

9613478.2248

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CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner



Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
7444-008	BODMT4	50151712	Soil	01/30/95

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: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite. Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

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SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013

Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/B94-098

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable)

2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, BODMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

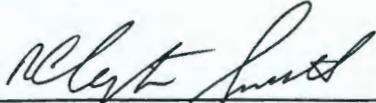
SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith / 
OSM Project Coordinator (Print/Sign Name)

1/31/95
Date

M.T. Stankovich / 
Technical Representative (Print/Sign Name)

2/13/95
Date

N/A
Quality Assurance (Print/Sign Name)

Date

DON'T SAY IT --- Write It!

DATE: May 11, 1995

TO: W0430-QES

FROM: Pat Reich

H4-14

Telephone: 372-2785

cc:

SUBJECT: DATA VALIDATION SUMMARY REPORT FOR 100-DR-1, D-PONDS PHASE II
Sampling Project

The Final Summary Validation Report for this data package is filed in
W0429-QES.

Pat Reich
Sample Management

Bechtel Hanford Incorporated
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III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

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

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analysis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

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Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

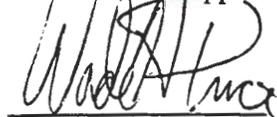
Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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

BODMS4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMP

Case No.: V44401

SDG No.: W0403

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-001

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

Lab File ID: E2015

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 4

Date Analyzed: 02/07/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG 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	5	U
67-64-1	-----Acetone	100	U
75-15-0	-----Carbon Disulfide	5	U
75-35-4	-----1,1-Dichloroethene	5	U
75-34-3	-----1,1-Dichloroethane	5	U
540-59-0	-----1,2-Dichloroethene (total)	5	U
67-66-3	-----Chloroform	5	U
107-06-2	-----1,2-Dichloroethane	5	U
78-93-3	-----2-Butanone	100	U
71-55-6	-----1,1,1-Trichloroethane	5	U
56-23-5	-----Carbon Tetrachloride	5	U
75-27-4	-----Bromodichloromethane	5	U
78-87-5	-----1,2-Dichloropropane	5	U
10061-01-5	-----cis-1,3-Dichloropropene	5	U
79-01-6	-----Trichloroethene	5	U
124-48-1	-----Dibromochloromethane	5	U
79-00-5	-----1,1,2-Trichloroethane	5	U
71-43-2	-----Benzene	5	U
10061-02-6	-----trans-1,3-Dichloropropene	5	U
75-25-2	-----Bromoform	5	U
108-10-1	-----4-Methyl-2-Pentanone	52	U
591-78-6	-----2-Hexanone	52	U
127-18-4	-----Tetrachloroethene	5	U
79-34-5	-----1,1,2,2-Tetrachloroethane	5	U
108-88-3	-----Toluene	5	U
108-90-7	-----Chlorobenzene	5	U
100-41-4	-----Ethylbenzene	5	U
100-42-5	-----Styrene	5	U
1330-20-7	-----Xylene (total)	5	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMP

Case No.: V44408

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

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

Lab File ID: E2000

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6

Date Analyzed: 02/06/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	7	B
67-64-1	Acetone	110	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	110	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	53	U
591-78-6	2-Hexanone	53	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

BODMT4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMP

Case No.: V44408

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

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

Lab File ID: E2000

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6

Date Analyzed: 02/06/95

Column (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

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

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

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMS4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S44401 SAS No.: SDG No.: W0403

Matrix: (soil/water) SOIL Lab Sample ID: 7444-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6739

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 4 dec. Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	690	U
111-44-4	bis(2-Chloroethyl) Ether	690	U
95-57-8	2-Chlorophenol	690	U
541-73-1	1,3-Dichlorobenzene	690	U
106-46-7	1,4-Dichlorobenzene	690	U
95-50-1	1,2-Dichlorobenzene	690	U
95-48-7	2-Methylphenol	690	U
108-60-1	2,2'-oxybis(1-Chloropropane)	690	U
106-44-5	4-Methylphenol	690	U
621-64-7	N-Nitroso-Di-n-Propylamine	690	U
67-72-1	Hexachloroethane	690	U
98-95-3	Nitrobenzene	690	U
78-59-1	Isophorone	690	U
88-75-5	2-Nitrophenol	690	U
105-67-9	2,4-Dimethylphenol	690	U
111-91-1	bis(2-Chloroethoxy) Methane	690	U
120-83-2	2,4-Dichlorophenol	690	U
120-82-1	1,2,4-Trichlorobenzene	690	U
91-20-3	Naphthalene	690	U
106-47-8	4-Chloroaniline	1400	U
87-68-3	Hexachlorobutadiene	690	U
59-50-7	4-Chloro-3-Methylphenol	1400	U
91-57-6	2-Methylnaphthalene	690	U
77-47-4	Hexachlorocyclopentadiene	690	U
88-06-2	2,4,6-Trichlorophenol	690	U
95-95-4	2,4,5-Trichlorophenol	690	U
91-58-7	2-Chloronaphthalene	690	U
88-74-4	2-Nitroaniline	3400	U
131-11-3	Dimethyl Phthalate	690	U
208-96-8	Acenaphthylene	690	U
606-20-2	2,6-Dinitrotoluene	690	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

BODMS4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S44401 SAS No.: SDG No.: W0403

Matrix: (soil/water) SOIL Lab Sample ID: 7444-001

Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6739

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 4 dec. Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	3400	U
83-32-9	Acenaphthene	690	U
51-28-5	2,4-Dinitrophenol	3400	U
100-02-7	4-Nitrophenol	3400	U
132-64-9	Dibenzofuran	690	U
121-14-2	2,4-Dinitrotoluene	690	U
84-66-2	Diethylphthalate	690	U
7005-72-3	4-Chlorophenyl-phenylether	690	U
86-73-7	Fluorene	690	U
100-01-6	4-Nitroaniline	1400	U
534-52-1	4,6-Dinitro-2-Methylphenol	3400	U
86-30-6	N-Nitrosodiphenylamine (1)	690	U
101-55-3	4-Bromophenyl-phenylether	690	U
118-74-1	Hexachlorobenzene	690	U
87-86-5	Pentachlorophenol	3400	U
85-01-8	Phenanthrene	690	U
120-12-7	Anthracene	690	U
86-74-8	Carbazole	690	U
84-74-2	Di-n-Butylphthalate	690	U
206-44-0	Fluoranthene	690	U
129-00-0	Pyrene	690	U
85-68-7	Butylbenzylphthalate	230	BJ
91-94-1	3,3'-Dichlorobenzidine	1400	U
56-55-3	Benzo (a) Anthracene	690	U
218-01-9	Chrysene	690	U
117-81-7	bis (2-Ethylhexyl) Phthalate	690	U
117-84-0	Di-n-Octyl Phthalate	690	U
205-99-2	Benzo (b) Fluoranthene	690	U
207-08-9	Benzo (k) Fluoranthene	690	U
50-32-8	Benzo (a) Pyrene	690	U
193-39-5	Indeno (1,2,3-cd) Pyrene	690	U
53-70-3	Dibenz (a,h) Anthracene	690	U
191-24-2	Benzo (g,h,i) Perylene	690	U

(1) - Cannot be separated from Diphenylamine

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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO

BODMS4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO

Case No.: S44401

SAS No.:

SDG No.: W0403

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-001

Sample wt/vol: 30.00 (g/mL) G

Lab File ID: D6739

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 4 dec.

Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1.00

Number TICs found: 1

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	5.31	13000	ABJ

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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO

Case No.: S44408

SAS No.:

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G

Lab File ID: D6748

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6 dec.

Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N

pH:

Dilution Factor: 1.00

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2-----	Phenol	700	U
111-44-4-----	bis(2-Chloroethyl) Ether	700	U
95-57-8-----	2-Chlorophenol	700	U
541-73-1-----	1,3-Dichlorobenzene	700	U
106-46-7-----	1,4-Dichlorobenzene	700	U
95-50-1-----	1,2-Dichlorobenzene	700	U
95-48-7-----	2-Methylphenol	700	U
108-60-1-----	2,2'-oxybis(1-Chloropropane)	700	U
106-44-5-----	4-Methylphenol	700	U
621-64-7-----	N-Nitroso-Di-n-Propylamine	700	U
67-72-1-----	Hexachloroethane	700	U
98-95-3-----	Nitrobenzene	700	U
78-59-1-----	Isophorone	700	U
88-75-5-----	2-Nitrophenol	700	U
105-67-9-----	2,4-Dimethylphenol	700	U
111-91-1-----	bis(2-Chloroethoxy) Methane	700	U
120-83-2-----	2,4-Dichlorophenol	700	U
120-82-1-----	1,2,4-Trichlorobenzene	700	U
91-20-3-----	Naphthalene	700	U
106-47-8-----	4-Chloroaniline	1400	U
87-68-3-----	Hexachlorobutadiene	700	U
59-50-7-----	4-Chloro-3-Methylphenol	1400	U
91-57-6-----	2-Methylnaphthalene	700	U
77-47-4-----	Hexachlorocyclopentadiene	700	U
88-06-2-----	2,4,6-Trichlorophenol	700	U
95-95-4-----	2,4,5-Trichlorophenol	700	U
91-58-7-----	2-Chloronaphthalene	700	U
88-74-4-----	2-Nitroaniline	3500	U
131-11-3-----	Dimethyl Phthalate	700	U
208-96-8-----	Acenaphthylene	700	U
606-20-2-----	2,6-Dinitrotoluene	700	U

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S44408 SAS No.: SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6748

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 6 dec. Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

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

CAS NO.

COMPOUND

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2-----	3-Nitroaniline	3500	U
83-32-9-----	Acenaphthene	700	U
51-28-5-----	2,4-Dinitrophenol	3500	U
100-02-7-----	4-Nitrophenol	3500	U
132-64-9-----	Dibenzofuran	700	U
121-14-2-----	2,4-Dinitrotoluene	700	U
84-66-2-----	Diethylphthalate	700	U
7005-72-3-----	4-Chlorophenyl-phenylether	700	U
86-73-7-----	Fluorene	700	U
100-01-6-----	4-Nitroaniline	1400	U
534-52-1-----	4,6-Dinitro-2-Methylphenol	3500	U
86-30-6-----	N-Nitrosodiphenylamine (1)	700	U
101-55-3-----	4-Bromophenyl-phenylether	700	U
118-74-1-----	Hexachlorobenzene	700	U
87-86-5-----	Pentachlorophenol	3500	U
85-01-8-----	Phenanthrene	700	U
120-12-7-----	Anthracene	700	U
86-74-8-----	Carbazole	700	U
84-74-2-----	Di-n-Butylphthalate	700	U
206-44-0-----	Fluoranthene	700	U
129-00-0-----	Pyrene	700	U
85-68-7-----	Butylbenzylphthalate	300	BJ
91-94-1-----	3,3'-Dichlorobenzidine	1400	U
56-55-3-----	Benzo (a) Anthracene	700	U
218-01-9-----	Chrysene	700	U
117-81-7-----	bis (2-Ethylhexyl) Phthalate	700	U
117-84-0-----	Di-n-Octyl Phthalate	700	U
205-99-2-----	Benzo (b) Fluoranthene	700	U
207-08-9-----	Benzo (k) Fluoranthene	700	U
50-32-8-----	Benzo (a) Pyrene	700	U
193-39-5-----	Indeno (1,2,3-cd) Pyrene	700	U
53-70-3-----	Dibenz (a,h) Anthracene	700	U
191-24-2-----	Benzo (g,h,i) Perylene	700	U

(1) - Cannot be separated from Diphenylamine

9613478.2262

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO Contract: 550-56
 Lab Code: ITMO Case No.: S44408 SAS No.: SDG No.: W0430
 Matrix: (soil/water) SOIL Lab Sample ID: 7444-008
 Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6748
 Level: (low/med) LOW Date Received: 01/30/95
 % Moisture: not dec. 6 dec. Date Extracted: 02/02/95
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95
 GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	5.31	16000	ABJ
2.	UNKNOWN	29.13	77	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMS4

Lab Name: ITAS-St. Louis Contract: 550-56
 Lab Code: ITSL Case No.: _____ SAS No.: _____ SDG No.: WO403
 Matrix: (soil/water) SOIL Lab Sample ID: 7444-001
 Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____
 Level: (low/med) LOW Date Sampled: 01-27-95
 % Moisture: not dec. 4 dec. _____ Date Extracted: 02-03-95
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-08-95
 GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

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

CAS NO. Compound UG/KG Q

CAS NO.	Compound	UG/KG	Q
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	3.1	U
58-89-9	gamma-BHC (Lindane)	1.4	U
76-44-8	Heptachlor	1.0	U
309-00-2	Aldrin	1.4	U
1024-57-3	Heptachlor epoxide	29	U
959-98-8	Endosulfan I	4.8	U
60-57-1	Dieldrin	0.69	U
72-55-9	4,4'-DDE	1.4	U
72-20-8	Endrin	2.1	U
33213-65-9	Endosulfan II	1.4	U
72-54-8	4,4'-DDD	3.8	U
1031-07-8	Endosulfan sulfate	23	U
50-29-3	4,4'-DDT	4.2	U
72-43-5	Methoxychlor	61	U
7421-93-4	Endrin Aldehyde	8.0	U
57-74-9	Chlordane (technical)	4.8	U
8001-35-2	Toxaphene	83	U
11104-28-2	Aroclor-1221	35	U
11141-16-5	Aroclor-1232	35	U
53469-21-9/12674-11-2	Aroclor-1242/1016	23	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

U: Concentration of analyte is less than the value given.

9613478.2264

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA, MO Contract: 550-56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled: 01-27-95

% Moisture: not dec. 6 dec. _____ Date Extracted: 02-03-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-08-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CONCENTRATION UNITS:

CAS NO. Compound (ug/L or ug/Kg) UG/KG Q

CAS NO.	Compound	(ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.1	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	3.2	U
58-89-9	gamma-BHC (Lindane)	1.4	U
76-44-8	Heptachlor	1.1	U
309-00-2	Aldrin	1.4	U
1024-57-3	Heptachlor epoxide	30	U
959-98-8	Endosulfan I	5.0	U
60-57-1	Dieldrin	0.71	U
72-55-9	4,4'-DDE	1.4	U
72-20-8	Endrin	2.1	U
33213-65-9	Endosulfan II	1.4	U
72-54-8	4,4'-DDD	3.9	U
1031-07-8	Endosulfan sulfate	24	U
50-29-3	4,4'-DDT	4.3	U
72-43-5	Methoxychlor	63	U
7421-93-4	Endrin Aldehyde	8.2	U
57-74-9	Chlordane (technical)	5.0	U
8001-35-2	Toxaphene	85	U
11104-28-2	Aroclor-1221	36	U
11141-16-5	Aroclor-1232	36	U
53469-21-9/12674-11-2	Aroclor-1242/1016	24	U
12672-29-6	Aroclor-1248	36	U
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

U: Concentration of analyte is less than the value given.

FORM I PEST

0063

9613478.2267

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

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.59	UG/G	U	2.59	1
BODMS4	7444-001DUP	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.58	UG/G	U	2.58	1
BODMS4	7444-001MS	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	100	%REC			5
BODMT4	7444-008	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.40	UG/G	U	2.40	1
NA	QCBLK58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.50	UG/G	U	2.50	1
NA	QCCLS58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	90	%REC			1

0095

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

Project: 550.56

Category: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.04	UG/G	U	1.04	1
BODMS4	7444-001DUP	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G	U	1.03	1
BODMS4	7444-001MS	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	112	%REC			1
BODMT4	7444-008	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	0.96	UG/G	U	0.96	1
NA	QCBLK58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.00	UG/G	U	1.00	1
NA	QCLCS58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	103	%REC			1

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

Project: 550.56

Category: Nitrate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.42	UG/G		0.21	1
BODMS4	7444-001DUP	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.34	UG/G		0.21	1
BODMS4	7444-001MS	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1
BODMT4	7444-008	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G		0.19	1
NA	QCBLK58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
NA	QCCLS58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

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

Project: 550.56

Category: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
BODMS4	7444-001DUP	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
BODMS4	7444-001MS	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	103	%REC			5
BODMT4	7444-008	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.19	UG/G	U	0.19	1
NA	QCBLK58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
NA	QCCLS58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

9613478.2271

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

Project: 550.56

Category: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.4	UG/G	U	10.4	1
BODMS4	7444-001DUP	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.3	UG/G	U	10.3	1
BODMS4	7444-001MS	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	104	%REC			1
BODMT4	7444-008	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	9.60	UG/G	U	9.60	1
NA	QCBLK58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
NA	QCLCS58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1

0099

9613478.2272

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

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	25.1	UG/G		10.4	1
BODMS4	7444-001DUP	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	24.7	UG/G		10.3	1
BODMS4	7444-001MS	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	95	%REC			5
BODMT4	7444-008	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	54.1	UG/G		9.60	1
NA	QCBLK58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
NA	QCLCS58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	92	%REC			1

0100

QUANTERRA ST. LOUIS

Project #: 550.56, 519.137
 Analyst: J. Flanahan
 Reviewed By: R. Patterson 102-28-95
 Reviewed By: R. Patterson 102-28-95
 Page 1 of 2

ANIONS BY I.C.

