



W0429-DE

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 1, 1995

Attention: Joan Kessner

Project number

550.56

Date Received by Lab

January 18, 1995

Number of Samples

Two (2)

Sample Type SDG Number Soil W0429

Data Deliverable

Standalone



#### I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

#### 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.





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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.

#### III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 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 arrived in St. Louis at  $0^{\circ}$ C which is not within the recommended  $4^{\circ}$ C  $\pm 2^{\circ}$ C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See R0D-B95-013.



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Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.



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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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#### **Analytical Data Package Prepared For**

#### **Bechtel Hanford**

Chemical Analysis By

Quanterra Environmental Services
St. Louis Laboratory

Sample Delivery Group Number: W0429



BHI IDENTIFICATION NUMBER

QUANTERRA ID NUMBER

BODMT2

7344-002

BODMT3

7344-004

07 1300 1203

## SAMPLE AND DATA MANAGEMENT

#### RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

Date

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) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMS3, B0DMS3, B0DMS8, B0DMT7, B0DMS4, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (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:

Quality Assurance (Print/Sign Name)

- 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 B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 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:	
ar novae sidirar ones.	
R. C. Smith/ Releft funts	1/3/95
OSM Project Coordinator (Print/Sign Name)	Date
M.T. Stankovich/ MILL	2/13/95
Technical Representative (Print/Sign Name)	Date
N/A	

Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0
Master Sample Login: 7344

Project Managers W. Price

Entered and Reviewed by:

ple No. Client ID. Comments Container Type	C-Matrix Analysis	Date: Col	'11. ZZiest	Anal. Due Date		Category Rad Sample No.  (Container Numbers:% Filled)
a:	Allacyets		Treservative	Anat. Due Date	note part of the	(container numbers and fitted)
4-001 BODMT6 NOTE: RICHLAND ID 50132201	Soil	17	65 at 10 at 1	8-JAN-95 10:50 2	1 2 2 4 1 1 YOUNG	Screening not Required
1 VI - Viet-40ml	S/9030/Q4 TOX/9020/Q4	S	COLD	15-FEB-95	24-JAN-95 R9C	(124719:100)
1 AN - Amber Glass-120ML	ANIONS/300.0/94	. P	COLD	N/A	N/A R9C	(124717:96)
1	AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
1	BNA/8270/94	S	COLD	15-FEB-95	31-JAN-95 R9C	(124715:98)
1	CL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124717:96)
1	FL/300.0/04	C	COLD	15-FEB-95	14-FEB-95 R9C	(124717:96)
!	ICAP/6010/Q4	S	COLD	15-FEB-95 15-FEB-95	16-JUL-95 R9C 19-JAN-95 R9C	(124713:100) (124717:96)
}	NO2/300.0/Q4 NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
	NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124718:94)
i	OPHOS/300.0/94	Č	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
i	PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
1	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124716:97)
1	PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124717:96)
1	SE/7740/04	S	COLD	15-FEB-95 15-FEB-95	16-JUL-95 R9C 14-FEB-95 R9C	(124713:100) (124717:96)
1	S04/300.0/Q4 TL/7841/Q4	6	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
i	VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95 109L	(124714:99)
4-001DUP BOONT6 NOTE: RICHLAND ID 50132201	<b>\$01</b> \$	17	-JAH-95 09:02	8-JAN-95 10:50 2	2-FEB-95 FED-EX 1	Screening not Required
1 VI - Viel-40ml	\$/9030/94	S	COLD	15-FEB-95	24-JAN-95 R9C	(124719:100)
1	T0X/9020/94	S	COLD	15-FEB-95	14-FEB-95 R9C	(124720:99)
1 AN - Amber Glass-120ML	ANIONS/300.0/04	Ρ.	COLD	N/A	N/A R9C 14-FEB-95 R9C	(124717:96) (124717:96)
1	CL/300.0/Q4 FL/300.0/Q4	C	COLD	15-FEB-95 15-FEB-95	14-FEB-95 R9C	(124717:96)
1	NO2/300.0/44	Č	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
	NO3/300.0/94	Č	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
1	NO3/353.1/94	S	COLD	15-FEB-95	14-FEB-95 R9C	(124718:94)
i	OPHOS/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
1	504/300.0/04	C	COLD	15-FEB-95	14-FEB-95 R9C	(124717:96)
44-001M\$ BODHT6 NOTE: RICHLAND ID 50132201	Soft	17	-JAN-95 09:02	18-JAN-95 10:50 2	2-FEB-95 FED-EX 1	Screening not Required
1 VI - Vial-40at	\$/9030/04	s s.	COLD	15-FEB-95	24-JAN-95 R9C	(124719:100)

Quanterra January 23, 1995 03:38 pm Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0 Master Sample Login: 7344

Project Manager: W. Price

Entered and Reviewed by: PH Revieu: Draft:

Comments Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers: X Filled)
:						(100,100,100,100,100,100,100,100,100,100
-	AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124715:98)
	CL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124717:96)
	FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95 R9C	(124717:96)
	ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	NO2/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
	NO3/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
	NO3/353.1/94	S	COLD	15-FEB-95	14-FEB-95 R9C	(124718:94)
	OPHOS/300.0/Q4	c	COLD	15-FEB-95	19-JAN-95 R9C	(124717:96)
	PB/7421/94	c	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	PEST-PCB/8080/Q4	6	COLD	15-FEB-95	31-JAN-95 R9C	(124716:97)
	SE/7740/94	č	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	504/300.0/94	c	COLD	15-FEB-95	14-FEB-95 R9C	(124717:96)
	TL/7841/94	c	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	VOA/8240/94		COLD	15-FEB-95	31-JAN-95 109L	(124714:99)
- OO INSD BOOKT6	eatt	17.	144-05 00-02	8-JAN-95 10:50 2	2- CER-05 CEN-EV	1 Screening not Required
NOTE: RICHLAND ID 50132201	501 V V V V V		444-73 07:0E	10-3/11-93 10:30 2	ETTEB-93 TEB-EN	actenting the secution
AN - Amber Glass-120ML	AS/7060/Q4	S	COLD .	15-FEB-95	16-JUL-95 R9C	(124713:100)
	BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124715:98)
1	ICAP/6010/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	PB/7421/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
1	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124716:97)
1	SE/7740/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124713:100)
	VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95 109L	(124714:99)
4-002 BOOMT2 NOTE: RICHLAND ID 50132203	Soil	17	JAN-95 09:35	18-JAN-95 10:50 2	2-FEB-95 FED-EX	1 Screening not Required
1 VI - Vial-40ml	\$/9030/Q4	· s.	COLD	15-FEB-95	24-JAN-95 R9C	(124727:100)
1	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124728:99)
AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R9C	(124725;96)
1	AS/7060/94	2	COLD	15-FEB-95	16-JUL-95 R9C	(124721:100)
	BNA/8270/94	S	COLD	15-FEB-95	31-JAN-95 R9C	(124723:98)
	CL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124725:96)
	FL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124725:96)
	ICAP/6010/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124721:100)
	NO2/300.0/44	C	COLD	15-FEB-95	19-JAN-95 R9C	(124725:96)
	NO3/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124725:96)
	NO3/353.1/94	S	COLD	15-FEB-95	14-FEB-95 R9C	(124726:94)
1	OPHOS/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124725:96)
•	PB/7421/94		COLD	15-FEB-95	16-JUL-95 R9C	(124721:100)

<sup>3\*=</sup>Sample has not been rad screened.

Quanterra January 23, 1995 03:38 pm Account: 10722 Project: 550.56 Quanterra-Richtand QAS No. 857 Rev. 0 Haster Sample Login: 7344

Project Manager: .. W. Price

Entered and Reviewed by: Finel:

# Container Type	Analysis	Class	Preservative	Anal. Due Dete	Hold Date Site	(Container Numbers:% Filled)
1	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124724:97)
1	PH/1T/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124725:96)
1	SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124721:100)
1	\$04/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124725:96)
1	TL/7841/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124721:100)
1	VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95 109L	(124722:99)
44-003 BODHR2	say Soil	17-	JAN-95 09:35 1	8-JAN-95 10:50 2	2-FEB-95 FED-EX 2	R3431-002
NOTE: RICHLAND ID 50132204		de la				
1 VI + Viel-40ml has a second	\$/9030/04	S	COLD	15-FEB-95	24-JAN-95 R9C	(124735:100)
1	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124736:99)
1 AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A R9C	(124733:96)
	AS/7060/Q4 BNA/8270/Q4	S	COLD	15-FEB-95 15-FEB-95	16-JUL-95 R9C	(124729:100)
1	CL/300.0/94	2	COLD	15-FEB-95	31-JAN-95 R9C 14-FEB-95 R9C	(124731:98) (124733:96)
	FL/300.0/94	Č	COLD	15-FEB-95	14-FEB-95 R9C	(124733:96)
	ICAP/6010/94	6	COLD	15-FEB-95	16-JUL-95 R9C	(124733:96)
	NO2/300.0/94	c	COLD	15-FEB-95	19-JAN-95 R9C	(124729:100)
	NO3/300.0/94	Č	COLD	15-FEB-95	19-JAN-95 R9C	(124733:96)
	NO3/353.1/94	Č	COLD	15-FEB-95	14-FEB-95 R9C	(124734:94)
	OPHOS/300.0/04	C	COLD	15-FEB-95	19-JAN-95 R9C	(124733:96)
	PB/7421/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124729:100)
	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124732:97)
i	PM/1T/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124733:96)
i	SE/7740/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124729:100)
1	\$04/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124733:96)
i	TL/7841/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124729:100)
	VOA/8240/94	S	COLD	15-FEB-95	31-JAN-95 109L	(124730:99)
-004 BOOMT3	Soil	17-	JAN-95 10:40 1	8-JAN-95 10:50 2	2-FEB-95 FED-EX 100	Screening not Required
NOTE: RICHLAND ID 50132205						
VI - Vist-40ml	\$/9030/94	S	COLD	15-FEB-95	24-JAN-95 R9C	(124743:100)
10 11 21 21 21	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124744:99)
AN - Amber Glass-120ML	ANIONS/300.0/94	P	COLD	N/A	N/A R9C	(124741:96)
	AS/7060/Q4	5	COLD	15-FEB-95	16-JUL-95 R9C	(124737:100)
	BNA/8270/94	S	COLD	15-FEB-95	31-JAN-95 R9C	(124739:98)
	CL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124741:96)
	FL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124741:96)
	ICAP/6010/04	S	COLD	15-FEB-95	16-JUL-95 R9C	(124737:100)
1	NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95 R9C	(124741:96)
1	NO3/300.0/04	Č	COLD	15-FEB-95	19-JAN-95 R9C	(124741:96)
1	NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124742:94)

Quanterra January 23, 1995 03:38 pm Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0 Master Sample Login: 7344

Project Manager: W. Price

Entered and Reviewed by: PH Review;\_

Container Type	Analysis	Cless	Preservetive	Anal. Due Date	Hold Date Site	(Container Numbers:% Filled)	
	OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95 R9C	(124741:96)	
	PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124737:100)	
	PEST-PCB/8080/Q4	s	COLD	15-FEB-95	31-JAN-95 R9C	(124740:97)	
	PM/1T/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124741:96)	
	SE/7740/04	S	COLD	15-FEB-95	16-JUL-95 R9C	(124737:100)	
	504/300.0/04	C	COLD	15-FEB-95	14-FEB-95 R9C	(124741:96)	
	TL/7841/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124737:100)	
	VOA/8240/94	S	COLD	15-FEB-95	31-JAN-95 109L	(124738:99)	
4-005 BODHR3	Soll	. 17-	JAN-95 10:47 1	8-JAN-95 10:50 2	2-FEB-95 FED-EX 1	Screening not Required	
NOTE: RICHLAND ID 50132206							
VI - Vial-40ml	\$/9030/04		COLD	15-FEB-95	24-JAN-95 R9C		
	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124752:99)	
AN - Amber Glass-120HL :	ANIONS/300.0/04	P	COLD	H/A	N/A R9C	(124749:96)	- 6
	AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124745:100)	
	BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124747:98)	
	CL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124749:96)	
	FL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124749:96)	
	ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124745:100)	
	NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95 R9C	(124749:96)	
	NO3/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124749:96)	
	NO3/353.1/94	S	COLD	15-FEB-95	14-FEB-95 R9C	(124750:94)	
	OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95 R9C	(124749:96)	
	PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124745:100)	
	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124748:97)	
	PM/1T/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124749:96)	
	SE/7740/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124745:100)	
	\$04/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124749:96)	
	TL/7841/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124745:100)	
	VOA/8240/94	S	COLD	15-FEB-95	31-JAN-95 109L	(124746:99)	
-006 B00MT5	Soil	17		18-JAN-95 10:50 2	2-FEB-95 FED-EX 1	Screening not Required	
NOTE: RICHLAND ID 50132207			· 4.80 .				
VI - Vial-40ml	\$/9030/Q4	S	COLD	15-FEB-95	24-JAN-95 R9C	(124759:100)	
	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124760:99)	
AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	. N/A	N/A R9C	(124757:96)	
	AS/7060/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124753:100)	
	BNA/8270/94	S	COLD	15-FEB-95	31-JAN-95 R9C	(124755:98)	
	CL/300.0/94	C	COLD	15-FEB-95	14-FEB-95 R9C	(124757:96)	
	FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95 R9C	(124757:96)	
	ICAP/6010/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124753:100)	
	NO2/300.0/Q4		COLD	15-FEB-95	19-JAN-95 R9C	(124757:96)	

<sup>3\*=</sup>Sample has not been rad screened.

Quanterra January 23, 1995 03:38 pm Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0 Haster Sample Login: 7344

Project Manager: W. Price

Entered and Reviewed by: Draft:

Comments	그 프랑스 사람들이 그렇게 모든 사람들은 사람들이 하고 있다고 있다.		11. (A.V.) (A.V.)	With the second of the second	THE STATE OF THE S	ad Category Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers: % Filled)
ta:						
1	NO3/300.0/94	C	COLD	15-FEB-95	19-JAN-95 R9C	(124757:96)
1	NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95 R9C	(124758:94)
1	OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95 R9C	(124757:96)
1	PB/7421/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124753:100)
i	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95 R9C	(124756:97)
i	PM/1T/94	S	COLD	15-FEB-95	16-JUL-95 R9C	(124757:96)
i	SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95 R9C	(124753:100)
	504/300.0/94	Č	COLD	15-FEB-95	14-FEB-95 R9C	(124757:96)
:	TL/7841/94	6	COLD	15-FEB-95	16-JUL-95 R9C	(124753:100)
	VOA/8240/94		COLD	15-FEB-95	31-JAN-95 109L	(124754:99)

7344-007 BODMS9 NOTE: RICHLAND ID 50132202	Soil	17	-JAN-95	09:07	18-JAN-95 10:50	22-FEB-95 FED-E	( 2 R3431+001	1
1 AN - Amber Glass-120ML	ANIONS/300.0/94	8 . P	COLD		N/A	N/A R9		
1	AS/7060/Q4	S	COLD		15-FEB-95	16-JUL-95 R9		
1	CL/300.0/Q4	C	COLD		15-FEB-95	14-FEB-95 R9		
1	FL/300.0/Q4	C	COLD		15-FEB-95	14-FEB-95 R9	(124765:96)	
1	ICAP/6010/94	S	COLD		15-FEB-95	16-JUL-95 R9	(124761:100)	
i	NO2/300.0/94	C	COLD		15-FEB-95	19-JAN-95 R9	(124765:96)	
i	NO3/300.0/94	C	COLD		15-FEB-95	19-JAN-95 R9	(124765:96)	
•	OPHOS/300.0/94	C	COLD		15-FEB-95	19-JAN-95 R9	(124765:96)	
i	PB/7421/94	S	COLD		15-FEB-95	16-JUL-95 R9	(124761:100)	
i	PEST-PCB/8080/94	S	COLD		15-FEB-95	31-JAN-95 R9	(124764:97)	
i	PM/1T/Q4	S	COLD		15-FEB-95	16-JUL-95 R9	(124765:96)	
i	\$/9030/94	S	COLD		15-FEB-95	24-JAN-95 R9	(124765:96)	
i	SE/7740/Q4	S	COLD		15-FEB-95	16-JUL-95 R9	(124761:100)	
i	504/300.0/94	C	COLD		15-FEB-95	14-FEB-95 R9	(124765:96)	
1	TL/7841/94	S	COLD		15-FEB-95	16-JUL-95 R9	(124761:100)	

<sup>3\*=</sup>Sample has not been rad screened.

