

START

9613447.0568

0044403

W0705



Quanterra Incorporated  
2800 George Washington Way  
Richland, Washington 99352

509 375-3131 Telephone  
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.  
345 Hills  
Richland, WA 99352

November 6, 1995

Attention: Joan Kessner




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SAF Number	:	B95-028
Date SDG Closed	:	September 22, 1995
Number of Samples	:	Two (2)
Sample Type	:	Water
SDG Number	:	W0705
Data Deliverable	:	Summary

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I. Introduction

On September 8, 1995, two water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) 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>QTESRL ID</u>	<u>BHI ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
50912201	B0GFJ1	Water	9/8/95
50912202	B0GFJ2	Water	9/8/95

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.



Bechtel Hanford, Inc.  
November 6, 1995  
Page 3

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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:



Suzanne Gaines  
Project Manager

9613447.0571



## SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND                      SDG: W0705  
LAB SAMPLE ID: 50911201                      MATRIX: WATER  
CLIENT ID: B0GFJ1                              DATE RECEIVED: 9/8/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TC-99	1.83E+03	1.4E+01	2.0E+02	3.80E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TOTAL-URANIUM	3.18E+02	N/A	4.3E+01	1.41E-03	ug/L	N/A	RD4200

Number of Results: 

0005

**SAMPLE RESULTS**

**LAB NAME:** ITAS-RICHLAND **SDG:** W0705  
**LAB SAMPLE ID:** 50911202 **MATRIX:** WATER  
**CLIENT ID:** B0GFJ2 **DATE RECEIVED:** 9/8/95 10:15:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
TC-99	1.82E-01	1.7E+00	4.6E+00	3.80E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TOTAL-URANIUM	2.66E-01	N/A	3.6E-02	1.41E-03	ug/L	N/A	RD4200

Number of Results:



Environmental Services

ITAS Data Review Checklist  
RADIOCHEMISTRY

BHI-Water

Work Order No(s): 509112

Lab Sample Numbers or SDG: W0705

Method/Test/Parameter: TC-99

Review Item	Yes (S)	No (S)	N/A (S)	2 <sup>nd</sup> Level review (S)
<b>A. Calibration</b>			X	✓
1. Is the calibration documentation included where applicable?			X	✓
<b>B. Sample Analysis</b>			X	✓
1. Are the sample Yields within acceptance criteria?			X	✓
2. Were all sample holding times met?			X	✓
<b>C. QC Samples</b>			X	✓
1. Is the Blank Yield within acceptance criteria?			X	✓
2. Is the Minimum Detectable Activity for the Blank result $\leq$ the Contract Detection Limit?	X			✓
3. Is the Blank result $\leq$ the Contract Detection Limit?	X			✓
4. Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			✓	✓
5. Is the LCS result within acceptance criteria?	X			✓
6. Is the LCS yield within acceptance criteria?	X			✓
7. Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?	X			✓
8. MS/MSD results and yield meet acceptance criteria?	✓	X		✓
9. Duplicate sample results and yield meet acceptance criteria?	X			✓
<b>D. Other</b>				✓
1. Are all nonconformances included and noted?	X			✓
2. Are all required forms filled out?	X			✓
3. Correct methodology used?	X			✓
4. Transcription checked?	im			✓
5. Were all calculations checked at a minimum frequency?	X			✓
6. Units checked?	✓			✓

Comments on any "No" response:

See NCM

Analyst: Thomas E. [Signature]

Date: 10/19/95

Second Level Review: Sally James

Date: 11/6/95

Form No: LS-038, 3/94, Rev 2

1068

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

PAGE 1 OF 2

LOG #: RD-95-\_\_\_\_\_

see 10/19/95

Project ID: PA BH NCM Initiated by: GC 10/19/95  
 Sample Numbers: H0911201 50911201  
 Tests: TC99 W0705  
 Matrix: H2O

**Analytical Area (check appropriate area):**

- Sample control
- Organic preparation
- Inorganic preparation
- GC
- HPLC
- GC/MS
- Wet chemistry
- Metals
- Reporting
- Data review
- Radiochemistry
- Bioassay

**Nonconformance (check appropriate area):**

**Holding Time Violations (exceeded by \_\_\_\_\_ days)**

*Category I: Laboratory Independent*

- 1. Holding time expired in transit
- 2. Sample received > 48 hrs. or 1/2 holding time has expired
- 3. Test added by client after expiration

