RECEIVED JULY 31, 2007

Analytical Data Package Prepared For

# Fluor Handord

Radiochemical Analysis By

## TAL Richland STLRL

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

*Data Package Contains _____ Pages*

Report Nbr: 36138

| SDG Nbr | ORDER Nbr | CLIENT ID NUMBER | LOT Nbr | WORK ORDER | RPT DB ID | BATCH |
|---|---|---|---|---|---|---|
| W05202 | S07-007 | B1NXV5 | J7G160221-1 | J204M1AA | 9J204M10 | 7198282 |

Comments:

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

Pacific Northwest National Laboratories
Sigma V Building
Richland, WA 99352

July 30, 2007

Attention: Steve Trent

| | | |
|---|---|---|
| SAF Number | : | S07-007 |
| Date SDG Closed | : | July 16, 2007 |
| Number of Samples | : | One (1) |
| Sample Type | : | Water |
| SDG Number | : | W05202 |
| Data Deliverable | : | 15-Day / Summary |

## CASE NARRATIVE

### I. Introduction

On July 16, 2007 one water sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID numbers to correspond with the Pacific Northwest National Laboratories (PGW) specific IDs:

| PGW ID# | STLR ID# | DATE OF RECEIPT | MATRIX |
|---|---|---|---|
| B1NXV5 | J204M | 7/16/07 | WATER |

### 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:

**Liquid Scintillation Counting**
Tritium by method RICH-RC-5007

## 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

**Liquid Scintillation Counting**
Tritium by method RICH-RC-5007:
The LCS, batch blank, samples and sample duplicate (B1NXV5) 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 Segre
Sherryl A. Adam
for 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. |

*7/30/2007 10:51:16 AM*

# TAL Richland Report

**Lab Code:** STLRL

**FormNbr:** R **FormatType:** FEAD **Version:** 05 **Rpt Nbr:** 36138 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05202.Edd, h:\Reportdb\edd\FeadIV\Rad\36138.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: |
|---|---|---|---|---|---|---|---|---|---|---|
| 9J204M10 | B1NXV5 | | MW6-SBB-A1 | S07-007 | W05202 | | | | | 07/16/2007 11:52 |

| Batch | Analyte | CAS# | Result | Unit | CntU 2S | TotU 2S | Qual | MDA | TrcYield | Method | Alq Size | Unit | Analy Date/Time | Act |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7198282 | H-3 | 10028-17-8 | 1.03E+04 | pCi/L | 3.5E+02 | 5.5E+02 | | 3.05E+02 | 100.0 | 906.0_H3_LSC | 5.00E-03 | L | 07/20/2007 16:48 | I |





U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

*Monday, July 30, 2007*

# TAL Richland QC Blank Report

**Lab Code:** STLRL

**FormNbr:** R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05202.Edd, h:\Reportdb\edd\FeadIV\Rad\36138.Edd

**Lab Sample Id:** J21W51AB **Sdg/Rept Nbr:** W05202 36138 **Collection Date:** 07/16/2007 11:52

**Client Id:** NA **Matrix:** WATER WATER **Sample On Date:**

**Moisture/Solids%*:** **QC Type:** BLK **Received Date:** 07/16/2007

| SAF Nbr | Contract Nbr | Test User | Case Nbr | SAS Nbr | Suffix | Decant | Distilled Volume | File Id | FSuffix | RTyp |
|---|---|---|---|---|---|---|---|---|---|---|
| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7198282 | H-3 | -1.90E+01 | pCi/L | 1.4E+02 | U | 3.05E+02 | 100.0 | | 906.0_H3_LSC | 5.00E-03 | 07/20/2007 | | | | D |
| BLK | 10028-17-8 | | | 1.2E+02 | | | | | | L | 11:21 | | | | |