INTERNATIONAL TECHNOLOGY
CORPORATION

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD\*

Cul# 2909	
Reference Document No.	453779
Page 1 of <u>4</u>	

	No. <sup>3</sup> 463 ager <sup>4</sup> V Pe		Proje	Latect Contac Carrier/W		12	Report to:	509 375 3 10	***************************************
Required Report (					CONT		PER LINE	٧	
Sample <sup>1-1</sup> Number	Sampl Description	e <sup>15</sup> /Type	Date/Time 16 Collected	Туре	Sample <sup>18</sup> Volume	Pre- <sup>19</sup> servative	Program	Condition on <sup>21</sup> Receipt	Disposal <sup>22</sup> Record No. 7
50132201A	BOD MTG	1soil		eacher.	125011	4°C	JCP Metals TAL SER WHILE COURSAR		100
1 8	1		1-17-17/09/02	AG-	125ml	1	, VoA		AH.
c			1-17-9>6:02	AG.	125ml		Semi-VOA	UNE	JELL W
D			1-17-97/0902		125m/		PCB/Est		.
E			H7-95/0002	1.	40.11		Sulfide	30.5	
F			1-17-95/0102	AG.	You		Tox		14.13
6			H75/090	A6-	125ml		ANIONS		
#			1-12/19010	A C-	125m/		NO2/NO3		Ino
Special Instruction	ons: <sup>23</sup>								
Possible Hazard Non-hazard		: 24 Skin Irrit	tant 🗓 Poi	son B 🗀	Unknown	1	Sample Disposal. 25 Return to Client 2 Dispo	sal by Lab 🔟 Archive	(mos.
urnaround Time Normal ' Rush	Required: 26	3			C Level: 2	7	B y drom 4 6 de 9 v. 4 de 10 d	-	
Normal - Hush  I. Relinquished by  Signature/Affiliation)		Partin	_ Dat	e: 1/18/				104/5 Date: Quanto 124 Time:	1-19-95
2. Relinquished by Signature/Affiliation)			Dat Tim		The state of the s	2. Rece	ived by	Date: Time:	- 10
3. Relinquished by			Dat		-	3. Rece	The state discussion and the discussion of the same transfer and t	Date:	

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

°C Culit 2909

Reference Document No.30 453773

Pagez of 4

Project Name

5PG W0386

Project No.

874-098

Samples Shipment Date

1/18/95

					ONE	CONT	INER	PER LINE		
Samp Numl	ole 14 ber	Sample Description/	Type	Date/Time 16 Collected	Container 17	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
501322	92 A	BODM59	150%	17-15/0107 Sag WHA	AG SAR	125m	40	JUP METALS-TAL SERVIC GOZISAA		100%
	В				A 6-	125ml	,	PCP/Fest		
	ح			1-17-95/0900	A6	125m		ANIONS-IC		
	3 A	BODMTZ		1775/03	A6	125ml		ICP Metals TAL		
	В	1		11/1	A6-	125ml		VOA-TCL		
	4				A 6-	125 ml		Semi-VoA PCB/Pest		
	D				A6-	125 m/		PCB/Pest		
	E				A6	40ml		Sulfide.		
	F				A6	Yoml		Tax		
	6				AG	125ml		ANJONS-IC		
	н				A6-	125m/		NOXNO3		
	4 A	BODMRZ			A6	125m/		Metals		
	В				AG-	125ml		VOA		
	<				A6-	125m/		Semi-VoA		
	D				16	125ml		PCB/Pest		
	E				AG	Youl		Sulti de		
	F				A 6-	40m1		Tox		
	G			,	A6	125m		ANIONS		
	н			1-1795/8/	AG.	125M/		No 2/203		
1	5A	BODMT3	1	1-17-15/1017	A6	125m	1	ICP Metals-1HU		100%

00022



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

Reference Document No.30 453779

ont.)\* Page 3 of 4

Project Name

W0386

Project No.

B94-098

Samples Shipment Date 1/18/75

Sample 14 Number	Sample Description/	15 <b>Type</b>	Collected	Container 1	Sample 18	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 2
50132205 B	BODMT3	Isoil	FIRS NOTE	me HO	125ml	40	See WHE bockSAR		100
1 0		1	1-12-17/10-17		125ml	1	semi-Volt		
D			11795/1047		1,25M		PCB/Pest		
E					yoml		Sulfide		
F					40ml		Tox		
6					125m/		ANIONS-IC	·	
И					125ml		NO2/NO3		,
GA	BOD MR3						ICP: Metals	-	
В							VOA-TCL		
4					1		Semi-VOA-TILL		
D					125M/		PCB/Pest		
Ε					40m/		PCB/Rest Sulfide		
F					40ml		Tox		
6					125m/		ANIONSTE		
4			1-17-95/04	2	125ml		NO2/NO3		
3A	BODMTS		1-1795/1053		125ml		TCP. Metals		
В	1				250m/		NOA-TCL		
c							Semi-VOA		
P					250m	ew	Semi-VOA STGB/PEST Saltidexu		
E			1-17/1153	AL	York		CJEX Sulfide		100

INTERNATIONAL TECHNOLOGY CORPORATION

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

Temp o C CMR # 2909

Reference Document No.30 453779

t.)\* Page 4 of 4

Project Name

W0386

Project No.

B94-098

Samples Shipment Date

1/18/95

Sample 14 Number	Sample 15 Description/Type	Date/Time (1)	Container 1	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 23 Record No. 4
0132207F	BODATS /Soi/	Spa MHC	AG SAR	40m/	40	See WHC GOUSAR		100
16		111	AG-	125 m/		ANIONS IC		100
l H	,	1795/1153	16	250m1		ANIONS IC NO2/NO3		100,
118/15								
	,							
				1				

**Data Tumaround** 

Priorty

Normal

1-17-9

SML 457 and ER	ul	Thomps	Field Logbook	No.							of Shipm	ent						
Shipped To	17	11-2-1-1	Offsite Propert	ly No.						HAND D	eding/Air	BIII No.						
QUANTERRA										N/A								
Possible Sample Hazarde/Remar	ke		Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cecc 4°	COOL 4	eca.4°				
			Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	6	G			
			No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1				
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGE			Volume	125ml	125ml	125ml	125ml	40ml	40ml	125mt	125ml	500ml*	20ml	500ml	95Dm	0		
	SAMPLE AN	IALYSIS		ICP METALS- TAL/AA MATALS (As,Pb, Se,Tl)	VOA-TCI	SEMI- VOA-TCI	PCB/ PEST	SULFIDE	TOX		NO2-NO3		ACTIVI- TY SCAN	Tutal alpha weta	total alpha bota	À		
501				A	В		D	E	F	6	4			Spec.	Spec	5013	2.3	********
Sample No.	Matrix*	Date Sampled	Time Sampled		<b>.</b>		K		-	J		(	1		JS2*1			
ECOMPA BODMT6	ol s	1/1-1/95	6000	$\geq$	X	$\geq$	$\times$	$\times$	$\times$	X	$\geq$	30	X	$\times$	$\times$	01		
BODMS9	35	1/17/95	0907	$\geq$			×	X		ļ.,		(1)	$\geq$	$\geq$	$\geq$	کہ		
BODMTZ	35	111195	0935	$\times$	$\geq$	$\geq$	$\geq$	$\geq$		X	$\times$	146	$\geq$	$\geq$	X	3		
BODMRA	45	1/17/95	0935	$\times$	$\geq$	$\times$	$\geq$	$\times$	$\geq$	$\geq$	$\geq$	$\times$	X			4		
BODM T3	55	117195	1047	>	$\geq$	$\geq$	$\geq$	$\geq$	$\geq$	$\times$	$\geq$		$\geq$	X	$\times$	5		
BODMR3	65	111795	10117	X	X	X	X	$\times$	$\times$	$\times$	X	$\times$	$\times$			6		
CHAIN OF POSSESSION		S	gn/Print Names					L INSTRU									Matrix*	
Relinquished By  Doug Bowers  Rejirquished By  GRE  KUL WALLE B. W. H. M.  Pletinquished By	Date/Ti	10830 Received	and Que	nc whiteen	Date/Ti	8-95 050	LABORA "INFOR HOLDIN "=THE 1500g	TORY AND MATION ( G TIME I	ALYSIS I ONLY." 1 WILL NOT	THE ERC T BE MET EQUIRED	PHATE, CONTRAC	TOR ACKN	OMLEDGE	S THE 40	LYSIS IS	SO SL W O A DS DL T	= Soil = Sedime = Solid = Sludge = Water = Oil = Air = Drum ! = Tieeue = Wipe	Solids Liquida
Relinquished By	Date/T	lme Receiv	ed By		Date/Ti	me	BC	DMT.	2-to	tala)	phalhe	talquand	~~~ 1×9:	Dul.	vided mo	L V X	= Liquid = Vegete = Other	ation
LABORATORY Received By SECTION			Title										5 DG	Date/Tk	me 386			
FINAL SAMPLE DISPOSEI Meti	nod						Diepo	sed By						Date/Ti				
DISTRIBUTION: Original- Samp	le Yellov	w - Sampler														BC-	6000-B2B (1	1 2/9 2)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Telephone No.

894-098

(509)372-2537/(509)376-2493 SAF No.

Company Contact

100-D

RC SMITH/MT STANKOVICH Sampling Location

Westinghouse Hanford

100-D PONDS PHASE II SAMPLING

bug towers /Do

Company

Fallector St. Jakus Project Designation

wst1-17-45

9613497.1254

Westinghouse Hanf Company				CHAIN O		STO	DY/S	AMP	LE AI	VALY			JEST			Page Data T	umaroun Priori	d /	15
Dave St John	1 Dou	a Bou	xrs	Company Cont RC SHITH/MT		/ICH					Telepho (509)3		(509)37	F04C-A			X Nom		
roject Designation 00-D PONDS PHASE II SAMP				C		1-11			-		SAF No		7555131	A P31/4		-	-		
ce Chest No.	1	ungi	icompa	Field Logbook	No.						B94-09	of Shipm	ent						
	R-14										HAND D	ELIVER							
Shipped To	•			Offsite Propert	ly No.							eding/Alr	Bill No.						
UANTERRA Possible Sample Hazards/Remark	k e			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	C001 4	M/A COOL 4	COOL 4		COOL 4					Ţ.
				Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	aG-	aG			
				No. of Contelner(e)											1	1			
Special Handling and/or Storage				Volume	1-1-	-	-	-			1		3			000			-
OOL TO 4 DEGREES CENTIGE				Volume	125ml	125ml		125ml	40ml	40ml	125ml	125ml	500ml *	20ml	500m		L		
s 50 3	AMPLE ANA	ALYSIS			TAL/AA MATALS (As,Pb, Se,TI)		SEMI- VOA-TCI	PC8/ PEST	SULFIDE	TOX	ANIONS- IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/ BETA, GEA	ACTIVI- TY SCAN	Total alpha beta gaman		u 4	323	
ST 9 Sample No.	Matrix*	Date S	ampled	Time Sampled	1	1-X-/	1	A		1/	1	1.77	1	1	17. 3/2	1-3/2		1323	
17 ASDIATE		1117	195	1153		N	<b>T</b>		K/	1	$\overline{}$		Γ	V		K/	67		T
CODIVITY	97 S	411	173	li 30										/>			01	,	
CHAIN OF POSSESSION	0			n/Print Names		0.4.00		and the same of the	L INSTRU		ID ALONE							Matrix	
Doug Bowers   Religioushed By Sun f Religioushed By But f Relinquished By	equished By  Date/Time  Received F  Date/Time  Date/Tim			Placelved By July 12 12 Date				LABORA "INFOR HOLD IN	TORY ANA MATION O G TIME I	TY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS TION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES TH TIME WILL NOT BE MET.  TAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA					S THE 4	B-HOUR	SO SL	= Solid = Skud = Wat = Oil = Air = Drur = Drur = Tiss	d ige ier m So m Liq
Relinquished By	Date/Tir	ne	Received			Date/Ti	me						51	)G- 1	w0380	,	r K	= Liqui = Veg	id etatk
LABORATORY Received By SECTION				Title											Date/Tk	me			
FINAL SAMPLE DISPOSITION	od							Dispo	ed By						Date/Te	me			

AL# 2431 7344 550.56

Mnts BACKGROUND
Cold Alpha Bela Mnts

011895G WQ2

TENNELEC #2

**BCREENING CALCULATION SPREADSHEET** 

BODMR2 and BODMS9 are Cat. I. BYLOUS are Cat. I. JAM 18 Jan 95

-	WHC	1-18-95			1-18		1-18	10	20	225	240								•		V
T	Customer	Sample Matrix	Residue Wght	Vol. Anal.	Sample Size	8MPL Hidr			Net Sam Counts/		DPM / A	Viquot	uCl per 8	ample	p C Grn		1-sigma pCt/ Gr		Calegory		to Cat 1
L	WHC	Salid/Liquid	mg	mg ml	Gm L	Num.	Alpha	Liula	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Yes/No	Alpha	Bela
	BODM13	LIQUID	0.0	100	1.0	35	0	14	-0 08	0 48	-3.5E-01	1.04E+00	0 0E+00	4.7E-05	-1 6E+01	4 7E+01	41 26	37 21	Yee	-0 4E+02	21E+03
-	BUDM15	LIQUID	0.0	100	10	36	0	12	-0.08	0 26	-3 4E-01	6 13E-01	0 0E+00	2 8E-05	-1 5E+01	2 8E+01	41.33	34 70	Yee	-0 0E+02	3 6E +03
	BODLX3	LIQUID	1.1	100	1.0	37	0	11	-0 08	0 18	-3.3E-01	4 00E-01	0 0E+00	1.8E-05	-1.5E+01	1.8E+01	41.37	33 37	Yee	-8 7E+02	5 6E+03
	80DN07	LIQUID	26	100	1.0	38	6	22	0 52	1 26	1.96E+00	2.35E+00	8 8E-05	1.1E-04	8 BE +01	1.1E+02	55.63	44 04	Yee	1.1E+02	9 5E+02
002	BODMR2	SOLID	976	976	623 0	30	7	34	0 62	2.48	4 45E+00	5 47E + 00	1 3E-02	1 6E-02	2.1E+01	25E+01	11.24	6 38	No	4 9E+02	4 0E+03
	BODMR3	SOLID	93.2	93 2	420 0	40	4	25	0 32	1.56	2 20E+00	3 51E+00	4 5E-03	7.1E-03	1.1E+01	1.7E+01	10 22	5 78	Yee	9 4E+02	5 9E +03
	BODMIS	SOLID	90 6	90 6	907 0	41	4	40	0 32	3 06	2 05E +00	7.09E+00	9 3E-03	3 2E 02	1 0E+01	3 5E+01	10 29	7 48	Yee	9 8E + 02	28E+03
	BODMT3	SOLID	99.7	99.7	659 0	42	4	30	0 32	2.06	2 25E+00	4.75E+00	6 7E-03	1.4E-02	1.0E+01	2.1E+01	9 88	5 97	Yee	9 9E+02	47E+03
	BODMT5	SOLID	58 8	56 6	7150	43	4	34	0 32	2 48	1.68E+00	5.30E+00	9 6E-03	3.1E-02	1.3E+01	4.3E+01	13.34	10.52	Yee	7 5E + 02	2 3E+03
	BODMT8	SOLID	94.7	94.7	1144 0	44	3	13	0.22	0.36	1 58E+00	7.04E-01	8 6E-03	3 8E-03	7 5E+00	3 3E+00	9 73	4.16	Yee	1 3E+03	3 0E+04
1	BOOMSO	SOLID	82.5	62.5	835.0	45	7	33	0.62	2.36	4.08E+00	5.12E+00	1.9E-02	2 3E-02	2.2E+01	2.8E+01	12.21	7.27	No	4 5E+02	3 6E+03

Jac Koch 01-20-95

AMPLE STATUS REPORT FOR N 4329. RAD SCREEN BODMT6 TIME: 1/18/95 8: 0 DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1

