START 9613453.0818

0044646 W0740

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

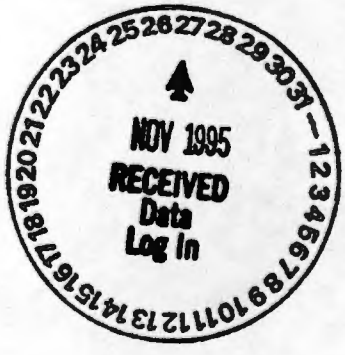
509 375-3131 Telephone
509 375-5590 Fax

Analytical Data Package Prepared For

Westinghouse/Bechtel Hanford

Radiochemical Analysis By

Quanterra Environmental Services
Richland Laboratory



Sample Delivery Group Number: W0740

CLIENT ID NUMBER	QUANTERRA ID NUMBER
B0GFN5	50940101
B0GFN9	50940102
B0GFN6	50946501

9613453.0819

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

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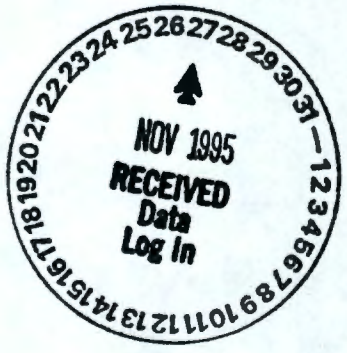
CERTIFICATE OF ANALYSIS



Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

November 27, 1995

Attention: Joan Kessner

SAF Number	:	B95-082
Date SDG Closed	:	October 11, 1995
Number of Samples	:	Three (3)
Sample Type	:	Water
SDG Number	:	W0740
Data Deliverable	:	Summary

I. Introduction

On September 27 and 29, 1995, a total of three 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:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50940101	B0GFN5	Water	9/27/95
50940102	B0GFN9	Water	9/27/95
50946501	B0GFN6	Water	9/29/95

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.

The requested analyses were:

Gas Proportional Counting
Gross Beta by method ITAS-RD-3214
Liquid Scintillation Counting
Technetium-99 by method ITAS-IT-RS-0001

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III. Quality Control

The analytical results for each analysis performed under SDG W0740 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 ITAS-RD-3214
The LCS, batch blank, sample and sample duplicate (B0GFN5) results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by method ITAS-IT-RS-0001
The samples were recounted due to an error in the order of the original count of the batch. The recount is accepted and reported. The matrix spike, LCS, batch blank, sample and sample duplicate (B0GFN6) 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:

Suzanne Gaines

Suzanne Gaines
Project Manager

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0740
LAB SAMPLE ID:	50940101	**MATRIX:**	WATER
CLIENT ID:	B0GFN5	**DATE RECEIVED:**	9/27/95 10:05:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
BETA	1.61E+02	6.3E+00	1.3E+01	2.89E+00	pCi/L	100.00%	RD3214
TC-99	6.85E+02	8.5E+00	7.8E+01	3.90E+00	pCi/L	95.10%	ITAS-IT-RS-0001

Number of Results: 2

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SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0740
LAB SAMPLE ID:	50940102	**MATRIX:**	WATER
CLIENT ID:	B0GFN9	**DATE RECEIVED:**	9/27/95 10:05:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
BETA	1.39E+02	8.6E+00	1.3E+01	7.47E+00	pCi/L	100.00%	RD3214
TC-99	1.54E+02	4.3E+00	2.0E+01	3.90E+00	pCi/L	95.10%	ITAS-IT-RS-0001

Number of Results: 2

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Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0740
LAB SAMPLE ID:	50946501	**MATRIX:**	WATER
CLIENT ID:	B0GFN6	**DATE RECEIVED:**	9/29/95 12:40:00 PM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
BETA	9.45E+01	4.9E+00	8.3E+00	2.85E+00	pCi/L	100.00%	RD3214
TC-99	3.38E+02	6.1E+00	4.0E+01	3.90E+00	pCi/L	95.10%	ITAS-IT-RS-0001