*Category II: Laboratory Dependent*

- 4. Instrument failure
- 5. Analyst error
- 6. Login error
- 7. Miscommunication
- 8. Other (complete description required)

*Category III: Analysis Reruns (QA/QC)*

- 9. Surrogates
- 10. Internal Standards
- 11. Spike Recoveries
- 12. Blank Contamination

*Category IV: Analysis Reruns (Confirmation)*

- 13. Second column
- 14. Contamination check
- 15. Confirmation of matrix effects
- 16. Other (complete description required)

**Quality Assurance/Quality Control**

- 17. QC data reported outside of controls
- 18. Incorrect procedure used
- 19. SOP intentionally modified with QA and Tech. approval
- 20. Invalid instrument calibration
- 21. Insufficient sample received for proper analysis

**Incorrect or Incomplete Client Deliverable**

- 22. Hardcopy deliverable error
- 23. Electronic deliverable error

**Reported detection limits elevated due to:**

- 24. Sample matrix
- 25. Insufficient sample volume
- 26. Other (complete description required)

27. Other (specify): Negative matrix split.  
Yield

Comments/Explanation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Notification (check appropriate area):**

Client notified by (name and date): \_\_\_\_\_ Client's name and response: \_\_\_\_\_

- in writing
- by telephone
- by facsimile
- other (explain)
- process "as is"
- on hold until \_\_\_\_\_
- re-sample
- other (explain)

Project Manager (signature and date): Sally James 11/3/95

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG#: RD-95-\_\_\_\_\_

Corrective Action

Root Cause

Initial and date: SEA 10/19/95

Sample contained solid material thus creating a potential homogeneity problem. Furthermore, the spike value  $\approx$  to the one sigma error

Corrective Action

Initial and Date: SEA 10/19/95

Report data.

Responsibility for performing CA assigned to: \_\_\_\_\_

Actions to prevent recurrence

Initial and Date: \_\_\_\_\_

First Level Supervisor: Steve E. Whelan

Date: 10/19/95

Responsible Manager: W. Mackelle

Date: 11/6/95

Quality Assurance Review

Anomaly

Deficiency

Rerun

Further action required: \_\_\_\_\_

Assigned to: \_\_\_\_\_

QA signature: Beverly Whelan

Date: 11/6/95

Corrective Action Verification

Verified

Cannot Verify (specify reason): \_\_\_\_\_

Nonconformance Memo Closure

QA signature/date: Beverly Whelan

11/6/95

*Handwritten:* 11-6-95



Environmental Services

Data Review Checklist  
RADIOCHEMISTRY

*BHI*

Work Order No(s): <i>50911201</i>				
Lab Sample Numbers or SDG: <i>W0705 09-114</i>				
Method/Test/Parameter: <i>Manure - water</i>				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level review (✓)
<b>A. Calibration</b>				
1. Is the calibration documentation included where applicable?	✓			✓
<b>B. Sample Analysis</b>				
1. Are the sample Yields within acceptance criteria?			✓	✓
2. Were all sample holding times met?	✓			✓
<b>C. QC Samples</b>				
1. Is the Blank Yield within acceptance criteria?			✓	✓
2. Is the Minimum Detectable Activity for the Blank result ≤ the Contract Detection Limit?		✓		✓
3. Is the Blank result ≤ the Contract Detection Limit?		✓		✓
4. Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?		✓		✓
5. Is the LCS result within acceptance criteria?	✓			✓
6. Is the LCS yield within acceptance criteria?			✓	✓
7. Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?			✓	✓
8. MS/MSD results and yield meet acceptance criteria?			✓	✓
9. Duplicate sample results and yield meet acceptance criteria?	✓			✓
<b>D. Other</b>				
1. Are all nonconformances included and noted?	✓			✓
2. Are all required forms filled out?	✓			✓
3. Correct methodology used?	✓			✓
4. Transcription checked?	✓			✓ <i>TR</i>
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Units checked?	✓			✓

Comments on any "No" response: *N/A blank MDA/result*

Analyst: *Paul Thompson*

Date: *10-26-95*

Second Level Review: *Shirley Jones*

Date: *11/6/95*

Form No: LS-038, 3/94, Rev 2

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

PAGE 1 OF 2

LOG #: RD-95-\_\_\_\_\_

Project ID: BHI NCM Initiated by: PKenitzer 10-24-95  
 Sample Numbers: 509112  
 Tests: uranium 60705  
 Matrix: water