RECEIVED: 1/18/95 7:54

END OF REPORT

00028

アエロ

הבב שרונו ומוטום משבה

TR-08 CC /01 /TR

AMPLE STATUS REPORT FOR N 4323. RAD SCREEN BODMS9 TIME: 1/18/95 7:59 DISPATCHED: 1/10/95 10:29 RECEIVED: 1/18/95 7:53 SAMPLE HAS NOT BEEN SLURPED PAGE 1

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

AMPLE STATUS REPORT FOR N 4325. RAD SCREEN BODMT2 TIME: 1/18/95 7:59 DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED RECEIVED: 1/18/95 7:54 PAGE 1

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

1/18/95 7:57 AMPLE STATUS REPORT FOR N 4306. RAD SCREEN BODMR2 TIME: PAGE 1

SAMPLE HAS NOT BEEN SLURPED DISPATCHED: 1/10/95 10:27

RECEIVED: 1/18/95 7:53

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

END OF REPORT

00031

900

בכל ב בחחמוזמה אמחנו

662:10 CS/QT/TO AMPLE STATUS REPORT FOR N 4326. RAD SCREEN BODMT3 TIME: 1/18/95 7:59 DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1

RECEIVED: 1/18/95 7:54

AMPLE STATUS REPORT FOR N 4307. RAD SCREEN BODMR3 TIME: 1/18/95 7:57 DISPATCHED: 1/10/95 10:27 SAMPLE HAS NOT BEEN SLURPED PAGE 1

RECEIVED: 1/18/95 7:54

AMPLE STATUS REPORT FOR N 4328. RAD SCREEN BODMT5 TIME: 1/18/95 8: 0 DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1

RECEIVED: 1/18/95 7:54



Regional Ottice 2800 George Washington Way Richland, Washington 99352

#### SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Ti	ime Received 1/18/95 1050	Client Name	BHI
	•		
	ID (if noted on the outside of cooler)		
1.	Condition of shipping container? 6K		
2.	Custody Seals on cooler intact? Yes	-83 N	· □
3.	Custody Seals dated and signed? Yes	5 <b>7</b> N	· □
4.	Chain of Custody record is taped on inside	of cooler lid? Y	'es ☐ No 💬
5.	Vermiculite/packing material is: Wet		ry 🛣
6.	Each sample is in a plastic bag? Yes	Ş <sup>y</sup> N	• 🗆
7.	Number of sample containers in cooler:	<u></u>	
8.	Samples have: tape	hazard lab	pels
		s appropriat	
	,		
9.	Samples are: in go	od condition	leaking
	broke	n	have air bubbles
	other		
10.	Coolant present? Yes		
Sampi	e temperature 3°C		./ .
11.	The following paperwork should be account	ted for (N/A if not as	oplicable): NA
	Chain of Custody #'(s)		
	Request for analysis #(s)		
	Airbill #		
12.	Have any anomalies been identified above?	Yes □	No 🕪
13.	Memos have been initiated for all anomalies	s identified above?	Yes □
	Name/Signature R.B. B. B. B. B.	A7D Date/	Time 1/18/95 1050
FORM I	NO 15-042 Rev 0 2/94		



Regional Office 1300 George Washington Way Richland, Washington 99352

#### SAMPLE CHECK-IN LIST

.1 Per Shipping Containers

Date/Time Received 118 75 1050 Client Name 847	
Project/Client # 894-098 Batch or Case #	
Cooler ID (if noted on the outside of cooler) SML 457	
1. Condition of shipping container? OC	
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 S	
5. Vermiculite/packing material is: Wet 🗆 Dry 🗹	
6. Each sample is in a plastic bag? Yes 🗹 No 🗆	
7. Number of sample containers in coo <u>ler: 39</u>	
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): N/A	
Chain of Custody #'(s)	
Request for analysis #(s)	
Airbill # Carrier	
12. Have any anomalies been identified above? Yes   No   No	
13. Memos have been initiated for all anomalies identified above? Yes	
Printed Name/Signature R. Boyd Rebit Bayl Date/Time 1/18/95 105	D
FORM NO. 15-042 Rev 0 2/94	

### SAMPLE RECEIPT VARIANCE REPORT ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: 5013	22	-	_ DATE IN	IITIATED:	1/18/95	·
INITIATED BY: TGilmare	-		_			
DATE/TIME OF SAMPLE (AND/OR	RFA & CO	C) RECE	HPT: 118	195 1	550	
CLIENT SAMPLE NUMBER	RFA/C	OC NUI	MBERS	ANAL	YSIS REQUE	STED
BODMSQ						
Samples were received with the fo	llowing det	ficiencie	s:			
1. Not enough sample received for p	roper analysis	s.≡ 7.	Holding time	exceeded at	receipt.	
2. Sample received without proper p	reservative.	⊒ 8.	Custody tape	broken.		
☐ 3. No sample received in container.		□ 9.	COC not relin	quished by o	lient.	
Sample received without a RFA/C	OC form.	10.			ntainer does no work (Explain be	ot match sample elow).
_ 5. No sample ID on container.		⊒ 11.	with shipmen		ed	rbill not received
_ 6. Sample received broken or leaking	<b>J</b> .	□ 12.	Other (Explain	n below).		
NOTES: cac Show	40 m/ S	w/fida	2 - Co.	mainer.	received	is
a 125ml marked A	11015,					
SUPERVISOR REVIEW:		-				
PROJECT MANAGER REVIEW:			***			
TELEPHONED TO:	•	_ON	B\	·		
TELEFAXED TO:		_ON_	В	Υ		
TELEFAXED TO: SIGNED OR	IGINAL MUST	BE RETA	INED IN WOR	ORDER FIL	E	
FORM NO 15-023 3/92 B	ev O					

Contractor	ні	OFF-SIT		(To be obtained from PROPE	RTY MANAGEMEN
	111	PROPERTY CO	UNTROL	W95-0-0304	1-3
			PLETED BY ORIGINATO		
Department ER E	ng. Support	Field &	Analytical Su	pp   Unit Field Samplin	g
The follow	wing Items are to be shipped t	rom X	Contractor V	'endor	
Routing			Prepaid C	Collect	
Shipped to Company Quan	terra (IT)	9	Off-site Custodian		
2800	Geo Wash Way				
Rich	land, Washington State	99352 Code	n-site Custodian		Payroll No.
Country					
Qty. Property No.	Desc	ription <i>Unclude Man</i>	ufacture Name, Model,	Serial No.)	Acquisition Cos
1	Sample #: BODM	TE BODMS9	וססמ בדתומש	NRZ BODMT3 BODMR3	
	Cooler ID: SML				N /A
1bs	Polycooler with	groundwater	samples packed	in wet ice and	N/A
1	Sample #: Cooler ID:				
	Polycooler with	groundwater	samples nacked	in wet ice and	N/A
16s	vermiculite				
Classified	X Unclassified Shi	ipped Under DOE Co	Пеь	ipped Under Contractor's Use Per	mit Contract
Business Trip		. <u>100-D</u> -		SE II. Lading #: W/R	
Business Trip Off-site Assig		act No.	Bill of	Lading #: W/R	VED
Business Trip Off-site Assig	gnment Subcontractor. List Subcontra	act No.	Bill of	Lading #: W/A	VED
Business Trip Off-site Assig	gnment Subcontractor. List Subcontra	act No.	Bill of	Lading #: W/R	
Business Trip Off-site Assig	gnment Subcontractor. List Subcontra	act No.	Bill of	Lading #: W/R	
Business Trip  Off-site Assig  Shipment to S  Other (Please	soment Subcontractor. List Subcontractor. Sampling s specify) Sampling s	supports RI/F	Bill of  U(A)  S work in the	Lading #: W/R	3 1995 RED 18 SAIASING
Business Trip  Off-site Assig  Shipment to:  Other (Please  CERTIFICATION OF TO	Subcontractor. List Subcontractor. List Subcontractor. Sampling statement of the subcontractor. Sampling statement of the subcontractor. Sampling statement of the subcontractor	supports RI/F	Bill of  U(A)  S work in the  ESECURED THE SAME EURYPY No.	Lading #: W/R  IOC AREA RECEI  'JAN 18  DAY THAT MATERIAL IS DELIVE	3 1995
Business Trip  Off-site Assig  Shipment to 3  Other (Please  CERTIFICATION OF TI  M. Clearance for Public	Subcontractor. List Subcontractor. List Subcontractor. Sampling statement of the subcontractor. Sampling statement of the subcontractor. Sampling statement of the subcontractor	RELEASE MUST BE	Bill of  U(A)  S work in the	Lading #: W/R  IOC AREA RECEI  'JAN 18  DAY THAT MATERIAL IS DELIVE	3 1995 RED 18 SAIPPING
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Business Trip  Off-site Assig  Shipment to S  Other (Please  CERTIFICATION OF TRI  M. Clearance for Public  Cocation of and Contact  B.T. Whitten  Oste Ready for Shipme	Subcontractor. List Subcontractor. List Subcontractor. List Subcontractor. List Subcontractor. Sampling Subcontractor. Sampling Subcontractor. Sampling Subcontractor. List Subcontractor.	RELEASE MUST BE RMS K  Go./Bidg./Area)  Cost Code to be ITE	Bill of  V(A)  S work in the  ESECURED THE SAME Survey No.  A CA — COS  Charged 2072 PV3AA	Lading #: W/R  IOC AREA  RECEI  '!AN 1  DAY THAT MATERIAL IS BELIVE  Approximate Date This Property will be Returned	1995
Business Trip  Off-site Assig  Shipment to S  Other (Please  CERTIFICATION OF TRI  M. Clearance for Public  Cocation of and Contact  B.T. Whitten  Oste Ready for Shipme	Subcontractor. List Subcontractor. List Subcontractor. List Subcontractor. List Subcontractor. Sampling Subcontractor. Sampling Subcontractor. Sampling Subcontractor. List Subcontractor.	RELEASE MUST BE RMS K  Ac./Bidg./Area)  Cost Code to be ITE  Date  Date  Date	Bill of  U(A)  S work in the  SECURED THE SAME SURVEY NO.  A CA — COS  Charged 2072 PV3AA  Authorized By Kill UKA	Lading #: W/R  IOC AREA  RECEI  '!AN 1  BROSERTY  DAY THAT MATERIAL IS BELIVE  Approximate Date This Property will be Returned  Approval  LADOR REA  RECEI  '!AN 1  RECEI	Date 1-18-95
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a. Boyd Quantena 1/18/95 1050

	uanterra 3497 267		
C.U COPIED DATE:_ TIME:_ BY:	Condition Upon Re	ceipt Varian Laboratory	
Client:	Richland	Date:	1-19-95 1000
Project No:	550.56	Initiated b	1-19-95 1000 by: finil lieber
	quested: Refer to RFA/COC		C Numbers: 453779
Client Samp	le Numbers Affected: Entire Login		,
Condition/V	Variance (Check all that apply): Circle Number to	o Denote that It	tem was Evaluated. "NA" = "Not Applicable".
NA C	Not enough sample received for proper analysis.  Received approximately:  Sample received broken/leaking.	9. NA 10. NA	Volatile sample received with approximately
	Sample received without proper preservative.  Cooler temperature not within 4°C ± 2°C  Record temperature: 0°C	<u>(11.)</u>	Sample ID on container does not match sample ID on paperwork. Explain:
(5.) a	other:  Sample received in improper container.  Sample received without proper paperwork. Explain:	12 0	All coolers on airbill not received with shipment.  Other (explain below):
	Paperwork received without sample.  No sample ID on sample container.		Shipping containers not rad surveyed.
Notes:			
Corrective A	ction:		
	Name: Informed ver		By:
		e-mail	120/45 By: John Libla
☐ Sample	(s) processed "as is". Comments:		-
	(s) on hold until:	lson	Date: 01-20-95
Project Manag	gement Review: Abigail Y Vada	~	Date:
	SIGNED ORIGINAL MUST BE R	ETAINED IN THE	E PROJECT FILE

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

Project: 550.56



Category: VOA-TCL Method: EPA 8240 Matrix: SOLID

Client ID: BODMT6

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID : 7344-001

nalyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
hloromethane	74-87-3	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
romomethane	74-83-9	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
inyl Chloride	75-01-4	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
hloroethane	75-00-3	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
ethylene Chloride	75-09-2	QCBLK57743-1	01/25/95	01/25/95	4	UG/KG	BJ	5	1
cetone	67-64-1	QCBLK57743-1	01/25/95	01/25/95	8	UG/KG	BJ	100	1
arbon Disulfide	75-15-0	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
.1-Dichloroethene	75-35-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
,1-Dichloroethane	75-34-3	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
,2-Dichloroethene (total)	540-59-0	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
hloroform	67-66-3	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
.2-Dichloroethane	107-06-2	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
-Butanone	78-93-3	QCBLK57743-1	01/25/95	01/25/95	100	UG/KG	U	100	1
,1,1-Trichloroethane	71-55-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
arbon Tetrachloride	56-23-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	Ū	5	1
romodichloromethane	75-27-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
.2-Dichtoropropane	78-87-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
is-1,3-Dichloropropene	10061-01-5		01/25/95	01/25/95	5	UG/KG	Ü	5	1
richloroethene	79-01-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG		5	1
ibromochloromethane	124-48-1	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
,1,2-Trichloroethane	79-00-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
enzene	71-43-2	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	Ü	5	1
rans-1,3-Dichloropropene	10061-02-6		01/25/95	01/25/95	5	UG/KG	U	5	1
romoform	75-25-2	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	_	5	1
-Methyl-2-Pentanone	108-10-1	QCBLK57743-1	01/25/95	01/25/95	50	UG/KG	U	50	1
-Hexanone	591-78-6	QCBLK57743-1	01/25/95	01/25/95	50	UG/KG	-	50	1
etrachloroethene	127-18-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	ŭ	5	1
1,2,2-Tetrachloroethane	79-34-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	Ü	5	1
oluene	108-88-3	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	ŭ	5	1
thlorobenzene	108-90-7	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	_	5	1
thylBenzene	100-41-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	ŭ	5	1
styrene	100-42-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	ŭ	5	1
(ylene (total)	1330-20-7	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	Ŭ	5	1
Ionanal	124-19-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	_	•	1
oluene-d8 (SURR)	2037-26-5		01/25/95	01/25/95	97	%REC	•		i
	460-00-4	QCBLK57743-1	01/25/95	01/25/95	92	%REC			1
romofluorobenzene (SURR) ,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57743-1 QCBLK57743-1	01/25/95	01/25/95	95	%REC			1

. . . . . . . . . . .