Number of Results: 2

9613453.0824

11-25-95

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ITAS Data Review Checklist
RADIOCHEMISTRY

BHI - Water

Work Order No(s): 509401, 509465

Lab Sample Numbers or SDG: W0740

Method/Test/Parameter: Beta

	Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level review (✓)
A. 1.	**Calibration** Is the calibration documentation included where applicable?			✓	✓
B. 1.	**Sample Analysis** Are the sample Yields within acceptance criteria?			✓	✓
2.	Were all sample holding times met?	✓			✓
C. 1.	**QC Samples** 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?	✓			✓
D. 1.	**Other** Are all nonconformances included and noted?			✓	✓
2.	Are all required forms filled out?	✓			✓
3.	Correct methodology used?	✓			
4.	Transcription checked?	JM			JMC
5.	Were all calculations checked at a minimum frequency?	✓			✓
6.	Units checked?	✓			✓

Comments on any "No" response:

Analyst: [signature] Date: 10-25-95

Second Level Review: [signature] Date: 11/27/95

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

C000012

9613453.0825

LS.95

Quanterra
Environmental Services

ITAS Data Review Checklist
RADIOCHEMISTRY

BHI-Water

Work Order No(s): 509401, 509465

Lab Sample Numbers or SDG: W0740

Method/Test/Parameter: Tc-99

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd 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?	✓			✓
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. 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?	✓			✓
D. Other				
1. Are all nonconformances included and noted?	✓			✓
2. Are all required forms filled out?	✓			✓
3. Correct methodology used?	✓			✓
4. Transcription checked?	JM			11/2
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Units checked?	✓			✓

Comments on any "No" response:

Analyst: Joel Thompson Date: 10-24-95

Second Level Review: Suzy Davies Date: 11/27/95

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

C000013

9613453.0826

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG #: RD-95- 364

Project ID: BHI NCM Initiated by: Joel Kempema

Sample Numbers: M094011S, H094010Z

Tests: Tc99

Matrix: Water WO740

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) 10-24-95

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):*** Samples counted in reversed order

Comments/Explanation: Sample results indicated the samples were switched or order reverted, upon examining samples in tray they were ordered as on COC but which is reversed from order on counting request sheet.

Notification (check appropriate area):

Client notified by (name and date): _____

- ☐ in writing
- ☐ by telephone
- ☐ by facsimile
- ☐ other (explain)

Client's name and response: _____

- ☐ process "as is"
- ☐ or hold until _____
- ☐ re-sample
- ☐ other (explain)

Project Manager (signature and date): Suzy Deimes 11/7/95

C000014

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG#: RD-95- 304

Corrective Action

Root Cause Initial and date: JJK 10-24-95

Lab technician error in arranging samples in counting rack

Corrective Action Initial and Date: JJK 10-24-95

Error uncovered, samples recounted in proper order. Recount results accepted.

Responsibility for performing CA assigned to: _____

Actions to prevent recurrence Initial and Date: WFM 11/27/95

Supervisor will inform the technician of this error.

Team leader Steve spoke with Tech BJ 11/27/95

BJ 11/27/95

First Level Supervisor: Joel T Kempema Date: 10-24-95

Responsible Manager: W. MacKellar Date: 11/27/95

Quality Assurance Review

☑ Anomaly ☐ Deficiency ☐ Rerun

☐ Further action required: _____

Assigned to: _____

QA signature: Beverly A Thomas Date: 11/27/95

Corrective Action Verification

☑ Verified

☐ Cannot Verify (specify reason): _____

Nonconformance Memo Closure

QA signature/date: Beverly A Thomas 11/27/95

CHAIN OF

CUSTODY FORMS

Bechtel Hanford, Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 1
		Data Turnaround ☐ Priority ■ Normal

Collector: K. J. Lee	Company Contact: C. D. Wittreich	Telephone: (509) 372-9315
Project Designation: 200-UP-1 LFI Groundwater Sampling - Round 3	Sampling Location: 200 West	SAF No.: B95-082
Ice Chest No.	Field Logbook No.: EFL-1124	Method of Shipment: Hand Delivered
Shipped To: Quanterra	Offsite Property No.: NA	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: Maintain samples between 2°C and 6°C.		