U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

*Monday, July 30, 2007*

# TAL Richland QC Blank Report

**Lab Code:** STLRL

**FormNbr:** R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05202.Edd, h:\Reportdb\edd\FeadIV\Rad\36138.Edd

**Lab Sample Id:** J21W51DX **Sdg/Rept Nbr:** W05202 36138 **Collection Date:** 07/16/2007 11:52

**Client Id:** NA **Matrix:** WATER WATER **Sample On Date:**

**Moisture/Solids%*:** **QC Type:** BLK **Received Date:** 07/16/2007

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7198282 | H-3 | 6.21E+01 | pCi/L | 1.4E+02 | U | 3.14E+02 | 100.0 | | 906.0_H3_LSC | 5.00E-03 | 07/20/2007 | | | | D |
| BLK | 10028-17-8 | | | 1.3E+02 | | | | | | L | 14:05 | | | | |





U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

*Monday, July 30, 2007*

# TAL Richland QC Control Sample Report

**Lab Code:** STLRL

**FormNbr:** R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05202.Edd, h:\Reportdb\edd\FeadIV\Rad\36138.Edd

**Lab Sample Id:** J21W51CS **Sdg/Rept Nbr:** W05202 36138 **Collection Date:** 07/16/2007 11:52

**Client Id:** NA **Matrix:** WATER WATER **Sample On Date:**

**Moisture/Solids%*:** **QC Type:** BS **Received Date:** 07/16/2007

| SAF Nbr | Contract Nbr | Test User | Case Nbr | SAS Nbr | Suffix | Decant | Distilled Volume | File Id | FSuffix | RTyp |
|---|---|---|---|---|---|---|---|---|---|---|
| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7198282 | H-3 | 2.68E+03 | pCi/L | 2.5E+02 | | 3.04E+02 | 100.0 | 2.71E+03 | 906.0_H3_LSC | 5.00E-03 | 07/20/2007 | | | 70 | D |
| BS | 10028-17-8 | | | 2.1E+02 | | | | 99.0 | | L | 12:43 | | | 130 | |





U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

*Monday, July 30, 2007*

# TAL Richland QC Control Sample Report

**Lab Code:** STLRL

**FormNbr:** R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05202.Edd, h:\Reportdb\edd\FeadIV\Rad\36138.Edd

**Lab Sample Id:** J21W51EM **Sdg/Rept Nbr:** W05202 36138 **Collection Date:** 07/16/2007 11:52

**Client Id:** NA **Matrix:** WATER WATER **Sample On Date:**

**Moisture/Solids%*:** **QC Type:** BS **Received Date:** 07/16/2007

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7198282 | H-3 | 2.39E+03 | pCi/L | 2.4E+02 | | 3.05E+02 | 100.0 | 2.71E+03 | 906.0_H3_LSC | 5.00E-03 | 07/20/2007 | | | 70 | D |
| BS | 10028-17-8 | | | 2.0E+02 | | | | 88.4 | | L | 15:26 | | | 130 | |





U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

*Monday, July 30, 2007*

# TAL Richland QC Duplicate Report

**Lab Code:** STLRL

**FormNbr:** R **FormatType:** FEAD **VersionNbr:** 05 **File Name:** h:\Reportdb\edd\FeadIV\Rad\W05202.Edd, h:\Reportdb\edd\FeadIV\Rad\36138.Edd

**Lab Sample Id:** J204M1CR **Sdg/Rept Nbr:** W05202 36138 **Collection Date:** 07/16/2007 11:52

**Client Id:** B1NXV5 **Matrix:** WATER WATER **Sample On Date:**

**Moisture/Solids%*:** **QC Type:** DUP **Received Date:** 07/16/2007

| SAF Nbr | Contract Nbr | Test User | Case Nbr | SAS Nbr | Suffix | Decant | Distilled Volume | File Id | FSuffix | RTyp |
|---|---|---|---|---|---|---|---|---|---|---|
| S07-007 | MW6-SBB-A19981 | | | | | | | | AB | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7198282 | H-3 | 1.06E+04 | pCi/L | 5.6E+02 | | 3.05E+02 | 100.0 | | 906.0_H3_LSC | 5.00E-03 | 07/20/2007 | 2.8 | 0.7 | | D |
| DUP | 10028-17-8 | 1.03E+04 | | 3.5E+02 | | | | | | L | 18:10 | 20.0 | 3 | | |





U Qual - Analyzed for, but the result is less than the Mdc or gamma scan did not identify the nuclide.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit (CRDL).
B Qual- Analyte was found in the associated laboratory blank above the MDC.

