

Analytical Data Package Prepared For

Fluor Hanford Inc.

Radiochemical Analysis By

STL Richland

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

Assigned Laboratory Code: STLRL

Data Package Contains _____ Pages

Report No.: 35781

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W05196	F07-035	B1NBC3	J7F280360-1	J12RP1AA	9J12RP10	7180246

STL Richland
2800 George Washington Way
Richland, WA 99354

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

Certificate of Analysis

Fluor Hanford, Inc.
1200 Jadwin Ave.
Richland, WA 99352

July 2, 2007

Attention: Steve Trent

SAF Number	:	F07-035
Date SDG Closed	:	June 28, 2007
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W05196
Data Deliverable	:	3/15 Day

CASE NARRATIVE

I. Introduction

On June 28, 2007 one sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned to lot J7F280360 and assigned the following laboratory ID number to correspond with the Fluor Hanford (FH) specific ID:

<u>FH ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
B1NBC3	J12RP	WATER	6/28/07

II. Sample Receipt

The sample was 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.

July 2, 2007

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, samples, sample duplicate (B1NBC3), sample matrix spike (B1NBC3), and matrix spike duplicate results (B1NBC3) 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:


Sherryl A. Adam
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, $R = \text{constants} * f(x,y,z,\dots)$. 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

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) <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 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

Date: 02-Jul-07

STL Richland STLRL

Ordered by Client Sample ID, Batch No.

Report No. : 35781

SDG No: W05196

Client ID	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC MDA	RPD
B1NBC3	J12RP1AA	HEXCHROME	6.10E-02 +- 0.00E+00		mg/L	N/A	2.00E-03	
	J12RP1AE	HEXCHROME	6.20E-02 +- 0.00E+00		mg/L	N/A	2.00E-03	1.6

Number of Results: 2

QC Results Summary
STL Richland STLRL
 Ordered by QC Type, Batch No.

Date: 02-Jul-07

Report No. : 35781

SDG No.: W05196

QC Type	Work Order Number	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDC MDA
MATRIX SPIK	J12RP1AC	HEXCHROME	2.67E-01 +- 0.00E+00		mg/L	N/A	102%	0.0	2.00E-03
MATRIX SPIK	J12RP1AD	HEXCHROME	2.68E-01 +- 0.00E+00		mg/L	N/A	102%	0.0	2.00E-03
BLANK QC	J13RQ1AA	HEXCHROME	2.00E-03 +- 0.00E+00	U	mg/L	N/A			2.00E-03
LCS	J13RQ1AC	HEXCHROME	5.15E-01 +- 0.00E+00		mg/L	N/A	103%	0.0	2.00E-03

Number of Results: 4

FORM I

Date: 02-Jul-07

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W05196

Collection Date: 6/28/2007 2:10:00 PM

Lot-Sample No.: J7F280360-1

Report No. : 35781

Received Date: 6/28/2007 3:50:00 PM

Client Sample ID: B1NBC3

COC No. : F07-035-970

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	Analy Method, Primary Detector
Batch: 7180246	Work Order: J12RP1AA	Report DB ID: 9J12RP10									
HEXCHROME	6.10E-02		0.0E+00	2.00E-03	mg/L	N/A	(30.5) N/A	6/29/07		100.0 ML	7196_CR6

Number of Results: 1

Comments:

FORM II

Date: 02-Jul-07

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W05196

Collection Date: 6/28/2007 2:10:00 PM

Lot-Sample No.: J7F280360-1

Report No. : 35781

Received Date: 6/28/2007 3:50:00 PM

Client Sample ID: B1NBC3

COC No. : F07-035-970

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	Analy Method, Primary Detector
Batch: 7180246	Work Order: J12RP1AE			Report DB ID: J12RP1ER		Orig Sa DB ID: 9J12RP10						
HEXCHROME	6.20E-02			0.0E+00	2.00E-03	mg/L	N/A	(31.)	6/29/07		100.0	7196_CR6
	6.10E-02	RPD	1.6					N/A			ML	

Number of Results: 1

Comments:

STL 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.

.3 A2002

FORM II
BLANK RESULTS

Date: 02-Jul-07

Lab Name: STL Richland

SDG: W05196

Lot-Sample No.: #Error

Report No. : 35781

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7180246	Work Order: J13RQ1AA			Report DB ID: J13RQ1AB								
HEXCHROME	2.00E-03	U		0.0E+00	2.00E-03	mg/L	N/A	1. N/A	6/29/07		100.0 ML	7196_CR6

Number of Results: 1

Comments:

FORM II
LCS RESULTS

Date: 02-Jul-07

Lab Name: STL Richland

SDG: W05196

Lot-Sample No.: #Error

Report No. : 35781

Matrix: WATER

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	Analy Method, Primary Detector
Batch: 7180246	Work Order: J13RQ1AC	Report DB ID: J13RQ1AS										
HEXCHROME	5.15E-01		0.0E+00	2.00E-03	mg/L	N/A	5.00E-01		103%	6/29/07	100.0	7196_CR6
Rec Limits:							85.	115.	0.0			

Number of Results: 1

Comments:

FORM II
MATRIX SPIKE RESULTS

Date: 02-Jul-07

Lab Name: STL Richland

SDG: W05196

Lot-Sample No.: J7F280360-1, B1NBC3

Report No. : 35781

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: 7180246	Work Order: J12RP1AC			Report DB ID: J12RP1CW		Orig Sa DB ID: 9J12RP10							
HEXCHROME	2.67E-01			0.0E+00	2.00E-03	mg/L	N/A	101.52%	2.63E-01		6/29/07	100.0	7196_CR6
	6.10E-01											ML	

