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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

October 24, 1995

Attention: Joan Kessner



| | | |
|-------------------|---|-----------------|
| SAF Number | : | B95-080 |
| Date SDG Closed | : | October 6, 1995 |
| Number of Samples | : | Two (2) |
| Sample Type | : | Water |
| SDG Number | : | W0758 |
| Data Deliverable | : | Summary |

I. Introduction

On October 6, 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> |
|------------------|---------------|---------------|------------------------|
| 501010701 | BOGP07 | Water | 10/6/95 |
| 501010702 | BOGP05 | Water | 10/6/95 |

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 analysis was: **Gas Proportional Counting**
Strontium-90 by method ITAS-RD-3204

Bechtel Hanford, Inc.
October 24, 1995
Page 2

III. Quality Control

The analytical results for each analysis performed under SDG W0758 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

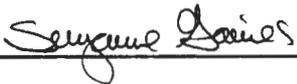
Gas Proportional Counting

Strontium-90 by method ITAS-RD-3204

The LCS, batch blank, sample and sample duplicate (B0GP07) 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
Project Manager

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND **SDG:** W0758
LAB SAMPLE ID: 51010701 **MATRIX:** WATER
CLIENT ID: B0GP07 **DATE RECEIVED:** 10/6/95 11:30:00 AM

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | REPORT UNIT | YIELD | METHOD NUMBER |
|-----------|----------|------------------------|---------------------|----------|----------------|--------|------------------|
| STRONTIUM | 1.36E+03 | 9.7E+00 | 3.6E+02 | 7.41E-01 | pCi/L | 99.40% | RD3204 |

Number of Results:

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND **SDG:** W0758
LAB SAMPLE ID: 51010702 **MATRIX:** WATER
CLIENT ID: B0GP05 **DATE RECEIVED:** 10/6/95 11:30:00 AM

| ISOTOPE | RESULT | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA | REPORT UNIT | YIELD | METHOD NUMBER |
|-----------|----------|------------------------|---------------------|----------|----------------|--------|------------------|
| STRONTIUM | 5.47E-01 | 3.4E-01 | 3.7E-01 | 8.08E-01 | pCi/L | 96.30% | RD3204 |

Number of Results:

10-21-95



ITAS Data Review Checklist
RADIOCHEMISTRY

B#I - Water

| Work Order No(s): 510 107 | | | | |
|--|---------|--------|-----------|----------------------------------|
| Lab Sample Numbers or SDG: W4758 | | | | |
| Method/Test/Parameter: - Total Sr | | | | |
| Review Item | Yes (✓) | No (✗) | N/A (N/A) | 2 nd 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? | WR | | | 7/7X |
| 5. Were all calculations checked at a minimum frequency? | ✓ | | | — |
| 6. Units checked? | ✓ | | | — |

Comments on any "No" response:

Analyst: Paul Kempson
 Second Level Review: Sally Jones
 Form No: LS-038, 3/94, Rev 2

Date: 10-13-95
 Date: 10/24/95

9613447.0457

**CHAIN OF
CUSTODY FORMS**

0010

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround
 Priority
 Normal

| | | |
|--|--------------------------------------|--------------------------------------|
| Collector <i>A. Rizzo</i> | Company Contact J.V. Borghese | Telephone (509) 372-9584 |
| Project Designation 100-NR-2 Performance Monitoring - Oct. 1995 | Sampling Location 100 N | SAF No. B95-080 |
| Ice Chest No. <i>ER-9</i> | Field Logbook No. <i>EFZ-1058</i> | Method of Shipment Hand Delivered |
| Shipped To Quanterra | Offsite Property No. NA | Bill of Lading/Air Bill No. NA |

| | | | | | | | | | | | | | |
|------------------------------------|--|------------|--|--------------|--|------------------|---------------|------|--|--|--|--|--|
| Possible Sample Hazards/Remarks | Preservation | | | | | HNO ₃ | Cool 4°C | | | | | | |
| | Type of Container | | | | | P/G | P/G | | | | | | |
| | No. of Container(s) | | | | | 3 | 1 | | | | | | |
| | Special Handling and/or Storage Maintain samples between 2°C and 6°C. | Volume | | | | | 1L | 20mL | | | | | |
| SAMPLE ANALYSIS <i>51010702</i> | | <i>SD6</i> | | <i>W0758</i> | | Sr-90 | Activity Scan | | | | | | |

| Sample No. | Matrix* | Date Sampled | Time Sampled | | | | | | | | | | |
|------------|---------|--------------|--------------|--|--|---|---|--|--|--|--|--|--|
| BOGP05 | W | 10-5-95 | 0941 | | | X | Y | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

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| | | | | | | | | | | | |
|---------------------------------------|----------------------------|---------------------------------|----------------------|----------------------|--|--|--|--|--|--|--|
| CHAIN OF POSSESSION | | Sign/Print Names | | SPECIAL INSTRUCTIONS | | | | | | Matrix* | |
| Relinquished By <i>Steve Gurek</i> | Date/Time 10/05/95 1400 | Received By <i>ER</i> | Date/Time 1400 | | | | | | | <ul style="list-style-type: none"> 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 | |
| Relinquished By <i>Eric Rizzo</i> | Date/Time 10-5-95 11:30 | Received By <i>Quanterra</i> | Date/Time 11:30 | | | | | | | | |
| Relinquished By <i>Bob Hatten</i> | Date/Time 10-6-95 | Received By <i>Quanterra</i> | Date/Time 10-6-95 | | | | | | | | |
| Relinquished By | Date/Time | Received By | Date/Time | | | | | | | | |
| LABORATORY SECTION | Received By | Title | | Date/Time | | | | | | | |
| FINAL SAMPLE DISPOSITION | Disposal Method | 0012 | | Disposed By | | | | | | Date/Time | |