Prep Date: 02-03-95
 Analysis Date: 02-03-95
 Loop Used: 50ul
 Batch #: 58660
 Method #: 300.0

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

Standard Value	Sample ID	Standard ID	Solid Fract.	DI.	FI	CI	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
	QCBLK5866				<1.00	<2.50	<10.0	<0.200	<10.0	<0.200	-
<small>FI 10 MS 2.00 DI 10 MS 0.85 SO4 40 OP 10</small>	QCCLS5866	AL087695			10.3	8.96	^{37.0} 37.0	1.95	^{37.1} 37.1	0.780	-
	7429-001		0.9638	<small>FI 10 MS 1 DI 10 MS 1 SO4 1 OP 1</small>	1.71	193	195	2.18	<10.4	<0.207	-
<small>FI 10 MS 4.00 DI 10 MS 1.70 SO4 40 OP 10</small>	DUP 001		↓	↓	1.27	186	191	2.12	<10.3	<0.206	-
<small>FI 10 MS 4.00 DI 10 MS 1.70 SO4 40 OP 10</small>	MS 001	AL0877-95	↓	<small>FI 10 MS 5 DI 10 MS 5 SO4 5 OP 1</small>	23.5	369	357	6.83	^{21.7} 21.7	6.78	-
	7444-001		0.9616	1	<1.04	<2.59	25.1	5.42	<10.4	<0.207	-
<small>FI 10 MS 4.00 DI 10 MS 1.70 SO4 40 OP 10</small>	DUP 001		↓	1	<1.03	<2.58	24.7	5.34	<10.3	<0.207	-
<small>FI 10 MS 4.00 DI 10 MS 1.70 SO4 40 OP 10</small>	MS 001	AL0878-95	↓	<small>FI 10 MS 5 DI 10 MS 5 SO4 5 OP 1</small>	22.4	200	216	9.61	20.9	6.24	-
	002		0.8574	1	3.18	<2.91	<11.6	1.01	<11.6	<0.233	-
	003		0.1630	<small>FI 10 MS 1 DI 10 MS 1 SO4 1 OP 1</small>	<6.03	49.5	1440	<1.21	<60.3	<1.21	-
	004		0.9128	1	1.13	<2.57	24.5	0.370	<10.3	<0.206	-
	005		0.4446	<small>FI 10 MS 5 DI 10 MS 5 SO4 5 OP 1</small>	<2.21	82.5	2250	41.2	<22.1	<0.442	-
	006		0.9445	1	<1.05	<2.62	<10.5	1.31	<10.5	<0.209	-
	007		0.8792	1	<1.12	13.3	^{11.3} 11.3	6.02	<11.2	<0.224	-
	008		0.9354	1	^{20.960} 20.960	^{22.40} 22.40	54.1	1.03	^{20.960} 20.960	^{20.192} 20.192	-
	009		0.9301	1	<0.977	<2.44	79.0	1.17	<9.77	<0.195	-

All sample results were corrected for solid fraction.
 % Recovery

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	103	90	92	98	93	98	-	✓	7429 DUP	30	4	2	3	*	*	✓
LCS-2									7444 DUP	*	*	2	1	*	*	✓
7429 MS	105	85	78	99	105	107	-	✓	DUP							
7444 MS	112	100	95	93	104	103	-	✓								
MS																

* can't calculate

0101

QUANTERRA ST. LOUIS

ANIONS BY I.C.

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

Prep Date: 02-03-95
 Analysis Date: 02-03-95
 Loop Used: 50ml
 Batch #: 58660
 Method #: 300.0

Project #: 550.56 519.137
 Analyst: J. Fladd
 Reviewed By: R. Patterson 102-28-95
 Reviewed By: R. Patterson 102-28-95
 Page 2 of 2

Standard Value	Sample ID	Standard ID	Solid Fract.	DR.	Fl	Cl	SO ₄	NO ₃ -N	OPO ₄	NO ₂ -N	Br
	7444-010		0.4744	Fl 10y 10 Nos 1 of 1	<2.02	<5.06	2000	3.54	<20.2	<0.405	-
	011		0.9991	1	<0.995	3.00	<9.95	0.269	<9.95	<0.199	-
	012		0.9285	1	<1.04	<2.60	31.3	4.04	<10.4	<0.208	-
	013		0.4893	Fl 10y 10 Nos 1 of 1	<1.84	39.1	1520	<0.369	<18.4	<0.369	-
	014		0.4030	Fl 5y 5 Nos 1 of 1	<2.47	11.6	1830	10.4	<24.7	<0.494	-
	015		0.9077	1	1.19	6.20	63.9	4.51	<10.9	<0.219	-
	✓ 016		0.9031	Fl 5y 5 Nos 1 of 1	1.89	<2.68	443	0.547	<10.7	<0.215	-
<p>J. Fladd 02-21-95</p>											

0102

9613478.2275

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

Project: 550.56

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

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.73	UG/G		0.51	1
BODMS4	7444-001DUP	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.75	UG/G		0.51	1
BODMS4	7444-001MS	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	80	%REC			1
BODMT4	7444-008	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	1.00	UG/G		0.53	1
NA	QCBLK59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	0.50	UG/G	U	0.50	1
NA	QCLCS59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	107	%REC			1

0104

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 1 of 2

Analyst: Steven Papp
 Project No.: misc
 Reviewed by: Roxanne Patterson

Batch No.: 59558

Prep Date: 02-15-95
 Analysis Date: 02-15-95
 Method No.: 353.1
 Date: 03-01-95

LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L or g) =	NITRATE/NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
Q20055584		-4.444		5.000		0.05		< 0.500		
Q205595584	AL1220-95	601.1		5.000				6.01	107	
7429-001		188.5		5.012			0.9638	1.95		
0010P		165.1		5.015				1.71		13
001MS	AL1221-95	724.4		5.014				7.50	95	
7462-001		1.484		5.002			0.6799	< 0.735		
0010P		15.71		5.014				< 0.733		X
001MS	AL1222-95	570.7		5.038				8.33	100	RP
7444-001		465.5		5.120			0.9616	4.73		5-1-95
0010P		466.7		5.108				4.75		< 1
001MS	AL1223-95	911.7		5.039				9.41	80	
002		57.80		5.077			0.8574	0.664		
003		-4.444		5.002			0.1630	< 3.07		
004		80.92		5.159			0.9128	0.859		
005		614.9	2	5.034			0.4446	27.5		
006		137.8		5.066			0.9445	1.44		
007		498.2		5.048			0.8792	5.61		
008		94.85		5.046			0.9354	1.00		
009		102.8		5.041			0.9301	1.09		
010		270.3		5.010			0.4744	5.69		

* RPD can not be calculated since sample concentration is below detection limit.
 All sample results were corrected for solid fraction

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 2 of 2

Analyst: Steven Rasmussen
 Project No.: misc.
 Reviewed by: R. Patterson

Batch No.: 59558

Prep Date: 02-15-95
 Analysis Date: 02-15-95
 Method No.: 3531
 Date: 03-01-95

LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L or g) -	NITRATE/NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N/(ug/g)-N	% RECOVERY	RPD
7444-011		5.041		5.014		0.05	0.9991	<0.499		
012		361.3		5.041			0.9285	3.86		
014		85.66		5.034			0.9031	0.942		
7466-001		75.58		5.046			0.8921	0.839		
002		28.75		5.058			0.9407	<0.525		
003		85.66		5.048			0.9182	0.924		
7474-001		12.15		5.053			0.6251	<0.791		
001DP		10.38		5.045				<0.793		*
001MS	AL124-95	608.2		5.001				9.73	108	
7398-001		297.6		5.023			0.3102	9.55		
001DP		296.1		5.035				9.25		3
001MS	AL125-95	745.1		5.047				23.8	28.79	RP
<p><i>Steven Rasmussen 02-15-95</i></p>										

* RPD can not be calculated since detection limit is below detect. on limit. sample concentration

9613478.2278

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

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.1	UG/G	U	11.1	1
BODMS4	7444-001DUP	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.0	UG/G	U	11.0	1
BODMS4	7444-001MS	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	107	%REC			1
BODMT4	7444-008	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.8	UG/G		11.4	1
NA	QCBLK58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	10.6	UG/G	U	10.6	1
NA	QCLCS58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	105	%REC			1

0118

9613478.2279

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

Project: 550.56

Category: TOX
 Method: EPA 9020
 Matrix: SOLID

Sample Date : 01/27/95
 Receipt Date : 01/30/95
 Report Date : 03/09/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B00MS4	7444-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.7	UG/G	U	47.7	1
B00MS4	7444-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	48.1	UG/G	U	48.1	1
B00MS4	7444-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	95	%REC			1
B00MT4	7444-008	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	49.3	UG/G	U	49.3	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
NA	QCCLS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			1

0120

9613478.2280



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: W0430



CLIENT ID NUMBER

B0DMT4

QUANTERRA ID NUMBER

50151812

0001

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

March 16, 1995

Attention: Joan Kessner



SAF Number	:	B94-098
Date SDG Closed	:	January 30, 1995
Number of Samples	:	One (1) - See ROD-B95-013
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Stand Alone

I. Introduction

On January 30, and February 1, 1995, a total of nineteen soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. After receipt, per ROD-B95-013, the samples were split into two separate SDGs for reporting purposes. 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>
50151812	B0DMT4	Soil	1/30/95

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.

Bechtel Hanford, Inc.
March 16, 1995
Page 2

The requested analyses were:

- Gamma Spectroscopy**
Gamma Scan by method ITAS-RD-3219
- Gas Proportional Counting**
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222

III. Quality Control

The analytical results for each analysis performed under SDG W0430 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 with the exception of gross alpha and gross beta QC sample results which are reported as pCi/sample.

IV. Comments

Samples submitted as a single SDG, SDG W0403 (stand alone), were split into two SDGs after analysis had been started, W0403 (summary) and W0430 (stand alone), as per ROD-B95-013.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219

The LCS, batch blank, sample and sample duplicate (B0DMR7, SDG W0403) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222

The batch was analyzed with two LCS samples. The soil lab is undergoing an investigation into the cause of a low spike bias for water spikes prepared in that area, and is preparing duplicate spikes for soil batches. LCS M015182S, which contains an iron carrier, is not used for reporting purposes. The LCS samples were recounted due to unacceptable recoveries and the recount result is accepted for M015181S. The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements, except as noted.

Bechtel Hanford, Inc.
March 16, 1995
Page 3

Gross Beta by method ITAS-RD-3222

The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements.

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

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND **SDG:** W0430
LAB SAMPLE ID: 50151812 **MATRIX:** SOIL
CLIENT ID: B0DMT4 **DATE RECEIVED:** 1/30/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	4.35E-03	1.2E-02	1.2E-02	2.06E-02	pCi/g	N/A	RD3219
CO-60	1.19E-02	1.0E-02	1.0E-02	1.90E-02	pCi/g	N/A	RD3219
CS-137DA	2.54E-02	1.4E-02	1.4E-02	N/A	pCi/g	N/A	RD3219
EU-152	1.86E-02	2.6E-02	2.6E-02	4.23E-02	pCi/g	N/A	RD3219
EU-154	-5.84E-03	3.1E-02	3.1E-02	5.33E-02	pCi/g	N/A	RD3219
EU-155	3.01E-02	2.2E-02	2.3E-02	3.84E-02	pCi/g	N/A	RD3219
FE-59	-4.77E-02	3.3E-02	3.4E-02	5.04E-02	pCi/g	N/A	RD3219
K-40	9.42E+00	4.3E-01	1.0E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.14E-01	2.8E-02	5.0E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.67E-01	4.0E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.42E-01	6.7E-02	8.0E-02	N/A	pCi/g	N/A	RD3219
ALPHA	1.90E+00	2.7E+00	2.7E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	1.59E+01	3.0E+00	3.2E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 13

3/18/95



ITAS Data Review Checklist
RADIOCHEMISTRY

Work Order No(s): 501518, 502020

Lab Sample Numbers or SDG: W0403

Method/Test/Parameter: Gamma RD3219

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level review (✓)
A. Calibration			/	-
1. Is the calibration documentation included where applicable?			/	-
B. Sample Analysis			/	✓
1. Are the sample Yields within acceptance criteria?			/	✓
2. Were all sample holding times met?	/			✓
C. QC Samples			/	✓
1. Is the Blank Yield within acceptance criteria?			/	✓
2. Is the Minimum Detectable Activity for the Blank result ≤ the Contract Detection Limit?	/			✓
3. Is the Blank result ≤ the Contract Detection Limit?	/			✓
4. Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			/	✓
5. Is the LCS result within acceptance criteria?	/			✓
6. Is the LCS yield within acceptance criteria?			/	✓
7. Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?			/	-
8. MS/MSD results and yield meet acceptance criteria?			/	-
9. Duplicate sample results and yield meet acceptance criteria?	/			✓
D. Other				✓
1. Are all nonconformances included and noted?	/			✓
2. Are all required forms filled out?	/			✓
3. Correct methodology used?	/			✓
4. Transcription checked?	/			✓
5. Were all calculations checked at a minimum frequency?	/			✓
6. Units checked?	/			✓

Comments on any "No" response: 2 NCMS 1-MDAS>CL
2- peaks reported not detected

Analyst: [Signature] Date: 3-10-95
 Second Level Review: [Signature] Date: 3/16/95
 Form No: IS-038, 3/94, Rev 2

Report isotopes as listed at the bottom of each spectrum, all samples report BHI "7".

186



PROJECT ID (Name/Number): BHI W0403/430

NCM INITIATED BY (Name/Date): Joe I T Kempema 3-10-95

PARAMETER(S): Gamma

SAMPLE NUMBER(S) AFFECTED: 50151804, 60151805, 50151806, 07, 09, 14

MATRIX: Soil

AREA: SHIPREC RADIOCHEM COUNTING BIOASSAY
 DATA VERIF REPORTING OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. Not enough sample received for proper analysis.

2. Holding time exceeded by _____ days due to:

2.1 CATEGORY I: Out of Laboratory Control
 Holding time expired at receipt.

2.2 CATEGORY II: Laboratory Dependent
 work backlog instrument failure
 communication other (see #10)

2.3 CATEGORY III: Laboratory Reruns

2.3.1 QA/QC:
 surrogates internal standards
 spike recoveries blank contamination

2.3.2 CONFIRMATION:
 second column contamination check
 other (see #10)

2.3.3 DILUTION:
 over calibration under calibration
 other (see #10)

2.3.4 OTHER: (see #10)

3. Sample lost during extraction/analysis; no re-prep or re-analysis possible.

4. QC data reported to client outside of:
 method limits internal limits
 QAPP limits contract limits
 regulatory limits blank criteria

5. Incorrect procedure(s) used. (See #10)

6. Invalid instrument calibration. (See #10)

7. Incorrect/incomplete data reported to client. (See #10)

8. Reported detection limit(s) higher than:
 method limits QAPP limits
 contract limits other (see #10)
 Due to:
 sample matrix insufficient sample
 instrumentation other (see #10)

9. Other (specify): #04 MDAs XCL Co58, Fe59, Eu152, Eu154, Eu155; G-05-Fe59
#06 Fe59 & Eu154; #07 Fe59, Eu155; #09 - Co58, Fe59, Eu155
#14 Co58, Fe59, Eu155

10. Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. Client notified by (name and date) _____
 in writing by FAX
 by phone Other (explain) _____

2. Client's name _____ and response:
 process "as is" resample
 on hold til _____ Other (explain) _____

PROJECT MANAGER (signature & date): Smig Jones 3/16/95

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

CORRECTIVE ACTION

ROOT CAUSE: _____

INITIALS/DATE TR 3-10-95

#04 - insufficient sample

3-10-95 TR 6-05, 06, 07, 09, 14 - sample matrix background interference
6-05 detector efficiency of 7259

CORRECTIVE ACTION: _____

INITIALS/DATE TR 3-10-95

data accepted MDA of afawa sand blank is less than CL

RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO: _____

ACTIONS TO PREVENT RECURRENCE: _____

INITIALS/DATE _____

FIRST LEVEL SUPERVISOR: _____

Neil Thompson

DATE: 3-10-95

RESPONSIBLE MANAGER: _____

W. Markella

DATE: 3/16/95

QC REVIEW

NONCONFORMANCE

DEFICIENCY

RERUN

FURTHER ACTION REQUIRED: _____

ASSIGNED TO _____

QC COORDINATOR: _____

C. Black

DATE: 3-16-95

CORRECTIVE ACTION VERIFICATION

VERIFIED

CANNOT VERIFY (specify reason)

REASON: _____

NCM CLOSURE

QC COORDINATOR: _____

C. Black

DATE: 3-16-95



PROJECT ID (Name/Number): BHI W0108/430

NCM INITIATED BY (Name/Date): Joe I Kempema 3-10-95

PARAMETER(S): Gamma

SAMPLE NUMBER(S) AFFECTED: 50151804-14, 50202001 + Associated QC

MATRIX: Soil

AREA: SHIP/REC RADIOCHEM COUNTING BIOASSAY
 DATA VERIF REPORTING OTHER:

NONCONFORMANCE [check appropriate item(s)]:

- 1. Not enough sample received for proper analysis.
- 2. Holding time exceeded by _____ days due to:
- 2.1. CATEGORY I: Out of Laboratory Control
 - Holding time expired at receipt.
- 2.2. CATEGORY II: Laboratory Dependent
 - work backlog instrument failure
 - communication other (see #10)
- 2.3. CATEGORY III: Laboratory Reruns
 - 2.3.1. QA/QC:
 - surrogates internal standards
 - spike recoveries blank contamination
 - 2.3.2. CONFIRMATION:
 - second column contamination check
 - other (see #10)
 - 2.3.3. DILUTION:
 - over calibration under calibration
 - other (see #10)
 - 2.3.4. OTHER: (see #10)
- 3. Samples lost during extraction/analysis; no re-prep or re-analysis possible.
- 4. QC data reported to client outside of:
 - method limits internal limits
 - QAPP limits contract limits
 - regulatory limits blank criteria
- 5. Incorrect procedure(s) used. (See #10)
- 6. Invalid instrument calibration. (See #10)
- 7. Incorrect/incomplete data reported to client. (See #10)
- 8. Reported detection limit(s) higher than:
 - method limits QAPP limits
 - contract limits other (see #10)
 Due to:
 - sample matrix insufficient sample
 - instrumentation other (see #10)

