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CERTIFICATE OF ANALYSIS

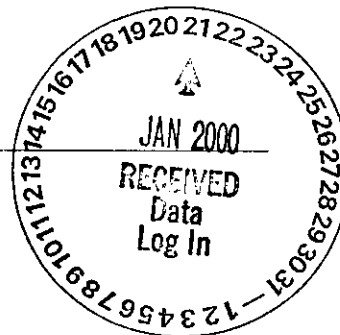


EDMC

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

January 17, 2000

Attention: Joan Kessner



| | | |
|-------------------|---|------------------|
| SAF Number | : | B00-006 |
| Date SDG Closed | : | December 6, 1999 |
| Number of Samples | : | One (1) |
| Sample Type | : | Soil |
| SDG Number | : | W02953 |
| Data Deliverable | : | Summary |

I. Introduction

On November 22, 1999, one soil sample was received at the Quanterra Richland Laboratory (QRL) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

| <u>QESRL ID#</u> | <u>BHI ID#</u> | <u>MATRIX</u> | <u>DATE OF RECEIPT</u> |
|------------------|----------------|---------------|------------------------|
| 9D5E8V10 | B0X0X4 | SOIL | 10/6/99 |

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 Alpha by method RICH-RC-5020
- Gross Beta by method RICH-RC-5020
- Total Strontium by method RICH-RC-5006
- Alpha Spectroscopy**
- Plutonium-238, -239/40 by method RICH-RC-5010
- Americium-241 by method RICH-RC-5080
- Gamma Spectroscopy**
- Gamma Scan by method RICH-RC-5017

Total Uranium

Total Uranium by method RICH-RC-5058

III. Quality Control

The analytical results for each analysis performed under SDG W02953 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

IV. Comments

Gas Proportional Counting

Gross Alpha by method RICH-RC-5020:

The LCS, batch blank, samples and sample duplicate (B0X0X4) results are within contractual requirements.

Gross Beta by method RICH-RC-5020:

The LCS, batch blank, samples and sample duplicate (B0X0X4) results are within contractual requirements.

Total Strontium by method RICH-RC-5006:

The LCS, batch blank, samples and sample duplicate (B0X0X4) results are within contractual requirements.

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010:

The LCS, batch blank, samples and sample duplicate (B0X0X4) results are within contractual requirements.

Americium-241 by method RICH-RC-5080:

The LCS, batch blank, samples and sample duplicate (B0X0X4) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017:

For sample B0X0X4, the achieved MDA for Eu154 does not meet the CRDL due to counting statistics. Since the MDA was only slightly elevated for this isotope alone, and the MDAs achieved for all isotopes on the duplicate sample analysis (count) meet the CRDL, the data are

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accepted for reporting. Except as noted, the LCS, batch blank, samples and sample duplicate (B0X0X4) results are within contractual requirements.

Total Uranium

Total Uranium by method RICH-RC-5058:

The LCS, batch blank, samples, sample duplicate (B0X0X4) and sample matrix spike (B0X0X4) 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:** W02953 / 9544
LAB SAMPLE ID: 9D5E8V10 **MATRIX:** SOIL
CLIENT ID: BOX0X4 **DATE RECEIVED:** 11/22/99 1:10:00 PM

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|---------------|-----------|---|------------------------|---------------------|----------|----------------|---------|------------------|
| TOTAL-URANIUM | 6.14E-01 | J | 0.0E+00 | 1.5E-01 | 7.29E-05 | ug/g | | RICHRC5058 |
| AM-241 | 9.40E-03 | U | 1.9E-02 | 1.9E-02 | 2.55E-02 | pCi/g | 55.65% | RICHRC5080 |
| PU-238 | 2.26E-03 | U | 1.0E-02 | 1.0E-02 | 3.17E-02 | pCi/g | 82.00% | RICHRC5010 |
| PU239/40 | 0.00E+00 | U | 0.0E+00 | 1.3E-02 | 1.39E-02 | pCi/g | 82.00% | RICHRC5010 |
| AM-241 | -5.91E-02 | U | 7.7E-02 | 7.7E-02 | 1.24E-01 | pCi/g | | RICHRC5017 |
| CO-60 | 1.55E-02 | U | 3.1E-02 | 3.1E-02 | 5.46E-02 | pCi/g | | RICHRC5017 |
| CS-137 | 3.26E-02 | U | 3.0E-02 | 3.0E-02 | 5.20E-02 | pCi/g | | RICHRC5017 |
| EU-152 | -2.30E-02 | U | 8.1E-02 | 8.1E-02 | 1.15E-01 | pCi/g | | RICHRC5017 |
| EU-154 | -8.39E-02 | U | 9.5E-02 | 9.5E-02 | 1.54E-01 | pCi/g | | RICHRC5017 |
| EU-155 | 3.76E-02 | U | 5.7E-02 | 5.7E-02 | 9.63E-02 | pCi/g | | RICHRC5017 |
| RA-228 | 8.34E-01 | | 2.0E-01 | 2.0E-01 | 1.94E-01 | pCi/g | | RICHRC5017 |
| ALPHA | 1.06E+01 | | 5.1E+00 | 5.5E+00 | 6.12E+00 | pCi/g | 100.00% | RICHRC5020 |
| BETA | 2.21E+01 | | 2.8E+00 | 4.0E+00 | 3.26E+00 | pCi/g | 100.00% | RICHRC5020 |
| STRONTIUM | 2.64E-02 | U | 5.3E-02 | 5.3E-02 | 1.18E-01 | pCi/g | 88.00% | RICHRC5006 |

Number of Results: 14

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1FR MATRIX: SOIL
CLIENT ID: B0X0X4 DATE RECEIVED: 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|-----------|---------------|---|-------------------------|----------------------|-------------|----------------|--------|------------------|----------------|--------|
| STRONTIUM | 1.29E-02 | U | 5.3E-02 | 5.3E-02 | 1.23E-01 | pCi/g | 82.40% | RICHRC5006 | 2.64E-02 | 68.75% |

Number of Results:

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1GR MATRIX: SOIL
CLIENT ID: B0X0X4 DATE RECEIVED: 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|---------|---------------|---|-------------------------|----------------------|-------------|----------------|---------|------------------|----------------|--------|
| ALPHA | 8.76E+00 | J | 4.5E+00 | 4.9E+00 | 5.70E+00 | pCi/g | 100.00% | RICHRC5020 | 1.06E+01 | 19.13% |

Number of Results:

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1HR MATRIX: SOIL
CLIENT ID: B0X0X4 DATE RECEIVED: 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | COUNTING Q ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|---------|---------------|----------------------------|-----------------------|-------------|----------------|---------|------------------|----------------|--------|
| BETA | 1.95E+01 | 2.7E+00 | 3.7E+00 | 3.36E+00 | pCi/g | 100.00% | RICHRC5020 | 2.21E+01 | 12.61% |

Number of Results:

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1KR MATRIX: SOIL
CLIENT ID: B0X0X4 DATE RECEIVED: 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|---------------|---------------|---|-------------------------|----------------------|-------------|----------------|-------|------------------|----------------|--------|
| TOTAL-URANIUM | 9.42E-01 | J | 0.0E+00 | 2.2E-01 | 7.29E-05 | ug/g | | RICHRC5058 | 6.14E-01 | 42.06% |

Number of Results: 1

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland **SDG: /RPT GRP:** W02953 / 9544
LAB SAMPLE ID: D5E8V1LR **MATRIX:** SOIL
CLIENT ID: B0X0X4 **DATE RECEIVED:** 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | COUNTING Q | ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|---------|---------------|---------------|--------------|-----------------------|-------------|----------------|-------|------------------|----------------|----------|
| AM-241 | 1.70E-01 | U | 1.8E-01 | 1.8E-01 | 2.75E-01 | pCi/g | | RICHRC5017 | -5.91E-02 | 412.44% |
| CO-60 | -8.62E-03 | U | 2.5E-02 | 2.5E-02 | 4.25E-02 | pCi/g | | RICHRC5017 | 1.55E-02 | 700.59% |
| CS-137 | 2.12E-02 | U | 2.2E-02 | 2.2E-02 | 3.93E-02 | pCi/g | | RICHRC5017 | 3.26E-02 | 42.25% |
| EU-152 | 2.69E-02 | U | 6.9E-02 | 6.9E-02 | 9.28E-02 | pCi/g | | RICHRC5017 | -2.30E-02 | 2583.64% |
| EU-154 | -5.83E-02 | U | 8.4E-02 | 8.4E-02 | 1.35E-01 | pCi/g | | RICHRC5017 | -8.39E-02 | 36.10% |
| EU-155 | 4.07E-02 | U | 5.5E-02 | 5.5E-02 | 9.14E-02 | pCi/g | | RICHRC5017 | 3.76E-02 | 7.91% |
| RA-228 | 7.96E-01 | | 2.0E-01 | 2.0E-01 | 1.50E-01 | pCi/g | | RICHRC5017 | 8.34E-01 | 4.72% |

Number of Results:

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1MR MATRIX: SOIL
CLIENT ID: B0X0X4 DATE RECEIVED: 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | COUNTING Q ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|----------|---------------|----------------------------|-----------------------|-------------|----------------|--------|------------------|----------------|---------|
| PU-238 | 3.87E-03 | U 1.0E-02 | 1.0E-02 | 2.54E-02 | pCi/g | 80.33% | RICHRC5010 | 2.26E-03 | 52.73% |
| PU239/40 | -4.07E-04 | U 8.1E-04 | 8.2E-04 | 2.05E-02 | pCi/g | 80.33% | RICHRC5010 | 0.00E+00 | 200.00% |

Number of Results: 2

DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1NR MATRIX: SOIL
CLIENT ID: B0X0X4 DATE RECEIVED: 11/22/99 1:10:00 P
ORIG LAB SAMPLE ID: 9D5E8V10

| ANALYTE | DUP RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | METHOD NUMBER | ORIG RESULT | RPD |
|---------|---------------|---|-------------------------|----------------------|-------------|----------------|--------|------------------|----------------|---------|
| AM-241 | 0.00E+00 | U | 0.0E+00 | 2.3E-02 | 2.59E-02 | pCi/g | 40.45% | RICHRC5080 | 9.40E-03 | 200.00% |

Number of Results: 1

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XC711B MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|-----------|----------|---|------------------------|---------------------|----------|----------------|--------|------------------|
| STRONTIUM | 5.03E-02 | U | 5.0E-02 | 5.2E-02 | 1.03E-01 | pCi/g | 97.40% | RICHRC5006 |