SEVERN TRENT STL

# Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

7/23/2007 11:13:03 AM

**Lot No., Due Date:** J7G160221; 07/31/2007

**Client, Site:** 384868; PGW 615HANFORD HANFORD

**QC Batch No., Method Test:** 7198282; RTRITIUM H-3 by LSC

**SDG, Matrix:** W05202; WATER

| | Yes | No | N/A |
|---|---|---|---|
| 8.0 Correction Calculation Protocol Used.<br>OK | ✓ | | |
| 8.01 The Appropriate Methods Were Used To Analyze the Samples<br>OK | ✓ | | |
| 8.02 Final Results Are in the Appropriate Activity Units<br>OK | ✓ | | |
| 8.03 Batch Contains the Required QC Appropriate for the Method<br>OK | ✓ | | |
| 8.04 The Correct Tracer and QC Vials Where Used in the Samples<br>OK | ✓ | | |
| 8.05 Sample was Appropriately Traced Before or After Fractionating the Sample<br>OK | ✓ | | |
| 8.06 At Least the Minimum Sample Volume Was Used<br>Analysis Volume => J204M1AA 5.00<10.00 Q:VB<br>OK AL 7/23/07 | | ✓ | |
| 8.07 The Correct Count Geometry was Used.<br>Count Geometry => J21W51AF SVP15/5<>SVP10/10<br>J21W51AG SVP15/5<>SVP10/10<br>J21W51AA SVP15/5<>SVP10/10<br>J21W51AC SVP15/5<>SVP10/10<br>J21W51AD SVP15/5<>SVP10/10<br>J21W51AE SVP15/5<>SVP10/10<br>J204M1AA SVP15/5<>SVP10/10<br>J204M1AC SVP15/5<>SVP10/10 Q:VC<br>OK AL 7/23/07 | | ✓ | |
| 8.08 The Sample was Counted for the Minimum Count Time or CRDL was Achieved.<br>OK | ✓ | | |
| 8.09 Method Blank is within Control Limits.<br>OK | ✓ | | |
| 8.1 Comments: | | | |
| 8.11 Matrix Blank is within Control Limits.<br>OK | ✓ | | |
| 8.12 Method Blank(s) < QAS Limit Value (No B Flag Necessary).<br>OK | ✓ | | |
| 8.13 QAS Specified Duplicate Equation Value within Control Limits.<br>OK (RPD) | ✓ | | |
| 8.14 LCS within Control Limits.<br>OK | ✓ | | |
| 8.15 MLCS within Control Limits.<br>OK | ✓ | | |
| 8.16 MS within Control Limits.<br>No Matrix Spike Samples (MS) found in Batch! | | | ✓ |
| 8.17 Tracer within Control Limits.<br>No Tracers found in Batch! | | | ✓ |
| 8.18 Samples are above Minimum Tracer Yield (No Failed Samples)<br>No Tracers found in Batch! | | | ✓ |
| 8.19 Sample Specific MDC <= CRDL.<br>OK | ✓ | | |
| 8.2 Comments: | | | |
| 8.21 Result < Lc, Activity Not Detected, U Flag.<br>No Limit Specified! | | | ✓ |
| 8.22 Result < Mdc, Activity Not Detected, U Flag.<br>No Positive Results<br>OK Calc_IDL Not Calculated | ✓ | | |
| 8.23 Result <= Action Level, when Defined.<br>OK; No Action Level Found => H-3 | ✓ | | |

OK; No Callin Level Found => H-3

8.24 Result + 3s >=0, Not Too Negative. **Yes** ✓ **No** **N/A**

OK

8.25 Counting Spectrum are within FWHM Limits. **Yes** **No** **N/A** ✓

No FWHM found in Batch Data!

8.26 Instruments have Current Calibrations. **Yes** **No** **N/A**

8.27 Correct Count Library Used. **Yes** **No** **N/A** ✓

No Count Library found in Batch Data!

