

Date: 21 September 2006  
 To: Fluor Hanford Inc. (technical representative)  
 From: TechLaw, Inc.  
 Project: 200-UW-1 Operable Unit Spoils Pile Analysis  
 Subject: Radiochemistry - Data Package No. W04998-ST

**INTRODUCTION**

This memo presents the results of data validation on Data Package No. W04998 prepared by Severn Trent (ST). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
B1KJ59	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ60	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ61	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ62	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ63	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ64	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ65	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ66	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ67	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ68	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ69	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ70	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ71	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ72	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ73	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ74	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ75	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ76	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ77	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ78	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ79	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ80	8/28/06	Other Solid	C	SE-79 by LSC
B1KJ81	8/28/06	Other Solid	C	SE-79 by LSC
B1KJJ2	8/28/06	Other Solid	C	SE-79 by LSC

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit, DOE/RL-2005-75, Rev. 0. Appendices 1 through 6 provide the following information as indicated below:

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- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Laboratory (Method) Blanks**

### Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

### Field Blanks

No field blanks were submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is 70-130%. In

000002

addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS or matrix spike analysis, all selenium-79 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than +/- 30 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

#### Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quantitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

· **Completeness**

Data package SDG No. W04998 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

**MAJOR DEFICIENCIES**

None found.

**MINOR DEFICIENCIES**

Due to the lack of an LCS or matrix spike analysis, all selenium-79 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the FHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

**REFERENCES**

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2005-75, Rev. 0, *Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit*, November 2005.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

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Qualifiers which may be applied by data validators in compliance with the FHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

**Appendix 2**  
**Summary of Data Qualification**

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RADIOCHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: W04998	REVIEWER: TLI	Project: 200-UW-1	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Selenium-79	J	All	No MS or LCS analysis

\* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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**Appendix 3**  
**Annotated Laboratory Reports**

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Sample Results Summary

Date: 12-Sep-06

STL Richland STLRL

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

Report No. : 33216

SDG No: W04998

Batch	Client Id Work Order	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
6242176 SE79_SEP_IE_LSC									
B1KJ59	JDEML1AA	SE-79	5.67E-01 +- 5.06E-01	U J	pCi/g	85%	1.02E+00	1.00E+01	
B1KJ59 DUP	JDEML1AC	SE-79	<del>9.39E-01 +- 5.25E-01</del>	U	pCi/g	84%	1.03E+00	1.00E+01	<del>4.5</del> <i>W 9/21/06</i>
B1KJ60	JDEMW1AA	SE-79	8.16E-02 +- 4.52E-01	U J	pCi/g	89%	9.46E-01	1.00E+01	
B1KJ61	JDEM31AA	SE-79	5.76E-01 +- 4.96E-01	U	pCi/g	87%	1.00E+00	1.00E+01	
B1KJ62	JDEM51AA	SE-79	4.00E-01 +- 5.46E-01	U	pCi/g	77%	1.12E+00	1.00E+01	
B1KJ63	JDEM71AA	SE-79	1.25E-01 +- 5.49E-01	U	pCi/g	74%	1.15E+00	1.00E+01	
B1KJ64	JDEM81AA	SE-79	6.21E-01 +- 7.52E-01	U	pCi/g	55%	1.54E+00	1.00E+01	
B1KJ65	JDEM91AA	SE-79	4.60E-01 +- 5.06E-01	U	pCi/g	82%	1.03E+00	1.00E+01	
B1KJ66	JDENC1AA	SE-79	5.23E-01 +- 5.22E-01	U	pCi/g	81%	1.06E+00	1.00E+01	
B1KJ67	JDENE1AA	SE-79	6.13E-01 +- 4.22E-01	U	pCi/g	96%	8.41E-01	1.00E+01	
B1KJ68	JDENF1AA	SE-79	3.39E-01 +- 4.55E-01	U	pCi/g	85%	9.35E-01	1.00E+01	
B1KJ69	JDENG1AA	SE-79	7.78E-01 +- 5.62E-01	U	pCi/g	78%	1.12E+00	1.00E+01	
B1KJ70	JDENJ1AA	SE-79	-6.35E-02 +- 4.64E-01	U	pCi/g	83%	9.88E-01	1.00E+01	
6242179 SE79_SEP_IE_LSC									
B1KJ71	JDENL1AA	SE-79	-1.02E-01 +- 5.33E-01	U J	pCi/g	74%	1.13E+00	1.00E+01	
B1KJ71 DUP	JDENL1AC	SE-79	<del>-4.60E-01 +- 5.24E-01</del>	U	pCi/g	73%	1.14E+00	1.00E+01	<del>-127.5</del> <i>W 9/21/06</i>
B1KJ72	JDENM1AA	SE-79	-1.91E-01 +- 6.51E-01	U J	pCi/g	60%	1.39E+00	1.00E+01	
B1KJ73	JDENP1AA	SE-79	-1.16E-01 +- 5.68E-01	U	pCi/g	70%	1.21E+00	1.00E+01	
B1KJ74	JDENR1AA	SE-79	-4.95E-01 +- 5.18E-01	U	pCi/g	77%	1.13E+00	1.00E+01	
B1KJ75	JDENV1AA	SE-79	-3.31E-01 +- 5.75E-01	U	pCi/g	68%	1.24E+00	1.00E+01	

