

START

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0045346

W0578-QES
Quanterra
Environmental Services

2692

July 24, 1995

Joan Kessner
Buyer's Technical Representative
Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352



Reference: Contract MPV-SVV-239000.

Dear Ms. Kessner:

Accompanying this letter are the Data Package Deliverables for the Chemical analyses on the following BHI samples:

<u>SDG NUMBER</u>	<u>SAF NUMBER</u>
W0576	B95-053
<u>W0578</u>	B95-032

The chemical electronic deliverable will be sent via modem on the BHI BBS.

If you have any questions regarding this data package or require any additional information please contact me at 375-3131.

Sincerely,

Jodie Carnes
Jodie Carnes
Document Control Officer



Receipt of this letter and the package are acknowledged by:

Chantl Koomen
Name

July 24, 1995
Date

4:00p
Time

XC: Vicki Parr
Van Pettey

Wade Price
File

i aw 6/21/96

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
 P.O. Box 1970
 Richland, Washington 99352

July 7, 1995

Attention: Joan Kessner

Project number	:	550.83
Date Received by Lab	:	June 1 and 5, 1995
Number of Samples	:	Ten (10)
Sample Type	:	Water
SDG Number	:	W0578
Data Deliverable	:	Standalone



I. Introduction

On June 1 and 5, 1995, ten (10) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

<u>St Louis ID</u>	<u>BHI ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
8542-001	B0FK97	50602301	Water	06/01/95
8542-002	B0FKB5	50602303	Water	06/01/95
8542-003	B0FK99	50602305	Water	06/01/95
8542-004	B0FKF3	50602307	Water	06/01/95
8542-005	B0FK98	50602302	Water	06/01/95
8542-006	B0FKB6	50602304	Water	06/01/95
8542-007	B0FKB0	50602306	Water	06/01/95
8549-001	B0FKB7	50607201	Water	06/05/95
8549-002	B0FKB8	50607202	Water	06/05/95
8549-003	B0FKC5	50607203	Water	06/05/95

Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
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II. 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: VOA, ICP metals, Arsenic, and Lead following EPA CLP90 methodology. Chloride, Fluoride, Nitrate, Nitrite, Phosphate, and Sulfate by EPA method 300.0.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate or Sample Duplicate analyses were performed per the protocol for each analyte.

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

V. Comments

There were no comments or nonconformances associated with the Volatiles analysis.

Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
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The Matrix Spike recovery of sample BOFK97 for zinc was 0% and outside the acceptable range. In accordance with the SOW a post digestion spike was performed and the associated data flagged. The Duplicate Relative Percent Difference for zinc was above the acceptable limit and the associated data was flagged. The serial dilution result for barium was above the acceptable limit, 10.6% and the associated data was flagged.

Nitrate, Nitrite, and Phosphate holding times were waived by client.

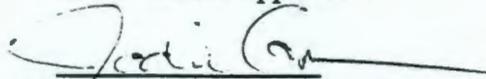
The Relative Percent Difference for Fluoride, Phosphate, and Nitrite could not be calculated due to values being below the detection limit on sample 8542-001.

The Matrix Spike for Nitrate was outside of suggested limits of 75-125 percent on sample 8542-001. The sample concentration was greater than four times the spike amount.

Samples 8542-001 and -001DUP for Fluoride was diluted 1:5 to remove an interfering peak on the ion chromatogram resulting in a higher detection limit. The Fluoride peaks for the samples integrated as a hit, but their peak area was less than the lowest calibration standard and they were reported as less than the detection limit.

I certify that this data package 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:



Wade H. Price

Project Manager

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FK97

Lab Name: QUANTERRA MO Contract: 550-83
 Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578
 Matrix: (soil/water) WATER Lab Sample ID: 8542-001
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3577
 Level: (low/med) LOW Date Received: 06/01/95
 % Moisture: not dec. Date Analyzed: 06/12/95
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

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06/01/95

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FK97

Lab Name: QUANTERRA MO Contract: 550-83

Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578

Matrix: (soil/water) WATER Lab Sample ID: 8542-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3577

Level: (low/med) LOW Date Received: 06/01/95

% Moisture: not dec. Date Analyzed: 06/12/95

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FK99

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3642

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
---------	----------	------	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	2	BJ
67-64-1-----	Acetone	10	U
75-15-0-----	Carbon Disulfide	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
540-59-0-----	1,2-Dichloroethene (total)	10	U
67-66-3-----	Chloroform	10	U
107-06-2-----	1,2-Dichloroethane	10	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon Tetrachloride	10	U
75-27-4-----	Bromodichloromethane	10	U
78-87-5-----	1,2-Dichloropropane	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
79-01-6-----	Trichloroethene	1	J
124-48-1-----	Dibromochloromethane	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
71-43-2-----	Benzene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
75-25-2-----	Bromoform	10	U
108-10-1-----	4-Methyl-2-Pentanone	10	U
591-78-6-----	2-Hexanone	10	U
127-18-4-----	Tetrachloroethene	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U
108-88-3-----	Toluene	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
100-42-5-----	Styrene	10	U
1330-20-7-----	Xylene (total)	10	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FK99

Lab Name: QUANTERRA MO Contract: 550-83

Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578

Matrix: (soil/water) WATER Lab Sample ID: 8542-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3642

Level: (low/med) LOW Date Received: 06/01/95

% Moisture: not dec. Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKB5

Lab Name: QUANTERRA MO Contract: 550-83
 Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578
 Matrix: (soil/water) WATER Lab Sample ID: 8542-002
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3641
 Level: (low/med) LOW Date Received: 06/01/95
 % Moisture: not dec. Date Analyzed: 06/14/95
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

10

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOFKB5

Lab Name: QUANTERRA MO Contract: 550-83

Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578

Matrix: (soil/water) WATER Lab Sample ID: 8542-002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3641

Level: (low/med) LOW Date Received: 06/01/95

% Moisture: not dec. Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKB7

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8549-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3648

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	10 U
74-83-9	Bromomethane	10 U
75-01-4	Vinyl Chloride	10 U
75-00-3	Chloroethane	10 U
75-09-2	Methylene Chloride	10 U
67-64-1	Acetone	10 U
75-15-0	Carbon Disulfide	10 U
75-35-4	1,1-Dichloroethene	10 U
75-34-3	1,1-Dichloroethane	10 U
540-59-0	1,2-Dichloroethene (total)	10 U
67-66-3	Chloroform	10 U
107-06-2	1,2-Dichloroethane	10 U
78-93-3	2-Butanone	10 U
71-55-6	1,1,1-Trichloroethane	10 U
56-23-5	Carbon Tetrachloride	10 U
75-27-4	Bromodichloromethane	10 U
78-87-5	1,2-Dichloropropane	10 U
10061-01-5	cis-1,3-Dichloropropene	10 U
79-01-6	Trichloroethene	2 J
124-48-1	Dibromochloromethane	10 U
79-00-5	1,1,2-Trichloroethane	10 U
71-43-2	Benzene	10 U
10061-02-6	trans-1,3-Dichloropropene	10 U
75-25-2	Bromoform	10 U
108-10-1	4-Methyl-2-Pentanone	10 U
591-78-6	2-Hexanone	10 U
127-18-4	Tetrachloroethene	10 U
79-34-5	1,1,2,2-Tetrachloroethane	10 U
108-88-3	Toluene	10 U
108-90-7	Chlorobenzene	10 U
100-41-4	Ethylbenzene	10 U
100-42-5	Styrene	10 U
1330-20-7	Xylene (total)	10 U

961497E.1039

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FKB7

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8549-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3648

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKC5

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8549-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3649

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624

ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	10	U
67-64-1	-----Acetone	10	U
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKF3

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-004

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3643

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
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74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	10	U
67-64-1	-----Acetone	20	
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

95-1700-1005

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0FKF3

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-004

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3643

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====



**St. Louis Laboratory
Data Review Check List
METALS**

Work Order Number(s): <u>550.83</u>
Lab Sample Numbers or SDG: <u>W0578</u>
Method/Test/Parameter: <u>PCP</u>

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency with required number of levels?	✓			/
2. Correlation coefficient within QC limits?			✓	NA
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			/
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			/
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			/
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			/
C. Sample Analysis				
1. Were any samples with concentrations > the linear range for any parameter diluted and reanalyzed?			✓	NA
2. Were all sample holding times met?	✓			/
D. QC Samples				
1. MS or MS/MSD percent recovery within QC limits?		✓		NA
2. Analytical spikes within QC limits?	✓			/
3. LCS recovery within QC limits?	✓			/
4. ICP only: One serial dilution performed per SDG?	✓			/
5. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?	✓			/
6. ICP only: Interference check samples (ICSA, ICSAB) analyzed at the beginning and end of analytical run or at minimum frequencies and within QC limits?	✓			/

**St. Louis Laboratory
Data Review Check List
METALS**

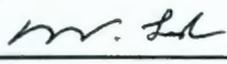
E. Other				
1. Are all nonconformances included and noted?			✓	MA
2. Is the correct date and time of analysis shown?	✓			-
3. Did the analyst sign and date the front page of the analytical run?	✓			-
4. Correct methodology used?	✓			-
5. Transcriptions checked?	✓			-
6. Calculations checked at minimum frequency?	✓			-
7. Units checked?	✓			-

Comments on any "No" response:

Sample 8542-001:
Zn - Sample read @ 1.0 ppm, The Post-Spike
was spiked at 2.0 ppm Zn The post-spike read @ 2.1 ppm.
yielding @ 50% Recovery. Mark

Analyst: 

Date: 06-25-95

Second-Level Review: 

Date: 6/29/95



Quanterra

Metals Prep Analyst: Scott Kruchowski

Metals Digestion Prep Sheet

Method: CLP90

Prep Batch: 71023

Digestion Method: _____

Prep Date: 23-JUN-95

Analyses: ICP GFAA FLAA HG

Page: 1

Sample Identification		Digestion		Sample Description				Spike Description							
Project Number	Sample Number	Client ID	Initial Vol	Final Vol	Color Initial	Color Final	Clarity Initial	Clarity Final	Texture Texture	Texture Artifacts	ID	Type	Amount	Units	Description
550.83	8542-001	B0FK97	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8542-001DUP	B0FK97	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8542-001MS	B0FK97	100. ML	100 ML	Colorless	Colorless	Clear	Clear			MS0046-95	ICP MS-	0.50	ml	
550.83	8542-002	B0FKB5	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8542-003	B0FK99	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8542-005	B0FK98	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8542-006	B0FKB6	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8542-007	B0FKB0	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8549-001	B0FKB7	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8549-002	B0FKB8	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
550.83	8549-003	B0FKC5	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
000.01	QCLCS71023-1	Lab Control Sample	100. ML	100 ML	Colorless	Colorless	Clear	Clear			MS0003-95	CA	1000 2.0	ml	
											MS0004-95	NA	1000 2.0	ml	
											MS0005-95	K	1000 2.0	ml	
											MS0006-95	MG	1000 2.0	ml	
											MS0016-95	ICP LCS	0.50	ml	
											MS0141-94	TL	0.10	ml	

ICAP/CLP90/Q4

ICAPD/CLP90/Q4

Relinquished By:

Scott Kruchowski 6-23-95

Received By:

M. H. [Signature] 06-24-95

Reviewed By:

M. H. [Signature] 6/29/95

Color Red, Blue, Yellow, Green, Orange, Violet, White, Brown, Grey, Black, Colorless
 Clarity Clear, Cloudy, Opaque
 Texture Fine(powdery), Medium(sand), Coarse(rocks)

613178.1905

Quanterra

Metals Prep Analyst: Scott Kruchowski

Metals Digestion Prep Sheet

Method: CLP 90

Prep Batch: 71023

Digestion Method: _____

Prep Date: 23-JUN-95

Analyses: ICP GFAA FLAA HG

Page: 2

Sample Identification		Digestion		Sample Description				Spike Description							
Project Number	Sample Number	Client ID	Initial Vol	Final Vol	Color Initial	Color Final	Clarity Initial	Clarity Final	Texture Texture	Artifacts	ID	Type	Amount	Units	Description
000.01	QCPREPBLK71023-1	Preparation Blank	100 ML	100 ML	Colorless	Colorless	Clear	Clear							
	ICAP/CLP90/Q4	ICAPD/CLP90/Q4													

9613478.1906

Relinquished By: Scott Kruchowski 6-23-95
 Received By: M. Huan 06-24-95
 Reviewed By: W. R. L. 6/23/95

Color Red, Blue, Yellow, Green, Orange, Violet, White, Brown, Grey, Black, Colorless
 Clarity Clear, Cloudy, Opaque
 Texture Fine(powdery), Medium(sand), Coarse(rocks)



Quanterra

Metals Digestion Prep Sheet

Method: CLP90

Metals Prep Analyst: Scott Kruchowski

Prep Batch: 70844

Prep Date: 22-JUN-95

Analyses: ICP GFAA FLAA HG

Digestion Method: _____

Page: 1

Sample Identification		Digestion	Sample Description						Spike Description						
Project Number	Sample Number	Client ID	Initial Vol	Final Vol	Color Initial	Color Final	Clarity Initial	Clarity Final	Texture Texture	Texture Artifacts	ID	Type	Amount	Units	Description
550.83	8542-001	BOFK97	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	PB/CLP90/Q4													
550.83	8542-001DUP	BOFK97	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	PB/CLP90/Q4													
550.83	8542-001MS	BOFK97	100. ML	100 ML	Colorless	Colorless	Clear	Clear			MS0033-95	MS/STOC 1.0	ml		
	AS/CLP90/Q4	PB/CLP90/Q4													
550.83	8542-002	BOFK85	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	PB/CLP90/Q4													
550.83	8542-003	BOFK99	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	PB/CLP90/Q4													
550.83	8542-005	BOFK98	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	ASD/CLP90/Q4	PBD/CLP90/Q4													
550.83	8542-006	BOFK86	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	ASD/CLP90/Q4	PBD/CLP90/Q4													
550.83	8542-007	BOFK80	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	ASD/CLP90/Q4	PBD/CLP90/Q4													
550.83	8549-001	BOFKB7	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	PB/CLP90/Q4													

Relinquished By:

Scott Kruchowski 6-22-95

Received By:

W. J. ... 6/23/95

Reviewed By:

W. J. ... 6/29/95

Color Red, Blue, Yellow, Green, Orange, Violet, White, Brown, Grey, Black, Colorless
 Clarity Clear, Cloudy, Opaque
 Texture Fine(powdery), Medium(sand), Coarse(rocks)

5613478.1907

Quanterra

Metals Prep Analyst: Scott Kruchowski

Metals Digestion Prep Sheet

Method: CLP90

Prep Batch: 70844

Digestion Method: _____

Prep Date: 22-JUN-95

Analyses: ICP GFAA FLAA HG

Page: 2

Sample Identification		Digestion		Sample Description				Spike Description							
Project Number	Sample Number	Client ID	Initial Vol Units	Final Vol Units	Color Initial	Color Final	Clarity Initial	Clarity Final	Texture Texture	Artifacts	ID	Type	Amount	Units	Description
550.83	8549-002	BOFKB8	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	ASD/CLP90/Q4	PBD/CLP90/Q4													
550.83	8549-003	BOFKC5	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	PB/CLP90/Q4													
000.01	QCLCS70844-1	Lab Control Sample	100. ML	100 ML	Colorless	Colorless	Clear	Clear			MS0031-95	LCS/CCV 1.0	ml		
	AS/CLP90/Q4	ASD/CLP90/Q4		PB/CLP90/Q4		PBD/CLP90/Q4									
000.01	QCPREPBLK70844-1	Preparation Blank	100. ML	100 ML	Colorless	Colorless	Clear	Clear							
	AS/CLP90/Q4	ASD/CLP90/Q4		PB/CLP90/Q4		PBD/CLP90/Q4									

9613478.1908

Relinquished By: Scott Kruchowski Comments: 6-22-95

Received By: not for GFAA 6/23/95

Reviewed By: W. Lutz 6/29/95

Color Red, Blue, Yellow, Green, Orange, Violet, White, Brown, Grey, Black, Colorless
 Clarity Clear, Cloudy, Opaque
 Texture Fine(powdery), Medium(sand), Coarse(rocks)

9615478.1319

Quanterra-Richland
 P.O. Box 1970
 Richland, WA 99352

Project: 550.83

Category: Chloride
 Method: EPA 300.0
 Matrix: LIQUID

Sample Date : 05/31/95
 Receipt Date : 06/01/95
 Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
BOFK97	8542-001	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	5.54	MG/L		1.00	5
BOFK97	8542-001DUP	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	5.52	MG/L		1.00	5
BOFK97	8542-001MS	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	89	%REC			10
BOFK85	8542-002	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	5.53	MG/L		1.00	5
BOFK99	8542-003	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	9.72	MG/L		1.00	5
BOFK87	8549-001	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	5.43	MG/L		1.00	5
BOFKC5	8549-003	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	0.20	MG/L	U	0.20	
NA	QCBLK69225-1	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	0.20	MG/L	U	0.20	
NA	QCBLK69455-1	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	0.20	MG/L	U	0.20	
NA	QCLCS69225-1	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	93	%REC			
NA	QCLCS69455-1	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	90	%REC			

961178.1710

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Fluoride
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	D
BOFK97	8542-001	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	
BOFK97	8542-001DUP	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	
BOFK97	8542-001MS	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	86	%REC			
BOFK85	8542-002	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L		0.10	
BOFK99	8542-003	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.27	MG/L		0.10	
BOFK87	8549-001	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	0.39	MG/L		0.10	
BOFKC5	8549-003	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	0.10	MG/L	U	0.10	
NA	QCBLK69225-1	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.10	MG/L	U	0.10	
NA	QCBLK69455-1	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	0.10	MG/L	U	0.10	
NA	QCCLS69225-1	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	94	%REC			
NA	QCCLS69455-1	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	87	%REC			

9613478.1911

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Nitrate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
BOFK97	8542-001	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	19.9	MG/L		1.00	50
BOFK97	8542-001DUP	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	19.8	MG/L		1.00	50
BOFK97	8542-001MS	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	58	%REC			50
BOFK85	8542-002	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	1.10	MG/L		0.10	5
BOFK99	8542-003	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	20.3	MG/L		1.00	50
BOFK87	8549-001	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	1.69	MG/L		0.10	5
BOFKC5	8549-003	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	1
NA	QCBLK69225-1	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	1
NA	QCBLK69455-1	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	1
NA	QCCLCS69225-1	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	98	%REC			1
NA	QCCLCS69455-1	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	99	%REC			1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Nitrite
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	D
B0FK97	8542-001	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	
B0FK97	8542-001DUP	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	
B0FK97	8542-001MS	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	88	%REC			
B0FKB5	8542-002	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	
B0FK99	8542-003	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	
B0FKB7	8549-001	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	
B0FKC5	8549-003	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	
NA	QCBLK69225-1	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	
NA	QCBLK69455-1	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	
NA	QCLCS69225-1	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	108	%REC			
NA	QCLCS69455-1	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	100	%REC			

9610478.1513

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Sulfate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Di
BOFK97	8542-001	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	46.4	MG/L		2.50	
BOFK97	8542-001DUP	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	46.1	MG/L		2.50	
BOFK97	8542-001MS	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	84	%REC			
BOFKB5	8542-002	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	34.6	MG/L		2.50	
BOFK99	8542-003	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	51.8	MG/L		2.50	
BOFKB7	8549-001	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	43.8	MG/L		2.50	
BOFKC5	8549-003	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	U	0.50	
NA	QCBLK69225-1	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	
NA	QCBLK69455-1	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	U	0.50	
NA	QCCLS69225-1	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	90	%REC			
NA	QCCLS69455-1	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	94	%REC			

9616178.1911

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Orthophosphate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
B0FK97	8542-001	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
B0FK97	8542-001DUP	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
B0FK97	8542-001MS	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	98	%REC			1
B0FK85	8542-002	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
B0FK99	8542-003	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
B0FKB7	8549-001	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	U	0.50	1
B0FKC5	8549-003	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	U	0.50	1
NA	QCBLK69225-1	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
NA	QCBLK69455-1	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	U	0.50	1
NA	QCCLCS69225-1	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	89	%REC			1
NA	QCCLCS69455-1	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	94	%REC			1



St. Louis Laboratory
Data Review Check List
GENERAL CHEMISTRY

Project Number(s): ~~578~~ ~~0573~~ BATCH # 69225
 550.83 317.36 368.01
 Lab Sample Numbers or SDG: 8509-001-004 8529-001
 8542-001-003 8533-001,007
 Method/Test/Parameter: F, Cl, Br, NO₂, NO₃, OPO₄, SO₄ / 300.0

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
A. Initial Calibration				
1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?	✓			✓
2. Is the initial calibration correlation coefficient ≥ 0.995 ?	✓			✓
B. Continuing Calibration				
1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?	✓			✓
C. Sample Analysis				
1. Were all sample holding times met?		* ✓		✓
D. QC Samples				
1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) <u>AND/OR</u> the Matrix Spike (MS) % recovery within QC limits?	* ✓			✓
3. When MS/MSD analyzed, is RPD within QC limits?			✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits?	* ✓			✓
E. Other				
1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?	✓			✓

Comments on any "No" response:

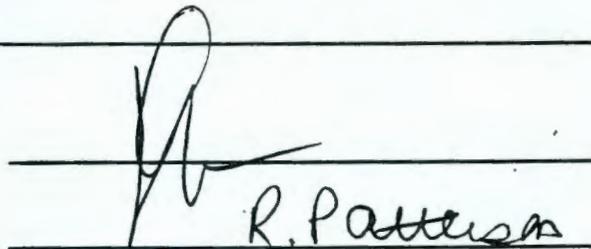
St. Louis Laboratory
Data Review Check List
GENERAL CHEMISTRY

* HOLD TIME LAYDOWN 8509-001-004 (N₂, 103.004) (W057)
 8542-001-003 (N₂, 103.004) (W057)
 8533-001,007 (N₂, 103.004) (388.0)

** MS OUTSIDE SIBB LIMITS 75-125% 8542-001 (N₂, 58%) (W057)
 but sample concentration exceeds spike concentration by a factor of 4 or more

*** W/7 CALCULATE RD DUE TO VALUES < DETECTION
 (W0578) LIMITS 8542-001 (F, 0.004, 102)

Analyst:



Date: 06/22/95

Second-Level Review:

Date: 6-16-95

for Fluoride

8542-001
 8542-001 (DUP)
 (W0578)

diluted 1:5[^] to remove an interfering peak on the ion chromatogram resulting in a higher det. limit. Also, the fluoride peak integrated as a hit but its area is < the peak area of the lowest calib. std so was reported as < de lim

9613478.1917



**St. Louis Laboratory
Data Review Check List
GENERAL CHEMISTRY**

Project Number(s):	BATCH # 69455	W0586, W0578
	519.153, 550.83	
Lab Sample Numbers or SDG:	8563-001 → 003	8549-001, 002
Method/Test/Parameter: F, Cl, NO ₂ , NO ₃ , Pb, Y, SO ₄ / 300.0		

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
A. Initial Calibration				
1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?	✓			/
2. Is the initial calibration correlation coefficient ≥ 0.995?	✓			/
B. Continuing Calibration				
1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?	✓			/
C. Sample Analysis				
1. Were all sample holding times met?		* ✓		/
D. QC Samples				
1. Is the Method Blank concentration less than the reporting limit?	✓			/
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	** ✓			/
3. When MS/MSD analyzed, is RPD within QC limits?			✓	/
4. When duplicate sample analysis performed, is RPD within QC limits?	*** ✓			/
E. Other				
1. Are all nonconformances included and noted?			✓	/
2. Are all required forms filled out?	✓			/
3. Was correct methodology used?	✓			/
4. Transcriptions checked?	✓			/
5. Were all calculations checked at minimum frequency?	✓			/
6. Did the analyst sign and date the front page of the analytical run?	✓			/
7. Units checked?	✓			/

Comments on any "No" response:

n 00414

Hold times were met for W0586

St. Louis Laboratory
Data Review Check List
GENERAL CHEMISTRY

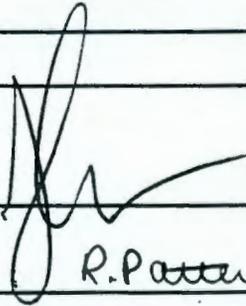
RP 6-30-95

~~Hold time waived~~ ~~8563-001, 003 (NO₂, NO₃, O₃)~~ ~~W0586~~
~~8549-001, 003 (NO₂, NO₃, O₃)~~ ~~W0578~~

~~MS outside sub. limits 25-125% 8563-001 (F^{2%}, NO₂^{62%}, O₃^{35%})~~
~~(W0586) but the sample concentration exceeded the spec concentration by a factor of 4 or more for F, NO₃~~

~~Can't calculate RPD due to values < detection~~
~~limits 8563-001 (NO₂-N)~~

Analyst:


R. Patterson

Date:

0612-95

Second-Level Review:

Date:

6-30-95

QUANTERRA ST. LOUIS

Project #: 550.83 317.36 388.01
 Analyst: J. CARRO
 Reviewed By: R. Patterson 06-16-95
 Reviewed By: R. Patterson 06-16-95
 Page 1 of 1

ANIONS BY I.C.