- 9. Other (specify): Isotopes marked detected not reported IX-Ra224 IM-CD109, Mn=
#04 CD109, #05 CD109, U238DLP, #G-05 CD109, U238DLP
#06 - CD109, Na22, Hg203 #07 - Zr95 + U238DLP #08 7/23-10-95
- 10. Comments/Explanation: #09 - Na22, Mn54, Zr95, CD109,
#12 - CD109, U238DLP #13 - CD109 #14 - Na22
50202001 - CD109

NOTIFICATION [check appropriate item(s)]:

- 1. Client notified by (name and date): _____
- 2. Client's name _____ and response: _____
- in writing by FAX process "as is" resample
- by phone Other (explain) on hold til _____ Other (explain)

PROJECT MANAGER (signature & date):

Greg Lewis 3/16/95

CORRECTIVE ACTION

ROOT CAUSE: INITIALS/DATE JRK 3-10-95
 1X - RAZZ4DA natural constituent of Ottawa sand blank matrix
 Cd 109 - known phantom ; Mn 54 is Ac 228 interference at 835.5 KEV ;
 U 238 DLP - error or 2X error > result ; Na 22 is Eu 154 interference @ 1274.5 KeV
 Hg 203 is Tl 208 interference @ 277.4 KEV ; Zr 95 is Eu interference also
 can be Th 234 (Pa 234m) interference

CORRECTIVE ACTION: INITIALS/DATE JRK 3-10-95
 Data accepted discuss in case narrative

RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO: _____

ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE _____

FIRST LEVEL SUPERVISOR: Jed Kempema DATE: 3-10-95
 RESPONSIBLE MANAGER: Joe Mackellar DATE: 3/16/95

QC REVIEW

NONCONFORMANCE DEFICIENCY RERUN
 FURTHER ACTION REQUIRED: _____

 _____ ASSIGNED TO _____
 QC COORDINATOR: Black DATE: 3/16/95

CORRECTIVE ACTION VERIFICATION

VERIFIED CANNOT VERIFY (specify reason)
 REASON: _____

NCM CLOSURE

QC COORDINATOR: Black DATE: 3/16/95

file.
7/18/95



ITAS Data Review Checklist
RADIOCHEMISTRY

BHI
Soil

Work Order No(s): 501518, 502020

Lab Sample Numbers or SDG: WD403

Method/Test/Parameter: Alpha

Review Item		Yes (✓)	No (✓)	N/A (✓)	2 nd Level review (✓)
A.	Calibration			✓	✓
1.	Is the calibration documentation included where applicable?			✓	✓
B.	Sample Analysis			✓	✓
1.	Are the sample Yields within acceptance criteria?			✓	✓
2.	Were all sample holding times met?	✓			✓
C.	QC Samples			✓	✓
1.	Is the Blank Yield within acceptance criteria?			✓	✓
2.	Is the Minimum Detectable Activity for the Blank result ≤ the Contract Detection Limit?	✓			✓
3.	Is the Blank result ≤ the Contract Detection Limit?	✓			✓
4.	Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			✓	✓
5.	Is the LCS result within acceptance criteria?	✓			✓
6.	Is the LCS yield within acceptance criteria?			✓	✓
7.	Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?	✓			✓
8.	MS/MSD results and yield meet acceptance criteria?			✓	✓
9.	Duplicate sample results and yield meet acceptance criteria?	✓			✓
D.	Other				✓
1.	Are all nonconformances included and noted?	✓			✓
2.	Are all required forms filled out?	✓			✓
3.	Correct methodology used?	✓			✓
4.	Transcription checked?	✓			✓
5.	Were all calculations checked at a minimum frequency?	✓			✓
6.	Units checked?	✓			✓

Comments on any "No" response: INCM account spikes

Analyst: Paul Thompson
 Second Level Review: Seung J. Kim
 Form No: LS-038, 3/94, Rev 2

Date: 3-2-95
 Date: 3/16/95

PROJECT ID (Name/Number): BHI

NCM INITIATED BY (Name/Date): Joel T Kempema 3-2-95

PARAMETER(S): Alpha

SAMPLE NUMBER(S) AFFECTED: MO15181S, MO15182S

MATRIX: Soil

AREA: SHIP/REC RADIOCHEM COUNTING BIOASSAY
 DATA VERIF REPORTING OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. Not enough sample received for proper analysis. Sample lost during extraction/analysis: no re-prep or re-analysis possible.

2. Holding time exceeded by _____ days due to: _____

3. CATEGORY I: Out of Laboratory Control QC data reported to client outside of:

Holding time expired at receipt. method limits internal limits

4. CATEGORY II: Laboratory Dependent QAPP limits contract limits

work backlog instrument failure regulatory limits blank criteria

communication other (see #10) Incorrect procedure(s) used. (See #10)

5. CATEGORY III: Laboratory Returns Invalid instrument calibration. (See #10)

6. QA/QC: surrogates internal standards spike recoveries blank contamination

7. CONFIRMATION: second column contamination check Incorrect/incomplete data reported to client. (See #10)

other (see #10) Reported detection limit(s) higher than:

8. DILUTION: over calibration under calibration method limits QAPP limits contract limits other (see #10)

other (see #10) sample matrix insufficient sample

9. OTHER: (see #10) instrumentation other (see #10)

10. Other (specify): Spikes have low bias accounted

11. Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

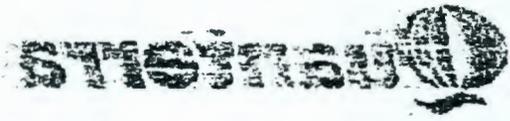
1. Client notified by (name and date): _____ 2. Client's name _____ and response:

in writing by FAX process "as is" resample

by phone Other (explain) on hold til _____ Other (explain)

PROJECT MANAGER (signature & date): Steve Davis 3/16/95

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2



CORRECTIVE ACTION

ROOT CAUSE: NR3285 INITIALS/DATE JKS-LB
 Uncertain if it is an in complete plug of liquid
 spike - under investigation

CORRECTIVE ACTION: INITIALS/DATE JKS-LB
 Data accepted from recount of 15 - 25 spike still
 out of limits but 25 contains Fe carrier which may be
 shielding of phase. Blank & duplicate sample acceptable

RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE JKS-LB
 Continuing to investigate low spike recoveries for
 liquid & spikes, soil matrices.

FIRST LEVEL SUPERVISOR: Jel Kempner DATE: 3-2-95
 RESPONSIBLE MANAGER: W Maxwell DATE: 3/16/95

QC REVIEW

NONCONFORMANCE DEFICIENCY RERUN

FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: C Black DATE: 3/16/95

CORRECTIVE ACTION VERIFICATION

VERIFIED CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: C Black DATE: 3-16-95

Due 3/18/95

9613478.2293

CB



ITAS Data Review Checklist
RADIOCHEMISTRY

Work Order No(s): 501518 502020

Lab Sample Numbers of (SDG): W0403

Method/Test/Parameter: Beta

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis				
1. Are the sample Yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			
C. QC Samples				
1. Is the Blank Yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the Blank result \leq the Contract Detection Limit?	✓			
3. Is the Blank result \leq the Contract Detection Limit?	✓			
4. Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			✓	
5. Is the LCS result within acceptance criteria?	✓			
6. Is the LCS yield within acceptance criteria?			✓	
7. Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?	✓			
8. MS/MSD results and yield meet acceptance criteria?			✓	
9. Duplicate sample results and yield meet acceptance criteria?	✓			
D. Other				
1. Are all nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Correct methodology used?	✓			
4. Transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			

Comments on any "No" response:

Analyst: Bel Thompson

Date: 3-2-95

Second Level Review: _____

Date: _____

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

0022

Project Manager: W. Price

Draft: Final Entered and Reviewed by: [Signature] PM Review: [Signature]

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
Comments # Container Type		Analysis	Class	Preservative	Anal. Due Date	Hold Date Site		(Container Numbers:% Filled)
7444-001	BODMS4	Soil	27-JAN-95 14:20	30-JAN-95 10:40	06-MAR-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50151701								
1 VI - Vial-40ml		S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95	EMPTY	(127155:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95	R68	(127156:99)
1 AN - Amber Glass-120ML		ANIONS/300.0/Q4	P	COLD	N/A	N/A	R68	(127153:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R68	(127149:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95	R68	(127151:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R68	(127153:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R68	(127153:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R68	(127149:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R68	(127153:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R68	(127153:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95	R68	(127154:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R68	(127153:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R68	(127149:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R68	(127152:97)
1		PH/11/Q4	S	COLD	27-FEB-95	26-JUL-95	R68	(127153:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R68	(127149:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R68	(127153:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R68	(127149:100)
1		VDA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95	109L	(127150:99)

7444-001DUP	BODMS4	Soil	27-JAN-95 14:20	30-JAN-95 10:40	06-MAR-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50151701								
1 VI - Vial-40ml		S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95	R68	(127155:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95	R68	(127156:99)
1 AN - Amber Glass-120ML		ANIONS/300.0/Q4	P	COLD	N/A	N/A	R68	(127153:96)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R68	(127153:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R68	(127153:96)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R68	(127153:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R68	(127153:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95	R68	(127154:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R68	(127153:96)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R68	(127153:96)

7444-001MS	BODMS4	Soil	27-JAN-95 14:20	30-JAN-95 10:40	06-MAR-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50151701								
1 VI - Vial-40ml		S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95	R68	(127155:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95	R68	(127156:99)
1 AN - Amber Glass-120ML		ANIONS/300.0/Q4	P	COLD	N/A	N/A	R68	(127153:96)

3**Sample has not been rad screened.

0000012

127153:96

Project Manager: W. Price

Draft: Final Entered and Reviewed by: _____ PH 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		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127151:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127153:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127153:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127153:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127153:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127154:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127153:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127152:97)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127153:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95	109L	(127150:99)

7444-001MSD 800MS4 Soil 27-JAN-95 14:20 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151701

1	AN - Amber Glass-120ML	AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127151:98)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127152:97)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127149:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95	109L	(127150:99)

7444-002 800HR9 Soil 27-JAN-95 15:10 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151702

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95	R6B	(127163:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127164:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R6B	(127161:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127157:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127159:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127161:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127161:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127157:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127161:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127161:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127162:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127161:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127157:100)

3*=Sample has not been rad screened.

0000013

9613478.2295

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 Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers:X Filled)	
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R68	(127160:97)	
1		PM/1T/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127161:96)	
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127157:100)	
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68	(127161:96)	
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127157:100)	
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L	(127158:99)	

7444-003 BODMR6 Soil 27-JAN-95 11:55 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151704

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R68	(127171:100)	
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R68	(127172:99)	
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R68	(127169:96)	
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127165:100)	
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R68	(127167:98)	
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68	(127169:96)	
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68	(127169:96)	
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127165:100)	
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68	(127169:96)	
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68	(127169:96)	
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R68	(127170:94)	
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68	(127169:96)	
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127165:100)	
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R68	(127168:97)	
1		PM/1T/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127169:96)	
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127165:100)	
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68	(127169:96)	
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127165:100)	
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L	(127166:99)	

7444-004 BODMR7 Soil 27-JAN-95 12:10 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151705

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R68	(127179:100)	
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R68	(127180:99)	
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R68	(127177:96)	
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127173:100)	
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R68	(127175:98)	
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68	(127177:96)	
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68	(127177:96)	
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R68	(127173:100)	
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68	(127177:96)	
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68	(127177:96)	
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R68	(127178:94)	

3*Sample has not been rad screened.

9613478.2296

000011

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:% Filled)
Container Type								
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127177:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127173:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127176:97)
1		PM/1T/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127177:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127173:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127177:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127173:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95	109L	(127174:99)

7444-005 BODMS6 Soil 27-JAN-95 14:00 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151706

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95	R6B	(127187:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127188:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A		R6B	(127185:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127181:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127183:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127185:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127185:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127181:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127185:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127185:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127186:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127185:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127181:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127184:97)
1		PM/1T/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127185:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127181:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127185:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127181:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95	109L	(127182:99)

7444-006 BODMS0 Soil 27-JAN-95 15:45 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151710

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95	R6B	(127195:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127196:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A		R6B	(127193:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127189:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127191:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127193:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127193:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127189:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127193:96)

3*Sample has not been rad screened.

0000015

1677/B/C197

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 Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site		(Container Numbers:% Filled)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127193:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127194:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127193:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127189:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127192:97)
1		PM/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127193:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127189:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127193:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127189:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127190:99)

7444-007 BODMS7 Soil 27-JAN-95 15:00 30-JAN-95 10:40 06-MAR-95 FED-EX 3* R3466-003
 NOTE: RICHLAND ID 50151711

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R6B		(127203:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127204:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R6B		(127201:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127197:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127199:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127201:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127201:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127197:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127201:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127201:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127202:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127201:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127197:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127200:97)
1		PM/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127201:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127197:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127201:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127197:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127198:99)

7444-008 BODMT4 Soil 27-JAN-95 09:30 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151712

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R6B		(127211:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127212:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R6B		(127209:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127205:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127207:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127209:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127209:96)

3*=Sample has not been rad screened.

9613478.2298

0000016

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 Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers:X Filled)	
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127205:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127209:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127209:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127210:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127209:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127205:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127208:97)
1		PH/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127209:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127205:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127209:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127205:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127206:99)

7444-009 BODMR4 Soil 27-JAN-95 09:30 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151713

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R6B		(127219:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127220:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R6B		(127217:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127213:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127215:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127217:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127217:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127213:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127217:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127217:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127218:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127217:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127213:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127216:97)
1		PH/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127217:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127213:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127217:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127213:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127214:99)

7444-010 BODMR5 Soil 27-JAN-95 10:55 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151714

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R6B		(127227:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127228:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R6B		(127225:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127221:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127223:98)

3*-Sample has not been rad screened.

9613478.2299

0000017

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:% Filled)	
#	Container Type							
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68		(127225:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68		(127225:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127221:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68		(127225:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68		(127225:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R68		(127226:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68		(127225:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127221:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R68		(127224:97)
1		PM/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127225:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127221:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68		(127225:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127221:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127222:99)

7444-011 BODMX5 Soil 27-JAN-95 11:20 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151715

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R68		(127235:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R68		(127236:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R68		(127233:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127229:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R68		(127231:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68		(127233:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68		(127233:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127229:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68		(127233:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68		(127233:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R68		(127234:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R68		(127233:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127229:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R68		(127232:97)
1		PM/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127233:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127229:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R68		(127233:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R68		(127229:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127230:99)

7444-012 BODMX3 Soil 27-JAN-95 13:45 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151716

1	VI - Vial-40ml	S/9030/Q4	S	COLD	27-FEB-95	03-FEB-95 R68		(127243:100)
1		TOX/9020/Q4	S	COLD	27-FEB-95	24-FEB-95 R68		(127244:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R68		(127241:96)

3*Sample has not been rad screened.

9613478.2300

0000018

Project Manager: M. 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:% Filled)	
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127237:100)
1		BNA/8270/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127239:98)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127241:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127241:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127237:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127241:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127241:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95 R6B		(127242:94)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127241:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127237:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127240:97)
1		PM/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127241:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127237:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127241:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127237:100)
1		VOA/8240/Q4	S	COLD	27-FEB-95	10-FEB-95 109L		(127238:99)

7444-013 BODMT0 Soil 27-JAN-95 14:45 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151703

1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R6B		(127249:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127245:100)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127249:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127249:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127245:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127249:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127249:96)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127249:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127245:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95 R6B		(127248:97)
1		PM/11/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127249:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127245:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127249:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127245:100)

7444-014 BODMT1 Soil 27-JAN-95 14:15 30-JAN-95 10:40 06-MAR-95 FED-EX 3* R3466-002
 NOTE: RICHLAND ID 50151707

1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R6B		(127255:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127253:100)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127255:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95 R6B		(127255:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95 R6B		(127253:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95 R6B		(127255:96)

3*=Sample has not been rad screened.

9613478.2301

0000019

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 Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:X Filled)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127255:96)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127255:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127253:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127254:97)
1		PH/IT/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127255:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127253:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127255:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127253:100)

7444-015 BOOMS8 Soil 27-JAN-95 15:15 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151708

1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R6B	(127258:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127256:100)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127258:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127258:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127256:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127258:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127258:96)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127258:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127256:100)
1		PEST-PCB/8080/Q4	S	COLD	27-FEB-95	10-FEB-95	R6B	(127257:97)
1		PH/IT/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127258:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127256:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127258:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127256:100)

7444-016 BODMT9 Soil 27-JAN-95 09:10 30-JAN-95 10:40 06-MAR-95 FED-EX 1 Screening not Required
 NOTE: RICHLAND ID 50151717

1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R6B	(127261:96)
1		AS/7060/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127259:100)
1		CL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127261:96)
1		FL/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127261:96)
1		ICAP/6010/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127259:100)
1		NO2/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127261:96)
1		NO3/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127261:96)
1		NO3/353.1/Q4	S	COLD	27-FEB-95	24-FEB-95	R6B	(127260:97)
1		OPHOS/300.0/Q4	C	COLD	27-FEB-95	29-JAN-95	R6B	(127261:96)
1		PB/7421/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127259:100)
1		PH/IT/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127261:96)
1		SE/7740/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127259:100)
1		SO4/300.0/Q4	C	COLD	27-FEB-95	24-FEB-95	R6B	(127261:96)
1		TL/7841/Q4	S	COLD	27-FEB-95	26-JUL-95	R6B	(127259:100)

3*-Sample has not been rad screened.