**Analytical Area (check appropriate area):**

- |  |                                |  |  |
|--|--------------------------------|--|--|
| <input type="checkbox"/> Sample control        | <input type="checkbox"/> GC    | <input type="checkbox"/> Wet chemistry | <input type="checkbox"/> Data review               |
| <input type="checkbox"/> Organic preparation   | <input type="checkbox"/> HPLC  | <input type="checkbox"/> Metals        | <input checked="" type="checkbox"/> Radiochemistry |
| <input type="checkbox"/> Inorganic preparation | <input type="checkbox"/> GC/MS | <input type="checkbox"/> Reporting     | <input type="checkbox"/> Bioassay                  |

**Nonconformance (check appropriate area):**

**Holding Time Violations (exceeded by \_\_\_\_\_ days)**

*Category I: Laboratory Independent*

- 1. Holding time expired in transit
- 2. Sample received > 48 hrs. or 1/2 holding time has expired
- 3. Test added by client after expiration

*Category II: Laboratory Dependent*

- 4. Instrument failure
- 5. Analyst error
- 6. Login error
- 7. Miscommunication
- 8. Other (complete description required)

*Category III: Analysis Reruns (QA/QC)*

- 9. Surrogates
- 10. Internal Standards
- 11. Spike Recoveries
- 12. Blank Contamination

*Category IV: Analysis Reruns (Confirmation)*

- 13. Second column
- 14. Contamination check
- 15. Confirmation of matrix effects
- 16. Other (complete description required)

**Quality Assurance/Quality Control**

- 17. QC data reported outside of controls
- 18. Incorrect procedure used
- 19. SOP intentionally modified with QA and Tech. approval
- 20. Invalid instrument calibration
- 21. Insufficient sample received for proper analysis

**Incorrect or Incomplete Client Deliverable**

- 22. Hardcopy deliverable error
- 23. Electronic deliverable error

**Reported detection limits elevated due to:**

- 24. Sample matrix
- 25. Insufficient sample volume
- 26. Other (complete description required)
- 27. Other (specify): \_\_\_\_\_

Comments/Explanation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Notification (check appropriate area):**

Client notified by (name and date): _____	Client's name and response: _____
<input type="checkbox"/> in writing	<input type="checkbox"/> process "as is"
<input type="checkbox"/> by facsimile	<input type="checkbox"/> re-sample
<input type="checkbox"/> by telephone	<input type="checkbox"/> on hold until _____
<input type="checkbox"/> other (explain)	<input type="checkbox"/> other (explain)

Project Manager (signature and date): Sue Jones 11/6/95

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

**Corrective Action**

Root Cause

Initial and date: PK 10-24-95

Sample 01 was very high in Uranium, the blank is above MDA but well below 01 sample.

Sample 02 + matrix spike were reanalyzed because they were low level - to show any contamination. Reanalysis shows they were not contaminated. Reanalysis data accepted for 02.

Corrective Action Original data accepted for 01. Initial and Date: PK 10-24-95

Reanalysis

Responsibility for performing CA assigned to: \_\_\_\_\_

Actions to prevent recurrence

Initial and Date: \_\_\_\_\_

First Level Supervisor: Pam Kertzel

Date: 10-24-95

Responsible Manager: W. Marshall

Date: 11/6/95

Quality Assurance Review

Anomaly

Deficiency

Return

Further action required: \_\_\_\_\_

Assigned to: \_\_\_\_\_

QA signature: [Signature]

Date: 11/6/95

Corrective Action Verification

Verified

Cannot Verify (specify reason): \_\_\_\_\_

Nonconformance Memo Closure

QA signature/date: [Signature]

11/6/95

9613447.0579

**CHAIN OF  
CUSTODY FORMS**

0022



Environmental  
Restoration  
Contractor

***ERC Team***

*Interoffice Memorandum*

Job No. 22192

Written Request Accepted: NO

CCN: N/A

OU: 200-UP-1

TSD: N/A

ERA: N/A

Subject Code: 580

TO: Curt Wittreich H6-04  
Wendy Thompson N3-01

DATE: April 28, 1995

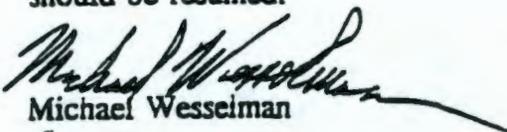
COPIES: See Below

FROM: Michael Wesselman  
Radiological Controls/200 areas  
N3-01/ 376-2084

*N3-06*

SUBJECT: Exemption of Samples from the 200-UP-1 Pump and Treat from Total Activity Analysis