SAMPLE ANALYSIS: 509401O1 SDG W0714O

Preservation					HNO_3		HCl	None		
Type of Container					P/G		P/G	P/G		
No. of Container(s)					1		3	1		
Volume					1L		1L	20mL		
					Gross Beta		Tc-99	Activity Scan		

Sample No.	Matrix*	Date Sampled	Time Sampled										
B0GFN5	W	9/26/95	1222					X		X	X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: STEVE GUZE	Date/Time: 9/26/95 1400	Received By: ERC	Date/Time: 1400
Relinquished By: ERC Barbara Baldwin	Date/Time: 10:05 9-27-95	Received By: Karen McKinley	Date/Time: 10:0 9-27-95
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
*1 4, 1L and 1, 500mL.

The Activity Scan is for all samples listed on this chain of custody.

5 Days TAT

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

C0001O7

C0001O7

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround: ☐ Priority ■ Normal

Collector	Company Contact C. D. Wittreich	Telephone (509) 372-9315
Project Designation 200-UP-1 LFI Groundwater Sampling - Round 3	Sampling Location 200 West	SAF No. B95-082
Ice Chest No.	Field Logbook No. EFL-1124	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. NA	Bill of Lading/Air Bill No. NA

Possible Sample Hazards/Remarks

Special Handling and/or Storage
Maintain samples between 2°C and 6°C.

			Preservation					HNO$_3$		HCl	None		
			Type of Container					P/G		P/G	P/G		
			No. of Container(s)					1		3	1		
			Volume					1L		1L	20mL		
SAMPLE ANALYSIS 50940102		SDG W0740						Gross Beta		Tc-99	Activity Scan		
Sample No.	Matrix*	Date Sampled	Time Sampled										
B0GFN9	W	9/26/95	1215					X		X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature] Steven [illegible]	9/26/95 1400	[signature] Bah.Hon	9-26-95 1400
[signature] Bah.Hon	9-27-95 10:05	Karen [illegible]	9-27-95 10:05
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
*1 4, 1L and 1, 500mL.

The Activity Scan is for all samples listed on this chain of custody.

[illegible] 100CPM

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

9 6 1 2 5 2 . 0 8 2 0

C000018

Environmental Restoration Contractor **ERC Team**

Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: 200-UP-1
TSD: N/A
ERA: N/A
Subject Code: 5400

TO: Curt Wittreich H6-02
Wendy Thompson N3-05

DATE: June 1,1995

COPIES: See Below

FROM: Michael Wesselman
Radiological Controls/200 areas
H4-82/ 372-9079

SUBJECT: **Exemption of Samples from the 200-UP-1 IRM, and the Limited Field Investigation(LFI) sampling from total activities.**

After reviewing sampling data recorded on GeoDat, it has been concluded that there is no need to perform total activity analysis of water samples from the designated wells on the attached list prior to offsite shipment. Only one of the wells submitted for assessment exceeds the 2000 picocurie per gram limit for shipment as a nonradioactive by Department of Transportation (DOT). Activity trends in all wells has been downward for the last twenty years. All gross alpha activities since 1990 have been less than 30 pCi/liter, and gross beta less than 1000 pCi/liter All discharges of radioactive material to the ground in the 200 West area have ceased, or been greatly reduced. Based on the above information and the results of total activities performed to date, there is sufficient process knowledge to conclude that preshipment screening of water samples is no longer required at all wells except for 299-W22-9.

