

Quanterra  
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0011194

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## CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.  
3350 George Washington Way  
Richland, WA 99352

March 13, 2000

Attention: Joan Kessner

SAF Number : B99-014  
Date SDG Closed : March 7, 2000  
Number of Samples : Two (2)  
Sample Type : Water  
SDG Number : W03105  
Data Deliverable : 7-Day / Summary



### I. Introduction

On March 7, 2000, two water samples were received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>QESRL ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
9D9C4K10	B0XN12	WATER	3/7/00
9D9C4N10	B0XN13	WATER	3/7/00

### II. 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 analysis was: **Gas Proportional Counting**  
Total Strontium by method RICH-RC-5006

Bechtel Hanford, Inc.  
March 13, 2000  
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### III. Quality Control

The analytical results for each analysis performed under SDG W03105 includes a minimum of two Laboratory Control Samples (LCS) and one method (reagent) blank. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

### IV. Comments

#### **Gas Proportional Counting**

Total Strontium by method RICH-RC-5006:

The laboratory control samples, batch blank and sample 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:

  
\_\_\_\_\_  
Jackie Waddell  
Project Manager

**SAMPLE RESULTS**

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W03105 / 9993  
LAB SAMPLE ID: 9D9C4K10 MATRIX: WATER  
CLIENT ID: B0XN12 DATE RECEIVED: 3/7/2000 11:55:00 AM

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ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
STRONTIUM	2.32E+03		3.2E+01	6.2E+02	3.26E+00	pCi/L	100.00%	RICHRC5006

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Number of Results:

### SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W03105 / 9993  
LAB SAMPLE ID: 9D9C4N10      MATRIX: WATER  
CLIENT ID: B0XN13      DATE RECEIVED: 3/7/2000 11:55:00 AM

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ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
STRONTIUM	6.42E+02		1.7E+01	1.7E+02	2.79E+00	pCi/L	100.00%	RICHRC5006

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Number of Results:

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W03105 / 9993  
LAB SAMPLE ID: D9CXN11B MATRIX: WATER

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
STRONTIUM	-1.36E-02	U	1.2E+00	1.2E+00	2.88E+00	pCi/L	97.60%	RICHRC5006

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W03105 / 9993  
LAB SAMPLE ID: D9CXN12S      MATRIX: WATER

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
STRONTIUM	7.68E+01		6.2E+00	2.1E+01	3.57E+00	pCi/L	96.10%	6.76E+01	113.63%

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Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W03105 / 9993  
LAB SAMPLE ID: D9CXN13S MATRIX: WATER

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
STRONTIUM	6.89E+01		5.7E+00	1.9E+01	3.28E+00	pCi/L	97.30%	6.78E+01	101.64%

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Number of Results:

Data Review Checklist  
RADIOCHEMISTRY

Priority

Lot Number: 30C 070196				
Client ID: BHI				
Due Date: 3-14-00				
QC Batch Number: 0068194			SDG Number: WP 3105	
Method Test Parameter: TOTAL SR				
Matrix: Water				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples				
1. Is the blank yield within acceptance criteria?	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Does the blank result meet the Contract criteria?	✓			✓
4. Is the blank result < the Contract Detection Limit?	✓			✓
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria?	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			✓
D. 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: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

First Level Review: Richard Wallace  
 Second Level Review: [Signature]

Date: 3/11/00  
 Date: 3/13/00

# CHAIN OF CUSTODY

Q-21040

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>				B99-014-02	Page #Error of #Error
Collector <i>PS Wilkerson</i>	Company Contact Julian Laurenz	Telephone No. 372-9582	Project Coordinator TRENT, SJ		Price Code <b>1D</b>	Data Turnaround <b>7 Days</b>	
Project Designation 100-NR-2 Pump & Treat Operational Sampling		Sampling Location <i>NR-2</i>		SAF No. B99-014	Air Quality <input type="checkbox"/>		
Ice Chest No. <i>WM-001</i>	Field Logbook No. <i>EL-1345-1</i>	COA	Method of Shipment Govt Vehicle				
Shipped To Quanterra Incorporated		Offsite Property No. <i>N/A</i>		Bill of Lading/Air Bill No. <i>N/A</i>			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation												
	Type of Container	<i>PL</i>											
	No. of Container(s)	<i>2</i>											
	Special Handling and/or Storage	Volume <i>500 cc 1000 cc</i>											