Prep Date: 06-06-95
 Analysis Date: 06-06-95
 Loop Used: 8012
 Batch #: 69225
 Method #: 3000

ug/g ug/L (mg/L)
 (circle one)

Standard Value	Sample ID	Standard ID	Solid Fract.	DH.	FI	CI	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
	AC3269225				<0.1	<0.2	<0.5	<0.02	<0.5	<0.02	<0.25
	AC3269225	AC3269225			0.938	0.934	3.62	0.195	3.57	0.086	0.95
	8529-001			F Cl Mg NO ₃ NO ₂ SO ₄	0.124	4.52	19.4	2.31	<0.5	<0.02	
	002			F Cl Mg NO ₃ NO ₂ SO ₄	0.158	12.4	79.2	22.7	<0.5	<0.02	
	003			F Cl Mg NO ₃ NO ₂ SO ₄	0.189	15.4	46.1	26.1	<0.5	<0.02	
	004			F Cl Mg NO ₃ NO ₂ SO ₄	<0.1	<0.2	<0.5	<0.02	<0.5	<0.02	
	8529-001			F Cl Mg NO ₃ NO ₂ SO ₄	2.40	10.6	27.1				<0.25
	8542-001			F Cl Mg NO ₃ NO ₂ SO ₄	<0.5*	5.54	46.4	19.9	<0.5	<0.02	
	00109			F Cl Mg NO ₃ NO ₂ SO ₄	<0.5*	5.52	46.1	19.8	<0.5	<0.02	
	001MS	AC3269225		F Cl Mg NO ₃ NO ₂ SO ₄	1.72	23.4	63.1	21.2	1.95	0.534	
	002			F Cl Mg NO ₃ NO ₂ SO ₄	0.503	5.53	34.6	1.10	<0.5	<0.02	
	003			F Cl Mg NO ₃ NO ₂ SO ₄	0.271	9.72	51.8	20.3	<0.5	<0.02	
	8533-001		F 500	F Cl Mg NO ₃ NO ₂ SO ₄	<50*	<50*	<50*	104000	<50*	9.63	<62.5*
	007			F Cl Mg NO ₃ NO ₂ SO ₄	7720	86900	<125*	2900	162000	693	<62.5*

* DILUTED DUE TO POOR INTERFERENCE
 + < LOW CAL STD

RPD

	FI	CI	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br		FI	CI	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
LCS-1	94	93	90	98	89	108	95	✓	8542-001	DUP	*	<1	<1	<1	* * ✓
LCS-2									DUP						
8542-001 MS	86	89	84	58*	96	88		✓	DUP						
MS															
MS															

* CAN'T CALCULATE RPD DUE TO VALUES < DETECTION LIMIT

* OUTSIDE SUGG LIMITS

00416

9613478.1421



Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

Analytical Data Package Prepared For

Westinghouse/Bechtel Hanford

Radiochemical Analysis By

Quanterra Environmental Services
Richland Laboratory

Sample Delivery Group Number: W0578

CLIENT ID NUMBER

QUANTERRA ID NUMBER

B0FK97	50602401
B0FKB5	50602402
B0FK99	50602403
B0FKB7	50607301
B0FKC5	50607302



0001

9615478.1922



Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

July 26, 1995

Attention: Joan Kessner



SAF Number	:	B95-052
Date SDG Closed	:	June 15, 1995
Number of Samples	:	Five (5)
Sample Type	:	Water
SDG Number	:	W0578
Data Deliverable	:	Stand Alone

I. Introduction

On May 30 and 31, 1995, a total of five water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>OTESRL ID</u>	<u>BHI ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
50602401	B0FK97	Water	6/1/95
50602402	B0FKB5	Water	6/1/95
50602403	B0FK99	Water	6/1/95
50607301	B0FKB7	Water	6/5/95
50607302	B0FKC5	Water	6/5/95

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

9510179.1015

Bechtel Hanford, Inc.
July 26, 1995
Page 2

The requested analyses were:

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3214

Gross Beta by method ITAS-RD-3214

Strontium-90 by method ITAS-RD-3204

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3263

Tritium by method ITAS-RD-3205

III. Quality Control

The analytical results for each analysis performed under SDG W0578 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

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

IV. Comments

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3214

The LCS, batch blank, sample and sample duplicate (B0FKC5) results are within contractual requirements.

Gross Beta by method ITAS-RD-3214

The LCS, batch blank, sample and sample duplicate (B0FKB7) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204

The LCS, batch blank, sample and sample duplicate (B0FK97) results are within contractual requirements.

Bechtel Hanford, Inc.
July 26, 1995
Page 3

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3263

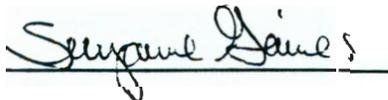
Sample B0FK97 and its duplicate were reanalyzed because the original duplicate results were 6.9 sigma from the expected value. The reanalysis results are within acceptable limits. The LCS, batch blank, sample and sample duplicate (B0FK97) results are within contractual requirements.

Tritium by method ITAS-RD-3205

The LCS, batch blank, sample and sample duplicate (B0FK97) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Suzanne Gaines
Project Manager

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50602401 MATRIX: WATER
CLIENT ID: B0FK97 DATE RECEIVED: 6/1/95 9:45:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	1.14E+01	2.8E+00	3.0E+00	1.86E+00	pCi/L	100.00%	RD3214
BETA	1.77E+01	2.6E+00	2.9E+00	3.24E+00	pCi/L	100.00%	RD3214
STRONTIUM	-1.56E-01	2.0E-01	2.1E-01	9.39E-01	pCi/L	73.80%	RD3204
C-14	2.99E+02	4.1E+00	1.6E+01	1.09E+00	pCi/L	100.00%	RD3263
TRITIUM	1.00E+05	1.3E+03	7.5E+03	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50602402 MATRIX: WATER
CLIENT ID: B0FKB5 DATE RECEIVED: 6/1/95 9:45:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	2.82E+00	1.2E+00	1.3E+00	1.25E+00	pCi/L	100.00%	RD3214
BETA	5.29E+00	1.7E+00	1.8E+00	2.97E+00	pCi/L	100.00%	RD3214
STRONTIUM	1.73E-01	2.0E-01	2.1E-01	7.57E-01	pCi/L	96.20%	RD3204
C-14	3.04E+00	1.5E+00	3.0E+00	3.40E+00	pCi/L	100.00%	RD3263
TRITIUM	2.48E+02	1.3E+02	2.0E+02	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50602403 MATRIX: WATER
CLIENT ID: B0FK99 DATE RECEIVED: 6/1/95 9:45:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	1.02E+01	2.6E+00	2.8E+00	1.45E+00	pCi/L	100.00%	RD3214
BETA	1.14E+01	2.1E+00	2.3E+00	2.99E+00	pCi/L	100.00%	RD3214
STRONTIUM	-8.18E-02	2.1E-01	2.1E-01	9.30E-01	pCi/L	74.70%	RD3204
C-14	6.01E+00	1.5E+00	3.1E+00	3.40E+00	pCi/L	100.00%	RD3263
TRITIUM	1.01E+04	4.4E+02	9.0E+02	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50607301 MATRIX: WATER
CLIENT ID: B0FKB7 DATE RECEIVED: 6/5/95 11:01:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	2.56E+00	1.1E+00	1.1E+00	1.20E+00	pCi/L	100.00%	RD3214
BETA	7.16E+00	1.8E+00	1.9E+00	2.89E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.38E-01	2.2E-01	2.3E-01	7.82E-01	pCi/L	93.50%	RD3204
C-14	2.52E+00	1.5E+00	3.0E+00	3.40E+00	pCi/L	100.00%	RD3263
TRITIUM	6.37E+02	1.6E+02	2.2E+02	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50607302 MATRIX: WATER
CLIENT ID: B0FKC5 DATE RECEIVED: 6/5/95 11:01:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	7.09E-02	2.7E-01	2.7E-01	6.42E-01	pCi/L	100.00%	RD3214
BETA	1.10E-01	1.2E+00	1.2E+00	2.76E+00	pCi/L	100.00%	RD3214
STRONTIUM	9.65E-02	2.2E-01	2.2E-01	8.47E-01	pCi/L	87.00%	RD3204
C-14	-7.66E-01	1.4E+00	2.9E+00	3.40E+00	pCi/L	100.00%	RD3263
TRITIUM	8.52E+01	1.2E+02	1.9E+02	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

DUPLICATE RESULTS

LAB NAME: ITAS-RICHLAND **SDG:** W0578
LAB SAMPLE ID: G0602401 **MATRIX:** WATER
CLIENT ID: B0FK97 **DATE RECEIVED:** 6/1/95 9:45:00 AM
ORIG LAB SAMPLE ID: 50602401

ISOTOPE	DUP RESULT	COUNTING ERROR ‡	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
STRONTIUM	-9.39E-03	2.3E-01	2.3E-01	9.72E-01	pCi/L	71.50%	RD3204	-1.56E-01	177.29
C-14	3.12E+02	4.2E+00	1.6E+01	1.09E+00	pCi/L	100.00%	RD3263	2.99E+02	4.26
TRITIUM	9.94E+04	1.3E+03	7.4E+03	2.80E+02	pCi/L	88.10%	RD3205	1.00E+05	0.60

Number of Results:

Project Manager: W. Price

Draft: Final Entered and Reviewed by: Bob Covert

PM Review: [Signature]

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: X Filled)	
8549-001	BOFKB7 RICHLAND I.D. 50607201	Water	02-JUN-95 12:15	05-JUN-95 11:01	10-JUL-95	FED-EX	1	Screening not Required
3 VI - Vial-40ml	VOA/CLP90/Q4	S	HCL	03-JUL-95	16-JUN-95	1091	(161768:100 161769:99 161770:98)	
1 PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161766:100)	
1	ICAP/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161766:100)	
1	PB/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161766:100)	
1 PN - Plastic-500ml	ANIONS/300.0/Q4	P	COLD	N/A	N/A	T1C	(161767:100)	
1	CL/300.0/Q4	C	COLD	03-JUL-95	30-JUN-95	T1C	(161767:100)	
1	FL/300.0/Q4	C	COLD	03-JUL-95	30-JUN-95	T1C	(161767:100)	
1	NO2/300.0/Q4	C	COLD	03-JUL-95	04-JUN-95	T1C	(161767:100)	
1	NO3/300.0/Q4	C	COLD	03-JUL-95	04-JUN-95	T1C	(161767:100)	
1	OPHOS/300.0/Q4	C	COLD	03-JUL-95	04-JUN-95	T1C	(161767:100)	
1	SO4/300.0/Q4	C	COLD	03-JUL-95	30-JUN-95	T1C	(161767:100)	
8549-002	BOFKB8 RICHLAND I.D. 50607202	Water	02-JUN-95 12:15	05-JUN-95 11:01	10-JUL-95	FED-EX	1	Screening not Required
1 PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161771:100)	
1	ICAPD/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161771:100)	
1	PBD/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161771:100)	
8549-003	BOFKC5 RICHLAND I.D. 50607203	Water	02-JUN-95 10:30	05-JUN-95 11:01	10-JUL-95	FED-EX	1	Screening not Required
3 VI - Vial-40ml	VOA/CLP90/Q4	S	HCL	03-JUL-95	16-JUN-95	1091	(161774:100 161775:99 161776:98)	
1 PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161772:100)	
1	ICAP/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161772:100)	
1	PB/CLP90/Q4	S	HNO3	03-JUL-95	02-DEC-95	T1C	(161772:100)	
1 PN - Plastic-500ml	ANIONS/300.0/Q4	P	COLD	N/A	N/A	T1C	(161773:100)	
1	CL/300.0/Q4	C	COLD	03-JUL-95	30-JUN-95	T1C	(161773:100)	
1	FL/300.0/Q4	C	COLD	03-JUL-95	30-JUN-95	T1C	(161773:100)	
1	NO2/300.0/Q4	C	COLD	03-JUL-95	04-JUN-95	T1C	(161773:100)	
1	NO3/300.0/Q4	C	COLD	03-JUL-95	04-JUN-95	T1C	(161773:100)	
1	OPHOS/300.0/Q4	C	COLD	03-JUL-95	04-JUN-95	T1C	(161773:100)	
1	SO4/300.0/Q4	C	COLD	03-JUL-95	30-JUN-95	T1C	(161773:100)	
8549-004	TRIP BLANK	Water	02-JUN-95 00:00	05-JUN-95 11:01	10-JUL-95	FED-EX	1	Screening not Required
2 VI - Vial-40ml	HOLD//Q4	S	HCL	11- ### **	11- ### **	1091	(161777:100 161778:100)	

9613478.1931

01000

3*-Sample has not been rad screened.

Temp 5°C / 6°C Temp Vial CML# 4376

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround

- Priority
- Normal

Collector K. D. Lee	Company Contact Bob Raidt	Telephone (509) 372 9641						
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052						
Ice Chest No. ERC-FS-008	Field Logbook No. EFL-1054	Method of Shipment Hand Delivered						
Shipped To Quanterra	Offsite Property No. PH2 N/A	Bill of Lading/Air Bill No. N/A						
Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	A _{Gs}	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS

506072

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP Metals-TAL AA Metals-As, Pb. (Unfiltered)	Anions (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-As, Pb. (Filtered)
BOFKB7	W	06/02/95	1215	PH2	X	X	X	X	X	X
BOFKB8	W	06/02/95	1215	100%	100%	100%				PH2

CHAIN OF POSSESSION

Sign/Print Names

SPECIAL INSTRUCTIONS

Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

Matrix*

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

Relinquished By K. D. Lee	Date/Time 6/5/95 0800	Received By Bob Raidt	Date/Time 6-5-95
Relinquished By Bob Raidt	Date/Time 6-5-95 1101	Received By K. D. Lee	Date/Time 6-5-95
Relinquished By	Date/Time	Received By Phil Weber	Date/Time 6-6-95/0747

SDG W0578

LABORATORY SECTION

Received By

Title

Date/Time

FINAL SAMPLE DISPOSITION

Disposal Method

Disposed By

Date/Time

11000

9613478.1932

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround
 Priority
 Normal

Collector <i>K.D. Lee</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAP No. B95-052
Ice Chest No. <i>ERC-FS-002</i>	Field Logbook No.	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>PH 2 N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	Ga	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS <i>506072</i>	ICP Metals-TAL AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium C-14	Activity Scan	ICP Metals-TAL AA Metals-Aa, Pb. (Filtered)
	<i>506072</i>						

Sample No.	Matrix*	Date Sampled	Time Sampled	PH 2	X	X	X	X	X	X	X	X
<i>BOFKCS</i>	W	<i>6/2/95</i>	<i>1030</i>	<i>PH 2</i>	X	X	X	X	X	X	X	X
<i>BOEKCS</i>	W	<i>NA 6-5-95</i>										<i>NA 6-5-95</i>
					<i>100%</i>	<i>100%</i>	<i>100%</i>					

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By <i>K.D. Lee</i>	Date/Time <i>6/5/95 0800</i>	Received By <i>Bob Raidl</i>	Date/Time <i>6-5-95</i>
Relinquished By <i>Bob Raidl</i>	Date/Time <i>6-5-95 1101</i>	Received By <i>R. Boyd</i>	Date/Time <i>6-5-95</i>
Relinquished By <i>Bob Raidl</i>	Date/Time <i>6-5-95</i>	Received By <i>Bob Raidl</i>	Date/Time <i>6-6-95 0745</i>
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS: Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

unable to take a filtered sample with could not be converted to cubic container 6-5-95

SDG W0578

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

00012

9613478 1993

Environmental
Restoration Contractor **ERC Team**
Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: 100-FR-3
TSD: N/A
ERA: N/A
Subject Code: 5830

TO: W. S. Thompson N3-06

DATE: April 27, 1995

COPIES: R. L. Biggerstaff H4-91

FROM: S. K. De Mers 
Radiological Controls
N3-06/376-2764

SUBJECT: 1995 Round 7 sampling for 100-FR-3

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from the attached list of wells.

All except two of the wells listed in the attachment were reviewed for radiological content based on the previous 4 years of sampling data. No well listed has a β activity in excess of 100,000 pCi/l (< .1 uCi/sample based on a 1 liter sample size) nor any α activity in excess of 10,000 pCi/l (< .01 uCi/l based on a 1 liter sample). All wells show activities < 2,000 pCi/gm (< 2 nCi/gm D.O.T. limit). The highest activity in recent samples is 9,900 pCi/l β (H³) and 50 pCi/l α .

The remaining wells are in locations that do not provide a credible path whereby they could become contaminated at the above listed levels.

Radiological monitoring during sampling will only be required if the wells are located in radiological areas or if the wells themselves are labeled with radiological stickers. Monitoring requirements for down hole work such as pump removal will be determined based on the history of each well on a case by case basis.

skd



WHC/BHI SAMPLE CHECK-IN LIST

Date/Time Received: 6/5/95 1052
5-06-072

SDG #: W0578

Work Order Number: 5-06-073

SAF #: B95-052, B95-053

Shipping Container ID: ERC FS 002 Chain of Custody # _____

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 30

5. Vermiculite/packing materials is Wet Dry

6. Number of samples in shipping container: 33

7. Sample holding times exceeded? Yes No

8. Samples have: _____ tape _____ hazard labels
 custody seals appropriate sample labels

9. Samples are: in good condition _____ leaking
_____ broken _____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes No

11. Description of anomalies (include sample numbers): _____

Sample Custodian: R. Bayl On 6/5/95

Telephoned To: _____ On _____ By _____

Client Sample Screening Results

05-Jun-95

(F3) 6/15/95

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B	
WHC	B0FKB7		6/5/95 11:30:00 AM	QUAD23B	6/5/95 12:59:03 PM	B0FKB7	30	17	0.46666667	82	1.9	
		LIQUID		Bkg:	6/5/95 8:16:14 AM	BKG	60	6	0.1	50	0.8333333	
And Date: 6/5/95		Tot Sa, Alq: 1.00E+00 ✓		1.00E+01		Alp: (Dpm/ 1.37E+00		(uCV 6.19E-05		(pCV 6.19E+01 ± 2.7E+01 CAT		4.0E-01 Lab
Ppt mg: 1.2 ✓		Units: 1.		ml		Bet; Alq: 3.32E+00		Sa: 1.50E-04		Lq: 1.50E+02 ± 2.8E+01		3.3E-01 Alq Lq
WHC	B0FKC5		6/5/95 11:30:00 AM	QUAD23C	6/5/95 12:59:03 PM	B0FKC5	30	10	0.3	98	2.1833333	
		LIQUID		Bkg:	6/5/95 8:16:14 AM	BKG	60	2	0.03333333	65	1.0833333	
And Date: 6/5/95		Tot Sa, Alq: 1.00E+00 ✓		1.00E+01		Alp: (Dpm/ 7.99E-01		(uCV 3.60E-05		(pCV 3.60E+01 ± 2.5E+01 CAT		6.9E-01 Lab
Ppt mg: 0 ✓		Units: 1.		ml		Bet; Alq: 4.04E+00		Sa: 1.82E-04		Lq: 1.82E+02 ± 3.1E+01		2.7E-01 Alq Lq
WHC	B0FLK9		6/5/95 11:30:00 AM	QUAD23D	6/5/95 12:59:03 PM	B0FLK9	30	34	1.11666667	122	3.1333333	
		LIQUID		Bkg:	6/5/95 8:16:14 AM	BKG	60	1	0.01666667	56	0.9333333	
And Date: 6/5/95		Tot Sa, Alq: 1.00E+00 ✓		1.00E+01		Alp: (Dpm/ 3.33E+00		(uCV 1.50E-04		(pCV 1.50E+02 ± 3.2E+01 CAT		1.7E-01 Lab
Ppt mg: 2.2 ✓		Units: 1.		ml		Bet; Alq: 5.28E+00		Sa: 2.38E-04		Lq: 2.38E+02 ± 3.2E+01		2.1E-01 Alq Lq
WHC	B0FLT9		6/5/95 11:30:00 AM	QUAD24A	6/5/95 12:58:58 PM	B0FLT9	30	39	1.23333333	151	3.9666667	
		LIQUID		Bkg:	6/5/95 8:16:05 AM	BKG	60	4	0.06666667	64	1.0666667	
And Date: 6/5/95		Tot Sa, Alq: 1.00E+00 ✓		1.00E+01		Alp: (Dpm/ 3.77E+00		(uCV 1.70E-04		(pCV 1.70E+02 ± 3.6E+01 CAT		1.5E-01 Lab
Ppt mg: 1.4 ✓		Units: 1.		ml		Bet; Alq: 7.01E+00		Sa: 3.16E-04		Lq: 3.16E+02 ± 3.7E+01		1.6E-01 Alq Lq
WHC	B0FM89		6/5/95 11:30:00 AM	QUAD24B	6/5/95 12:58:58 PM	B0FM89	30	31	0.95	98	2.25	
		LIQUID		Bkg:	6/5/95 8:16:05 AM	BKG	60	5	0.08333333	61	1.0166667	
And Date: 6/5/95		Tot Sa, Alq: 1.00E+00 ✓		1.00E+01		Alp: (Dpm/ 2.92E+00		(uCV 1.31E-04		(pCV 1.31E+02 ± 3.4E+01 CAT		1.9E-01 Lab
Ppt mg: 3.8 ✓		Units: 1.		ml		Bet; Alq: 3.84E+00		Sa: 1.73E-04		Lq: 1.73E+02 ± 3.0E+01		2.9E-01 Alq Lq

9613478.1937

00016

05-Jun-95

COPIES
DATE: 6-6-95
BY: Rich Weber

Work Order No.: _____

**Condition Upon Receipt Variance Report
St. Louis Laboratory**

Client: Bechtel Hanford

Date: 6-6-95 0745

Project No: 550.83

Initiated by: Rich Weber

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: 04783

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

<input checked="" type="checkbox"/> 1. NA Not enough sample received for proper analysis. Received approximately: _____	<input checked="" type="checkbox"/> 8. <input type="checkbox"/> Custody tape disturbed/broken/missing.
<input checked="" type="checkbox"/> 2. <input type="checkbox"/> Sample received broken/leaking.	9. NA Sample splits performed by lab.
<input checked="" type="checkbox"/> 3. <input type="checkbox"/> Sample received without proper preservative. <input type="checkbox"/> Cooler temperature not within 4°C ± 2°C Record temperature: <u>5°C / 6°C Temp Vial</u>	10. NA Volatile sample received with approximately _____ mm headspace.
<input type="checkbox"/> pH <u>2</u>	<input checked="" type="checkbox"/> 11. <input type="checkbox"/> Sample ID on container does not match sample ID on paperwork. Explain: _____
<input type="checkbox"/> other: _____	_____
<input checked="" type="checkbox"/> 4. <input type="checkbox"/> Sample received in improper container.	<input checked="" type="checkbox"/> 12. <input type="checkbox"/> All coolers on airbill not received with shipment.
<input checked="" type="checkbox"/> 5. <input type="checkbox"/> Sample received without proper paperwork. Explain: _____	13. <input type="checkbox"/> Other (explain below): <u>Shipping containers not red surveyed.</u>
<input checked="" type="checkbox"/> 6. <input type="checkbox"/> Paperwork received without sample.	_____
<input checked="" type="checkbox"/> 7. <input type="checkbox"/> No sample ID on sample container.	_____

Notes: 2 X 40ml AG Trip Blanks

Corrective Action:

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

Sample Control Supervisor Review: (or designate) [Signature] Date: 6-6-95
Project Management Review: [Signature] Date: 6-6-95

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Project Manager: W. Price

Draft: Final

Entered and Reviewed by: *Sue Hesse*

PM Review: *Abby Wolder*

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
#	Comments	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:	Container Type							
8542-001	BOFK97 RICHLAND I.D. 50602301	Water	31-MAY-95 09:39	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
3	VI - Vial-40ml	VOA/CLP90/Q4	S	HCL	29-JUN-95	14-JUN-95	1091	(161617:100 161618:99 161619:98)
1	PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1		ICAP/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1		PB/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1	PN - Plastic-500ml	ANIONS/300.0/Q4	P	COLD	N/A	N/A	T11C	(161616:100)
1		CL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
1		FL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
1		NO2/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		NO3/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		OPHOS/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		SO4/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
8542-001DUP	BOFK97 RICHLAND I.D. 50602301	Water	31-MAY-95 09:39	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
1	PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1		ICAP/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1		PB/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1	PN - Plastic-500ml	ANIONS/300.0/Q4	P	COLD	N/A	N/A	T11C	(161616:100)
1		CL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
1		FL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
1		NO2/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		NO3/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		OPHOS/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		SO4/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
8542-001HS	BOFK97 RICHLAND I.D. 50602301	Water	31-MAY-95 09:39	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
3	VI - Vial-40ml	VOA/CLP90/Q4	S	HCL	29-JUN-95	14-JUN-95	1091	(161617:100 161618:99 161619:98)
1	PN - Plastic-1L	AS/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1		ICAP/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1		PB/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95	T11C	(161615:100)
1	PN - Plastic-500ml	ANIONS/300.0/Q4	P	COLD	N/A	N/A	T11C	(161616:100)
1		CL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
1		FL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)
1		NO2/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		NO3/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		OPHOS/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95	T11C	(161616:100)
1		SO4/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95	T11C	(161616:100)

3*=Sample has not been rad screened.

9613478.1939

M-0018

Project Manager: W. Price

Draft: Final Entered and Reviewed by: PM Review:

Sample Header Template:

Sample No. # Container Type Date:	Client ID	C-Matrix Analysis	Date Collected	Received	Due	Shipper	Rad Category	Rad Sample No. (Container Numbers: % Filled)
8542-001MSD RICHLAND I.D. 50602301	BOFK97	Water	31-MAY-95 09:39	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
3 VI - Vial-40ml		VOA/CLP90/Q4	S	HCL	29-JUN-95	14-JUN-95 1091		(161617:100 161618:99 161619:98)
8542-002 RICHLAND I.D. 50602303	BOFKB5	Water	31-MAY-95 11:37	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
3 VI - Vial-40ml		VOA/CLP90/Q4	S	HCL	29-JUN-95	14-JUN-95 1091		(161622:100 161623:99 161624:98)
1 PN - Plastic-1L		AS/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 111C		(161620:100)
1		ICAP/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 111C		(161620:100)
1		PB/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 111C		(161620:100)
1 PN - Plastic-500ml		ANIONS/300.0/Q4	P	COLD	N/A	N/A 111C		(161621:100)
1		CL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95 111C		(161621:100)
1		FL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95 111C		(161621:100)
1		NO2/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95 111C		(161621:100)
1		NO3/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95 111C		(161621:100)
1		OPHOS/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95 111C		(161621:100)
1		SO4/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95 111C		(161621:100)
8542-003 RICHLAND I.D. 50602305	BOFK99	Water	31-MAY-95 08:47	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
3 VI - Vial-40ml		VOA/CLP90/Q4	S	HCL	29-JUN-95	14-JUN-95 1091		(161627:100 161628:99 161629:98)
1 PN - Plastic-1L		AS/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 111C		(161625:100)
1		ICAP/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 111C		(161625:100)
1		PB/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 111C		(161625:100)
1 PN - Plastic-500ml		ANIONS/300.0/Q4	P	COLD	N/A	N/A 111C		(161626:100)
1		CL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95 111C		(161626:100)
1		FL/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95 111C		(161626:100)
1		NO2/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95 111C		(161626:100)
1		NO3/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95 111C		(161626:100)
1		OPHOS/300.0/Q4	C	COLD	29-JUN-95	02-JUN-95 111C		(161626:100)
1		SO4/300.0/Q4	C	COLD	29-JUN-95	28-JUN-95 111C		(161626:100)
8542-004 RICHLAND I.D. 50602307	BOFKF3	Water	31-MAY-95 08:47	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
3 VI - Vial-40ml		VOA/CLP90/Q4	S	HCL	29-JUN-95	14-JUN-95 1091		(161632:100 161633:99 161634:98)
8542-005 RICHLAND I.D. 50602302	BOFK98	Water	31-MAY-95 09:39	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required

3*-Sample has not been rad screened.