Number of Results: 1

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XC911B MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|---------|----------|---|------------------------|---------------------|----------|----------------|---------|------------------|
| ALPHA | 8.88E-01 | U | 1.2E+00 | 1.2E+00 | 2.33E+00 | pCi/g | 100.00% | RICHRC5020 |

Number of Results: 1

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCA11B MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|---------|----------|---|------------------------|---------------------|----------|----------------|---------|------------------|
| BETA | 9.16E-01 | U | 1.2E+00 | 1.2E+00 | 2.50E+00 | pCi/g | 100.00% | RICHRC5020 |

Number of Results: 1

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCE11B MATRIX: Solid

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|---------|-----------|---|------------------------|---------------------|----------|----------------|-------|------------------|
| AM-241 | -2.63E-02 | U | 6.2E-02 | 6.2E-02 | 1.05E-01 | pCi/g | | RICHRC5017 |
| CO-60 | -1.72E-02 | U | 2.2E-02 | 2.2E-02 | 3.56E-02 | pCi/g | | RICHRC5017 |
| CS-137 | -4.02E-03 | U | 2.0E-02 | 2.0E-02 | 3.34E-02 | pCi/g | | RICHRC5017 |
| EU-152 | 4.96E-03 | U | 4.3E-02 | 4.3E-02 | 7.26E-02 | pCi/g | | RICHRC5017 |
| EU-154 | 2.27E-02 | U | 6.6E-02 | 6.6E-02 | 1.17E-01 | pCi/g | | RICHRC5017 |
| EU-155 | 6.86E-03 | U | 3.3E-02 | 3.3E-02 | 5.67E-02 | pCi/g | | RICHRC5017 |
| RA-228 | -1.07E-01 | U | 1.6E-01 | 1.6E-01 | 1.62E-01 | pCi/g | | RICHRC5017 |

Number of Results: 7

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCF13B MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|----------|-----------|---|------------------------|---------------------|----------|----------------|--------|------------------|
| PU-238 | 0.00E+00 | U | 0.0E+00 | 2.4E-02 | 2.60E-02 | pCi/g | 32.07% | RICHRC5010 |
| PU239/40 | -2.30E-03 | U | 2.7E-03 | 2.7E-03 | 4.79E-02 | pCi/g | 32.07% | RICHRC5010 |

Number of Results:

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCK11X MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|---------|----------|---|------------------------|---------------------|----------|----------------|--------|------------------|
| AM-241 | 6.17E-03 | U | 1.2E-02 | 1.2E-02 | 1.67E-02 | pCi/g | 62.78% | RICHRC5080 |

Number of Results: 1

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCK13B MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | YIELD | METHOD NUMBER |
|---------|-----------|---|------------------------|---------------------|----------|----------------|--------|------------------|
| AM-241 | -1.85E-03 | U | 2.1E-03 | 2.2E-03 | 3.85E-02 | pCi/g | 53.79% | RICHRC5080 |

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XC712S MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|-----------|----------|---|-------------------------|----------------------|-------------|----------------|--------|----------|----------|
| STRONTIUM | 1.02E+00 | | 1.2E-01 | 3.1E-01 | 1.11E-01 | pCi/g | 96.40% | 1.13E+00 | 89.46% |

Number of Results: 1

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XC912S MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|---------|----------|---|-------------------------|----------------------|-------------|----------------|---------|----------|----------|
| ALPHA | 7.99E+01 | | 8.3E+00 | 1.8E+01 | 2.38E+00 | pCi/g | 100.00% | 9.07E+01 | 88.16% |

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCA12S MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|---------|----------|---|-------------------------|----------------------|-------------|----------------|---------|----------|----------|
| BETA | 6.51E+01 | | 3.9E+00 | 9.1E+00 | 2.72E+00 | pCi/g | 100.00% | 6.81E+01 | 95.57% |

Number of Results: 1

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCC12S MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|---------------|----------|---|-------------------------|----------------------|-------------|----------------|-------|----------|----------|
| TOTAL-URANIUM | 1.49E-01 | J | 0.0E+00 | 2.4E-02 | 7.29E-05 | ug/g | | 2.01E-01 | 73.96% |

Number of Results: 1

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCE12S MATRIX: Solid

| ANALYTE | RESULT | COUNTING Q ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|---------|----------|---------------------------|----------------------|-------------|----------------|-------|----------|----------|
| CS-137 | 9.88E-01 | 1.5E-01 | 1.5E-01 | 8.14E-02 | pCi/g | | 9.89E-01 | 99.92% |
| RA-226 | 1.57E+00 | 3.0E-01 | 3.0E-01 | 1.38E-01 | pCi/g | | 2.14E+00 | 73.35% |

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCF14S MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|----------|----------|---|-------------------------|----------------------|-------------|----------------|--------|----------|----------|
| PU239/40 | 3.56E+00 | | 3.3E-01 | 7.4E-01 | 3.10E-02 | pCi/g | 43.00% | 3.46E+00 | 102.96% |

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCK12M MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|---------|----------|---|-------------------------|----------------------|-------------|----------------|--------|----------|----------|
| AM-241 | 3.34E+00 | | 2.7E-01 | 6.5E-01 | 1.50E-02 | pCi/g | 76.23% | 4.71E+00 | 71.00% |

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5XCK14S MATRIX: SOIL

| ANALYTE | RESULT | Q | COUNTING ERROR (2 s) | TOTAL ERROR (2 s) | MDA/ IDL | REPORT UNIT | YIELD | EXPECTED | RECOVERY |
|---------|----------|---|-------------------------|----------------------|-------------|----------------|--------|----------|----------|
| AM-241 | 3.48E+00 | | 3.0E-01 | 6.9E-01 | 3.13E-02 | pCi/g | 63.90% | 4.68E+00 | 74.48% |

Number of Results: 1

MATRIX SPIKE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02953 / 9544
LAB SAMPLE ID: D5E8V1JW MATRIX: SOIL

| ANALYTE | SPIKE RESULT* Q | COUNTING ERROR (2s) | TOTAL ERROR (2s) | MDA/IDL | REPORT UNIT | SAMPLE RESULT | EXPECTED | RECOVERY |
|---------------|--------------------|------------------------|---------------------|----------|----------------|------------------|----------|----------|
| TOTAL-URANIUM | 1.58E+00 | 0.0E+00 | 2.6E-01 | 7.29E-05 | ug/g | 6.14E-01 | 9.03E-01 | 174.85% |

Number of Results:

*Spike Result Corrected For Sample Result

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: 39K220152 | | | | | |
|---|---------|--------|--------------------|----------------------------------|---|
| Client ID: BHI 127642 | | | | | |
| Due Date: 12-7-99 | | | | | |
| QC Batch Number: 9341433 | | | SDG Number: WQ2953 | | |
| Method Test Parameter: Am241 SX | | | | | |
| Matrix: Soil | | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | ✓ | | | | |
| 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: Pam Kennedy Date: 1-13-00
 Second Level Review: Jacqui Waddell Date: 1/16/00

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: <u>J9K220152</u> | | | | | |
|---|---------|--------|---------------------------|----------------------------------|--|
| Client ID: <u>BHI</u> | | | | | |
| Due Date: <u>12-7-99</u> | | | | | |
| QC Batch Number: <u>9341432</u> | | | SDG Number: <u>W02953</u> | | |
| Method Test Parameter: <u>Plutonium</u> | | | | | |
| Matrix: <u>Soil</u> | | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | / | | | | |
| 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: Pam Kenitzer
 Second Level Review: Jacqui Waddell

Date: 1-10-00
 Date: 1/10/00

0030

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: <u>J9K220152</u> | | | | | |
|---|---------|-----------------|---------------------------|----------------------------------|--|
| Client ID: <u>BHI</u> | | | | | |
| Due Date: <u>1-6-99</u> | | | | | |
| QC Batch Number: <u>9341431</u> | | | SDG Number: <u>W02953</u> | | |
| Method Test Parameter: <u>gamma</u> | | | | | |
| Matrix: <u>soil</u> | | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | ✓ | N/A 12-30-99 | | | |
| 3. Is the sample Minimum Detectable Activity < the Contract Detection Limit? | ✓ | N/A | | | |
| 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: DJESV10A E-154^{only} MPA > CRDL NCM J00956

First Level Review: Pam Kennedy

Date: 12-30-99

Second Level Review: Jackie Waddell

Date: 1/3/00



Nonconformance Memo

| | |
|--------------------------------|---------------------------------------|
| NCM #: J00956 | Classification: Anomaly |
| NCM Initiated By: Pam Kenitzer | Status: CLOSED |
| Date Opened: 12/30/99 | Production Area: Environmental - Prep |
| Date Closed: 01/06/00 | Tests: Gamma by GER 10D |
| | Lot #'s (Sample #'s): J9K220152 (1) |
| | QC Batch: 9341431 |
| Nonconformance: MDA not met | |
| Subcategory: Data accepted | |

Problem Description / Root Cause

| Name | Date | Description |
|--------------|----------|---|
| Pam Kenitzer | 12/30/99 | MDA for isotope EU 154 only for sample D5E8V10A > CRDL. |

Corrective Action

| Name | Date | Corrective Action |
|---------------|----------|---------------------------------|
| Dale OConnell | 01/04/00 | Report data with MDAs achieved. |

Quality Assurance Verification

| Verified By | Due Date | Status | Notes: |
|--------------|----------|--------------------|--------|
| Jodie Carnes | N/A | Verified/completed | |

Client Notification Summary

| Client | Project Manager | Date Notified | Response Date | How Notified |
|-----------------------|-------------------|-------------------------|---------------|--------------|
| BECHTEL HANFORD, INC. | Jackie Waddell | 01/05/00 | 01/05/00 | by narrative |
| | <u>Response</u> | <u>Response Details</u> | | |
| | No response saved | | | |

Approval History

| Name | Date Approved: | Position |
|----------------|----------------|-------------------|
| Pam Kenitzer | 12/30/99 | Group Leader |
| Dale OConnell | 01/04/00 | Group Leader |
| Jackie Waddell | 01/05/00 | Project Manager |
| Jodie Carnes | 01/06/00 | Quality Assurance |