Well # 299-W22-9, last sampled in December, 1993, was recorded as having 2,800,000 pCi/liter of tritium. The trend in 1993 was that the level dropped by 500,000 pCi/liter, per quarter for the year. A total activity of this well's water could prove that it does not qualify for packaging as radioactive per DOT requirements. If no total activity is performed this sample will have to be shipped as radioactive, curie content and isotopes can be determined from the 12/93 sampling data.

This exemption from total activities is valid as long as the activities of any of the wells does not exceed 100,000 pCi/liter for uranium, iodine, and technetium combined, remain less than 1,000,000 pCi/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. Radiological coverage is not required unless entry into contaminated areas or wells tagged as radioative is expected.

M.W.

Well List and Requested Analyses for 200-UP-1 LFI Second Round of Groundwater Sampling

Well	Requested Analysis	Notes
299-W14-10	Pesticides, Semi-Volatiles, Cadmium	
299-W22-1	Sr-90	
299-W22-2	Sr-90	
299-W22-7	Gross Beta, VOA	Sampled last on 2/8/95; HEIS no. B0DMZ2
299-W22-19	Gross Beta, VOA, Chromium	Sampled last on 2/14/95; HEIS no. B0DM26
299-W22-20	VOA, Chromium	Sampled last on 2/8/95; HEIS no. B0DMZ8
299-W22-21	Pu-238, I-129, Sr-90, Tc-99, Gross Alpha, Gross Beta, VOA, Chromium	
299-W23-2	Gross Beta, Tc-99	
299-W23-3	Gross Beta, Tc-99	
299-W23-4	U-234/235/238, Gross Alpha, Gross Beta, VOA	Sampled last on 2/13/95, HEIS no. B0DN02
299-W23-7	Gross Beta, Tc-99	
299-W23-10	Semi-Volatiles,	
299-W26-6	Chromium,	
299-W27-1	Pu-238, Chromium, VOA	Sampled last on 1/13/95; HEIS no. B0DN08
699-32-62	I-129	
699-36-61A	Nitrate, I-129	
699-36-70A	Nitrate, I-129	Sampled last on 2/10/95; HEIS no. B0DN10
699-40-62	Nitrate, I-129	

WELL REQUIRING A TOTAL ACTIVITY

299-W22-9 VOA, Chromium, I-129 2.8E6 pCi/L TRITIUM IN 12/93

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 9-27-95 10:05 Client Name BHI

Project/Client # B95-082 Batch or Case # _____

Cooler ID (if noted on outside of cooler) ER-9

1. Condition of shipping container? O.K.
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [X]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [X] No [ ] _____
7. Number of sample containers in cooler: 22
8. Samples have:
   - [X] tape
   - [X] custody seals
   - [ ] hazard labels
   - [ ] appropriate sample labels
9. Samples are:
   - [X] in good condition
   - [ ] broken
   - [ ] other
   - [ ] leaking
   - [ ] have air bubbles
10. Coolant Present? Yes [X] No [ ] Sample Temperature 4°C
11. The following paperwork should be accounted for (N/A if not applicable):
    - Chain of Custody #(s) N/A
    - Request for Analysis #(s) _____
    - Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [X]

Printed Name/Signature Susan Ackerman Date/Time 9-27-95 10:10

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 9-27-95 10:05 Client Name BHI

Project/Client # B95-082 Batch or Case # _____

Cooler ID (if noted on outside of cooler) ER-9

1. Condition of shipping container? O.K.
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [X]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [X] No [ ] _____
7. Number of sample containers in cooler: 22
8. Samples have:
   - [X] tape
   - [X] custody seals
   - [ ] hazard labels
   - [ ] appropriate sample labels
9. Samples are:
   - [X] in good condition
   - [ ] broken
   - [ ] other
   - [ ] leaking
   - [ ] have air bubbles
10. Coolant Present? Yes [X] No [ ] Sample Temperature 4°C
11. The following paperwork should be accounted for (N/A if not applicable):
    - Chain of Custody #(s) N/A
    - Request for Analysis #(s) _____
    - Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [X]