0000020

9613478.2302

Project Managers: 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	PW - Plastic-2oz	HOLD//04	S COLD	11-888-88	11-888-88	R6B		(127265:100)
7444-017	BODMT7 NOTE: RICHLAND ID 50151709	Soil	27-JAN-95 15:30	30-JAN-95 10:40	06-MAR-95	FED-EX	3*	R3466-001
1	AW - Amber Glass-120ML	AS/7060/04	S COLD	27-FEB-95	26-JUL-95	R6B		(127262:100)
1		ICAP/6010/04	S COLD	27-FEB-95	26-JUL-95	R6B		(127262:100)
1		PB/7421/04	S COLD	27-FEB-95	26-JUL-95	R6B		(127262:100)
1		PM/11/04	S COLD	27-FEB-95	26-JUL-95	R6B		(127262:100)
1		SE/7740/04	S COLD	27-FEB-95	26-JUL-95	R6B		(127262:100)
1		TL/7841/04	S COLD	27-FEB-95	26-JUL-95	R6B		(127262:100)
7444-018	TRIP BLANK	Water	27-JAN-95 00:00	30-JAN-95 10:40	06-MAR-95	FED-EX	3*	Sample not Screened
4	VI - Vial-40ml	HOLD//04	S COLD	11-888-88	11-888-88	109L		(127266:100 127267:100 127268:100 127269:100)

0000021

3*=Sample has not been rad screened.



Temp 0°/ 1° cur# 3041

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD *

Reference Document No. 453800
Page 1 of 6

Project Name/No. 1 B94-098
Sample Team Members 2
Profit Center No. 3
Project Manager 4 V Petley
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 1/30/95
Lab Destination 8 st Louis
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13

Bill to: 5 Quanterra Richland
509 375 3131

Report to: 10

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
50157014	BODM54 Soil	1-27-95 14:20 See WHC	GIS AM 600ml	120 ml	no	metals See WHC GC/SAR	100	
B						VOA	FOR LAB USE ONLY	
C						Semi VOA		
D						PCB/pest		
E				40 ml		Sulfide		
F						Tox		
G				120 ml		Anions		
H						NO2/NO3		10

Special Instructions: 23

Possible Hazard Identification: 24

Non-hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal: 25

Return to Client Disposal by Lab Archive (mos.)

Turnaround Time Required: 26

Normal Rush

QC Level: 27

I. II. III. Project Specific (specify): SDG W0403

1. Relinquished by 28

(Signature/Affiliation) [Signature]

Date: 1/30/95

Time: 1600

1. Received by 29

(Signature/Affiliation) [Signature]

Date: 1-31-95

Time: 0935

2. Relinquished by

(Signature/Affiliation)

Date:

Time:

2. Received by

(Signature/Affiliation)

Date:

Time:

3. Relinquished by

(Signature/Affiliation)

Date:

Time:

3. Received by

(Signature/Affiliation)

Date:

Time:

Comments: 29

Recv BODM19 20 ml poly for screen 1-27-95 19:10 not listed on coc

0000022

White: To accompany samples Yellow: Field copy

* See back of form for special instructions.



INTERNATIONAL
TECHNOLOGY
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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

Reference Document No. ³⁰ 453800
Page 2 of 6

Project Name W0403

Project No. B74-098

Samples Shipment Date 1/30/75

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
50151702A	BODMRA /soil	1-27-95 See WHC	GIS-AMB COCSAR	120 ml	0 4c	metals See WHC COCSAR	100	
B						MAE VOA		
C						Semi VOA		
D						PCB pest		
E				40 ml		Sulfide		
F						Tox		
G				120 ml		Anions		
H						NO2/NO3		
3A	BODMTO	1-27-95 14:45	GIS AMB	120 ml		metals		
B						Anions		
C						PCB/pest		
4A	BODMRA	1-27-95 11:55		120 ml		metals		
B						VOA		
C						Semi VOA		
D						PCB pest		
E				40 ml		Sulfide		
F						Tox		
G				120 ml		Anions		
H						NO2/NO3		
5A	BODMRA	1-27-95 12:10	GIS AMB			metals		

0000023

Write: To accompany samples
9613478 2305
Yellow: Field copy

* See back of form for special instructions.



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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

Reference Document No. ³⁰ 453800
Page 3 of 6

Project Name W0403

Project No. B77-098

Samples Shipment Date 1/30/95

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing Program 20	Condition on 21 Receipt	Disposal 22 Record No.
50151705B	BODMRG /soil	1-27-95/12:00 See WHC	GS-Amb GocSAR	120 ml	4c	See WHC codSAR	100	
C	2m Sample Containers are LABeich					Semi vOA		
D				↓		PCB/pest		
E				40 ml		Sulfide		
F	BODMR7			↓		Tox		
G	B Thm H			120 ml		Anions		
H				↓		NO2/NO3		
6A	BODMSG	1-27-95 14:00		↓		metals		
B						vOA		
C						Semi vOA		
D				↓		PCB pest		
E				40 ml		Sulfide		
F				↓		Tox		
G				120 ml		Anions		
H				↓		NO2/NO3		
7A	BODMT1	1-27-95 14:15		↓		Metals		
B						PCB/pest		
C				↓		Anions		
8A	BODMSB	1-27-95 16:15		↓		metals		
B				↓		PCB/pest		

0000024

Write: To accompany samples
9613478 2306
Yellow: Field copy
* See back of form for special instructions.



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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

Reference Document No.³⁰ 453800
Page 4 of 6

Project Name W0403

Project No. 894-098

Samples Shipment Date 1/30/95

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	% Condition on 21 Receipt	Disposal 22 Record No.
50151708C	BODMSB /soil	1-27-95 15:45 See WHC	615 AMB COC/SAR	120 ml	0 4c	Anions See WHC COC/SAR	100 Ant	
9A	BODMT7	1-27-95 15:30	↓	↓		Metals	100	
10A	BODMSO	1-27-95 15:45	↓	↓		Metals		
B			↓	↓		VOA		
C			↓	↓		Semi VOA		
D			↓	↓		PCB/pest		
E			↓	40 ml		Sulfide		
F			↓	↓		Tox		
G			↓	120 ml		Anions		
H			↓	↓		NO2/NO3		
11A	BODMS7	1-27-95 15:00	↓	↓		metals		
B			↓	↓		VOA		
C			↓	↓		Semi VOA		
D			↓	↓		PCB/pest		
E			↓	40 ml		Sulfide		
F			↓	↓		Tox		
G			↓	120 ml		Anions		
H			↓	↓		NO2/NO3		
12A	BODMT4	1-27-95 09:30	↓	↓		metals		
B			↓	↓		VOA		

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.

0000025



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TECHNOLOGY
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**ANALYSIS REQUEST AND
CHAIN OF CUSTODY RECORD (cont.)***

Reference Document No. ³⁰ 453800

Page 5 of 6

Project Name W0403

Project No. 894-098

Samples Shipment Date 1/30/95

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt Temp	Disposal 22 Record No.
50151712 C	BODMT4 Soil	1-27-95 0980 See WHC	603 AMS COCSAR	120 ml	4°C	Semi VOA See WHC COCSAR	1°	
D				↓		PCB Pest	1°	
E				40 ml		Sulfide	1°	
F				↓		Tox	1°	
G				120 ml		Anions	1°	
H				↓		NO2/NO3	↓	
13 A	BODMR4	1-27-95 0980		↓		Metals		
B						VOA		
C						Semi VOA	1°	
D				↓		PCB Pest	1°	
E				40 ml		Sulfide	1°	
F				↓		Tox	1°	
G				120 ml		Anions	1°	
H				↓		NO2/NO3		
14 A	BODMR5	1-27-95 1055		↓		Metals		
B						VOA		
C						Semi VOA		
D				↓		PCB/Pest		
E				40 ml		Sulfide		
F				↓		Tox		

0000026

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions.

9613478-2308



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No. ³⁰ 453800
Page 6 of 6

Project Name W0403

Project No. B94-098

Samples Shipment Date 1/30/95

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
50151714 G	BODMRS / Soil	1-27-95 1055 See WHC	G 15 Am Coc/SAA	120 ml	4°C	ANIONS SER. WHC COC/SAR		
H		1-27-95 1055	↓	↓	↓	NO2/NO3		
15A	BODMX5	1-27-95 11:20	↓	↓	↓	metals		
B		↓	↓	↓	↓	VOA		
C		↓	↓	↓	↓	semi VOA		
D		↓	↓	↓	↓	PCB pest		
E		↓	↓	40 ml	↓	Sulfide		
F		↓	↓	↓	↓	Tox		
G		↓	↓	120 ml	↓	Anions		
H		↓	↓	↓	↓	NO2/NO3		
16A	BODM53	1-27-95 13:45	↓	403	↓	metals		
B		↓	↓	↓	↓	VOA		
C		↓	↓	↓	↓	semi VOA		
D		↓	↓	↓	↓	PCB Pest		
E		↓	↓	40 ml	↓	Sulfide		
F		↓	↓	↓	↓	Tox		
G		↓	↓	403	↓	Anions		
H		↓	↓	↓	↓	NO2/NO3		
17A	BODMT9	1-27-95 19:10	↓	↓	↓	metals		
B		↓	↓	↓	↓	Anions		
C		↓	↓	↓	↓	NO2/NO3		

0000027

White: To accompany samples
Yellow: Field copy
* See back of form for special instructions.

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

WS Thompson/Amy Simpson

Collector Dave St. John / Doug Bawer	Company Contact RC SHITH/MI STANKOVICH	Telephone No. (509)372-2537/(509)376-2493
Project Designation 100-D POUNDS PHASE II SAMPLING	Sampling Location 100-D	SAF No. B94-098
Ice Chest No. ER-80	Field Logbook No.	Method of Shipment HAND DELIVER
Shipped To QUANTERRA	Offsite Property No. N/A	Bill of Lading/Air Bill No. N/A

Data Turnaround

Priority

Normal

Possible Sample Hazards/Remarks	Preservative	COOL 4															
	Type of Container	gG	Gs	gG	gG	gG	gGs	gG	gG	gG	gG	P/G	P/G	P/G	P/G		
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1	1	1	3	2		
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml	500ml*	950ml			

SAMPLE ANALYSIS	ICP METALS-TAL/AA	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA
	(As, Pb, Se, Tl)	B	C	D	E	F	G	H	501518			

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	501518	18	17	15	16
000117 BODMT9	17s	1-27-95	0910	X												
BODMT412	S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	12
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	13
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X	X	X	14
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	X	X	X	15
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X	X	X	X	X	16

<p>Relinquished By: <i>David St. John</i> Date/Time: 1/30/95 0830</p> <p>Relinquished By: <i>David St. John</i> ERC Date/Time: 10:40</p> <p>Relinquished By: <i>David St. John</i> Date/Time: 1-30-95</p>		<p>Sign/Print Names</p> <p>Received By: <i>Eric</i> Date/Time: 0870</p> <p>Received By: <i>Kim E. ...</i> Date/Time: 1-30-95</p> <p>Received By: <i>Quanterra</i> Date/Time: 10:40</p> <p>Received By: <i>Kevin ...</i> Date/Time: 1-30-95</p>		<p>SPECIAL INSTRUCTIONS</p> <p>DATA DELIVERABLE-STAND ALONE. LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.</p> <p>*THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g</p> <p>Correction from 1 500ml to 3,500ml pers. wrong but initially checked, corrected in field. Study of Thompson 1-27-95</p>		<p>Matrix*</p> <ul style="list-style-type: none"> S = Soil BE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air OS = Drum Solids DL = Drum Liquids T = Tissue WL = Wipe L = Liquid V = Vegetation X = Other 	
---	--	--	--	--	--	---	--

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

SDG W0403

LABORATORY COPY

N-31-1995 11:13 QUANTERRA, RICHLAND 5093755590 P. 02

AL# 3466

7444

550186

SCREENING CALCULATION SPREADSHEET

ENVIRONMENTAL

(P3) 1-30-95

Customer Code	Received Date	Screening Prep Date	Count Date	Mins. Crtd	BACKGROUND		
WHC	1-30-95	1-30-95	1-30	10	Alpha	Beta	Mins
					80	227	960

Customer ID	Sample Matrix	Residue Wght mg	Vol. Anal. mg ml	Sample Size Gm L	SAMPLE CNT DATA			Net Sample Counts/Minute		DPM / Aliquot		uCi per Sample		pCi / Gm or L		1-sigma error pCi / Gm or L		Category 1 Yes/No	Aliquot to Cat 1 Gm or L	
					Hidr Num.	Total Alpha	Counts Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta		Alpha	Beta
BODMT9	SOLID	93.8	93.8	172.8	30	8	23	0.52	1.35	3.78E+00	3.04E+00	3.1E-03	2.5E-03	1.8E+01	1.5E+01	11.58	5.74	Yes	5.5E+02	6.8E+03
✓ BODMT4	SOLID	97.5	97.5	1178.3	31	3	32	0.22	2.25	1.55E+00	5.54E+00	8.5E-03	3.0E-02	7.2E+00	2.6E+01	9.99	6.64	Yes	1.4E+03	3.9E+03
✓ BODMR4	SOLID	94.3	94.3	595.8	32	1	21	0.02	1.15	7.75E-02	2.80E+00	2.2E-04	8.2E-03	3.7E-01	1.4E+01	9.18	5.63	Yes	2.7E+04	7.2E+03
✓ BODMR5	SOLID	91.8	91.8	286.0	33	7	59	0.62	4.95	4.34E+00	1.20E+01	8.1E-03	1.7E-02	2.1E+01	5.9E+01	12.03	9.38	Yes	4.7E+02	1.7E+03
✓ BODMX5	SOLID	88.3	88.3	841.1	34	1	20	0.02	1.05	7.80E-02	2.61E+00	2.6E-04	8.5E-03	4.0E-01	1.3E+01	9.45	5.62	Yes	2.5E+04	7.5E+03
✓ BODMS3	SOLID	89.8	89.8	1063.9	35	1	21	0.02	1.15	7.48E-02	2.87E+00	4.1E-04	1.8E-02	3.8E-01	1.4E+01	9.36	5.88	Yes	2.7E+04	6.9E+03
003 BODMT1	SOLID	85.8	85.8	841.7	36	7	40	0.62	3.05	3.74E+00	8.91E+00	1.8E-02	3.0E-02	2.6E+01	4.7E+01	14.38	10.30	No	3.9E+02	2.1E+03
✓ BODMS8	SOLID	98.8	98.8	1390.7	37	0	31	-0.08	2.15	-7.2E-01	5.50E+00	0.0E+00	3.8E-02	-3.3E+00	2.6E+01	6.46	6.66	Yes	-3.0E+03	3.9E+03
✓ BODMT7 0019	SOLID	73.9	73.9	871.8	38	289	448	26.82	43.95	1.75E+02	8.87E+01	7.2E-01	3.6E-01	1.1E+03	5.4E+02	58.86	28.60	No	9.4E+00	1.9E+02

Cat I
Cat II
Cat I
Cat III

9613478.2311

0000029-

9615478.2512

SAMPLE STATUS REPORT FOR N 4327. RAD SCREEN BODMT4 TIME: 1/30/95 7:45
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 1/28/95 22:40

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

0000030



SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 1-30-95 10:40 Client Name BFI

Project/Client # B94-098 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) ER-80

1. Condition of shipping container? OK

2. Custody Seals on cooler intact? Yes No

3. Custody Seals dated and signed? Yes No

4. Chain of Custody record is taped on inside of cooler lid? Yes No

5. Vermiculite/packing material is: Wet Dry

6. Each sample is in a plastic bag? Yes No

7. Number of sample containers in cooler: 62

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

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

10. Coolant present? Yes No

Sample temperature 40C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) N/A

Request for analysis #'(s) N/A

Airbill # N/A Carrier N/A

12. Have any anomalies been identified above? Yes No

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

Printed Name/Signature *Kevin A. Hutterling* Date/Time 1-30-95 10:40



9613478.2314

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 1-30-95 10:40 Client Name B.H.F

Project/Client # 894-018 Batch or Case # _____

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

1. Condition of shipping container? OK

2. Custody Seals on cooler intact? Yes No

3. Custody Seals dated and signed? Yes No

4. Chain of Custody record is taped on inside of cooler lid? Yes No

5. Vermiculite/packing material is: Wet Dry

6. Each sample is in a plastic bag? Yes No

7. Number of sample containers in cooler: 66

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

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

10. Coolant present? Yes No

Sample temperature 40°C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) N/A

Request for analysis #'(s) N/A

Airbill # N/A Carrier N/A

12. Have any anomalies been identified above? Yes No

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

Printed Name/Signature Kevin Hattenberg Date/Time 1-30-95 10:40



SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 1-30-95 10:40 Client Name BHI

Project/Client # 394-098 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) SML-401

1. Condition of shipping container? O.K.

2. Custody Seals on cooler intact? Yes No

3. Custody Seals dated and signed? Yes No

4. Chain of Custody record is taped on inside of cooler lid? Yes No

5. Vermiculite/packing material is: Wet Dry

6. Each sample is in a plastic bag? Yes No

7. Number of sample containers in cooler: 39

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

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

10. Coolant present? Yes No

Sample temperature 40 C

11. The following paperwork should be accounted for (N/A if not applicable):

Chain of Custody #'(s) N/A

Request for analysis #'(s) N/A

Airbill # N/A Carrier AFA

12. Have any anomalies been identified above? Yes No

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

Printed Name/Signature Karin Schenk Date/Time 1-30-95 10:40

C.U.R. and C.C.C.
COPIED TO: BU + WP
DATE: 1-31-95
TIME: 1350
BY: zm

Work Order No.: 7444

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richland
Project No: 550.52
Analysis Requested: Refer to RFA/COC
Client Sample Numbers Affected: Entire Login

Date: 1-31-95 09 35
Initiated by: Zuel Mitchell
RFA/COC Numbers: 452800

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

1. 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. NA	Sample splits performed by lab.
3. <input type="checkbox"/>	Sample received without proper preservative. <input type="checkbox"/> Cooler temperature not within 4°C ± 2°C Record temperature: <u>Temp 0°/1°/0°</u> <input type="checkbox"/> pH _____ <input type="checkbox"/> other: _____	10. NA	Volatile sample received with approximately _____ mm headspace.
4. <input type="checkbox"/>	Sample received in improper container.	11. <input type="checkbox"/>	Sample ID on container does not match sample ID on paperwork. Explain: <u>50151705(B) Thru(H) COC Label</u> <u>BODMR6; Cont. Label BODMR7</u>
5. <input checked="" type="checkbox"/>	Sample received without proper paperwork. Explain: <u>1-27-95 09:40</u> <u>Recv BODMT9 20ml Pily For screen</u>	12. <input checked="" type="checkbox"/>	All coolers on airbill not received with shipment.
6. <input type="checkbox"/>	Paperwork received without sample.	13. <input type="checkbox"/>	Other (explain below): <u>Shipping containers not rad surveyed.</u>
7. <input type="checkbox"/>	No sample ID on sample container.		