2373 3178
9615447.0460

SAMPLE STATUS REPORT FOR N 5979. RAD SCREEN 199N92A TIME: 10/ 6/95 8:57
DISPATCHED: 9/29/95 10:56 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/ 5/95 11:45

| EXT. | DETER. | RESULTS OR STATUS | OUT OF RANGE? | GOOD ANS? | CHARGE CODE |
|------|---------|---------------------|---------------|-----------|-------------|
| **** | ***** | ***** | *** | *** | ***** |
| 4271 | TOT-ACT | < 5.00000E 01 pCi/G | N | Y | XR5807 |

END OF REPORT

9613447.0461

SAMPLE STATUS REPORT FOR N 5979. RAD SCREEN 199N92A TIME: 10/ 6/95 8:57
 DISPATCHED: 9/29/95 10:56 SAMPLE HAS NOT BEEN SLURPED
 RECEIVED: 10/ 5/95 11:45

| EXT. | DETER. | RESULTS OR STATUS | OUT OF RANGE? | GOOD ANS? | CHARGE CODE |
|------|---------|---------------------|---------------|-----------|-------------|
| **** | ***** | ***** | *** | *** | ***** |
| 4271 | TOT-ACT | < 5.00000E 01 pCi/G | N | Y | XR5807 |

END OF REPORT

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10-6-95 11:30 Client Name _____

Project/Client # B95-080 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: 6

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 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 N/A

- 12. Have any anomalies been identified above? Yes [] No []

13. Memos have been initiated for all anomalies identified above? Yes []

Printed Name/Signature Karin A. Huxley Date/Time 10-6-95 11:30

Client Sample Screening Results

06-Oct-95

(B) 10/6/95

| CLIENT CODE | ID | MATRIX | RECEIVED | DETECTOR | ACQ DATE | SAMPLE | MINUTES | CNTS A | NET CPM A | CNTS B | NET CPM B | | | |
|-------------|---------|--------------|---------------------|------------|--------------------|----------|---------|----------|------------|----------|-----------|-----|---------|-----|
| BHI | B0GP05 | | 10/6/95 11:30:00 AM | QUAD22A | 10/6/95 2:45:54 PM | B0GP05 | 30 | 21 | 0.63875 | 99 | 2.23625 | | | |
| | | LIQUID | | Bkg: | 10/6/95 7:22:48 AM | BKG | 800 | 49 | 0.06125 | 851 | 1.06375 | | | |
| Anl Date: | 10/6/95 | Tot Sa, Alq: | 1.00E+00 | , 1.00E+01 | Alp; (Dpm/ | 1.77E+00 | (uCV/ | 7.99E-05 | (pCV/ | 7.99E+01 | ± 2.5E+01 | CAT | 3.1E-01 | Lab |
| Ppt mg: | 0.8 ✓ | Units: | L | , ml | Bet; Alq): | 3.78E+00 | Sa): | 1.70E-04 | Ljg): | 1.70E+02 | ± 2.7E+01 | I | 2.9E-01 | Alq |
| | | | | | | | | | | | | | | Ljg |
| BHI | B0GP07 | | 10/6/95 11:30:00 AM | QUAD22B | 10/6/95 2:45:54 PM | B0GP07 | 30 | 31 | 0.96083333 | 725 | 23.155417 | | | |
| | | LIQUID | | Bkg: | 10/6/95 7:22:48 AM | BKG | 800 | 58 | 0.0725 | 809 | 1.01125 | | | |
| Anl Date: | 10/6/95 | Tot Sa, Alq: | 1.00E+00 | , 1.00E+01 | Alp; (Dpm/ | 2.30E+00 | (uCV/ | 1.04E-04 | (pCV/ | 1.04E+02 | ± 2.8E+01 | CAT | 2.4E-01 | Lab |
| Ppt mg: | 1.5 ✓ | Units: | L | , ml | Bet; Alq): | 4.36E+01 | Sa): | 1.96E-03 | Ljg): | 1.96E+03 | ± 7.6E+01 | I | 2.5E-02 | Alq |
| | | | | | | | | | | | | | | Ljg |

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0016

06-Oct-95

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9613447.0464
CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

6-Oct-1995
Page 1

Due
10-21-95

CUSTOMER: BHI

SAF

SAMPLE DELIVERY GROUP

W0758

MATRIX : WATER

B95-080

BATCH NUMBER

10-107

| ITAS ID | DUP | ACCOUNT | CUSTOMER ID | COMMENTS |
|---------|-----|---------|-------------|----------|
|---------|-----|---------|-------------|----------|

| | | | | |
|-----|------------------------|--|-----|-------------------------------|
| *) | /M101071B | | BHI | |
| *) | /M101071S | | BHI | EGL 1352 30.182 ± 0.43936 DPM |
| 3) | /51010701 /G1010701 | | BHI | BOGP07 |
| 4) | /51010702 | | BHI | BOGP05 |

ACTIONS (Initial & Date)

1) INITIATED

JH 10/6/95

5) COUNTING/MEASUREMENT LAB

OP 10/11/95

2) PREP LAB RECEIVED

RTM 10/9/95

6) DATA REVIEWED AND

ANALYTICAL PREP STORED

MC 10-13-95

3) SAMPLE REMAINDER STORED

N/A

4) SEPARATION LAB RECEIVED

RTM 10/9/95

Priority