**Quanterra**Environmental
Services

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

Project: 550.56

Category: VOA-TCL Method: EPA 8240 Matrix: SOLID

Client ID: BODMT6

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID: 7344-001MS

		Blank Sample	Prep.	Analyses				Detection	
Analyte	CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK57814-1	01/26/95	01/26/95	84	%REC			1
Trichloroethene	79-01-6	QCBLK57814-1	01/26/95	01/26/95	98	%REC			1
Benzene	71-43-2	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
Toluene	108-88-3	QCBLK57814-1	01/26/95	01/26/95	95	%REC			1
Chlorobenzene	108-90-7	QCBLK57814-1	01/26/95	01/26/95	94	%REC			1
Toluene-d8 (SURR)	2037-26-5	QCBLK57814-1	01/26/95	01/26/95	99	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57814-1	01/26/95	01/26/95	95	%REC			1

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

Project: 550.56



Category: VOA-TCL Method: EPA 8240 Matrix: SOLID

Client ID: BODMT6

Sample Pate : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID : 7344-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution	
1,1-Dichloroethene	75-35-4	QCBLK57814-1	01/26/95	01/26/95	88	XREC			1	
Trichloroethene	79-01-6	QCBLK57814-1	01/26/95	01/26/95	96	<b>XREC</b>			1	
Benzene	71-43-2	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1	
Toluene	108-88-3	QCBLK57814-1	01/26/95	01/26/95	96	<b>XREC</b>			1	
Chlorobenzene	108-90-7	QCBLK57814-1	01/26/95	01/26/95	100	*REC			1	
Toluene-d8 (SURR)	2037-26-5	QCBLK57814-1	01/26/95	01/26/95	103	XREC			1	
Bromofluorobenzene (SURR)	460-00-4	QCBLK57814-1	01/26/95	01/26/95	97	XREC.			1	
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57814-1	01/26/95	01/26/95	93	%REC			1	

Quanterra
Environmental
Services

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

Project: 550.56

Category: VOA-TCL Method: EPA 8240 Matrix: SOLID

Client ID: BODMT2

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID : 7344-002

nalyte	CAS Number	Blank Sample Name	Prep.	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
	7/ 07 7	QCBLK57743-1	01/25/95	01/25/95	18	UG/KG	U	18	1
hloromethane	74-87-3			01/25/95	18	UG/KG		18	i
romomethane	74-83-9 75-01-4	QCBLK57743-1	01/25/95 01/25/95	01/25/95	18	UG/KG		18	i
inyl Chloride hloroethane	75-00-3	QCBLK57743-1 QCBLK57743-1	01/25/95	01/25/95	18	UG/KG	Ŭ	18	i
ethylene Chloride	75-09-2	QCBLK57743-1	01/25/95	01/25/95	20	UG/KG	В	9	1
cetone	67-64-1	QCBLK57743-1	01/25/95	01/25/95	43	UG/KG	BJ	180	1
arbon Disulfide	75-15-0	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	i
.1-Dichloroethene	75-35-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	_	9	1
	75-34-3	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	-	ý	i
,1-Dichloroethane	540-59-0	QCBLK57743-1	01/25/95	01/25/95	ý	UG/KG		ý	i
,2-Dichloroethene (total)			01/25/95	01/25/95	9	UG/KG		9	i
hloroform	67-66-3 107-06-2	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	-	ý	i
,2-Dichloroethane	78-93-3	QCBLK57743-1	01/25/95	01/25/95	180	UG/KG		180	i
-Butanone		QCBLK57743-1	01/25/95	01/25/95	9	UG/KG		9	1
,1,1-Trichloroethane	71-55-6	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG		ý	i
arbon Tetrachloride	56-23-5	QCBLK57743-1			9	UG/KG	-	ý	1
romodichloromethane	75-27-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG		9	i
,2-Dichloropropane	78-87-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	-	ý	i
is-1,3-Dichloropropene	10061-01-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	-	ý	i
richloroethene	79-01-6	QCBLK57743-1	01/25/95	01/25/95		UG/KG	-	9	•
ibromochloromethane	124-48-1	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	-	9	
,1,2-Trichloroethane	79-00-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	_	9	•
enzene	71-43-2	QCBLK57743-1	01/25/95	01/25/95	9			9	1
rans-1,3-Dichloropropene	10061-02-6	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG		9	- 1
romoform	75-25-2	QCBLK57743-1	01/25/95	01/25/95	89	UG/KG	-	89	- 1
-Methyl-2-Pentanone	108-10-1	QCBLK57743-1	01/25/95	01/25/95		UG/KG	_	89	•
- Hexanone	591-78-6	QCBLK57743-1	01/25/95	01/25/95	89	UG/KG		9	4
etrachloroethene	127-18-4	QCBLK57743-1	01/25/95	01/25/95	9			9	- 1
,1,2,2-Tetrachloroethane	79-34-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	_	9	•
oluene	108-88-3	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	_	9	- 1
hlorobenzene	108-90-7	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG		9	- 1
thylBenzene	100-41-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG		9	1
tyrene	100-42-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	_	9	4
ylene (total)	1330-20-7	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	4	4
oluene-d8 (SURR)	2037-26-5	QCBLK57743-1	01/25/95	01/25/95	116	%REC			4
romofluorobenzene (SURR)	460-00-4	QCBLK57743-1	01/25/95	01/25/95	77	%REC			1
,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57743-1	01/25/95	01/25/95	95	%REC			1

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

Project: 550.56

Category: VOA-TCL Method: EPA 8240 Matrix: SOLID

Client ID: BODMT3



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID : 7344-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
romomethane	74-83-9	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
/inyl Chloride	75-01-4	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
Chloroethane	75-00-3	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
Methylene Chloride	75-09-2	QCBLK57814-1	01/26/95	01/26/95	74	UG/KG	В	16	1
cetone	67-64-1	QCBLK57814-1	01/26/95	01/26/95	51	UG/KG	BJ	310	1
Carbon Disulfide	75-15-0	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1-Dichloroethene	75-35-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1.1-Dichloroethane	75-34-3	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,2-Dichloroethene (total)	540-59-0	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Chloroform	67-66-3	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1.2-Dichloroethane	107-06-2	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
2-Butanone	78-93-3	QCBLK57814-1	01/26/95	01/26/95	310	UG/KG	U	310	1
1,1,1-Trichloroethane	71-55-6	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Carbon Tetrachloride	56-23-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
3romodich (oromethane	75-27-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,2-Dichloropropane	78-87-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
cis-1,3-Dichloropropene	10061-01-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Trichloroethene	79-01-6	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
ibromochloromethane	124-48-1	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1,2-Trichloroethane	79-00-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Benzene	71-43-2	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
trans-1,3-Dichloropropene	10061-02-6	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Bromoform	75-25-2	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
4-Methyl-2-Pentanone	108-10-1	QCBLK57814-1	01/26/95	01/26/95	160	UG/KG	U	160	1
2-Hexanone	591-78-6	QCBLK57814-1	01/26/95	01/26/95	160	UG/KG	U	160	1
Tetrachloroethene	127-18-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Toluene	108-88-3	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Chlorobenzene	108-90-7	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
thylBenzene	100-41-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Styrene	100-42-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
(ylene (total)	1330-20-7	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Toluene-d8 (SURR)	2037-26-5	QCBLK57814-1	01/26/95	01/26/95	112	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57814-1	01/26/95	01/26/95	79	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57814-1	01/26/95	01/26/95	95	%REC			1

#### VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO COMPOUND

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	UG/ KG	Q
74-87-3	Chloromethane			18	U
74-83-9	Bromomethane			18	U
75-01-4	Vinyl Chloride			18	Ū
75-00-3	Chloroethane			18	Ū
75-09-2	Methylene Chlo	ride		20	В
67-64-1	Acetone		_	43	BJ
75-15-0	Carbon Disulfic	de		9	U
75-35-4	1,1-Dichloroet	hene		9	U
75-34-3	1,1-Dichloroet	hane		9	Ū
540-59-0	1,2-Dichloroet	hene (total)		9	Ū
67-66-3	Chloroform			9	Ū
107-06-2	1,2-Dichloroet	hane		9	U
78-93-3	2-Butanone			180	U
	1,1,1-Trichlor	pethane		9	U
56-23-5	Carbon Tetrach	loride		9	Ū
75-27-4	Bromodichlorom	ethane		9	U
78-87-5	1,2-Dichloropr	opane		9	U
10061-01-5	cis-1,3-Dichlo	ropropene		9	U
79-01-6	Trichloroethen	e		9	U
124-48-1	Dibromochlorom	ethane		9	U
79-00-5	1,1,2-Trichlor	oethane		9	Ū
71-43-2	Benzene			9	U
	trans-1,3-Dich	loropropene		9	U
75-25-2	Bromoform			9	U
108-10-1	4-Methyl-2-Pen	tanone		89	U
591-78-6	2-Hexanone			89	U
127-18-4	Tetrachloroeth	ene		9	U
79-34-5	1,1,2,2-Tetrac	hloroethane		9	U
108-88-3	Toluene	-		9	U
108-90-7	Chlorobenzene_			9	U
100-41-4	Ethylbenzene			9	Ū
100-42-5	Styrene			9	Ū
	Xylene (total)			9	U

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO

Case No.: V34402

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID: F0621

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 44

Date Analyzed: 01/25/95

Column (pack/cap) CAP

Dilution Factor: 1.0

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

Number TICs found:

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

#### EPA SAMPLE NO.

### VOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG O

		(ug/L or	3, -3,		~
74-87-3	Chloromethane			31	U
74-83-9	Bromomethane			31	U
	Vinyl Chloride			31	U
75-00-3	Chloroethane			31	U
	Methylene Chloric	ie		74	В
57-64-1				51	BJ
	Carbon Disulfide	***	_	16	U
	1,1-Dichloroether			16	U
75-34-3	1,1-Dichloroethan	ne	_	16	U
540-59-0	1,2-Dichloroether	ne (total)		16	Ū
	Chloroform	(00001/_		16	U
	1,2-Dichloroethan	ne		16	U
78-93-3	2-Butanone			310	Ū
	1,1,1-Trichloroet	hane		16	U
6-23-5	Carbon Tetrachlo	ride		16	U
75-27-4	Bromodichloromet	nane		16	U
78-87-5	1,2-Dichloropropa	ane	<u> </u>	16	U
10061-01-5	cis-1,3-Dichloro	propene		16	U
79-01-6	Trichloroethene	or opene		16	U
24-48-1	Dibromochlorometh	nane		16	U
79-00-5	1,1,2-Trichloroet	hane		16	Ū
71-43-2				16	Ū
	trans-1,3-Dichlo	ropropene		16	U
	Bromoform			16	U
	4-Methyl-2-Pentar	none		160	Ū
591-78-6	2-Hexanone			160	Ū
	Tetrachloroethene	2	_	16	Ū
	1,1,2,2-Tetrachle			16	U
108-88-3	Toluene			16	U
	Chlorobenzene		_	16	Ū
100-41-4	Ethylbenzene		_	16	Ū
100-42-5				16	U
	Xylene (total)			16	U

EPA SAMPLE NO.

### VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

B0DMT3

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: V34402

SDG No.: W0429

Matrix: (soil/water, SOIL

Lab Sample ID: 7344-004

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

Lab File ID: F0635

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 68

CAS NUMBER

=============

Date Analyzed: 01/26/95

Column (pack/cap) CAP

Dilution Factor: 1.0

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

Number TICs found:

EST. CONC. RT COMPOUND NAME \_\_\_\_\_

Quanterra Environmental

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

Project: 550.56

Category: Semi-VOA-TCL Method: EPA 8270 Matrix: SOLID

Client ID: BODMT2

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

		Blank Sample	Prop	Analyses				Detection	
Analyte	CAS Number	Name Name	Prep. Date	Date	Result	Unit	Qual.	Limit	Dilution
Phenol	108-95-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
ois(2-Chloroethyl)Ether	111-44-4	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Chlorophenol	95-57-8	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,3-Dichlorobenzene	541-73-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,4-Dichlorobenzene	106-46-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	_	1200	1
,2-Dichlorobenzene	95-50-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Methylphenol	95-48-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
is(2-Chloroisopropyl)Ether	108-60-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Methylphenol	106-44-5	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-nitroso-di-n-propylamine	621-64-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
exachloroethane	67-72-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
itrobenzene	98-95-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
sophorone	78-59-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
-Nitrophenol	88-75-5	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,4-Dimethylphenol	105-67-9	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
is(2-Chloroethoxy)Methane	111-91-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
,4-Dichlorophenol	120-83-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,2,4-Trichlorobenzene	120-82-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
aphthalene	91-20-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Chloroaniline	106-47-8	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG		2300	1
exachlorobutadiene	87-68-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Chloro-3-Methylphenol	59-50-7	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG		2300	1
-Methylnaphthalene	91-57-6	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
exachlorocyclopentadiene	77-47-4	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,4,6-Trichlorophenol	88-06-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	_	1200	1
,4,5-Trichlorophenol	95-95-4	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Chloronaphthalene	91-58-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Nitroaniline	88-74-4	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG		5900	1
imethylPhthalate	131-11-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
cenaphthylene	208-96-8	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,6-Dinitrotoluene	606-20-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Nitroaniline	99-09-2	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG		5900	1
cenaphthene	83-32-9	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
,4-Dinitrophenol	51-28-5	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG		5900	1
-Nitrophenol	100-02-7	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	_	5900	1
ibenzofuran	132-64-9	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	_	1200	1
,4-Dinitrotoluene	121-14-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
iethylphthalate	84-66-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
-Chlorophenyl-PhenylEther	7005-72-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	_	1200	1
luorene	86-73-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	-	1200	1
-Nitroaniline	100-01-6	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG		2300	i
,6-Dinitro-2-Methylphenol	534-52-1	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	_	5900	1
-Nitrosodiphenylamine (1)	86-30-6	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	_	1200	i
-Bromophenyl-Phenyl Ether	101-55-3	QCBLK57260-1	01/20/95		1200	UG/KG		1200	1
exachlorobenzene	118-74-1	QCBLK57260-1	01/20/95	01/23/95 01/23/95	1200	UG/KG		1200	1
entachlorophenol	87-86-5	QCBLK57260-1			5900	UG/KG	_	5900	•
henanthrene	85-01-8	QCBLK57260-1	01/20/95	01/23/95	440	UG/KG		1200	•
nthracene	120-12-7	QCBLK57260-1	01/20/95	01/23/95	1200	-		1200	
arbazole	86-74-8	QCBLK57260-1	01/20/95	01/23/95		UG/KG		1200	4
i-N-Butylphthalate	84-74-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	- 1
luoranthene	206-44-0		01/20/95	01/23/95	170	UG/KG		1200	
yrene	129-00-0	QCBLK57260-1	01/20/95	01/23/95	590	UG/KG		1200	4
utylBenzylPhthalate	85-68-7	QCBLK57260-1	01/20/95	01/23/95	570	UG/KG		1200	4
,3'-Dichlorobenzidine		QCBLK57260-1	01/20/95	01/23/95	820	UG/KG			
	91-94-1	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG		2300	
enzo(a)Anthracene	56-55-3	QCBLK57260-1	01/20/95	01/23/95	180	UG/KG		1200	4
hrysene	218-01-9	QCBLK57260-1	01/20/95	01/23/95	220	UG/KG		1200	4
is(2-Ethylhexyl)Phthalate	117-81-7	QCBLK57260-1	01/20/95	01/23/95	81	UG/KG		1200	4
i-N-OctylPhthalate	117-84-0	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG		1200	1
enzo(b)Fluoranthene	205-99-2	QCBLK57260-1	01/20/95	01/23/95	420	UG/KG		1200	1
enzo(k)Fluoranthene	207-08-9 50-32-8	QCBLK57260-1	01/20/95 01/20/95	01/23/95 01/23/95	130 1200	UG/KG		1200 1200	1
enzo(a)Pyrene		QCBLK57260-1							

Project: 550.56

Category: Semi-VOA-TCL Method: EPA 8270 Matrix: SOLID

Client ID: BODMT2

Services

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Indeno(1,2,3-CD)Pyrene	193-39-5	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Dibenz(a,h)Anthracene	53-70-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Benzo(g,h,i)Perylene	191-24-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Aldol Condensation-1	TIC-108	QCBLK57260-1	01/20/95	01/23/95	25000	UG/KG	BJ		1
Aldol Condensation-2	TIC-109	QCBLK57260-1	01/20/95	01/23/95	2600	UG/KG	BJ		1
Unknown-1	T1C-32	QCBLK57260-1	01/20/95	01/23/95	240	UG/KG	J		1
Jnknown-2	T1C-33	QCBLK57260-1	01/20/95	01/23/95	2800	UG/KG	J		1
Unknown Alkane-1	T1C-42	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	J		1
Unknown Alkane-2	T1C-43	QCBLK57260-1	01/20/95	01/23/95	320	UG/KG	J		1
Unknown Alkane-3	TIC-142	QCBLK57260-1	01/20/95	01/23/95	290	UG/KG	J		1
Unknown-3	TIC-34	QCBLK57260-1	01/20/95	01/23/95	390	UG/KG	J		1
Jnknown C12H6C14-1	T1C-402	QCBLK57260-1	01/20/95	01/23/95	220	UG/KG	J		1
Jnknown C12H6C14-2	T1C-403	QCBLK57260-1	01/20/95	01/23/95	340	UG/KG	J		1
Unknown C12H5C15-1	T1C-330	QCBLK57260-1	01/20/95	01/23/95	1400	UG/KG	J		1
Unknown C12H5C15-2	TIC-331	QCBLK57260-1	01/20/95	01/23/95	590	UG/KG	J		1
Jnknown C12#4C16-1	TIC-335	QCBLK57260-1	01/20/95	01/23/95	560	UG/KG	J		1
Jnknown C12H4C16-2	TIC-336	QCBLK57260-1	01/20/95	01/23/95	990	UG/KG	J		1
Jnknown C12W5C15-3	TIC-332	QCBLK57260-1	01/20/95	01/23/95	900	UG/KG	J		1
Unknown C12H4C16-3	TIC-337	QCBLK57260-1	01/20/95	01/23/95	1100	UG/KG	J		1
Jnknown C12H4C16-4	T1C-338	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	J		1
Unknown C12H3C17-1	T1C-348	QCBLK57260-1	01/20/95	01/23/95	500	UG/KG	J		1
Jnknown C12H3C17-2	TIC-349	QCBLK57260-1	01/20/95	01/23/95	650	UG/KG	J		1
Jnknown-4	T1C-35	QCBLK57260-1	01/20/95	01/23/95	610	UG/KG	J		1
Jnknown-5	TIC-36	QCBLK57260-1	01/20/95	01/23/95	1000	UG/KG	J		1
Jnknown-6	TIC-37	QCBLK57260-1	01/20/95	01/23/95	1100	UG/KG	J		1
Nitrobenzene-d5	4165-60-0	QC91 K57260-1	01/20/95	01/23/95	83	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK57260-1	01/20/95	01/23/95	73	%REC			1
Terphenyl-d14	1718-51-0	QCBLK57260-1	01/20/95	01/23/95	95	%REC			1
Phenol-d5	13127-88-3	QCBLK57260-1	01/20/95	01/23/95	92	%REC			. 1
2-Fluorophenol	367-12-4	QCBLK57260-1	01/20/95	01/23/95	83	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK57260-1	01/20/95	01/23/95	65	%REC			1



