

Analytical Data Package Prepared For  
**Pacific Northwest National Lab**

Radiochemical Analysis By

**STL Richland STLRL**

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

*Data Package Contains \_\_\_\_\_ Pages*

**Report Nbr: 33774**

<b>SDG Nbr</b>	<b>ORDER Nbr</b>	<b>CLIENT ID NUMBER</b>	<b>LOT Nbr</b>	<b>WORK ORDER</b>	<b>RPT DB ID</b>	<b>BATCH</b>
<b>W05031</b>	<b>X06-048</b>	<b>B1K8W1</b>	<b>J6I290186-1</b>	<b>JFC191AA</b>	<b>9JFC1910</b>	<b>6286347</b>
		<b>B1K8W3</b>	<b>J6I290186-2</b>	<b>JFC2P1AA</b>	<b>9JFC2P10</b>	<b>6286347</b>

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Comments:

**STL Richland**  
2800 George Washington Way  
Richland, WA 99354

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## Certificate of Analysis

Pacific Northwest National Laboratories  
Sigma V Building  
Richland, WA 99352

November 17, 2006

Attention: Dot Stewart

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SAF Number	:	X06-048
Date SDG Closed	:	October 12, 2006
Number of Samples	:	Two (2)
Sample Type	:	Water
SDG Number	:	W05031
Data Deliverable	:	45-Day / Summary

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### CASE NARRATIVE

#### I. Introduction

On September 28, 2006 two water samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Pacific Northwest National Laboratories (PGW) specific IDs:

<u>PGW ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
B1K8W1	JFC19	WATER	9/28/06
B1K8W3	JFC2P	WATER	9/28/06

#### 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:

**Laser Induced Phosphorimetry**  
Total Uranium by method RICH-RC-5058

#### 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

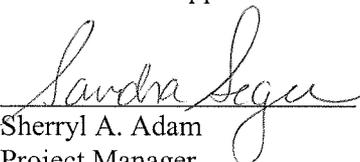
##### **Total Uranium**

Total Uranium by method RICH-RC-5058:

The LCS, batch blank, samples, sample duplicate (B1K8W1), and sample matrix spike (B1K8W3) 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:

  
for 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,  $R = \text{constants} * f(x,y,z,...)$ . 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 (Result/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> - Combined Uncertainty.</i></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> the combined uncertainty</i> . 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%. $Lc = (1.645 * \text{Sqrt}(2 * (\text{BkgrndCnt}/\text{BkgrndCntMin})/\text{SCntMin})) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$ . 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%. $MDC = (4.65 * \text{Sqrt}((\text{BkgrndCnt}/\text{BkgrndCntMin})/\text{SCntMin}) + 2.71/\text{SCntMin}) * (\text{ConvFct}/(\text{Eff} * \text{Yld} * \text{Abn} * \text{Vol}) * \text{IngrFct})$ . 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 <b>Work Order</b> 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.

11/17/2006 11:38:42 AM

### STL Richland Report

Lab Code: STLRL

FormNbr: R      FormatType: FEAD      Version: 05      Rpt Nbr: 33774      File Name: h:\Reportdb\edd\Fead\VRad\W05031.Edd, h:\Reportdb\edd\Fead\VRad\33774.Edd

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/Solids%*:	Distilled Volume	Sample On Date:	Collection Date:				
9JFC1910	B1K8W1		MW6-SBB-A1	X06-048	W05031					09/28/2006 09:15				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
6286347	Uranium	7440-61-1	2.46E+01	ug/L	3.7E+00	3.7E+00		8.22E-02		UTOT_KPA	2.55E-02	ML	11/16/2006 15:18	I