Notes: Allso 2x40 ml TRIP BIKS 0° cooler no LABEL
2x40 ml TRIP BIKS 0° cooler no LABEL

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: 1-31-95
Project Management Review: [Signature] Date: 2/3/95

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

0000034

DON'T SAY IT - - WRITE IT!

Date:

From: P. K. Reich H4-14, (509) 372-2785

Subject: Correction of Validation Date Received Stamp

The Date Stamped on this Validation Report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front page(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Data Management

RECORD COPY

Date: April 21, 1995
 To: Westinghouse Hanford Company (technical representative)
 From: A.T. Kearney, Inc.
 Project: 100-DR-1 100-D Ponds Phase II Sampling
 Subject: Inorganics - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: CLP-ICP Metals/AA Metals

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for ICP metals and GFAA metals analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six months for all metals.

Holding time requirements for all analytes were met.

RECORD COPY

Date: April 21, 1995
 To: Westinghouse Hanford Company (technical representative)
 From: A.T. Kearney, Inc.
 Project: 100-DR-1 100-D Ponds Phase II Sampling
 Subject: Wet Chemistry - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Fluoride, Sulfate, Chloride, Sulfide, Nitrate, Nitrite, Phosphate, Nitrate/Nitrite and TOX

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for fluoride, sulfate, chloride, sulfide, nitrate, nitrite, phosphate, nitrate/nitrite and TOX were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for chloride, fluoride, sulfate, TOX and nitrate/nitrite; seven days for sulfide; and two days for nitrate, nitrite and phosphate.

If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times for all analytes met QC requirements.

- **Blanks**

One laboratory preparation blank is analyzed with each sample batch. At least one initial calibration blank is analyzed for every 20 samples. As per WHC guidelines, no qualification of data was necessary.

- **Accuracy**

- Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within a range of 75% to 125%. Samples with a spike recovery <30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery between 30% to 74% and a sample value below the IDL are qualified as estimates and flagged "UJ". Samples with a spike recovery of <75% or >125% and a sample value >IDL are qualified as "J". Finally, samples with a spike recovery of >125% and a sample value <IDL are acceptable and do not require qualification.

All matrix spike results were acceptable.

- Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80% to 120%. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

All LCS results were acceptable.

- **Precision**

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Samples whose precision results fell outside the quality control limits were qualified as estimates and flagged "J".

All duplicate analyses results were acceptable.

- **Sample Result Verification and Detection Limits**

Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

- EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.
- EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.
- EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.
- EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.
- WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

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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 same 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 the 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 is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

Project: 550.56

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Category: Nitrate
Method: EPA 300.0
Matrix: SOLID

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
ODMS4	7444-001	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.42	UG/G		0.21	1
ODMS4	7444-001DUP	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.34	UG/G		0.21	1
ODMS4	7444-001MS	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1
ODMT4	7444-008	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G		0.19	1
A	QCBLK58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
A	QCLCS58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

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

Project: 550.56

Category: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
ODMS4	7444-001	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
ODMS4	7444-001DUP	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
ODMS4	7444-001MS	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	103	%REC			5
ODMT4	7444-008	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.19	UG/G	U	0.19	1
A	QCBLK58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
A	QCLCS58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

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5/9/95

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

Project: 550.56

Category: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30DMS4	7444-001	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.4	UG/G	U	10.4	1
30DMS4	7444-001DUP	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.3	UG/G	U	10.3	1
30DMS4	7444-001MS	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	104	%REC			1
30DMT4	7444-008	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	9.60	UG/G	U	9.60	1
1A	QCBLK58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
1A	QCCLSS58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1

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5/1/95

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

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.59	UG/G	U	2.59	1
BODMS4	7444-001DUP	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.58	UG/G	U	2.58	1
BODMS4	7444-001MS	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	100	%REC			5
BODMT4	7444-008	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.40	UG/G	U	2.40	1
NA	QCBLK58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.50	UG/G	U	2.50	1
NA	QCCLCS58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	90	%REC			1

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

Project: 550.56

Category: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30DMS4	7444-001	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.04	UG/G	U	1.04	1
30DMS4	7444-001DUP	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G	U	1.03	1
30DMS4	7444-001MS	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	112	%REC			1
30DMT4	7444-008	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	0.96	UG/G	U	0.96	1
VA	QCBLK58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.00	UG/G	U	1.00	1
VA	QCCLS58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	103	%REC			1

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

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
BODMS4	7444-001	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	25.1	UG/G		10.4	1
BODMS4	7444-001DUP	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	24.7	UG/G		10.3	1
BODMS4	7444-001MS	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	95	%REC			5
BODMT4	7444-008	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	54.1	UG/G		9.60	1
NA	QCBLK58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
NA	QCCLCS58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	92	%REC			1

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

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.1	UG/G	U	11.1	1
BODMS4	7444-001DUP	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.0	UG/G	U	11.0	1
BODMS4	7444-001MS	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	107	%REC			1
BODMT4	7444-008	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.8	UG/G		11.4	1
NA	QCBLK58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	10.6	UG/G	U	10.6	1
NA	QCLCS58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	105	%REC			1

RES 4/11/95

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

Project: 550.56

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

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.73	UG/G		0.51	1
BODMS4	7444-001DUP	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.75	UG/G		0.51	1
BODMS4	7444-001MS	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	80	%REC			1
BODMT4	7444-008	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	1.00	UG/G		0.53	1
NA	QCBLK59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	0.50	UG/G	U	0.50	1
NA	QCCLCS59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	107	%REC			1

RJS 4/11/95

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

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/09/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30DMS4	7444-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.7	UG/G	U	47.7	1
30DMS4	7444-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	48.1	UG/G	U	48.1	1
30DMS4	7444-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	95	%REC			1
30DMS4	7444-008	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	49.3	UG/G	U	49.3	1
3A	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
3A	QCCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			1

RES 4/11/95

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000020

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
7444-008	BODMT4	50151712	Soil	01/30/95

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: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

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

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analysis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

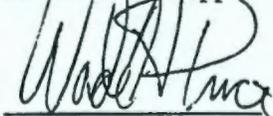
Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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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Westinghouse Hanford Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 Page 1 of 13

Collector: WS Thompson / Amy Simpson
 Company Contact: RC SMITH/MI STANKOVICH
 Telephone No.: (509)372-2537/(509)376-2493
 Project Designation: 100-D PONDS PHASE II SAMPLING
 Sampling Location: 100-D
 SAF No.: B94-098
 Ice Chest No.: E1-80
 Field Logbook No.:
 Method of Shipment: HAND DELIVER
 Shipped To: QUANTERRA
 Offsite Property No.: N/A
 Bill of Lading/Air Bill No.: N/A

Date Turnaround
 Priority
 Normal

Possible Sample Hazards/Remarks	Preservative	COOL 4															
	Type of Container	gG	Gs	gG	gG	gG	gGs	gG	gG	gG	P/G	P/G	P/G	P/G			
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	No. of Container(s)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml	500ml*	950ml			

SAMPLE ANALYSIS	ICP METALS-TAL/AA	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA
	501517	B	C	D	E	F	G	H	501518				

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
000173 BODMT9	17s	1-27-95	0910	X																										
BODMT412	S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	12
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	13
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	16

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>David St. John</i>	Date/Time 1/30/95	Received By <i>Eric</i>	Date/Time 0870
Relinquished By <i>David St. John</i>	Date/Time 0830	Received By <i>William Bahner</i>	Date/Time 1-30-95
Relinquished By <i>Eric</i>	Date/Time 10:40	Received By <i>Quanterra</i>	Date/Time 10:40
Relinquished By <i>William Bahner</i>	Date/Time 1-30-95	Received By <i>Kevin Hattenberg</i>	Date/Time 1-30-95
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
 DATA DELIVERABLE-STAND ALONE.
 LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.
 *THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g
 Correction from 1,500ml to 3,500ml jars. Wrong but initially checked, corrected in field. *Stacy Thompson* 1-27-95

- 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

SDG W0403

9613178.2342

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-B Ponds/824-099

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:
~~w0389~~ ~~w0380~~ 50132209 + 05 32303 + 05
 1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) w0380
~~w0306~~ ~~w0403~~ 50151712 + 51812
 2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, BODMV2 (1 SDG, summary deliverable) w0403

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

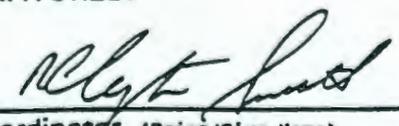
SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith /  1/31/95
 OSM Project Coordinator (Print/Sign Name) Date

M. T. Stankovich /  2/13/95
 Technical Representative (Print/Sign Name) Date

N/A
 Quality Assurance (Print/Sign Name) 000025 Date

9613478.2344
OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

MS
11/17/95

REV. 3 .

DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES 28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY: 1. EXPEDITED RESPONSE ACTION
2. TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY REGULAR RADCHEM

SAMPLE MATRIX: SOIL/SEDIMENT SLUDGE WATER CONCRETE VEGETATION OTHER _____ OILS

LABORATORY SERVICES ON-SITE OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
<u>Quanterra (Main)</u>	<u>Not Applicable</u>	<u>N/A</u>
<u>Lockheed (Split)</u>	<u>Not Applicable</u>	<u>N/A</u>
_____	_____	_____

COMMENTS:

- ▶▶ Revision 1 — Changes to the EAL bottle requirements.
- ▶▶ Revision 2 — Change to laboratories.
- ▶▶ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

- ▶▶ Data Deliverable — Standalone
- ▶▶ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

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Appendix 5

Data Validation Supporting Documentation

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GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: WHC/BHI			DATA PACKAGE: W0430-QES		
VALIDATOR: RJS		LAB: Quanterra		DATE: 3/31/95	
CASE: 100-DR-1		100-D-PONDS		SDG: W0430	
ANALYSES PERFORMED					
<input type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input checked="" type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input checked="" type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₃ /NO ₂
<input checked="" type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input checked="" type="checkbox"/> Phosphate	<input type="checkbox"/>	<input checked="" type="checkbox"/> Nitrate
<input checked="" type="checkbox"/> fluoride	<input checked="" type="checkbox"/> Sulfide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Nitrite
SAMPLES/MATRIX					
BODMTH (soil)					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A
 Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No *RJS for N/A RJS*

Comments: _____
 Chloride - 28 days ✓
 Fluoride - 28 days ✓
 Nitrate - 2 days ✓ (7 days) > 2x limit (OR - nondetect, I - Detect) *RJS for RI*
 Nitrite - 2 days ✓ (7 days) > 2x limit (OR - nondetect, I - Detect) *RJS for RI*
 O-Phosphate - 2 days ✓ (7 days) > 2x limit (OR - nondetect, I - detect) *RJS for RI*
 NO₃/NO₂ - 28 days ✓
 Sulfide - 7 days ✓
 TOX - 28 days ✓
 Sulfate - 28 days ✓

A-23 RJS

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

- Was initial calibration performed for all applicable analyses? Yes No N/A
- Are initial calibration results acceptable? Yes No N/A
- Was a calibration check performed for all applicable analyses? Yes No N/A
- Are calibration check results acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: _____

5. ACCURACY

- Were spike samples analyzed at the required frequency? . . . Yes No N/A
- Are spike recoveries acceptable? Yes No N/A
- Were LCS analyses performed at the required frequency? . . . Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: _____

6. PRECISION

- Were laboratory duplicate samples analyzed at the required frequency? Yes No N/A
- Are laboratory duplicate sample RPD values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

RECORD COPY

Date: April 21, 1995
 To: Westinghouse Hanford Company (technical representative)
 From: A.T. Kearney, Inc.
 Project: 100-DR-1 100-D Ponds Phase II Sampling
 Subject: Volatiles - Data Package No. W0430-QES (SDG No. W0430)

**INTRODUCTION**

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: VOA-TCL

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 14 days of the date of sample collection.

If holding times are exceeded, but not by $> 2x$ the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-

detects. If holding times are exceeded by $>2x$ the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Instrument Calibration and Tuning**

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are performed according to CLP protocols and all results must meet validation requirements set by Westinghouse-Hanford (WHC 1992,b). An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at $<5X$ the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at $<10x$ the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is $<CRQL$ and is $<10x$ (or $<5x$ for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within ± 0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is $<5x$ (or $<10x$ for common laboratory contaminants) the highest blank concentration.

Due to the presence of positive blank results, sample number B0DMT4 was flagged "U" for methylene chloride.

All other method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using five compounds and % recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results $< 5x$ the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results $> 5x$ the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Compounds with surrogate recoveries $< 10\%$ are qualified as estimates "J" for detects, and "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol, results must be within RPD limits of $\pm 35\%$. If RPD values are out of specification and the sample concentration is $< 5x$ the spike concentration, all associated sample results are qualified as estimated "J" for detects, "UJ" for non-detects. If RPD values are out of specification and the sample concentration is $> 5x$ the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

- **System Performance**

- Internal Standards Performance

- The evaluation of the internal standards criteria provide a means to assess the stability and sensitivity of the GC/MS system on every analysis. Internal standard area counts must be within the limits of -50% to +100% of the most recent standard. The retention time of the internal standard must not vary by more than +/-30 seconds of the most recent calibration. If area counts for a particular internal are outside the control limits or relative retention time criteria are > +/-30 seconds, all associated sample results are qualified as estimates (J for detects, UJ for non-detects). If area counts and retention times are both outside control limits, all non-detect sample results associated with that internal standard are qualified as unusable "UR".

- All internal standard recovery results were acceptable.

- Compound Identification

- The identity of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If a compound was incorrectly reported as undetected, the associated result is qualified as detected (no qualifier) or estimated "J". If retention time and mass spectral criteria are exceeded, all associated results are qualified as unusable and flagged "R". If it is determined that incorrect identifications were made as a result of cross-contamination or carryover between analyses, then the affected data are qualified as unusable and flagged "UR/R".

- All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

- The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

- All sample results and reported detection limits were acceptable.

000005

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive blank contamination was noted in one methylene chloride result. All results were flagged accordingly. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

- EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.
- EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.
- WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

000006

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 same 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 the 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 is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

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Appendix 2

Summary of Data Qualification

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUSE-HANFORD																			
Laboratory: QUANTERRA																			
Case:		SDG: W0430																	
Sample Number		BODMT4																	
Location		Test Pit #2																	
Remarks																			
Sample Date		01/27/95																	
Analysis Date		02/06/95																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	U																
Bromomethane	10	11	U																
Vinyl Chloride	10	11	U																
Chloroethane	10	11	U																
Methylene Chloride	10	11	U																
Acetone	10	110	U																
Carbon Disulfide	10	5	U																
1,1-Dichloroethene	10	5	U																
1,1-Dichloroethane	10	5	U																
1,2-Dichloroethene (total)	10	5	U																
Chloroform	10	5	U																
1,2-Dichloroethane	10	5	U																
2-Butanone	10	110	U																
1,1,1-Trichloroethane	10	5	U																
Carbon Tetrachloride	10	5	U																
Bromodichloromethane	10	5	U																
1,2-Dichloropropane	10	5	U																
cis-1,3-Dichloropropene	10	5	U																
Trichloroethene	10	5	U																
Dibromochloromethane	10	5	U																
1,1,2-Trichloroethane	10	5	U																
Benzene	10	5	U																
trans-1,3-Dichloropropene	10	5	U																
Bromoform	10	5	U																
4-Methyl-2-pentanone	10	53	U																
2-Hexanone	10	53	U																
Tetrachloroethene	10	5	U																
1,1,2,2-Tetrachloroethane	10	5	U																
Toluene	10	5	U																
Chlorobenzene	10	5	U																
Ethylbenzene	10	5	U																
Styrene	10	5	U																
Xylene (total)	10	5	U																

JBC 4-18-95

000011

1907 B/40106

9613478.2361

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMP

Case No.: V44408

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

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

Lab File ID: E2000

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6

Date Analyzed: 02/06/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

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

CAS NO. COMPOUND UG/KG Q

74-87-3	-----Chloromethane	11	U
74-83-9	-----Bromomethane	11	U
75-01-4	-----Vinyl Chloride	11	U
75-00-3	-----Chloroethane	11	U
75-09-2	-----Methylene Chloride	11	U
67-64-1	-----Acetone	110	U
75-15-0	-----Carbon Disulfide	5	U
75-35-4	-----1,1-Dichloroethene	5	U
75-34-3	-----1,1-Dichloroethane	5	U
540-59-0	-----1,2-Dichloroethene (total)	5	U
67-66-3	-----Chloroform	5	U
107-06-2	-----1,2-Dichloroethane	5	U
78-93-3	-----2-Butanone	110	U
71-55-6	-----1,1,1-Trichloroethane	5	U
56-23-5	-----Carbon Tetrachloride	5	U
75-27-4	-----Bromodichloromethane	5	U
78-87-5	-----1,2-Dichloropropane	5	U
10061-01-5	-----cis-1,3-Dichloropropene	5	U
79-01-6	-----Trichloroethene	5	U
124-48-1	-----Dibromochloromethane	5	U
79-00-5	-----1,1,2-Trichloroethane	5	U
71-43-2	-----Benzene	5	U
10061-02-6	-----trans-1,3-Dichloropropene	5	U
75-25-2	-----Bromoform	5	U
108-10-1	-----4-Methyl-2-Pentanone	53	U
591-78-6	-----2-Hexanone	53	U
127-18-4	-----Tetrachloroethene	5	U
79-34-5	-----1,1,2,2-Tetrachloroethane	5	U
108-88-3	-----Toluene	5	U
108-90-7	-----Chlorobenzene	5	U
100-41-4	-----Ethylbenzene	5	U
100-42-5	-----Styrene	5	U
1330-20-7	-----Xylene (total)	5	U

FORM I VOA

1/87 Rev.