*SPC* **SAMPLE ANALYSIS** *The 3-14*  
*W03105* *W030196*

Sample No.	Matrix *	Sample Date	Sample Time										
<i>Box N12</i>	<i>Water</i>	<i>3-7-00</i>	<i>0800</i>	<i>X</i>	<i>D9C4K</i>								
<i>Box N13</i>	<i>Water</i>	<i>3-7-00</i>	<i>0800</i>	<i>X</i>	<i>D9C4N</i>								

<b>CHAIN OF POSSESSION</b>		<b>Sign/Print Names</b>		<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>
Relinquished By <i>D. Blenkinship</i>	Date/Time <i>3/7/00 11:00</i>	Received By <i>M. S. GALE</i>	Date/Time <i>3-7-00 11:00</i>	<i>SAMPLE COLLECTED WITH HISTORICAL DATA &lt; 2000 pci/g</i>				<ul style="list-style-type: none"> <li>S=Soil</li> <li>SE=Sediment</li> <li>SO=Solid</li> <li>S=Sludge</li> <li>W=Water</li> <li>O=Oil</li> <li>A=Air</li> <li>OS=Orum Solids</li> <li>DL=Drum Liquids</li> <li>T=Tissue</li> <li>WI=Wipe</li> <li>L=Liquid</li> <li>V=Vegetation</li> <li>X=Other</li> </ul>
Relinquished By <i>S. GALE</i>	Date/Time <i>3-7-00 11:55</i>	Received By <i>K. Blenkinship</i>	Date/Time <i>3-7-00</i>					
Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time					

<b>LABORATORY SECTION</b>	Received By	Title	Date/Time
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method	Disposed By	Date/Time

Figure 1. Sample Check-in List

Date/Time Received: 3-7-00 1155 SDG#: W03105  
 Work Order Number: JOCO70196 SAF#: B99-014  
 Shipping Container ID: UM-01 Chain of Custody #: B99-014-02

1. Outermost shipping container damaged? Yes  No
2. Custody Seals on shipping container intact? Yes  No
3. Custody Seals dated and signed? Yes  No
4. Chain-of-Custody record present? Yes  No
5. Chain-of-Custody includes the following information:
  - Client name Yes  No
  - Project name or number Yes  No
  - Sample date/time for each sample Yes  No
  - Container types, sizes and number of containers Yes  No
  - Short description of sample, i.e., matrix Yes  No
  - Analyses requested Yes  No
  - Preservation used or "none" or N/A if not applicable Yes  No  *H37100*
  - Date and time of relinquish and receipt Yes  No
  - Signatures of those persons relinquishing and receiving Yes  No
6. Sample numbers on chain of custody match those on sample containers? Yes  No
7. Collection date and date of laboratory receipt are within project specific holding time requirements? Yes  No  *2 bottles*
8. Cooler temperature: n/a
9. Vermiculite/packing materials is: Wet  Dry

10. Samples have: <input checked="" type="checkbox"/> tape <input checked="" type="checkbox"/> custody seals	<input type="checkbox"/> hazard labels <input type="checkbox"/> appropriate sample labels
11. Samples are: <input checked="" type="checkbox"/> in good condition <input type="checkbox"/> broken	<input type="checkbox"/> leaking <input type="checkbox"/> have air bubbles

12. Were any anomalies identified in sample receipt? Yes  No
13. Description of anomalies (include sample numbers): \_\_\_\_\_

Sample Custodian/Laboratory: K. Hattenberg Date: 3-7-00  
 Telephone/Fax/E:mailed to: \_\_\_\_\_ On \_\_\_\_\_ By \_\_\_\_\_

# Client Sample Screening Results

07-Mar-00

② 3/7/00

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B	
BHI	B0XN12D9C4K		3/7/2000 1:41:00 PM	QUAD22A	3/7/2000 2:29:03 PM	B0XN12D9C4K	30	12	0.278333333	117	2.83666667	
	D9C4K	LIQUID		Bkg:	3/7/2000 1:52:36 AM	BKG	600	73	0.121666667	638	1.06333333	
Anl Date: 3/7/00		Tot Sa, Alq: 5.00E-01		, 1.00E+00		Alp; (Dpm/ 7.15E-01	(uCi/ 1.61E-04	(pCi/ 3.22E+02	+ 2.2E+02	CAT	7.8E-02	Lab
Ppt mg: 0.3		Units: L		, ml		Bet; Alq: 5.11E+00	Sa): 1.15E-03	L/g): 2.30E+03	+ 3.0E+02	I	2.2E-02	Alq
BHI	B0XN13D9C4N		3/7/2000 1:41:00 PM	QUAD22C	3/7/2000 2:29:03 PM	B0XN13D9C4N	30	8	0.166666667	67	1.25166667	
	D9C4N	LIQUID		Bkg:	3/7/2000 1:52:36 AM	BKG	600	60	0.1	589	0.98166667	
Anl Date: 3/7/00		Tot Sa, Alq: 5.00E-01		, 1.00E+00		Alp; (Dpm/ 4.47E-01	(uCi/ 1.01E-04	(pCi/ 2.01E+02	+ 2.1E+02	CAT	1.2E-01	Lab
Ppt mg: 0.2		Units: L		, ml		Bet; Alq: 2.22E+00	Sa): 5.01E-04	L/g): 1.00E+03	+ 2.3E+02	I	5.0E-02	Alq