STL Richland  
rptSTLRchSaSum  
mary2 V5.0.1  
A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

000010

*W 9/20/06*

Sample Results Summary

Date: 12-Sep-06

STL Richland STLRL

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

Report No. : 33216

SDG No: W04998

Batch	Client Id Work Order	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
6242179	SE79_SEP_IE_LSC								
	B1KJ76								
	JDEN11AA	SE-79	-1.41E-01 +- 6.01E-01	U	pCi/g	68%	1.28E+00	1.00E+01	
	B1KJ77								
	JDEN41AA	SE-79	-3.49E-01 +- 6.24E-01	U	pCi/g	62%	1.35E+00	1.00E+01	
	B1KJ78								
	JDEN61AA	SE-79	7.50E-02 +- 5.34E-01	U	pCi/g	75%	1.12E+00	1.00E+01	
	B1KJ79								
	JDEN71AA	SE-79	3.18E-01 +- 5.52E-01	U	pCi/g	76%	1.14E+00	1.00E+01	
	B1KJ80								
	JDEN91AA	SE-79	-7.72E-02 +- 5.30E-01	U	pCi/g	78%	1.13E+00	1.00E+01	
	B1KJ81								
	JDEPD1AA	SE-79	1.73E-02 +- 6.33E-01	U	pCi/g	61%	1.33E+00	1.00E+01	
	B1KJJ2								
	JDEPF1AA	SE-79	-9.94E-02 +- 5.25E-01	U	pCi/g	75%	1.12E+00	1.00E+01	
No. of Results: 26									

*Handwritten signature*  
9/20/06

STL Richland

RPD - Relative Percent Difference.

rpt(STLRchSaSum  
mary2 V5.0.1  
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.

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**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000012**



**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

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

September 12, 2006

Attention: John Trechter

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SAF Number	:	R06-033
Date SDG Closed	:	August 29, 2006
Number of Samples	:	Twenty Four (24)
Sample Type	:	Other Solid
SDG Number	:	W04998
Data Deliverable	:	7 / 15-Day Summary

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### CASE NARRATIVE

#### I. Introduction

On August 29, 2006, twenty four other solid samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned to lot J6H290284 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>
B1KJ59	JDEML	OTHER SOLID	8/29/06
B1KJ60	JDEMW	OTHER SOLID	8/29/06
B1KJ61	JDEM3	OTHER SOLID	8/29/06
B1KJ62	JDEM5	OTHER SOLID	8/29/06
B1KJ63	JDEM7	OTHER SOLID	8/29/06
B1KJ64	JDEM8	OTHER SOLID	8/29/06
B1KJ65	JDEM9	OTHER SOLID	8/29/06
B1KJ66	JDENC	OTHER SOLID	8/29/06
B1KJ67	JDENE	OTHER SOLID	8/29/06
B1KJ68	JDENF	OTHER SOLID	8/29/06
B1KJ69	JDENG	OTHER SOLID	8/29/06
B1KJ70	JDENJ	OTHER SOLID	8/29/06
B1KJ71	JDENL	OTHER SOLID	8/29/06