Number of Results: 1

Comments:



STL

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

Work Order Number(s): J13RQ, J12RP				
Lab Sample Numbers or SDG: W05196				
Method/Test/Parameter: Cr+6 in Water / RICH-WC-5003				
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 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?			✓	/



STL

Sample Check-in List

Date/Time Received: 062807 1550

Client: FLH SDG #: W05196 NA SAF #: F07-035 NA

Work Order Number: J7F280360 Chain of Custody # F07-035-970

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? Yes No
4. Cooler temperature: _____ NA 5. Vermiculite/packing materials is NA Wet Dry
6. Number of samples in shipping container: 1-500MLP
7. Sample holding times exceeded? NA Yes No
8. Samples have:
 - tape _____ hazard labels
 - custody seals _____ appropriate samples labels
9. Samples are:
 - in good condition _____ leaking
 - broken _____ have air bubbles

(Only for samples requiring head space)
10. Sample pH taken? NA pH < 2 pH > 2 pH > 9 062807
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): _____

Sample Custodian: [Signature] Date: 062807

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

[] No action necessary; process as is.

Project Manager _____ Date 062807

6/29/2007 9:41:46 AM

Sample Preparation/Analysis

Balance Id: _____

108302, Fluor Hanford Inc
Management Federal Servi

, Waste

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
01 STANDARD TEST SET

Pipet #: _____

AnalyDueDate: 07/02/2007 **W05196**

Sep1 DT/Tm Tech: _____

Batch: 7180246 WATER ug/L
SEQ Batch, Test: None

PM, Quote: SA , 29754

Sep2 DT/Tm Tech: _____

Prep Tech: _____



Work Order, Lot, Sample Date/Time	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:
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1 J12RP-1-AA								
J7F280360-1-SAMP								
06/28/2007 14:10		AmtRec: 500G	#Containers: 1			Scr:	Alpha:	Beta:

2 J12RP-1-AC-S								
J7F280360-1-MS								
06/28/2007 14:10		AmtRec: 500G	#Containers: 1			Scr:	Alpha:	Beta:

3 J12RP-1-AD-D								
J7F280360-1-MSD								
06/28/2007 14:10		AmtRec: 500G	#Containers: 1			Scr:	Alpha:	Beta:

4 J12RP-1-AE-X								
J7F280360-1-DUP								
06/28/2007 14:10		AmtRec: 500G	#Containers: 1			Scr:	Alpha:	Beta:

5 J13RQ-1-AA-B								
J7F290000-246-BLK								
06/28/2007 14:10		AmtRec:	#Containers: 1			Scr:	Alpha:	Beta:

6 J13RQ-1-AC-C								
J7F290000-246-LCS								
06/28/2007 14:10		AmtRec:	#Containers: 1			Scr:	Alpha:	Beta:

6/29/2007 9:41:53 AM

Sample Preparation/Analysis

Balance Id: _____

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION
EA Chromium, Hexavalent (7196A)
01 STANDARD TEST SET

Pipet #: _____

AnalyDueDate: 07/02/2007

PRIORITY

Sep1 DT/Tm Tech: _____

Batch: 7180246

ug/L

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	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
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Comments:

All Clients for Batch:

108302, Fluor Hanford Inc

Waste Management Federal Servi, SA , 29754

J12RP1AA-SAMP Constituent List:

HEXCHROME RDL: ug/L LCL:85 UCL:115 RPD:20

J12RP1AC-MS Constituent List:

HEXCHROME RDL:10 ug/L LCL:85 UCL:115 RPD:20

J12RP1AD-MSD:

HEXCHROME RDL:10 ug/L LCL:85 UCL:115 RPD:20

J13RQ1AA-BLK:

HEXCHROME RDL: ug/L LCL: UCL: RPD:

J13RQ1AC-LCS:

HEXCHROME RDL:10 ug/L LCL:85 UCL:115 RPD:20

J12RP1AA-SAMP Calc Info:

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

J12RP1AC-MS Calc Info:

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

J12RP1AD-MSD:

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

J13RQ1AA-BLK:

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

J13RQ1AC-LCS:

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

Approved By _____ Date: _____

TestAmerica Richland (fka STL)
2800 George Washington Way
Richland,WA 99354-1613
(509) 375-3131
(509) 375-5590 FAX

30059836 02 JUL 07
J7F280360 00108302

TESTAMERICA LABORATORIES, INC. (FKA STL)
BOX 4305
PHILADELPHIA, PA 19175-4305

NET 30 DAYS
SAMPLE RECEIVING DATE : 6/28/07
REPORT DATE : 7/02/07

Accounts Payable
Fluor Hanford Inc
PO Box 1000 T6-03
Richland,WA 99352

Fluor Hanford Inc
PO Box 1000 T6-03
Richland,WA 99352

4	WATER	WATER, 7196A, Hexavalent Chromium + 3 QC	115.00	460.00
		W05196		
		EC at 100-DR, EFF/R1		
		F07-035		
		7A 3/15		

Please reference Invoice number when remitting.

/FLH/HANFORD

Sherryl Adam

P R O J E C T F I L E C O P Y

460.00