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: <u>J9K220152</u> | | | | |
|---|---------|--------|---------------------------|----------------------------------|
| Client ID: <u>127642</u> | | | | |
| Due Date: <u>12-13-99</u> | | | | |
| QC Batch Number: <u>9341427</u> | | | SDG Number: <u>002953</u> | |
| Method Test Parameter: <u>L</u> | | | | |
| Matrix: <u>SOIL</u> | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | ✓ | | | |
| 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: Pam Kenitzer
 Second Level Review: Jackie Waddell

Date: 12-17-99
 Date: 12/27/99

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: <u>39K 220152</u> | | | | |
|---|---------|--------|---------------------------|----------------------------------|
| Client ID: <u>127642</u> | | | | |
| Due Date: <u>12-13-99</u> | | | | |
| QC Batch Number: <u>9341428</u> | | | SDG Number: <u>W02953</u> | |
| Method Test Parameter: <u>Beta</u> | | | | |
| Matrix: <u>Soil</u> | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | ✓ | | | |
| 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: Pam Kunitz
 Second Level Review: Jackie Waddell

Date: 12-16-99
 Date: 12/21/99

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: <u>J9K 220152</u> | | | | |
|---|---------|--------|---------------------------|----------------------------------|
| Client ID: <u>127642</u> | | | | |
| Due Date: <u>12-7-99</u> | | | | |
| QC Batch Number: <u>9341424</u> | | | SDG Number: <u>W02953</u> | |
| Method Test Parameter: <u>TOTAL SL</u> | | | | |
| Matrix: <u>Soil</u> | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | ✓ | | | |
| 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: Pam Kevitz Date: 12-27-99
 Second Level Review: Kevin Waddell Date: 12/31/99

Data Review Checklist
RADIOCHEMISTRY

| Lot Number: <u>J9K220152</u> | | | | |
|---|---------|-------------------------|---------|----------------------------------|
| Client ID: <u>BHI</u> | | | | |
| Due Date: <u>12-13-99</u> | | | | |
| QC Batch Number: <u>9341429</u> | | SDG Number: <u>2953</u> | | |
| Method Test Parameter: <u>uranium</u> | | | | |
| Matrix: <u>soil</u> | | | | |
| Review Item | Yes (✓) | No (✓) | 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? | ✓ | | | |
| 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: Pam Kemnitz Date: 1-7-00
 Second Level Review: Jackie Waddell Date: 1/10/00

CHAIN OF CUSTODY

W-21020

| | | | | | | | | | | | |
|--|--|---|--|---------------------------|--|------------------------------------|--|---------------|--|----------------------------|--|
| Bechtel Hanford Inc. | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | B00-006-21 | | Page 1 of 2 | | | |
| Collector Fahlberg | | Company Contact C Cearlock | | Telephone No. 372-9574 | | Project Coordinator TRENT, SJ | | Price Code 8N | | Data Turnaround 45 Days | |
| Project Designation 200 Area Source Characterization 200-CS-1 Operable Unit | | Sampling Location 200 West | | SAF No. B00-006 | | Air Quality | | | | | |
| Ice Chest No. SML 69 | | Field Logbook No. EL 1435 | | COA B20CS1671C | | Method of Shipment Gov. Vehicle | | | | | |
| Shipped To Quanterra Incorporated Richland | | Offsite Property No. N/A | | | | Bill of Lading/Air Bill No. N/A | | | | | |

| | | | | | | | | | | | |
|---------------------------------|---------------------------------|--------|--------|--------|------|---------|-------|---------|------|------|------|
| POSSIBLE SAMPLE HAZARDS/REMARKS | Preservation | None | None | None | None | Cool 4C | None | Cool 4C | None | None | None |
| | Type of Container | aG | aG | aG | aG | aG | G/P | aG | aG | aG | aG |
| | No. of Container(s) | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| | Special Handling and/or Storage | Volume | 60mL ✓ | 60mL ✓ | 60mL | 60mL | 120mL | 20g | 60mL | 60mL | 60mL |

| | | | | | | | | | | | | | |
|-----------------|----------|-------------|-------------|------------------|-----------|---------------|--------------|--------------------------------------|---------------|---|--------------------------------------|--------------------------------------|---------------|
| SAMPLE ANALYSIS | | | | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | See item (1) in Special Instructions | Activity Scan | VOA - 8260A (TCL); VOA - 8260A (Add-On) [1-Propanol, Ethanol] | See item (2) in Special Instructions | See item (3) in Special Instructions | Neptunium-237 |
| SDX W02953 | | | | JAK220152 | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
| BOX0X4 | Soil | 11/19/99 | 1105 | X | X | X | X | | X | | X | X | X |

| | | | | | | | | | | | | |
|--------------------------------|--|----------------------------|--|------------------------|--|-----------------------|--|--|--|--|--|---|
| CHAIN OF POSSESSION | | | | Sign/Print Names | | | | SPECIAL INSTRUCTIONS | | | | Matrix * |
| Relinquished By P. Fahlberg | | Date/Time 11-19-99 | | Received By Ref 2-C | | Date/Time 11-19-99 | | See Chain Of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63, Tech-99, Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals. (1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); 7196_CR6: Hexavalent Chromium (1) (2) Gamma Spec - Complete (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228) (3) Gross Alpha; Gross Beta; Gamma Spectroscopy (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-228); Strontium-89,90 -- Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Tho) | | | | S=Soil SE=Sediment SO=Solid S=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue W1=Wipe L=Liquid V=Vegetation X=Other |
| Relinquished By R. Thoren | | Date/Time 11-22-99/1310 | | Received By BWK | | Date/Time 11-22-99 | | | | | | |
| Relinquished By | | Date/Time | | Received By | | Date/Time | | | | | | |
| Relinquished By | | Date/Time | | Received By | | Date/Time | | | | | | |
| Relinquished By | | Date/Time | | Received By | | Date/Time | | | | | | |
| | | | | Tie to Box 069 | | | | | | | | |

| | | | |
|--------------------------|-----------------|-------------|-----------|
| 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: 11-22-99 1310 SG#: W02953
Work Order Number: J9K220152 SAF #: B00-006
Shipping Container ID: SML69 Chain of Custody # B00-006-21

- 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 N/A
- 5. Vermiculite/packing materials is Wet Dry
- 6. Number of samples in shipping container: 4
- 7. Sample holding times exceeded? Yes No

| |
|--|
| 8. Samples have: <input checked="" type="checkbox"/> tape <input type="checkbox"/> hazard labels <input type="checkbox"/> custody seals <input type="checkbox"/> appropriate sample labels |
|--|

| |
|--|
| 9. Samples are: <input checked="" type="checkbox"/> in good condition <input type="checkbox"/> leaking <input type="checkbox"/> broken <input type="checkbox"/> have air bubbles |
|--|

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

Sample Custodian/Laboratory: BWK Date: 11-22-99

Telephoned To: _____ On _____ By _____

Client Sample Screening Results

23-Nov-99

③ 11/24/99

| CLIENT CODE | ID | MATRIX | RECEIVED | DETECTOR | ACQ DATE | SAMPLE | MINUTES | CNTS A | NET CPM A | CNTS B | NET CPM B |
|--------------------|-------------|-----------------------|---------------------|------------|----------------------|-------------|----------------|----------------|-------------|--------|--------------------|
| BH1 | B0NLP7D5F7F | | 11/23/99 2:33:00 PM | QUAD24A | 11/23/99 3:31:23 PM | B0NLP7D5F7F | 30 | 48 | 1.471666667 | 915 | 29.4266667 |
| | D5F7F | LIQUID | | Bkg: | 11/23/99 2:05:04 AM | BKG | 600 | 77 | 0.128333333 | 644 | 1.073333333 |
| Anl Date: 11/23/99 | | Tot Sa, Alq: 5.00E-01 | | , 1.00E+01 | Alp; (Dpm/ 3.73E+00) | | (uCi/ 8.41E-05 | (pCi/ 1.68E+02 | ± 3.3E+01 | CAT | 1.5E-01 Lab |
| Ppt mg: 1.5 | | Units: L | | , ml | Bet; Alq: 5.65E+01 | | Sa): 1.27E-03 | L/g): 2.54E+03 | ± 8.8E+01 | I | 2.0E-02 Alq L/g |
| BH1 | B0NLP8D5F7J | | 11/23/99 2:33:00 PM | QUAD24B | 11/23/99 3:31:23 PM | B0NLP8D5F7J | 30 | 21 | 0.581666667 | 260 | 7.625 |
| | D5F7J | LIQUID | | Bkg: | 11/23/99 2:05:04 AM | BKG | 600 | 71 | 0.118333333 | 625 | 1.04166667 |
| Anl Date: 11/23/99 | | Tot Sa, Alq: 5.00E-01 | | , 1.00E+01 | Alp; (Dpm/ 1.54E+00 | | (uCi/ 3.47E-05 | (pCi/ 6.94E+01 | ± 2.6E+01 | CAT | 3.6E-01 Lab |
| Ppt mg: 1.7 | | Units: L | | , ml | Bet; Alq: 1.45E+01 | | Sa): 3.27E-04 | L/g): 6.54E+02 | ± 4.7E+01 | I | 7.6E-02 Alq L/g |
| BH1 | B0X0X4D5E8V | | 11/22/99 2:30:00 PM | QUAD23D | 11/23/99 3:23:02 PM | B0X0X4D5E8V | 30 | 10 | 0.261666667 | 102 | 2.42 |
| | D5E8V | SOLID | | Bkg: | 11/23/99 2:05:17 AM | BKG | 600 | 43 | 0.071666667 | 588 | 0.98 |
| Anl Date: 11/23/99 | | Tot Sa, Alq: 1.92E+02 | | , 1.07E+02 | Alp; (Dpm/ 1.67E+00 | | (uCi/ 1.35E-03 | (pCi/ 7.02E+00 | ± 4.8E+00 | CAT | 7.1E+00 Lab |
| Ppt mg: 107 | | Units: g | | , mg | Bet; Alq: 5.10E+00 | | Sa): 4.12E-03 | L/g): 2.15E+01 | ± 3.1E+00 | I | 4.7E+00 Alq L/g |

0040

23-Nov-99

COC Signature Page

W02953

Lot or Batch #: 9341433

Initials/Date

Procedure #

| Released By | Initials/Date | Procedure # |
|-------------|-----------------------|--------------|
| Released By | KA 12-9-99 | Richer0009 |
| Received | WV 12-9-99 | RC 5013 |
| Released By | W 12-13-99 | n/a |
| Received | SK 12/13/99 | RC5019-1 |
| Released By | SIC 12/22/99 | n/a |
| Received | QB 12/22/99 | RC5080 |
| Released By | AS 1/8/00 | n/a |
| Received | SD 1/8/00 | RC5003-2 |
| Released By | SD 1/11/00 | n/a |
| Received | CO 1/11/00 | RC5000000001 |
| Released By | CO 1/12/00 | n/a |
| Received | SM 1-12-00 | RadcaDec 2.4 |
| Released By | SM 1-12-00 | n/a |
| Received | PK 1-12-00 | Richer0002 |
| | PK 1-13-00 | |