Fluor Hanford  
September 12, 2006

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B1KJ72	JDENM	OTHER SOLID	8/29/06
B1KJ73	JDENP	OTHER SOLID	8/29/06
B1KJ74	JDENR	OTHER SOLID	8/29/06
B1KJ75	JDENV	OTHER SOLID	8/29/06
B1KJ76	JDEN1	OTHER SOLID	8/29/06
B1KJ77	JDEN4	OTHER SOLID	8/29/06
B1KJ78	JDEN6	OTHER SOLID	8/29/06
B1KJ79	JDEN7	OTHER SOLID	8/29/06
B1KJ80	JDEN9	OTHER SOLID	8/29/06
B1KJ81	JDEPD	OTHER SOLID	8/29/06
B1KJ82	JDEPF	OTHER SOLID	8/29/06

## II. Sample Receipt

The samples were received in good condition. The second relinquished to field on chain of custodies R06-033-005, R06-033-06, R06-033-007, R06-033-008 and R06-033-010 were signed on 8/30/06 per email from John Trechter dated 8/30/06. This email is included in this report and is located behind the chain of custody.

## 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**  
Selenium-79 by method RICH-RC-5043

## 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.

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Fluor Hanford  
September 12, 2006

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**V. Comments**

**Gas Proportional Counting**  
Selenium-79 by method RICH-RC-5043

**Batch 6242176**

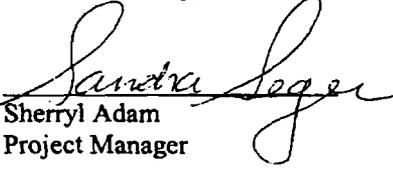
There is currently not an available standard for Selenium 79 and an LCS was not analyzed. The batch blank, sample and sample duplicate (B1KJ59) results are within contractual requirements.

**Batch 6242179**

There is currently not an available standard for Selenium 79 and an LCS was not analyzed. The batch blank, sample and sample duplicate (B1KJ71) 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 Adam  
Project Manager

000015

**Seger, Sandra**

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**From:** Seger, Sandra  
**Sent:** Wednesday, August 30, 2006 1:43 PM  
**To:** 'Trechter, John E Jr.'  
**Cc:** Adam, Sherryl  
**Subject:** RE: W04998 COCs

John,

The QC manager has spoke with the sample receiving personnel regarding this issue.

Sandra

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**From:** Trechter, John E Jr. [mailto:John\_E\_Jr.\_Trechter@RL.gov]  
**Sent:** Wednesday, August 30, 2006 9:54 AM  
**To:** Seger, Sandra; Hogan, James G  
**Cc:** Klages, Deanna L  
**Subject:** FW: W04998 COCs  
**Importance:** High

Sandra,

It should be a policy at your facility to not accept samples that have not been properly relinquished to you as indicated on the chain of custody. Since chains of custody are legal records, signatures regarding receiving and relinquishing samples are absolutely required.

Jim,

Ditto. Please have the individual that delivered the samples go back to STL and properly sign the chains with the date and time that he signs them, and provide appropriate comments on the chain explaining what happened. This will be necessary since the time of his signature will not match the STL receiving signature. I think this is the best way to handle this.

Thanks

John Trechter  
Fluor Hanford

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**From:** Seger, Sandra [mailto:SSeger@stl-inc.com]  
**Sent:** Wednesday, August 30, 2006 8:26 AM  
**To:** Trechter, John E Jr.  
**Subject:** W04998 COCs

<<W04998.PDF>>

John,

The relinquished by signature is missing on COCs R06-033-005, 006, 007, 008 & 010.

Sandra

000016

STL RICHLAND

Fluor Hanford Inc.

JG H 290284

W04998

Aug 9.5.06

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-033-008

PAGE 1 OF 1

COLLECTOR  
HOGAN, JG

COMPANY CONTACT  
KLAGES, DL

TELEPHONE NO.  
373-6312

PROJECT COORDINATOR  
TRECHTER, JE

PRICE CODE 9B

DATA  
TURNAROUND

SAMPLING LOCATION  
PILE # 5

PROJECT DESIGNATION  
200-UW-1 Operable Unit Spoils Pile Analysis

SAF NO.  
R06-033

AIR QUALITY

7 Days /  
15 Days

ICE CHEST NO.