Project: 550.56

Category: Semi-VOA-TCL Method: EPA 8270 Matrix: SOLID

Client ID: BODMT3

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

		Blank Sample	Prep.	Analyses				Detection	
Analyte	CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dilution
Phenol	108-95-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
ois(2-Chloroethyl)Ether	111-44-4	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
2-Chiorophenoi	95-57-8	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,3-Dichlorobenzene	541-73-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,4-Dichlorobenzene	106-46-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,2-Dichlorobenzene	95-50-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2-Methylphenol	95-48-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
bis(2-Chloroisopropyl)Ether	108-60-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Methylphenol	106-44-5	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
-nitroso-di-n-propylamine	621-64-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	_	2100	1
lexachloroethane	67-72-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
litrobenzene	98-95-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
sophorone	78-59-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
2-Nitrophenol	88-75-5	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
2,4-Dimethylphenol	105-67-9	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
ois(2-Chloroethoxy)Methane	111-91-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4-Dichlorophenol	120-83-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
1,2,4-Trichlorobenzene	120-82-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Vaphthalene	91-20-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Chloroanitine	106-47-8	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
lexach lorobutadiene	87-68-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Chloro-3-Methylphenol	59-50-7	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
2-Methylnaphthalene	91-57-6	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
lexachlorocyclopentadiene	77-47-4	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4,6-Trichlorophenol	88-06-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
,4,5-Trichtorophenot	95-95-4	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
-Chloronaphthalene	91-58-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
-Nitroaniline	88-74-4	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
imethylPhthalate	131-11-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
cenaphthylene	208-96-8	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
,6-Dinitrotoluene	606-20-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
-Nitroaniline	99-09-2	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
cenaphthene	83-32-9	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
,4-Dinitrophenol	51-28-5	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
-Nitrophenol	100-02-7	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
ibenzofuran	132-64-9	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
,4-Dinitrotoluene	121-14-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
iethylphthalate	84-66-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
-Chlorophenyl-PhenylEther	7005-72-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
luorene	86-73-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
-Nitroaniline	100-01-6	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
,6-Dinitro-2-Methylphenol	534-52-1	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
-Nitrosodiphenylamine (1)	86-30-6	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
-Bromophenyl-Phenyl Ether	101-55-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
exachlorobenzene	118-74-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
entachlorophenol	87-86-5	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG		10000	1
henanthrene	85-01-8	QCBLK57260-1	01/20/95	01/23/95	470	UG/KG	J	2100	1
nthracene	120-12-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
carbazole	86-74-8	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
i-N-Butylphthalate	84-74-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
luoranthene	206-44-0	QCBLK57260-1	01/20/95	01/23/95	940	UG/KG		2100	1
yrene	129-00-0	QCBLK57260-1	01/20/95	01/23/95	820	UG/KG		2100	1
ButylBenzylPhthalate	85-68-7	QCBLK57260-1	01/20/95	01/23/95	1400	UG/KG		2100	1
,3'-Dichlorobenzidine	91-94-1	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG		4100	1
enzo(a)Anthracene	56-55-3	QCBLK57260-1	01/20/95	01/23/95	340			2100	1
Chrysene	218-01-9	QCBLK57260-1	01/20/95	01/23/95	400	UG/KG		2100	1
ois(2-Ethylhexyl)Phthalate	117-81-7	QCBLK57260-1	01/20/95	01/23/95	130	UG/KG		2100	1
ii-N-OctylPhthalate	117-84-0	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
Benzo(b)Fluoranthene	205-99-2	QCBLK57260-1	01/20/95	01/23/95	580	UG/KG		2100	i
Benzo(k)Fluoranthene	207-08-9	QCBLK57260-1	01/20/95	01/23/95	220	UG/KG		2100	i
Benzo(a)Pyrene	50-32-8	QCBLK57260-1	01/20/95	01/23/95	290	UG/KG		2100	i



Project: 550.56

Category: Semi-VOA-TCL Method: EPA 8270 Matrix: SOLID

Client ID: BODMT3

Sample Date : 01/17/92 Receipt Date : 01/18/95 Report Date : 03/01/95

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Indeno(1,2,3-CD)Pyrene	193-39-5	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Dibenz(a,h)Anthracene	53-70-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG		2100	1
Benzo(g,h,i)Perylene	191-24-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Aldol Condensation	TIC-4	QCBLK57260-1	01/20/95	01/23/95	36000	UG/KG	BJ		1
Unknown-1	TIC-32	QCBLK57260-1	01/20/95	01/23/95	240	UG/KG			1
Unknown-2	T1C-33	QCBLK57260-1	01/20/95	01/23/95	4600	UG/KG			1
Jnknown Alkane-1	TIC-42	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	J		1
Unknown-3	TIC-34	QCBLK57260-1	01/20/95	01/23/95	260	UG/KG			1
Unknown Alkane-2	TIC-43	QCBLK57260-1	01/20/95	01/23/95	230	UG/KG			1
Jnknown-4	T1C-35	QCBLK57260-1	01/20/95	01/23/95	620	UG/KG			1
onknown-5	TIC-36	QCBLK57260-1	01/20/95	01/23/95	360	UG/KG			1
Jnknown-6	TIC-37	QCBLK57260-1	01/20/95	01/23/95	230	UG/KG	J		1
Jnknown-7	TIC-7	QCBLK57260-1	01/20/95	01/23/95	230	UG/KG	J		1
Jnknown-8	TIC-8	QCBLK57260-1	01/20/95	01/23/95	270	UG/KG			1
Jnknown-9	TIC-9	QCBLK57260-1	01/20/95	01/23/95	280	UG/KG	J		1
Jnknown-10	TIC-10	QCBLK57260-1	01/20/95	01/23/95	600	UG/KG			1
Jnknown-11	TIC-11	QCBLK57260-1	01/20/95	01/23/95	440	UG/KG			1
Jnknown-12	TIC-12	QCBLK57260-1	01/20/95	01/23/95	360	UG/KG			1
Jnknown-13	TIC-13	QCBLK57260-1	01/20/95	01/23/95	490	UG/KG	J		1
Jnknown-14	TIC-14	QCBLK57260-1	01/20/95	01/23/95	410	UG/KG			1
Unknown-15	TIC-15	QCBLK57260-1	01/20/95	01/23/95	700	UG/KG			1
Nitrobenzene-d5	4165-60-0	QCBLK57260-1	01/20/95	01/23/95	77	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK57260-1	01/20/95	01/23/95	69	%REC			1
Terphenyl-d14	1718-51-0	QCBLK57260-1	01/20/95	01/23/95	76	ZREC.			1
Phenol-d5	13127-88-3	QCBLK57260-1	01/20/95	01/23/95	86	%REC			1
2-Fluorophenol	367-12-4	QCBLK57260-1	01/20/95	01/23/95	70	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK57260-1	01/20/95	01/23/95	59	%REC			1

### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.:

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID: A7716

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 44 dec.

Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N

pH:

Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO. COMPOUND

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

	(45/2 52 45/		
108-95-2	Phenol	1200	U
111-44-4	bis(2-Chloroethyl)Ether	1200	U
	2-Chlorophenol	1200	U
541-73-1	1,3-Dichlorobenzene	1200	U
106-46-7	1,4-Dichlorobenzene	1200	U
	1,2-Dichlorobenzene	1200	U
	2-Methylphenol	1200	U
	2,2'-oxybis(1-Chloropropane)	1200	U
	4-Methylphenol	1200	U
621-64-7	N-Nitroso-Di-n-Propylamine	1200	U
67-72-1	Hexachloroethane	1200	U
98-95-3	Nitrobenzene	1200	U
78-59-1	Isophorone	1200	U
	2-Nitrophenol	1200	U
	2,4-Dimethylphenol	1200	U
111-91-1	bis(2-Chloroethoxy)Methane	1200	U
	2,4-Dichlorophenol	1200	U
120-82-1	1,2,4-Trichlorobenzene	1200	U
91-20-3	Naphthalene	1200	U
	4-Chloroaniline	2300	U
87-68-3	Hexachlorobutadiene	1200	U
59-50-7	4-Chloro-3-Methylphenol	2300	U
91-57-6	2-Methylnaphthalene	1200	U
77-47-4	Hexachlorocyclopentadiene	1200	U
88-06-2	2,4,6-Trichlorophenol	1200	U
95-95-4	2,4,5-Trichlorophenol	1200	U
	2-Chloronaphthalene	1200	U
	2-Nitroaniline	5900	U
131-11-3	Dimethyl Phthalate	1200	U
	Acenaphthylene	1200	U
	2,6-Dinitrotoluene	1200	U

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) GLab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Date Analyzed: 01/23/95 Extraction: (SepF/Cont/Sonc) SONC

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

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

	3-Nitroaniline	5900	U
	Acenaphthene	1200	U
	2,4-Dinitrophenol	5900	U
	4-Nitrophenol	5900	U
	Dibenzofuran	1200	U
	2,4-Dinitrotoluene	1200	U
	Diethylphthalate	1200	U
7005-72-3	4-Chlorophenyl-phenylether	1200	U
86-73-7	Fluorene	1200	U
100-01-6	4-Nitroaniline	2300	U
534-52-1	4,6-Dinitro-2-Methylphenol	5900	U
	N-Nitrosodiphenylamine (1)	1200	U
101-55-3	4-Bromophenyl-phenylether	1200	U
118-74-1	Hexachlorobenzene	1200	U
87-86-5	Pentachlorophenol	5900	U
85-01-8	Phenanthrene	440	J
	Anthracene	430	J
86-74-8	Carbazole	1200	U
84-74-2	Di-n-Butylphthalate	170	J
206-44-0	Fluoranthene	590	J
129-00-0	Pyrene	570	J
85-68-7	Butylbenzylphthalate	820	BJ
	3,3'-Dichlorobenzidine	2300	U
56-55-3	Benzo(a)Anthracene	180	J
	Chrysene	220	J
117-81-7	bis(2-Ethylhexyl)Phthalate	81	J
117-84-0	Di-n-Octyl Phthalate	1200	U
205-99-2	Benzo(b)Fluoranthene	420	J
207-08-9	Benzo(k)Fluoranthene	130	J
50-32-8	Benzo(a)Pyrene	1200	U
	Indeno(1,2,3-cd)Pyrene	1200	U
	Dibenz (a, h) Anthracene	1200	U
	Benzo(g,h,i)Perylene	1200	U

EPA SAMPLE NO.

### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

BODMT2

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

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

Number TICs found: 22

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		=======	=======================================	====
1. 0	Aldol Condensation	4.64	25000	ABJ
2.	Aldol Condensation	4.70	2600	ABJ
3.	UNKNOWN	16.77	240	J
4.	UNKNOWN	18.59	2800	J
5.	Unknown Alkane	18.84	1200	J
6.	Unknown Alkane	18.94	320	J
7.	Unknown Alkane	19.44	290	J
8.	UNKNOWN	20.50	390	J
9.	Unknown C12H6Cl4	22.92	220	J
10.	Unknown C12H6Cl4	23.02	340	J
11.	Unknown C12H5Cl5	23.53	1400	J
12.	Unknown C12H5Cl5	24.07	590	J
13.	Unknown C12H4Cl6	24.46	560	J
14.	Unknown C12H4Cl6	24.70	990	J
15.	Unknown C12H5Cl5	24.79	900	J
16.	Unknown C12H4Cl6	25.22	1100	J
17.	Unknown C12H4Cl6	25.75	1200	J
18.	Unknown C12H3Cl7	26.02	500	J
19.	Unknown C12H3Cl7	27.03	650	J
20.	UNKNOWN	28.32	610	J
21.	UNKNOWN	29.60	1000	J
22.	UNKNOWN	29.88	1100	J

#### EPA SAMPLE NO.

### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG 0 99-09-2----3-Nitroaniline 10000 U 83-32-9-----Acenaphthene U 2100 51-28-5----2,4-Dinitrophenol 10000 U 100-02-7----4-Nitrophenol U 10000 132-64-9-----Dibenzofuran 2100 U 121-14-2----2,4-Dinitrotoluene U 2100 U 84-66-2-----Diethylphthalate 2100 7005-72-3----4-Chlorophenyl-phenylether U 2100 86-73-7-----Fluorene U 2100 100-01-6----4-Nitroaniline 4100 U U 534-52-1----4,6-Dinitro-2-Methylphenol 10000 86-30-6----Nitrosodiphenylamine (1) U 2100 101-55-3----4-Bromophenyl-phenylether U 2100 118-74-1-----Hexachlorobenzene U 2100 10000 87-86-5----Pentachlorophenol U 85-01-8-----Phenanthrene 470 J J 120-12-7-----Anthracene 460 U 86-74-8-----Carbazole 2100 84-74-2-----Di-n-Butylphthalate U 2100 J 206-44-0-----Fluoranthene 940 129-00-0-----Pyrene J 820 85-68-7-----Butylbenzylphthalate 1400 BJ 91-94-1----3,3'-Dichlorobenzidine 4100 U 56-55-3-----Benzo(a)Anthracene 340 J 218-01-9-----Chrysene 400 J 117-81-7-----bis(2-Ethylhexyl)Phthalate 130 J 117-84-0-----Di-n-Octyl Phthalate U 2100 205-99-2----Benzo (b) Fluoranthene 580 J J 207-08-9-----Benzo(k)Fluoranthene 220 50-32-8-----Benzo (a) Pyrene 290 J 193-39-5----Indeno(1,2,3-cd) Pyrene 2100 U 53-70-3-----Dibenz (a,h) Anthracene U 2100 2100 U 191-24-2----Benzo(g,h,i)Perylene

# 9613497,1285

### 1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS:

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

CAS NO.	COMPOUND (ug/L of ug/	rkg/ og/kg	2
108-95-2	Phenol	2100	U
111-44-4	bis(2-Chloroethyl)Ether	2100	U
95-57-8	2-Chlorophenol	2100	U
541-73-1	1,3-Dichlorobenzene	2100	U
106-46-7	1,4-Dichlorobenzene	2100	U
	1,2-Dichlorobenzene	2100	U
	2-Methylphenol	2100	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2100	U
106-44-5	4-Methylphenol	2100	U
621-64-7	N-Nitroso-Di-n-Propylamine	2100	U
67-72-1	Hexachloroethane	2100	U
98-95-3	Nitrobenzene	2100	U
	Isophorone	2100	U
88-75-5	2-Nitrophenol	2100	U
	2,4-Dimethylphenol	2100	U
	bis(2-Chloroethoxy)Methane	2100	U
	2,4-Dichlorophenol	2100	U
	1,2,4-Trichlorobenzene	2100	U
	Naphthalene	2100	U
	4-Chloroaniline	4100	U
87-68-3	Hexachlorobutadiene	2100	U
	4-Chloro-3-Methylphenol	4100	U
91-57-6	2-Methylnaphthalene	2100	U
77-47-4	Hexachlorocyclopentadiene	2100	U
	2,4,6-Trichlorophenol	2100	U
95-95-4	2,4,5-Trichlorophenol	2100	U
91-58-7	2-Chloronaphthalene	2100	U
88-74-4	2-Nitroaniline	10000	U
	Dimethyl Phthalate	2100	U
	Acenaphthylene	2100	U
	2,6-Dinitrotoluene	2100	U

### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-004

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

Lab File ID: A7718

Date Received: 01/18/95

% Moisture: not dec. 68 dec.