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. **Yes** ✓ **No** **N/A**

OK

**First Level Review** Angela Long **Date** 7/23/07

SEVERN TRENT STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 719828 2
W05202

| Review Item | Yes (√) | No (√) | N/A (√) |
|---|---|---|---|
| A. Sample Analysis<br>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<br>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<br>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 Adam Date: 7-24-07

FLUOR HANFORD

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

J7G160221 W05202 due 07.31.07

C.O.C. # S07-007-24

Page 1 of 1

| | | |
|---|---|---|
| Collector: Fluor Hanford F. M. HALL | Contact/Requester: Steve Trent | Telephone No.: 509-373-5869 MSIN FAX |
| SAF No.: S07-007 | Sampling Origin: Hanford Site | Purchase Order/Charge Code |
| Project Title: SURV, JULY 2007 | HNF-N-506-7 | Ice Chest No. SAWS102 Temp. |
| Shipped To (Lab): Severn Trent Incorporated, Richland | Method of Shipment: Govt. Vehicle | Bill of Lading/Air Bill No. |
| Protocol: SURV | Priority: 15 Days PRIORITY | Offsite Property No. |

**POSSIBLE SAMPLE HAZARDS/REMARKS**
** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

**SPECIAL INSTRUCTIONS** **Hold Time** Total Activity Exemption: Yes ☑ No ☐
All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W 07 SAFs into one SDG, not to exceed SDG closure of 14 days.
WSCF: Batch all GW samples submitted into one SDG, daily closure.

| Sample No. | Lab ID | * | Date | Time | No/Type Container | Sample Analysis | Preservative |
|---|---|---|---|---|---|---|---|
| B1NXV5 | | W | 7/16/7 | 1152 | 1x250-mL G | 906.0_H3_LSC: Tritium (1) | None |
| B1NXV5 | | W | ↓ | ↓ | 1x20-mL P | Activity Scan | None |
| | | | | | | J204m | |

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |
|---|---|---|---|---|---|---|---|
| Fluor Hanford F. M. HALL | | JUL 16 2007 | 1520 | | LARRY HLANE | JUL 16 2007 | 1520 |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |
| Relinquished By | | | Date/Time | Received By | | | Date/Time |

Matrix *

| | | | |
|---|---|---|---|
| S = Soil | | DS = Drum Solid | |
| SE = Sediment | | DL = Drum Liqui | |
| SO = Solid | | T = Tissue | |
| SL = Sludge | | WI = Wine | |
| W = Water | | L = Liquid | |
| O = Oil | | V = Vegetation | |
| A = Air | | X = Other | |

**FINAL SAMPLE DISPOSITION** Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

STL RICHLAND

15

SEVERN TRENT STL

# Sample Check-in List

Date/Time Received: 071607 1520

Client: PGW SDG #: W05202 NA [ ] SAF #: 507-007 NA [ ]

Work Order Number: J7G160221 Chain of Custody # 507-007-24

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
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 [✓] pH>9 [ ]
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: 071706

| 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, 9/03, Rev. 5

7/17/2007 9:05:14 AM

# Sample Preparation/Analysis

384868, Pacific Northwest National Laboratory ,
Pacific Northwest National Lab

AnalyDueDate: 07/31/2007 WD5202

AR H-3 Prp/SepRC5007
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

**PRIORITY**

Balance Id: 12445
Pipet #:
Sep1 DT/Tm Tech: 7-18-07
Sep2 DT/Tm Tech:
Prep Tech:

Batch: 7198282 WATER pCi/L
EQ Batch, Test: None All Tests: ARS6, 7198282 ARS6,

PM, Quote: SA , 57671

STL RICHLAND

| 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 J204M-1-AA<br>J7G160221-1-SAMP<br>07/16/2007 11:52 | | AmtRec: 20ML,250G | #Containers: 2 | | | Scr: | Alpha: | Beta: |
| 2 J204M-1-AC-X<br>J7G160221-1-DUP<br>07/16/2007 11:52 | | AmtRec: 20ML,250G | #Containers: 2 | | | Scr: | Alpha: | Beta: |
| 3 J21W5-1-AA-B<br>J7G170000-282-BLK<br>07/16/2007 11:52 | | AmtRec: | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 4 J21W5-1-AC-C<br>J7G170000-282-LCS<br>07/16/2007 11:52 | | AmtRec: | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 5 J21W5-1-AD-BX<br>J7G170000-282-MBLK<br>07/16/2007 11:52 | | AmtRec: | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 6 J21W5-1-AE-CM<br>J7G170000-282-MLCS<br>07/16/2007 11:52 | | AmtRec: | #Containers: 1 | | | Scr: | Alpha: | Beta: |
| 7 J21W5-1-AF-BN<br>J7G170000-282-IBLK<br>07/16/2007 11:52 | | AmtRec: | #Containers: 1 | | | Scr: | Alpha: | Beta: |