FIELD LOGBOOK NO.  
DTS-SHWS-H112

COA  
121595ES20

METHOD OF SHIPMENT  
GOVERNMENT VEHICLE

SHIPPED TO

Severn Trent Incorporated, Richland

BILL OF LADING/AIR BILL NO.

MATRIX\*  
OL = OTHER LIQUID  
OS = OTHER SOLID  
S = SOIL  
W = WATER

SPECIAL HANDLING AND/OR STORAGE

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)

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1KJ75		OS	← 28-06	1330	1X60mL G/P Selenium-79 (Se-79)	J DEN V	None
B1KJ76		OS	↓	1335	1X60mL G/P Selenium-79 (Se-79)	J DEN I	None
B1KJ77		OS		1346	1X60mL G/P Selenium-79 (Se-79)	J DEN 4	None
B1KJ78		OS		1535	1X60mL G/P Selenium-79 (Se-79)	J DEN 6	None

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM  
DURATEK  
G. HOGAN  
RELINQUISHED BY/REMOVED FROM  
DURATEK  
RELINQUISHED BY/REMOVED FROM

DATE/TIME  
1155  
AUG 29 2006  
DATE/TIME  
1515  
8-29-06  
DATE/TIME

RECEIVED BY/STORED IN  
DURATEK  
F. M. HALL  
RECEIVED BY/STORED IN  
S. Smith S. Smith  
RECEIVED BY/STORED IN

DATE/TIME  
1155  
8-29-06  
DATE/TIME  
1515  
8/29/06  
DATE/TIME

Reporting format the same as GPP, including QC. STL, send copy of chain of custody (COC) to John Trechter within 24 hours of sample receipt. WSCF will send copies of COC to ^CPP Sample Management mailbox. Duratek shall provide copies of all field documents to Steve Trent. Final report to be uploaded into HETS. Samples WILL NOT be taken using the multi-increment sampling technique. Analyze normal sample aliquot used for the analyte run. Run gross alpha/beta on equipment blank only.

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

LABORATORY SECTION

RECEIVED BY

TITLE

DATE/TIME

FINAL SAMPLE DISPOSITION

DISPOSAL METHOD

DISPOSED BY

DATE/TIME

\* Signed 8-30-06 BECAUSE A PLETHORA OF CHAINS & SAMPLES BEING DELIVERED I MISSED SIGNING CHAINS

000017

J6H290284 W04998 Ave 9.5.06

STL RICHLAND

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-033-007 PAGE 1 OF 1

COLLECTOR  
HOGAN, JG  
SAMPLING LOCATION  
PILE # 3  
ICE CHEST NO.

COMPANY CONTACT  
KLAGES, DL  
TELEPHONE NO.  
373-6312  
PROJECT DESIGNATION  
200-UW-1 Operable Unit Spoils Pile Analysis  
FIELD LOGBOOK NO.  
DTS-SANS-H11Z  
OFFSITE PROPERTY NO.

PROJECT COORDINATOR  
TRECHTER, JE  
SAF NO.  
R06-033  
METHOD OF SHIPMENT  
GOVERNMENT VEHICLE  
BILL OF LADING/AIR BILL NO.

PRICE CODE 9B  
AIR QUALITY  
DATA TURNAROUND  
7 Days / 15 Days

SHIPPED TO  
Severn Trent Incorporated, Richland

MATRIX\*  
OL = OTHER LIQUID  
OS = OTHER SOLID  
S = SOIL  
W = WATER

SPECIAL HANDLING AND/OR STORAGE

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)

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1KJ71		OS	8-28-06	1305	1X60mL G/P Selenium-79 (Se-79)	J DENL	None
B1KJ72		OS	↓	1318	1X60mL G/P Selenium-79 (Se-79)	J DENM	None
B1KJ73		OS		1320	1X60mL G/P Selenium-79 (Se-79)	J DENP	None
B1KJ74		OS		1530	1X60mL G/P Selenium-79 (Se-79)	J DENR	None

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

Reporting format the same as GPP, including QC. STL, send copy of chain of custody (COC) to John Trechter within 24 hours of sample receipt. WSCF will send copies of COC to ^CPP Sample Management mailbox. Duratek shall provide copies of all field documents to Steve Trent. Final report to be uploaded into HEIS. Samples WILL NOT be taken using the multi-increment sampling technique. Analyze normal sample aliquot used for the analyte run. Run gross alpha/beta on equipment blank only.