No liquid samples from the 200-UP-1 pump and treat system require total activity analysis prior to offsite shipment to a radioactive material licensed lab. The levels in the current source wells do not exceed the 50 picocuries per gram detection limit of a total activity analysis. There is no mechanism for concentrating radioactivity in the water in the pump and treat since the 2.5 micron bag filters and the dowex 21K resins tend to reduce the amount of activity in the water. The numerous total activities performed to date as well as the offsite lab analysis confirm the system's ability to remove contaminants from the water. This exemption from total activities is valid as long as the activities of any new source wells attached to the system do not exceed 100,000 picocuries per liter for uranium and technetium combined, remain less than 1,000,000 picocuries per liter tritium, and samples are sent to laboratories licensed to handle radioactive materials. Results from the offsite analysis should always be reviewed to ensure levels are not increasing over time. If there is a fifty percent increase in activities between sampling intervals, total activities should be resumed.

  
Michael Wesselman  
maw

Distribution

GC Henckel	H6-07
AP Goforth	H6-08
TL LaFreniere	X0-23
CH St John	N3-06
BHI Document Control	H4-79

WC# 705  
509112

9613447.0582

Figure 1

### SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 9/8/95 1015 Client Name BHT  
 Project/Client # B95-028 Batch or Case # \_\_\_\_\_  
 Cooler ID (if noted on outside of cooler) ER-9

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes  No [ ]
3. Custody Seals dated and signed? Yes  No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No
5. Vermiculite/packing material is: Wet  Dry [ ] \_\_\_\_\_
6. Each sample is in a plastic bag? Yes [ ] No  \_\_\_\_\_
7. Number of sample containers in cooler: 28
8. Samples have:  tape \_\_\_\_\_ hazard labels  
 custody seals \_\_\_\_\_ appropriate sample labels
9. Samples are:  in good condition \_\_\_\_\_ leaking  
 \_\_\_\_\_ broken \_\_\_\_\_ have air bubbles  
 \_\_\_\_\_ other
10. Coolant Present? Yes  No [ ] Sample Temperature \_\_\_\_\_
11. The following paperwork should be accounted for (N/A if not applicable):  
 Chain of Custody #(s) N/A  
 Request for Analysis #(s) 1  
 Airbill # \_\_\_\_\_ Carrier \_\_\_\_\_
12. Have any anomalies been identified above? Yes [ ] No [ ]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Tom Gilmore  Date/Time 9/8/95 1015