3/30/95 SC 000012 ~~0015~~

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1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMP

Case No.: V44408

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

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

Lab File ID: E2000

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6

Date Analyzed: 02/06/95

Column (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

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

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

3/30/95 SC

000013

~~0018~~

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014

Quanterra Incorporated
 13715 Rider Trail North
 Earth City, Missouri 63045

314 298-8566 Telephone
 314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
7444-008	B0DMT4	50151712	Soil	01/30/95

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: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

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

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analysis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

000016

0000720

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

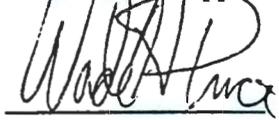
Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\sqmlo01\price\$labbydave\hanford\hanw0430.nar

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page <u>1</u> of <u>13</u>
Collector <u>WS Thompson/Amy Simpson</u>		Date Turnaround
Company Contact <u>RC SMITH/MT STANKOVICH</u>		<input type="checkbox"/> Priority
Telephone No. <u>(509)372-2537/(509)376-2493</u>		<input checked="" type="checkbox"/> Normal

Project Designation 100-D PONDS PHASE II SAMPLING	Sampling Location 100-D	SAF No. B94-098
Ice Chest No. <u>ER-80</u>	Field Logbook No.	Method of Shipment HAND DELIVER
Shipped To QUANTERRA	Offette Property No. N/A	Bill of Lading/Air Bill No. N/A

Possible Sample Hazards/Remarks	Preservative	COOL 4													
	Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G	
No. of Container(s)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Special Handling and/or Storage	Volume	ICP METALS-TAL/AA MATALS (As, Pb, Se, Tl)	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVI-TY SCAN	total alpha GEA	total alpha beta GEA	total alpha beta GEA
COOL TO 4 DEGREES CENTIGRADE	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml	
SAMPLE ANALYSIS		A	B	C	D	E	F	G	H	501518				

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	501518	12	13	14	15	16
<u>1-27-95</u> 000173 BODMT9	17s	1-27-95	0910	X													
BODMT412	S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By <u>David St. John</u>	Date/Time <u>1/30/95</u>	DATA DELIVERABLE-STAND ALONE. LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET. *THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g Correction from 1,500ml to 3,500ml jars. Wrong but initially checked, corrected in field. Reedy & Thompson 1-27-95
Received By <u>RC Smith</u>	Date/Time <u>0870</u>	
Relinquished By <u>RC Smith</u>	Date/Time <u>1-30-95</u>	
Received By <u>David St. John</u>	Date/Time <u>1-30-95</u>	

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

- 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

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/224-022

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

- ~~was 59~~ ~~was 506~~ ~~50132209~~ +05 32303 +05
 1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) ~~was 386~~
~~was 306~~ ~~was 403~~ 50151712 + 51812
 2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, BODMV2 (1 SDG, summary deliverable) ~~was 403~~

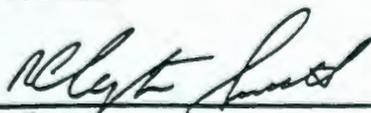
DESCRIPTION OF EVENT:

- 1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.
- 2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.
- SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

- 1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.
- 2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith /  1/31/95
 OSM Project Coordinator (Print/sign Name) Date

M.T. Stankovich /  2/13/95
 Technical Representative (Print/sign Name) Date

N/A
 Quality Assurance (Print/sign Name) Date

000019

Handwritten initials

76137/8.2369
OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

MS
1/17/95

REV. 3 .

DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES 28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY: 1. EXPEDITED RESPONSE ACTION
2. TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY REGULAR RADCHEM

SAMPLE MATRIX: SOIL/SEDIMENT SLUDGE WATER CONCRETE VEGETATION OTHER _____
OILS _____

LABORATORY SERVICES ON-SITE OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
<u>Quanterra (Main)</u>	<u>Not Applicable</u>	<u>N/A</u>
<u>Lockheed (Split)</u>	<u>Not Applicable</u>	<u>N/A</u>
_____	_____	_____

COMMENTS:

- ▶▶ Revision 1 — Changes to the EAL bottle requirements.
- ▶▶ Revision 2 — Change to laboratories.
- ▶▶ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

- ▶▶ Data Deliverable — Standalone
- ▶▶ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

9613478.2370

Appendix 5

Data Validation Supporting Documentation

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GC/MS ORGANIC DATA VALIDATION CHECKLIST

IDENTIFICATION	A	B	C	D	E
----------------	---	---	---	----------	---

PROJECT: WTC DATA PACKAGE: SAF-B94-098
2/28/1954

ANALYST: S. Chan LAB: _____ DATE: ~~W0430~~ 3/30/95

IDENTIFICATION: V44408 SDG: W0430

ANALYSES PERFORMED

P Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input checked="" type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLES/MATRIX Soil
BODMT4

DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A
 Case narrative present? Yes No N/A

Comments: _____

HOLDING TIMES

sample holding times acceptable? Yes No N/A

Comments: _____

A-DK

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

- Is the GC/MS tuning/performance check acceptable? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are continuing calibrations acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: _____
 "u" for Methylene Chloride detect in
 lab blank

5. ACCURACY

- Were surrogates/System Monitoring Compounds analyzed? Yes No N/A
- Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
- Were MS/MSD samples analyzed? Yes No N/A
- Are MS/MSD results acceptable? Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? Yes No N/A
Are field duplicate RPD values acceptable? Yes No N/A
Are field split RPD values acceptable? Yes No N/A

SC 3/31/95

Comments: _____

7. SYSTEM PERFORMANCE

Were internal standards analyzed? Yes No N/A
Are internal standard areas acceptable? Yes No N/A
Are internal standard retention times acceptable? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? Yes No N/A
Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? Yes No N/A
Are all results supported in the raw data? Yes No N/A
Do results meet the CRQLs? Yes No N/A
Has the laboratory properly identified and coded all TIC? Yes No N/A

3/31/95 SC

Comments: _____

RECORD COPY



Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Semi-Volatiles - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Semi-VOA-TCL

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

000001

If holding times are exceeded, but not by $>2x$ the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by $>2x$ the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Instrument Calibration and Tuning**

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are performed according to CLP protocols and all results must meet validation requirements set by Westinghouse-Hanford (WHC 1992,b). An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at $<5X$ the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at $<10x$ the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is $<CRQL$ and is $<10x$ (or $<5x$ for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within ± 0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is $<5x$ (or $<10x$ for common laboratory contaminants) the highest blank concentration.

Due to the presence of a positive blank result, sample number B0DMT4 was flagged "U" for aldol condensate.

Due to the presence of a positive blank result, sample number BODMT4 was flagged "U" for butylbenzylphthalate.

All other method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using six compounds and percent recoveries must be within the established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results $< 5x$ the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results $> 5x$ the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results $> CRQL$ are qualified as estimates and flagged "J". Sample results $< CRQL$ and below the lower control limit are qualified as estimates and flagged "UJ". Sample results $< CRQL$ with recoveries above the upper control limit require no qualification. Compounds with surrogate recoveries $< 10\%$ are qualified as "J" for detects, and "UR" for nondetects.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol, results must be within RPD limits of $\pm 35\%$. If RPD values are out of

specification and the sample concentration is $< 5x$ the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is $> 5x$ the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

- **System Performance**

- Internal Standards Performance

The evaluation of the internal standards criteria provide a means to assess the stability and sensitivity of the GC/MS system on every analysis. Internal standard area counts must be within the limits of -50% to +100% of the most recent standard. The retention time of the internal standard must not vary by more than ± 30 seconds of the most recent calibration. If area counts for a particular internal are outside the control limits or relative retention time criteria are $> \pm 30$ seconds, all associated sample results are qualified as estimates (J for detects, UJ for non-detects). If area counts and retention times are both outside control limits, all non-detect sample results associated with that internal standard are qualified as unusable "UR".

All internal standard recovery results were acceptable.

- Compound Identification

The identity of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If a compound was incorrectly reported as undetected, the associated result is qualified as detected (no qualifier) or estimated "J". If retention time and mass spectral criteria are exceeded, all associated results are qualified as unusable and flagged "R". If it is determined that incorrect identifications were made as a result of cross-contamination or carryover between analyses, then the affected data are qualified as unusable and flagged "UR/R".

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw

data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive blank contamination was noted in one butylbenzylphthalate result and in one aldol condensate results. All results were flagged accordingly. Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

000006

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 same 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 the 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 is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

0000C8

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUSE--HANFORD																						
Laboratory: QUANTERRA																						
Case:		SDG: W0430																				
Sample Number		B0DMT4																				
Location		Test Pit #2																				
Remarks																						
Sample Date		01/27/95																				
Extraction Date		02/02/95																				
Analysis Date		02/06/95																				
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Phenol	330	700	U																			
bis(2-Chloroethyl)ether	330	700	U																			
2-Chlorophenol	330	700	U																			
1,3-Dichlorobenzene	330	700	U																			
1,4-Dichlorobenzene	330	700	U																			
1,2-Dichlorobenzene	330	700	U																			
2-Methylphenol	330	700	U																			
2,2'-oxybis(1-Chloropropane)	330	700	U																			
4-Methylphenol	330	700	U																			
N-Nitroso-di-n-propylamine	330	700	U																			
Hexachloroethane	330	700	U																			
Nitrobenzene	330	700	U																			
Isophorone	330	700	U																			
2-Nitrophenol	330	700	U																			
2,4-Dimethylphenol	330	700	U																			
bis(2-Chloroethoxy)methane	330	700	U																			
2,4-Dichlorophenol	330	700	U																			
1,2,4-Trichlorobenzene	330	700	U																			
Naphthalene	330	700	U																			
4-Chloroaniline	1700	1400	U																			
Hexachlorobutadiene	330	700	U																			
4-Chloro-3-methylphenol	1700	1400	U																			
2-Methylnaphthalene	330	700	U																			
Hexachlorocyclopentadiene	330	700	U																			
2,4,6-Trichlorophenol	330	700	U																			
2,4,5-Trichlorophenol	330	700	U																			
2-Chloronaphthalene	330	700	U																			
2-Nitroaniline	1700	3500	U																			
Dimethyl phthalate	330	700	U																			
Acenaphthylene	330	700	U																			
2,6-Dinitrotoluene	330	700	U																			

RBC 4-18-95

000011

Project: WESTINGHOUSE-HANFORD																					
Laboratory: QUANTERRA																					
Case:		SDG: W0430																			
Sample Number		B0DMT4																			
Location		Test Pit #2																			
Remarks																					
Sample Date		01/27/95																			
Extraction Date		02/02/95																			
Analysis Date		02/06/95																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
3-Nitroaniline	1700	3500	U																		
Acenaphthene	330	700	U																		
2,4-Dinitrophenol	1700	3500	U																		
4-Nitrophenol	1700	3500	U																		
Dibenzofuran	330	700	U																		
2,4-Dinitrotoluene	330	700	U																		
Diethyl phthalate	330	700	U																		
4-Chlorophenyl-phenyl ether	330	700	U																		
Fluorene	330	700	U																		
4-Nitroaniline	1700	1400	U																		
4,6-Dinitro-2-methylphenol	1700	3500	U																		
N-Nitrosodiphenylamine	330	700	U																		
4-Bromophenyl-phenylether	330	700	U																		
Hexachlorobenzene	330	700	U																		
Pentachlorophenol	1700	3500	U																		
Phenanthrene	330	700	U																		
Anthracene	330	700	U																		
Carbazole	330	700	U																		
Di-n-butylphthalate	330	700	U																		
Fluoranthene	330	700	U																		
Pyrene	330	700	U																		
Butyl benzyl phthalate	330	700	U																		
3,3'-Dichlorobenzidine	330	1400	U																		
Benzo(a)anthracene	330	700	U																		
Chrysene	330	700	U																		
bis(2-Ethylhexyl) phthalate	330	700	U																		
Di-n-octylphthalate	330	700	U																		
Benzo(b)fluoranthene	330	700	U																		
Benzo(k)fluoranthene	330	700	U																		
Benzo(a)pyrene	330	700	U																		
Indeno(1,2,3-cd)pyrene	330	700	U																		
Dibenz(a,h)anthracene	330	700	U																		
Benzo(g,h,i)perylene	330	700	U																		

000012

RBC - 4/18/95

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA MO

Contract: 550-56

BODMT4

Lab Code: ITMO

Case No.: S44408

SAS No.:

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G

Lab File ID: D6748

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6 dec.

Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N

pH:

Dilution Factor: 1.00

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

CAS NO.

COMPOUND

Q

108-95-2	Phenol	700	U
111-44-4	bis(2-Chloroethyl) Ether	700	U
95-57-8	2-Chlorophenol	700	U
541-73-1	1,3-Dichlorobenzene	700	U
106-46-7	1,4-Dichlorobenzene	700	U
95-50-1	1,2-Dichlorobenzene	700	U
95-48-7	2-Methylphenol	700	U
108-60-1	2,2'-oxybis(1-Chloropropane)	700	U
106-44-5	4-Methylphenol	700	U
621-64-7	N-Nitroso-Di-n-Propylamine	700	U
67-72-1	Hexachloroethane	700	U
98-95-3	Nitrobenzene	700	U
78-59-1	Isophorone	700	U
88-75-5	2-Nitrophenol	700	U
105-67-9	2,4-Dimethylphenol	700	U
111-91-1	bis(2-Chloroethoxy) Methane	700	U
120-83-2	2,4-Dichlorophenol	700	U
120-82-1	1,2,4-Trichlorobenzene	700	U
91-20-3	Naphthalene	700	U
106-47-8	4-Chloroaniline	1400	U
87-68-3	Hexachlorobutadiene	700	U
59-50-7	4-Chloro-3-Methylphenol	1400	U
91-57-6	2-Methylnaphthalene	700	U
77-47-4	Hexachlorocyclopentadiene	700	U
88-06-2	2,4,6-Trichlorophenol	700	U
95-95-4	2,4,5-Trichlorophenol	700	U
91-58-7	2-Chloronaphthalene	700	U
88-74-4	2-Nitroaniline	3500	U
131-11-3	Dimethyl Phthalate	700	U
208-96-8	Acenaphthylene	700	U
606-20-2	2,6-Dinitrotoluene	700	U

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA MO Contract: 550-56
 Lab Code: ITMO Case No.: S44408 SAS No.: SDG No.: W0430
 Matrix: (soil/water) SOIL Lab Sample ID: 7444-008
 Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6748
 Level: (low/med) LOW Date Received: 01/30/95
 % Moisture: not dec. 6 dec. Date Extracted: 02/02/95
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95
 GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

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

99-09-2	3-Nitroaniline	3500	U
83-32-9	Acenaphthene	700	U
51-28-5	2,4-Dinitrophenol	3500	U
100-02-7	4-Nitrophenol	3500	U
132-64-9	Dibenzofuran	700	U
121-14-2	2,4-Dinitrotoluene	700	U
84-66-2	Diethylphthalate	700	U
7005-72-3	4-Chlorophenyl-phenylether	700	U
86-73-7	Fluorene	700	U
100-01-6	4-Nitroaniline	1400	U
534-52-1	4,6-Dinitro-2-Methylphenol	3500	U
86-30-6	N-Nitrosodiphenylamine (1)	700	U
101-55-3	4-Bromophenyl-phenylether	700	U
118-74-1	Hexachlorobenzene	700	U
87-86-5	Pentachlorophenol	3500	U
85-01-8	Phenanthrene	700	U
120-12-7	Anthracene	700	U
86-74-8	Carbazole	700	U
84-74-2	Di-n-Butylphthalate	700	U
206-44-0	Fluoranthene	700	U
129-00-0	Pyrene	700	U
85-68-7	Butylbenzylphthalate	700	U U
91-94-1	3,3'-Dichlorobenzidine	1400	U
56-55-3	Benzo (a) Anthracene	700	U
218-01-9	Chrysene	700	U
117-81-7	bis (2-Ethylhexyl) Phthalate	700	U
117-84-0	Di-n-Octyl Phthalate	700	U
205-99-2	Benzo (b) Fluoranthene	700	U
207-08-9	Benzo (k) Fluoranthene	700	U
50-32-8	Benzo (a) Pyrene	700	U
193-39-5	Indeno (1,2,3-cd) Pyrene	700	U
53-70-3	Dibenz (a,h) Anthracene	700	U
191-24-2	Benzo (g,h,i) Perylene	700	U

(1) - Cannot be separated from Diphenylamine

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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO

Case No.: S44408

SAS No.:

SDG No.: W0430

Matrix: (soil/water) SOIL

Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G

Lab File ID: D6748

Level: (low/med) LOW

Date Received: 01/30/95

% Moisture: not dec. 6 dec.

Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1.00

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	5.31	16000	ABJU
2.	UNKNOWN	29.13	77	J

0118C

9613478.2394

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000016

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
7444-008	BODMT4	50151712	Soil	01/30/95

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: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

000017

00007198

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

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

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analysis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

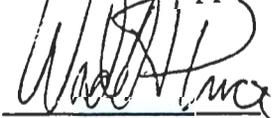
Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\\sqmlo01\price\$labbydave\hanford\hanw0430.nar

000019

80007206

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

WS Thompson / Amy Simpson

Data Turnaround

Priority
 Normal

Collector Dave St. John / Doug Bauer	Company Contact RC SMITH/MT STANKOVICH	Telephone No. (509)372-2537/(509)376-2493
Project Designation 100-D PONDS PHASE II SAMPLING	Sampling Location 100-D	SAF No. 894-098
Ice Chest No. Er-80	Field Logbook No.	Method of Shipment HAND DELIVER
Shipped To QUANTERRA	Offsite Property No. N/A	Bill of Lading/Air Bill No. N/A

Possible Sample Hazards/Remarks	Preservative	COOL 4																		
	Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G									
No. of Container(s)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Volume		125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml	500ml*	950ml						

Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	SAMPLE ANALYSIS	ICP METALS-TAL/AA METALS (As, Pb, Se, Tl)	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA
		A	B	C	D	E	F	G	H	501518				

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
100-173 BODMT9	17s	1-27-95	0910	X																									
BODMT412	S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	12
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	13
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	16

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By <i>David St. John</i>	Date/Time 1/30/95	Received By <i>Eric</i>	Date/Time 0870
Relinquished By <i>David St. John ERC</i>	Date/Time 0830	Received By <i>Kia Carter</i>	Date/Time 1-30-95
Relinquished By <i>Eric</i>	Date/Time 11:40	Received By <i>Quanterra</i>	Date/Time 11:40
Relinquished By <i>Kia Carter</i>	Date/Time 1-30-95	Received By <i>Karen Hattenburg</i>	Date/Time 1-30-95
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
 DATA DELIVERABLE-STAND ALONE.
 LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.
 **THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g
 Correction from 1,500ml to 3,500ml jars. Wrong but initially checked, corrected in field. *Stenley J Thompson* 1-27-95

- 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

SDG-W0403

9613478.2398

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/824-089

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

- w039 w0386 50132209 + 05 32303 + 05*
 1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) *w0386*
w030 w0403 50151712 + 51812
 2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BODSMX5, BODMVO, BODMV1, BODMV2 (1 SDG, summary deliverable) *w0403*

DESCRIPTION OF EVENT:

- 1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.
- 2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.
- SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

- 1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.
- 2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BODSMX5, BODMVO, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ *[Signature]* 1/31/95
OSM Project Coordinator (Print/sign Name) Date

M.T. Stankovich/ *[Signature]* 2/13/95
Technical Representative (Print/sign Name) Date

N/A 000021
Quality Assurance (Print/sign Name) Date

AA 28

9613478.2400
OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

rcs
1/17/95

REV. 3 .

DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY: 1. EXPEDITED RESPONSE ACTION
2. TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY REGULAR RADCHEM

SAMPLE MATRIX: SOIL/SEDIMENT SLUDGE WATER CONCRETE VEGETATION OTHER _____ OILS

LABORATORY SERVICES ON-SITE OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
<u>Quanterra (Main)</u>	<u>Not Applicable</u>	<u>N/A</u>
<u>Lockheed (Split)</u>	<u>Not Applicable</u>	<u>N/A</u>
_____	_____	_____

COMMENTS:

- ▶▶ Revision 1 — Changes to the EAL bottle requirements.
- ▶▶ Revision 2 — Change to laboratories.
- ▶▶ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

- ▶▶ Data Deliverable — Standalone
- ▶▶ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

9613478.2401

Appendix 5

Data Validation Supporting Documentation

000023

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
-------------------	---	---	---	----------	---

OBJECT: WHC DATA PACKAGE: W0430 ^{3/30/95} SAFE-894-018

ANALYST: S. Chan LAB: _____ DATE: 3/30/95

PROJECT: S4408 SDG: W0430

ANALYSES PERFORMED

CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input checked="" type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLES/MATRIX Soil
BODMTY

DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? **Yes** No N/A
 Is a case narrative present? **Yes** No N/A
 Comments: _____

HOLDING TIMES

Are sample holding times acceptable? **Yes** No N/A
 Comments: _____

ATL

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

- Is the GC/MS tuning/performance check acceptable? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are continuing calibrations acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were laboratory blanks analyzed? Yes No N/A
- Are laboratory blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: _____
 Butylbenzyl phthalate: 490 (in blank)
 "u" in sample

5. ACCURACY

- Were surrogates/System Monitoring Compounds analyzed? Yes No N/A
- Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
- Were MS/MSD samples analyzed? Yes No N/A
- Are MS/MSD results acceptable? Yes No N/A

Comments: _____ 3/30/95
 MSD

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: _____

RPP = 1,2,4-Trichlorobenzene: +25 (limit - 23)

Acenaphthene: 210 (limit: 19)

No qualification required since all results are non-detected.

Analyze J only for detects - as per guidelines.

7. SYSTEM PERFORMANCE

- Were internal standards analyzed? Yes No N/A
- Are internal standard areas acceptable? Yes No N/A
- Are internal standard retention times acceptable? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? Yes No N/A
- Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Do results meet the CRQLs? Yes No N/A
- Has the laboratory properly identified and coded all TIC? Yes No N/A

Comments: _____

9613478.2410

RECORD COPY



Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Pesticide/PCB - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Pesticide/PCB

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by $< 2x$ the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If

000001

holding times are exceeded by $> 2x$ the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Instrument Performance and Calibrations**

- Initial Calibrations

- The laboratory performed an initial multipoint calibration for all target compounds at the concentrations required by SW-846 protocols. The linearity of the initial calibration is established when the %RSD or the calibration factors are $< 20\%$. If the RSD is $> 20\%$, all detected results are qualified as estimates and flagged "J", and all nondetects are flagged "UJ".

- All initial calibration results were acceptable.

- Calibration Verification

- The criteria for acceptable continuing calibrations requires that the calibration factors for all target compounds have a percent difference of $\leq 15\%$ of the average calibration factor calculated for the associated initial calibration standard. If the percent difference for the continuing calibration is $> 15\%$, all associated results for that compound are qualified as estimates (J for detects, UJ for nondetects).

- Continuing calibration results exceeded the 15% QC limit for alpha-BHC, beta-BHC, delta-BHC, 4,4-DDE, endrin, 4,4-DDD, heptachlor, 4,4-DDT, aroclor-1221, aroclor-1248 and methoxychlor in sample number BODMT4. All associated samples were qualified as estimates and flagged "UJ".

- All other calibration verification results were acceptable.

- **Blanks**

- Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration $> CRQL$. If target compounds are present, sample results $< 5x$ the blank concentration are qualified as undetected "U". If the sample result is $< 5x$ the blank concentration and $< CRQL$, the result is qualified as undetected and elevated to the CRQL.

All method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits (EPA 1991b). If spike recoveries are outside control limits, detected sample results $< 5x$ the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results $> 5x$ the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Undetected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol, results must be within RPD limits of $\pm 35\%$. If RPD values are out of specification and the sample concentration is $< 5x$ the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If

RPD values are out of specification and the sample concentration is $> 5x$ the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

- **System Performance**

Compound Identification

The identity of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If the qualitative criteria are not met, detected results are qualified as follows: Misidentified peaks outside the retention time window are reported to the CRQL level if no interferences are noted. If the misidentified peak interferes with a target peak then the reported value is qualified as estimated and undetected "UJ". If detected results have not been analyzed on dissimilar columns, qualify the results as unusable "R".

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to calibration verification results outside QC limits, eleven compounds in sample number BODMT4 were qualified as estimates and flagged "UJ". Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

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 same 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 the 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 is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

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DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
alpha-BHC	UJ	BODMT4	%D in Continuing Calibration Out
delta-BHC	UJ	BODMT4	%D in Continuing Calibration Out
beta-BHC	UJ	BODMT4	%D in Continuing Calibration Out
4,4-DDE	UJ	BODMT4	%D in Continuing Calibration Out
Endrin	UJ	BODMT4	%D in Continuing Calibration Out
4,4-DDD	UJ	BODMT4	%D in Continuing Calibration Out
Heptachlor	UJ	BODMT4	%D in Continuing Calibration Out
4,4-DDT	UJ	BODMT4	%D in Continuing Calibration Out
Methoxychlor	UJ	BODMT4	%D in Continuing Calibration Out
Aroclor-1221	UJ	BODMT4	%D in Continuing Calibration Out
Aroclor-1248	UJ	BODMT4	%D in Continuing Calibration Out

000009

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUSE-HANFORD																			
Laboratory: QUANTERRA																			
Case:	SDG: W0430																		
Sample Number	B0DMT4																		
Location	Test Pit #2																		
Remarks																			
Sample Date	01/27/95																		
Extraction Date	02/03/95																		
Analysis Date	02/08/95																		
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	1.1	UJ																
beta-BHC	1.7	2.1	UJ																
delta-BHC	1.7	3.2	UJ																
gamma-BHC (Lindane)	1.7	1.4	U																
Heptachlor	1.7	1.1	UJ																
Aldrin	1.7	1.4	U																
Heptachlor epoxide	1.7	30	U																
Endosulfan I	1.7	5.0	U																
Dieldrin	3.3	0.71	U																
4,4'-DDE	3.3	1.4	UJ																
Endrin	3.3	2.1	UJ																
Endosulfan II	3.3	1.4	U																
4,4'-DDD	3.3	3.9	UJ																
Endosulfan sulfate	3.3	24	U																
4,4'-DDT	3.3	4.3	UJ																
Methoxychlor	17.0	63	UJ																
Endrin Ketone	3.3	8.2	U																
Tech. Chlordane	1.7	5.0	U																
Toxaphene	170.0	85	U																
Arochlor-1221	33.0	36	UJ																
Arochlor-1232	67.0	36	U																
Arochlor-1242/1016	33.0	24	U																
Arochlor-1248	33.0	36	UJ																
Arochlor-1254	33.0	36	U																
Arochlor-1260	33.0	36	U																

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RBe 4/18/95

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA, MO Contract: 550-56
 Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0430
 Matrix: (soil/water) SOIL Lab Sample ID: 7444-008
 Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____
 Level: (low/med) LOW Date Sampled: 01-27-95
 % Moisture: not dec. 6 dec. _____ Date Extracted: 02-03-95
 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-08-95
 GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	alpha-BHC	1.1	U J
319-85-7	beta-BHC	2.1	U J
319-86-8	delta-BHC	3.2	U J
58-89-9	gamma-BHC (Lindane)	1.4	U
76-44-8	Heptachlor	1.1	U J
309-00-2	Aldrin	1.4	U
1024-57-3	Heptachlor epoxide	30	U
959-98-8	Endosulfan I	5.0	U
60-57-1	Dieldrin	0.71	U
72-55-9	4,4'-DDE	1.4	U J
72-20-8	Endrin	2.1	U J
33213-65-9	Endosulfan II	1.4	U
72-54-8	4,4'-DDD	3.9	U J
1031-07-8	Endosulfan sulfate	24	U
50-29-3	4,4'-DDT	4.3	U J
72-43-5	Methoxychlor	63	U J
7421-93-4	Endrin Aldehyde	8.2	U
57-74-9	Chlordane (technical)	5.0	U
8001-35-2	Toxaphene	85	U
11104-28-2	Aroclor-1221	36	U J
11141-16-5	Aroclor-1232	36	U
53469-21-9/12674-11-2	Aroclor-1242/1016	24	U
12672-29-6	Aroclor-1248	36	U J
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

U: Concentration of analyte is less than the value given.

FORM I PEST

3/30/95 SC

A00302

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
7444-008	B0DMT4	50151712	Soil	01/30/95

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: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

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Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

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

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analysis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

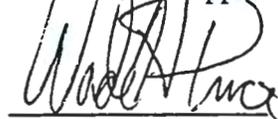
Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\sqm\lo01\price\$abbydave\hanford\hanw0430.nar

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~~0000720~~

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

WS Thompson/Amy Simpson

Date Turnaround

Priority
 Normal

Collector Dave St. John / Doug Baver	Company Contact RC SMITH/MT STANKOVICH	Telephone No. (509)372-2537/(509)376-2493
Project Designation 100-D PONDS PHASE II SAMPLING	Sampling Location 100-D	SAF No. 894-098
Ice Chest No. Er-80	Field Logbook No.	Method of Shipment HAND DELIVER
Shipped To QUANTERRA	Offsite Property No. N/A	Bill of Lading/Air Bill No. N/A

Possible Sample Hazards/Remarks	Preservative	COOL 4		COOL 4														
	Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G	P/G	P/G	P/G	P/G
	No. of Container(s)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml	500ml	950ml				

SAMPLE ANALYSIS	ICP METALS-TAL/AA METALS (As, Pb, Se, Tl)	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA
	A	B	C	D	E	F	G	H	501518				

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CA	CB
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SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-B Ponds/824-022

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

~~W0389~~ ~~W03706~~ 50132209 + 05 32303 + 05

1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) ~~W0386~~

~~W03D60403~~ 50151712 + 51812

2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BODSMX5, BODMV0, BODMV1, BODMV2 (1 SDG, summary deliverable) ~~W0403~~

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

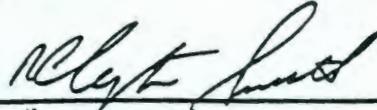
SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BODSMX5, BODMV0, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith / 
OSM Project Coordinator (Print/Sign Name)

1/31/95
Date

M.T. Stankovich / 
Technical Representative (Print/Sign Name)

2/13/95
Date

N/A
Quality Assurance (Print/Sign Name)

000018

Date

000018

2613978 2928
OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

MS
11/7/95

REV. 3 .

DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY: 1. EXPEDITED RESPONSE ACTION
2. TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY REGULAR RADCHEM

SAMPLE MATRIX: SOIL/SEDIMENT SLUDGE WATER CONCRETE VEGETATION OTHER _____ OILS

LABORATORY SERVICES ON-SITE OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
<u>Quanterra (Main)</u>	<u>Not Applicable</u>	<u>N/A</u>
<u>Lockheed (Split)</u>	<u>Not Applicable</u>	<u>N/A</u>
_____	_____	_____

COMMENTS:

- ▶▶ Revision 1 — Changes to the EAL bottle requirements.
- ▶▶ Revision 2 — Change to laboratories.
- ▶▶ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

- ▶▶ Data Deliverable — Standalone
- ▶▶ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

PAGE 1 OF 2

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9613478.2429

Appendix 5

Data Validation Supporting Documentation

000020

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: <i>WHC</i>	DATA PACKAGE: <i>SAF-1394-098</i>				
VALIDATOR: <i>S. Chari</i>	LAB:		DATE: <i>3/30/95</i>		
CASE:		SDG: <i>W0430</i>			

ANALYSES PERFORMED

<input type="checkbox"/> CLP3/90	<input checked="" type="checkbox"/> SW-846 8080	<input type="checkbox"/> SW-846 8081	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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SAMPLES/MATRIX *SOIL*

BODMT4

DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

technical verification documentation present? **Yes** No N/A

a case narrative present? **Yes** No N/A

Comments: _____

HOLDING TIMES

sample holding times acceptable? **Yes** No N/A

Comments: _____

INSTRUMENT PERFORMANCE AND CALIBRATIONS

INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

DDT retention times acceptable **Yes** No N/A

calibration standard retention times acceptable? **Yes** No N/A

DDT and endrin breakdowns acceptable? **Yes** No N/A

A-5 BC

000021

06131179 2431

Are DBC retention times acceptable? Yes No N/A
Is the GC/MS tuning/performance check acceptable? Yes No N/A

Comments: _____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? Yes No N/A
Are quantitation column calibration factor %RSD values acceptable? Yes No N/A
Were the analytical sequence requirements met? Yes No N/A
Are continuing calibration %D values acceptable? Yes No N/A

Comments: _____
All up table for qualifiers

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? Yes No N/A
Was the resolution acceptable in the resolution check mix? Yes No N/A
Is resolution acceptable in the PEM, INDA and INDB? Yes No N/A
Are DDT and Endrin breakdowns acceptable? Yes No N/A
Are retention times in PEMs and calibration mixes acceptable? Yes No N/A
Are RPD values in the PEMs acceptable? Yes No N/A
Are %RSD values acceptable? Yes No N/A

Comments: _____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? Yes No N/A
Is resolution acceptable in the PEMs? Yes No N/A
Are initial calibrations acceptable? Yes No N/A

A-682

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Retention times acceptable in the PEMS, INDA and INDB mixes? Yes No N/A

RPD values in the PEMS acceptable? Yes No N/A

the DDT and endrin breakdowns acceptable? Yes No N/A

GPC cleanup performed? Yes No N/A

the GPC calibration check acceptable? Yes No N/A

Florisol cleanup performed? Yes No N/A

the Florisol performance check acceptable? Yes No N/A

Comments: _____

BLANKS

laboratory blanks analyzed? Yes No N/A

laboratory blank results acceptable? Yes No N/A

field/trip blanks analyzed? Yes No N/A

field/trip blank results acceptable? Yes No N/A

Comments: _____

ACCURACY

surrogates analyzed? Yes No N/A

surrogate recoveries acceptable? Yes No N/A

MS/MSD samples analyzed? Yes No N/A

MS/MSD results acceptable? Yes No N/A

LCS samples analyzed? Yes No N/A

LCS results acceptable? Yes No N/A

Comments: _____

A-786

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD values acceptable? Yes No N/A
- Are laboratory duplicate results acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: _____

7. SYSTEM PERFORMANCE

- Is chromatographic performance acceptable? Yes No N/A
- Are positive results resolved acceptably? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? Yes No N/A
- Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

- Are results reported for all requested analyses? Yes No N/.
- Are all results supported in the raw data? Yes No N/
- Do results meet the CRQLs? Yes No N/

Comments: _____

A-8/BL

CALIBRATION DATA SUMMARY

SDG: W0430		REVIEWER: SC		DATE: 3/30/95		PAGE 1 OF 1	
COMMENTS: No problems.							
CALIB. TYPE:		INITIAL		<u>CONTINUING</u>		INSTRUMENT:	
CALIB. DATE	COMPOUND	RF	RSD/ <u>%D</u> / <u>%R</u>	SAMPLES AFFECTED	QUALIFIER		
2/7/95	alpha-BHC		32%	BODMT4	UJ		
2/7/95	delta-BHC		30	BODMT4	UJ		
2/7/95	beta-BHC		47	BODMT4	UJ		
2/7/95	4,4-DDE		33	BODMT4	UJ		
2/7/95	Endrin		35	BODMT4	UJ		
2/7/95	4,4-DDD		29	BODMT4	UJ		
2/7/95	Heptachlor		17	BODMT4	UJ		
2/7/95	4,4-DDT		17	BODMT4	UJ		
2/7/95	Methoxychlor		24	BODMT4	UJ		
2/7/95	Aroclor-1221		24	BODMT4	UJ		
2/7/95	Aroclor-1248		19	BODMT4	UJ		

000025



Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Inorganics - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: SW-846/ICP Metals, SW-846/GFAA Metals

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

• **Holding Times**

Analytical holding times for ICP metals and GFAA metals analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six months for all metals.

