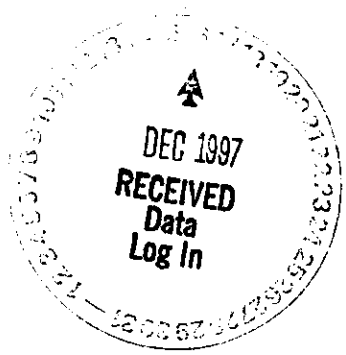
W02100

Quanterra
Environmental
Services

0049061

Analytical Data Package Prepared For

Bechtel Hanford



Analysis By

Quanterra Environmental Services
Richland Laboratory

Report Nbr: 4026

SDG No.	SAF No.	CLIENT ID No.	QUANTERRA ID No.
W02100	B98-010	B0MJX5	71207301
		B0MJX6	71207302

Comments:

000001

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

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

December 16, 1997

Attention: Joan Kessner

SAF Number	:	B97-159
Date SDG Closed	:	December 3, 1997
Number of Samples	:	Two (2)
Sample Type	:	Water
SDG Number	:	W02100
Data Deliverable	:	Summary

I. Introduction

On December 3, 1997, two water samples were received by the Quanterra, Inc., Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford (BHI) specific IDs:

QTESRL ID#	BHI ID#	MATRIX	RECEIPT DATE
71207301	B0MJX5	WATER	12/3/97
71207302	B0MJX6	WATER	12/3/97

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 analyses were:

Gas Proportional Counting
Gross Beta by method RICH-RC-5014
Liquid Scintillation Counting
Tritium by method RICH-RC-5007

III. Quality Control

The analytical results for each analysis performed under SDG W02100 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

IV. Comments

Gas Proportional Counting

Gross Beta by method RICH-RC-5014
The LCS, batch blank, sample and sample duplicates (B0MJX5) results are within contractual requirements.

Liquid Scintillation Counting

Tritium by method RICH-RC-5007
The LCS, batch blank, sample and sample duplicates (B0MJX5) 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:

Andy Kopriva
Project Manager

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02100 / 4026
LAB SAMPLE ID:	71207301	**MATRIX:**	WATER
CLIENT ID:	B0MJX5	**DATE RECEIVED:**	12/3/1997 4:00:00 PM

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
BETA	3.30E+00	1.5E+00	1.5E+00	2.74E+00	pCi/L	100.00%	RICHRC5014-B
TRITIUM	2.92E+02	1.4E+02	2.1E+02	3.01E+02	pCi/L	88.10%	RICHRC5007

Number of Results: 2

000004

Result = IDL When Not Detected

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02100 / 4026
LAB SAMPLE ID:	71207302	**MATRIX:**	WATER
CLIENT ID:	B0MJX6	**DATE RECEIVED:**	12/3/1997 4:00:00 PM

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
BETA	3.08E+00	1.5E+00	1.5E+00	2.70E+00	pCi/L	100.00%	RICHRC5014-B
TRITIUM	1.70E+04	5.7E+02	1.4E+03	3.01E+02	pCi/L	88.10%	RICHRC500[illegible]

Number of Results: 2

Result = IDL When Not Detected

Quanterra Data Review Checklist
RADIOCHEMISTRY

er number (s): 712073

ID: BN I

Due Date: 12-18-97

Lab Sample Number or SDG: W#21C0

Method Test Parameters: Beta

Matrix: Water

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			X	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?			X	
2. Were all sample holding times met?	X			/
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	X			/
C. QC Samples				
1. Is the blank yield within acceptance criteria			X	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	X			/
3. Is the blank result < 1/2 the Contract Detection Limit?	X			/
4. Is the blank > 1/2 the Contract Detection Limit but < Contract Detection Limit?			X	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			X	
6. Is the LCS result within acceptance criteria?	✓			/
7. Is the LCS yield within acceptance criteria	X			/
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	X			/
9. MS/MSD results and yield meet acceptance criteria?			X	
10. Duplicate sample results and yield meet acceptance criteria?	X			/
D. Other				
1. Are all Nonconformances included and noted?			X	
2. Are all required forms filed out?	X			/
3. Correct methodology used?	X			/
4. Transcription checked? cm 12-9-97	X			
5. Were all calculations checked at a minimum frequency?	X			
6. Units checked?	X			/