7/17/2007 9:05:16 AM

STL RICHLAND

# Sample Preparation/Analysis

AR H-3 Prp/SepRC5007
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

PRIORITY

Balance Id: 12445
Pipet #:
Sep1 DT/Tm Tech: 7-18-07 pm
Sep2 DT/Tm Tech:
Prep Tech:

AnalyDueDate: 07/31/2007

Batch: 7198282 pCi/L
EQ Batch, Test: None

| 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 J21W5-1-AG-BN<br>J7G170000-282-IBLK<br>07/16/2007 11:52 | AmtRec: | #Containers: 1 | | | | Scr: | Alpha: | Beta: |

**Comments:**

All Clients for Batch:
384868, Pacific Northwest National Laboratory Pacific Northwest National Lab, SA , 57671

J204M1AA-SAMP Constituent List:
H-3 RDL:400 pCi/L LCL:70 UCL:130 RPD:20
J21W51AA-BLK:
H-3 RDL:400 pCi/L LCL: UCL: RPD:
J21W51AC-LCS:
H-3 RDL:400 pCi/L LCL:70 UCL:130 RPD:20
J21W51AD-MBLK:
H-3 RDL:400 pCi/L LCL: UCL: RPD:
J21W51AE-MLCS:
H-3 RDL:400 pCi/L LCL:70 UCL:130 RPD:20
J21W51AF-IBLK:
H-3 RDL:400 pCi/L LCL: UCL: RPD:
J21W51AG-IBLK:
H-3 RDL:400 pCi/L LCL: UCL: RPD:

J204M1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
J21W51AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
J21W51AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
J21W51AD-MBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
J21W51AE-MLCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
J21W51AF-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

# Sample Preparation/Analysis

AR H-3 Prp/SepRC5007
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

PRIORITY

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

AnalyDueDate: 07/31/2007

Batch: 7198282 pCi/L
EQ Batch, Test: None

| 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: |
|---|---|---|---|---|---|---|---|---|

J21W51AG-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

Approved By _____ Date: _____

STL RICHLAND

19

7/23/2007 11:12:47 AM

# ICOC Fraction Transfer/Status Report

ByDate: 7/23/2006, 7/28/2007, Batch: '7198282', User: *ALL Order By DateTimeAccepting

| Q Batch | Work Ord | CurStatus | Accepting | | | Comments |
|---|---|---|---|---|---|---|
| **7198282** | | | | | | |
| *AC* | | **CalcC** | **McDowellD** | 7/18/2007 9:58:17 | | |
| *SC* | | | wagarr | IsBatched | 7/17/2007 9:05:52 AM | ICOC_RADCALC v4.8.26 |
| *SC* | | | McDowellD | InSep1 | 7/18/2007 9:58:17 AM | RICH-RC-5007 REVISION 6 |
| *SC* | | | McDowellD | Sep1C | 7/19/2007 11:20:47 AM | RICH-RC-5007 REVISION 6 |
| *SC* | | | BlackCL | InCnt1 | 7/19/2007 11:42:33 AM | RICH-RD-0001 REVISION 4 |
| *SC* | | | StringerR | CalcC | 7/21/2007 2:08:36 PM | RICH-RD-0001 REVISION 4 |
| *AC* | | | **McDowellD** | 7/19/2007 11:20:47 | | |
| *AC* | | | **BlackCL** | 7/19/2007 11:42:33 | | |
| *AC* | | | **StringerR** | 7/21/2007 2:08:36 PM | | |

*AC: Accepting Entry; SC: Status Change*

*STL Richland*

Richland Wa.



Grp Rec Cnt: 4

ICOCFractions v4.8.27