61000-0019

9613478.1940

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: _____ PM Review: _____

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
#	Comments	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers:X Filled)	
1	PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161635:100)	
1		ICAPD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161635:100)	
1		PBD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161635:100)	
8542-006	BOFKB6 RICHLAND I.D. 50602304	Water	31-MAY-95 11:37	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
1	PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161640:100)	
1		ICAPD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161640:100)	
1		PBD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161640:100)	
8542-007	BOFKB0 RICHLAND I.D. 50602306	Water	31-MAY-95 08:47	01-JUN-95 09:45	06-JUL-95	FED-EX	1	Screening not Required
1	PN - Plastic-1L	ASD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161641:100)	
1		ICAPD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161641:100)	
1		PBD/CLP90/Q4	S	HNO3	29-JUN-95	28-NOV-95 T11C	(161641:100)	

9613478.1941

00020

3*=Sample has not been rad screened.

Temp 4°C cur# 4348

Chain of Custody Record

St Louis



QUA-4124

Client: Bechtel Hanford	Project Manager:	Date: 6-1-95	Chain Of Custody Number: 04736
Address: of Wade	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page 1 of 1
City: 550.83 State: IA Zip Code:	Site Contact:	SEE COC	
Project Name: SAF-B95-032	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers		Preservative	Condition on Receipt
					Type	No.		
50602301 BOEK97								
02 K98								
03 KB5								
04 KB6								
05 K99								
06 KB0								
07 KF3								

Special Instructions

Possible Hazard Identification		Sample Disposal	
<input type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Return To Client	<input type="checkbox"/> Disposal By Lab
<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input checked="" type="checkbox"/> Unknown	<input type="checkbox"/> Archive For _____ Months
Turn Around Time Required	OC Level	Project Specific (Specify) ED6-W0578	
<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> I. <input type="checkbox"/> II. <input type="checkbox"/> III.	1. Received By Fred Mitchell	Date 6-2-95 Time 09:15
Relinquished By Heidberg Quanterra	Date 6-1-95 Time 16:00	2. Received By	Date
2. Relinquished By	Date	3. Received By	Date
3. Relinquished By	Date		

Comments

00021

9613478.1942

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround

Priority
 Normal

Collector <i>K. Lee / A. Rizzo</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 P	SAF No. B95-052
Ice Chest No. <i>Rm136</i>	Field Logbook No. <i>ERL-108A</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>PH IMA</i>	Bill of Lading/Air Bill No. <i>n/r 1</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/Ø	P/Ø	A Gs	P/G	G	P/G	P/Ø
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS <i>506023</i>	ICP METALS - TAL. AA Metals - As, Pb. (Unfiltered)	ANIONS (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP METALS - TAL. AA Metals - As, Pb. (Filtered)

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS - TAL. AA (Unfiltered)	ANIONS (IC)	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP METALS - TAL. AA (Filtered)
BOFK97 01	W	5-31-95	0939	Y	X	X	X	X	X	
BOFK98 02	W	5-31-95	0939							X
				100	100	3X100				100

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.	Media* S - Soil SS - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Dross Solids DL - Dross Liquids T - Tissue WI - Waste L - Lipid V - Vegetation X - Other		
	Relinquished By <i>AG Rizzo</i>	Date/Time 5-31-95 1330			Received By <i>Eric</i>	Date/Time 5-31-95 1330
	Relinquished By <i>Eric</i>	Date/Time 5-31-95 9:45			Received By <i>Karen</i>	Date/Time 5-31-95 9:45
	Relinquished By <i>Karen</i>	Date/Time 5-31-95 5:15			Received By <i>Eric</i>	Date/Time 5-31-95 5:15
Relinquished By	Date/Time	Received By	Date/Time			

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

00022

9613478.1943

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround
 Priority
 Normal

Collector <i>K. Lee / A. Rizzo</i>	Company Contact Bob Raddi	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 P	SAP No. B95-052
Ice Chest No. <i>GWS122</i>	Field Logbook No. <i>ER-1054</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>PH N/A</i>	Bill of Lading/Air Bill No. <i>N/A 1</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	G	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500ml	40ml	1L	1L	20ml	1L

SAMPLE ANALYSIS <i>506023</i>	ICP Metals-TAL AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) P, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-Aa, Pb. (Filtered)
				<i>506024.02</i>			

Sample No.	Matrix*	Date Sampled	Time Sampled							
BOFKB5 03	W	5-31-95	1137	Y	Y	Y	Y	Y	Y	
BOFKB6 04	W	5-31-95	1137							Y
				100	100	3x100				100

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*
Relinquished By <i>AG Rizzo</i>	Date/Time <i>5-31-95 1330</i>	Received By <i>Bob Raddi</i>	Date/Time <i>5-31-95</i>	Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				<ul style="list-style-type: none"> S - Soil SB - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Dross Solids DL - Dross Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other
Relinquished By <i>AG Rizzo</i>	Date/Time <i>6-1-95</i>	Received By <i>Bob Raddi</i>	Date/Time <i>6-1-95</i>					
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

No. 00N23

96134/B-1949

Collector: K. Lee / A. Rizzo Company Contact: Bob Raidl Telephone: (509) 372-9641
 Project Designation: 100-FR-3 Groundwater - Round 7 Sampling Location: 100 F SAP No.: B95-052
 Ice Chest No.: Rm136 Field Logbook No.: EFL 1059 Method of Shipment: Hand Delivered
 Shipped To: Quanterra Offsite Property No.: PH 1 N/A Bill of Lading/Air Bill No.: 1/A 1

Possible Sample Hazards/Remarks:
 Preservation: HNO₃, Cool 4°C, HCl, HNO₂, Cool 4°C, Cool 4°C, HNO₃
 Type of Container: P/G, P/G, Ga, P/G, G, P/G
 No. of Container(s): 1, 1, 3, 4, 3, 1
 Special Handling and/or Storage: Maintain samples between 2°C and 6°C. Volume: 1L, 500mL, 40mL, 1L, 1L, 20mL, 1L

SAMPLE ANALYSIS: 500023 SPW W0578
 ICP Metals-TAL AA Metals-Aa, Pb. (Unfiltered) ICP Metals-TAL AA Metals-Aa, Pb. (Filtered)
 Anions (C) - F, Cl, SO₄, PO₄, NO₃, NO₂ VOA-TCL
 Gross Alpha, Gross Beta, Sr-90 50002403
 Tritium, C-14 Activity Scan

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP Metals-TAL AA Metals-Aa, Pb. (Unfiltered)	Anions (C) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-Aa, Pb. (Filtered)
BOFK99 05	W	5-31-95	0847	X	X	X	X	X	X	
BOFKB0 06	W	5-31-95	0847							X
BOFKF3 07	W	5-31-95	0847			X				
		→ 5-31-95								
				100	100	3x100				100

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By: <u>AGP/A</u>	Date/Time: <u>5-31-95 1330</u>	Received By: <u>ERC</u>	Date/Time: <u>1370</u>
Relinquished By: <u>AGP/A</u>	Date/Time: <u>9-25</u>	Received By: <u>AGP/A</u>	Date/Time: <u>9-25</u>
Relinquished By: <u>AGP/A</u>	Date/Time: <u>6-1-95</u>	Received By: <u>AGP/A</u>	Date/Time: <u>6-1-95</u>
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS: Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

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

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

00024

9613478.1945

Client Sample Screening Results

01-Jun-95

Ⓟ 6/1/95

CLIENT CODE	ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B	
WHC	BOFK97		6/1/95 10:00:00 AM	QUAD21A	6/1/95 10:57:46 AM	BOFK97	30	81	2.664	1019	33.036667	
		LIQUID		Bkg:	6/1/95 2:40:22 AM	BKG	500	18	0.036	465	0.93	
Anal Date:	6/1/95	Tot Sa, Alq:	1.00E+00	1.00E+01	Alq:	(Dpm/ 7.47E+00	(uCV 3.36E-04	(pCV 3.36E+02	± 4.2E+01	CAT	7.4E-02	Lab
Ppt mg:	7.1	Units:	L	ml	Bot:	Alq): 6.55E+01	So): 2.95E-03	Liq): 2.95E+03	± 9.5E+01	I	1.7E-02	Alq
												Liq
WHC	BOFK99		6/1/95 10:00:00 AM	QUAD21C	6/1/95 10:57:46 AM	BOFK99	30	40	1.29133333	124	3.1893333	
		LIQUID		Bkg:	6/1/95 2:40:22 AM	BKG	500	21	0.042	472	0.944	
Anal Date:	6/1/95	Tot Sa, Alq:	1.00E+00	1.00E+01	Alq:	(Dpm/ 3.87E+00	(uCV 1.74E-04	(pCV 1.74E+02	± 3.2E+01	CAT	1.4E-01	Lab
Ppt mg:	3.7	Units:	L	ml	Bot:	Alq): 5.57E+00	So): 2.51E-04	Liq): 2.51E+02	± 3.2E+01	I	2.0E-01	Alq
												Liq
WHC	BOFKB5		6/1/95 10:00:00 AM	QUAD21B	6/1/95 10:57:46 AM	BOFKB5	30	27	0.872	82	1.8413333	
		LIQUID		Bkg:	6/1/95 2:40:22 AM	BKG	500	14	0.028	446	0.892	
Anal Date:	6/1/95	Tot Sa, Alq:	1.00E+00	1.00E+01	Alq:	(Dpm/ 2.74E+00	(uCV 1.24E-04	(pCV 1.24E+02	± 2.9E+01	CAT	2.0E-01	Lab
Ppt mg:	2.3	Units:	L	ml	Bot:	Alq): 3.05E+00	So): 1.37E-04	Liq): 1.37E+02	± 2.5E+01	I	3.6E-01	Alq
												Liq

00025

01-Jun-95

WHC/BHI SAMPLE CHECK-IN LIST

Received: 6-1-95 9:45 SDG #: _____

Order Number: _____ SAF #: B95-052

Shipping Container ID: RM136 Chain of Custody # _____

- 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 RM 6-1-95 40C
- 5. Vermiculite/packing materials is Wet Dry
- 6. Number of samples in shipping container: 21
- 7. Sample holding times exceeded? Yes No
- 8. Samples have: tape hazard labels
 custody seals appropriate sample labels
- 9. Samples are: in good condition leaking
 broken have air bubbles
- 10. Were any anomalies identified in sample receipt? Yes No
- 11. Description of anomalies (include sample numbers): _____

Sample Custodian: Karen Anderson On 6-1-95

Telephoned To: _____ On _____ By _____



WHC/BHI SAMPLE CHECK-IN LIST

Date/Time Received: 6-1-95 9:14 SDG #: _____

Work Order Number: _____ SAF #: B95-052

Shipping Container ID: GUS-122 Chain of Custody # _____

- 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 _____ 40C
- 5. Vermiculite/packing materials is Wet Dry
- 6. Number of samples in shipping container: _____ 14
- 7. Sample holding times exceeded? Yes No
- 8. Samples have: tape _____ hazard labels
 custody seals _____ appropriate sample labels
- 9. Samples are: in good condition _____ leaking
_____ broken _____ have air bubbles
- 10. Were any anomalies identified in sample receipt? Yes No
- 11. Description of anomalies (include sample numbers): _____

Sample Custodian: Karin Pettenberg On 6-1-95

Telephoned To: _____ Or _____ By _____

Environmental
Restoration
Contractor

ERC Team
Interoffice Memorandum

Job No. 22192
Written Estimate Required NO
CCN: N/A
OU: 100-FR-3
TSD: N/A
ERAs: N/A
Subject Code: 328

TO: W. S. Thompson N3-06 DATE: April 27, 1995

COPIES: R. L. Biggerstaff H4-91 FROM: S. K. De Mers 
Radiological Controls
N3-06/376-2764

SUBJECT: 1995 Round 7 sampling for 100-FR-3

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from the attached list of wells.

All except two of the wells listed in the attachment were reviewed for radiological content based on the previous 4 years of sampling data. No well listed has a β activity in excess of 100,000 pCi/l ($< .1$ uCi/sample based on a 1 liter sample size) nor any α activity in excess of 10,000 pCi/l ($< .01$ uCi/l based on a 1 liter sample). All wells show activities $< 2,000$ pCi/gm (< 2 nCi/gm D.O.T. limit). The highest activity in recent samples is 9,900 pCi/l $\beta(H^3)$ and 50 pCi/l α .

The remaining wells are in locations that do not provide a credible path whereby they could become contaminated at the above listed levels.

Radiological monitoring during sampling will only be required if the wells are located in radiological areas or if the wells themselves are labeled with radiological stickers. Monitoring requirements for down hole work such as pump removal will be determined based on the history of each well on a case by case basis.

skd

00028

C.U.R. and C.O.C.
COPIED TO: BW&WP
DATE: 6-2-95
TIME: 12:00
BY: jm

Work Order No.: 8542

**Condition Upon Receipt Variance Report
St. Louis Laboratory**

Client: Richland
Project No: 550.70 550.83
Analysis Requested: Refer to RFA/COC
Client Sample Numbers Affected: Entire Login

Date: 6-2-95 09:45
Initiated by: Paul Mitchell
RFA/COC Numbers: 04736

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

1. <input checked="" type="checkbox"/> NA	Not enough sample received for proper analysis. Received approximately: _____	8. <input checked="" type="checkbox"/>	Custody tape disturbed/broken/missing.
2. <input type="checkbox"/>	Sample received broken/leaking.	9. <input type="checkbox"/> NA	Sample splits performed by lab.
3. <input type="checkbox"/>	Sample received without proper preservative.	10. <input type="checkbox"/> NA	Volatile sample received with approximately _____ mm headspace.
	<input type="checkbox"/> Cooler temperature not within 4°C ± 2°C Record temperature: <u>4°C</u>	11. <input checked="" type="checkbox"/>	Sample ID on container does not match sample ID on paperwork. Explain: _____
	<input type="checkbox"/> pH _____		
	<input type="checkbox"/> other: _____		
4. <input type="checkbox"/>	Sample received in improper container.	12. <input checked="" type="checkbox"/>	All coolers on airbill not received with shipment.
5. <input type="checkbox"/>	Sample received without proper paperwork. Explain: _____	13. <input type="checkbox"/>	Other (explain below): <u>Shipping containers not red surveyed.</u> <u>841 7572 204</u>
6. <input type="checkbox"/>	Paperwork received without sample.		
7. <input type="checkbox"/>	No sample ID on sample container.		

Notes: _____

Corrective Action:

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

Sample Control Supervisor Review: (or designate) Paul Mitchell Date: 6-2-95
Project Management Review: Abby Walker Date: 6-5-95

783-9661

August 23, 1995
LATA95-171

Ms. Joan Kessner
Bechtel
345 Hills
Richland, WA 99352



Subject: VB403.81, SDG W0578-QES

Dear Ms. Kessner:

Attached is the data validation report for analytical results for 100-FR-3 Groundwater Round 7, (SDG W0578-QES). The package was received by Los Alamos Technical Associates on August 2, 1995.

If you have any questions, please feel free to contact me.

Sincerely,

Marsha C Webb

Marsha C. Webb
Deputy Project Manager

Attachment

cc: Jeanette Duncan, CH2M Hill
Don Smith, LATA
VB403.81
MCW/lb

ln

DATA VALIDATION REPORT
for
100-FR-3 GROUNDWATER ROUND 7
Metals Analysis
SDG W0578-QES
LATA VB403.81

Bechtel Hanford Inc.
P.O. Box 969
Richland, Washington

August 23, 1995

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**100-FR-3 Groundwater Round 7
Data Validation Narrative**

INTRODUCTION

All samples in Sample Delivery Group (SDG) W0578-QES (VB403.81) were validated at level "D" as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002, Rev. 2).

The analyses were performed by Quanterra Environmental Services.

ANALYSES REQUESTED

See Table 1.

DATA QUALITY OBJECTIVES

- Precision:** Goals for precision were met with the exception of those items discussed in the "Qualification Summary Table".
- Accuracy:** Goals for accuracy were met with the exception of those items discussed in the "Qualification Summary Table".
- Sample Result Verification:** All sample results were supported in the raw data.
- Detection Limits:** Detection limit goals were met for all sample results as specified in the *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL 91-53, Rev. 0.
- Completeness:** The data package was 100% complete for all requested analyses.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

Minor deficiencies were identified during validation which required qualification of data as estimated. See the "Qualification Summary Table".

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Table 1
Chain-of-Custody
Analysis Request

LATA ID #: VB403.81

SDG: W0578-QES

Sample Information							Analyses Requested					
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	TEMP °C	1	2	3	4	5	6
BOFK97	31-May-95	WATER	B95-052	199-F8-3			X		X		X	
BOFK98	31-May-95	WATER	B95-052	199-F8-3				X		X		X
BOFK99	31-May-95	WATER	B95-052	199-F8-4			X		X		X	
BOFKB5	31-May-95	WATER	B95-052	699-81-38			X		X		X	
BOFKB6	31-May-95	WATER	B95-052	699-81-38				X		X		X
BOFKB0	31-May-95	WATER	B95-052	199-F8-4				X		X		X
BOFKB7	2-Jun-95	WATER	B95-052	699-83-47			X		X		X	
BOFKB8	2-Jun-95	WATER	B95-052	699-83-47				X		X		X
BOFKC5	2-Jun-95	WATER	B95-052	699-83-47	TRIP BLANK		X		X		X	

Method References:

<u>Analysis</u>	<u>Method</u>
1. ICP Metals TAL (Unfiltered)	CLP
2. ICP Metals TAL (Filtered)	CLP
3. Lead (Unfiltered)	CLP
4. Lead (Filtered)	CLP
5. Arsenic (Unfiltered)	CLP
6. Arsenic (Filtered)	CLP

REFERENCES

WHC 1993, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

DOE 1992, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL 91-53, Rev. 0, Department of Energy-Hanford, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY)

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

- U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate.
- J- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision making purposes.
- BJ- Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency the data are unusable.
- UR- Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data are unusable due to an identified QC deficiency.

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Commonly used laboratory metals (inorganic) qualifiers:

- U- Indicates the analyte was analyzed for but not detected in the sample.
- B- Indicates the analyte concentration is less than the CRDL but greater than the IDL.
- E- Indicates the value reported is estimated due to the presence of interference.
- M- Indicates duplicate injection precision criteria were not met during graphite furnace (GFAA) analysis.
- N- Indicates spiked sample recovery was not within the control limits.
- S- Indicates the reported value was determined by the Method of Standard Additions (MSA).
- W- Indicates post-digestion spike for GFAA analysis is outside control limits and the sample absorbance is less than 50% of the spike absorbance.
- *- Indicates duplicate analysis was not within control limits.
- + - Indicates the correlation coefficient (r) for the MSA was less than 0.995.

Qualification Summary Table

Qualification Summary Table

Inorganics (Metals)

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Lead	MINOR	UJ	B0FKB5 B0FKB8	ACCURACY	Analytical spikes for the graphite furnace analysis are outside acceptance criteria.
Zinc	MINOR	J/BJ	B0FK97 B0FK98 B0FK99 B0FKB5 B0FKB6 B0FKB0 B0FKB7 B0FKB8 B0FKC5	ACCURACY	Matrix spike recovery is outside acceptance criteria.
Aluminum	MINOR	U	B0FKB5 B0FKB6 B0FK97 B0FK98	BLANK	Calibration blank values are positive and outside acceptance criteria.
Antimony	MINOR	U	B0FK97	BLANK	Calibration blank values are positive and outside acceptance criteria.
Beryllium	MINOR	U	B0FK97	BLANK	Calibration blank values are positive and outside acceptance criteria.
Cadmium	MINOR	U	B0FKB8 B0FKC5	BLANK	Calibration blank values are positive and outside acceptance criteria.
Copper	MINOR	UJ/BJ	B0FK97 B0FK98 B0FK99 B0FKB5 B0FKB6 B0FKB0 B0FKB7 B0FKB8 B0FKC5	BLANK	Calibration blank value is negative and outside acceptance criteria.
Iron	MINOR	U	B0FK98 B0FK99 B0FKB5 B0FKB6 B0FKB0 B0FKB7 B0FKB8	BLANK	Calibration blank values are positive and outside acceptance criteria.
Magnesium	MINOR	U	B0FKC5	BLANK	Calibration blank value is negative and outside acceptance criteria.
Vanadium	MINOR	UJ/BJ	B0FK98 B0FK99 B0FKB0 B0FKC5	BLANK	Calibration blank values are positive and outside acceptance criteria.
Zinc	MINOR	U	B0FKB0 B0FKB7 B0FKB8 B0FK99	BLANK	Preparation blank values are positive and outside acceptance criteria.
Barium	MINOR	BJ	B0FK97 B0FK98	PRECISION	Serial dilution percent difference is outside acceptance criteria and the sample results are greater than 50 times the instrument detection limit.
Zinc	MINOR	J/BJ	B0FK97 B0FK98 B0FK99 B0FKB5 B0FKB6 B0FKB0 B0FKB7 B0FKB8 B0FKC5	PRECISION	Duplicate precision is outside acceptance criteria.

Qualification Summary Table

Inorganics (Metals) Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
Barium Calcium Magnesium Sodium Zinc	Trip Blank	NONE	BOFKC5	BLANKS	Trip Blank contamination noted.

Comments:

1. Data qualification is not required based on trip blanks, however trip blank results are noted here to alert the data user to uncertainties in the data set during decision making processes.

000009

9613979.1962

Data Summary Table

9613478.1963

METALS
DATA SUMMARY TABLE

LATA ID#: VB403.81		HEIS #:	B0FKB0	B0FKB5	B0FKB6	B0FKB7	B0FKB8	B0FKC5
		Date:	31-May-95	31-May-95	31-May-95	2-Jun-95	2-Jun-95	2-Jun-95
		Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
Constituent	CAS #	Units	Results Q					
Aluminum	7429-90-5	µg/L	23.4 U	44.1 U	52.5 U	23.4 U	23.4 U	23.4 U
Antimony	7440-36-0	µg/L	26.3 U					
Arsenic	7440-38-2	µg/L	5.7 B	10.9	10.1	6.2 B	6.2 B	0.80 U
Barium	7440-39-3	µg/L	37.3 B	31.6 B	30.0 B	41.2 B	41.2 B	8.7 B
Beryllium	7440-41-7	µg/L	0.60 U					
Cadmium	7440-43-9	µg/L	2.4 U	2.4 U	2.4 U	2.4 U	2.9 U	3.5 U
Calcium	7440-70-2	µg/L	67200	36300	36500	33300	33400	2140 B
Chromium	7440-47-3	µg/L	11.4	8.9 B	6.4 B	39.6	40.3	4.7 U
Cobalt	7440-48-4	µg/L	3.4 U					
Copper	7440-50-8	µg/L	9.8 UJ					
Iron	7439-89-6	µg/L	36.9 U	33.6 U	29.8 U	20.8 U	14.8 U	9.6 U
Lead	7439-92-1	µg/L	0.80 U	0.80 UJ	0.80 U	1.8 B	0.80 UJ	0.80 U
Magnesium	7439-95-4	µg/L	17600	13600	13600	12600	12700	335 U
Manganese	7439-96-5	µg/L	4.1 B	3.7 B	3.1 B	2.2 B	1.9 B	6.3 B
Nickel	7440-02-0	µg/L	15.4 U					
Potassium	7440-09-7	µg/L	5830	5380	4700 B	4540 B	4680 B	1180 U
Silver	7440-22-4	µg/L	4.1 U					
Sodium	7440-23-5	µg/L	48600	37400	37200	19800	19900	264 B
Vanadium	7440-62-2	µg/L	12.6 BJ	22.2 B	20.7 B	24.2 B	22.8 B	8.6 UJ
Zinc	7440-66-6	µg/L	19.8 UJ	236 J	36.5 J	17.3 UJ	15.1 UJ	45.0 J

Shaded areas indicate changes by the validator.

000011

9613478.1964

METALS
DATA SUMMARY TABLE

LATA ID#: VB403.81		HEIS #:	B0FK97	B0FK98	B0FK99			
		Date:	31-May-95	31-May-95	31-May-95			
		Matrix:	WATER	WATER	WATER			
Constituent	CAS #	Units	Results	Q	Results	Q	Results	Q
Aluminum	7429-90-5	µg/L	59.2	U	51.6	U	23.4	U
Antimony	7440-36-0	µg/L	45.9	U	26.3	U	26.3	U
Arsenic	7440-38-2	µg/L	3.1	B	3.4	B	6.2	B
Barium	7440-39-3	µg/L	138	BJ	138	BJ	37.3	B
Beryllium	7440-41-7	µg/L	0.70	U	0.60	U	0.60	U
Cadmium	7440-43-9	µg/L	2.4	U	2.4	U	2.4	U
Calcium	7440-70-2	µg/L	150000		147000		67500	
Chromium	7440-47-3	µg/L	15.8		13.6		13.8	
Cobalt	7440-48-4	µg/L	3.4	U	3.4	U	3.4	U
Copper	7440-50-8	µg/L	14.1	BJ	12.0	BJ	9.8	UJ
Iron	7439-89-6	µg/L	75.8	B	61.2	U	45.7	U
Lead	7439-92-1	µg/L	0.80	U	0.80	U	0.80	U
Magnesium	7439-95-4	µg/L	39900		39400		17600	
Manganese	7439-96-5	µg/L	13.2	B	6.4	B	3.8	B
Nickel	7440-02-0	µg/L	15.4	U	15.4	U	15.4	U
Potassium	7440-09-7	µg/L	8290		7920		5820	
Silver	7440-22-4	µg/L	4.1	U	4.1	U	4.1	U
Sodium	7440-23-5	µg/L	64000		63300		48600	
Vanadium	7440-62-2	µg/L	21.9	B	18.8	BJ	12.6	BJ
Zinc	7440-66-6	µg/L	1080	J	42.2	J	18.3	UJ

Shaded areas indicate changes by the validator.
40381DST.XLS, METALS

8/30/95, 12:12 PM

000012

9613178.1965

Sample Results (Form I's)

Checklist

000023

9613478-1976

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	<input type="checkbox"/> WHC-CM-5-3, Rev. 0		<input checked="" type="checkbox"/> WHC-SD-EN-SPP-002, Rev. 2		
PROJECT:	100-FR-3 ROUND 7		SDG:	W0578-QES	
VALIDATOR:	AM FREIER	LATA NO:	VB403.81	DATE:	9-Aug-95
REVIEWER:	BJ MORRIS	LAB:	QES	CASE:	N/A
SAF NO:	B95-052	QAPP NO:	DOE/RL-91-53, R0	SAP NO:	N/A
ANALYSES REQUESTED					
<input checked="" type="checkbox"/> ICP Metals Filtered	<input checked="" type="checkbox"/> ICP Metals Unfiltered	<input checked="" type="checkbox"/> Arsenic Filtered	<input checked="" type="checkbox"/> Arsenic Unfiltered	<input checked="" type="checkbox"/> Lead Filtered	<input checked="" type="checkbox"/> Lead Unfiltered
SAMPLE NO.	MATRIX	COMMENTS:			
BOFK97 BOFK98	WATER				
BOFK99 BOFKB5					
BOFKB6 BOFKB0					
BOFKB7 BOFKB8					
BOFKC5					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

YES NO N/A

Is technical verification documentation present?

