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0077045

Analytical Data Package Prepared For

Fluor Hanford Inc.

Radiochemical Analysis By

TAL Richland

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

Assigned Laboratory Code: STLRL

Data Package Contains _____ Pages

Report No.: 37243

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
<u>W05253</u>	I08-004	B1PV93	J7J170305-1	J864P1AA	9J864P10	7290610

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Certificate of Analysis

Fluor Hanford
P.O. Box 1000, T6-03
Richland, WA 99352

October 31, 2007
Attention: Steve Trent

SAF Number	:	I08-004
Date SDG Closed	:	October 17, 2007
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W05253
Data Deliverable	:	15/15 Day

CASE NARRATIVE

I. Introduction

On October 17, 2007 one sample was received at TestAmerica Laboratories Richland (TALR) for radiochemical analysis. Upon receipt, the sample was assigned to lot J7J170305 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>
B1PV93	J864P	WATER	10/17/07

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.

The requested analyses were:

Chemical Analysis
Hexavalent Chromium by EPA method 7196A

October 31, 2007

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 (B1PV93), sample matrix spike (B1PV93), and matrix spike duplicate results (B1PV93) 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 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

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.
Rs/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: 31-Oct-07

TAL Richland STLR

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

Report No. : 37243

SDG No: W05253

Batch	Client Id Work Order	Parameter	Result +/- Uncertainty (2s)	Qual	Units	Tracer Yield	MDC or MDA	CRDL	RPD
7290610	7196_CR6								
	B1PV93								
	J864P1AA	HEXCHROME	4.60E-01 +- 0.00E+00		mg/L	N/A		2.00E-03	
	J864P1AD	HEXCHROME	4.60E-01 +- 0.00E+00		mg/L	N/A		2.00E-03	0.0
No. of Results:		2							

TAL Richland RPD - Relative Percent Difference.

rptSTLRchSaSum
mary2 V5.1.4
A2002

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

Date: 31-Oct-07

Report No. : 37243

SDG No.: W05253

Batch	Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDC MDA
7196_CR6									
7290610 MATRIX SPIKE, B1PV93									
	J864P1AC	HEXCHROME	2.60E-01 +- 0.00E+00		mg/L	N/A	99%	0.0	
	J864P1AE	HEXCHROME	2.57E-01 +- 0.00E+00		mg/L	N/A	98%	0.0	
7290610 BLANK QC,									
	J87M11AA	HEXCHROME	2.00E-03 +- 0.00E+00	U	mg/L	N/A			
7290610 LCS,									
	J87M11AC	HEXCHROME	4.89E-01 +- 0.00E+00		mg/L	N/A	98%	0.0	
No. of Results: 4									

TAL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRehQcSummary V5.1.4 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
SAMPLE RESULTS

Date: 31-Oct-07

Lab Name: TA Richland

SDG: W05253

Collection Date: 10/17/2007 10:34:00 AM

Lot-Sample No.: J7J170305-1

Report No. : 37243

Received Date: 10/17/2007 2:00:00 PM

Client Sample ID: B1PV93

COC No. : I08-004-6

Matrix: WATER

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: 7290610	7196_CR6			Work Order: J864P1AA		Report DB ID: 9J864P10						
HEXCHROME	4.60E-01			0.0E+00		mg/L	N/A	N/A	10/17/07		100.0	
							2.00E-03	N/A			ML	

No. of Results: 1

Comments:

FORM II

Date: 31-Oct-07

DUPLICATE RESULTS

Lab Name: TA Richland

SDG: W05253

Collection Date: 10/17/2007 10:34:00 AM

Lot-Sample No.: J7J170305-1

Report No. : 37243

Received Date: 10/17/2007 2:00:00 PM

Client Sample ID: B1PV93

COC No. : 108-004-6

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: 7290610	7196_CR6				Work Order: J864P1AD				Report DB ID: J864P1R			
HEXCHROME	4.60E-01			0.0E+00		mg/L	N/A	N/A	10/17/07		100.0	
	4.60E-01		RPD 0.0			2.00E-03		N/A			ML	

No. of Results: 1 Comments:

TAL Richland RPD - Relative Percent Difference.

rptSTLRchDupV5.1 .4 A2002 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: 31-Oct-07