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DURATEK J. G. HOGAN	AUG 29 2006 1155	DURATEK [Signature]	8-29-06 1155
DURATEK F. M. [Signature]	8-29-06 1515	[Signature] J. Smith	8/29/06 1515
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

000018

\* Signed 8-30-06 because a Plethora of chains + samples being delivered I missed signing chains

STL RICHLAND

Fluor Hanford Inc.

JG1290284

W04998

Due 9.5.06

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-033-006

PAGE 1 OF 1

COLLECTOR

HOGAN, JG

COMPANY CONTACT

KLAGES, DL

TELEPHONE NO.

373-6312

PROJECT COORDINATOR

TRECHTER, JE

PRICE CODE 9B

DATA TURNAROUND

SAMPLING LOCATION

PILE #2

PROJECT DESIGNATION

200-UW-1 Operable Unit Spoils Pile Analysis

SAF NO.

R06-033

AIR QUALITY

7 Days / 15 Days

ICE CHEST NO.

FIELD LOGBOOK NO.

DTS-SAWS-H112

COA

121595ES20

METHOD OF SHIPMENT

GOVERNMENT VEHICLE

SHIPPED TO

Severn Trent Incorporated, Richland

BILL OF LADING/AIR BILL NO.

MATRIX\*

OL = OTHER LIQUID  
OS = OTHER SOLID  
S = SOIL  
W = WATER

SPECIAL HANDLING AND/OR STORAGE

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)

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1KJ66		OS	8-28-06	1250	1X60mL G/P Selenium-79 (Se-79)	J DENC	None
B1KJ67		OS		1257	1X60mL G/P Selenium-79 (Se-79)	J DENE	None
B1KJ68		OS		1305	1X60mL G/P Selenium-79 (Se-79)	J DENF	None
B1KJ69		OS		1305	1X60mL G/P Selenium-79 (Se-79)	J DENG	None
B1KJ70		OS		1518	1X60mL G/P Selenium-79 (Se-79)	J DENJ	None

000019

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM

J. G. HOGAN

DATE/TIME

AUG 29 2006 1155

RECEIVED BY/STORED IN

DURATEK F. M. HALL

DATE/TIME

8-29-06 1155

Reporting format the same as GPP, including QC. STL, send copy of chain of custody (COC) to John Trechter within 24 hours of sample receipt. WSCF will send copies of COC to ^CPP Sample Management mailbox. Duratek shall provide copies of all field documents to Steve Trent. Final report to be uploaded into HEIS. Samples WILL NOT be taken using the multi-increment sampling technique. Analyze normal sample aliquot used for the analyte run. Run gross alpha/beta on equipment blank only.

RELINQUISHED BY/REMOVED FROM

DURATEK F. M. HALL

DATE/TIME

8-29-06 1515

RECEIVED BY/STORED IN

S. Smith S. Smith

DATE/TIME

8/29/06 1515

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

LABORATORY SECTION

RECEIVED BY

TITLE

DATE/TIME

FINAL SAMPLE DISPOSITION

DISPOSAL METHOD

DISPOSED BY

DATE/TIME

43

\* signed 8-30-06 because a plethora of chains & samples being delivered I missed signing chains

J6H290284

W04998

Aug 9.5.06

STL RICHLAND

Fluor Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-033-005

PAGE 1 OF 1

COLLECTOR  
HOGAN, JG

COMPANY CONTACT  
KLAGES, DL

TELEPHONE NO.  
373-6312

PROJECT COORDINATOR  
TRECHTER, JE

PRICE CODE 9B

DATA  
TURNAROUND

SAMPLING LOCATION  
PILE # 1

PROJECT DESIGNATION  
200-UW-1 Operable Unit Spills Pile Analysis

SAF NO.  
R06-033

AIR QUALITY

7 Days /  
15 Days

ICE CHEST NO.