Level: (low/med) LOW

Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1.00

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

Number TICs found: 18

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=========	= =====================================	=======		====
1. 0	Aldol Condensation	4.65	36000	ABJ
2.	UNKNOWN	16.77	240	J
3.	UNKNOWN	18.59	4600	J
4.	Unknown Alkane	18.85	2100	J
5.	UNKNOWN	18.94	260	J
6.	Unknown Alkane	19.45	230	J
7.	UNKNOWN	20.50	620	J
8.	UNKNOWN	20.97	360	J
9.	UNKNOWN	21.82	230	J
10.	UNKNOWN	26.55	230	J
11.	UNKNOWN	28.12	270	J
12.	UNKNOWN	28.30	280	J
13.	UNKNOWN	29.56	600	J
14.	UNKNOWN	30.48	440	J
15.	UNKNOWN	31.19	360	J
16.	UNKNOWN	31.39	490	J
17.	UNKNOWN	31.75	410	J
18.	UNKNOWN	32.01	700	J

		% Solids				oject	589.01	550.57	550.56 57	205	
Analysi Child By Batch No Method No	5. Par 8. Par 5734 8.400	tason	_ Date		<u>-</u> 45 0	Date. Let Date von Temp slance #	11-23-95 01-23 95 105°C AGECO		Time 3:40 p	41	
Sample No	Pan No	ParVA Weight	Wet/B Soil+Pan	Dry/C Soil+Pan	Dry/C1 Soil+Pan	Diff C1-C	Dry/C2 Soll+Pan	Diff C2-C1	Dry/C3 Soil+Pan	Diff C3 C2	% Solids
7.335-001		1,5832	12.06.32	10.0805							
-205	2	1.5587	11.2113	9,5001							
.503	3	1,5601	12.7497	10.6153	-						
-004	4	1.5619	11.8959	9,7204							
-025	5	1.5696	12.4069	10.2507		1					
-006	6	1. Steleg	11.3003	9.511le		1					,
-107	7	1.5616	11.1991	9.4121			W				
~22±0V	8	1.5707	11.4113	9.8374			15	7			
7330-001	9	1.5612	11.1209	9,3104			Y	2			
+004	10	15265	11.3763	9.5704				0,			
-0:5	11	1.2218	13.9413	11.6474				3			
-006	12	1.5810	131031	10.3135					2		
-007	13	1.5742	11.4406	9.6187							
860-	14	1.5805	12.3828	10.0375							
PGG-	15	1.5821	11.8398	9.6288							
-010	16	1.5824	11.010.3	9.2686							
511	17	1.5987	13 4339	11.4220							
-12/2	18	1.5813	12.4865	10.4608							1
-013	19	1.57.18	11.3406	9.7921							1
-014	50	1,5773	11.1481	9.2652							1

# NON-DECANTED % SOLIDS/% MOISTURE

page 2 of2

Analysi Chird By Batch No Melhod No	5, 100 P.P.O 5734 56400	% Solids	Date Date	0-20-13	g 5 0	roject Date: out Date won Temp	589.01 01-23-9 01-23-9 1050 Aero	5	51 550.54 lime 3:43 p	74	
Sample No	Pan No	ParvA Weight	Wet/B Soil+Pan	Dry/C Soil+Pan	Dry/C1 Soil+Pan	Diff C1-C	Dry/C2 Soil+Pan	Diff C2-C1	Dry/C3 Soil+Pan	Diff C3-C2	% Solids
7337-001	7.1	1.5777	13.081	11.0621							
500-	22	1,5754	13.6446	11.3021							
-523	23	1.5828	13,0802	10.7096							
Lico-	24	1.5866	11.3243	8.7141							
-205	25	1.5779	12.2091	11.3514							
-000	26	1.5749	11.5481	95063							,
500-	27	1.5854	12.6073	11.1845			View.				
7337-00700	28	1.5833	12.0902	1582.01			Se.	9			
7274-001	29	1.5838	11.6936	10.7568				B			
7344-201	30	1.5917	12.2002	12.1973				65			
ا دنند	31	1.5877	11.6851	72917				8,8	1	1	
CCC-	32	1.5491	11.4998	6.3386							
٧٠٠	33	1,5925	11,4273	4.7668							
-005	34	1.5890	11.5018	4.5669							
-504	35	1.5835	11.5159	4.5736							
7222	30	1.5802	12.9811	95825							
7342-014	37	1.5460	11.2876	3.9633							
-212.	38	1.6224	12.1978	4.0929							1
nk-	31	1.5662	13 5305	11.1052							1



Project: 550.56

Category: Pesticide/PCBs Method: EPA 8080

Matrix: SOLID

Client ID: BODMT2

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

nalyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
lpha-BHC	319-84-6	QCBLK57279-1	01/20/95	01/25/95	1.8	UG/KG	U	1.8	1
eta-BHC	319-85-7	QCBLK57279-1	01/20/95	01/25/95	3.5	UG/KG	U	3.5	1
elta-BHC	319-86-8	QCBLK57279-1	01/20/95	01/25/95	5.3	UG/KG	U	5.3	1
amma-BHC (Lindane)	58-89-9	QCBLK57279-1	01/20/95	01/25/95	4.5	UG/KG		2.3	1
eptachlor	76-44-8	QCBLK57279-1	01/20/95	01/25/95	1.8	UG/KG	U	1.8	1
ldrin	309-00-2	QCBLK57279-1	01/20/95	01/25/95	8.2	UG/KG		2.3	1
eptachlor Epoxide	1024-57-3	QCBLK57279-1	01/20/95	01/25/95	49	UG/KG	U	49	1
ndosulfan I	959-98-8	QCBLK57279-1	01/20/95	01/25/95	8.3	UG/KG	U	8.3	1
ieldrin	60-57-1	QCBLK57279-1	01/20/95	01/25/95	1.2	UG/KG	U	1.2	1
,4'-DDE	72-55-9	QCBLK57279-1	01/20/95	01/25/95	25	UG/KG	UX	25	1
ndrin	72-20-8	QCBLK57279-1	01/20/95	01/25/95	140	UG/KG	UX	140	1
ndosulfan II	33213-65-9	QCBLK57279-1	01/20/95	01/25/95	45	UG/KG	UX	45	1
,4'-DDD	72-54-8	QCBLK57279-1	01/20/95	01/25/95	6.5	UG/KG	U	6.5	1
ndosulfan Sulfate	1031-07-8	QCBLK57279-1	01/20/95	01/25/95	39	UG/KG	U	39	1
,4'-DDT	50-29-3	QCBLK57279-1	01/20/95	01/25/95	170	UG/KG	UX	170	1
ethoxychlor	72-43-5	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
ndrin Aldehyde	7421-93-4	QCBLK57279-1	01/20/95	01/25/95	54	UG/KG	UX	54	1
hlordane	57-74-9	QCBLK57279-1	01/20/95	01/25/95	8.3	UG/KG	U	8.3	1
oxaphene	8001-35-2	QCBLK57279-1	01/20/95	01/25/95	140	UG/KG	U	140	1
roctor-1016	12674-11-2	QCBLK57279-1	01/20/95	01/25/95	39	UG/KG	U	39	1
roclor-1221	11104-28-2	QCBLK57279-1	01/20/95	01/25/95	59	UG/KG	U	59	1
roctor-1232	11141-16-5	QCBLK57279-1	01/20/95	01/25/95	59	UG/KG	U	59	1
roclor-1242	53469-21-9	QCBLK57279-1	01/20/95	01/25/95	39	UG/KG	U	39	1
roclor-1248	12672-29-6	QCBLK57279-1	01/20/95	01/25/95	59	UG/KG	U	59	1
roctor-1254	11097-69-1	QCBLK57279-1	01/20/95	02/02/95	2300	UG/KG		590	10
roctor-1260	11096-82-5	QCBLK57279-1	01/20/95	02/02/95	1800	UG/KG		590	10
BC	1770-80-5	QCBLK57279-1	01/20/95	01/25/95	72	%REC			1



Project: 550.56

Category: Pesticide/PCBs Method: EPA 8080

Matrix: SOLID

Client ID: BODMT3

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

nalyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
lpha-BHC	319-84-6	QCBLK57279-1	01/20/95	01/25/95	3.1	UG/KG	Ü	3.1	1
eta-BHC	319-85-7	QCBLK57279-1	01/20/95	01/25/95	6.2	UG/KG	U	6.2	1
lelta-BHC	319-86-8	QCBLK57279-1	01/20/95	01/25/95	9.3	UG/KG	U	9.3	1
jamma-BHC (Lindane)	58-89-9	QCBLK57279-1	01/20/95	01/25/95	4.1	UG/KG	U	4.1	1
leptachlor	76-44-8	QCBLK57279-1	01/20/95	01/25/95	3.1	UG/KG	U	3.1	1
ldrin	309-00-2	QCBLK57279-1	01/20/95	01/25/95	36	UG/KG		4.1	1
leptachlor Epoxide	1024-57-3	QCBLK57279-1	01/20/95	01/25/95	86	UG/KG	U	86	1
indosulfan I	959-98-8	QCBLK57279-1	01/20/95	01/25/95	14	UG/KG	U	14	1
ieldrin	60-57-1	QCBLK57279-1	01/20/95	01/25/95	2.1	UG/KG	U	2.1	1
4'-DDE	72-55-9	QCBLK57279-1	01/20/95	01/25/95	82	UG/KG	UX	82	1
ndrin	72-20-8	QCBLK57279-1	01/20/95	01/25/95	440	UG/KG	UX	440	1
ndosulfan II	33213-65-9	QC8LK57279-1	01/20/95	01/25/95	55	UG/KG	UX	55	1
.4'-DDD	72-54-8	QCBLK57279-1	01/20/95	01/25/95	24	UG/KG	UX	24	1
ndosulfan Sulfate	1031-07-8	QCBLK57279-1	01/20/95	01/25/95	68	UG/KG	U	68	1
,4'-DDT	50-29-3	QCBLK57279-1	01/20/95	01/25/95	190	UG/KG	UX	190	1
ethoxychlor	72-43-5	QCBLK57279-1	01/20/95	01/25/95	180	UG/KG	U	180	1
ndrin Aldehyde	7421-93-4	QCBLK57279-1	01/20/95	01/25/95	110	UG/KG	UX	110	1
hlordane	57-74-9	QCBLK57279-1	01/20/95	01/25/95	14	UG/KG	U	14	1
oxaphene	8001-35-2	QCBLK57279-1	01/20/95	01/25/95	250	UG/KG	U	250	1
roclor-1016	12674-11-2	QCBLK57279-1	01/20/95	01/25/95	68	UG/KG	U	68	1
roctor-1221	11104-28-2	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
roclor-1232	11141-16-5	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
roclor-1242	53469-21-9	QCBLK57279-1	01/20/95	01/25/95	68	UG/KG	U	68	1
roclor-1248	12672-29-6	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
roclor-1254	11097-69-1	QCBLK57279-1	01/20/95	01/24/95	9800	UG/KG		2500	25
roclor-1260	11096-82-5	QCBLK57279-1	01/20/95	01/24/95	7500	UG/KG		2500	25
BC	1770-80-5	QCBLK57279-1	01/20/95	01/25/95	66	%REC			1

# 9613497-1291

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DAT	
Lab Name: QUANTERRA, MO Contract:	550.56 BODMT2
Lab Code: <u>ITMO</u> Case No.: SAS N	No.: SDG No.:W0429
Matrix: (soil/water)SOIL	Lab Sample ID:7344-002
Sample wt/vol: _30.0 (g/ml) _ q	Lab File ID:
Level: (low/med) LOW	Date Sampled : 01-17-95
% Moisture: not dec. 44 dec.	Date Extracted: 01-20-95
Extraction: (SepF/Cont/Sonc) SONC	Date Analyzed: 01-25-95

Dilution Factor:

pH:\_\_\_\_

CONCENTRATION UNITS: CAS NO. Compound Q (ug/L or ug/Kg) uq/Kq 319-84-6-----alpha-BHC U 1.8 319-85-7------beta-BHC U 3.5 319-86-8-----delta-BHC 5.3 U 58-89-9-----gamma-BHC (Lindane) 4.5 76-44-8------Heptachlor U 1.8 309-00-2-----Aldrin 8.2 1024-57-3------Heptachlor epoxide 49 U U 959-98-8-----Endosulfan I 8.3 U 60-57-1------Dieldrin 1.2 72-55-9-----4,4'-DDE 25 UX 72-20-8-----Endrin 140 UX 33213-65-9-----Endosulfan II 45 UX 72-54-8-----4,4'-DDD U 6.5 1031-07-8-----Endosulfan sulfate U 39 50-29-3-----4,4'-DDT 170 UX 72-43-5-----Methoxychlor 100 Ū 53494-70-5-----Endrin Aldehyde 54 UX 57-74-9-----Tech. Chlordane 8.3 U ับ 8001-35-2-----Toxaphene 140 11104-28-2-----Aroclor-1221 59 IJ 11141-28-2-----Aroclor-1232 59 U 53469-21-9/12674-11-2-Aroclor-1242/1016 39 U TT 12672-29-6------Aroclor-1248 59 11097-57-4------Aroclor-1254 SD SD 11096-82-5------Aroclor-1260

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

SD: See dilution

GPC Cleanup: (Y/N) N

X: Elevated detection limit due to PCB interference.

FORM I PEST

36131971, 1292

ID

ORGANICS ANALYSIS DATA SHE

EPA SAMPLE NO.

	1	BODMT2DL
Lab Name: <u>QUANTERRA,MO</u> Contract: _	550.56	BODMIZDE
Lab Code: ITMO Case No.:	SAS No.: SDG No.:	<u>w</u> 0429
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID:	7344-002DL
Sample wt/vol: <u>30.0</u> (g/ml) <u>q</u>	Lab File ID:	
Level: (low/med) LOW	Date Sampled :	01-17-95
% Moisture: not dec. 44 dec.	Date Extracted:	01-20-95
Extraction: (SepF/Cont/Sonc) SONC	Date Analyzed:	02-02-95
GPC Cleanup: (Y/N) N pH:	Dilution Factor:	10
CAS NO. Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	
11104-28-2	590 390	U U U U

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

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

BODMT3

Lab Name: OUANTERRA, MO Contract: 550.56

 Lab Name:
 QUANTERRA,MO
 Contract:
 550.56

 Lab Code:
 ITMO
 Case No.:
 SAS No.:
 SDG No.:
 W0429

 Matrix:
 (soil/water)
 SOIL
 Lab Sample ID:
 7344-004

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

 Level:
 (low/med)
 LOW
 Date Sampled:
 01-17-95

 % Moisture:
 not dec.
 68
 dec.
 Date Extracted:
 01-20-95

 Extraction:
 (SepF/Cont/Sonc)
 SONC
 Date Analyzed:
 01-25-95

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

CONCENTRATION UNITS:

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

319-84-6	alpha-BHC	3.1	ט
319-85-7	beta-BHC	6.2	U
319-86-8	delta-BHC	9.3	ש
58-89-9	gamma-BHC (Lindane)	4.1	U
76-44-8	Heptachlor	3.1	U
309-00-2		36	
1024-57-3	Heptachlor epoxide	86	U
959-98-8	Endosulfan I	14	
60-57-1	Dieldrin	2.1	U
72-55-9	4,4'-DDE	82	UX
72-20-8	Endrin	440	UX
33213-65-9	Endosulfan II	55	UX
72-54-8	4,4'-DDD	24	UX
1031-07-8	Endosulfan sulfate	68 .	
50-29-3		190	UX
72-43-5	Methoxychlor	180	U
	Endrin Aldehyde	110	UX
57-74-9	Tech. Chlordane	14	
8001-35-2	Toxaphene	250	ט
	Aroclor-1221	100	U
11141-28-2	Aroclor-1232	100	U
53469-21-9/12674-	11-2-Aroclor-1242/1016	68	U
12672-29-6	Aroclor-1248	100	
11097-57-4	Aroclor-1254		SD
11096-82-5	Aroclor-1260		SD

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

SD: See dilution

X: Elevated detection limit due to PCB interference.