Is a case narrative present?

2. HOLDING TIMES

YES NO N/A

Are sample holding times acceptable?

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

YES NO N/A

Were initial calibrations performed on all instruments?

Are initial calibrations acceptable?

Are ICP interference checks acceptable?

Were ICV and CCV checks performed on all instruments?

Are ICV and CCV checks acceptable?

Validation calculation checks were performed and are acceptable.

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

**LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST**

4. BLANKS

	YES	NO	N/A
Were ICB and CCB checks performed for all applicable analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are ICB and CCB results acceptable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Were preparation blanks analyzed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are preparation blank results acceptable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all spike sample recoveries acceptable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all elements spiked at an appropriate level?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a post digestion spike analyzed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all post digestion spike recoveries acceptable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Were laboratory control samples (LCS) analyzed at the proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all LCS recoveries acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Validation calculation checks were performed and are acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all duplicate RPD values acceptable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Were MS/MSDs analyzed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all MS/MSD RPD values acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were ICP serial dilution samples analyzed at the proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all ICP serial dilution %D values acceptable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Validation calculation checks were performed and are acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see PRECISION DATA SUMMARY form

9613478.1978

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

7. FIELD QC SAMPLES

YES NO N/A

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?

Are field/trip blank results acceptable? (see Blank Data Summary form)

Are field duplicate RPD values acceptable? (see Field QC calculations)

Are field split RPD values acceptable? (see Field QC calculations)

Are performance audit sample results acceptable?

Comments: Sample B0FKC5 is a trip blank.

8. FURNACE AA QUALITY CONTROL

YES NO N/A

Were duplicate injections performed if required?

Are all duplicate injection %RSD values acceptable?

Were analytical spikes performed if required?

Are all analytical spike recoveries acceptable?

Was MSA performed if required?

Are all MSA results acceptable?

Validation calculation checks were performed and are acceptable.

Comments: The Analytical Spike for Lead did not meet acceptable criteria .

See the Qualification Summary Table for complete information.

9. REPORTED RESULTS AND DETECTION LIMITS

YES NO N/A

Are results reported for all requested analyses?

Are all results supported in the raw data?

Are results calculated properly?

Do results meet the CRDLs?

Validation calculation checks were performed and are acceptable.

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

9613478.1929

DATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG: W0578-QES			VALIDATOR: AM FREIER					DATE: 09-Aug-95		
PROJECT: 100-FR-3 ROUND 7			REVIEWER: BJ MORRIS					LATA NO.: VB403.81		
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	<i>Required HT (days)</i>	ANALYSIS HT (days)	<i>Required HT (days)</i>	VAL Q
BOFK97	WATER	ICP Metals , As, Pb	31-May-95	N/A	23-Jun-95	N/A	N/A	23	180	NONE
BOFK98	WATER	ICP Metals , As, Pb	31-May-95	N/A	23-Jun-95	N/A	N/A	23	180	NONE
BOFK99	WATER	ICP Metals , As, Pb	31-May-95	N/A	23-Jun-95	N/A	N/A	23	180	NONE
BOFKB5	WATER	ICP Metals , As, Pb	31-May-95	N/A	23-Jun-95	N/A	N/A	23	180	NONE
BOFKB6	WATER	ICP Metals , As, Pb	31-May-95	N/A	23-Jun-95	N/A	N/A	23	180	NONE
BOFKB0	WATER	ICP Metals , As, Pb	31-May-95	N/A	23-Jun-95	N/A	N/A	23	180	NONE
BOFKB7	WATER	ICP Metals , As, Pb	2-Jun-95	N/A	23-Jun-95	N/A	N/A	21	180	NONE
BOFKB8	WATER	ICP Metals , As, Pb	2-Jun-95	N/A	23-Jun-95	N/A	N/A	21	180	NONE
BOFKC5	WATER	ICP Metals , As, Pb	2-Jun-95	N/A	23-Jun-95	N/A	N/A	21	180	NONE

000027

9613478.1980

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

BLANK DATA SUMMARY

SDG: W0578-QES			VALIDATOR: AM FREIER						DATE: 09-Aug-95	
PROJECT: 100-FR-3 ROUND 7			REVIEWER: BJ MORRIS						LATA NO.: VB403.81	
BLANK ID	ANALYTE	RESULT	LAB Q	RT	UNITS	2X RESULT	5X RESULT	10X RESULT	SAMPLES AFFECTED	VAL Q
Calibration Blank	Aluminum	34.8	B				174		BOFK97 BOFK98 BOFKB5 BOFKB6	U
Calibration Blank	Antimony	48.7	B				243.5		BOFK97	U
Calibration Blank	Beryllium	1.0	B				5.0		BOFK97	U
Calibration Blank	Cadmium	4.2	B				21.0		BOFKB8 BOFKC5	U
Preparation Blank	Calcium	48.190	B				240.95		NONE	NONE
Calibration Blank	Copper	-10.1	B			20.2			BOFK97 BOFK98 BOFK99 BOFKB5 BOFKB6 BOFKB0 BOFKB7 BOFKB8 BOFKC5	UJ/BJ
Calibration Blank	Iron	13.1	B				65.5		BOFK98 BOFK99 BOFKB5 BOFKB6 BOFKB0 BOFKB7 BOFKB8	U
Calibration Blank	Magnesium	-188.8	B			377.6			BOFKC5	U
Calibration Blank	Vanadium	-9.8	B			19.6			BOFK98 BOFK99 BOFKB0 BOFKC5	UJ/BJ
Preparation Blank	Zinc	5.140	B				25.7		BOFKB0 BOFKB7 BOFKB8 BOFK99	U
Trip Blank BOFKC5	Barium	8.7	B						NONE	NONE
Trip Blank BOFKC5	Calcium	2140	B						NONE	NONE
Trip Blank BOFKC5	Manganese	6.3	B						NONE	NONE
Trip Blank BOFKC5	Sodium	264	B						NONE	NONE
Trip Blank BOFKC5	Zinc	45.0							NONE	NONE

9613478.1981

U.S. EPA - CLP

3
BLANKS

Lab Name: QUANTERRA_MO

Contract: 550.83

Lab Code: ITMO Case No.:

SAS No.:

SDG No.: W0578

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
	1	C	1	C	2	C	3	C	Blank	C	
Aluminum	23.4	U	26.3	B	23.4	U	34.8	B	23.400	U	P
Antimony	26.3	U	48.7	B	26.3	U	48.7	B	35.910	B	P
Arsenic	0.8	U	0.8	U	0.8	U	0.8	U	0.800	U	F
Barium	1.3	U	1.3	U	1.3	U	1.3	U	1.300	U	P
Beryllium	0.6	U	1.0	B	0.6	U	0.7	B	0.600	U	P
Cadmium	2.4	U	4.2	B	2.4	U	2.4	B	2.400	U	P
Calcium	17.5	U	17.5	U	17.5	U	17.5	U	48.190	B	P
Chromium	4.7	U	4.7	U	4.7	U	4.7	U	4.700	U	P
Cobalt	3.4	U	3.4	U	3.4	U	3.4	U	3.400	U	P
Copper	9.8	U	9.8	U	9.8	U	-10.1	B	9.800	U	P
Iron	9.6	U	13.1	B	9.6	U	10.5	B	9.600	U	P
Lead	0.8	U	0.8	U	0.8	U	0.8	U	0.800	U	F
Magnesium	139.5	U	139.5	U	139.5	U	188.8	B	139.500	U	P
Manganese	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Nickel	15.4	U	15.4	U	15.4	U	15.4	U	15.400	U	P
Potassium	1180.0	U	1180.0	U	1180.0	U	1180.0	U	1180.000	U	P
Silver	4.1	U	4.1	U	4.1	U	4.1	U	4.100	U	P
Sodium	86.7	U	86.7	U	86.7	U	-99.5	B	86.700	U	P
Vanadium	8.6	U	8.6	U	8.6	U	-9.8	B	8.600	U	P
Zinc	3.3	B	2.3	B	2.0	B	4.2	B	5.140	B	P

000029

8-22-95
00234

9613478, 1982

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

ACCURACY DATA SUMMARY

SDG:		W0578-QES		VALIDATOR:		AM FREIER		DATE:		09-Aug-95			
PROJECT:		100-FR-3 ROUND 7		REVIEWER:		BJ MORRIS		LATA NO.:		VB403.81			
HEIS-SN	ANALYTE	RESULTS	Lab Q	Actual Spiking Level	Minimum Required Spiking Level	Difference	PERCENT RECOVERY (%R)				SAMPLES AFFECTED	VAL Q	
							Matrix Spike	Matrix Spike Duplicate	Post Digestion Spike	Laboratory Control Standard			
BOFK97	Zinc	1082.11		500	270.528	229.4725	-107.5%			53.6%		BOFK97 BOFK98 BOFK99 BOFKB5 BOFKB6 BOFKB0 BOFKB7 BOFKB8 BOFKC5	J/BJ
BOFKB5	Lead	Analytical spike recovery is < 85%.										BOFKB5	UJ
BOFKB8	Lead	Analytical spike recovery is < 85%.										BOFKB8	UJ

9613478.1986

DATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

PRECISION DATA SUMMARY

SDG: W0578-QES				VALIDATOR: AM FREIER										09-Aug-95	
PROJECT: 100-FR-3 ROUND 7				REVIEWER: BJ MORRIS										VB403.81	
HEIS-SN	ANALYTE	RESULTS	DUP RESULT	LAB Q	IDL µg/L	10*IDL µg/L	50*IDL µg/L	SERIAL DIL %D	CRDL µg/L	2 CRDL µg/L	5 CRDL µg/L	DUPE RPD %	DUPE CRDL dif	SAMPLES AFFECTED	VAL Q
BOFK97	Zinc	45.01	1082.11						20	40	100	184.0%	N/A	BOFK97 BOFK98 BOFK99 BOFKB5 BOFKB6 BOFKB0 BOFKB7 BOFKB8 BOFKC5	J/BJ
BOFK97	Barium	137.77		B	1.3	13	65	10.6						BOFK97 BOFK98	BJ

000034

9613478.1989

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

LINEAR REGRESSION ANALYSIS

SDG: W0578-QES Date: 9-Aug-95

LATA No.: VB403.81 Validator: AM FREIER

Analyte/Calibration Date: As / 6/23/95

Concentration	Absorbance
x	y
0	0.000
10	0.054
40	0.220
80	0.416

r	r ²
0.9995	0.9991
slope	x intercept
0.0052	-0.6212
1/slope	y intercept
192.1939	0.0034

LINEAR REGRESSION ANALYSIS

SDG: W0578-QES Date: 9-Aug-95

LATA No.: VB403.81 Validator: AM FREIER

Analyte/Calibration Date: Pb / 6/23/95

Concentration	Absorbance
x	y
0	0.001
3	0.012
40	0.171
80	0.319

r	r ²
0.9993	0.9987
slope	x intercept
0.0040	-0.6597
1/slope	y intercept
250.1334	0.0028

000037

9613478, 1990

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

PERCENT RECOVERY (ICV/CCV)

SDG: W0578-QES
LATA No.: VB403.81

Date: 9-Aug-95
Validator: AM FREIER

Analyte	ICV/CCV ID	Observed Value	True Value	%R
		O	A	
Arsenic	ICV	20.16	20.0	100.8%
Lead	CCV	40.12	40.0	100.3%
Aluminum	ICV	49974.10	50000.0	99.9%
Calcium	CCV	20433.68	20000.0	102.2%

000038

9613478.1991

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

MATRIX SPIKE RECOVERY (MS)

SDG: W0578-QES
LATA No.: VB403.81

Date: 9-Aug-95
Validator: AM FREIER

Analyte	Sample ID	Spike Sample Result	Sample Result	Spike Added	%R
		SSR	SR	SA	
<u>Barium</u>	<u>B0FK97</u>	<u>2161.5300</u>	<u>137.7700</u>	<u>2000.00</u>	<u>101.2%</u>
<u>Arsenic</u>	<u>B0FK97</u>	<u>42.5700</u>	<u>3.0800</u>	<u>40.00</u>	<u>98.7%</u>

000039

9613478.1992

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

PERCENT RECOVERY (LCS)

SDG: W0578-QES
LATA No.: VB403.81

Date: 9-Aug-95
Validator: AM FREIER

Analyte	Observed value	True value	%R
	OLCS	ALCS	
Cobalt	1023.57	1000.00	102.4%
Lead	40.70	40.0	101.8%

000040

9613478.1993

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

RELATIVE PERCENT DIFFERENCE

SDG: W0578-QES

Date: 9-Aug-95

LATA No.: VB403.81

Validator: AM FREIER

Analyte	Sample ID	Original (Sample)	Duplicate	RPD
		concentration	concentration	
		OS	D	
<u>Calcium</u>	<u>B0FK97</u>	<u>149775.3200</u>	<u>143524.3500</u>	<u>4.3%</u>
<u>Magnesium</u>	<u>B0FK97</u>	<u>39884.9200</u>	<u>38361.6600</u>	<u>3.9%</u>

000041

9613478.1994

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

PERCENT DIFFERENCE (ICP SERIAL DILUTION)

SDG: W0578-QES

Date: 9-Aug-95

LATA No.: VB403.81

Validator: AM FREIER

Analyte	Analyte Concentration before Dilution	Analyte Concentration after Serial Dilution	%D
	I	S	
<u>Calcium</u>	<u>149775.32</u>	<u>144883.65</u>	3.3%
<u>Magnesium</u>	<u>39884.92</u>	<u>38129.57</u>	4.4%

000042

96134/8.1995

LATA INORGANIC (METALS)
DATA VALIDATION CHECKLIST

INORGANICS RESULTS CALCULATION, WATER

SDG: W0578-QES Date: 9-Aug-95
LATA No.: VB403.81 Validator: AM FREIER

Analyte	Concentration from curve		Dilution Factor	Concentration
	CONCW	units	DFW	
<u>Zinc</u>	<u>0.01976</u>	<u>mg/L</u>	<u>1</u>	<u>19.8</u>
<u>Arsenic</u>	<u>6.23</u>	<u>µg/L</u>	<u>1</u>	<u>6.2</u>

000043

9615178 1996

Laboratory Case Narrative

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
 P.O. Box 1970
 Richland, Washington 99352

July 7, 1995

Attention: Joan Kessner

Project number	:	550.83
Date Received by Lab	:	June 1 and 5, 1995
Number of Samples	:	Ten (10)
Sample Type	:	Water
SDG Number	:	W0578
Data Deliverable	:	Standalone



I. Introduction

On June 1 and 5, 1995, ten (10) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

<u>St Louis ID</u>	<u>BHI ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
8542-001	B0FK97	50602301	Water	06/01/95
8542-002	B0FKB5	50602303	Water	06/01/95
8542-003	B0FK99	50602305	Water	06/01/95
8542-004	B0FKF3	50602307	Water	06/01/95
8542-005	B0FK98	50602302	Water	06/01/95
8542-006	B0FKB6	50602304	Water	06/01/95
8542-007	B0FKB0	50602306	Water	06/01/95
8549-001	B0FKB7	50607201	Water	06/05/95
8549-002	B0FKB8	50607202	Water	06/05/95
8549-003	B0FKC5	50607203	Water	06/05/95

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Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
Page 2

II. 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: VOA, ICP metals, Arsenic, and Lead following EPA CLP90 methodology. Chloride, Fluoride, Nitrate, Nitrite, Phosphate, and Sulfate by EPA method 300.0.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate or Sample Duplicate analyses were performed per the protocol for each analyte.

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

V. Comments

There were no comments or nonconformances associated with the Volatiles analysis.

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Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
Page 3

The Matrix Spike recovery of sample BOFK97 for zinc was 0% and outside the acceptable range. In accordance with the SOW a post digestion spike was performed and the associated data flagged. The Duplicate Relative Percent Difference for zinc was above the acceptable limit and the associated data was flagged. The serial dilution result for barium was above the acceptable limit, 10.6% and the associated data was flagged.

Nitrate, Nitrite, and Phosphate holding times were waived by client.

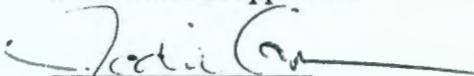
The Relative Percent Difference for Fluoride, Phosphate, and Nitrite could not be calculated due to values being below the detection limit on sample 8542-001.

The Matrix Spike for Nitrate was outside of suggested limits of 75-125 percent on sample 8542-001. The sample concentration was greater than four times the spike amount.

Samples 8542-001 and -001DUP for Fluoride was diluted 1:5 to remove an interfering peak on the ion chromatogram resulting in a higher detection limit. The Fluoride peaks for the samples integrated as a hit, but their peak area was less than the lowest calibration standard and they were reported as less than the detection limit.

I certify that this data package 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:



Wade H. Price

Project Manager

c:\price\$labbydave\hanw0578.nar

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Chain-of-Custody Information

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										Page <u>1</u> of <u>1</u>	
Collector <i>K Lee / A Rizzo</i>		Company Contact Bob Raidt				Telephone (509) 372-9641				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal			
Project Designation 100-FR-3 Groundwater - Round 7		Sampling Location 100 F				SAP No. B95-052							
Ice Chest No. <i>Rm135</i>		Field Logbook No. <i>ERL-105A</i>				Method of Shipment Hand Delivered							
Shipped To Quanterra		Offsite Property No. <i>PH 1/A</i>				Bill of Lading/Air Bill No. <i>n/R 1</i>							
Possible Sample Hazards/Remarks		Preservation		HNO ₃	Cool 4°C	HCl	HNO ₂	Cool 4°C	Cool 4°C		HNO ₃		
		Type of Container		P/G	P/G	A/Gs	P/G	G	P/G		P/G		
		No. of Container(s)		1	1	3	4	3	1		1		
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume		1L	500mL	40mL	1L	1L	20mL		1L		
SAMPLE ANALYSIS <i>506023</i>		<i>876</i> <i>W0578</i>		ICP Metals-TAL AA Metals-As, Pb. (Unfiltered)	Asbestos (IC) - F, Cl, SO ₂ , PO ₄ , NO ₂ , NO ₃ .	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan		ICP Metals-TAL AA Metals-As, Pb. (Filtered)		
							<i>50602401</i>						
Sample No.	Matrix*	Date Sampled	Time Sampled										
B0FK97	01	W	5-31-95	0939	Y	X	X	X	X	X			
B0FK98	02	W	5-31-95	0939								X	
					100	100	3x100					100	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>Ag Rizzo</i>				Date/Time <i>5-31-95 1330</i>				Received By <i>Eric</i>				Date/Time <i>1330</i>	
Relinquished By <i>Eric</i>				Date/Time <i>5-31-95</i>				Received By <i>Eric</i>				Date/Time <i>5-31-95</i>	
Relinquished By <i>Eric</i>				Date/Time <i>5-1-95</i>				Received By <i>Eric</i>				Date/Time <i>6-1-95</i>	
Relinquished By				Date/Time				Received By				Date/Time	
LABORATORY SECTION		Received By		Title				Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time					

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06/13/95 12:00

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

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Data Turnaround

Priority
 Normal

Collector <i>K. Lee / A. Rizzo</i>	Company Contact Bob Raldi	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAP No. B95-052
Ice Chest No. <i>G-5122</i>	Field Logbook No. <i>EFL-1054</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>PH 1 N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
		Type of Container	P/D	P/D	Ga	P/G	G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS
506023 *SPW*
W0578

ICP Metals-TAL, AA Metals-Ar, Pb. (Unfiltered)	Asides (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Ar, Pb. (Filtered)
					<i>506024.02</i>	

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP Metals-TAL, AA Metals-Ar, Pb. (Unfiltered)	Asides (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Ar, Pb. (Filtered)
B0PKB5 03	w	5-31-95	1137	Y	Y	Y	Y	Y	Y	
B0PKB6 04	w	5-31-95	1137							Y
				100	100	3x100				100

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*
Relinquished By <i>AG Rizzo</i>	Date/Time <i>5-31-95 1330</i>	Received By <i>Bob Raldi</i>	Date/Time <i>5-31-95</i>	Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.		S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other
Relinquished By <i>Bob Raldi</i>	Date/Time <i>6-1-95</i>	Received By <i>Harold Klenig</i>	Date/Time <i>6-1-95</i>			
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

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Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								Page <u>1</u> of <u>1</u>		
Collector <i>K. Lee / A. Rizzo</i>		Company Contact Bob Raidl				Telephone (509) 372-9641				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal		
Project Designation 100-FR-3 Groundwater - Round 7		Sampling Location 100 F				SAF No. B95-052						
Ice Chest No. <i>Rm136</i>		Field Logbook No. <i>ERL-1059</i>				Method of Shipment Hand Delivered						
Shipped To Quanterra		Offsite Property No. <i>PH 1 N/A</i>				Bill of Lading/Air Bill No. <i>1/A 1</i>						
Possible Sample Hazards/Remarks		Preservation		HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃		
		Type of Container		<i>P/G</i>	<i>P/G</i>	<i>Gs</i>	<i>P/G</i>	<i>G</i>	<i>P/G</i>	<i>P/G</i>		
		No. of Container(s)		<i>1</i>	<i>1</i>	<i>3</i>	<i>4</i>	<i>3</i>	<i>1</i>	<i>1</i>		
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume		<i>1L</i>	<i>500mL</i>	<i>40mL</i>	<i>1L</i>	<i>1L</i>	<i>20mL</i>	<i>1L</i>		
SAMPLE ANALYSIS <i>506023</i>		<i>SDW</i>		ICP Metals-TAL, AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂ .	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Aa, Pb. (Filtered)		
		<i>W0578</i>					<i>506024</i>	<i>03</i>				
Sample No.	Matrix*	Date Sampled	Time Sampled									
BOFK99	<i>05</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>			
BOFKB0	<i>06</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>						<i>X</i>		
BOFKF3	<i>07</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>			<i>X</i>					
	<i>5-31-95</i>	<i>⊙</i>										
					<i>100</i>	<i>100</i>	<i>3x100</i>			<i>100</i>		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix*
Relinquished By <i>AS-CA Asher</i>				Date/Time <i>(SAR) 5-31-95 1330</i>				Received By <i>Eric Rizzo</i>				Date/Time <i>1330</i>
Relinquished By <i>Eric Rizzo</i>				Date/Time <i>6-1-95</i>				Received By <i>James Asher</i>				Date/Time <i>6-1-95</i>
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				

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- Matrix*
- S - Soil
 - SE - Sediment
 - SO - Solid
 - SL - Sludge
 - W - Water
 - O - Oil
 - A - Air
 - D3 - Drum Solids
 - DL - Drum Liquids
 - T - Tissue
 - W1 - Wipe
 - L - Liquid
 - V - Vegetation
 - X - Other

Temp 5°C / 6°C Temp Vial UIR# 4376

Bechtel Hanford, Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page <u>1</u> of <u>1</u>
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Collector K. D. Lee	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. ERC-FS-002	Field Logbook No. EFL-1054	Method of Shipment Hand Delivered

Data Turnaround
 Priority
 Normal

Shipped To Quanterra	Offsite Property No. PH2 N/A	Bill of Lading/Air Bill No. N/A
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Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	A _{Gs}	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS		ICP Metals-TAL AA Metals-As, Pb. (Unfiltered)	Anions (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-As, Pb. (Filtered)
506072								

Sample No.	Matrix*	Date Sampled	Time Sampled	PH	ICP	Anions	VOA	Alpha/Beta	Tritium	Activity	ICP (Filtered)
BOFKB7	W	06/02/95	1215	PH 2	X	X	X	X	X	X	
BOFKB8	W	06/02/95	1215	PH 2	100%	100%	100%				100%

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>K. D. Lee</i>	Date/Time 6/5/95 0800	Received By <i>Bob Raidl</i>	Date/Time 6-5-95
Relinquished By <i>Bob Raidl</i>	Date/Time 6-5-95	Received By <i>K. Boyd</i>	Date/Time 6-5-95
Relinquished By <i>Phil Wren</i>	Date/Time 6-6-95/0747	Received By <i>Phil Wren</i>	Date/Time 6-6-95/0747

SPECIAL INSTRUCTIONS
 Sample analysis for PO₄, NO₂, and NO₃ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

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

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06/02/95 2004

Data Turnaround
 Priority
 Normal

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							
Collector <i>K.D. Lee</i>		Company Contact Bob Raidl			Telephone (509) 372-9641				
Project Designation 100-FR-3 Groundwater - Round 7		Sampling Location 100 F			SAF No. B95-052				
Ice Chest No. <i>ERC-FS-002</i>		Field Logbook No.			Method of Shipment Hand Delivered				
Shipped To Quanterra		Offsite Property No. <i>PH 2 N/A</i>			Bill of Lading/Air Bill No. <i>N/A</i>				
Possible Sample Hazards/Remarks		Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
		Type of Container	P/G	P/G	Gs	P/G	G	P/G	P/G
		No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume	1L	500mL	40mL	1L	1L	20mL	1L
SAMPLE ANALYSIS		ICP Metals-TAL, AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Aa, Pb. (Filtered)	
<i>506012</i>									
Sample No.	Matrix*	Date Sampled	Time Sampled						
<i>BOFKCS</i>	<i>W</i>	<i>6/2/95</i>	<i>1030</i>	<i>PH 2</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>
<i>BOEKCS</i>	<i>W</i>	<i>NA 6/2/95</i>							<i>NA 6/2/95</i>
					<i>100%</i>	<i>100%</i>	<i>100%</i>		
CHAIN OF POSSESSION		Sign/Print Names			SPECIAL INSTRUCTIONS				
Relinquished By <i>Kathy Lee</i>	Date/Time <i>6/5/95 0800</i>	Received By <i>Bob Raidl</i>	Date/Time <i>6-5-95</i>	Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.					
Relinquished By <i>Kathy Lee</i>	Date/Time <i>6-5-95</i>	Received By <i>R Boyd</i>	Date/Time <i>6-5-95</i>	unable to make a filteral sample					
Relinquished By <i>Bob Raidl</i>	Date/Time <i>6-6-95</i>	Received By <i>Bob Raidl</i>	Date/Time <i>6-6-95</i>	filter could not be connected to collection container 6/2/95					
Relinquished By <i>Bob Raidl</i>	Date/Time <i>6-6-95</i>	Received By <i>Bob Raidl</i>	Date/Time <i>6-6-95</i>	<i>SDG W0578</i>					
LABORATORY SECTION	Received By	Title			Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By			Date/Time				

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506012

END OF PACKAGE

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DATA VALIDATION REPORT
for
100-FR-3 GROUNDWATER ROUND 7
General Chemistry Analysis
SDG W0578-QES
LATA VB403.81

Bechtel Hanford, Inc.
P.O. Box 969
Richland, Washington

August 23, 1995

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**100-FR-3 Groundwater Round 7
Data Validation Narrative**

INTRODUCTION

All samples in Sample Delivery Group (SDG) W0578-QES (VB403.81) were validated at level "D" as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002, Rev. 2).