RQC053

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:40:24

Parent Batch:
Associated Batches:

* QC BATCH: 9341433 *

Page: 1

Due 1-6-99

W0 2953

SX: Americium-241 by Alpha Spec
6I: PuAm PrpRC5013/RC5019, SepRC5080(5003)/R
5I: CLIENT: HANFORD

Analytical Due Date: 12/07/99

Project Manager: JW2

| Lot# Work Order | Analyt Due Client Matrix | Client Name Aliquot Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|--|-----------------------------|------------------------------------|-------|------|----------------------|-----------------------|------|-------|----------------------------------|-----------|
| J9K220152-001 D5E8V-1-0D SOIL Comments: SOIL | 12/07/99 | Bechtel Hanford, .0000 | .000 | | 11/19/99 11:05 | | 1 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 X D5E8V-1-0N SOIL Comments: SOIL | 12/07/99 | Bechtel Hanford, .0000 | .000 | | 11/19/99 11:05 | | 1 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-433 B D5XCK-1-01 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | | 11/19/99 11:05 | | | pCi/g | **NA **NA | JW2 |
| J9L070000-433 C D5XCK-1-02 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | | 11/19/99 11:05 | | 1 | pCi/g | **NA **NA | JW2 |
| J9L070000-433 B D5XCK-1-03 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | | 11/19/99 11:05 | | 1 | pCi/g | **NA **NA | JW2 |
| J9L070000-433 C D5XCK-1-04 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | | 11/19/99 11:05 | | 1 | pCi/g | **NA **NA | JW2 |

Total Number of Samples In Batch: 00006

Batch Information:

Dry Wt: Y

Decay Correct: Y

Blank Sub: None

Call In:

Uncert: Both

Sigma: 1.960

ODR: Target List + Other Detected

BLANK CRDL
Americium 241 1

Tracer Yield
Americium 243 (020-105)

Type
RPD

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.

0042

COC Signature Page

W002953

Lot or Batch #: 9341432

Initials/Date

Procedure #

| | Initials/Date | Procedure # |
|-------------|-----------------------|----------------|
| Released By | SK 12-9-99 | Richec0009 |
| Received | W 12-9-99 | |
| Released By | IP 12-13-99 | n/a |
| Received | SK 12/13/99 | RC 5019-1 |
| Released By | SK 12/22/99 | n/a |
| Received | QB 12/22/98 | RC 5080 / 5010 |
| Released By | QB 1/5/00 | n/a |
| Received | SD 1/5/00 | RC 5039-2 |
| Released By | SD 1/6/00 | n/a |
| Received | CD 1/7/00 | RC 5039-2 (M) |
| Released By | CD 1/6/00 | n/a |
| Received | DM 1-7-00 | Radcalc 1/24 |
| Released By | DM 1-7-00 | n/a |
| Received | PK 1-7-00 | RC 5039-2 |
| | PK 1-10-00 | |

RQC053

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:39:20

Parent Batch:
Associated Batches:

* QC BATCH: 9341432 *

Page: 1

Due 1-6-99

W02953
SO: Plutonium-238,239/40 by Alpha Spec
6I: PuAm PrpRC5013/RC5019, SepRC5080(5003)/R
5I: CLIENT: HANFORD

Analytical Due Date: 12/07/99

Project Manager: JW2

| Lot# Work Order | Analyt Due Client Matrix | Client Name Aliquot Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|--|-----------------------------|------------------------------------|-------|----------|----------------------|-----------------------|------|-------|----------------------------------|-----------|
| J9K220152-001 D5E8V-1-0C SOIL Comments: SOIL | 12/07/99 | Bechtel Hanford, .0000 | .000 | 11/19/99 | 11:05 | | 1 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 X D5E8V-1-0M SOIL Comments: SOIL | 12/07/99 | Bechtel Hanford, .0000 | .000 | 11/19/99 | 11:05 | | 1 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-432 B D5XCF-1-01 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1 | pCi/g | **NA **NA | JW2 |
| J9L070000-432 C D5XCF-1-02 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1 | pCi/g | **NA **NA | JW2 |
| J9L070000-432 B D5XCF-1-03 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1 | pCi/g | **NA **NA | JW2 |
| J9L070000-432 C D5XCF-1-04 SOLID Comments: | 12/07/99 | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1 | pCi/g | **NA **NA | JW2 |

Total Number of Samples In Batch: 00006

Batch Information:

Dry Wt: Y

Decay Correct: Y

Blank Sub: None

Call In:

Uncert: Both

Sigma: 1.960

ODR: Target List + Other Detected

BLANK CRDL
Plutonium 238 1
Plutonium 239/4 1

Tracer Yield
Plutonium 242 (020-105)

Type
RPD
RPD

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.

0044

COC Signature Page

W02953

Lot or Batch #: 9341431

Initials/Date

Procedure #

| Released By | Initials/Date | Procedure # |
|-------------|--------------------|-------------------------|
| Released By | <u>KA 12-9-99</u> | <u>RichRC0009</u> |
| Received | <u>W 12-9-99</u> | <u>RichRC 5017-5017</u> |
| Released By | <u>W 12-12-99</u> | <u>n/a</u> |
| Received | <u>ml 12/13/99</u> | <u>RichRC00007</u> |
| Released By | <u>d 12/27/99</u> | <u>n/a</u> |
| Received | <u>PK 12-28-99</u> | <u>RichRC0002</u> |
| Released By | <u>PK 12-30-99</u> | <u>n/a</u> |
| Received | | |
| Released By | | <u>n/a</u> |
| Received | | |
| Released By | | <u>n/a</u> |
| Received | | |
| Released By | | <u>n/a</u> |
| Received | | |

RQC053

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:37:18

Parent Batch:
Associated Batches:

* QC BATCH: 9341431 *
*

Page: 1

Due 1-6-99

WO 3953
T9: Gamma by HPGE 10 day ingrowth (12/23)
AW: Gamma PrpRC5017
SI: CLIENT: HANFORD

Analytical Due Date: 12/13/99

Project Manager: JW2

| Lot# Work Order | Client | Analyt Due Matrix | Client Name Aliquot | Name Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|--|--------|----------------------|---------------------------|------------------|-------|----------------|----------------------|-----------------------|------|-------|----------------------------------|-----------|
| J9K220152-001 D5E8V-1-0A SOIL Comments: SOIL | | 12/13/99 | Bechtel Hanford, .0000 | | .000 | 11/19/99 11:05 | | | 0.05 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 X D5E8V-1-0L SOIL Comments: SOIL | | 12/13/99 | Bechtel Hanford, .0000 | | .000 | 11/19/99 11:05 | | | 0.05 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-431 B D5XCE-1-01 SOLID Comments: | | 12/13/99 | Bechtel Hanford, | | | 11/19/99 11:05 | | | -- | pCi/g | **NA **NA | JW2 |
| J9L070000-431 C D5XCE-1-02 SOLID Comments: | | 12/13/99 | Bechtel Hanford, | | | 11/19/99 11:05 | | | 0.1 | pCi/g | **NA **NA | JW2 |

0046

COC Signature Page

W02953

| Lot or Batch #: | Initials/Date | Procedure # |
|-----------------|-----------------------|-----------------|
| 9341427 | | |
| Released By | PK 12-9-99 | RichRC0009 |
| Received | W 12-9-99 | RichRC5013/5020 |
| Released By | W 12-15-99 | n/a |
| Received | C 12/15/99 | RSCPRD0003R2 |
| Released By | C 12/16/99 | n/a |
| Received | DM 12-16-99 | RADcalc V2.4 |
| Released By | DM 12-16-99 | n/a |
| Received | PK 12-16-99 | RichRC0002 |
| Released By | PK 12-17-99 | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |

RQC053

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:35:32

Parent Batch:
Associated Batches:

* QC BATCH: 9341427 *

Page: 1

W00753

Due 1-6-99

S7: Gross Alpha by GPC using Am-241 curve
AY: Gross Alpha Prep RC5013/5020
SI: CLIENT: HANFORD

Analytical Due Date: 12/13/99
Project Manager: JW2

| Lot# Work Order | Client | Analyt Due Matrix | Client Name Aliquot | Name Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|--|--------|----------------------|---------------------------|------------------|-------|----------|----------------------|-----------------------|----------|-------|----------------------------------|-----------|
| J9K220152-001 X D5E8V-1-0G SOIL Comments: SOIL | | 12/13/99 | Bechtel Hanford, .0000 | | .000 | 11/19/99 | 11:05 | | 1.00E+01 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 D5E8V-1-07 SOIL Comments: SOIL | | 12/13/99 | Bechtel Hanford, .0000 | | .000 | 11/19/99 | 11:05 | | 1.00E+01 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-427 B D5XC9-1-01 SOLID Comments: | | 12/13/99 | Bechtel Hanford, | | | 11/19/99 | 11:05 | | 1.00E+01 | pCi/g | **NA **NA | JW2 |
| J9L070000-427 C D5XC9-1-02 SOLID Comments: | | 12/13/99 | Bechtel Hanford, | | | 11/19/99 | 11:05 | | | pCi/g | **NA **NA | JW2 |

Total Number of Samples In Batch: 00004

Batch Information:

| | | | |
|----------------------------|---------------------|-----------------------------------|--------------------------|
| Dry Wt: | Decay Correct: Y | Blank Sub: None | Call In: |
| Uncert: Both | Sigma: 1.960 | ODR: Target List + Other Detected | |
| <u>BLANK CRDL</u> Alpha | <u>Tracer Yield</u> | <u>Type</u> RPD | <u>QC Control Limits</u> |
| 1.00E+01 | | | |

** 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.

0048

COC Signature Page

W02953
Lot or Batch #: 9341488

| | Initials/Date | Procedure # |
|-------------|---------------|------------------|
| Released By | KTB 12-9-99 | RichRC0009 |
| Received | WV 12-9-99 | RichRC 5012/5020 |
| Released By | NA 12-15-99 | n/a |
| Received | CD 12/15/99 | RichRC0003/02 |
| Released By | CD 12/16/99 | n/a |
| Received | Jm 12-16-99 | Radcalc V2.4 |
| Released By | Jm 12-16-99 | n/a |
| Received | PK 12-16-99 | RichRC0002 |
| Released By | PK 12-16-99 | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |

RQC053

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:36:01

Parent Batch:
Associated Batches:

* QC BATCH: 9341428 *
* *WO 2953* *****

Page: 1

Due 1-6-99

S8: Gross Beta by GPC using Sr/Y-90 curve
BB: Gross Beta PrpRC5013/5020
SI: CLIENT: HANFORD

Analytical Due Date: 12/13/99
Project Manager: JW2

| Lot# | Work Order | Analyt Due | Client Name | Client Matrix | Aliquot | Name Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|---------------|------------|------------|------------------|---------------|---------|---------------|-------|----------|-------------------|--------------------|----------|-------|-------------------------------|--------|
| J9K220152-001 | X | 12/13/99 | Bechtel Hanford, | SOIL | .0000 | | .000 | 11/19/99 | 11:05 | | 1.50E+01 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 | | 12/13/99 | Bechtel Hanford, | SOIL | .0000 | | .000 | 11/19/99 | 11:05 | | 1.50E+01 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-428 | B | 12/13/99 | Bechtel Hanford, | SOLID | | | | 11/19/99 | 11:05 | | 1.50E+01 | pCi/g | **NA **NA | JW2 |
| J9L070000-428 | C | 12/13/99 | Bechtel Hanford, | SOLID | | | | 11/19/99 | 11:05 | | | pCi/g | **NA **NA | JW2 |

Total Number of Samples In Batch: 00004

Batch Information:

| | | | |
|-------------------|---------------------|-----------------------------------|--------------------------|
| Dry Wt: | Decay Correct: Y | Blank Sub: None | Call In: |
| Uncert: Both | Sigma: 1.960 | ODR: Target List + Other Detected | |
| <u>BLANK CRDL</u> | <u>Tracer Yield</u> | <u>Type</u> | <u>QC Control Limits</u> |
| Beta 1.50E+01 | | RPD | |

** 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.

0050

COC Signature Page

W02953

| Lot or Batch #: | Initials/Date | Procedure # |
|-----------------|---------------------|-------------------------|
| 9341424 | | |
| Released By | <u>RM 12-9-99</u> | <u>RichRC0009</u> |
| Received | <u>W 12-9-99</u> | <u>RC 5013</u> |
| Released By | <u>W 12-13-99</u> | <u>n/a</u> |
| Received | <u>SK 12/13/99</u> | <u>RC5013-2</u> |
| Released By | <u>SK 12/21/99</u> | <u>n/a</u> |
| Received | <u>RTM 12/20/99</u> | <u>RichRC5006</u> |
| Released By | <u>RTM 12/22/99</u> | <u>n/a</u> |
| Received | <u>CA 12/22/99</u> | <u>RichRC0003 Rev 2</u> |
| Released By | <u>CS 12/24/99</u> | <u>n/a</u> |
| Received | <u>DM 12-23-99</u> | <u>Badcase V2.4</u> |
| Released By | <u>DM 12-23 99</u> | <u>n/a</u> |
| Received | <u>PK 12-23-99</u> | <u>RichRC0002</u> |
| Released By | <u>PK 12-28-99</u> | <u>n/a</u> |
| Received | | |

RQC053

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:34:56

Parent Batch:
Associated Batches:
:
:
:
:

* QC BATCH: 9341424 *
*

Page: 1

W02953
TH: Total Strontium by GPC
CH: Sr-Total PrpRC5013, SepRC5006
SI: CLIENT: HANFORD

Due 1-6-99
Analytical Due Date: 12/07/99
Project Manager: JW2

| Lot# Work Order | Analyt Due Client Matrix | Client Name Aliquot | Client Name Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|---|-----------------------------|------------------------|-------------------------|-------|----------|----------------------|-----------------------|------|-------|----------------------------------|-----------|
| J9K220152-001 X D5E8V-1-0F SOIL Comments: SOIL | 12/07/99 | .0000 | Bechtel Hanford, | .000 | 11/19/99 | 11:05 | | 1 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| ++ J9K220152-001 D5E8V-1-02 SOIL Comments: SOIL | 12/07/99 | .0000 | Bechtel Hanford, | .000 | 11/19/99 | 11:05 | | 1 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-424 B D5XC7-1-01 SOLID Comments: | 12/07/99 | | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1 | pCi/g | **NA **NA | JW2 |
| J9L070000-424 C D5XC7-1-02 SOLID Comments: | 12/07/99 | | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1 | pCi/g | **NA **NA | JW2 |

Total Number of Samples In Batch: 00004

Batch Information:

| | | | |
|----------------------------|---------------------------------|-----------------------------------|-------------------|
| Dry Wt: | Decay Correct: Y | Blank Sub: None | Call In: |
| Uncert: Both | Sigma: 1.960 | ODR: Target List + Other Detected | |
| BLANK CRDL Strontium 90 | Tracer Yield Strontium Trace | Type RPD | 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.

0052

COC Signature Page

W02953

Lot or Batch #: 9341429 Initials/Date Procedure #

| Released By | Initials/Date | Procedure # |
|-------------|-----------------------|----------------|
| | KA 12-9-99 | RichRC0009 |
| Received | W 12-9-99 | RC 5013 |
| Released By | W 12-13-99 | n/a |
| Received | SIC 12/13/99 | RC5013-2 |
| Released By | Doc 12-30-99 | n/a |
| Received | BAB 1-4-00 | RICHRC 5058 R1 |
| Released By | BAB 1-4-00 | n/a |
| Received | PK1-5-00 | RichRC0002 |
| Released By | PK1-7-00 | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |
| Released By | | n/a |
| Received | | |

RQC053

Parent Batch:
Associated Batches:
:
:
:
:

Quanterra Incorporated
Information Sheet Rad Prep

Run Date: 12/07/99
Time: 16:36:36

* QC BATCH: 9341429 *
*

Page: 1

W02953

SS: Total Uranium by KPA
DS: Unat Laser Prep RC5013, Sep RC5015
5J: RCH: BATTELLE ENVIRONMENTAL

Analytical Due Date: 12/13/99
Project Manager: JW2

Due 1-6-99

| Lot# Work Order | Analyt Due Client Matrix | Client Name Aliquot Geometry | Count | Time | Mid/Ave Date/Time | Tracer ID Spike ID | CRDL | Units | Screen Info - (Ci) Alpha Beta | PM Bin |
|--|-----------------------------|---------------------------------|-------|----------|----------------------|-----------------------|----------|-------|----------------------------------|-----------|
| J9K220152-001 S D5E8V-1-0J SOIL Comments: SOIL | 12/13/99 | Bechtel Hanford, .0000 | .000 | 11/19/99 | 11:05 | | | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 X D5E8V-1-0K SOIL Comments: SOIL | 12/13/99 | Bechtel Hanford, .0000 | .000 | 11/19/99 | 11:05 | | 1.00E-02 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9K220152-001 D5E8V-1-09 SOIL Comments: SOIL | 12/13/99 | Bechtel Hanford, .0000 | .000 | 11/19/99 | 11:05 | | 1.00E-02 | pCi/g | 7.02E-12 2.15E-11 84-11/99 | JW2 |
| J9L070000-429 B D5XCC-1-01 SOLID Comments: | 12/13/99 | Bechtel Hanford, | | 11/19/99 | 11:05 | | 1.00E-02 | pCi/g | **NA **NA | JW2 |
| J9L070000-429 C D5XCC-1-02 SOLID Comments: | 12/13/99 | Bechtel Hanford, | | 11/19/99 | 11:05 | | 0.01 | pCi/g | **NA **NA | JW2 |

Total Number of Samples In Batch: 00005

Batch Information:

| | | | |
|-----------------------|------------------|-----------------------------------|-------------------|
| Dry Wt: | Decay Correct: Y | Blank Sub: None | Call In: |
| Uncert: Both | Sigma: 1.960 | ODR: Target List + Other Detected | |
| BLANK CRDL Uranium | Tracer Yield | Type RPD | QC Control Limits |
| 1.00E-02 | | | |

- ** 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.

0054

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

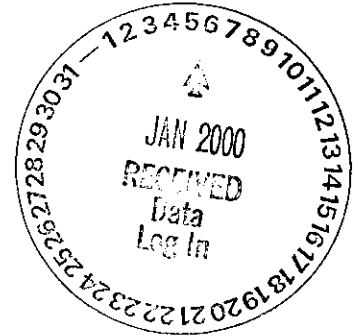
CASE NARRATIVE

314 298-8566 Telephone
314 298-8757 Fax

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

January 5, 2000

Attention: Joan Kessner



| | | |
|-------------------|---|-------------------|
| Project Number | : | 550.267 |
| SDG | : | W02953 |
| Number of Samples | : | One (1) |
| Sample Matrix | : | Soil |
| Data Deliverable | : | Summary |
| Date SDG Closed | : | November 22, 1999 |

II. Introduction

On November 22, 1999, one (1) "soil" sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The samples were received at the St. Louis lab on 11/24/99 at 6 degrees C. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

| <u>St. Louis ID</u> | <u>BHI ID</u> | <u>SAF ID</u> | <u>Matrix</u> | <u>Date of Receipt</u> |
|---------------------|---------------|---------------|---------------|------------------------|
| 22598-001 | B0X0X4 | B00-006 | SOIL | 22-NOV-99 |

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested:

- ICP Metals - 6010
- Anions - 300.0 {Cl,Fl,N03,N02,Phos,S04}
- Nitrate - 353.1
- pH - 9045
- Hexavalent Cr - 7196

000002

Bechtel Hanford Incorporated
January 5, 2000
Project Number: 550.267
SDG: W02953
Page 2

Deviation from Request: None

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike
MS- Matrix Spike.
DUP- Matrix Duplicate
MSD- Matrix Spike Duplicate.

V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Several analyses are listed on the client chain of custody that were later cancelled by the client (VOA, SVOA, PCB, WTPH-D, Sulfides, Ammonia, Cyanide and Mercury). See the copy of e-mail received on 11/23/99.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

There were no comments or non-conformances associated with this data.

Wet Chemistry: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Duplicate were analyzed with each preparation batch per the protocol for this analysis. A duplicate was done for the pH analysis.

There were no comments or non-conformances associated with this data.