0013

07-Mar-00

RQC053

Parent Batch:  
Associated Batches:

:  
:  
:  
:

Quanterra Incorporated  
Information Sheet Rad Prep

Run Date: 3/08/00  
Time: 9:21:02

Page: 1

**PRIORITY**  
*7day*

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\* QC BATCH: 0068194 \*  
\*  
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**PRIORITY**  
*7day*

TH: Total Strontium by GPC  
CG: Sr-Total Prp/SepRC5006  
SI: CLIENT: HANFORD

Analytical Due Date: 3/14/00

Project Manager:

Lot#	Analyt Due	Client Name	Mid/Ave	Tracer ID	CRDL	Units	Screen Info - (Ci)	PM
Work Order	Client Matrix	Aliquot	Geometry	Count Time	Date/Time	Spike ID	Alpha	Beta
J0C080000-194 B D9CXN-1-01 WATER Comments:	3/14/00				3/07/00 8:00		2.00E+00 pCi/L	**NA **NA
J0C080000-194 C D9CXN-1-02 WATER Comments:	3/14/00				3/07/00 8:00	2	pCi/L **NA **NA	
J0C080000-194 C D9CXN-1-03 WATER Comments:	3/14/00				3/07/00 8:00	2	pCi/L **NA **NA	
J0C070196-001 D9C4K-1-01 WATER Comments: WATER	3/14/00	.0000		.000	3/07/00 8:00		2.00E+00 pCi/L	3.22E-13 2.30E-12 33-03/00 JW2
J0C070196-002 D9C4N-1-01 WATER Comments: WATER	3/14/00	.0000		.000	3/07/00 8:00		2.00E+00 pCi/L	2.01E-13 1.00E-12 33-03/00 JW2

Total Number of Samples In Batch: 00005

Batch Information:

Dry Wt: N

Decay Correct: Y

Blank Sub: None

Call In:

Uncert: Both

Sigma: 1.960

ODR: Target List + Other Detected

BLANK CRDL  
Strontium 90

2.00E+00

Tracer Yield  
Strontium Trace (020-105)

Type

QC Control Limits

\*\* NYS = Not Yet Screened

\*\* NA = Not Applicable

\*\* Other = Other than Gross Alpha or Gross Beta

\*\* Indicates that Batch Information has changed for this sample. Print worksheet for details.

0014

COC Signature Page  
W03105

Lot or Batch #:	Initials/Date	Procedure #
Released By	JH 3-8-00	RC0009
Received	DM 3-8-00	RICHRC5006
Released By	DM 3-9-00	n/a
Received	CS 3/9/00	RCENTR2003102
Released By	CS 3/10/00	n/a
Received	DM 3-10-00	Radcalc V2.7.1
Released By	JM 3-10-00	n/a
Received	JW 3/10/00	RICHRC0002
Released By	JW 3/11/00	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

SDR # B00-059  
Revision #: 0  
Date Initiated: 3/08/00

**SAMPLE DISPOSITION RECORD**

SAF: B99-014  
OU: 100-NR-2  
Project ID: 100-NR-2 TS  
Task ID: 1  
Sampling Event: Pump & Treat Operational Sampling

Laboratory: Quanterra Incorporated

Task Manager: J. E. Laurenz

Sampling Information:  
Number of Samples: 2  
ID Numbers: B0XN12, B0XN13  
Matrix: Water  
Collection Date: 3/07/00

**Issue Background:**

Class:  Project Data Use  General Laboratory Direction  Validation Direction  Sample Management Direction

Type: Addition of Analyses

Description: Addition of Total Radioactive Sr Analysis

**Disposition:**

Description: The chain of custody for the listed samples did not include analysis for total radioactive Sr.

Justification: Total radioactive Sr results are needed to monitor treatment system performance.

**Approval Signatures:**

S. J. Trent  
Project Coordinator (Print/Sign Name)

3/14/00

Date

J. E. Laurenz  
Task Manager (Print/Sign Name)

3/14/00

Date