Printed Name/Signature Susan Achterberg Date/Time 9-27-95 10:10

SDG 40740 WO# 509401

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 9-27-95 10:05 Client Name BHI

Project/Client # B95-082 Batch or Case # _____

Cooler ID (if noted on outside of cooler) ER-9

1. Condition of shipping container? O.K.
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [X]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [X] No [ ] _____
7. Number of sample containers in cooler: 22
8. Samples have:
   - [X] tape
   - [X] custody seals
   - [ ] hazard labels
   - [ ] appropriate sample labels
9. Samples are:
   - [X] in good condition
   - [ ] broken
   - [ ] other
   - [ ] leaking
   - [ ] have air bubbles
10. Coolant Present? Yes [X] No [ ] Sample Temperature 4°C
11. The following paperwork should be accounted for (N/A if not applicable):
    - Chain of Custody #(s) N/A
    - Request for Analysis #(s) ✓
    - Airbill # ✓ Carrier _____
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [X]

Printed Name/Signature Karen Hottenberg Date/Time 9-27-95 10:10

509401-Rad

SDG WO740

Client Sample Screening Results

27-Sep-95

(R3) 9/27/95

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
WHC B0GFN5		9/27/95 10:05:00 AM	QUAD21A	9/27/95 3:17:35 PM	B0GFN5	30	30	0.95375	296	8.7591667
01	LIQUID		Bkg:	9/27/95 5:00:22 AM	BKG	800	37	0.04625	886	1.1075
Anl Date: 9/27/95	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp; (Dpm/ 2.54E+00	(uCi/ 1.15E-04	(pCi/ 1.15E+02	± 2.9E+01	CAT	2.2E-01	Lab	
Ppt mg: 1.2	Units: L	, ml	Bet; Alq): 1.70E+01	Sa): 7.65E-04	L|g): 7.65E+02	± 5.1E+01	I	6.5E-02	Alq	
									Lig	
WHC B0GFN9		9/27/95 10:05:00 AM	QUAD21B	9/27/95 3:17:35 PM	B0GFN9	30	6	0.1575	84	1.86625
02	LIQUID		Bkg:	9/27/95 5:00:22 AM	BKG	800	34	0.0425	747	0.93375
Anl Date: 9/27/95	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp; (Dpm/ 4.46E-01	(uCi/ 2.01E-05	(pCi/ 2.01E+01	± 2.2E+01	CAT	1.2E+00	Lab	
Ppt mg: 2.4	Units: L	, ml	Bet; Alq): 3.53E+00	Sa): 1.59E-04	L|g): 1.59E+02	± 2.7E+01	I	3.1E-01	Alq	
									Lig	
WHC B0GKK1		9/27/95 10:05:00 AM	QUAD21C	9/27/95 3:17:35 PM	B0GKK1	30	26	0.83166667	108	2.39625
	LIQUID		Bkg:	9/27/95 5:00:22 AM	BKG	800	28	0.035	963	1.20375
Anl Date: 9/27/95	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp; (Dpm/ 2.36E+00	(uCi/ 1.06E-04	(pCi/ 1.06E+02	± 2.8E+01	CAT	2.4E-01	Lab	
Ppt mg: 0.6	Units: L	, ml	Bet; Alq): 4.22E+00	Sa): 1.90E-04	L|g): 1.90E+02	± 3.0E+01	I	2.6E-01	Alq	
									Lig	
WHC B0GKZ4		9/27/95 10:05:00 AM	QUAD21D	9/27/95 3:17:35 PM	B0GKZ4	30	31	0.98333333	1278	41.59625
	LIQUID		Bkg:	9/27/95 5:00:22 AM	BKG	800	40	0.05	803	1.00375
Anl Date: 9/27/95	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp; (Dpm/ 1.84E+00	(uCi/ 8.30E-05	(pCi/ 8.30E+01	± 2.7E+01	CAT	3.0E-01	Lab	
Ppt mg: 1.2	Units: L	, ml	Bet; Alq): 8.12E+01	Sa): 3.66E-03	L|g): 3.66E+03	± 1.0E+02	I	1.4E-02	Alq	
									Lig	