FIELD LOGBOOK NO.  
DTS-SAWS-H11Z

COA  
121595ES20

METHOD OF SHIPMENT  
GOVERNMENT VEHICLE

SHIPPED TO  
Severn Trent Incorporated, Richland

OFFSITE PROPERTY NO.

BILL OF LADING/AIR BILL NO.

MATRIX\*  
OL = OTHER LIQUID  
OS = OTHER SOLID  
S = SOIL  
W = WATER

SPECIAL HANDLING AND/OR STORAGE

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)

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1KJ59		OS	8-28-06	1235	1X60mL G/P Selenium-79 (Se-79)	JDEML	None
B1KJ60		OS		1242	1X60mL G/P Selenium-79 (Se-79)	JDEM W	None
B1KJ61		OS		1255	1X60mL G/P Selenium-79 (Se-79)	JDEM3	None
B1KJ62		OS		1515	1X60mL G/P Selenium-79 (Se-79)	JDEM5	None
B1KJ63		OS		1235	1X60mL G/P Selenium-79 (Se-79)	JDEM7	None
B1KJ64		OS		1230	1X60mL G/P Selenium-79 (Se-79)	JDEM8	None
B1KJ65		OS		1355	1X60mL G/P Selenium-79 (Se-79)	JDEM9	None

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DURATEK J. G. HOGAN	AUG 29 2006 1155	DURATEK E. J. WILSON	8-29-06 1155
DURATEK F. M. WILSON	8-29-06 1515	J. Smith	8/29/06 1515

Reporting format the same as GPP, including QC. STL, send copy of chain of custody (COC) to John Trechter within 24 hours of sample receipt. WSCF will send copies of COC to ^CPP Sample Management mailbox. Duratek shall provide copies of all field documents to Steve Trent. Final report to be uploaded into HEIS. Samples WILL NOT be taken using the multi-increment sampling technique. Analyze normal sample aliquot used for the analyte run. Run gross alpha/beta on equipment blank only.

LABORATORY SECTION

RECEIVED BY

TITLE

DATE/TIME

FINAL SAMPLE DISPOSITION

DISPOSAL METHOD

DISPOSED BY

DATE/TIME

\* signed 8-30-06 because a plethora of chains + samples being delivered I missed signing chain

STL RICHLAND

Fluor Hanford Inc.

36H290284

W04998

Aug 9.5.06

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

R06-033-010

PAGE 1 OF 1

COLLECTOR

HOGAN, JG

COMPANY CONTACT

KLAGES, DL

TELEPHONE NO.

373-6312

PROJECT COORDINATOR

TRECHTER, JE

PRICE CODE 9B

DATA TURNAROUND

SAMPLING LOCATION

ICE CHEST NO.

FILE # 6

PROJECT DESIGNATION

200-UW-1 Operable Unit Spoils Pile Analysis

SAF NO.

R06-033

AIR QUALITY

7 Days / 15 Days

FIELD LOGBOOK NO.

DTS-SALS-H112

COA

121595ES20

METHOD OF SHIPMENT

GOVERNMENT VEHICLE

SHIPPED TO

Severn Trent Incorporated, Richland

BILL OF LADING/AIR BILL NO.

MATRIX\*

OL = OTHER LIQUID  
OS = OTHER SOLID  
S = SOIL  
W = WATER

SPECIAL HANDLING AND/OR STORAGE

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)

SAMPLE NO.	LAB ID	MATRIX*	SAMPLE DATE	SAMPLE TIME	NO./TYPE CONTAINER(S)	ANALYSIS	PRESERVATION
B1KJ79		OS	8-28-06	1402	1X60mL G/P	Selenium-79 (Se-79) J DEN7	None
B1KJ80		OS		1405	1X60mL G/P	Selenium-79 (Se-79) J DEN9	None
B1KJ81		OS		1407	1X60mL G/P	Selenium-79 (Se-79) J DEPD	None
B1KJ2		OS		1507	1X60mL G/P	Selenium-79 (Se-79) J DEPF	None