FORM I PEST

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SE	HEET	BODMT3DL
Lab Name:QUANTERRA,MO Contract:	550.56	.————
Lab Code: ITMO Case No.: SAS No.:	SDG No.:	W0429
Matrix: (soil/water)SOIL	Lab Sample ID:	7344-004DL
Sample wt/vol: _30.0 (g/ml) _ g	Lab File ID:	
Level: (low/med) LOW	Date Sampled : _	01-17-95
Moisture: not dec. 68 dec.	Date Extracted:	01-20-95
Extraction: (SepF/Cont/Sonc) SONC	Date Analyzed:	01-24-95
GPC Cleanup: (Y/N) N pH:	Dilution Factor:	25
	TRATION UNITS: or ug/Kg) <u>uq/Kg</u>	Q
319-84-6	77	U U U U U U U U U U U U U U U U U U U
11097-57-4Aroctor-1254 11096-82-5Aroctor-1260	9800 7500	

Concentration of analyte is less than the value given. Elevated detection limit is due to PCB interference. U:

X:

FORM I PEST



Project: 550.56

Category: ICAP Metals Method: EPA 6010 Matrix: SOLID

Client ID: BODMT2

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID : 7344-002

	Blank Sample	Prep.	Analyses						
CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dilution	
7429-90-5	QCBLK57519-1	01/24/95	01/25/95	53700	MG/KG	-	35.4	1	
7440-36-0	QCBLK57519-1	01/24/95	01/25/95	7.8	MG/KG	В	17.7	1	
7440-39-3	QCBLK57519-1	01/24/95	01/25/95	74.3	MG/KG		35.4	1	
7440-41-7	QCBLK57519-1	01/24/95	01/25/95	0.59	MG/KG	В	1.2	1	
7440-43-9	QCBLK57519-1	01/24/95	01/25/95	2.6	MG/KG	В	3.5	1	
7440-70-2	QCBLK57519-1						885	1	
7440-47-3							3.5	1	
7440-48-4							8.9	1	
							4.4	1	
1 1 1 2 2 2							17.7	1	
								1	
								1	
								1	
,								1	
						R		1	
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					-			i	
								i	
								i	
	7429-90-5 7440-36-0 7440-39-3 7440-41-7 7440-43-9 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-95-4 7439-96-5 7440-02-0 7440-02-0 7440-23-5 7440-62-2	7429-90-5 QCBLK57519-1 7440-36-0 QCBLK57519-1 7440-39-3 QCBLK57519-1 7440-41-7 QCBLK57519-1 7440-43-9 QCBLK57519-1 7440-47-3 QCBLK57519-1 7440-47-3 QCBLK57519-1 7440-50-8 QCBLK57519-1 7439-89-6 QCBLK57519-1 7439-95-4 QCBLK57519-1 7439-95-4 QCBLK57519-1 7439-96-5 QCBLK57519-1 7440-02-0 QCBLK57519-1 7440-02-0 QCBLK57519-1 7440-22-4 QCBLK57519-1 7440-23-5 QCBLK57519-1 7440-23-5 QCBLK57519-1 7440-62-2 QCBLK57519-1	CAS Number         Name         Date           7429-90-5         QCBLK57519-1         01/24/95           7440-36-0         QCBLK57519-1         01/24/95           7440-39-3         QCBLK57519-1         01/24/95           7440-41-7         QCBLK57519-1         01/24/95           7440-43-9         QCBLK57519-1         01/24/95           7440-47-3         QCBLK57519-1         01/24/95           7440-48-4         QCBLK57519-1         01/24/95           7440-50-8         QCBLK57519-1         01/24/95           7439-89-6         QCBLK57519-1         01/24/95           7439-92-1         QCBLK57519-1         01/24/95           7439-95-4         QCBLK57519-1         01/24/95           7440-02-0         QCBLK57519-1         01/24/95           7440-09-7         QCBLK57519-1         01/24/95           7440-02-0         QCBLK57519-1         01/24/95           7440-22-4         QCBLK57519-1         01/24/95           7440-23-5         QCBLK57519-1         01/24/95           7440-62-2         QCBLK57519-1         01/24/95	CAS Number         Name         Date         Date           7429-90-5         QCBLK57519-1         01/24/95         01/25/95           7440-36-0         QCBLK57519-1         01/24/95         01/25/95           7440-39-3         QCBLK57519-1         01/24/95         01/25/95           7440-41-7         QCBLK57519-1         01/24/95         01/25/95           7440-43-9         QCBLK57519-1         01/24/95         01/25/95           7440-70-2         QCBLK57519-1         01/24/95         01/25/95           7440-48-4         QCBLK57519-1         01/24/95         01/25/95           7440-50-8         QCBLK57519-1         01/24/95         01/25/95           7439-89-6         QCBLK57519-1         01/24/95         01/25/95           7439-92-1         QCBLK57519-1         01/24/95         01/25/95           7439-95-4         QCBLK57519-1         01/24/95         01/25/95           7439-96-5         QCBLK57519-1         01/24/95         01/25/95           7440-02-0         QCBLK57519-1         01/24/95         01/25/95           7440-02-0         QCBLK57519-1         01/24/95         01/25/95           7440-22-4         QCBLK57519-1         01/24/95         01/25/95	CAS Number         Name         Date         Result           7429-90-5         QCBLK57519-1         01/24/95         01/25/95         53700           7440-36-0         QCBLK57519-1         01/24/95         01/25/95         7.8           7440-39-3         QCBLK57519-1         01/24/95         01/25/95         74.3           7440-41-7         QCBLK57519-1         01/24/95         01/25/95         0.59           7440-43-9         QCBLK57519-1         01/24/95         01/25/95         2.6           7440-70-2         QCBLK57519-1         01/24/95         01/25/95         3630           7440-47-3         QCBLK57519-1         01/24/95         01/25/95         66.4           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         7.3           7440-50-8         QCBLK57519-1         01/24/95         01/25/95         68.6           7439-89-6         QCBLK57519-1         01/24/95         01/25/95         20100           7439-92-1         QCBLK57519-1         01/24/95         01/25/95         104           7439-95-4         QCBLK57519-1         01/24/95         01/25/95         14.0           7440-02-0         QCBLK57519-1         01/24/95         01/25/95         1	CAS Number         Name         Date         Result Unit           7429-90-5         QCBLK57519-1         01/24/95         01/25/95         53700         MG/KG           7440-36-0         QCBLK57519-1         01/24/95         01/25/95         7.8         MG/KG           7440-39-3         QCBLK57519-1         01/24/95         01/25/95         74.3         MG/KG           7440-41-7         QCBLK57519-1         01/24/95         01/25/95         0.59         MG/KG           7440-43-9         QCBLK57519-1         01/24/95         01/25/95         2.6         MG/KG           7440-47-3         QCBLK57519-1         01/24/95         01/25/95         3630         MG/KG           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         7.3         MG/KG           7440-50-8         QCBLK57519-1         01/24/95         01/25/95         7.3         MG/KG           7439-89-6         QCBLK57519-1         01/24/95         01/25/95         68.6         MG/KG           7439-95-4         QCBLK57519-1         01/24/95         01/25/95         3090         MG/KG           7439-96-5         QCBLK57519-1         01/24/95         01/25/95         3090         MG/KG           744	CAS Number         Name         Date         Date         Result Unit Qual.           7429-90-5         QCBLK57519-1         01/24/95         01/25/95         53700         MG/KG           7440-36-0         QCBLK57519-1         01/24/95         01/25/95         7.8         MG/KG           7440-39-3         QCBLK57519-1         01/24/95         01/25/95         74.3         MG/KG           7440-41-7         QCBLK57519-1         01/24/95         01/25/95         0.59         MG/KG         B           7440-43-9         QCBLK57519-1         01/24/95         01/25/95         2.6         MG/KG         B           7440-70-2         QCBLK57519-1         01/24/95         01/25/95         3630         MG/KG           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         66.4         MG/KG           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         68.6         MG/KG           7440-50-8         QCBLK57519-1         01/24/95         01/25/95         20100         MG/KG           7439-89-6         QCBLK57519-1         01/24/95         01/25/95         20100         MG/KG           7439-95-4         QCBLK57519-1         01/24/95         01/25/95         <	CAS Number         Name         Date         Date         Result Unit Qual.         Limit           7429-90-5         QCBLK57519-1         01/24/95         01/25/95         53700         MG/KG         35.4           7440-36-0         QCBLK57519-1         01/24/95         01/25/95         7.8         MG/KG         B         17.7           7440-39-3         QCBLK57519-1         01/24/95         01/25/95         74.3         MG/KG         35.4           7440-41-7         QCBLK57519-1         01/24/95         01/25/95         0.59         MG/KG         B         1.2           7440-43-9         QCBLK57519-1         01/24/95         01/25/95         2.6         MG/KG         B         3.5           7440-70-2         QCBLK57519-1         01/24/95         01/25/95         3630         MG/KG         885           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         66.4         MG/KG         3.5           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         7.3         MG/KG         8.9           7440-50-8         QCBLK57519-1         01/24/95         01/25/95         20.0         MG/KG         4.4           7439-99-4         QCBLK57519-1	CAS Number         Name         Date         Date         Result Unit Qual.         Limit Dilution           7429-90-5         QCBLK57519-1         01/24/95         01/25/95         53700         MG/KG         35.4         1           7440-36-0         QCBLK57519-1         01/24/95         01/25/95         7.8         MG/KG         B         17.7         1           7440-39-3         QCBLK57519-1         01/24/95         01/25/95         74.3         MG/KG         35.4         1           7440-41-7         QCBLK57519-1         01/24/95         01/25/95         0.59         MG/KG         B         1.2         1           7440-43-9         QCBLK57519-1         01/24/95         01/25/95         2.6         MG/KG         B         3.5         1           7440-47-3         QCBLK57519-1         01/24/95         01/25/95         3630         MG/KG         885         1           7440-48-4         QCBLK57519-1         01/24/95         01/25/95         7.3         MG/KG         8.9         1           7439-92-1         QCBLK57519-1         01/24/95         01/25/95         68.6         MG/KG         4.4         1           7439-95-4         QCBLK57519-1         01/24/95 <t< td=""></t<>

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Project: 550.56

Category: ICAP Metals Method: EPA 6010 Matrix: SOLID

Client ID: BODMT3

**Quanterra**Environmental
Services

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

		Blank Sample	Prep.	Analyses				Detection	ı
Inalyte	CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dilution
luminum	7429-90-5	QCBLK57519-1	01/24/95	01/25/95	63400	MG/KG		62.0	1
Intimony	7440-36-0	QCBLK57519-1	01/24/95	01/25/95	10.1	MG/KG	U	31.0	1
Barium	7440-39-3	QCBLK57519-1	01/24/95	01/25/95	107	MG/KG		62.0	1
Beryllium	7440-41-7	QCBLK57519-1	01/24/95	01/25/95	0.76	MG/KG	В	2.2	1
Cadmium	7440-43-9	QCBLK57519-1	01/24/95	01/25/95	4.7	MG/KG	В	6.2	1
Calcium	7440-70-2	QCBLK57519-1	01/24/95	01/25/95	4200	MG/KG		1550	1
Chromium	7440-47-3	QCBLK57519-1	01/24/95	01/25/95	77.1	MG/KG		6.2	1
obalt	7440-48-4	QCBLK57519-1	01/24/95	01/25/95	9.4	MG/KG		15	1
Copper	7440-50-8	QCBLK57519-1	01/24/95	01/25/95	55.8	MG/KG		7.7	1
ron	7439-89-6	QCBLK57519-1	01/24/95	01/25/95	21000	MG/KG		31.0	1
.ead	7439-92-1	QCBLK57519-1	01/24/95	01/25/95	197	MG/KG		31.0	1
lagnes i um	7439-95-4	QCBLK57519-1	01/24/95	01/25/95	4180	MG/KG		1550	1
langanese	7439-96-5	QCBLK57519-1	01/24/95	01/25/95	201	MG/KG		4.6	1
lickel	7440-02-0	QCBLK57519-1	01/24/95	01/25/95	18.8	MG/KG		12	1
otassium	7440-09-7	9CBLK57519-1	01/24/95	01/25/95	970	MG/KG	В	1550	1
ilver	7440-22-4	QCBLK57519-1	01/24/95	01/25/95	1.3	MG/KG		62.0	1
odium	7440-23-5	QCBLK57519-1	01/24/95	01/25/95	286	MG/KG		310	1
anadium	7440-62-2	QCBLK57519-1	01/24/95	01/25/95	46.5	MG/KG	-	15	1
inc	7440-66-6	QCBLK57519-1	01/24/95	01/25/95	1030	MG/KG		6.2	i

Project: 550.56

Category: Arsenic Method: EPA 7060 Matrix: SOLID

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	n Dil.
BODMT6	7344-001	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	0.12	MG/KG	U	1.0	1
BODMT6	7344-001MS	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	105	%REC			1
BODMT6	7344-001MSD	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	104	%REC			1
BODMT2	7344-002	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	14.4	MG/KG		17.7	10
BODMT3	7344-004	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	41.1	MG/KG		31.0	10
NA	QCBLK57520-1	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	0.12	MG/KG	U	1.0	1
NA	QCLCS57520-1	Arsenic	7440-38-2	QCBLK57520-1	01/24/9	5 01/25/95	126	%REC			20

Project: 550.56

Category: Selenium Method: EPA 7740 Matrix: SOLID

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	n Dil.
BODMT6	7344-001	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	0.10	MG/KG	U	0.50	1
BODMT6	7344-001MS	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	106	%REC			1
BODMT6	7344-001MSD	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	97	<b>XREC</b>			1
BODMT2	7344-002	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	0.18	MG/KG	U	0.89	1
BODMT3	7344-004	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	0.31	MG/KG	U	1.5	1
NA	QCBLK57520-1	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	0.10	MG/KG	U	0.50	1
NA	QCLCS57520-1	Selenium	7782-49-2	QCBLK57520-1	01/24/9	5 01/25/95	112	<b>X</b> REC			20

Project: 550.56

Category: Thallium Method: EPA 7841 Matrix: SOLID

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	0.10	MG/KG	В	1.0	1
BODMT6	7344-001MS	Thallium	7440-28-0	QCBLK57520-1	01/24/95	5 01/25/95	91	%REC			1
BODMT6	7344-001MSD	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	89	%REC			1
BODMT2	7344-002	Thallium	7440-28-0	QCBLK57520-1	01/24/95	5 01/25/95	0.28	MG/KG	8	1.8	1
BODMT3	7344-004	Thallium	7440-28-0	QCBLK57520-1	01/24/9	5 01/25/95	0.32	MG/KG	8	3.1	1
NA	QCBLK57520-1	Thallium	7440-28-0	QCBLK57520-1	01/24/9	5 01/25/95	0.090	MG/KG	U	1.0	1
NA	QCLCS57520-1	Thallium	7440-28-0	QCBLK57520-1	01/24/9	5 01/25/95	100	%REC			20

## U.S. EPA - CLP

	1		
INORGANIC	ANALYSES	DATA	SHEET

EPA SAMPLE NO.