C000024

96080-5345-0836

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: ☐ Priority ■ Normal

Collector: A R, 2220	Company Contact: C. D. Wittreich	Telephone: (509) 372-9315
Project Designation: 200-UP-1 LFI Groundwater Sampling - Round 3	Sampling Location: 200 West	SAF No.: B95-082
Ice Chest No.: EC-20	Field Logbook No.: EFR - 1124	Method of Shipment: Hand Delivered
Shipped To: Quanterra	Offsite Property No.: NA	Bill of Lading/Air Bill No.: NA
Possible Sample Hazards/Remarks	Special Handling and/or Storage: Maintain samples between 2°C and 6°C.	

SAMPLE ANALYSIS: 50946501 SDC LOC 740

Sample No.	Matrix*	Date Sampled	Time Sampled	Preservation	Type of Container	No. of Container(s)	Volume	HNO_3	HCl	None			Gross Beta	Tc-99	Activity Scan		
								P/G	P/G	P/G			1	3	1		
								1L	1L	20mL							
B0GFN6	W	9-27-95	1053					X	X	X							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: AGR, 2220 (SERVICE)	Date/Time: 9-27-95 1245	Received By: EC Burkhart	Date/Time: 9-27-95 1245
Relinquished By: EC Burkhart	Date/Time: 9-29-95 1240	Received By: Tom Patterson	Date/Time: 9/29/95 1240
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
*1 4, 1L and 1, 500mL.

The Activity Scan is for all samples listed on this chain of custody.

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

C0000253

C0000253

Environmental Restoration Contractor **ERC Team**

Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: 200-UP-1
TSD: N/A
ERA: N/A
Subject Code: 5480

TO: Curt Wittreich H6-02
Wendy Thompson N3-01

DATE: June 1,1995

COPIES: See Below

FROM: Michael Wesselman
Radiological Controls/200 areas
H4-82/ 372-9079

SUBJECT: **Exemption of Samples from the 200-UP-1 IRM, and the Limited Field Investigation(LFI) sampling from total activities.**

After reviewing sampling data recorded on GeoDat, it has been concluded that there is no need to perform total activity analysis of water samples from the designated wells on the attached list prior to offsite shipment. Only one of the wells submitted for assessment exceeds the 2000 picocurie per gram limit for shipment as a nonradioactive by Department of Transportation (DOT). Activity trends in all wells has been downward for the last twenty years. All gross alpha activities since 1990 have been less than 30 pCi/liter, and gross beta less than 1000 pCi/liter All discharges of radioactive material to the ground in the 200 West area have ceased, or been greatly reduced. Based on the above information and the results of total activities performed to date, there is sufficient process knowledge to conclude that preshipment screening of water samples is no longer required at all wells except for 299-W22-9.

Well # 299-W22-9, last sampled in December, 1993, was recorded as having 2,800,000 pCi/liter of tritium. The trend in 1993 was that the level dropped by 500,000 pCi/liter, per quarter for the year. A total activity of this well's water could prove that it does not qualify for packaging as radioactive per DOT requirements. If no total activity is performed this sample will have to be shipped as radioactive, curie content and isotopes can be determined from the 12/93 sampling data.

This exemption from total activities is valid as long as the activities of any of the wells does not exceed 100,000 pCi/liter for uranium, iodine, and technetium combined, remain less than 1,000,000 pCi/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. Radiological coverage is not required unless entry into contaminated areas or wells tagged as radioative is expected.

M.W.