Lab Sample Id:	Client Id:	Test User	Contract Nbr	SAF Nbr	Sdg Nbr:	QC Type:	Moisture/Solids%*:	Distilled Volume	Sample On Date:	Collection Date:				
9JFC2P10	B1K8W3		MW6-SBB-A1	X06-048	W05031					09/28/2006 09:00				
Batch	Analyte	CAS#	Result	Unit	CntU 2S	TotU 2S	Qual	MDA	TrcYield	Method	Alq Size	Unit	Analy Date/Time	Act
6286347	Uranium	7440-61-1	1.86E+01	ug/L	2.8E+00	2.8E+00		8.15E-02		UTOT_KPA	2.57E-02	ML	11/16/2006 15:23	I

Friday, November 17, 2006

# STL Richland QC Blank Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\ledd\Fead\I\Rad\W05031.Edd, h:\Reportdb\ledd\Fead\I\Rad\33774.Edd

Lab Sample Id: JGD091AB

Sdg/Rept Nbr: W05031

33774

Collection Date: 09/28/2006 09:15

Client Id: NA

Matrix: WATER

WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: BLK

Received Date: 09/28/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AE	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6286347 BLK	Uranium 7440-61-1	2.16E-02	ug/L	2.4E-03 2.4E-03	U	8.03E-02			UTOT_KPA	2.61E-02 ML	11/16/2006 15:09				D

Friday, November 17, 2006

### STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\ledd\Fead\I\Rad\W05031.Edd, h:\Reportdb\ledd\Fead\I\Rad\33774.Edd

Lab Sample Id: JGD091CS

Sdg/Rept Nbr: W05031 33774

Collection Date: 09/28/2006 09:15

Client Id: NA

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: BS

Received Date: 09/28/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AF	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6286347 BS	Uranium 7440-61-1	3.43E+01	ug/L	5.1E+00 5.1E+00		8.15E-02		3.53E+01 97.2	UTOT_KPA	2.57E-02 ML	11/16/2006 15:13			70 130	D

Friday, November 17, 2006

### STL Richland QC Control Sample Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\ledd\Fead\I\Rad\W05031.Edd, h:\Reportdb\ledd\Fead\I\Rad\33774.Edd

Lab Sample Id: JGD091DS

Sdg/Rept Nbr: W05031

33774

Collection Date: 09/28/2006 09:15

Client Id: NA

Matrix: WATER

WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: BS

Received Date: 09/28/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
	MW6-SBB-A19981								AG	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6286347 BS	Uranium 7440-61-1	3.35E+00	ug/L	3.4E-01 3.4E-01		8.03E-02		3.47E+00 96.4	UTOT_KPA	2.61E-02 ML	11/16/2006 15:16			70 130	D

Friday, November 17, 2006

### STL Richland QC Duplicate Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\ledd\Fead\I\Rad\W05031.Edd, h:\Reportdb\ledd\Fead\I\Rad\33774.Edd

Lab Sample Id: JFC191CR

Sdg/Rept Nbr: W05031 33774

Collection Date: 09/28/2006 09:15

Client Id: B1K8W1

Matrix: WATER WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: DUP

Received Date: 09/28/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X06-048	MW6-SBB-A19981								AC	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6286347 DUP	Uranium 7440-61-1	2.49E+01 2.46E+01	ug/L	3.7E+00 3.7E+00		8.25E-02			UTOT_KPA	2.54E-02 ML	11/16/2006 15:21	1.6 20.0	0.1 3		D

Friday, November 17, 2006

### STL Richland Qc Matrix Spike Report

Lab Code: STLRL

FormNbr: R

FormatType: FEAD

VersionNbr: 05

File Name: h:\Reportdb\ledd\Fead\VRad\W05031.Edd, h:\Reportdb\ledd\Fead\VRad\33774.Edd

Lab Sample Id: JFC2P1CW

Sdg/Rept Nbr: W05031

33774

Collection Date: 09/28/2006 09:00

Client Id: B1K8W3

Matrix: WATER

WATER

Sample On Date:

Moisture/Solids%\*:

QC Type: MS

Received Date: 09/28/2006

SAF Nbr	Contract Nbr	Test User	Case Nbr	SAS Nbr	Suffix	Decant	Distilled Volume	File Id	FSuffix	RTyp					
X06-048	MW6-SBB-A19981								AD	H					
Batch # / Qc Type	Analyt/ CAS#	Result/ Orig Rst	Unit	Tot/Cnt Uncert 2S	Qu- al	MDC	Tracer Yield	Spk Conc/ %Rec	Analy Method	Aliq Size/	Date/Time Analyzed	RPD/ UCL	RER/ UCL	LCS LCL/UCL	R Typ
6286347 MS	Uranium 7440-61-1	3.50E+01	ug/L	8.5E+00 8.5E+00		8.22E-02		3.52E+01 99.4	UTOT_KPA	2.55E-02 ML	11/16/2006 15:25			60 140	D

**Lot No., Due Date:** J6I290186; 11/27/2006  
**Client, Site:** 384868; PGW 615HANFORD HANFORD  
**QC Batch No., Method Test:** 6286347; RUNAT UNat by KPA  
**SDG, Matrix:** W05031; WATER

	Yes	No	N/A
8.0 Correction Calculation Protocol Used. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.01 The Appropriate Methods Were Used To Analyze the Samples OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.02 Final Results Are in the Appropriate Activity Units OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.03 Batch Contains the Required QC Appropriate for the Method OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.04 The Correct Tracer and QC Vials Where Used in the Samples Incorrect Tracer/Vial => JGD091AD UNSC<>UNSF Q:V9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.05 Sample was Appropriately Traced Before or After Fractionating the Sample OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.06 At Least the Minimum Sample Volume Was Used No Count Analysis Size found in Batch Data!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.07 The Correct Count Geometry was Used. No Count Geometry found in Batch Data!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.08 The Sample was Counted for the Minimum Count Time or CRDL was Achieved. No Count Duration Field Found in Batch Data!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.09 Method Blank is within Control Limits. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1 Comments:			
8.11 Matrix Blank is within Control Limits. No Matrix Blanks (MBIks) found in Batch!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.12 Method Blank(s) < QAS Limit Value (No B Flag Necessary). OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.13 QAS Specified Duplicate Equation Value within Control Limits. OK (RPD)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.14 LCS within Control Limits. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.15 MLCS within Control Limits. No Matrix Spikes (MLCS) found in Batch!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.16 MS within Control Limits. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.17 Tracer within Control Limits. No Tracers found in Batch!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.18 Samples are above Minimum Tracer Yield (No Failed Samples) No Tracers found in Batch!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.19 Sample Specific MDC <= CRDL. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2 Comments:			
8.21 Result < Lc, Activity Not Detected, U Flag. No Limit Specified!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.22 Result < Mdc, Activity Not Detected, U Flag. Batch Positive Result => JFC191AA Uranium 2.5E+01 L:8.2E-02 JFC2P1AA Uranium 1.9E+01 L:8.2E-02	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.23 Result <= Action Level, when Defined. OK; No Action Level Found => Uranium  OK; No Callin Level Found => Uranium	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.24 Result + 3s >=0, Not Too Negative. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.25 Counting Spectrum are within FWHM Limits. No FWHM found in Batch Data!	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

8.26 Instruments have Current Calibrations.	Yes	No	N/A
8.27 Correct Count Library Used. No Count Library found in Batch Data!	Yes	No	N/A <input checked="" type="checkbox"/>
8.28 Instrument Background within Limits at Time of Counting. (Not Applicable to this version. To be developed in later versions)	Yes	No	N/A
8.29 Instrument Check Source within Limits at the Time of Counting. (Not Applicable to this version. To be developed in later versions)	Yes	No	N/A

8.3 Comments:

8.31 Results Blank Subtracted as Appropriate. OK	Yes	No	N/A <input checked="" type="checkbox"/>
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First Level Review Pam Anderson Date 11-17-04



# STL

Data Review Checklist  
RADIOCHEMISTRY  
Second Level Review

QC Batch Number: 6286347  
w05031

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Second Level Review: Sheryl A Adams