Holding time requirements for all analytes were met.

- **Blanks**

Calibration Blanks

A calibration blank must be analyzed immediately after every initial and continuing calibration verification. The blank must be analyzed at the beginning of the run and after the last analytical sample. In the case of positive blank results, samples with digestate concentrations (in ug/L) of $< 5x$ the highest amount found in any of the associated blanks have had their associated values qualified as non-detected and flagged "U". Samples with concentrations $> 5x$ the highest blank value do not require qualification.

In the case of negative calibration blank results, if the absolute value of any calibration blank exceeds the Instrument Detection Limit (IDL), all non-detects are qualified as estimates and flagged "UJ", and all positive results within two times ($2x$) the absolute value of the blank result are qualified as estimates and flagged "J". The qualification is applied only to results generated between the calibration blank IDL and the nearest acceptable blank.

All calibration blank results were acceptable.

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations (in ug/L) of $< 5x$ the preparation blank value have had their associated values qualified as non-detects and flagged "U". Samples with concentrations $> 5x$ the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all non-detects are rejected and flagged "UR" and all detects that are $< 10x$ the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is $> IDL$ and $\leq CRDL$, all non-detects are qualified as estimates and flagged "UJ" and all detects $< 10x$ the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are $> 10x$ the absolute value of the preparation blank, no qualification is necessary.

Due to the presence of negative preparation blank results, sample number BODMT4 was flagged "BJ" for beryllium.

All other preparation blanks results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of <30% and a sample value below the IDL were rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result <IDL are qualified "UJ". Samples with a spike recovery of >125% or <75% and a sample result >IDL are qualified "J". Finally, all samples with a spike recovery >125% and a sample result <IDL, no qualification is required.

The matrix spike recovery fell outside QC limits and the associated result was flagged "BJ" for antimony in sample number BODMT4.

The matrix spike recovery fell outside QC limits and the associated result was flagged "J" for manganese in sample number BODMT4.

The matrix spike recovery fell outside QC limits and the associated result was flagged "UJ" for thallium in sample number BODMT4.

All other matrix spike recovery results were acceptable.

Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be digested or distilled and analyzed with every group of samples which have been prepared together. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

One liquid LCS was digested and analyzed for each sample batch in this report that contained water samples.

All LCS results were found to be acceptable.

- **Precision**

Laboratory Duplicate Samples

The laboratory duplicate result measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. Samples whose precision fell outside the quality control requirements were qualified as estimates and flagged "J".

All laboratory duplicate recovery results were acceptable.

ICP Serial Dilution

The ICP serial dilution is used to determine whether significant physical or chemical interferences exist due to the sample matrix. If the sample concentration is $\geq 50x$ IDL for an analyte and the %D is outside the control limits $> 10\%$, the associated data must be qualified as estimated "J".

No ICP serial dilution was analyzed with this SDG. No data was qualified since SW-846 methods do not require dilution analysis unless sample concentrations are greater than the linear range of the instrument.

- **Furnace AA Quality Control**

The post-digestion analytical spike is analyzed to determine the extent of interference in the digestate matrix. When the result of the analytical spike analysis exceeds the control window of 85% to 115% recovery and the absorbance of the sample is $> 50\%$ of the analytical spike absorbance, then the sample must be reanalyzed using the MSA. The duplicate injections and the analytical spike recoveries establish the precision and accuracy of the individual GFAA determinations.

Duplicate Injections

Each furnace analysis requires a minimum of two injections (burns), except for full MSA. For concentrations $> CRDL$, the duplicate injection readings must agree within 20% RSD or CV. If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

Analytical Spike Recoveries

For all samples whose analytical spike results are outside the 85% to 115% control limit, but whose absorbances are < 50% of the analytical spike absorbance, the samples were qualified as estimates and flagged "J". In cases where the analytical spike recovery was < 10%, non-detect results were rejected and flagged "UR".

No analytical spikes results were determined for this SDG. No qualification of data was necessary since GFAA analytical spikes are not required by SW-846 validation guidelines.

- **Sample Result Verification and Detection Limits**

Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Negative blank contamination was noted for beryllium. Sample results were qualified accordingly. The results, however, were not sufficiently high to affect the usability of the data. Due to matrix spike recovery problems, antimony, manganese and thallium results were qualified as estimates and flagged "J". Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

- EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.
- EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.
- EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.
- EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.
- WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

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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 same 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 the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, 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 is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

<u>St Louis ID</u>	<u>WHC ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
7444-008	B0DMT4	50151712	Soil	01/30/95

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: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

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00007194

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

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

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analysis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

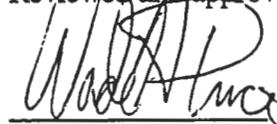
Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\sqr\lo01\price\$labbydave\hanford\hanw0430.nar

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/894-000

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

~~w0389~~ ~~w0386~~ 50132208 + 05 32303 + 05

1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) w0386

~~w0386~~ ~~w0403~~ 50151712 + 51812

2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMVO, BODMV1, BODMV2 (1 SDG, summary deliverable) w0403

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

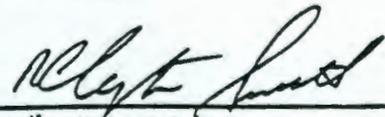
SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMVO, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith / 
OSM Project Coordinator (Print/Sign Name)

1/31/95
Date

M.T. Stankovich / 
Technical Representative (Print/Sign Name)

2/13/95
Date

N/A
Quality Assurance (Print/Sign Name)

000019

Date

AA-86

9613478.2958
OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

rcs
1/17/95

REV. 3 .

DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES 28 SAMPLING LOCATION 100-DR-1

- SAMPLE PRIORITY: 1. EXPEDITED RESPONSE ACTION
2. TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY REGULAR RADCHEM

SAMPLE MATRIX: SOIL/SEDIMENT SLUDGE WATER CONCRETE VEGETATION OTHER _____ OILS

LABORATORY SERVICES ON-SITE OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
<u>Quanterra (Main)</u>	<u>Not Applicable</u>	<u>N/A</u>
<u>Lockheed (Split)</u>	<u>Not Applicable</u>	<u>N/A</u>
_____	_____	_____

COMMENTS:

- ▶▶ Revision 1 — Changes to the EAL bottle requirements.
- ▶▶ Revision 2 — Change to laboratories.
- ▶▶ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

- ▶▶ Data Deliverable — Standalone
- ▶▶ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

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Appendix 5

Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: BHI/WHC			DATA PACKAGE: W0430-QES		
VALIDATOR: RJS	LAB: Quanterra		DATE: 3/28/95		
CASE: 100-DR-1	100-D Ponds	SDG: W0430			
ANALYSES PERFORMED					
<input type="checkbox"/> CLP/CP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Hg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> SW-846/CP	<input checked="" type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX					
BODMTH (soil)					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A

Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: metals < 6 months

A-19/x

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

- Were initial calibrations performed on all instruments? Yes No N/A
- Are initial calibrations acceptable? Yes No N/A
- Are ICP interference checks acceptable? Yes No N/A
- Were ICV and CCV checks performed on all instruments? Yes No N/A
- Are ICV and CCV checks acceptable? Yes No N/A

Comments: _____

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
- Are ICB and CCB results acceptable? Yes No N/A
- Were preparation blanks analyzed? Yes No N/A
- Are preparation blank results acceptable? Yes No N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments: _____
Be - neg Prep blank

5. ACCURACY

- Were spike samples analyzed? Yes No N/A
- Are spike sample recoveries acceptable? Yes No N/A
- Were laboratory control samples (LCS) analyzed? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments: _____
Sb (56.7%) - BJ
Mn (145.2%) - J
Tl (63.2%) - UJ

A-20/21

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? Yes No N/A
- Were ICP serial dilution samples analyzed? Yes No N/A
- Are ICP serial dilution %D values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: NO ICP Serial dilution analysis was performed
with this SDG, therefore all results are qualified
as estimates and flagged (LJ, BJ, S) RS.

* No qualification of data was necessary since
SW-846 methods do not require dilution analysis unless sample
concentration is greater than the linear range.

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? Yes No N/A
- Are duplicate injection %RSD values acceptable? Yes No N/A
- Were analytical spikes performed as required? Yes No N/A
- Are analytical spike recoveries acceptable? Yes No N/A
- Was MSA performed as required? Yes No N/A
- Are MSA results acceptable? Yes No N/A

Comments: NO GFAA analytical spike analysis. NO data
qualified since Guidelines reference laboratory criteria
which doesn't require GFAA spike to be run.

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments: _____

RECORD COPY

Date: April 21, 1995
 To: Westinghouse Hanford Company (technical representative)
 From: A.T. Kearney, Inc.
 Project: 100-DR-1 D-Ponds Phase II Sampling
 Subject: Radiochemistry - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Gross Alpha/Beta and Gamma Spectroscopy

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualifications
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preparation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analyses is six months.

All holding times and sample preparation measures were acceptable.

- **Instrument Calibration and Performance**

Instrument calibration is performed to establish that the counters used to determine radionuclide activities are capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

All calibration results, including efficiency checks and background counts, were acceptable.

- **Blanks**

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers were applied: All positive sample results less than five times the highest blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the highest blank concentration were not qualified.

All blank results were acceptable.

Field Blanks

SDG No. W0430-QES contained no field blanks.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges results in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent for strontium-90 and technetium-99. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 35 percent for soil samples and 20 percent for water samples, the results are acceptable. If either activities are $< 5 \times \text{CRDL}$, a control limit of $\leq 2 \times \text{CRDL}$ is used for soil samples and $\leq \text{CRDL}$ for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are $\leq \text{CRDL}$ for water samples and $\leq 2 \times \text{CRDL}$ for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All precision results were acceptable.

- **Sample Result Verification and Detection Limits**

Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. Minimum Detectable Activities (MDA) for each analyte were assessed to ensure that they met the contract required detection levels (CRDL).

The reviewer verified that the results and detection limits fell within the linear range of the instrument. The MDA for Fe-59 exceeded the CRDL. In accordance with WHC guidelines, no qualification was required.

All sample results were acceptable.

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES.

None found.

REFERENCES

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*,
WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

WHC, 1992b, *Data Validation Procedures for Radiochemical Analyses*,
WHC-SD-EN-001, Rev. 1, Westinghouse Hanford Company, 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

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 same 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 the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, 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 is unusable due to an identified QC deficiency.

9613478.2474

Appendix 2

Summary of Data Qualification

000007

9613478.2476

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

9613478.2478



SAMPLE RESULTS

LAB NAME: ITAS-RICHLAND SDG: W0430
 LAB SAMPLE ID: 50151812 MATRIX: SOIL
 CLIENT ID: B0DMT4 DATE RECEIVED: 1/30/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	4.35E-03 U	1.2E-02	1.2E-02	2.06E-02	pCi/g	N/A	RD3219
CO-60	1.19E-02 U	1.0E-02	1.0E-02	1.90E-02	pCi/g	N/A	RD3219
CS-137DA	2.54E-02	1.4E-02	1.4E-02	N/A	pCi/g	N/A	RD3219
EU-152	1.86E-02 U	2.6E-02	2.6E-02	4.23E-02	pCi/g	N/A	RD3219
EU-154	-5.84E-03 U	3.1E-02	3.1E-02	5.33E-02	pCi/g	N/A	RD3219
EU-155	3.01E-02 U	2.2E-02	2.3E-02	3.84E-02	pCi/g	N/A	RD3219
FE-59	-4.77E-02 U	3.3E-02	3.4E-02	5.04E-02	pCi/g	N/A	RD3219
K-40	9.42E+00	4.3E-01	1.0E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.14E-01	2.8E-02	5.0E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.67E-01	4.0E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.42E-01	6.7E-02	8.0E-02	N/A	pCi/g	N/A	RD3219
ALPHA	1.90E+00 U	2.7E+00	2.7E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	1.59E+01	3.0E+00	3.2E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 13

RBC
30-3-95

A000 RBC

000010

9613478.2179

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000011

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

March 16, 1995

Attention: Joan Kessner



SAF Number	:	B94-098
Date SDG Closed	:	January 30, 1995
Number of Samples	:	One (1) - See ROD-B95-013
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Stand Alone

I. Introduction

On January 30, and February 1, 1995, a total of nineteen soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. After receipt, per ROD-B95-013, the samples were split into two separate SDGs for reporting purposes. 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>
50151812	B0DMT4	Soil	1/30/95

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.

000308

Bechtel Hanford, Inc.
March 16, 1995
Page 2

The requested analyses were:

- Gamma Spectroscopy**
- Gamma Scan by method ITAS-RD-3219
- Gas Proportional Counting**
- Gross Alpha by method ITAS-RD-3222
- Gross Beta by method ITAS-RD-3222

III. Quality Control

The analytical results for each analysis performed under SDG W0430 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 with the exception of gross alpha and gross beta QC sample results which are reported as pCi/sample.

IV. Comments

Samples submitted as a single SDG, SDG W0403 (stand alone), were split into two SDGs after analysis had been started, W0403 (summary) and W0430 (stand alone), as per ROD-B95-013.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219

The LCS, batch blank, sample and sample duplicate (B0DMR7, SDG W0403) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222

The batch was analyzed with two LCS samples. The soil lab is undergoing an investigation into the cause of a low spike bias for water spikes prepared in that area, and is preparing duplicate spikes for soil batches. LCS M015182S, which contains an iron carrier, is not used for reporting purposes. The LCS samples were recounted due to unacceptable recoveries and the recount result is accepted for M015181S. The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements, except as noted.

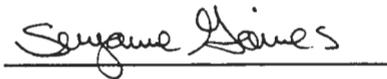
Bechtel Hanford, Inc.
March 16, 1995
Page 3

Gross Beta by method ITAS-RD-3222

The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements.

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

Reviewed and approved:



Suzanne Gaines

Suzanne Gaines
Project Manager

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013

Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/224-099

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

~~was 40386~~ ~~was 40386~~ 50132209 + 05 32303 + 05

1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) 40386

~~was 40386~~ 50151712 + 51812

2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMVO, BODMV1, BODMV2 (1 SDG, summary deliverable) 40403

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMVO, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ *[Signature]*
OSM Project Coordinator (Print/Sign Name)

1/31/95
Date

M.T. Stankovich/ *[Signature]*
Technical Representative (Print/Sign Name)

2/13/95
Date

N/A
Quality Assurance (Print/Sign Name)

Date

000016

9613478.2485

Appendix 5

Data Validation Supporting Documentation

000017

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT: 100-DR-1 DPonds			DATA PACKAGE: W0430-QES		
VALIDATOR: RBC		LAB: QES		DATE: 30 Mar 95	
CASE:			SDG: W0430-QES		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Gross Alpha/Beta	<input type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX <u>Soil</u>					
<u>BODMT4</u>					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration N/A

Instruments/detectors calibrated within one year of sample analysis? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Comments: _____

A-RBC

000018

3. Continuing Calibration N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards NIST traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Comments: The checksource standard is not identified on the continuing calibration data. No qualification required.

4. Blanks N/A

Method blank analyzed? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

5. Matrix Spikes N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? Yes No N/A

Spike source expired? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

A-22

6. Laboratory Control Samples N/A

LCS analyzed? Yes No N/A

LCS recoveries acceptable? Yes No N/A

LCS traceable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

7. Chemical Recovery N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? Yes No N/A

Chemical carrier expired? Yes No N/A

Transcription/Calculation errors? Yes No N/A

Comments: _____

8. Duplicates N/A

Duplicates Analyzed? Yes No N/A

RPD Values Acceptable? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: _____

A-J

- 9. Field QC Samples N/A
- Field duplicate sample(s) analyzed? Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split sample(s) analyzed? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Performance audit sample(s) analyzed? Yes No N/A
- Performance audit sample results acceptable? Yes No N/A

Comments: _____

10. Holding Times

- Are sample holding times acceptable? Yes No N/A

Comments: _____

11. Results and Detection Limits (Levels D & E) N/A

- Results reported for all required sample analyses? Yes No N/A
- Results supported in raw data? Yes No N/A
- Results Acceptable? Yes No N/A
- Transcription/Calculation errors? Yes No N/A
- MDA's meet required detection limits? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments: Fe-59 MDA above CRDL

A-476