Bechtel Hanford Incorporated

January 5, 2000

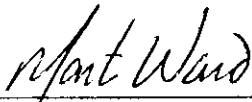
Project Number: 550.267

SDG: W02953

Page 3

I certify that this Summary 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:

A handwritten signature in cursive script that reads "Marti Ward".

Marti Ward

St. Louis Project Manager

000004

Ward, Marti

From: Waddell, Jackie
Sent: Tuesday, November 23, 1999 11:55 AM
To: Heidelberg, Tami; Ward, Marti; Louvier, Shiela
Subject: FW: B00-006

From: Kessner, Joan H[SMTP:JHKessne@mail.bhi-erc.com]
Sent: Tuesday, November 23, 1999 9:53 AM
To: 'jackie'
Cc: Trent, Stephen J; St John, David A; Ayres, Doris E
Subject: B00-006

Jackie---

Had a little trouble with sample B0X0X4 under SAF B00-006. Steve will be sending a SDR to make everything official, but we need you to make the following corrections.....

rad analysis:

- * cancel the following - Th-iso, Tc-99, H-3, Np-237 and Ni-63.
- * add the following - Am-241 (AEA).
- * please remember to hold U-iso until the project has time to review the Total U data.

chem analysis:

- * cancel the following - VOA, SVOA, PCB, WTPH-D, Sulfides, Ammonia, Total Cyanide and Mercury.
- * nothing to add.....

Thanks the help. Please call if you have any questions.
Joan

Quanterra St. Louis

Sample Preparation Methods

"Quanterra Standard" Preparation Method Used Unless Otherwise Noted

| Organic Preparation Methods | Matrix | Analysis | SW846 Reference |
|---|-------------|--|-----------------|
| Separatory Funnel Liquid-Liquid <i>(Quanterra Standard)</i> | Liquid | Pesticides, PCBs, Semivolatiles, TPH (Diesel Range Organics), Herbicides, TCLP (Semivolatiles, Pesticides, Herbicides), Phenols, PAHs, | 3510C |
| Continuous Liquid-Liquid | Liquid | Pesticides, Semivolatiles | 3520C |
| Ultrasonic <i>(Quanterra Standard)</i> | Solid | Pesticides, PCBs, Semivolatiles, Herbicides, PAHs | 3550B |
| Pressurized Fluid Extraction | Solid | Pesticides, PCBs, Semivolatiles, PAHs | 3545 |
| Waste Dilution <i>(Quanterra Standard)</i> | Solvent/Oil | Pesticides, PCBs, Semivolatiles, TPH, Herbicides, TCLP (Semivolatiles, Pesticides, Herbicides) | 3580A |
| Purge and Trap <i>(Quanterra Standard)</i> | All | Volatiles, Gasoline Range Organics | 5030B |
| Toxicity Characteristic Leaching Procedure <i>(Quanterra Standard)</i> | All | Pesticides, Semivolatiles, Herbicides, Volatiles, Metals | 1311 |
| Inorganic Preparation Methods | Matrix | Analysis | SW846 Reference |
| Acid Digestion <i>(Quanterra Standard)</i> | Liquid | ICP or FLAA Metals | 3010A |
| Acid Digestion – Total Recoverable | Liquid | ICP or FLAA Metals | 3005A |
| Acid Digestion <i>(Quanterra Standard)</i> | Liquid | GFAA Metals | 3020A |
| Acid Digestion <i>(Quanterra Standard)</i> | Solid | ICP, FLAA, or GFAA Metals | 3050B |

000004B

W02953

Quanterra November 29, 1999 10:08 am

Account: 10722 Project: 550.267 Quanterra-Richland QAS No. 550.267 Rev. 1
Master Sample Login: 22598

Project Manager: M. Ward

Reviewed by and Date: M. Ward 11-29-99

Sample Header Template:

| Sample No. | Client ID | C-Matrix | Date: Collected | Received | Due | Shipper | Rad Category | Rad Sample No. |
|------------|----------------|----------|-----------------|--------------|----------------|-----------|--------------|-------------------------------|
| # | Container Type | Analysis | Class | Preservative | Anal. Due Date | Hold Date | Site | (Container Numbers: % Filled) |

| | | | | | | | | |
|--------------------------------|--------|------|-----------------|-----------------|-----------|-------|---|------------------------|
| 22598-001 | BOX0X4 | Soil | 19-NOV-99 11:05 | 22-NOV-99 09:00 | 22-DEC-99 | FED X | 1 | Screening not Required |
| SAFB00-006//SEE SAF FOR METALS | | | | | | | | |

| | | | | | | | | |
|---|------------------------|-----------------|---|------|-----------|-----------|-----|--------------|
| 1 | AN - Amber Glass-120ML | ANIONS/300.0/Q4 | P | COLD | N/A | N/A | T1C | (470625:100) |
| 1 | | CL/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | CR6/7196/Q4 | S | COLD | 20-DEC-99 | 20-NOV-99 | T1C | (470625:100) |
| 1 | | FL/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | HOLD//Q4 | S | COLD | 20-DEC-99 | 02-DEC-99 | T1C | (470626:99) |
| 1 | | ICAPT/6010A/Q4 | S | COLD | 20-DEC-99 | 17-MAY-00 | T1C | (470625:100) |
| 1 | | NO2/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | NO3/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | NO3/353.1/Q4 | S | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | OPHOS/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | SO4/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | AW - Amber Glass-2oz | HOLD//Q4 | S | COLD | 20-DEC-99 | 02-DEC-99 | T1C | (470642:99) |
| 1 | | PH/9045/Q4 | S | COLD | 20-DEC-99 | 03-DEC-99 | T1C | (470624:100) |

| | | | | | | | | |
|--------------------------------|--------|------|-----------------|-----------------|-----------|-------|---|------------------------|
| 22598-001DUP | BOX0X4 | Soil | 19-NOV-99 11:05 | 22-NOV-99 09:00 | 22-DEC-99 | FED X | 1 | Screening not Required |
| SAFB00-006//SEE SAF FOR METALS | | | | | | | | |

| | | | | | | | | |
|---|------------------------|-----------------|---|------|-----------|-----------|-----|--------------|
| 1 | AN - Amber Glass-120ML | ANIONS/300.0/Q4 | P | COLD | N/A | N/A | T1C | (470625:100) |
| 1 | | CL/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | FL/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | NO2/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | NO3/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | NO3/353.1/Q4 | S | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | OPHOS/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | SO4/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | AW - Amber Glass-2oz | PH/9045/Q4 | S | COLD | 20-DEC-99 | 03-DEC-99 | T1C | (470624:100) |

| | | | | | | | | |
|--------------------------------|--------|------|-----------------|-----------------|-----------|-------|---|------------------------|
| 22598-001MS | BOX0X4 | Soil | 19-NOV-99 11:05 | 22-NOV-99 09:00 | 22-DEC-99 | FED X | 1 | Screening not Required |
| SAFB00-006//SEE SAF FOR METALS | | | | | | | | |

| | | | | | | | | |
|---|------------------------|-----------------|---|------|-----------|-----------|-----|--------------|
| 1 | AN - Amber Glass-120ML | ANIONS/300.0/Q4 | P | COLD | N/A | N/A | T1C | (470625:100) |
| 1 | | CL/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | FL/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | ICAPT/6010A/Q4 | S | COLD | 20-DEC-99 | 17-MAY-00 | T1C | (470625:100) |
| 1 | | NO2/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | NO3/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | NO3/353.1/Q4 | S | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |
| 1 | | OPHOS/300.0/Q4 | C | COLD | 20-DEC-99 | 21-NOV-99 | T1C | (470625:100) |
| 1 | | SO4/300.0/Q4 | C | COLD | 20-DEC-99 | 17-DEC-99 | T1C | (470625:100) |

3*-Sample has not been rad screened.

000005

Quanterra November 29, 1999 10:08 am
Account: 10722 Project: 550.267 Quanterra-Richland QAS No. 550.267 Rev. 1
Master Sample Login: 22598

Project Manager: M. Ward

Reviewed by and Date: MW 11/29/99

Sample Header Template:

| Sample No. | Client ID | C-Matrix | Date: Collected | Received | Due | Shipper | Rad Category | Rad Sample No. |
|--------------------------------|------------------------|----------------|-----------------|-----------------|----------------|-----------|--------------|-------------------------------|
| # | Container Type | Analysis | Class | Preservative | Anal. Due Date | Hold Date | Site | (Container Numbers: # Filled) |
| 22598-001MSD | BOXOX4 | Soil | 19-NOV-99 11:05 | 22-NOV-99 09:00 | 22-DEC-99 | FED X | 1 | Screening not Required |
| SAFB00-006//SEE SAF FOR METALS | | | | | | | | |
| 1 | AN - Amber Glass-120ML | ICAPT/6010A/Q4 | S | COLD | 20-DEC-99 | 17-MAY-00 | T1C | (470625;100) |

3*-Sample has not been rad screened.