509112-Rad

SDG W0705

## Client Sample Screening Results

08-Sep-95

P3 a/8/95

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B	
BHI	B0GFJ1		9/8/95 1:00:00 PM	QUAD21B	9/8/95 3:02:51 PM	B0GFJ1	30	88	2.90133333	593	18.892667	
	01	LIQUID		Bkg:	9/8/95 1:12:22 AM	BKG	500	16	0.032	437	0.874	
Anl Date:	9/8/95	Tot Sa, Alq:	1.00E+00	, 1.00E+01	Alp;	(Dpm/ 9.27E+00	(uCV/ 4.17E-04	(pCV/ 4.17E+02	± 4.6E+01	CAT	6.0E-02	Lab
Ppt mg:	7.3 ✓	Unkts:	L	, ml	Bet;	Alq): 3.53E+01	Sa): 1.59E-03	Ljg): 1.59E+03	± 7.0E+01	I	3.1E-02	Alq Ljg
BHI	B0GFJ2		9/8/95 1:00:00 PM	QUAD21C	9/8/95 3:02:51 PM	B0GFJ2	30	13	0.38933333	69	1.188	
	02	LIQUID		Bkg:	9/8/95 1:12:22 AM	BKG	500	22	0.044	556	1.112	
Anl Date:	9/8/95	Tot Sa, Alq:	1.00E+00	, 1.00E+01	Alp;	(Dpm/ 1.42E+00	(uCV/ 6.38E-05	(pCV/ 6.38E+01	± 3.2E+01	CAT	3.9E-01	Lab
Ppt mg:	17.8 ✓	Unkts:	L	, ml	Bet;	Alq): 2.19E+00	Sa): 9.88E-05	Ljg): 9.88E+01	± 2.5E+01	I	5.1E-01	Alq Ljg
BHI	B0GJK2		9/8/95 1:00:00 PM	QUAD21D	9/8/95 3:02:51 PM	B0GJK2	30	18	0.542	107	2.5646667	
		SOLID		Bkg:	9/8/95 1:12:22 AM	BKG	500	29	0.058	501	1.002	
Anl Date:	9/8/95	Tot Sa, Alq:	1.34E+03	, 9.22E+01	Alp;	(Dpm/ 3.46E+00	(uCV/ 2.26E-02	(pCV/ 1.69E+01	± 6.3E+00	CAT	3.0E+00	Lab
Ppt mg:	92.2 ✓	Unkts:	g	, mg	Bet;	Alq): 5.43E+00	Sa): 3.55E-02	Ljg): 2.65E+01	± 3.7E+00	II	3.8E+00	Alq Ljg
BHI	B0GJK3		9/8/95 1:00:00 PM	QUAD22A	9/8/95 3:02:55 PM	B0GJK3	30	9	0.248	110	2.6086667	
		SOLID		Bkg:	9/8/95 1:12:29 AM	BKG	500	26	0.052	529	1.058	
Anl Date:	9/8/95	Tot Sa, Alq:	1.35E+03	, 9.11E+01	Alp;	(Dpm/ 1.44E+00	(uCV/ 9.60E-03	(pCV/ 7.11E+00	± 5.4E+00	CAT	7.0E+00	Lab
Ppt mg:	91.1 ✓	Unkts:	g	, mg	Bet;	Alq): 5.44E+00	Sa): 3.63E-02	Ljg): 2.69E+01	± 3.7E+00	I	3.7E+00	Alq Ljg
BHI	B0GJK4		9/8/95 1:00:00 PM	QUAD22B	9/8/95 3:02:55 PM	B0GJK4	30	11	0.29466667	122	3.0946667	
		SOLID		Bkg:	9/8/95 1:12:29 AM	BKG	500	36	0.072	486	0.972	
Anl Date:	9/8/95	Tot Sa, Alq:	1.79E+03	, 7.72E+01	Alp;	(Dpm/ 1.59E+00	(uCV/ 1.66E-02	(pCV/ 9.28E+00	± 6.0E+00	CAT	5.4E+00	Lab
Ppt mg:	77.2 ✓	Unkts:	g	, mg	Bet;	Alq): 6.40E+00	Sa): 6.68E-02	Ljg): 3.73E+01	± 4.6E+00	II	2.7E+00	Alq Ljg

9613447.0583

0026

08-Sep-95

1

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

CUSTOMER: BHI SAF SAMPLE DELIVERY GROUP W0705  
 MATRIX : WATER B05-028 BATCH NUMBER 09-112

ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
<u>M091121U</u>		<u>M091121B</u>	<u>M091121M</u>	
<u>M091122N</u>		<u>H0911201</u>	<u>G0911202</u>	
1 ) 50911201		BHI	BOGFJ1	SAND in sample
2 ) 50911202		BHI	BOGFJ2	

ACTIONS (Initial & Date)

- 1) INITIATED JH 9/8/95
- 2) PREP LAB RECEIVED 10/10/95 mm
- 3) SAMPLE REMAINDER STORED UA
- 4) SEPARATION LAB RECEIVED 10/10/95 mm
- 5) COUNTING/MEASUREMENT LAB OD 10/06/95
- 6) DATA REVIEWED AND ANALYTICAL PREP STORED SE 10/19/95

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

CUSTOMER: BHI SAF SAMPLE DELIVERY GROUP W0705  
 MATRIX : WATER B95-028 BATCH NUMBER 09-112

ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
<u>m0911215</u>				
<u>m0911215</u>			<u>EQIP 316</u>	
1 ) <u>50911201</u>		<u>BHI</u>	<u>BOGFJ1</u>	
<u>G0911201</u>		<u>DUP</u>		
2 ) <u>50911202</u>		<u>BHI</u>	<u>BOGFJ2</u>	
<u>H0911202</u>		<u>M-Spks</u>	<u>EQIP 317</u>	

ACTIONS (Initial & Date)

- 1) INITIATED JH 9/8/95
- 2) PREP LAB RECEIVED 10-2-95 <
- 3) SAMPLE REMAINDER STORED N/A
- 4) SEPARATION LAB RECEIVED ↓
- 5) COUNTING/MEASUREMENT LAB 10/13/95
- 6) DATA REVIEWED AND ANALYTICAL PREP STORED TR 10-26-95