Comments on any "No" response: _____

First Level Review: _____ Date: 12/9/97

Second Level Review: _____ Date: 12/16/97

Form #: LS-038.2 /96, Rev 4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	712073, 711106, 711019
Client ID:	BHI
Due Date:	12-18-97
Lab Sample Number or SDG:	WQ2100, WQ2041, WQ2031
Method Test Parameters:	Tritium
Matrix:	Water

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			X	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?			X	
2. Were all sample holding times met?	X			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	X			✓
C. QC Samples				
1. Is the blank yield within acceptance criteria			X	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	X			✓
3. Is the blank result < 1/2 the Contract Detection Limit?	X			✓
4. Is the blank > 1/2 the Contract Detection Limit but < Contract Detection Limit?			X	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			X	
6. Is the LCS result within acceptance criteria?	X			✓
7. Is the LCS yield within acceptance criteria	X			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	X			✓
9. MS/MSD results and yield meet acceptance criteria?			X	
10. Duplicate sample results and yield meet acceptance criteria?	X			✓
D. Other				
1. Are all Nonconformances included and noted?			X	
2. Are all required forms filed out?	X			✓
3. Correct methodology used?	X			✓
4. Transcription checked? JM 12-10-97	X			
5. Were all calculations checked at a minimum frequency?	X			
6. Units checked?	X			✓

Comments on any "No" response: _____

First Level Review: _____ Date: 12/11/97

Second Level Review: _____ Date: 12/16/97

Form #: LS-038.2/96, Rev.4

CHAIN OF

CUSTODY FORMS

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B97-159-193	Page 1 of 1

Collector D. Weeks/L. Walker	**Company Contact** Jane V. Borghese	**Telephone No.** 375-4688	**Project Coordinator** Koerner, CC	**Data Turnaround** 15 Days
Project Designation Aquifer Sample Tube Installation Sampling	**Sampling Location** 100-Areas		**SAF No.** B97-159	
Ice Chest No. SML-558	**Field Logbook No.**		**Method of Shipment** Hand Delivery - Govt. Vehicle	
Shipped To Quanterra Incorporated	**Offsite Property No.**		**Bill of Lading/Air Bill No.** N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS
None Known

Special Handling and/or Storage

SAMPLE ANALYSIS 712073 SDG W0210

Preservation	HNO3 to pH <2	None	None										
Type of Container	P	P	aG										
No. of Container(s)	1	1	3										
Volume	1L	20ml	500ml										
	Gross Beta	Activity Scan	Tritium - H3										
Sample No.	Matrix *	Sample Date	Sample Time										
B0MJX5 01	Water	12/3/97	1030	X	X	X							
B0MJX6 02	Water	12/3/97	1230	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time 12/3/97 1540	Received By R. Fahlberg / R. Fahlberg	Date/Time 12/3/97 1540
Relinquished By R. Fahlberg / T. Eddy	Date/Time 12-3-97 1600	Received By Karen Ashenburg	Date/Time 12-3-97 1600
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
15 Day Turnaround Time

Lincoln

Matrix *

S	= Soil
SE	= Sediment
SO	= Solid
SL	= Sludge
W	= Water
O	= Oil
A	= Air
DS	= Drum Solids
DL	= Drum Liquids
T	= Tissue
WI	= Wipe
L	= Liquid
V	= Vegetation
X	= Other

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

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 12-3-97 1600 SG#: W0210

Work Order Number: 712073 SAF #: B97-159

Shipping Container ID: ERC 96-056 Chain of Custody # B97-159-193

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 10
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - [✓] tape
   - [X] custody seals
   - [ ] hazard labels
   - [ ] appropriate sample labels

9. Samples are:
   - [X] in good condition
   - [ ] broken
   - [ ] leaking
   - [ ] have air bubbles

10. Where any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Date: 12-3-97

Telephoned To: _____ On _____ By _____

7/20/03 Rec'd.