900020

| Bechtel Hanford Inc. | | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | | | B00-006-21 | | Page 1 of 2 | | | | |
|--|----------|----------------------------|--|--------------------------|---------------------------|----------------------------|--|--|---------------|---|---------------------------------------|---------------------------------------|--|------|--|
| Collector Fahlberg | | | Company Contact C Cearlock | | Telephone No. 372-9574 | | Project Coordinator TRENT, SJ | | Price Code 8N | | Data Turnaround 45 Days | | | | |
| Project Designation 200 Area Source Characterization 200-CS-1 Operable Unit | | | Sampling Location 200 West | | | SAF No. B00-006 | | Air Quality <input type="checkbox"/> | | | | | | | |
| Ice Chest No. ERC96033 | | | Field Logbook No. EL 1435 | | COA B20CS1671C | | Method of Shipment FED EX | | | | | | | | |
| Shipped To Quanterra Incorporated St Louis | | | Offsite Property No. A000045 | | | | Bill of Lading/Air Bill No. 42357953 2123 | | | | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS | | | | Preservation | None | None | None | None | Cool 4C | Cool 4C | None | None | None | | |
| | | | | Type of Container | aG | aG | aG | aG | aG | G/P | aG | aG | aG | aG | |
| | | | | No. of Container(s) | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | |
| | | | | Volume | 60mL | 60mL | 60mL | 60mL | 60mL | 20g | 60mL | 60mL | 60mL | 60mL | |
| Special Handling and/or Storage | | | | Isotopic Uranium | Nickel-63 | Technetium-99 | Tritium - H3 | See item (1) in Special Instructions. | Activity Scan | VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol) | See item (2) in Special Instructions. | See item (3) in Special Instructions. | Neptunium-237 | | |
| SAMPLE ANALYSIS | | | | | | | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | | | |
| BOX0X4 | Soil | 11/19/99 | 1105 | | | | | | | | | | | | |
| CHAIN OF POSSESSION | | | | Sign/Print Names | | | | SPECIAL INSTRUCTIONS | | | | | Matrix * | | |
| Relinquished By B. Soren | | Date/Time 11/19/99 | | Received By Ref 2-C | | Date/Time 11/19/99 | | See Chain Of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63, Tech-99, Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals. (1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); 7196_CR6: Hexavalent Chromium (I) (2) Gamma Spec - Complete (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228) (3) Gross Alpha; Gross Beta; Gamma Spectroscopy (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-228); Strontium-89,90 - Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Th) | | | | | S=Soil SE=Sediment SO=Solid S=Sludge W=Water O=Oil A=Air DS=Dry Solid DL=Dry Liquid T=Tissue W=Wipe L=Liquid V=Vegetation X=Other | | |
| Relinquished By R. Thoner | | Date/Time 11/22/99/0900 | | Received By R. Thoner | | Date/Time 11/22/99/0900 | | | | | | | | | |
| Relinquished By R. Thoner | | Date/Time 11/22/99/1430 | | Received By FED EX | | Date/Time 11/24/99/0905 | | | | | | | | | |
| Relinquished By | | Date/Time | | Received By | | Date/Time | | | | | | | | | |
| Relinquished By | | Date/Time | | Received By | | Date/Time | | | | | | | | | |
| LABORATORY SECTION | | | | Received By | | | | Title | | | | Date/Time | | | |
| FINAL SAMPLE DISPOSITION | | | | Disposal Method | | | | Disposed By | | | | Date/Time | | | |

TUMP 67 UM 020287

| | | | | | | |
|--|-------------------------------|---|----------------------------------|--|--------------------------------------|----------------------------|
| Bechtel Hanford Inc. | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | B00-006-21 | Page 2 of 2 |
| Collector Fahlberg | Company Contact C Cearlock | Telephone No. 372-9574 | Project Coordinator TRENT, SJ | | Price Code 8N | Data Turnaround 45 Days |
| Project Designation 200 Area Source Characterization 200-CS-1 Operable Unit | | Sampling Location 200 West | | SAF No. B00-006 | Air Quality <input type="checkbox"/> | |
| Ice Chest No. ERC 99034 | Field Logbook No. EL 1435 | COA B20CS1671C | | Method of Shipment FED EX | | |
| Shipped To Quanterra Incorporated St Louis | | Offsite Property No. A000045 | | Bill of Lading/Air Bill No. 42357953 2123 | | |

| | | | | | | | | | | | | | |
|---------------------------------|---------------------------------|-------------------------------|---|---|-------|---|--|--|--|--|--|--|--|
| POSSIBLE SAMPLE HAZARDS/REMARKS | Preservation | None | Cool 4C | Cool 4C | | | | | | | | | |
| | Type of Container | aG | aG | aG | | | | | | | | | |
| | No. of Container(s) | 1 | 1 | 1 | | | | | | | | | |
| | Special Handling and/or Storage | Volume | 60mL | 120mL | 120mL | | | | | | | | |
| SAMPLE ANALYSIS | | pH (Soil) - 9045 100% full | See item (1) in Special Instructions 100% full | Semi-VOA - 8270A (TCL), TPH-Diesel 100% full | | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
| BOX0X4 | Soil | 11/19/99 | 1105 | X | X | X | | | | | | | |

| | | | | | | | | |
|---------------------------------------|-----------|-----------------------------------|-----------|--|--|--|--|---|
| CHAIN OF POSSESSION | | | | SPECIAL INSTRUCTIONS | | | | Matrix * S=Soil SE=Settlement SO=Solid S=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 R. Thoren 11/22/99 | Date/Time | Received By R. Thoren 11/22/99 | Date/Time | See Chain Of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63, Tech-99, Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals. | | | | |
| Relinquished By R. Thoren 11/22/99 | Date/Time | Received By FED EX | Date/Time | (1) NO2/N03 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.1; Total Cyanide - 9010 | | | | |
| Relinquished By | Date/Time | Received By R. Thoren 11/24/99 | Date/Time | tie to Box 069 | | | | |
| Relinquished By | Date/Time | Received By | Date/Time | | | | | |
| Relinquished By | Date/Time | Received By | Date/Time | | | | | |

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

000008

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richard
Project No: #-2459
Shipper/No: ALBONNE # Peck
Condition/Variance (Check all that apply): 123579532123

Date: 11/24/99 Time: 0905
Initiated by: [Signature]
RFA/COC Numbers: 300-006-21

- | | |
|---|--|
| 1. <input type="checkbox"/> Sample received broken/leaking. | 8. <input type="checkbox"/> Sample ID on container does not match sample ID on paperwork. Explain: _____ |
| 2. <input type="checkbox"/> Sample received without proper preservative. <input type="checkbox"/> Cooler temperature not within $4C \pm 2C$ Record temperature: _____ <input type="checkbox"/> pH _____ <input type="checkbox"/> other: _____ | 9. <input type="checkbox"/> All coolers on airbill not received with shipment. |
| 3. <input type="checkbox"/> Sample received in improper container. | 10. <input type="checkbox"/> Other (explain below): _____ |
| 4. <input type="checkbox"/> Sample received without proper paperwork. Explain: _____ | |
| 5. <input type="checkbox"/> Paperwork received without sample. | |
| 6. <input type="checkbox"/> No sample ID on sample container. | |
| 7. <input type="checkbox"/> Custody tape disturbed/broken/missing/not tamper evident type (circle all that apply). | |

No variances were noted during sample receipt. Cooler Temperature Upon Receipt: 6°

Temperature Variance Does Not Affect the Following Analyses: _____

Notes: _____

Corrective Action:

- Client's Name: _____ Informed verbally on: _____ By: _____
- Client's Name: _____ Informed in writing on: _____ By: _____
- Sample(s) processed "as is".
- Comments: _____ If released, notify: _____
- Sample(s) on hold until: _____

Sample Control Supervisor Review: [Signature] Date: 11/24/99

Project Management Review: [Signature] Date: 11/24/99

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Bechtel Hanford Inc.
 3350 George Washington Way
 MSIN H9-03
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: ICAP Metals
 Method: EPA 6010
 Matrix: SOLID

Sample Date : 11/19/99
 Receipt Date : 11/22/99
 Report Date : 12/30/99

Client ID: B0X0X4

Quanterra ID : 22598-001

| Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result Unit | Qual. | Detection Limit | Dilution |
|-----------|------------|-------------------|------------|---------------|-------------|-------|-----------------|----------|
| Arsenic | 7440-38-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 2.5 MG/KG | | 1.0 | 1 |
| Barium | 7440-39-3 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 95.1 MG/KG | | 20.0 | 1 |
| Beryllium | 7440-41-7 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 0.30 MG/KG | B | 0.50 | 1 |
| Cadmium | 7440-43-9 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 0.03 MG/KG | U | 0.50 | 1 |
| Chromium | 7440-47-3 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 8.9 MG/KG | | 1.0 | 1 |
| Copper | 7440-50-8 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 12.6 MG/KG | | 2.5 | 1 |
| Lead | 7439-92-1 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 3.3 MG/KG | | 0.30 | 1 |
| Nickel | 7440-02-0 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 9.3 MG/KG | | 4.0 | 1 |
| Selenium | 7782-49-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 0.78 MG/KG | | 0.50 | 1 |
| Silver | 7440-22-4 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 0.09 MG/KG | U | 1.0 | 1 |
| Vanadium | 7440-62-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 56.8 MG/KG | | 5.0 | 1 |
| Zinc | 7440-66-6 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 38.3 MG/KG | E | 2.0 | 1 |

Data is incomplete without Case Narrative

000011

Bechtel Hanford Inc.
 3350 George Washington Way
 MSIN H9-03
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: ICAP Metals
 Method: EPA 6010
 Matrix: SOLID

Sample Date : 11/19/99
 Receipt Date : 11/22/99
 Report Date : 12/30/99

Client ID: BOX0X4

Quanterra ID : 22598-001MS

| Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result | Unit | Qual. | Detection Limit | Dilution |
|-----------|------------|-------------------|------------|---------------|--------|------|-------|-----------------|----------|
| Arsenic | 7440-38-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 98 | %REC | | | 1 |
| Barium | 7440-39-3 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 103 | %REC | | | 1 |
| Beryllium | 7440-41-7 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 104 | %REC | | | 1 |
| Cadmium | 7440-43-9 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 76 | %REC | | | 1 |
| Chromium | 7440-47-3 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 97 | %REC | | | 1 |
| Copper | 7440-50-8 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 103 | %REC | | | 1 |
| Lead | 7439-92-1 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 92 | %REC | | | 1 |
| Nickel | 7440-02-0 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 95 | %REC | | | 1 |
| Selenium | 7782-49-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 93 | %REC | | | 1 |
| Silver | 7440-22-4 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 92 | %REC | | | 1 |
| Vanadium | 7440-62-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 102 | %REC | | | 1 |
| Zinc | 7440-66-6 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 101 | %REC | | | 1 |

Data is incomplete without Case Narrative

000012

Bechtel Hanford Inc.
3350 George Washington Way
MSIN H9-03
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: ICAP Metals
Method: EPA 6010
Matrix: SOLID

Sample Date : 11/19/99
Receipt Date : 11/22/99
Report Date : 12/30/99

Client ID: B0X0X4

Quanterra ID : 22598-001MSD

| Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result Unit | Qual. | Detection Limit | Dilution |
|-----------|------------|-------------------|------------|---------------|-------------|-------|-----------------|----------|
| Arsenic | 7440-38-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 98 %REC | | | 1 |
| Barium | 7440-39-3 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 103 %REC | | | 1 |
| Beryllium | 7440-41-7 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 104 %REC | | | 1 |
| Cadmium | 7440-43-9 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 76 %REC | | | 1 |
| Chromium | 7440-47-3 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 102 %REC | | | 1 |
| Copper | 7440-50-8 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 102 %REC | | | 1 |
| Lead | 7439-92-1 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 91 %REC | | | 1 |
| Nickel | 7440-02-0 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 95 %REC | | | 1 |
| Selenium | 7782-49-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 93 %REC | | | 1 |
| Silver | 7440-22-4 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 91 %REC | | | 1 |
| Vanadium | 7440-62-2 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 101 %REC | | | 1 |
| Zinc | 7440-66-6 | QCBLK212312-1 | 12/15/99 | 12/15/99 | 100 %REC | | | 1 |