Well List and Requested Analyses for 200-UP-1 LFI Second Round of Groundwater Sampling

Well	Requested Analysis	Notes
299-W14-10	Pesticides, Semi-Volatiles, Cadmium	
299-W22-1	Sr-90	
299-W22-2	Sr-90	
299-W22-7	Gross Beta, VOA	Sampled last on 2/8/95; HEIS no. B0DMZ2
299-W22-19	Gross Beta, VOA, Chromium	Sampled last on 2/14/95; HEIS no. B0DM26
299-W22-20	VOA, Chromium	Sampled last on 2/8/95; HEIS no. B0DMZ8
299-W22-21	Pu-238, I-129, Sr-90, Tc-99, Gross Alpha, Gross Beta, VOA, Chromium	
299-W23-2	Gross Beta, Tc-99	
299-W23-3	Gross Beta, Tc-99	
299-W23-4	U-234/235/238, Gross Alpha, Gross Beta, VOA	Sampled last on 2/13/95, HEIS no. B0DN02
299-W23-7	Gross Beta, Tc-99	
299-W23-10	Semi-Volatiles,	
299-W26-6	Chromium,	
299-W27-1	Pu-238, Chromium, VOA	Sampled last on 1/13/95; HEIS no. B0DN08
699-32-62	I-129	
699-36-61A	Nitrate, I-129	
699-36-70A	Nitrate, I-129	Sampled last on 2/10/95; HEIS no. B0DN10
699-40-62	Nitrate, I-129	

WELL REQUIRING A TOTAL ACTIVITY

299-W22-9 VOA, Chromium, I-129 2.8E6 pCi/L TRITIUM IN 12/93

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 9/29/95 Client Name BHI

Project/Client # B95-082 Batch or Case # _____

Cooler ID (if noted on outside of cooler) ER-20

1. Condition of shipping container? ok
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [X]
5. Vermiculite/packing material is: Wet [X] Dry [ ] _____
6. Each sample is in a plastic bag? Yes [ ] No [X] _____
7. Number of sample containers in cooler: 13
8. Samples have:
   - X tape
   - X custody seals
   - ____ hazard labels
   - ____ appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ broken
   - ____ other
   - ____ leaking
   - ____ have air bubbles
10. Coolant Present? Yes [X] 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) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Tom Gilmore Tom Gilmore Date/Time 9/29/95 1240