Client Sample Screening Results

04-Dec-97

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
BHI B0MJX5		12/4/1997	QUAD23B	12/4/1997 9:14:31 AM	B0MJX5	30	33	1.03833333	112	2.7816667
01	LIQUID		Bkg:	12/4/1997 12:03:59 AM	BKG	600	37	0.06166667	571	0.9516667
Anl Date: 12/4/1997	Tot Sa, Alq: 2.50E+00	, 1.00E+01	Alp;	(Dpm/ 3.17E+00	(uCi/ 3.57E-04	(pCi/ 1.43E+02	± 3.0E+01	CAT	1.8E-01	Lab
Ppt mg: 2.9	Units: L	, ml	Bet;	Alq): 4.67E+00	Sa): 5.26E-04	L/g): 2.10E+02	± 2.9E+01	I	2.4E-01	Alq L/g
BHI B0MJX6		12/4/1997	QUAD23C	12/4/1997 9:14:31 AM	B0MJX6	30	22	0.655	82	1.8283333
02	LIQUID		Bkg:	12/4/1997 12:03:59 AM	BKG	600	47	0.07833333	543	0.905
Anl Date: 12/4/1997	Tot Sa, Alq: 2.50E+00	, 1.00E+01	Alp;	(Dpm/ 1.92E+00	(uCi/ 2.17E-04	(pCi/ 8.66E+01	± 2.6E+01	CAT	2.9E-01	Lab
Ppt mg: 3.3	Units: L	, ml	Bet;	Alq): 3.16E+00	Sa): 3.56E-04	L/g): 1.43E+02	± 2.6E+01	I	3.5E-01	Alq L/g

Reviewed 12/4/97 MD

000016

*** BETA ***

Dec 97
12-18-97

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

4-Dec-1997
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP WO2100

MATRIX : WATER B97-159

BATCH NUMBER 12-073

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
~~1)~~	~~71207301~~		~~BHI~~	~~BOMJX5~~	
	T1207315				
1)	71207301		BHI	BOMJX5	pH<2
	R1207301				
2)	71207302		BHI	BOMJX6	✓

ACTIONS (Initial & Date)

1) INITIATED SH 12/4/97

SOP(S) # RD355W

2) PREP LAB RECEIVED 12/5/97 BG

SOP(S) # RICHRC8014W

3) SAMPLE REMAINDER STORED N/A

SOP(S) # ✓

4) SEPARATION LAB RECEIVED ✓

SOP(S) # ✓

5) COUNTING/MEASUREMENT LAB 12/8/97

SOP(S) # RICHRO2203

6) DATA REVIEWED AND ANALYTICAL PREP STORED GB 12/9/97

SOP(S) # RICHRD0002

Quanterra
Environmental Services

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Tritium **MATRIX** water **DUE DATE** 12-18-97

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
T 13073	~~-LB~~ 1N03N	BHI W02100	QC BATCH REAGENT BLANK
T 13073	-LX		QC BATCH MATRIX BLANK
T 13073	~~-1M~~ (1S) (circle)		QC BATCH MATRIX/REAGENT SPIKE
T NA	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
R 1207301	-		Duplicate of Sample # 71207301
71207301	- 02		
T11106	- 1X, 1m, 1S	W02041	
R1110601	-		Dup of Sample # 71110601
71110601	-		
T11019	- 1X, 1m, 1S	W02031	
R1101901	-		Dup of Sample # 71101901
71101901	- 02		

Batched and QC updated by BAB on 12-5-97

Rec'd in Prep Lab by NA	on NA	Sop# RICHRC 5007	Rev# 1
Rec'd in Sep Lab by	on	Sop# NA	Rev# NA
Rec'd in Sep lab by	on	Sop#	Rev#
ED/CPPT by	on	Sop#	Rev#
Rec'd in C.R. by [illegible]	on 12/5/97	Sop# RICHRD0001	Rev# 0
Data Reviewed by SE	on 12/11/97	Sop# RICHRD0002	Rev# 1

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/97, Rev. 7

Dul 12-18-97

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP 100210

MATRIX : WATER B97-159

BATCH NUMBER 12-073

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	T120731N T120732N T120733N				
1)	71207301		BHI	BOMJX5	
	R1207301	Dup			
2)	71207302		BHI	BOMJX6	
	T120721X T120721S T120721m				61.354 ± 2.647 dpm/10 ml # 3911

ACTIONS (Initial & Date)

1) INITIATED JH 12/4/97

SOP(S) # RDMD

2) PREP LAB RECEIVED BAB 12-5-97

SOP(S) # RICHLC 5007

3) SAMPLE REMAINDER STORED ~ 19

SOP(S) # _____

4) SEPARATION LAB RECEIVED _____

SOP(S) # _____

5) COUNTING/MEASUREMENT LAB _____

SOP(S) # _____

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

SOP(S) # _____