000021

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM

J. G. HOGAN

DATE/TIME  
AUG 29 2006 1155

RECEIVED BY/STORED IN

DURATEK  
F. M. HALL

DATE/TIME  
8-29-06 1155

Reporting format the same as GPP, including QC. STL, send copy of chain of custody (COC) to John Trechter within 24 hours of sample receipt. WSCF will send copies of COC to ^CPP Sample Management mailbox. Duratek shall provide copies of all field documents to Steve Trent. Final report to be uploaded into HEIS. Samples WILL NOT be taken using the multi-increment sampling technique. Analyze normal sample aliquot used for the analyte run. Run gross alpha/beta on equipment blank only.

RELINQUISHED BY/REMOVED FROM

F. M. HALL

DATE/TIME  
8-29-06 1515

RECEIVED BY/STORED IN

S. Smith S. Smith

DATE/TIME  
8/29/06 1515

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

LABORATORY SECTION

RECEIVED BY

TITLE

DATE/TIME

FINAL SAMPLE DISPOSITION

DISPOSAL METHOD

DISPOSED BY

DATE/TIME

45 \* signed 8-30-06 BECAUSE A PLETHORA OF CHAINS & SAMPLES BEING DELIVERED I MISSED SIGNING CHAINS

**Appendix 5**  
**Data Validation Supporting Documentation**

**000022**

**APPENDIX A  
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	200-UW-1 Spoils pile		DATA PACKAGE: W04998		
VALIDATOR:	TLJ	LAB:	ST	DATE:	9/20/06
			SDG:	W04998	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	<b>SE-7?</b>		
SAMPLES/MATRIX					
BIKJ59 BIKJ60 BIKJ61 BIKJ62 BIKJ63 BIKJ64 BIKJ65					
BIKJ66 BIKJ67 BIKJ68 BIKJ69 BIKJ70 BIKJ71 BIKJ72					
BIKJ73 BIKJ74 BIKJ75 BIKJ76 BIKJ77 BIKJ78 BIKJ79					
BIKJ80 BIKJ81 BIKJ82 other solid					

1. Completeness .....  N/A

Technical verification forms present? ..... Yes No **C** N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. Initial Calibration (Levels D, E) .....  N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Background Counts (Levels D, E)

N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Blanks (Levels B, C, D, E) .....  N/A

Method blank analyzed within required frequency?..... Yes  No  N/A

Method blank results acceptable?..... Yes  No  N/A

Analytes detected in method blank?..... Yes  No  N/A

Field blank(s) analyzed?..... Yes  No  N/A

Field blank results acceptable?..... Yes  No  N/A

Analytes detected in field blank(s)?..... Yes  No  N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes  No  N/A

Comments: no FR

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6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) .....  N/A

LCS /BSS analyzed within required frequency? ..... Yes  No  N/A

LCS/BSS recoveries acceptable?..... Yes  No  N/A

LCS/BSS traceable? (Levels D,E)..... Yes  No  N/A

LCS/BSS expired? (Levels D,E)..... Yes  No  N/A

LCS/BSS levels correct? (Levels D,E)..... Yes  No  N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes  No  N/A

Comments: no LCS - J all

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7. Chemical Carrier Recovery (Levels C, D, E) .....  N/A

Chemical carrier added? ..... Yes  No  N/A

Chemical recovery acceptable?..... Yes  No  N/A

Chemical carrier traceable? (Levels D, E)..... Yes  No  N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. Tracer Recovery (Levels C, D, E ) .....  N/A

Tracer added?..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E ) ..... Yes No N/A

Tracer expired? (Levels D, E)..... Yes No N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. Matrix Spikes (Levels C, D, E).....  N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E)..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes No N/A

Comments: no MS - Tall

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. Duplicates (Levels C, D, E) .....  N/A

Duplicates Analyzed at required frequency? .....  Yes  No  N/A

RPD Values Acceptable? .....  Yes  No  N/A

Transcription/Calculation Errors? (Levels D, E) .....  Yes  No  N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