5-09-465-Rad

SDW-WD740

Client Sample Screening Results

29-Sep-95

(R3) 9/29/95

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
WHC B0GFN6		9/29/95 12:40:00 PM	QUAD23A	9/29/95 2:21:47 PM	B0GFN6	30	18	0.544	184	5.1713333
01	LIQUID		Bkg:	9/29/95 2:05:35 AM	BKG	500	28	0.056	481	0.962
Anl Date: 9/29/95	Tot Sa, Alq: 1.00E+00 ✓	, 1.00E+01	Alp; (Dpm/ 1.47E+00	(uCi/ 6.63E-05	(pCi/ 6.63E+01	± 2.4E+01	CAT I ✓	3.8E-01	Lab Alq	
Ppt mg: 1.5 ✓	Units: L ✓	, ml	Bet; Alq): 9.47E+00	Sa): 4.27E-04	L/g): 4.27E+02	± 3.8E+01		1.2E-01	L/g	
WHC B0GKK2		9/29/95 12:40:00 PM	QUAD23B	9/29/95 2:21:47 PM	B0GKK2	30	27	0.856	97	2.2753333
	LIQUID		Bkg:	9/29/95 2:05:35 AM	BKG	500	22	0.044	479	0.958
Anl Date: 9/29/95	Tot Sa, Alq: 1.00E+00 ✓	, 1.00E+01	Alp; (Dpm/ 2.55E+00	(uCi/ 1.15E-04	(pCi/ 1.15E+02	± 2.8E+01	CAT I ✓	2.2E-01	Lab Alq	
Ppt mg: 1.1 ✓	Units: L	, ml	Bet; Alq): 3.78E+00	Sa): 1.70E-04	L/g): 1.70E+02	± 2.7E+01		2.9E-01	L/g	
WHC B0GKK3		9/29/95 12:40:00 PM	QUAD23C	9/29/95 2:21:47 PM	B0GKK3	30	22	0.68733333	97	2.1893333
	LIQUID		Bkg:	9/29/95 2:05:35 AM	BKG	500	23	0.046	522	1.044
Anl Date: 9/29/95	Tot Sa, Alq: 1.00E+00 ✓	, 1.00E+01	Alp; (Dpm/ 1.94E+00	(uCi/ 8.75E-05	(pCi/ 8.75E+01	± 2.6E+01	CAT I ✓	2.9E-01	Lab Alq	
Ppt mg: 1.2 ✓	Units: L	, ml	Bet; Alq): 3.83E+00	Sa): 1.72E-04	L/g): 1.72E+02	± 2.8E+01		2.9E-01	L/g	
WHC B0GKL7		9/29/95 12:40:00 PM	QUAD23D	9/29/95 2:21:47 PM	B0GKL7	30	453	15.06	699	22.358
	LIQUID		Bkg:	9/29/95 2:05:35 AM	BKG	500	20	0.04	471	0.942
Anl Date: 9/29/95	Tot Sa, Alq: 1.00E+00 ✓	, 1.00E+01	Alp; (Dpm/ 4.90E+01	(uCi/ 2.21E-03	(pCi/ 2.21E+03	± 9.3E+01	CAT I	1.1E-02	Lab Alq	
Ppt mg: 7.8 ✓	Units: L	, ml	Bet; Alq): 3.41E+01	Sa): 1.54E-03	L/g): 1.54E+03	± 6.8E+01	✓	3.3E-02	L/g	

C000029

9613453.0842 *** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD 27-Sep-1995
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP W0740

MATRIX : WATER B95-082

BATCH NUMBER 09-401

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	M0940118				
	M0940115		EQAH 2831		
1)	50940101		BHI	BOGFN5	
	G0940101		Dup		
2)	50940102		BHI	BOGFN9	

ACTIONS (Initial & Date)

1) INITIATED JH 9/27/95

2) PREP LAB RECEIVED 10-18-95 S

3) SAMPLE REMAINDER STORED 10-20-95 S

4) SEPARATION LAB RECEIVED n/a

5) COUNTING/MEASUREMENT LAB RD 10/20/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

C000030

9613453.0845 *** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD 29-Sep-1995
Page 1

CUSTOMER: BHI SAF SAMPLE DELIVERY GROUP W0740

MATRIX : WATER B95-082 BATCH NUMBER 09-465

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	50946501		BHI	BOGFN6	

ACTIONS (Initial & Date)

1) INITIATED JH 10/2/95

2) PREP LAB RECEIVED 10-18-95 C

3) SAMPLE REMAINDER STORED 10-20-95 C

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB DD 10/20/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

C000031

9613453.0844 *** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

27-Sep-1995
Page 1

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP WC740

MATRIX : WATER B95-082

BATCH NUMBER 09-401

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	50940101		BHI	BOGFN5	
2)	50940102		BHI	BOGFN9	

ACTIONS (Initial & Date)

1) INITIATED JH 9/27/95

2) PREP LAB RECEIVED _____

3) SAMPLE REMAINDER STORED _____

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB OD 10/20/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

C000032

9613453.0845 *** TC-99 ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

CUSTOMER: BHI SAF

SAMPLE DELIVERY GROUP WO740

MATRIX : WATER B95-082

BATCH NUMBER 09-465

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	50946501		BHI	BOGFN6	

ACTIONS (Initial & Date)

1) INITIATED JH 10/2/95

2) PREP LAB RECEIVED _____

3) SAMPLE REMAINDER STORED _____

4) SEPARATION LAB RECEIVED _____

5) COUNTING/MEASUREMENT LAB DD 10/20/95

6) DATA REVIEWED AND ANALYTICAL PREP STORED _____

C000033