Data is incomplete without Case Narrative

000013

Bechtel Hanford Inc.
3350 George Washington Way
MSIN H9-03
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Anions
Method: EPA 300.0
Matrix: SOLID

Sample Date : 11/19/99
Receipt Date : 11/22/99
Report Date : 12/30/99

Client ID: BOX0X4

Quanterra ID : 22598-001

| Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result | Unit | Qual. | Detection Limit | Dilution |
|---------------|------------|-------------------|------------|---------------|--------|-------|-------|-----------------|----------|
| Fluoride | 16984-48-8 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 1.00 | MG/KG | U | 1.00 | 1 |
| Chloride | 16887-00-6 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 2.00 | MG/KG | U | 2.00 | 1 |
| Nitrite | NO2-N | QCBLK212564-1 | 12/22/99 | 12/22/99 | 0.20 | MG/KG | U | 0.20 | 1 |
| Nitrate | NO3-N | QCBLK212564-1 | 12/22/99 | 12/22/99 | 0.98 | MG/KG | | 0.20 | 1 |
| O-phosphate-P | 14265-44-2 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 5.00 | MG/KG | U | 5.00 | 1 |
| Sulfate | 14808-79-8 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 5.73 | MG/KG | | 5.00 | 1 |

Data is incomplete without Case Narrative

000024

Bechtel Hanford Inc.
3350 George Washington Way
MSIN H9-03
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Anions
Method: EPA 300.0
Matrix: SOLID

Sample Date : 11/19/99
Receipt Date : 11/22/99
Report Date : 12/30/99

Client ID: BOX0X4

Quanterra ID : 22598-001DUP

| Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result | Unit | Qual. | Detection Limit | Dilution |
|---------------|------------|-------------------|------------|---------------|--------|-------|-------|-----------------|----------|
| Fluoride | 16984-48-8 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 0.99 | MG/KG | U | 0.99 | 1 |
| Chloride | 16887-00-6 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 1.99 | MG/KG | U | 1.99 | 1 |
| Nitrite | NO2-N | QCBLK212564-1 | 12/22/99 | 12/22/99 | 0.20 | MG/KG | U | 0.20 | 1 |
| Nitrate | NO3-N | QCBLK212564-1 | 12/22/99 | 12/22/99 | 0.95 | MG/KG | U | 0.20 | 1 |
| O-phosphate-P | 14265-44-2 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 4.97 | MG/KG | U | 4.97 | 1 |
| Sulfate | 14808-79-8 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 4.97 | MG/KG | U | 4.97 | 1 |

Data is incomplete without Case Narrative

000025

Bechtel Hanford Inc.
3350 George Washington Way
MSIN H9-03
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Anions
Method: EPA 300.0
Matrix: SOLID

Sample Date : 11/19/99
Receipt Date : 11/22/99
Report Date : 12/30/99

Client ID: BOX0X4

Quanterra ID : 22598-001MS

| Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result Unit | Qual. | Detection Limit | Dilution |
|---------------|------------|-------------------|------------|---------------|-------------|-------|-----------------|----------|
| Fluoride | 16984-48-8 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 72 | %REC | | 1 |
| Chloride | 16887-00-6 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 116 | %REC | | 10 |
| Nitrite | NO2-N | QCBLK212564-1 | 12/22/99 | 12/22/99 | 132 | %REC | | 10 |
| Nitrate | NO3-N | QCBLK212564-1 | 12/22/99 | 12/22/99 | 134 | %REC | | 10 |
| O-phosphate-P | 14265-44-2 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 91 | %REC | | 1 |
| Sulfate | 14808-79-8 | QCBLK212564-1 | 12/22/99 | 12/22/99 | 105 | %REC | | 10 |

Data is incomplete without Case Narrative

000026

Bechtel Hanford Inc.
3350 George Washington Way
MSIN H9-03
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Hexavalent Chromium
Method: SW846 7196
Matrix: SOLID

Sample Date : 11/19/99
Receipt Date : 11/22/99
Report Date : 12/30/99

| Client ID | Quanterra ID | Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result | Unit | Qual. | Detection Limit | Dil. |
|-----------|---------------|-----------------|------------|-------------------|------------|---------------|--------|------|-------|-----------------|------|
| BOX0X4 | 22598-001 | Hexavalent Chro | 18540-29-9 | QCBLK212381-1 | 12/17/99 | 12/17/99 | 0.10 | UG/G | U | 0.10 | 1 |
| NA | QCBLK212381-1 | Hexavalent Chro | 18540-29-9 | QCBLK212381-1 | 12/17/99 | 12/17/99 | 0.10 | UG/G | U | 0.10 | 1 |
| NA | QCLCS212381-1 | Hexavalent Chro | 18540-29-9 | QCBLK212381-1 | 12/17/99 | 12/17/99 | 125 | %REC | | | 1 |

Data is incomplete without Case Narrative

000029

Bechtel Hanford Inc.
 3350 George Washington Way
 MSIN H9-03
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: NO3-NO2
 Method: EPA 353.1
 Matrix: SOLID

Sample Date : 11/19/99
 Receipt Date : 11/22/99
 Report Date : 12/30/99

| Client ID | Quanterra ID | Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result | Unit | Qual. | Detection Limit | Dil. |
|-----------|---------------|-----------------|------------|-------------------|------------|---------------|--------|-------|-------|-----------------|------|
| BOX0X4 | 22598-001 | Nitrate/Nitrite | NO2+NO3-N | QCBLK212450-1 | 12/22/99 | 12/22/99 | 0.50 | MG/KG | U | 0.50 | 1 |
| BOX0X4 | 22598-001DUP | Nitrate/Nitrite | NO2+NO3-N | QCBLK212450-1 | 12/22/99 | 12/22/99 | 0.50 | MG/KG | U | 0.50 | 1 |
| BOX0X4 | 22598-001MS | Nitrate/Nitrite | NO2+NO3-N | QCBLK212450-1 | 12/22/99 | 12/22/99 | 54 | %REC | | | 1 |
| NA | QCBLK212450-1 | Nitrate/Nitrite | NO2+NO3-N | QCBLK212450-1 | 12/22/99 | 12/22/99 | 0.50 | MG/KG | U | 0.50 | 1 |
| NA | QCCLS212450-1 | Nitrate/Nitrite | NO2+NO3-N | QCBLK212450-1 | 12/22/99 | 12/22/99 | 102 | %REC | | | 1 |

Data is incomplete without Case Narrative

000030

Bechtel Hanford Inc.
3350 George Washington Way
MSIN H9-03
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: pH
Method: EPA 9045
Matrix: SOLID

Sample Date : 11/19/99
Receipt Date : 11/22/99
Report Date : 12/30/99

| Client ID | Quanterra ID | Analyte | CAS Number | Blank Sample Name | Prep. Date | Analyses Date | Result | Unit | Qual. | Detection Limit | Dil. |
|-----------|--------------|---------|------------|-------------------|------------|---------------|--------|------|-------|-----------------|------|
| BOX0X4 | 22598-001 | pH | PH | NA | 12/09/99 | 12/09/99 | 8.88 | PH | | | 1 |
| BOX0X4 | 22598-001DUP | pH | PH | NA | 12/09/99 | 12/09/99 | 8.93 | PH | | | 1 |

Sample 22598-001 analysis time : 16:55
Sample 22598-001DUP analysis time : 16:57

Data is incomplete without Case Narrative

000031

ORIGINAL *Dayes*

SDR # B00-027

Revision #: 0

Date Initiated: 11/22/99

SAMPLE DISPOSITION RECORD

SAF: B00-006

OU: 200-CS-1

Project ID: 200-CS-1

Task ID: 1

Sampling Event: 200 Area Source Characterization 200-CS-1 OU

Laboratory: Quanterra Incorporated

Task Manager: C. S. Cearlock

Sampling Information:

Number of Samples: 1

ID Numbers: B0X0X4

Matrix: Soil

Collection Date: 11/19/99

Issue Background:

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

Type: Cancellation of Analyses

Description: Incorrect Analyses Requested

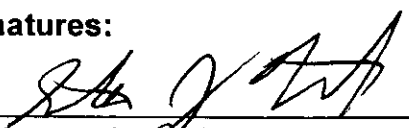
Disposition:


Description: For the listed samples the 200-CS-1 characterization project requested that the following analyses be cancelled:

Isotopic Th, Tc-99, H-3, Np-237, Ni-63, VOA, SVOA, PCB, WTPH-D, Sulfides, Ammonia, Total Cyanide, and Mercury.

Justification: Chains of custody for the listed samples requested analyses not required by the project.

Approval Signatures:

S. J. Trent  11/29/99
Project Coordinator (Print/Sign Name) Date

C. S. Cearlock 
Task Manager (Print/Sign Name) Date

SDR # B00-028

Revision #: 0

Date Initiated: 11/22/99

SAMPLE DISPOSITION RECORD

SAF: B00-006
OU: 200-CS-1
Project ID: 200-CS-1
Task ID: 1
Sampling Event: 200 Area Source Characterization 200-CS-1 OU

Laboratory: **Quanterra Incorporated**

Task Manager: **C. S. Cearlock**

Sampling Information:
Number of Samples: 1
ID Numbers: B0X0X4
Matrix: Soil
Collection Date: 11/19/99

Issue Background:

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

Type: **Addition of Analyses**


Description: **Addition of Am-241 Analysis**

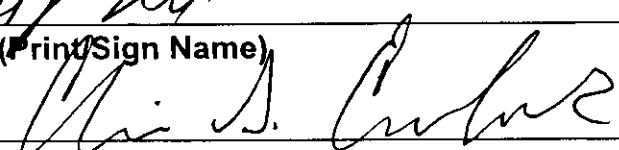
Disposition:

Description: The chain of custody for the listed samples did not request Am-241 by Alpha spectrometry.

Justification: Am-241 by Alpha spectrometry is a data quality objective analytical requirement for the 200-CS-1 OU characterization project.

Approval Signatures:

S. J. Trent  11/29/99
Project Coordinator (Print/Sign Name) Date

C. S. Cearlock 
Task Manager (Print/Sign Name) Date