1AC-MS Constituent List:
HEXCHROME RDL:0.002 mg/L LCL:85 UCL:115 RPD:20
H6XGD1AD-MSD:
HEXCHROME RDL:0.002 mg/L LCL:85 UCL:115 RPD:20
H60LD1AA-BLK:
HEXCHROME RDL:0.002 mg/L LCL: UCL: RPD:
H60LD1AC-LCS:
HEXCHROME RDL:0.002 mg/L LCL:85 UCL:115 RPD:20

H6XGD1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
H6XGD1AC-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
H6XGD1AD-MSD:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
H60LD1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
H60LD1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

STL RICHLAND

6/8/2006 8:16:55 AM

Sample Preparation/Analysis

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Balance Id:

Pipet #:

AnalyDueDate: 06/27/2006

Sep1 DT/Tm Tech:

Batch: 6159204 mg/L
SEQ Batch, Test: None

Sep2 DT/Tm Tech:

Prep Tech:

[redacted]

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

Approved By _____ Date: _____