The analyses were performed by Quanterra Environmental Services.

ANALYSES REQUESTED

See Table 1.

DATA QUALITY OBJECTIVES

- Precision:** Goals for precision were met.
- Accuracy:** Goals for accuracy were met with the exception of those items discussed in the "**Qualification Summary Table**".
- Sample Result Verification:** All sample results were supported in the raw data.
- Detection Limits:** Detection limit goals were met for all sample results as specified in the *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit, DOE/RL 91-53, Rev. 0*.
- Completeness:** The data package was 63% complete for all requested analyses.

MAJOR DEFICIENCIES

Major deficiencies were identified during validation which required qualification of data as unusable. See the "**Qualification Summary Table**".

MINOR DEFICIENCIES

Minor deficiencies were identified during validation which required qualification of data as estimated. See the "**Qualification Summary Table**".

9613478.2010

Table 1
Chain-of-Custody
Analysis Request

LATA ID #: VB403.81

SDG: W0578-QES

Sample Information						Analyses Requested
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	1
B0FK97	31-May-95	WATER	B95-052	199-F8-3		X
B0FK99	31-May-95	WATER	B95-052	199-F8-4		X
B0FKB5	31-May-95	WATER	B95-052	699-81-38		X
B0FKB7	2-Jun-95	WATER	B95-052	699-83-47		X
B0FKC5	2-Jun-95	WATER	B95-052	699-83-47	TRIP BLANK	X

Method References:

<u>Analysis</u>	<u>Method</u>
1. Anions (Cl, F, SO ₄ , PO ₄ , NO ₂ , NO ₃)	300.0

REFERENCES

WHC 1993, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

DOE 1992, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL 91-53, Rev. 0, Department of Energy-Hanford, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY)

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

- U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate.
- J- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision making purposes.
- BJ- Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency the data are unusable.
- UR- Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data are unusable due to an identified QC deficiency.

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Commonly used laboratory general chemistry qualifiers:

U- Indicates the analyte was analyzed for but not detected in the sample.

Qualification Summary Table

000007

Qualification Summary Table

General Chemistry

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Nitrate	MAJOR	UR	B0FKC5	HOLD TIME	Holding time is exceeded by greater than 2 times.
Nitrite	MAJOR	UR	B0FK97 B0FKB5 B0FK99 B0FKB7 B0FKC5	HOLD TIME	Holding time is exceeded by greater than 2 times.
Ortho-phosphate	MAJOR	UR	B0FK97 B0FKB5 B0FK99 B0FKB7 B0FKC5	HOLD TIME	Holding time is exceeded by greater than 2 times.
Nitrate	MINOR	J	B0FK97 B0FKB5 B0FK99 B0FKB7	HOLD TIME	Holding time is exceeded by greater than 2 times.
Nitrate	MINOR	J/UJ	B0FK97 B0FKB5 B0FK99 B0FKB7 B0FKC5	ACCURACY	Matrix spike recovery is outside acceptance criteria.

Comments:

1. Samples B0FK97 and B0FK97 DUP for Fluoride was diluted 1:5 to remove an interfering peak on the ion chromatogram resulting in a higher detection limit. The Fluoride peaks for the samples integrated as a hit, but their peak area was less than the lowest calibration standard, and they were reported as less than the detection limit.

General Chemistry Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
All	Trip Blank	NONE	B0FKC5	BLANKS	Trip Blank results are acceptable.

000008

Data Summary Table

000009

9613478.2017

**GENERAL CHEMISTRY
DATA SUMMARY TABLE**

LATA ID#: VB403.81		HEIS #:	B0FK97	B0FK99	B0FKB5	B0FKB7	B0FKC5					
		Date:	31-May-95	31-May-95	31-May-95	2-Jun-95	2-Jun-95					
		Matrix:	WATER	WATER	WATER	WATER	WATER					
Constituent	CAS #	Units	Results	Q	Results	Q	Results	Q	Results	Q		
Chloride by IC	16887-00-6	mg/L	5.54		9.72		5.53		5.43		0.20	U
Fluoride by IC	16984-48-8	mg/L	0.50	U	0.27		0.50		0.39		0.10	U
Nitrate by IC	14797-55-8	mg/L	19.9	J	20.3	J	1.10	J	1.69	J	0.02	UR
Nitrite by IC	14797-65-0	mg/L	0.02	UR	0.02	UR	0.02	UR	0.02	UR	0.02	UR
Ortho-phosphate by IC	14265-44-2	mg/L	0.50	UR	0.50	UR	0.50	UR	0.50	UR	0.50	UR
Sulfate by IC	14808-79-8	mg/L	46.4		51.8		34.6		43.8		0.50	U

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Shaded areas indicate changes by the validator.
40381DST.XLS, GENERAL CHEMISTRY

8/23/95, 11:04 AM

Sample Results (Form I's)

9613478.2019

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Chloride
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
BOFK97	8542-001	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	5.54	MG/L		1.00	5
BOFK97	8542-001DUP	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	5.52	MG/L		1.00	5
BOFK97	8542-001MS	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	89	%REC			10
BOFKB5	8542-002	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	5.53	MG/L		1.00	5
BOFK99	8542-003	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	9.72	MG/L		1.00	5
BOFKB7	8549-001	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	5.43	MG/L		1.00	5
BOFKC5	8549-003	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	0.20	MG/L	U	0.20	1
NA	QCBLK69225-1	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	0.20	MG/L	U	0.20	1
NA	QCBLK69455-1	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	0.20	MG/L	U	0.20	1
NA	QCCLCS69225-1	Chloride	16887-00-6	QCBLK69225-1	06/06/95	06/06/95	93	%REC			1
NA	QCCLCS69455-1	Chloride	16887-00-6	QCBLK69455-1	06/07/95	06/07/95	90	%REC			1

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9613478.2020

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Fluoride
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOFK97	8542-001	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	5
BOFK97	8542-001DUP	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	5
BOFK97	8542-001MS	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	86	%REC			5
BOFKB5	8542-002	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L		0.10	1
BOFK99	8542-003	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.27	MG/L		0.10	1
BOFKB7	8549-001	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	0.39	MG/L		0.10	1
BOFKC5	8549-003	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	0.10	MG/L	U	0.10	1
NA	QCBLK69225-1	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	0.10	MG/L	U	0.10	1
NA	QCBLK69455-1	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	0.10	MG/L	U	0.10	1
NA	QCCLCS69225-1	Fluoride	16984-48-8	QCBLK69225-1	06/06/95	06/06/95	94	%REC			1
NA	QCCLCS69455-1	Fluoride	16984-48-8	QCBLK69455-1	06/07/95	06/07/95	87	%REC			1

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9615478.2021

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Nitrate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOFK97	8542-001	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	19.9	MG/L	J	1.00	50
BOFK97	8542-001DUP	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	19.8	MG/L		1.00	50
BOFK97	8542-001MS	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	58	%REC			50
BOFKB5	8542-002	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	1.10	MG/L	J	0.10	5
BOFK99	8542-003	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	20.3	MG/L	J	1.00	50
BOFKB7	8549-001	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	1.69	MG/L	J	0.10	5
BOFKC5	8549-003	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	u u R	0.02	1
NA	QCBLK69225-1	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	1
NA	QCBLK69455-1	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	1
NA	QCLCS69225-1	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	98	%REC			1
NA	QCLCS69455-1	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	99	%REC			1

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Nitrite
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
B0FK97	8542-001	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	UUR	0.02	1
B0FK97	8542-001DUP	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	1
B0FK97	8542-001MS	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	88	%REC			5
B0FKB5	8542-002	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	UUR	0.02	1
B0FK99	8542-003	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	UUR	0.02	1
B0FKB7	8549-001	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	UUR	0.02	1
B0FKC5	8549-003	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	UUR	0.02	1
NA	QCBLK69225-1	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	0.02	MG/L	U	0.02	1
NA	QCBLK69455-1	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	0.02	MG/L	U	0.02	1
NA	QCLCS69225-1	Nitrite	7632-00-0	QCBLK69225-1	06/06/95	06/06/95	108	%REC			1
NA	QCLCS69455-1	Nitrite	7632-00-0	QCBLK69455-1	06/07/95	06/07/95	100	%REC			1

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Sulfate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dil.
B0FK97	8542-001	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	46.4 MG/L		2.50	5
B0FK97	8542-001DUP	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	46.1 MG/L		2.50	5
B0FK97	8542-001MS	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	84 %REC			5
B0FKB5	8542-002	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	34.6 MG/L		2.50	5
B0FK99	8542-003	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	51.8 MG/L		2.50	5
B0FKB7	8549-001	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	43.8 MG/L		2.50	5
B0FKC5	8549-003	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	0.50 MG/L	U	0.50	1
NA	QCBLK69225-1	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	0.50 MG/L	U	0.50	1
NA	QCBLK69455-1	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	0.50 MG/L	U	0.50	1
NA	QCLCS69225-1	Sulfate	14808-79-8	QCBLK69225-1	06/06/95	06/06/95	90 %REC			1
NA	QCLCS69455-1	Sulfate	14808-79-8	QCBLK69455-1	06/07/95	06/07/95	94 %REC			1

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9613478.2024

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Orthophosphate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOFK97	8542-001	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	UUR	0.50	1
BOFK97	8542-001DUP	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
BOFK97	8542-001MS	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	98	%REC			1
BOFKB5	8542-002	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	UUR	0.50	1
BOFK99	8542-003	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	UUR	0.50	1
BOFKB7	8549-001	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	UUR	0.50	1
BOFKC5	8549-003	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	UUR	0.50	1
NA	QCBLK69225-1	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	0.50	MG/L	U	0.50	1
NA	QCBLK69455-1	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	0.50	MG/L	U	0.50	1
NA	QCLCS69225-1	Ortho-Phosphate	14265-44-2	QCBLK69225-1	06/06/95	06/06/95	89	%REC			1
NA	QCLCS69455-1	Ortho-Phosphate	14265-44-2	QCBLK69455-1	06/07/95	06/07/95	94	%REC			1

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Checklist

9613478-2026

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
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VALIDATION PROCEDURE:	<input type="checkbox"/> WHC-CM-5-3, Rev. 0	<input checked="" type="checkbox"/> WHC-SD-EN-SPP-002, Rev. 2
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PROJECT:	100-FR-3 ROUND 7	SDG:	W0578-QES
VALIDATOR:	<i>bis 8-7-95</i> BJ SEYMOUR	LATA NO:	VB403.81
REVIEWER:	MC WEBB <i>8-9-95</i>	LAB:	QES
DATE:	4-Aug-95	CASE:	N/A
SAF NO:	B95-052	QAPP NO:	DOE/RL-91-53, R0
		SAP NO:	N/A

ANALYSES REQUESTED

<input checked="" type="checkbox"/>	Anions 300.0
-------------------------------------	-----------------

SAMPLE NO.	MATRIX	COMMENTS:
B0FK97 B0FKB5	WATER	
B0FK99 B0FKB7		
B0FKC5		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

YES NO N/A

Is technical verification documentation present?

Is a case narrative present?

2. HOLDING TIMES

YES NO N/A

Are sample holding times acceptable?

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

YES NO N/A

Were initial calibrations performed on all instruments?

Are initial calibrations acceptable?

Were calibration checks performed on all instruments?

Are calibration checks acceptable?

Validation calculation checks were performed and are acceptable.

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

9613978.2022

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

4. BLANKS

YES NO N/A

Were laboratory blanks performed for all applicable analyses?

Are laboratory blank results acceptable?

Were preparation blanks analyzed?

Are preparation blank results acceptable?

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

YES NO N/A

Were spike samples analyzed at the proper frequency?

Are all spike sample recoveries acceptable?

Were laboratory control samples (LCS) analyzed at the proper frequency?

Are all LCS recoveries acceptable?

Validation calculation checks were performed and are acceptable.

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

YES NO N/A

Were laboratory duplicates analyzed at the proper frequency?

Are all duplicate RPD values acceptable?

Were MS/MSDs analyzed?

Are all MS/MSD RPD values acceptable?

Validation calculation checks were performed and are acceptable.

If NO(s) are checked, see PRECISION DATA SUMMARY form

7. FIELD QC SAMPLES

YES NO N/A

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?

Are field/trip blank results acceptable? (see Blank Data Summary form)

Are field duplicate RPD values acceptable? (see Field QC calculations)

Are field split RPD values acceptable? (see Field QC calculations)

Are performance audit sample results acceptable?

Comments: Sample B0FKC5 is a Trip Blank

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

8. ANALYTE QUANTITATION

YES NO N/A

Was analyte quantitation performed properly?

Are results calculated properly?

Validation calculation checks were performed and are acceptable.

Comments:

9. REPORTED RESULTS AND DETECTION LIMITS

YES NO N/A

Are results reported for all requested analyses?

Are all results supported in the raw data?

Do results meet the CRDLs?

Validation calculation checks were performed and are acceptable.

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

96139/8.2029

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG: W0578-QES			VALIDATOR: BJ SEYMOUR					DATE: 04-Aug-95		
PROJECT: 100-FR-3 ROUND 7			REVIEWER: MC WEBB					LATA NO.: VB403.81		
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	Required HT (days)	ANALYSIS HT (days)	Required HT (days)	VAL Q
B0FK97	WATER	Anions(Cl,F,SO ₄)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	28	NONE
B0FK99	WATER	Anions(Cl,F,SO ₄)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	28	NONE
B0FKB5	WATER	Anions(Cl,F,SO ₄)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	28	NONE
B0FKB7	WATER	Anions(Cl,F,SO ₄)	2-Jun-95	N/A	07-Jun-95	N/A	N/A	5	28	NONE
B0FKC5	WATER	Anions(Cl,F,SO ₄)	2-Jun-95	N/A	07-Jun-95	N/A	N/A	5	28	NONE
B0FK97	WATER	Anions(NO ₂ ,PO ₄)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	2	UR
B0FK99	WATER	Anions(NO ₂ ,PO ₄)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	2	UR
B0FKB5	WATER	Anions(NO ₂ ,PO ₄)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	2	UR
B0FKB7	WATER	Anions(NO ₂ ,PO ₄)	2-Jun-95	N/A	07-Jun-95	N/A	N/A	5	2	UR
B0FKC5	WATER	Anions(NO ₂ ,PO ₄)	2-Jun-95	N/A	07-Jun-95	N/A	N/A	5	2	UR
B0FK97	WATER	Anions(NO ₃)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	2	J
B0FK99	WATER	Anions(NO ₃)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	2	J
B0FKB5	WATER	Anions(NO ₃)	31-May-95	N/A	06-Jun-95	N/A	N/A	6	2	J
B0FKB7	WATER	Anions(NO ₃)	2-Jun-95	N/A	07-Jun-95	N/A	N/A	5	2	J
B0FKC5	WATER	Anions(NO ₃)	2-Jun-95	N/A	07-Jun-95	N/A	N/A	5	2	UR

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9613478.2030

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

BLANK DATA SUMMARY

SDG: W0578-QES			VALIDATOR: BJ SEYMOUR					DATE: 04-Aug-95		
PROJECT: 100-FR-3 ROUND 7			REVIEWER: MC WEBB					LATA NO.: VB403.81		
BLANK ID	ANALYTE	RESULT	LAB Q	RT	UNITS	2X RESULT	5X RESULT	10X RESULT	SAMPLES AFFECTED	VAL Q
BOFKC5 Trip Blank	All analytes are non detect								NONE	NONE

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9613478.2031

**LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST**

ACCURACY DATA SUMMARY

SDG: W0578-QES				VALIDATOR: BJ SEYMOUR		DATE: 04-Aug-95		
PROJECT: 100-FR-3 ROUND 7				REVIEWER: MC WEBB		LATA NO.: VB403.81		
HEIS-SN	ANALYTE	RESULTS	Lab Q	PERCENT RECOVERY (%R)			SAMPLES AFFECTED	VAL Q
				Matrix Spike	Matrix Spike Duplicate	Laboratory Control Standard		
B0FK97	Nitrate	19.9		58%	N/A	N/A	B0FK97 B0FKB5 B0FK99 B0FKB7 B0FKC5	J/UJ

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9613478.2032

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.83

Category: Nitrate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 05/31/95
Receipt Date : 06/01/95
Report Date : 07/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dil.
BOFK97	8542-001	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	19.9 MG/L		1.00	50
BOFK97	8542-001DUP	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	19.8 MG/L		1.00	50
BOFK97	8542-001MS	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	58 %REC			50
BOFKB5	8542-002	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	1.10 MG/L		0.10	5
BOFK99	8542-003	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	20.3 MG/L		1.00	50
BOFKB7	8549-001	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	1.69 MG/L		0.10	5
BOFKC5	8549-003	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	0.02 MG/L	U	0.02	1
NA	QCBLK69225-1	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	0.02 MG/L	U	0.02	1
NA	QCBLK69455-1	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	0.02 MG/L	U	0.02	1
NA	QCCLCS69225-1	Nitrate	14797-55-8	QCBLK69225-1	06/06/95	06/06/95	98 %REC			1
NA	QCCLCS69455-1	Nitrate	14797-55-8	QCBLK69455-1	06/07/95	06/07/95	99 %REC			1

bis 8-7-95

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J.C.
7/12/95

9613478.2033

**LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET**

LINEAR REGRESSION ANALYSIS

SDG: W0578-QESDate: 4-Aug-95LATA No.: VB403.81Validator: BJ SEYMOURAnalyte/Calibration Date: Chloride/ 6-6-95

Concentration	Absorbance
x	y
0.000	0
0.200	969
0.500	2530
1.000	5103
2.500	15266
5.000	33399

r	r ²
0.9986	0.9972
slope	x intercept
6722.1917	0.1175
1/slope	y intercept
0.0001	-762.8606

LINEAR REGRESSION ANALYSIS

SDG: W0578-QESDate: 4-Aug-95LATA No.: VB403.81Validator: BJ SEYMOURAnalyte/Calibration Date: Fluoride/ 6-7-95

Concentration	Absorbance
x	y
0.000	0
0.100	563
0.500	12884
1.000	27607
2.500	88300
5.000	191983

r	r ²
0.9984	0.9968
slope	x intercept
38881.5599	0.1436
1/slope	y intercept
0.0000	-5414.1992

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**LATA GENERAL CHEMISTRY
 CALCULATION SPREADSHEET**

PERCENT RECOVERY (ICV/CCV)

SDG: W0578-QES

Date: 4-Aug-95

LATA No.: VB403.81

Validator: BJ SEYMOUR

Analyte	Sample ID	Observed Value	True Value	%R
		O	A	
Chloride	ICV	1.802	2	90%
Chloride	CCV	1.911	2	96%
Fluoride	ICV	1.857	2	93%
Fluoride	CCV	1.881	2	94%

9613478.2035

LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

MATRIX SPIKE RECOVERY (MS)

SDG: W0578-QESDate: 4-Aug-95LATA No.: VB403.81Validator: BJ SEYMOUR

Analyte	Sample ID	Spike Sample Result	Sample Result	Spike Added	%R
		SSR	SR	SA	
<u>Chloride</u>	<u>B0FK97</u>	<u>23.351</u>	<u>5.536</u>	<u>20</u>	<u>89%</u>
<u>Fluoride</u>	<u>B0FK97</u>	<u>1.718</u>	<u>0.000</u>	<u>2</u>	<u>86%</u>

9613478.2036

LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

PERCENT RECOVERY (LCS)

SDG: W0578-QES
LATA No.: VB403.81

Date: 4-Aug-95
Validator: BJ SEYMOUR

Analyte	Observed value	True value	%R
	OLCS	ALCS	
<u>Chloride</u>	<u>0.934</u>	<u>1</u>	93%
<u>Fluoride</u>	<u>0.938</u>	<u>1</u>	94%

9613478.2037

LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: W0578-QESDate: 4-Aug-95LATA No.: VB403.81Validator: BJ SEYMOUR

Analyte	Sample ID	Original (Sample) concentration	Duplicate concentration	RPD
		OS	D	
<u>Chloride</u>	<u>B0FK97</u>	<u>5.536</u>	<u>5.524</u>	0.2%
<u>Fluoride</u>	<u>B0FK97</u>	<u>0.568</u>	<u>0.568</u>	0.0%

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LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

RESULTS CALCULATION, WATER

SDG: W0578-QES
LATA No.: VB403.81

Date: 4-Aug-95
Validator: BJ SEYMOUR

Analyte	Concentration from curve		Dilution Factor	Concentration (mg/L)
	CONCW	units	DFW	
<u>Chloride (B0FK99)</u>	9.723	mg/L	1	9.72
<u>Fluoride (B0FK99)</u>	0.271	mg/L	1	0.27

Laboratory Case Narrative

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
 P.O. Box 1970
 Richland, Washington 99352

July 7, 1995

Attention: Joan Kessner

Project number	:	550.83
Date Received by Lab	:	June 1 and 5, 1995
Number of Samples	:	Ten (10)
Sample Type	:	Water
SDG Number	:	W0578
Data Deliverable	:	Standalone



I. Introduction

On June 1 and 5, 1995, ten (10) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

<u>St Louis ID</u>	<u>BHI ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
8542-001	BOFK97	50602301	Water	06/01/95
8542-002	BOFKB5	50602303	Water	06/01/95
8542-003	BOFK99	50602305	Water	06/01/95
8542-004	BOFKF3	50602307	Water	06/01/95
8542-005	BOFK98	50602302	Water	06/01/95
8542-006	BOFKB6	50602304	Water	06/01/95
8542-007	BOFKB0	50602306	Water	06/01/95
8549-001	BOFKB7	50607201	Water	06/05/95
8549-002	BOFKB8	50607202	Water	06/05/95
8549-003	BOFKC5	50607203	Water	06/05/95

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Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
Page 2

II. 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: VOA, ICP metals, Arsenic, and Lead following EPA CLP90 methodology. Chloride, Fluoride, Nitrate, Nitrite, Phosphate, and Sulfate by EPA method 300.0.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate or Sample Duplicate analyses were performed per the protocol for each analyte.

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

V. Comments

There were no comments or nonconformances associated with the Volatiles analysis.

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Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
Page 3

The Matrix Spike recovery of sample BOFK97 for zinc was 0% and outside the acceptable range. In accordance with the SOW a post digestion spike was performed and the associated data flagged. The Duplicate Relative Percent Difference for zinc was above the acceptable limit and the associated data was flagged. The serial dilution result for barium was above the acceptable limit, 10.6% and the associated data was flagged.

Nitrate, Nitrite, and Phosphate holding times were waived by client.

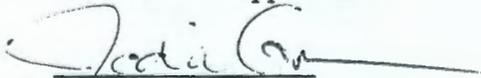
The Relative Percent Difference for Fluoride, Phosphate, and Nitrite could not be calculated due to values being below the detection limit on sample 8542-001.

The Matrix Spike for Nitrate was outside of suggested limits of 75-125 percent on sample 8542-001. The sample concentration was greater than four times the spike amount.

Samples 8542-001 and -001DUP for Fluoride was diluted 1:5 to remove an interfering peak on the ion chromatogram resulting in a higher detection limit. The Fluoride peaks for the samples integrated as a hit, but their peak area was less than the lowest calibration standard and they were reported as less than the detection limit.