Lab Name: TA Richland
Matrix: WATER

SDG: W05253
Report No. : 37243

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 7290610	7196_CR6				Work Order: J87M11AA			Report DB ID: J87M1AB				
HEXCHROME	2.00E-03	U		0.0E+00		mg/L	N/A	N/A	10/17/07		100.0	
						2.00E-03		N/A			ML	

No. of Results: 1 Comments:

TAL Richland MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rpt|STLRchBlank 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.
 V5.1.4 A2002

FORM II
LCS RESULTS

Date: 31-Oct-07

Lab Name: TA Richland

SDG: W05253

Matrix: WATER

Report No. : 37243

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: 7290610	7196_CR6			Work Order: J87M11AC			Report DB ID: J87M1AC						
HEXCHROME	4.89E-01			0.0E+00		mg/L	N/A	5.00E-01		98%	10/17/07	100.0	
							Rec Limits:	85	115	0.0		ML	
No. of Results: 1		Comments:											

FORM II
MATRIX SPIKE RESULTS

Date: 31-Oct-07

Lab Name: TA Richland

SDG: W05253

Lot-Sample No.: J7J170305-1, B1PV93

Report No. : 37243

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: 7290610	Work Order: J864P1AC			Report DB ID: J864P1AC			Orig Sa DB ID: 9J864P10						
HEXCHROME	2.60E-01			0.0E+00		mg/L	N/A	98.80%	2.63E-01		10/17/07	100.0 ML	7196_CR6
	4.60E-01												
Batch: 7290610	Work Order: J864P1AE			Report DB ID: J864P1AD			Orig Sa DB ID: J864P1AC						
HEXCHROME	2.57E-01			0.0E+00		mg/L	N/A	97.66%	2.63E-01		10/17/07	100.0 ML	7196_CR6
	7.16E-01												

Number of Results: 2

Comments:

TAL Richland RER - Replicate Error Ratio = $(S-D)/[\text{sqrt}(\text{sq}(\text{TPUs})+\text{sq}(\text{TPUd}))]$ as defined by ICPT BOA.
 rptSTLRchMs Bias - $(\text{Result}/\text{Expected})-1$ as defined by ANSI N13.30.
 V5.1.4 A2002

FORM II

Date: 31-Oct-07

MATRIX SPIKE DUPLICATE RESULTS

Lab Name: TA Richland

SDG: W05253

Lot-Sample No.: J7J170305-1, B1PV93

Report No.: 37243

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: 7290610	7196_CR6			Work Order: J864P1AC		Report DB ID: J864P1AC		Orig Sa DB ID: J864P1AD					
HEXCHROME	2.60E-01			0.0E+00		mg/L	N/A	98.80%	2.63E-01		10/17/07	100.0	
	2.57E-01	RPD	1.2									ML	
Batch: 7290610	7196_CR6			Work Order: J864P1AE		Report DB ID: J864P1AD		Orig Sa DB ID: J864P1AC					
HEXCHROME	2.57E-01			0.0E+00		mg/L	N/A	97.66%	2.63E-01		10/17/07	100.0	
	2.60E-01	RPD	1.2									ML	
No. of Results: 2	Comments:												

TAL Richland RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
 rptSTLRchMsDup2 Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 V5.1.4 A2002



STL

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

Batch Number(s): 7290610				
Lab Sample Numbers or				
Method/Test/Parameter: Cr+6 in Water / RICH-WC-5003				
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 (✓)	2 nd 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: *[Signature]*

Date: 10/18/2007

Second-Level Review: *[Signature]*

Date: 10-31-07

Sample Check-in List

Date/Time Received: 10-17-07 1400
 Client: PCW SDG #: W0525³ NA [] SAF #: I08-004 NA []
 Work Order Number: J7J770305 Chain of Custody # I08-004-6
 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:

<input checked="" type="checkbox"/> Tape <input checked="" type="checkbox"/> Custody Seals	<input checked="" type="checkbox"/> Hazard Lables <input checked="" type="checkbox"/> Appropriate Sample Lables
---	--
9. Samples are:

<input checked="" type="checkbox"/> In Good Condition <input type="checkbox"/> Broken	<input type="checkbox"/> Leaking <input type="checkbox"/> Have Air Bubbles <small>(Only for samples requiring no head space.)</small>
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10. Sample pH taken? NA [] pH < 2 pH > 2 pH > 9 []
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: 10-17-07

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person Contacted _____

[] No action necessary; process as is.

Project Manager _____ Date _____