11. Field QC Samples (Levels C, D E) .....  N/A

Field duplicate sample(s) analyzed? .....  Yes  No  N/A

Field duplicate RPD values acceptable? .....  Yes  No  N/A

Field split sample(s) analyzed? .....  Yes  No  N/A

Field split RPD values acceptable? .....  Yes  No  N/A

Performance audit sample(s) analyzed? .....  Yes  No  N/A

Performance audit sample results acceptable? .....  Yes  No  N/A

Comments: \_\_\_\_\_ *No Field QC*

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

12. Holding Times (All levels)

Are sample holding times acceptable? .....  Yes  No  N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

13. Results and Detection Limits (All Levels) .....  N/A

Results reported for all required sample analyses? .....  Yes  No  N/A

Results supported in raw data?(Levels D, E) .....  Yes  No  N/A

Results Acceptable? (Levels D, E) .....  Yes  No  N/A

Transcription/Calculation errors? (Levels D, E) .....  Yes  No  N/A

MDA's meet required detection limits? .....  Yes  No  N/A

Transcription/calculation errors? (Levels D, E) .....  Yes  No  N/A

Comments: all over

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**Appendix 6**

**Additional Documentation Requested by Client**

**000029**

**FORM II**  
**BLANK RESULTS**

Date: 12-Sep-06

Lab Name: STL Richland

SDG: W04998

Matrix: SOLID

Report No. : 33216

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	Primary Detector
Batch: 6242176	SE79_SEP_IE_LSC			Work Order: JDFR81AA		Report DB ID: JDFR81AB						
SE-79	6.43E-03	U	6.5E-01	7.5E-01	1.59E+00	pCi/g	55%	0.	9/9/06 02:26 a		2.0	LSC3
					7.62E-01	1.00E+01		0.02			G	
Batch: 6242179	SE79_SEP_IE_LSC			Work Order: JDFTF1AA		Report DB ID: JDFTF1AB						
SE-79	3.23E-02	U	5.2E-01	6.0E-01	1.26E+00	pCi/g	70%	0.03	9/9/06 05:17 p		2.0	LSC3
					6.02E-01	1.00E+01		0.11			G	
No. of Results: 2			Comments:									

000030

## FORM II

Date: 12-Sep-06

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04998

Collection Date: 8/28/2006 12:35:00 PM

Lot-Sample No.: J6H290284-1

Report No.: 33216

Received Date: 8/29/2006 3:15:00 PM

Client Sample ID: B1KJ59 DUP

COC No.: R06-033-005

Matrix: SOLID

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: 6242176	SE79_SEP_JE_LSC			Work Order: JDEML1AC		Report DB ID: JDEML1CR		Orig Sa DB ID: 9JDEML10				
SE-79	9.39E-01	U	4.5E-01	5.3E-01	1.03E+00	pCi/g	84%	0.91	9/8/06 02:56 p		201	LSC3
	5.67E-01	U	RPD 49.5			1.00E+01		(3.6)			G	

No. of Results: 1    Comments:

000031

STL Richland    RPD - Relative Percent Difference.

rptSTLRchDupV5.0    MDC|MDA,Le - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

.1 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 II

Date: 12-Sep-06

## DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04998

Collection Date: 8/28/2006 1:05:00 PM

Lot-Sample No.: J6H290284-13

Report No.: 33216

Received Date: 8/29/2006 3:15:00 PM

Client Sample ID: B1KJ71 DUP

COC No.: R06-033-007

Matrix: SOLID

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6242179	SE79_SEP_IE_LSC			Work Order: JDENL1AC		Report DB ID: JDENL1CR		Orig Sa DB ID: 9JDENL10				
SE-79	-4.60E-01	U	4.6E-01	5.2E-01	1.14E+00	pCi/g	73%	-0.4	9/9/06 05:48 a		2.1	LSC3
	-1.02E-01	U	RPD -127.5			1.00E+01		-(1.8)			G	

No. of Results: 1    Comments:

000032

STL Richland

RPD - Relative Percent Difference.

rptSTLRchDupV5.0  
.1 A2002

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

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.