I certify that this data package 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:



Mr. Wade H. Price

Project Manager

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Chain-of-Custody Information

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround
 Priority
 Normal

Collector <i>K Lee / A Rizzo</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-PR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. <i>Rm136</i>	Field Logbook No. <i>ERL-105A</i>	Method of Shipment Hand Delivered
Shipped To Quinterra	Offsite Property No. <i>PH 1/A</i>	Bill of Lading/Air Bill No. <i>N/R 1</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃		
	Type of Container	P/O	P/O	A/Ga	P/G	G	P/G	P/O		
	No. of Container(s)	1	1	3	4	3	1	1		
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L		

SAMPLE ANALYSIS <i>50602.3</i>	Matrix*	Date Sampled	Time Sampled	ICP Metals-TAL AA Metals-Aa, Pb (Unfiltered)	Asides (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-Aa, Pb (Filtered)
				<i>876</i>	<i>W0578</i>		<i>50602401</i>			

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP Metals-TAL AA Metals-Aa, Pb (Unfiltered)	Asides (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-Aa, Pb (Filtered)
BOPK97	01	W	5-31-95	0939	Y	X	X	X	X	
BOPK98	02	W	5-31-95	0939						X
					100	100	3X100			100

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By <i>AGP/20 ACR (ERC)</i>	Date/Time <i>5-31-95 1330</i>	Received By <i>Eric</i>	Date/Time <i>5-31-95</i>
Relinquished By <i>Eric</i>	Date/Time <i>9-45</i>	Received By <i>Karen</i>	Date/Time <i>9-45</i>
Relinquished By <i>Eric</i>	Date/Time <i>6-1-95</i>	Received By <i>Eric</i>	Date/Time <i>6-1-95</i>
Relinquished By	Date/Time	Received By	Date/Time

Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

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

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 b/s 8-1-95

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								Page <u>1</u> of <u>1</u>	
Collector <i>K. Lee / A. Rizzo</i>		Company Contact Bob Raidl				Telephone (509) 372-9641				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal	
Project Designation 100-FR-3 Groundwater - Round 7		Sampling Location 100 F				SAP No. B95-052					
Ice Chest No. <i>G-5122</i>		Field Logbook No. <i>ER-1054</i>				Method of Shipment Hand Delivered					
Shipped To Quanterra		Offsite Property No. <i>PH 1 N/A</i>				Bill of Lading/Air Bill No. <i>N/A</i>					
Possible Sample Hazards/Remarks		Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C		HNO ₃	
		Type of Container	P/G	P/G	Gs	P/G	G	P/G		P/G	
		No. of Container(s)	1	1	3	4	3	1		1	
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume	1L	500mL	40mL	1L	1L	20mL		1L	
SAMPLE ANALYSIS <i>506023</i>		<i>SRX</i> <i>W0578</i>		ICP Metals TAL. AA Metals-Aa, Fb. (Unfiltered)	Asbestos (TC) P, Cl, SO ₂ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan		ICP Metals TAL. AA Metals-Aa, Fb. (Filtered)
Sample No.	Matrix*	Date Sampled	Time Sampled								
BOFKB5	03	W	5-31-95	1137	Y	Y	Y	Y	Y	Y	
BOFKB6	04	W	5-31-95	1137							Y
					100	100	3X100				100
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By <i>AG Rizzo</i>		Date/Time <i>5-31-95 1330</i>		Received By <i>Bob Raidl</i>		Date/Time <i>5-31-95</i>		Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.			
Relinquished By <i>AG Rizzo</i>		Date/Time <i>6-1-95</i>		Received By <i>Bob Raidl</i>		Date/Time <i>6-1-95</i>		Matrix*			
Relinquished By		Date/Time		Received By		Date/Time		S - Soil SB - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drydown Solids DL - Drown Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other			
LABORATORY SECTION		Received By		Title				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time			

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8-4-95

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										Page <u>1</u> of <u>1</u>	
Collector <i>K. Lee / A. Rizzo</i>		Company Contact Bob Raidl				Telephone (509) 372-9641				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal			
Project Designation 100-PR-3 Groundwater - Round 7		Sampling Location 100 P				SAF No. B95-052							
Ice Chest No. <i>Rm136</i>		Field Logbook No. <i>EFL-1059</i>				Method of Shipment Hand Delivered							
Shipped To Quanterra		Offsite Property No. <i>PH 1 N/A</i>				Bill of Lading/Air Bill No. <i>1/A 1</i>							
Possible Sample Hazards/Remarks		Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C		HNO ₃			
		Type of Container	<i>P/G</i>	<i>P/G</i>	<i>Gs</i>	<i>P/G</i>	<i>G</i>	<i>P/G</i>		<i>P/G</i>			
		No. of Container(s)	<i>1</i>	<i>1</i>	<i>3</i>	<i>4</i>	<i>3</i>	<i>1</i>		<i>1</i>			
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume	<i>1L</i>	<i>500mL</i>	<i>40mL</i>	<i>1L</i>	<i>1L</i>	<i>20mL</i>		<i>1L</i>			
SAMPLE ANALYSIS <i>506023</i>		<i>SPW</i> <i>W0578</i>		ICP Metals-TAL, AA Metals-Aa, Pb, (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Aa, Pb, (Filtered)			
							<i>506024</i>	<i>03</i>					
Sample No.	Matrix*	Date Sampled	Time Sampled										
BOFK99	<i>05</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>				
BOFKB0	<i>06</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>							<i>X</i>		
BOFKF3	<i>07</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>			<i>X</i>						
	<i>→ 5-31-95</i>	<i>⊙</i>											
					<i>100</i>	<i>100</i>	<i>3x100</i>				<i>100</i>		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>Asst. Asst. (SAC)</i>				Received By <i>ERC</i>				Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				S - Soil	
Date/Time <i>5-31-95 1330</i>				Date/Time <i>5-31-95</i>								SH - Sediment	
Relinquished By <i>Asst. Asst.</i>				Received By <i>Asst. Asst.</i>								SO - Solid	
Date/Time <i>9-45</i>				Date/Time <i>94</i>								SL - Sludge	
Relinquished By <i>Asst. Asst.</i>				Received By <i>Asst. Asst.</i>								W - Water	
Date/Time <i>6-1-95</i>				Date/Time <i>6-1-95</i>								O - Oil	
Relinquished By <i>Asst. Asst.</i>				Received By <i>Asst. Asst.</i>								A - Air	
Date/Time <i>6-1-95</i>				Date/Time <i>6-1-95</i>								DS - Drum Solids	
Relinquished By <i>Asst. Asst.</i>				Received By <i>Asst. Asst.</i>								DL - Drum Liquids	
Date/Time <i>6-1-95</i>				Date/Time <i>6-1-95</i>								T - Tissue	
Relinquished By <i>Asst. Asst.</i>				Received By <i>Asst. Asst.</i>								WT - Wipe	
Date/Time <i>6-1-95</i>				Date/Time <i>6-1-95</i>								L - Liquid	
Relinquished By <i>Asst. Asst.</i>				Received By <i>Asst. Asst.</i>								V - Vegetation	
Date/Time <i>6-1-95</i>				Date/Time <i>6-1-95</i>								X - Other	
LABORATORY SECTION		Received By		Title		Date/Time							
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time							

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b/s

8-4-95

9613178-2146

Temp 5°C / 6°C Temp Vial CML# 4376

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround

- Priority
- Normal

Collector K. D. Lee	Company Contact Bob Raidl	Telephone (509) 372-9641								
Project Designation 100-IR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052								
Ice Chest No. ERC-FS-002	Field Logbook No. EFL-1054	Method of Shipment Hand Delivered								
Shipped To Quanterra	Offsite Property No. PH2 N/A	Bill of Lading/Air Bill No. N/A								
Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃		
	Type of Container	P P/G	P P/G	A G _s	P/G	G	P/G		P/G	
	No. of Container(s)	1	1	3	4	3	1		1	
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL		1L	

SAMPLE ANALYSIS				ICP Metals-TAL. AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL. AA Metals-Aa, Pb. (Filtered)
506072										
Sample No.	Matrix*	Date Sampled	Time Sampled	PH ₂ 2.9						PH ₂
1) BOF-KD7	W	06/02/95	1215	X	X	X	X	X	X	
2) BOF-KD8	W	06/02/95	1215	100%						100%

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By K. D. Lee	Date/Time 6/5/95 0800	Received By Bill Whitton	Date/Time 6-5-95	Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				<ul style="list-style-type: none"> S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other 	
Relinquished By Bill Whitton	Date/Time 6-5-95 1101	Received By R. Boyd	Date/Time 6-5-95						
Relinquished By Phil Wern	Date/Time 6-6-95/0747	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						
LABORATORY SECTION	Received By	Title		SDG W0578				Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By		Date/Time				

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Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										Page <u>1</u> of <u>1</u>		
Collector <i>K.D. Lee</i>		Company Contact Bob Raidl				Telephone (509) 372 9641				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal				
Project Designation 100-FR-3 Groundwater - Round 7		Sampling Location 100 F'				SAF No. B95-052								
Ice Chest No. <i>ERC-FS-002</i>		Field Logbook No.				Method of Shipment Hand Delivered								
Shipped To Quanterra		Offsite Property No. <i>PH 2 N/A</i>				Bill of Lading/Air Bill No. <i>N/A</i>								
Possible Sample Hazards/Remarks		Preservation	IINO,	Cool 4°C	IICI	IINO,	Cool 4°C	Cool 4°C		IINO,				
		Type of Container	P/G	P/G	Gs	P/G	G	P/G		P/G				
		No. of Container(s)	1	1	3	4	3	1		1				
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume	1L	500mL	40mL	1L	1L	20mL		1L				
SAMPLE ANALYSIS			ICP Metals-TAL AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂ .	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan		ICP Metals-TAL AA Metals-Aa, Pb. (Filtered)				
<i>506012</i>														
Sample No.	Matrix*	Date Sampled	Time Sampled											
<i>506012</i>	<i>W</i>	<i>6/2/95</i>	<i>1030</i>	<i>PH 2</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>				
<i>506012</i>	<i>W</i>	<i>N/A 6-5-95</i>									<i>N/A 6-5-95</i>			
				<i>100%</i>	<i>100%</i>	<i>100%</i>								
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS						Matrix*		
Relinquished By <i>Kathy Lee</i>		Date/Time <i>6/5/95 0800</i>		Received By <i>Bob Raidl</i>		Date/Time <i>6-5-95</i>		<p>unable to locate a federal sample with could not be converted to cubic container 6-5-95 SDG W0578</p>						<ul style="list-style-type: none"> S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drums Solids DL - Drums Liquids T - Tissue WL - Wipe L - Liquid V - Vegetation X - Other
Relinquished By <i>Bob Raidl</i>		Date/Time <i>6-5-95 1101</i>		Received By <i>R. Boyd</i>		Date/Time <i>6-5-95 1101</i>								
Relinquished By <i>Bob Raidl</i>		Date/Time <i>6-6-95/0745</i>		Received By <i>Bob Raidl</i>		Date/Time <i>6-6-95/0745</i>								
Relinquished By		Date/Time		Received By		Date/Time								
LABORATORY SECTION	Received By	Title				Date/Time								
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time								

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b/s 8-4-95
00012

NORMAL

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END OF PACKAGE

DATA VALIDATION REPORT
for
100-FR-3 GROUNDWATER ROUND 7
Volatile Organic Analysis
SDG W0578-QES
LATA VB403.81

Bechtel Hanford, Inc.
P.O. Box 969
Richland, Washington

August 23, 1995

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**100-FR-3 Groundwater Round 7
Data Validation Narrative**

INTRODUCTION

All samples in Sample Delivery Group (SDG) W0578-QES (VB403.81) were validated at level D as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002, Rev. 2).

The analyses were performed by Quanterra Environmental Services.

ANALYSES REQUESTED

See Table 1.

DATA QUALITY OBJECTIVES

Precision:	Goals for precision were met.
Accuracy:	Goals for accuracy were met.
Sample Result Verification:	All sample results were supported in the raw data.
Detection Limits:	Detection limit goals were met for all sample results as specified in the <i>Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit, DOE/RL 91-53, Rev. 0.</i>
Completeness:	The data package was 100% complete for all requested analyses.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

Minor deficiencies were identified during validation which required qualification of data as estimated. See the "Qualification Summary Table".

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Table 1
Chain-of-Custody
Analysis Request

LATA ID #: VB403.81

SDG: W0578-QES

Sample Information						Analyses Requested
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	1
B0FK97	31-May-95	WATER	B95-052	199-F8-3		X
B0FK99	31-May-95	WATER	B95-052	199-F8-4		X
B0FKB5	31-May-95	WATER	B95-052	699-81-38		X
B0FKB7	2-Jun-95	WATER	B95-052	699-83-47		X
B0FKF3	31-May-95	WATER	B95-052	199-F8-4	TRIP BLANK	X
B0FKC5	2-Jun-95	WATER	B95-052	699-83-47	TRIP BLANK	X

Method References:

Analysis
 1. VOA - TCL

Method
CLP

REFERENCES

WHC 1993, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

DOE 1992, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL 91-53, Rev. 0. Department of Energy- Hanford, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY)

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

- U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate.
- J- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision making purposes.
- R- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency the data are unusable.
- UR- Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data are unusable due to an identified QC deficiency.
- JN- Indicates a tentatively identified compound (TIC) that has been determined to be valid in terms of identification and quantitation.
- UJN- Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.
- NJ- Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific application (i.e., usable for decision making purposes).
- N- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision making purposes).

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Commonly used laboratory qualifiers:

- U- Indicates the analyte was analyzed for but not detected in the sample.
- J- Indicates the analyte concentration is less than the CRQL but greater than the IDL.
- B- Indicates the analyte was detected in the method blank.

Qualification Summary Table

000007

Qualification Summary Table

Volatile Organic

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Methylene Chloride	MINOR	U	B0FK99 B0FKB5	BLANKS	Preparation blank value is positive and outside acceptance criteria.

Comments:

An upward adjustment to meet the CRQL for sample results qualified non-detect (U) due to blank contamination has been made by the validator on the Data Summary Tables and Form Is as required.

Volatile Organic Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
Acetone	Trip Blank	NONE	B0FKF3	BLANKS	Trip blank contamination noted.
All	Trip Blank	NONE	B0FKC5	BLANKS	Trip blank results are acceptable.

Comments:

Data qualification is not required based on field QC, however, field QC results are summarized here to alert the data user to uncertainties in the data set during decision making processes.

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Data Summary Table

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**VOLATILE ORGANIC
DATA SUMMARY TABLE**

LATA ID#: VB403.81		HEIS #:	B0FK97	B0FK99	B0FKB5	B0FKB7	B0FKC5			
		Date:	31-May-95	31-May-95	31-May-95	2-Jun-95	2-Jun-95			
		Matrix:	WATER	WATER	WATER	WATER	WATER			
Constituent	CAS #	Units	Results	Q	Results	Q	Results	Q	Results	Q
Chloromethane	74-87-3	µg/L	10	U	10	U	10	U	10	U
Bromomethane	74-83-9	µg/L	10	U	10	U	10	U	10	U
Vinyl chloride	75-01-4	µg/L	10	U	10	U	10	U	10	U
Chloroethane	75-00-3	µg/L	10	U	10	U	10	U	10	U
Methylene chloride	75-09-2	µg/L	10	U	10	U	10	U	10	U
Acetone	67-64-1	µg/L	10	U	10	U	10	U	10	U
Carbon disulfide	75-15-0	µg/L	10	U	10	U	10	U	10	U
1,1-Dichloroethene	75-35-4	µg/L	10	U	10	U	10	U	10	U
1,1-Dichloroethane	75-34-3	µg/L	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)	540-59-0	µg/L	10	U	10	U	10	U	10	U
Chloroform	67-66-3	µg/L	10	U	10	U	10	U	10	U
1,2-Dichloroethane	107-06-2	µg/L	10	U	10	U	10	U	10	U
2-Butanone	78-93-3	µg/L	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane	71-55-6	µg/L	10	U	10	U	10	U	10	U
Carbon tetrachloride	56-23-5	µg/L	10	U	10	U	10	U	10	U
Bromodichloromethane	75-27-4	µg/L	10	U	10	U	10	U	10	U
1,2-Dichloropropane	78-87-5	µg/L	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene	10061-01-5	µg/L	10	U	10	U	10	U	10	U
Trichloroethene	79-01-6	µg/L	10	U	1	J	10	U	2	J
Dibromochloromethane	124-48-1	µg/L	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	79-00-5	µg/L	10	U	10	U	10	U	10	U
Benzene	71-43-2	µg/L	10	U	10	U	10	U	10	U
trans-1,3-Dichloropropene	10061-02-6	µg/L	10	U	10	U	10	U	10	U
Bromoform	75-25-2	µg/L	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone	108-10-1	µg/L	10	U	10	U	10	U	10	U
2-Hexanone	591-78-6	µg/L	10	U	10	U	10	U	10	U
Tetrachloroethene	127-18-4	µg/L	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	10	U	10	U	10	U	10	U
Toluene	108-88-3	µg/L	10	U	10	U	10	U	10	U
Chlorobenzene	108-90-7	µg/L	10	U	10	U	10	U	10	U
Ethylbenzene	100-41-4	µg/L	10	U	10	U	10	U	10	U
Styrene	100-42-5	µg/L	10	U	10	U	10	U	10	U
Xylenes (Total)	1330-20-7	µg/L	10	U	10	U	10	U	10	U

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Shaded areas indicate changes by the validator.

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**VOLATILE ORGANIC
DATA SUMMARY TABLE**

LATA ID#: VB403.81		HEIS #:	B0FKF3	
		Date:	31-May-95	
		Matrix:	WATER	
Constituent	CAS #	Units	Results	Q
Chloromethane	74-87-3	µg/L	10	U
Bromomethane	74-83-9	µg/L	10	U
Vinyl chloride	75-01-4	µg/L	10	U
Chloroethane	75-00-3	µg/L	10	U
Methylene chloride	75-09-2	µg/L	10	U
Acetone	67-64-1	µg/L	20	
Carbon disulfide	75-15-0	µg/L	10	U
1,1-Dichloroethene	75-35-4	µg/L	10	U
1,1-Dichloroethane	75-34-3	µg/L	10	U
1,2-Dichloroethene (total)	540-59-0	µg/L	10	U
Chloroform	67-66-3	µg/L	10	U
1,2-Dichloroethane	107-06-2	µg/L	10	U
2-Butanone	78-93-3	µg/L	10	U
1,1,1-Trichloroethane	71-55-6	µg/L	10	U
Carbon tetrachloride	56-23-5	µg/L	10	U
Bromodichloromethane	75-27-4	µg/L	10	U
1,2-Dichloropropane	78-87-5	µg/L	10	U
cis-1,3-Dichloropropene	10061-01-5	µg/L	10	U
Trichloroethene	79-01-6	µg/L	10	U
Dibromochloromethane	124-48-1	µg/L	10	U
1,1,2-Trichloroethane	79-00-5	µg/L	10	U
Benzene	71-43-2	µg/L	10	U
trans-1,3-Dichloropropene	10061-02-6	µg/L	10	U
Bromoform	75-25-2	µg/L	10	U
4-Methyl-2-pentanone	108-10-1	µg/L	10	U
2-Hexanone	591-78-6	µg/L	10	U
Tetrachloroethene	127-18-4	µg/L	10	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	10	U
Toluene	108-88-3	µg/L	10	U
Chlorobenzene	108-90-7	µg/L	10	U
Ethylbenzene	100-41-4	µg/L	10	U
Styrene	100-42-5	µg/L	10	U
Xylenes (Total)	1330-20-7	µg/L	10	U

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Shaded areas indicate changes by the validator.
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Sample Results (Form I's)

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FK97

Lab Name: QUANTERRA MO Contract: 550-83
 Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578
 Matrix: (soil/water) WATER Lab Sample ID: 8542-001
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3577
 Level: (low/med) LOW Date Received: 06/01/95
 % Moisture: not dec. Date Analyzed: 06/12/95
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	10	U
67-64-1	-----Acetone	10	U
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FK97

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3577

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/12/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
-----	-----	-----	-----	-----

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FK99

Lab Name: QUANTERRA MO Contract: 550-83
 Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578
 Matrix: (soil/water) WATER Lab Sample ID: 8542-003
 Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3642
 Level: (low/med) LOW Date Received: 06/01/95
 % Moisture: not dec. Date Analyzed: 06/14/95
 GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0
 Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	10	U
67-64-1	-----Acetone	10	U
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	1	J
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

10 → BS U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FK99

Lab Name: QUANTERRA MO Contract: 550-83

Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578

Matrix: (soil/water) WATER Lab Sample ID: 8542-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3642

Level: (low/med) LOW Date Received: 06/01/95

% Moisture: not dec. Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

PM
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKB5

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-002

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3641

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

10 → ~~10~~ U

3/90

76154/B.2068

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0FKB5

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-002

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3641

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

DM
8-10-95

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKB7

Lab Name: QUANTERRA MO Contract: 550-83

Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578

Matrix: (soil/water) WATER Lab Sample ID: 8549-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3648

Level: (low/med) LOW Date Received: 06/01/95

% Moisture: not dec. Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	2	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

96030701.2079

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FKB7

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8549-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3648

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

BM
8/10/95

13

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0FKC5

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8549-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3649

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.

COMPOUND

Q

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9603978.2072

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FKC5

Lab Name: QUANTERRA MO Contract: 550-83

Lab Code: ITMO Case No.: V54201 SAS No.: SDG No.: W0578

Matrix: (soil/water) WATER Lab Sample ID: 8549-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E3649

Level: (low/med) LOW Date Received: 06/01/95

% Moisture: not dec. Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

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8-10-95

15

9613478.2073

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOFKF3

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-004

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3643

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624

ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	Q
---------	----------	---

74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	10	U
67-64-1	-----Acetone	20	
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

9815478 20/4

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0FKF3

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: 8542-004

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3643

Level: (low/med) LOW

Date Received: 06/01/95

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

AM
6/14/95

TJ

Checklist

9613478.2076

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	<input type="checkbox"/> WHC-CM-5-3, Rev. 0		<input checked="" type="checkbox"/> WHC-SD-EN-SPP-002, Rev. 2		

PROJECT:	100-FR-3 ROUND 7	SDG:	W0578-QES
VALIDATOR:	BJ MORRIS <i>8-10-95</i>	LATA NO:	VB403.81
REVIEWER:	BJ SEYMOUR <i>8-23-95</i>	LAB:	QES
DATE:	7-Aug-95		
SAF NO:	B95-052	QAPP NO:	DOE/RL-91-53, R0
CASE:	N/A		
SAP NO:	N/A		

ANALYSES REQUESTED

<input checked="" type="checkbox"/> Volatiles CLP
--

SAMPLE NO.	MATRIX	COMMENTS:
B0FK97 B0FK99	WATER	
B0FKB5 B0FKB7		
B0FKC5 B0FKF3		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

YES NO N/A

Is technical verification documentation present?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

Is a case narrative present?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

2. HOLDING TIMES

YES NO N/A

Are sample holding times acceptable?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

See HOLDING TIME SUMMARY form

3. INSTRUMENT TUNING/PERFORMANCE AND CALIBRATIONS

YES NO N/A

Is the GC/MS tuning/performance check acceptable?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

Were initial calibrations performed on all instruments at the proper frequency?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

Are initial calibrations acceptable?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

Were continuing calibrations performed on all instruments at the proper frequency?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

Are continuing calibrations acceptable?

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

Validation calculation checks were performed and are acceptable.

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------	--------------------------

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

000026

4. BLANKS

YES NO N/A

Were laboratory blanks analyzed?

Are laboratory blank results acceptable?

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

YES NO N/A

Were surrogates/System Monitoring Compounds analyzed at the proper frequency?

Are all surrogate/System Monitoring Compound recoveries acceptable?

Were spike samples (MS/MSD) analyzed at the proper frequency?

Are all spike sample (MS/MSD) recoveries acceptable?

Validation calculation checks were performed and are acceptable.

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

YES NO N/A

Were MS/MSDs analyzed?

Are all MS/MSD RPD values acceptable?

Validation calculation checks were performed and are acceptable.

If NO(s) are checked, see PRECISION DATA SUMMARY form

7. FIELD QC SAMPLES

YES NO N/A

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?

Are field/trip blank results acceptable? (see Blank Data Summary form)

Are field duplicate RPD values acceptable? (see Field QC calculations)

Are field split RPD values acceptable? (see Field QC calculations)

Are performance audit sample results acceptable?

 Comments: B0FKC5 and B0FKF3 were identified as a Trip Blanks.

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

8. SYSTEM PERFORMANCE

YES NO N/A

Were internal standards analyzed?

Are all internal standard areas acceptable?

Are all internal standard retention times acceptable?

9. COMPOUND IDENTIFICATION AND QUANTITATION

YES NO N/A

Is compound identification acceptable?

Is compound quantitation acceptable?

Are all TICs properly identified and coded?

10. REPORTED RESULTS AND QUANTITATION LIMITS

YES NO N/A

Are results reported for all requested analyses?

Are all results supported in the raw data?

Do results meet the CRQLs?

Validation calculation checks were performed and are acceptable.