Date: 11-17-06

PNNL <i>UGI 290186</i> <i>W05031</i> <i>Date 11-13-04</i>	<h2 style="margin: 0;">CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</h2>	C.O.C. # <h3 style="margin: 0;">X06-048-2</h3>
		Page <u>1</u> of <u>1</u>

<b>Collector</b> <i>CJD</i>	<b>Contact/Requester</b> Dot Stewart	<b>Telephone No.</b> MSIN FAX 509-376-5056
<b>SAF No.</b> X06-048	<b>Sampling Origin</b> Hanford Site	<b>Purchase Order/Charge Code</b>
<b>Project Title</b> 331 Bldg Aquaculture Outfall		<b>Ice Chest No.</b> <b>Temp.</b>
<b>Shipped To (Lab)</b> Severn Trent Incorporated, Richland	<b>Method of Shipment</b> Govt. Vehicle	<b>Bill of Lading/Air Bill No.</b>
<b>Protocol</b> Other	<b>Priority:</b> 45 Days	<b>Offsite Property No.</b>

<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> ** **	<b>SPECIAL INSTRUCTIONS</b> <b>Hold Time</b> <b>Total Activity Exemption:</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1K8W1	STLRL	W	9-28-06	9:15	1x20-mL P	Activity Scan	None
B1K8W1	STLRL	W	9-28-06	9:15	1x500-mL G/P	UTOT_KPA: Uranium (1)	HNO3 to pH <2
<div style="font-size: 2em; font-family: cursive;">JFC19</div>							

<b>Relinquished By</b> Print Sign <i>Cheryl Duckshorer Cheryl Duckshorer</i>	<b>Date/Time</b> <i>9-28-06 09:40</i>	<b>Received By</b> Print Sign <i>A. Smith S. Smith</i>	<b>Date/Time</b> <i>9-28-06 09:40</i>	<b>Matrix *</b> S = Soil DS = Drum Solid SF = Sediment DI = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
<b>Relinquished By</b>	<b>Date/Time</b>	<b>Received By</b>	<b>Date/Time</b>	
<b>Relinquished By</b>	<b>Date/Time</b>	<b>Received By</b>	<b>Date/Time</b>	
<b>Relinquished By</b>	<b>Date/Time</b>	<b>Received By</b>	<b>Date/Time</b>	
<b>FINAL SAMPLE DISPOSITION</b>	<b>Disposal Method (e.g., Return to customer, per lab procedure, used in process)</b>		<b>Disposed By</b>	<b>Date/Time</b>





# STL

### Sample Check-in List

Date/Time Received: 9-28-06 09:40

Client: PGW

SDG #: W05031 NA  SAF #: X06-048 NA

Work Order Number: J6I290186

Chain of Custody # X06-048-2,4

Shipping Container ID: N/A

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: 2
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: J. Smith Date: 9-28-06 09:40

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on \_\_\_\_\_ by \_\_\_\_\_ Person contacted \_\_\_\_\_

[ ] No action necessary; process as is.

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

11/7/2006 3:15:02 PM

### Sample Preparation/Analysis

Balance Id:206113

384868, Pacific Northwest National Laboratory ,  
Pacific Northwest National Lab

DH UNat\_Laser PrpRC5015  
SS Total Uranium by KPA  
5I CLIENT: HANFORD

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

AnalyDueDate: 11/13/2006 *W05031*

Sep1 DT/Tm Tech:

Batch: 6286347 WATER ug/L  
SEQ Batch, Test: None

PM, Quote: SA , 57671

Sep2 DT/Tm Tech:

Prep Tech: ,BockJ



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:
1 JFC19-1-AA J6I290186-1-SAMP 09/28/2006 09:15		25.50g,in						
			AmtRec: 20ML,500ML	#Containers: 2	Scr:	Alpha: 4.46E-05 uCi/Sa	Beta: -5.84E-05 uCi/Sa	
2 JFC19-1-AC-X J6I290186-1-DUP 09/28/2006 09:15		25.40g,in						
			AmtRec: 20ML,500ML	#Containers: 2	Scr:	Alpha: 4.46E-05 uCi/Sa	Beta: -5.84E-05 uCi/Sa	
3 JFC2P-1-AA J6I290186-2-SAMP 09/28/2006 09:00		25.70g,in						
			AmtRec: 20ML,500ML	#Containers: 2	Scr:	Alpha: -7.45E-05 uCi/Sa	Beta: 7.32E-06 uCi/Sa	
4 JFC2P-1-AC-S J6I290186-2-MS 09/28/2006 09:00		25.50g,in	UNSF3391 11/02/06,pd 03/22/05,r					
			AmtRec: 20ML,500ML	#Containers: 2	Scr:	Alpha: -7.45E-05 uCi/Sa	Beta: 7.32E-06 uCi/Sa	
5 JGD09-1-AA-B J6J130000-347-BLK 09/28/2006 09:15		26.10g,in						
			AmtRec:	#Containers: 1	Scr:	Alpha:	Beta:	
6 JGD09-1-AC-C J6J130000-347-LCS 09/28/2006 09:15		25.70g,in	UNSF3392 11/02/06,pd 03/22/05,r					
			AmtRec:	#Containers: 1	Scr:	Alpha:	Beta:	
7 JGD09-1-AD-C J6J130000-347-LCS 09/28/2006 09:15		26.10g,in	UNSC1359 10/23/06,pd 04/28/06,r					
			AmtRec:	#Containers: 1	Scr:	Alpha:	Beta:	

11/7/2006 3:15:04 PM

### Sample Preparation/Analysis

Balance Id:206113

DH UNat\_Laser PrpRC5015  
SS Total Uranium by KPA  
5I CLIENT: HANFORD

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

AnalyDueDate: 11/13/2006

Sep1 DT/Tm Tech:

Batch: 6286347  
SEQ Batch, Test: None

ug/L

Sep2 DT/Tm Tech:

Prep Tech: ,BockJ



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: PHC2.0 JB 11-7-06

All Clients for Batch:

384868, Pacific Northwest National Laboratory Pacific Northwest National Lab, SA , 57671

JFC191AA-SAMP Constituent List:

Uranium	RDL:1.44E-01	ug/L	LCL:	UCL:	RPD:
JFC2P1AC-MS:					
JGD091AA-BLK:					
Uranium	RDL:1.44E-01	ug/L	LCL:	UCL:	RPD:
JGD091AC-LCS:					
Uranium	RDL:0.144343	ug/L	LCL:70	UCL:130	RPD:20
JGD091AD-LCS:					
Uranium	RDL:0.144343	ug/L	LCL:70	UCL:130	RPD:20

JFC191AA-SAMP Calc Info:

Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
JFC2P1AC-MS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
JGD091AA-BLK:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
JGD091AC-LCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
JGD091AD-LCS:				
Uncert Level (#s): 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B

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

11/17/2006 8:59:18 AM

# ICOC Fraction Transfer/Status Report

ByDate: 11/17/2005, 11/22/2006, Batch: '6286347', User: \*ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
6286347				
AC		<b>Cnt1C</b>	<b>BockJ</b> 11/7/2006 3:15:11 PM	
SC		wagarr	IsBatched 10/13/2006 11:42:32 AM	ICOC_RADCALC v4.8.24
SC		BockJ	Prep1C 11/7/2006 3:15:11 PM	RICH-RC-5015 REVISION 4
SC		AntonsonL	InSep1 11/8/2006 9:17:22 AM	RICH-RC-5015 REVISION 4
SC		AntonsonL	Sep1C 11/13/2006 1:52:56 PM	RICH-RC-5015 REVISION 4
SC		AndersonE	Cnt1C 11/16/2006 5:09:14 PM	RICH-RC-5058 REV 7
AC		<b>AntonsonL</b>	11/8/2006 9:17:22	
AC		<b>AntonsonL</b>	11/13/2006 1:52:56	
AC		<b>AndersonE</b>	11/16/2006 5:09:14	

AC: Accepting Entry; SC: Status Change

STL Richland  
Richland Wa.