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

9613478.2079

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG: W0578-QES			VALIDATOR: BJ MORRIS						DATE: 07-Aug-95	
PROJECT: 100-FR-3 ROUND 7			REVIEWER: BJ SEYMOUR						LATA NO.: VB403.81	
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	<i>Required HT (days)</i>	ANALYSIS HT (days)	<i>Required HT (days)</i>	VAL Q
B0FK97	WATER	Volatiles	31-May-95	N/A	12-Jun-95	N/A	<i>N/A</i>	12	<i>14</i>	NONE
B0FK99	WATER	Volatiles	31-May-95	N/A	14-Jun-95	N/A	<i>N/A</i>	14	<i>14</i>	NONE
B0FKB5	WATER	Volatiles	31-May-95	N/A	14-Jun-95	N/A	<i>N/A</i>	14	<i>14</i>	NONE
B0FKB7	WATER	Volatiles	2-Jun-95	N/A	14-Jun-95	N/A	<i>N/A</i>	12	<i>14</i>	NONE
B0FKC5	WATER	Volatiles	2-Jun-95	N/A	14-Jun-95	N/A	<i>N/A</i>	12	<i>14</i>	NONE
B0FKF3	WATER	Volatiles	31-May-95	N/A	14-Jun-95	N/A	<i>N/A</i>	14	<i>14</i>	NONE

9613478.2080

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

BLANK DATA SUMMARY

SDG: W0578-QES			VALIDATOR: BJ MORRIS				DATE: 07-Aug-95		
PROJECT: 100-FR-3 ROUND 7			REVIEWER: BJ SEYMOUR				LATA NO.: VB403.81		
BLANK ID	ANALYTE	RESULT	LAB Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	VAL Q
VBLK02	Methylene Chloride	1	J		µg/L		10	B0FK99 B0FKB5	U
B0FKC5 Trip Blank	All compounds nondetect							NONE	NONE
B0FKF3 Trip Blank	Acetone	20			µg/L			NONE	NONE

9613478.2081

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK02

Lab Name: QUANTERRA MO

Contract: 550-83

Lab Code: ITMO

Case No.: V54201

SAS No.:

SDG No.: W0578

Matrix: (soil/water) WATER

Lab Sample ID: QCBLK70056

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: E3639

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 06/14/95

GC Column: DB-624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	1	J
67-64-1	-----Acetone	10	U
75-15-0	-----Carbon Disulfide	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
540-59-0	-----1,2-Dichloroethene (total)	10	U
67-66-3	-----Chloroform	10	U
107-06-2	-----1,2-Dichloroethane	10	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon Tetrachloride	10	U
75-27-4	-----Bromodichloromethane	10	U
78-87-5	-----1,2-Dichloropropane	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
79-01-6	-----Trichloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
71-43-2	-----Benzene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
75-25-2	-----Bromoform	10	U
108-10-1	-----4-Methyl-2-Pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U
108-88-3	-----Toluene	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
100-42-5	-----Styrene	10	U
1330-20-7	-----Xylene (total)	10	U

15

9613478.2082 LATA GC/MS ORGANICS
 DATA VALIDATION CALCULATION SPREADSHEET

SDG: W0578-QES

Date: 34918.000

LATA No.: VB403.81

Validator: BJ MORRIS

VOA RELATIVE RESPONSE FACTOR

Analyte	Response for Analyte of Interest	Conc. of Internal Standard	Area of Internal Standard	Conc. of Analyte of Interest	RRF
Vinyl Chloride (rf20)	12855	50.00	38854	20.00	0.827
Benzene (rf50)	89968	50.00	132883	50.00	0.677
Toluene (rf200)	454019	50.00	108910	200.00	1.042

9613978.2183
LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: W0578-QES

Date: 7-Aug-95

LATA No.: VB403.81

Validator: BJ MORRIS

RELATIVE STANDARD DEVIATION

RRF1 Analyte: Bromomethane

1.051			
1.123	MEAN	STDEV	RSD
1.059	1.006	0.1067	10.6
0.939			
0.856			

RELATIVE STANDARD DEVIATION

RRF2 Analyte: Chloroform

3.317			
3.151	MEAN	STDEV	RSD
3.072	3.099	0.1436	4.6
3.007			
2.947			

RELATIVE STANDARD DEVIATION

RRF3 Analyte: Benzene

0.707			
0.690	MEAN	STDEV	RSD
0.677	0.673	0.0273	4.1
0.643			
0.648			

RELATIVE STANDARD DEVIATION

RRF4 Analyte: Styrene

0.867			
0.794	MEAN	STDEV	RSD
0.798	0.790	0.0497	6.3
0.753			
0.740			

000033

9613478.2084

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: W0578-QES

Date: 7-Aug-95

LATA No.: VB403.81

Validator: BJ MORRIS

VOA PERCENT DIFFERENCE			
Analyte	Initial Calibration Average RRF	Continuing Calibration Average RRF	%D
Bromomethane	1.006	1.010	0.4%
Benzene	0.673	0.737	9.5%

000034

9613478.2085

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: W0578-QES

Date: 7-Aug-95

LATA No.: VB403.81

Validator: BJ MORRIS

VOA SURROGATE RECOVERY			
Analyte	surrogate result	surrogate added	%R
Toluene-d8	50.38	50.00	100.8%
Bromofluorobenzene	47.88	50.00	95.8%

000035

9613478.2086

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

MATRIX SPIKE RECOVERY (MS/MSD)

SDG: W0578-QES

Date: 7-Aug-95

LATA No.: VB403.81

Validator: BJ MORRIS

Analyte	Sample ID	MS Result	MSD Result	Sample Result	Spike Added	MS%R	MSD%R
Benzene	B0FK97	51.74	49.10	0.00	50.00	103.5%	98.2%
Chlorobenzene	B0FK97	50.92	49.17	0.00	50.00	101.8%	98.3%

000036

9613478.2087
LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: W0578-QES

Date: 7-Aug-95

LATA No.: VB403.81

Validator: BJ MORRIS

<u>Analyte</u>	<u>Sample ID</u>	<u>MS %R</u>	<u>MSD %R</u>	<u>RPD</u>
<u>Benzene</u>	<u>B0FK97</u>	<u>103.5%</u>	<u>98.2%</u>	<u>5.2%</u>
<u>Chlorobenzene</u>	<u>B0FK97</u>	<u>101.8%</u>	<u>98.3%</u>	<u>3.5%</u>

000037

9613478..2088
LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

RESULTS CALCULATIONS FOR VOA WATER SAMPLES

SDG: W0578-QES

Date: 7-Aug-95

LATA No.: VB403.81

Validator: BJ MORRIS

Analyte	Area of the Quant Ion for the Analyte of Interest	Area of the Quant Ion for the Internal Standard	Amount of Internal Standard added (ng)	Relative Response Factor	Volume of Water Purged (ml)	Dilution Factor	Conc (µg/L)
Trichloroethene (-KB7)	787	52062	250.00	0.487	5.00	1.00	1.55
Acetone (-KF3)	3034	16618	250.00	0.461	5.00	1.00	19.80

000038

Laboratory Case Narrative

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
 P.O. Box 1970
 Richland, Washington 99352

July 7, 1995

Attention: Joan Kessner

Project number	:	550.83
Date Received by Lab	:	June 1 and 5, 1995
Number of Samples	:	Ten (10)
Sample Type	:	Water
SDG Number	:	W0578
Data Deliverable	:	Standalone



I. Introduction

On June 1 and 5, 1995, ten (10) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

<u>St Louis ID</u>	<u>BHI ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
8542-001	B0FK97	50602301	Water	06/01/95
8542-002	B0FKB5	50602303	Water	06/01/95
8542-003	B0FK99	50602305	Water	06/01/95
8542-004	B0FKF3	50602307	Water	06/01/95
8542-005	B0FK98	50602302	Water	06/01/95
8542-006	B0FKB6	50602304	Water	06/01/95
8542-007	B0FKB0	50602306	Water	06/01/95
8549-001	B0FKB7	50607201	Water	06/05/95
8549-002	B0FKB8	50607202	Water	06/05/95
8549-003	B0FKC5	50607203	Water	06/05/95

000040

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Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
Page 2

II. 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: VOA, ICP metals, Arsenic, and Lead following EPA CLP90 methodology. Chloride, Fluoride, Nitrate, Nitrite, Phosphate, and Sulfate by EPA method 300.0.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate or Sample Duplicate analyses were performed per the protocol for each analyte.

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

V. Comments

There were no comments or nonconformances associated with the Volatiles analysis.

000041

bis 8-4-95
2

Bechtel Hanford Incorporated
July 7, 1995
Project Number: 550.83
SDG: W0578
Page 3

The Matrix Spike recovery of sample BOFK97 for zinc was 0% and outside the acceptable range. In accordance with the SOW a post digestion spike was performed and the associated data flagged. The Duplicate Relative Percent Difference for zinc was above the acceptable limit and the associated data was flagged. The serial dilution result for barium was above the acceptable limit, 10.6% and the associated data was flagged.

Nitrate, Nitrite, and Phosphate holding times were waived by client.

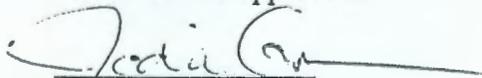
The Relative Percent Difference for Fluoride, Phosphate, and Nitrite could not be calculated due to values being below the detection limit on sample 8542-001.

The Matrix Spike for Nitrate was outside of suggested limits of 75-125 percent on sample 8542-001. The sample concentration was greater than four times the spike amount.

Samples 8542-001 and -001DUP for Fluoride was diluted 1:5 to remove an interfering peak on the ion chromatogram resulting in a higher detection limit. The Fluoride peaks for the samples integrated as a hit, but their peak area was less than the lowest calibration standard and they were reported as less than the detection limit.

I certify that this data package 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:



Wade H. Price

Project Manager

e:\price\$labbydave\hanw0578.nar

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8.2396
B

Chain-of-Custody Information

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								Page <u>1</u> of <u>1</u>			
Collector <i>K Lee / A Rizzo</i>		Company Contact Bob Raidl				Telephone (509) 372-9641				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal			
Project Designation 100-PR-3 Groundwater - Round 7		Sampling Location 100 P				SAF No. B95-052							
Ice Chest No. <i>Rm136</i>		Field Logbook No. <i>ERL-105A</i>				Method of Shipment Hand Delivered							
Shipped To Quinterra		Offsite Property No. <i>PH 1/A</i>				Bill of Lading/Air Bill No. <i>N/A 1</i>							
Possible Sample Hazards/Remarks		Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃				
		Type of Container	<i>P/G</i>	<i>P/G</i>	<i>A Gs</i>	<i>P/G</i>	<i>G</i>	<i>P/G</i>	<i>P/G</i>				
		No. of Container(s)	<i>1</i>	<i>1</i>	<i>3</i>	<i>4</i>	<i>3</i>	<i>1</i>	<i>1</i>				
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume	<i>1L</i>	<i>500mL</i>	<i>40mL</i>	<i>1L</i>	<i>1L</i>	<i>20mL</i>	<i>1L</i>				
SAMPLE ANALYSIS <i>50602.3</i>		ICP Metals-TAL, AA Metals-Ac, Pb. (Unfiltered)	<i>876</i> <i>W0578</i>		Asbestos (IC) - P, Cl, SO ₂ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Ac, Pb. (Filtered)			
							<i>50602401</i>						
Sample No.	Matrix*	Date Sampled	Time Sampled										
B0FK97	<i>01</i>	<i>W</i>	<i>5-31-95</i>	<i>0939</i>	<i>Y</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>			
B0FK98	<i>02</i>	<i>W</i>	<i>5-31-95</i>	<i>0939</i>						<i>X</i>			
					<i>100</i>	<i>100</i>	<i>3x100</i>			<i>100</i>			
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix*			
Relinquished By		Date/Time		Received By		Date/Time		Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				S - Soil SB - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tinne W1 - Wipe L - Liquid V - Vegetation X - Other	
<i>AG Rizzo</i>		<i>5-31-95 1330</i>		<i>Eric</i>		<i>5-31-95 1330</i>							
<i>Eric</i>		<i>5-31-95 9:45</i>		<i>Eric</i>		<i>5-31-95 9:45</i>							
<i>Eric</i>		<i>5-31-95</i>		<i>Eric</i>		<i>5-31-95</i>							
Relinquished By		Date/Time		Received By		Date/Time							
LABORATORY SECTION		Received By		Title				Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time					

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b/s
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100-PR-3-0201

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								Page <u>1</u> of <u>1</u>		
Collector: <u>K. Lee / A. Rizzo</u>		Company Contact: <u>Bob Raidl</u>				Telephone: <u>(509) 372-9641</u>				Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal		
Project Designation: <u>100-FR-3 Groundwater - Round 7</u>		Sampling Location: <u>100 P</u>				SAF No.: <u>B95-052</u>						
Ice Chest No.: <u>G45122</u>		Field Logbook No.: <u>ERL-1054</u>				Method of Shipment: <u>Hand Delivered</u>						
Shipped To: <u>Quanterra</u>		Offsite Property No.: <u>PH 1 N/A</u>				Bill of Lading/Air Bill No.: <u>N/A</u>						
Possible Sample Hazards/Remarks		Preservation		HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃		
		Type of Container		P/G	P/G	G	P/G	G	P/G	P/G		
		No. of Container(s)		1	1	3	4	3	1	1		
Special Handling and/or Storage: <u>Maintain samples between 2°C and 6°C.</u>		Volume		1L	500mL	40mL	1L	1L	20mL	1L		
SAMPLE ANALYSIS <u>506023</u>		<u>SPX</u> <u>W0578</u>		ICP Metals-TAL, AA, Metals-Aa, Pb. (Unfiltered)	Anions (IC) F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA, Metals-Aa, Pb. (Filtered)		
Sample No.	Matrix*	Date Sampled	Time Sampled									
B0FKB5	03	W	5-31-95	1137	Y	Y	Y	Y	Y	Y		
B0FKB6	04	W	5-31-95	1137							Y	
					100	100	3x100				100	
CHAIN OF POSSESSION				Sign/Print Name				SPECIAL INSTRUCTIONS				Matrix*
Relinquished By: <u>AG Rizzo</u>		Date/Time: <u>5-31-95 5:45</u>		Received By: <u>Bob Raidl</u>		Date/Time: <u>5-31-95 1330</u>		Sample analysis for PO ₄ , NO ₃ , and NO _x by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				<ul style="list-style-type: none"> S - Soil SR - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other
Relinquished By: <u>Bob Raidl</u>		Date/Time: <u>6-1-95</u>		Received By: <u>AG Rizzo</u>		Date/Time: <u>6-1-95</u>						
Relinquished By: <u>AG Rizzo</u>		Date/Time: <u>6-1-95</u>		Received By: <u>Bob Raidl</u>		Date/Time: <u>6-1-95</u>						
Relinquished By: <u>AG Rizzo</u>		Date/Time: <u>6-1-95</u>		Received By: <u>Bob Raidl</u>		Date/Time: <u>6-1-95</u>						
LABORATORY SECTION		Received By		Title				Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time				

06/13/2005 09:13:17

0000045
v.s.
8-4-95
001123

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround
 Priority
 Normal

Collector <i>K. Lee / A. Rizzo</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAP No. B95-052
Ice Chest No. <i>Rm136</i>	Field Logbook No. <i>EFL 105A</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>PH 1 N/A</i>	Bill of Lading/Air Bill No. <i>1/A 1</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₂	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	<i>P/G</i>	<i>P/G</i>	<i>G</i>	<i>P/G</i>	<i>G</i>	<i>P/G</i>	<i>P/G</i>
	No. of Container(s)	<i>1</i>	<i>1</i>	<i>3</i>	<i>4</i>	<i>3</i>	<i>1</i>	<i>1</i>
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	<i>1L</i>	<i>500mL</i>	<i>40mL</i>	<i>1L</i>	<i>1L</i>	<i>20mL</i>	<i>1L</i>

SAMPLE ANALYSIS <i>506023</i>	<i>SDW</i>	<i>W0578</i>	ICP Metah-TAL. AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂ .	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metah-TAL. AA Metals-Aa, Pb. (Filtered)
						<i>506024</i>	<i>03</i>		

Sample No.	Matrix*	Date Sampled	Time Sampled								
BOFK99	<i>05</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>		
BOFK80	<i>06</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>						<i>X</i>	
BOFK83	<i>07</i>	<i>W</i>	<i>5-31-95</i>	<i>0847</i>			<i>X</i>				
					<i>100</i>	<i>100</i>	<i>3x100</i>			<i>100</i>	

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>AGP/A. Asher</i>	Date/Time <i>(SAR) 5-31-95 1330</i>	Received By <i>Eric R. ...</i>	Date/Time <i>1370</i>
Relinquished By <i>Eric R. ...</i>	Date/Time <i>9-45</i>	Received By <i>...</i>	Date/Time <i>94</i>
Relinquished By <i>Eric R. ...</i>	Date/Time <i>6-1-95</i>	Received By <i>...</i>	Date/Time <i>6-1-95</i>
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
 Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

Matrix*
 S - Soil
 SB - Sediment
 SO - Solid
 SL - Sludge
 W - Water
 O - Oil
 A - Air
 DS - Dross Solids
 DL - Dross Liquids
 T - Tissue
 W1 - Wipe
 L - Liquid
 V - Vegetation
 X - Other

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

0000046
 00024
 8-4-95

Temp 5°C / 6°C Temp Vial CUP# 4376

Bechtel Hanford, Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						Page <u>1</u> of <u>1</u>	
Collector <i>K. D. Lee</i>		Company Contact <i>Bob Raidl</i>		Telephone <i>(509) 372-9641</i>		Data Turnaround <input type="checkbox"/> Priority <input checked="" type="checkbox"/> Normal			
Project Designation <i>100-FR-3 Groundwater - Round 7</i>		Sampling Location <i>100 F</i>		SAF No. <i>B95-052</i>					
Ice Chest No. <i>ERC-FS-008</i>		Field Logbook No. <i>EFL-1054</i>		Method of Shipment <i>Hand Delivered</i>					
Shipped To <i>Quanterra</i>		Offsite Property No. <i>pH2 N/A</i>		Bill of Lading/Air Bill No. <i>N/A</i>					
Possible Sample Hazards/Remarks		Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
		Type of Container	P/G	P/G	A _{Gs}	P/G	G	P/G	P/G
		No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.		Volume	1L	500mL	40mL	1L	1L	20mL	1L
SAMPLE ANALYSIS <i>506072</i>		ICP Metals-TAL, AA Metals-Aa, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL, AA Metals-Aa, Pb. (Filtered)	
					<i>506073</i>	<i>71</i>			
Sample No.	Matrix*	Date Sampled	Time Sampled	pH 2					
<i>1) BOFKB7</i>	<i>W</i>	<i>06/02/95</i>	<i>1215</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>
<i>2) BOFKB8</i>	<i>W</i>	<i>06/02/95</i>	<i>1215</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
CHAIN OF POSSESSION		Sign/Print Names			SPECIAL INSTRUCTIONS				
Relinquished By <i>K. D. Lee</i> Date/Time <i>6/5/95 0800</i>		Received By <i>Eric</i> Date/Time <i>0800</i>			Sample analysis for PO ₄ , NO ₃ , and NO ₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				
Relinquished By <i>Bob Raidl</i> Date/Time <i>6-5-95 1101</i>		Received By <i>Richard Whitaker</i> Date/Time <i>6-5-95</i>							
Relinquished By <i>Bob Raidl</i> Date/Time <i>6-5-95</i>		Received By <i>R. Boyd</i> Date/Time <i>1101</i>							
Relinquished By <i>Phil Wren</i> Date/Time <i>6-6-95/0747</i>		Received By <i>Phil Wren</i> Date/Time <i>6-6-95/0747</i>							
LABORATORY SECTION	Received By	Title			Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By			Date/Time				

000048

00012

000049

00011

000047

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

SDG W0578

END OF PACKAGE

7815478.2100

DATA VALIDATION REPORT
for
100-FR-3 GROUNDWATER ROUND 7
Radiochemistry Analysis
SDG W0578-QES
LATA VB403.81

Bechtel Hanford Inc.
P.O. Box 969
Richland, Washington

August 23, 1995

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9615478.2102

**100-FR-3 Groundwater Round 7
Data Validation Narrative**

INTRODUCTION

All samples in Sample Delivery Group (SDG) W0578-QES (VB403.81) were validated at level "D" as defined in the Data Validation Procedures for Radiochemical Analyses (WHC-SD-EN-SPP-001, Rev. 1)

The analyses were performed by Quanterra Environmental Services.

ANALYSES REQUESTED

See Table 1.

DATA QUALITY OBJECTIVES

- Precision:** Goals for precision were met.
- Accuracy:** Goals for accuracy were met.
- Sample Result Verification:** Results were supported in the raw data.
- Detection Limits:** Detection limit goals were met for all sample results as specified in the *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit, DOE/RL 91-53, Rev. 0.*
- Completeness:** The data package was 100% complete for all requested analyses.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data as unusable.

9613478.2103

Table 1
Chain-of-Custody
Analysis Request

LATA ID #: VB403.81

SDG: W0578-QES

Sample Information						Analyses Requested					
SAMPLE NO.	DATE COLLECTED	MATRIX	SAF	SAMPLING LOCATION	FIELD QC INFO	1	2	3	4	5	6
B0FK97	31-May-95	WATER	B95-052	199-F8-3		X	X	X	X	X	X
B0FK99	31-May-95	WATER	B95-052	199-F8-4		X	X	X	X	X	X
B0FKB5	31-May-95	WATER	B95-052	699-81-38		X	X	X	X	X	X
B0FKB7	2-Jun-95	WATER	B95-052	699-83-47		X	X	X	X	X	X
B0FKC5	2-Jun-95	WATER	B95-052	699-83-47	TRIP BLANK	X	X	X	X	X	X

Method References:

<u>Analysis</u>	<u>Method</u>
1. Gross Alpha	ITAS-RD-3214
2. Gross Beta	ITAS-RD-3214
3. Strontium-90	ITAS-RD-3204
4. Tritium	ITAS-RD-3205
5. Carbon-14	ITAS-RD-3263
6. Activity Scan	Lab Specific

Notes:

1. The duplicate for the gross alpha analysis was performed on B0FKC5, the trip blank.

9616478

REFERENCES

WHC 1993, *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-SPP-001, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

DOE 1992, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL 91-53, Rev. 0. Department of Energy-Hanford, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (RADIOCHEMISTRY)

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

- U- Indicates the constituent was analyzed for, but was not detected at a concentration above the Minimum Detectable Activity (MDA). The concentration reported is the sample result corrected for sample aliquot size, dilution factors, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ- Indicates the constituent was analyzed for and was not detected at a concentration above the Minimum Detectable Activity (MDA). Due to a quality control deficiency identified during data validation, the result reported may not accurately reflect the sample concentration. The associated data should be considered usable for decision making purposes.
- J- Indicates a constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during validation. The data should be considered usable for decision making purposes.
- R- Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision making purposes.
- UR- Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision making purposes.

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Commonly used laboratory radiochemistry qualifiers:

Indicates the analyte was analyzed for but not detected in the sample.

Indicates the value reported is estimated due to the presence of interference.

Qualification Summary Table

Qualification Summary Table

Radiochemistry

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
) qualifiers were added by validator.					

Comments:

The "U" qualifiers added to the Data Summary Tables and Form 1s are laboratory concentration qualifiers to indicate that the results are <MDA and are not due to a validation deficiency.

A Rad Screen before shipment was deemed unnecessary.

The gross alpha duplicate was performed on sample B0FKC5, a trip blank.

Radiochemistry Field QC

ANALYTE	TYPE	QUALIFIER	FIELD QC SAMPLES	DQO	ASSESSMENT
L	FIELD QC	NONE	B0FKC5	BLANKS	Trip Blank results were acceptable.

000008

9613478.2109

Data Summary Table

9613478.2110

**RADIOCHEMISTRY
DATA SUMMARY TABLE**

LATA ID#: VB403.81		HEIS #:	B0FK97	B0FKB5	B0FK99	B0FKB7	B0FKC5					
		Date:	31-May-95	31-May-95	31-May-95	2-Jun-95	2-Jun-95					
		Matrix:	WATER	WATER	WATER	WATER	WATER					
Constituent	CAS #	Units	Results	Q	Results	Q	Results	Q	Results	Q		
Gross Alpha	ALPHA	pCi/L	1.14E+01		2.82E+00		1.02E+01		2.56E+00		7.09E-02	U
Gross Beta	BETA	pCi/L	1.77E+01		5.29E+00		1.14E+01		7.16E+00		1.10E-01	U
Strontium-90	10098-97-2	pCi/L	-1.56E-01	U	1.73E-01	U	-8.18E-02	U	2.38E-01	U	9.65E-02	U
Carbon-14	14762-75-5	pCi/L	2.99E+02		3.04E+00	U	6.01E+00		2.52E+00	U	-7.66E-01	U
Tritium	10028-17-8	pCi/L	1.00E+05		2.48E+02	U	1.01E+04		6.37E+02		8.52E+01	U

000010

Shaded areas indicate changes by the validator.
40381DST.XLS, RADIOCHEMISTRY

8/23/95, 11:24 AM

9613478.2111

Sample Results (Form I's)

9613478.2112

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50602401 MATRIX: WATER
CLIENT ID: B0FK97 DATE RECEIVED: 6/1/95 9:45:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	1.14E+01	2.8E+00	3.0E+00	1.86E+00	pCi/L	100.00%	RD3214
BETA	1.77E+01	2.6E+00	2.9E+00	3.24E+00	pCi/L	100.00%	RD3214
STRONTIUM	-1.56E-01	2.0E-01	2.1E-01	9.39E-01	pCi/L	73.80%	RD3204 U
C-14	2.99E+02	4.1E+00	1.6E+01	1.09E+00	pCi/L	100.00%	RD3263
TRITIUM	1.00E+05	1.3E+03	7.5E+03	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

000012

bis 8-8-95
~~0007~~

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50602402 MATRIX: WATER
CLIENT ID: B0FKB5 DATE RECEIVED: 6/1/95 9:45:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	2.82E+00	1.2E+00	1.3E+00	1.25E+00	pCi/L	100.00%	RD3214
BETA	5.29E+00	1.7E+00	1.8E+00	2.97E+00	pCi/L	100.00%	RD3214
STRONTIUM	1.73E-01	2.0E-01	2.1E-01	7.57E-01	pCi/L	96.20%	RD3204 u
C-14	3.04E+00	1.5E+00	3.0E+00	3.40E+00	pCi/L	100.00%	RD3263 u
TRITIUM	2.48E+02	1.3E+02	2.0E+02	2.80E+02	pCi/L	88.10%	RD3205 u

Number of Results:

000013

bis 8-8-95
~~0008~~

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
 LAB SAMPLE ID: 50602403 MATRIX: WATER
 CLIENT ID: B0FK99 DATE RECEIVED: 6/1/95 9:45:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	1.02E+01	2.6E+00	2.8E+00	1.45E+00	pCi/L	100.00%	RD3214
BETA	1.14E+01	2.1E+00	2.3E+00	2.99E+00	pCi/L	100.00%	RD3214
STRONTIUM	-8.18E-02	2.1E-01	2.1E-01	9.30E-01	pCi/L	74.70%	RD3204 U
C-14	6.01E+00	1.5E+00	3.1E+00	3.40E+00	pCi/L	100.00%	RD3263
TRITIUM	1.01E+04	4.4E+02	9.0E+02	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

000014

bis 8-8-95

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SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50607301 MATRIX: WATER
CLIENT ID: B0FKB7 DATE RECEIVED: 6/5/95 11:01:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	2.56E+00	1.1E+00	1.1E+00	1.20E+00	pCi/L	100.00%	RD3214
BETA	7.16E+00	1.8E+00	1.9E+00	2.89E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.38E-01	2.2E-01	2.3E-01	7.82E-01	pCi/L	93.50%	RD3204 U
C-14	2.52E+00	1.5E+00	3.0E+00	3.40E+00	pCi/L	100.00%	RD3263 U
TRITIUM	6.37E+02	1.6E+02	2.2E+02	2.80E+02	pCi/L	88.10%	RD3205

Number of Results:

bis 8-8-95

000015

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SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0578
LAB SAMPLE ID: 50607302 MATRIX: WATER
CLIENT ID: B0FKC5 DATE RECEIVED: 6/5/95 11:01:00 AM

ISOTOPE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	7.09E-02	2.7E-01	2.7E-01	6.42E-01	pCi/L	100.00%	RD3214 u
BETA	1.10E-01	1.2E+00	1.2E+00	2.76E+00	pCi/L	100.00%	RD3214 u
STRONTIUM	9.65E-02	2.2E-01	2.2E-01	8.47E-01	pCi/L	87.00%	RD3204 u
C-14	-7.66E-01	1.4E+00	2.9E+00	3.40E+00	pCi/L	100.00%	RD3263 u
TRITIUM	8.52E+01	1.2E+02	1.9E+02	2.80E+02	pCi/L	88.10%	RD3205 u

Number of Results:

000016

bis 8-8-

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Checklist

9613478.2118

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	<input type="checkbox"/> WHC-CM-5-3, Rev. 0		<input checked="" type="checkbox"/> WHC-SD-EN-SPP-001, Rev. 1		
PROJECT:	100-FR-3 ROUND 7		SDG:	W0578-QES	
VALIDATOR:	MC WEBB	LATA NO:	VB403.81	DATE:	8-Aug-95
REVIEWER:	AM FREIER	LAB:	QES	CASE:	N/A
SAF NO:	B95-052	QAPP NO:	DOE/RL-91-53, R0	SAP NO:	N/A
ANALYSES REQUESTED					
<input checked="" type="checkbox"/> Gross Alpha ITAS-RD-3214	<input checked="" type="checkbox"/> Gross Beta ITAS-RD-3214	<input checked="" type="checkbox"/> Tritium ITAS-RD-3205	<input checked="" type="checkbox"/> Strontium-90 ITAS-RD-3204	<input checked="" type="checkbox"/> Carbon-14 ITAS-RD-3263	
SAMPLE NO.	MATRIX	COMMENTS:			
B0FK97 B0FKB5 B0FK99 B0FKB7 B0FKC5	WATER				

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

YES NO N/A

Is technical verification documentation present?

Is a case narrative present?

2. HOLDING TIMES

YES NO N/A

Are sample holding times acceptable?

Are samples preserved correctly?

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

YES NO N/A

Were instruments/detectors calibrated within one year of sample analysis?

Are initial calibrations acceptable?

Are standards NIST traceable?

Are standards acceptable?

Comments: Calibration of instruments/detectors was not performed within one year of sample analysis,

however continuing calibration data is acceptable. Therefore, no qualifiers are assigned.

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

4. CONTINUING CALIBRATION	YES	NO	N/A
Background checked at proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Background check acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Efficiency checked at proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Efficiency check acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Calibration check standards NIST traceable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Calibration check standards acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

5. BLANKS	YES	NO	N/A
Were method blanks analyzed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the method blanks free of analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were method blank results acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Validation calculation/transcription checks were performed and are acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see BLANK DATA SUMMARY form

6. ACCURACY	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all spike sample recoveries acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were laboratory control standards (LCS) analyzed at the proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all LCS recoveries acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a tracer/chemical carrier added?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the tracer/chemical carrier recovery acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are standard sources traceable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are standards acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Validation calculation checks were performed and are acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see ACCURACY DATA SUMMARY form

7. PRECISION	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all duplicate RPD values acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Validation calculation checks were performed and are acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If NO(s) are checked, see PRECISION DATA SUMMARY form

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LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

8. FIELD QC SAMPLES

YES NO N/A

Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?

Are field/trip blank results acceptable? (see Blank Data Summary form)

Are field duplicate RPD values acceptable? (see Field QC calculations)

Are field split RPD values acceptable? (see Field QC calculations)

Are performance audit sample results acceptable?

Comments: B0FKC5 is a trip blank.

9. REPORTED RESULTS AND DETECTION LIMITS

YES NO N/A

Are results reported for all requested analyses?

Are all results supported in the raw data?

Are results calculated properly?

Do MDAs meet the RDLs?

Validation calculation checks were performed and are acceptable.

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

9613478.2121

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG: W0578-QES			VALIDATOR: MC WEBB				DATE: 08-Aug-95			
PROJECT: 100-FR-3 ROUND 7			REVIEWER: AM FREIER				LATA NO.: VB403.81			
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	Required HT (days)	ANALYSIS HT (days)	Required HT (days)	VAL Q
B0FK97	WATER	Gross Alpha	31-May-95	N/A	17-Jul-95	N/A	N/A	47	180	NONE
B0FK99	WATER	Gross Alpha	31-May-95	N/A	17-Jul-95	N/A	N/A	47	180	NONE
B0FKB5	WATER	Gross Alpha	31-May-95	N/A	17-Jul-95	N/A	N/A	47	180	NONE
B0FKB7	WATER	Gross Alpha	2-Jun-95	N/A	17-Jul-95	N/A	N/A	45	180	NONE
B0FKC5	WATER	Gross Alpha	2-Jun-95	N/A	17-Jul-95	N/A	N/A	45	180	NONE
B0FK97	WATER	Gross Beta	31-May-95	N/A	17-Jul-95	N/A	N/A	47	180	NONE
B0FK99	WATER	Gross Beta	31-May-95	N/A	17-Jul-95	N/A	N/A	47	180	NONE
B0FKB5	WATER	Gross Beta	31-May-95	N/A	17-Jul-95	N/A	N/A	47	180	NONE
B0FKB7	WATER	Gross Beta	2-Jun-95	N/A	17-Jul-95	N/A	N/A	45	180	NONE
B0FKC5	WATER	Gross Beta	2-Jun-95	N/A	17-Jul-95	N/A	N/A	45	180	NONE
B0FK97	WATER	Strontium-90	31-May-95	N/A	30-Jun-95	N/A	N/A	30	180	NONE
B0FK99	WATER	Strontium-90	31-May-95	N/A	30-Jun-95	N/A	N/A	30	180	NONE
B0FKB5	WATER	Strontium-90	31-May-95	N/A	30-Jun-95	N/A	N/A	30	180	NONE
B0FKB7	WATER	Strontium-90	2-Jun-95	N/A	30-Jun-95	N/A	N/A	28	180	NONE
B0FKC5	WATER	Strontium-90	2-Jun-95	N/A	30-Jun-95	N/A	N/A	28	180	NONE
B0FK97	WATER	Carbon-14	31-May-95	N/A	16-Jun-95	N/A	N/A	16	180	NONE
B0FK99	WATER	Carbon-14	31-May-95	N/A	16-Jun-95	N/A	N/A	16	180	NONE
B0FKB5	WATER	Carbon-14	31-May-95	N/A	16-Jun-95	N/A	N/A	16	180	NONE
B0FKB7	WATER	Carbon-14	2-Jun-95	N/A	16-Jun-95	N/A	N/A	14	180	NONE
B0FKC5	WATER	Carbon-14	2-Jun-95	N/A	16-Jun-95	N/A	N/A	14	180	NONE
B0FK97	WATER	Tritium	31-May-95	N/A	29-Jun-95	N/A	N/A	29	180	NONE
B0FK99	WATER	Tritium	31-May-95	N/A	29-Jun-95	N/A	N/A	29	180	NONE
B0FKB5	WATER	Tritium	31-May-95	N/A	29-Jun-95	N/A	N/A	29	180	NONE
B0FKB7	WATER	Tritium	2-Jun-95	N/A	29-Jun-95	N/A	N/A	27	180	NONE
B0FKC5	WATER	Tritium	2-Jun-95	N/A	29-Jun-95	N/A	N/A	27	180	NONE

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LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: W0578-QESDate: 8-Aug-95LATA No.: VB403.81Validator: MC WEBB

Analyte	Sample ID	Original (Sample) concentration	Duplicate concentration	RPD
Gross Alpha	B0FKC5	-0.07	-0.02	-111.0%
Gross Beta	B0FKB7	7.16	5.50	26.2%
Strontium-90	B0FK97	-0.01	-0.16	-177.3%
Carbon-14	B0FK97	299.00	312.00	4.3%
Tritium	B0FK97	100000.00	99400.00	0.6%

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LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

PERCENT RECOVERY (LCS)

SDG: W0578-QESDate: 8-Aug-95LATA No.: VB403.81Validator: MC WEBB

Analyte	Observed value	True value	%R
Gross Alpha	19.7	22.6	87.2%
Gross Beta	23.4	22.8	102.6%
Strontium-90	13.5	13.6	99.3%
Carbon-14	1260	1800	70.0%
Tritium	2560	2690	95.2%

9613478.2124

LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

MINIMUM DETECTABLE ACTIVITY (MDA)

SDG: W0578-QESDate: 8-Aug-95LATA No.: VB403.81Validator: MC WEBB

Analyte	Sample ID	Bkgnd counts/ min (cpm) or Std Dev of bkgnd (cpm)	Count time for assoc. sample	Detector Efficiency	Ingrowth corr. factor	Tracer/ Carrier recovery factor	Decay factor	Chemical yield factor	Sample volume (L or g)	MDA
Gross Alpha	B0FKB5	0.03	100.00	5.05	1.00	1.00	1.00	1.00	0.20	1.25
Gross Beta	B0FKB5	1.02	100.00	2.66	1.00	1.00	1.00	1.00	0.20	2.97
Strontium-90	B0FKB5	0.96	50.00	2.29	1.00	1.00	1.00	0.96	0.99	0.756
Carbon-14	BLANK	17.50	200.00	1.08	1.00	1.00	1.00	1.00	0.20	3.38
Tritium	BLANK	4.35	40.00	3.43	1.00	1.00	1.00	0.88	0.01	280.40

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LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

RESULTS CALCULATION GROSS ALPHA/BETA AND TRITIUM

SDG: W0578-QESDate: 8-Aug-95LATA No.: VB403.81Validator: MC WEBB

Analyte	Gross Counts per minute	Background Counts per minute	Yield/ Decay	Detector Efficiency	Sample volume (L or g)	Result
Alpha B0FKB5	0.28	0.03	1.00	5.05	0.20	2.82
Beta B0FKB5	1.90	1.02	1.00	2.66	0.20	5.29
Carbon-14 B0FKB5	18.82	17.57	1.00	1.08	0.20	3.035
Tritium B0FK99	61.70	4.35	0.88	3.42	0.01	10065

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LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

RESULTS CALCULATION TOTAL STRONTIUM

SDG: W0578-QESDate: 8-Aug-95LATA No.: VB403.81Validator: MC WEBB

<u>Analyte</u>	<u>Gross Counts per minute</u>	<u>Background Counts per minute</u>	<u>(dpc)Sr90 /(dpc)Y90</u>	<u>Detector Efficiency</u>	<u>Strontium decay factor</u>	<u>Strontium yield</u>	<u>Sample volume (L or g)</u>	<u>Result pCi/L</u>
Strontium B0FKB5	1.24	0.96	1.14	2.29	0.66	0.96	0.99	0.1733

Laboratory Case Narrative

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

July 26, 1995

Attention: Joan Kessner



SAF Number : B95-052
Date SDG Closed : June 15, 1995
Number of Samples : Five (5)
Sample Type : Water
SDG Number : W0578
Data Deliverable : Stand Alone

I. Introduction

On May 30 and 31, 1995, a total of five water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>QTESRL ID</u>	<u>BHI ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
50602401	B0FK97	Water	6/1/95
50602402	B0FKB5	Water	6/1/95
50602403	B0FK99	Water	6/1/95
50607301	B0FKB7	Water	6/5/95
50607302	B0FKC5	Water	6/5/95

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

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Bechtel Hanford, Inc.
July 26, 1995
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The requested analyses were:

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3214

Gross Beta by method ITAS-RD-3214

Strontium-90 by method ITAS-RD-3204

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3263

Tritium by method ITAS-RD-3205

III. Quality Control

The analytical results for each analysis performed under SDG W0578 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

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

IV. Comments

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3214

The LCS, batch blank, sample and sample duplicate (B0FKC5) results are within contractual requirements.

Gross Beta by method ITAS-RD-3214

The LCS, batch blank, sample and sample duplicate (B0FKB7) results are within contractual requirements.

Strontium-90 by method ITAS-RD-3204

The LCS, batch blank, sample and sample duplicate (B0FK97) results are within contractual requirements.

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Bechtel Hanford, Inc.
July 26, 1995
Page 3

Liquid Scintillation Counting

Carbon-14 by method ITAS-RD-3263

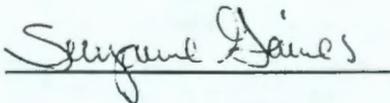
Sample B0FK97 and its duplicate were reanalyzed because the original duplicate results were 6.9 sigma from the expected value. The reanalysis results are within acceptable limits. The LCS, batch blank, sample and sample duplicate (B0FK97) results are within contractual requirements.

Tritium by method ITAS-RD-3205

The LCS, batch blank, sample and sample duplicate (B0FK97) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Suzanne Gaines
Project Manager

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Chain-of-Custody Information

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround

- Priority
- Normal

Collector <i>K-Lee / A Rizzo</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. <i>Rm 135</i>	Field Logbook No. <i>ERL-105A</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	Gs	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1

Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L
--	--------	----	-------	------	----	----	------	----

SAMPLE ANALYSIS <i>50602.3</i>								
<i>876</i>	<i>W0578</i>	ICP Metals-TAL AA Metals-As, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-As, Pb. (Filtered)
							<i>50602401</i>	

Sample No.	Matrix*	Date Sampled	Time Sampled	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
BOFK97	01	W	5-31-95	0939	<i>Y</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>
BOFK98	02	W	5-31-95	0939						<i>X</i>

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By <i>AG Rizzo</i>	Date/Time <i>5-31-95 1330</i>	Received By <i>Eric</i>	Date/Time <i>1330</i>
Relinquished By <i>Eric</i>	Date/Time <i>9:45</i>	Received By <i>Kevin Batten</i>	Date/Time <i>5-31-95</i>
Relinquished By <i>Kevin Batten</i>	Date/Time <i>6-1-95</i>	Received By <i>Kevin Batten</i>	Date/Time <i>6-1-95</i>
Relinquished By	Date/Time	Received By	Date/Time

Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

Matrix*

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

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

000032

9613478.2132

0030

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround
 Priority
 Normal

Collector <i>K. Lee / A. Rizzo</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. <i>G-5122</i>	Field Logbook No. <i>ERL-1054</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	Gs	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS
506023

SDX
W0578

ICP Metals-TAL. AA Metals-As, Pb. (Unfiltered)

Anions (IC) - F, Cl, SO₄, PO₄, NO₃, NO₂

VOA-TCL

Gross Alpha, Gross Beta, Sr-90 *506024.02*

Tritium, C-14

Activity Scan

ICP Metals-TAL. AA Metals-As, Pb. (Filtered)

Sample No.	Matrix*	Date Sampled	Time Sampled							
BOFKB5	03	W	5-31-95	1137	Y	Y	Y	Y	Y	Y
BOFKB6	04	W	5-31-95	1137						Y

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS Sample analysis for PO ₄ , NO ₂ , and NO ₃ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.	Matrix* S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other
Relinquished By <i>A. Rizzo</i>	Date/Time <i>5-31-95 1330</i>	Received By <i>Bob Raidl</i>	Date/Time <i>5-31-95 1330</i>
Relinquished By <i>Bob Raidl</i>	Date/Time <i>6-1-95 9:45</i>	Received By <i>Quanterra</i>	Date/Time <i>6-1-95 9:45</i>
Relinquished By	Date/Time	Received By	Date/Time

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

000033

9613478.2123

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround

- Priority
- Normal

Collector <i>K. Lee / A. Rizzo</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. <i>Rm136</i>	Field Logbook No. <i>EFL-1054</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	Gs	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS
506023

SDW
W0578

ICP Metals-TAL AA Metals-As, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-As, Pb. (Filtered)
			<i>506024</i>		<i>03</i>	

Sample No.	Matrix*	Date Sampled	Time Sampled							
BOFK99 <i>05</i>	w	<i>5-31-95</i>	<i>0847</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	
BOFKB0 <i>06</i>	w	<i>5-31-95</i>	<i>0847</i>							<i>X</i>
BOFKF3 <i>07</i>	w	<i>5-31-95</i>	<i>0847</i>			<i>X</i>				
<i>5-31-95</i>	<i>⊙</i>									

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS Sample analysis for PO ₄ , NO ₂ , and NO ₃ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.	Matrix*
Relinquished By <i>AGP/Ashley</i>	Date/Time <i>5-31-95 1330</i>	Received By <i>ERC</i>	Date/Time <i>1330</i>
Relinquished By <i>AGP/Ashley</i>	Date/Time <i>9:45</i>	Received By <i>Bwh/Hen</i>	Date/Time <i>5-31-95</i>
Relinquished By <i>AGP/Ashley</i>	Date/Time <i>6-1-95</i>	Received By <i>Kramer</i>	Date/Time <i>6-1-95</i>
Relinquished By	Date/Time	Received By	Date/Time
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000034

9613170-2134

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround

- Priority
- Normal

Collector <i>K.D. Lee</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. <i>ERC-FS-002</i>	Field Logbook No. <i>EFL-1054</i>	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	Gs	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L
SAMPLE ANALYSIS <i>506072</i>	ICP Metals-TAL. AA Metals-As, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL. AA Metals-As, Pb. (Filtered)	
				<i>50607301</i>				

9613478.135

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP Metals-TAL. AA	Anions (IC)	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL. AA
<i>01</i> BOFKB7	W	<i>06/02/95</i>	<i>1215</i>	X	X	X	X	X	X	
<i>02</i> BOFKB8	W	<i>06/02/95</i>	<i>1215</i>							X

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*
Relinquished By <i>K.D. Lee</i>	Date/Time <i>6/5/95 0800</i>	Received By <i>R. Baird</i>	Date/Time <i>6-5-95 1101</i>	Sample analysis for PO ₄ , NO ₂ , and NO ₃ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.				<ul style="list-style-type: none"> S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other
Relinquished By <i>R. Baird</i>	Date/Time <i>6-5-95</i>	Received By <i>R. Baird</i>	Date/Time <i>6-5-95</i>	<i>506 W0578</i>				
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				

000035

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround
 Priority
 Normal

Collector <i>K.D. Lee</i>	Company Contact Bob Raidl	Telephone (509) 372-9641
Project Designation 100-FR-3 Groundwater - Round 7	Sampling Location 100 F	SAF No. B95-052
Ice Chest No. <i>ERC-FS-002</i>	Field Logbook No.	Method of Shipment Hand Delivered
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>

Possible Sample Hazards/Remarks	Preservation	HNO ₃	Cool 4°C	HCl	HNO ₃	Cool 4°C	Cool 4°C	HNO ₃
	Type of Container	P/G	P/G	Gs	P/G	G	P/G	P/G
	No. of Container(s)	1	1	3	4	3	1	1
Special Handling and/or Storage Maintain samples between 2°C and 6°C.	Volume	1L	500mL	40mL	1L	1L	20mL	1L

SAMPLE ANALYSIS <i>506072</i>	ICP Metals-TAL AA Metals-As, Pb. (Unfiltered)	Anions (IC) - F, Cl, SO ₄ , PO ₄ , NO ₃ , NO ₂	VOA-TCL	Gross Alpha, Gross Beta, Sr-90	Tritium, C-14	Activity Scan	ICP Metals-TAL AA Metals-As, Pb. (Filtered)
	<i>50607302</i>						

Sample No.	Matrix*	Date Sampled	Time Sampled							
<i>03</i> BOFKC5	W	<i>6/2/95</i>	<i>1030</i>	X	X	X	X	X	X	
BOFKC6	W	NA 5:25 PM								<i>NA 5:25 PM</i>

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix*
Relinquished By <i>K.D. Lee</i>	Date/Time <i>6/5/95 08:00</i>	Received By <i>Bob Raidl</i>	Date/Time <i>6-5-95</i>
Relinquished By <i>Bob Raidl</i>	Date/Time <i>6-5-95 1101</i>	Received By <i>R. Boyd</i>	Date/Time <i>6-5-95 1101</i>
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

Sample analysis for PO₄, NO₃, and NO₂ by EPA 300.0 is being requested for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

Unable to take a filtered sample filter could not be connected to collection container 6:25 PM

506 W0578

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

0000036

96134782136

Client Sample Screening Results

Ⓟ 6/1/95

01-Jun-95

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B		
WHC B0FK97 <i>01 + 02</i>	<i>(01)</i> LIQUID	6/1/95 10:00:00 AM	QUAD21A	6/1/95 10:57:46 AM	B0FK97	30	81	2.664	1019	33.036667		
			Bkg:	6/1/95 2:40:22 AM	BKG	500	18	0.036	465	0.93		
Anal Date: 6/1/95	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp: (Dpm/	7.47E+00	(uCV/ 3.36E-04	(pCV/ 3.36E+02	± 4.2E+01	CAT	7.4E-02	Lab		
Ppt mg: 7.1 /	Units: L /	ml	Bet: Alq): 6.55E+01	Sa): 2.95E-03	L(g): 2.95E+03	± 9.5E+01	I ✓	1.7E-02	Alq	L(g)		
WHC B0FK99 <i>03 + 04</i>	<i>(03)</i> LIQUID	6/1/95 10:00:00 AM	QUAD21C	6/1/95 10:57:46 AM	B0FK99	30	40	1.29133333	124	3.1893333		
			Bkg:	6/1/95 2:40:22 AM	BKG	500	21	0.042	472	0.944		
Anal Date: 6/1/95	Tot Sa, Alq: 1.00E+00	, 1.00E+01	Alp: (Dpm/	3.87E+00	(uCV/ 1.74E-04	(pCV/ 1.74E+02	± 3.2E+01	CAT	1.4E-01	Lab		
Ppt mg: 3.7 /	Units: L /	ml	Bet: Alq): 5.57E+00	Sa): 2.51E-04	L(g): 2.51E+02	± 3.2E+01	I ✓	2.0E-01	Alq	L(g)		
WHC B0FKB5 <i>05-07</i>	<i>(02)</i> LIQUID	6/1/95 10:00:00 AM	QUAD21B	6/1/95 10:57:46 AM	B0FKB5	30	27	0.872	82	1.8413333		
			Bkg:	6/1/95 2:40:22 AM	BKG	500	14	0.028	446	0.892		
Anal Date: 6/1/95	Tot Sa, Alq: 1.00E+00 ✓	, 1.00E+01	Alp: (Dpm/	2.74E+00	(uCV/ 1.24E-04	(pCV/ 1.24E+02	± 2.9E+01	CAT	2.0E-01	Lab		
Ppt mg: 2.3 /	Units: L /	ml	Bet: Alq): 3.05E+00	Sa): 1.37E-04	L(g): 1.37E+02	± 2.5E+01	I ✓	3.6E-01	Alq	L(g)		

Handwritten arrow pointing to the first three rows of the table.

6/2/95

506023-Chem

506024-Rad

SDG-W0578

0000037

0036

6/5 885

01-Jun-95

506072 Chem
506073 Rad

SNL W0578

Client Sample Screening Results

(F3) 6/15/95

05-Jun-95

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B		
WHC B0FKB7 01+02	(01) LIQUID	6/5/95 11:30:00 AM	QUAD23B	6/5/95 12:59:03 PM	B0FKB7	30	17	0.46666667	82	1.9		
			Bkg:	6/5/95 8:16:14 AM	BKG	60	6	0.1	50	0.8333333		
And Date: 6/5/95	Tot Sa, Alq: 1.00E+00 ✓	1.00E+01	Alp: (Dpm/ 1.37E+00	(uCV/ 6.19E-05	(pCV/ 6.19E+01 ± 2.7E+01	CAT I ✓	4.0E-01	Lab				
Ppt mg: 1.2 ✓	Units: L	ml	Bet; Alq): 3.32E+00	Sa): 1.50E-04	Ljg): 1.50E+02 ± 2.8E+01		3.3E-01	Alq				Ljg
WHC B0FKC5 03	(02) LIQUID	6/5/95 11:30:00 AM	QUAD23C	6/5/95 12:59:03 PM	B0FKC5	30	10	0.3	98	2.1833333		
			Bkg:	6/5/95 8:16:14 AM	BKG	60	2	0.03333333	65	1.0833333		
And Date: 6/5/95	Tot Sa, Alq: 1.00E+00 ✓	1.00E+01	Alp: (Dpm/ 7.99E-01	(uCV/ 3.60E-05	(pCV/ 3.60E+01 ± 2.5E+01	CAT I ✓	6.9E-01	Lab				
Ppt mg: 0 ✓	Units: L	ml	Bet; Alq): 4.04E+00	Sa): 1.82E-04	Ljg): 1.82E+02 ± 3.1E+01		2.7E-01	Alq				Ljg
WHC B0FLK9	LIQUID	6/5/95 11:30:00 AM	QUAD23D	6/5/95 12:59:03 PM	B0FLK9	30	34	1.11666667	122	3.1333333		
			Bkg:	6/5/95 8:16:14 AM	BKG	60	1	0.01666667	56	0.9333333		
And Date: 6/5/95	Tot Sa, Alq: 1.00E+00 ✓	1.00E+01	Alp: (Dpm/ 3.33E+00	(uCV/ 1.50E-04	(pCV/ 1.50E+02 ± 3.2E+01	CAT I ✓	1.7E-01	Lab				
Ppt mg: 2.2 ✓	Units: L	ml	Bet; Alq): 5.28E+00	Sa): 2.38E-04	Ljg): 2.38E+02 ± 3.2E+01		2.1E-01	Alq				Ljg
WHC B0FLT9	LIQUID	6/5/95 11:30:00 AM	QUAD24A	6/5/95 12:58:58 PM	B0FLT9	30	39	1.23333333	151	3.9666667		
			Bkg:	6/5/95 8:16:05 AM	BKG	60	4	0.06666667	64	1.0666667		
And Date: 6/5/95	Tot Sa, Alq: 1.00E+00 ✓	1.00E+01	Alp: (Dpm/ 3.77E+00	(uCV/ 1.70E-04	(pCV/ 1.70E+02 ± 3.6E+01	CAT I ✓	1.5E-01	Lab				
Ppt mg: 1.4 ✓	Units: L	ml	Bet; Alq): 7.01E+00	Sa): 3.16E-04	Ljg): 3.16E+02 ± 3.7E+01		1.6E-01	Alq				Ljg
WHC B0FM89	LIQUID	6/5/95 11:30:00 AM	QUAD24B	6/5/95 12:58:58 PM	B0FM89	30	31	0.95	98	2.25		
			Bkg:	6/5/95 8:16:05 AM	BKG	60	5	0.08333333	61	1.0166667		
And Date: 6/5/95	Tot Sa, Alq: 1.00E+00 ✓	1.00E+01	Alp: (Dpm/ 2.92E+00	(uCV/ 1.31E-04	(pCV/ 1.31E+02 ± 3.4E+01	CAT I ✓	1.9E-01	Lab				
Ppt mg: 3.8 ✓	Units: L	ml	Bet; Alq): 3.84E+00	Sa): 1.73E-04	Ljg): 1.73E+02 ± 3.0E+01		2.9E-01	Alq				Ljg

0041
6/15 3-8-95

000038

05-Jun-95

9613478..2139

Supplemental Information

Environmental
Restoration
Contractor

ERC Team

Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: 100-FR-3
TSD: N/A
ERA: N/A
Subject Code: 5850

TO: W. S. Thompson N3-06

DATE: April 27, 1995

COPIES: R. L. Biggerstaff H4-91

FROM: S. K. De Mers
Radiological Controls
N3-06/376-2764



SUBJECT: 1995 Round 7 sampling for 100-FR-3

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from the attached list of wells.

All except two of the wells listed in the attachment were reviewed for radiological content based on the previous 4 years of sampling data. No well listed has a β activity in excess of 100,000 pCi/l (<.1 uCi/sample based on a 1 liter sample size) nor any α activity in excess of 10,000 pCi/l (<.01 uCi/l based on a 1 liter sample). All wells show activities < 2,000 pCi/gm (< 2 nCi/gm D.O.T. limit). The highest activity in recent samples is 9,900 pCi/l $\beta(H^3)$ and 50 pCi/l α .

The remaining wells are in locations that do not provide a credible path whereby they could become contaminated at the above listed levels.

Radiological monitoring during sampling will only be required if the wells are located in radiological areas or if the wells themselves are labeled with radiological stickers. Monitoring requirements for down hole work such as pump removal will be determined based on the history of each well on a case by case basis.

skd

000040

bio 8-8-95
~~0033~~

9613478.2141

END OF PACKAGE