Name: ITAS	_STLOUIS_		Contract: 550	0.5			BODMT2
Code: ITMO		0.:	SAS No.:		SDG	No.	W0429
rix (soil/w	ater): SOIL			Lab	Sampl	e ID:	7344-002
el (low/med	): LOW	-	ī	Date	Rece	ived	01/18/95
olids:	56.	5	•	Juc		_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	01/10/33
Co	ncentration	Units (ug/	L or mg/kg dry	y w	eight)	: MG/	/KG
				П			
	CAS No.	Analyte	Concentration	C	Q	M	
	7429-90-5	Aluminum	53700			P	
	7440-36-0	Antimony	7.8	B.		P P	
	7440-38-2	Arsenic	14.4			F-	
	7440-39-3	Barium	74.3			F_ P_ P_	
		Beryllium	0.59	등		D-	
		Cadmium	2.6	B .		P-	
						P_P	
	7440-70-2	Calcium_	3630			P-	
	7440-47-3	Chromium_	66.4	= -		P-	
		Cobalt	7.3			P_ P_ P_	
	7440-50-8	Copper	68.6			P_	
	7439-89-6	Iron	20100			P_ P_ P_ P_	
	7439-92-1	Lead	104			P_	
		Magnesium	3090			P_	
		Manganese	140			P	
		Nickel	14.7			P	
	7440-09-7	Potassium	654	B		P	
		Selenium	0.18			F	
		Silver	0.76	B		P_ P_ F_	
	7440-23-5	Sodium	244	1		P	
	7440-28-0	Thallium	0.28	B		F	
	7440-62-2	Vanadium	45.0	-		P_	
	7440-66-6	Zinc	450	- -		P_	
	7440 00 0		450	- -			
				- -		-	
				-		-	
				-		-	
						1-1	
				-			
or Before:		Clarit	Defense			marri	<b></b>
		Clarit	y Before:				ture:
or After:		Clari	ty After:			Art:	ifacts:
ments:							
			· · · · · · · · · · · · · · · · · · ·				

SW-846

# U.S. EPA - CLP

	1		
INORGANIC	ANALYSES	DATA	SHEET

EPA SAMPLE NO.

Lab Name: ITAS_STLOUIS_		Contract: 550	0.5	6		вормтз
Lab Code: ITMO Case N	0. •	SAS No.:			NO.:	W0429
Matrix (soil/water): SOIL	···		ah			7344-004
Level (low/med): LOW_ % Solids:32.		i	Dat	e Rece	ived:	01/18/95
Concentration	Units (ug,	/L or mg/kg dry	y w	eight)	MG/	KG
CAS No.	Analyte	Concentration	С	Q	M	
7429-90-5	Aluminum	63400	-		P	
7440-36-0	Antimony	10.1	Ū		P-	
7440-38-2	Arsenic	41.1			F-	
7440-39-3	Barium	107	-		P P	
7440-41-7	Beryllium	0.76	B		P-	
7440-43-9	Cadmium	4.7	В		P-	
7440-70-2	Calcium	4200	-		P_	
7440-47-3	Chromium	77.1	-		P_	
7440-48-4	Cobalt	9.4	B		P	
7440-50-8	Copper	55.8			P_ P	
7439-89-6	Iron	21000	-		P	
7439-92-1	Lead	197			P	
7439-95-4	Magnesium	4180	-		P_ P_	
7439-96-5	Manganese	201	-		P	
7440-02-0	Nickel	18.8	-		P	
7440-09-7	Potassium	970	B		P	
7782-49-2	Selenium	0.31	Ū		F-	
7440-22-4	Silver	1.3			P	
7440-23-5	Sodium	286		-	p_	
7440-28-0	Thallium	0.32			F	
7440-62-2	Vanadium	46.5			F_ P_	
7440-66-6	Zinc	1030			P_	
			1_1			

Color Before:	Clarity Before:	Texture:
Comments:	· · · · · · · · · · · · · · · · · · ·	
	FORM I - IN	

SW-846

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

Environmental Services

Project: 550.56

Category: Chloride Method: EPA 300.0 Matrix: SOLID

Client	Quanterra			Blank Sample	Prep.	Analyses				Detection	n
ID	ID	Analyte	CAS Number	Name	Date	Date	Result	Unit	Qual.		Dil.
BODMT6	7344-001	Chloride	16887-00-6	QCBLK57444-2	01/20/9	5 01/20/95	2.96	UG/G		2.47	1
BODMT6	7344-001DUP	Chloride	16887-00-6	QCBLK57444-2	01/20/9	5 01/20/95	2.96	UG/G		2.46	1
BODMT6	7344-001MS	Chloride	16887-00-6	QC8LK57444-2	01/20/9	5 01/20/95	102	%REC			5
BODMT2	7344-002	Chloride	16887-00-6	QCBLK57444-2	01/20/9	5 01/20/95	15.4	UG/G		4.25	1
BODMT3	7344-004	Chloride	16887-00-6	QCBLK57444-2	01/20/9	5 01/20/95	20.3	UG/G		7.66	1
NA	QCBLK57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/9	5 01/20/95	2.50	UG/G	U	2.50	1
NA	QCLCS57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/9	5 01/20/95	94	%REC			1

Project: 550.56



Category: Fluoride Method: EPA 300.0 Matrix: SOLID

Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.		n Dil.
7344-001	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	0.99	UG/G	U	0.99	1
7344-001DUP	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	0.98	UG/G	U	0.98	1
7344-001MS	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	107	%REC			1
7344-002	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	1.70	UG/G	U	1.70	1
7344-004	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	6.25	UG/G		3.06	1
QCBLK57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	1.00	UG/G	υ	1.00	1
QCLCS57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/9	5 01/20/95	103	%REC			1
-	7344-001 7344-001DUP 7344-001MS 7344-002 7344-004 QCBLK57444-2	TD Analyte  7344-001 Fluoride  7344-001DUP Fluoride  7344-001MS Fluoride  7344-002 Fluoride  7344-004 Fluoride  0CBLK57444-2 Fluoride	TD Analyte CAS Number  7344-001 Fluoride 16984-48-8  7344-001DUP Fluoride 16984-48-8  7344-001MS Fluoride 16984-48-8  7344-002 Fluoride 16984-48-8  7344-004 Fluoride 16984-48-8  QCBLK57444-2 Fluoride 16984-48-8	ID Analyte CAS Number Name  7344-001 Fluoride 16984-48-8 QCBLK57444-2  7344-001DUP Fluoride 16984-48-8 QCBLK57444-2  7344-001MS Fluoride 16984-48-8 QCBLK57444-2  7344-002 Fluoride 16984-48-8 QCBLK57444-2  7344-004 Fluoride 16984-48-8 QCBLK57444-2  QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2	ID Analyte CAS Number Name Date  7344-001 Fluoride 16984-48-8 QCBLK57444-2 01/20/9  7344-001DUP Fluoride 16984-48-8 QCBLK57444-2 01/20/9  7344-001MS Fluoride 16984-48-8 QCBLK57444-2 01/20/9  7344-002 Fluoride 16984-48-8 QCBLK57444-2 01/20/9  7344-004 Fluoride 16984-48-8 QCBLK57444-2 01/20/9  QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2 01/20/9	ID Analyte CAS Number Name Date Date  7344-001 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95  7344-001DUP Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95  7344-001MS Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95  7344-002 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95  7344-004 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95  QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95	ID Analyte CAS Number Name Date Date Result  7344-001 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.99  7344-001DUP Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.98  7344-001MS Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 107  7344-002 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.70  7344-004 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 6.25  QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.00	ID Analyte CAS Number Name Date Date Result Unit 7344-001 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.99 UG/G 7344-001DUP Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.98 UG/G 7344-001MS Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 107 %REC 7344-002 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.70 UG/G 7344-004 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 6.25 UG/G QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.00 UG/G	ID Analyte CAS Number Name Date Date Result Unit Qual.  7344-001 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.99 UG/G U  7344-001DUP Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.98 UG/G U  7344-001MS Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 107 %REC  7344-002 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.70 UG/G U  7344-004 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 6.25 UG/G  QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.00 UG/G U	ID Analyte CAS Number Name Date Date Result Unit Qual. Limit  7344-001 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.99 UG/G U 0.99  7344-001DUP Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 0.98 UG/G U 0.98  7344-001MS Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 107 %REC  7344-002 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.70 UG/G U 1.70  7344-004 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 6.25 UG/G 3.06  QCBLK57444-2 Fluoride 16984-48-8 QCBLK57444-2 01/20/95 01/20/95 1.00 UG/G U 1.00

Project: 550.56



Category: Nitrate Method: EPA 300.0 Matrix: SOLID

Client	Quanterra			Blank Cample	D	Annlunna				Detection	
ID	ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.		Dil.
BODMT6	7344-001	Nitrate	14797-55-8	QCBLK57444-2	01/20/9	5 01/20/95	0.20	UG/G	U	0.20	1
B0DMT6	7344-001DUP	Nitrate	14797-55-8	QC8LK57444-2	01/20/9	5 01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrate	14797-55-8	QCBLK57444-2	01/20/9	5 01/20/95	106	%REC			1
BODMT2	7344-002	Nitrate	14797-55-8	QCBLK57444-2	01/20/9	5 01/20/95	69.5	UG/G		1.70	5
BODMT3	7344-004	Nitrate	14797-55-8	QCBLK57444-2	01/20/9	5 01/20/95	50.3	UG/G		1.22	2
NA	QCBLK57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/9	5 01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/9	5 01/20/95	100	%REC			1

Quanterra
Environmental
Services

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

Project: 550.56

Category: Nitrite 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	n Dil
BODMT6	7344-001	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	0.20	UG/G	Ų	0.20	1
BODMT6	7344-001DUP	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	103	%REC			5
BODMT2	7344-002	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	0.34	UG/G	U	0.34	1
BODMT3	7344-004	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	0.61	UG/G	U	0.61	1
NA	QCBLK57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/9	5 01/20/95	104	%REC			1

**Quanterra**Environmental

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

Project: 550.56

Category: Orthophosphate 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.
BODMT6	7344-001	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	Ü	9.86	1
BODMT6	7344-001DUP	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	102	%REC			1
BODMT2	7344-002	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	17.0	UG/G	U	17.0	1
BODMT3	7344-004	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	30.6	UG/G	U	30.6	1
NA	QC8LK57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	96	%REC			1

**Quanterra**Environmental
Services

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

Project: 550.56

Category: Sulfate 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	n Dil.
BODMT6	7344-001	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	101	%REC			5
BODMT2	7344-002	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	2230	UG/G		170	10
BODMT3	7344-004	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	4040	UG/G		306	10
NA	QCBLK57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/9	5 01/20/95	97	%REC			1

Project #: 262
Analyst:
Reviewed By:

Reviewed By:

Page 1 of 2

J. Flandean / Jm Klin is/02-03-95

ANIONS BY I.C.

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

Prep Date: 01-20-95

Analysis Date: 01-20-95

Loop Used: 57444

Method #: 370.0

Standard Value	Sample ID	Standard ID	Solid Fract.	Dil.	FI	СІ	804	NO <sub>3</sub> -N	OPO <sub>4</sub>	NO₂-N	Br
	OCBULS744			1	40.100°	<0.250	×1.00	<0,070	<1.00	10.0W	_
501 4 P P P 1020	acces 57444	AL0459-95		1	0.774	0,925	3.84 -	0.197	3.80 -	0.081	_
	7339-001			45 1 5045	0.372	15.8	27.3	1	1	-	
	100 do			Į.	0.357	15.4	27.3 -	-	-	-	-
F12 04 20	us col	AL0460-95		Fl 1 527 5	2.30	35.1	48.3	1	(	-	_ 0
	003			F1 2041	<0.100	40,250	<1.00	1	(	1	- 1
	V 004			FI I SON I	<0.100	<0.250	<1.00	1	1	1	7.2
	7343-001			E 2 2 200 1	0.206	8.18	22.6	<0.000	<1.00 -	<0.000	-
	002			FI NOT	40,100	40,250	<(.00)	<0.000	<1.00	<0.020	_
	003			FI S 504 25	<0.100 -	<0.250	<1.00	<0.000	<1.00	<0.020 €	_
	7338-003			FIS 504 25 C150	6.78	161	437	1	1	1	-
	004			61 70 801 2	-	50.9	35.5 /	1	1	1	-
	005			20 20 CM 20	_	140 -	64.1	)	-	~	~
	006			504 20	-	8,09	291	-	7	_	~
	V 007			504 20	-	7.05	349 -	/ -	7	1	~
	OCBUL ST444			1	< 1.00 mg/4	42.50 usig	<10.0 uglg	<0.200ugly	<10.045	<0.700m	_

% Recovery

RPD

	FI CI 80 <sub>4</sub> NO <sub>3</sub> -N OPO <sub>4</sub> NO <sub>2</sub> -N Br	FI CI SO <sub>4</sub> NO <sub>3</sub> -N OPO <sub>4</sub> NO <sub>2</sub> -N Br
105-1 H20 105-2 SOIU 7339 MS 1340 MS	97 92 96 98 95 101 — 103 94 97 100 96 104 — 96 96 105 — — — — 107 102 101 106 102 103 —	7339 DUP 4 3 <1

QUANTERRA ST. LOUIS

262.01,550.50,578.02,550.56 Project #: Analyst: Reviewed By:

ANIONS BY I.C.

Prep Date: 01-70-95
Analysis Date: 01-70-95

Loop Used: 50.00 Batch #: 52444

( ug/s	ug/L	mg/L
	circle o	ne)

Rep	viewed By: viewed By: age <u>2</u> of <u>7</u>	=	a, a, i,	102-03-45		ug/g (cir	ug/L mg/L cle one)			Loop Used:S  Batch #:S  Method #:S	57444	
	Standard Value	Sample ID	Standard ID	Solid Fract.	Dil.	FI	CI	so <sub>4</sub>	NO <sub>3</sub> -N	OPO4	NO <sub>2</sub> -N	Br
7	110 No. 140	access7444	AL 0461-95		1	10.3	9.36	38.8	2.00 /	38.5 -	0.830	-
9		7344-001		0,9997	Í	< 0.986	2.96	<9.86	<0.197	<9.86	<0.197	
١		DYP 001			1	<0.984 1	2.96	49.84	<0.197 -	29.89 Sutorous	<0.197 -	_
0 5	190 No. 5.19 0 190 No. 5.19	45001	AL0462-95	1	E1 5 W. 5	20.3	194	191	4.56	19.3	5.98	- San
4 [		002		0.5649	61 1 1 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	<1.70	15.4	2230	69.5	<17.0-	<0.340	
ı		003		0.4787	Eli ar 5	22.07	16.9	2130	78.4 /	<20,7	<0,415-	
3		004		0.3228	FIT NEW 7	6.25 -	20,3	4040	50.3	<30.6	KO.612	San A
4		005		0.3004	E1 N3 2	6.45	21.5	4390	40.2	₹32.8	<0.655-	
لک		006		0.3010	501 5 OP 1	13.26	17.6	2100	₹0.653	<32.6 °	<0.653	_
4		F00 V		0.7019	Ely Mari	<1.39	81.7	774	10.0	<13.9 -	KO.277	_
			/									
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								200				
								-	60			
									4 4.4	95		
0												

9613497.1310

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

Project: 550.56



Category: NO2-NO3 Method: EPA 353.1 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	n Dil.
BODMT6	7344-001	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.48	UG/G	U	0.48	1
BODMT6	7344-001DUP	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
BODMT6	7344-001MS	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	104	%REC			1
BODMT2	7344-002	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	53.4	UG/G		4.40	5
BODMT3	7344-004	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	35.4	UG/G		3.09	2
NA	QCBLK57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	บ	0.50	1
NA	QCLCS57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	92	%REC			1

# ITAS-ST. LOUIS

#### NITRATE/NITRITE-N REPORT

Pg. 1 of 2

S, POPPE Analyst: Project No.:

Reviewed by:

550.56 522.05 R-Patterson

Batch No.: \_ 57497

Analysis Date: 01-2495 Method No.: 353.1

Date: 03-09-95

	LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L o(g) =	NITRATE/ NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTR <del>ATIO</del> N (ug/L)-N (ug/g)-N	% RECOVERY	RPI
84	CKS7497-1		-3.764		5.000		0.05		<0.5		
5 100	ussy97-1	AWSBEYS	\$29.2		5.000				5.29	94	-
73	342-014		72.19		5.006			0.2443	2.95		
	015		302.6	-	5.103 -			0.2336	12.7		
1	016		1,909		5.028			0.7973	<0.624	/	
77	57-00/		42.25	_	5.162			0.2180	< 2.22		
	002		32.80		5.072			0.6437	<0.766 .	'	
	003		36.58		5.041			0.1624	- < 3.05		
	030P		36.58		5-153				< 2.99	/	X
	cogms	Aw56795	489.1.		5.091			V	29.6	87 .	
$\Box$	004		17.04		5-160			0.6509	· <0.744		
	025		28.38		5,369 -			0.1122 -	- < 4.15		
	006		26.49		5.271			0.6941 -	< 0.683	/	
	007		28.70		5.312			0.2305	< 2.04	1	
$\Box$	008		17.67		5.093			0.6325 -	< 0.776	/	
	ωg		23.97		5.065			0.2369	< 2.08	/	
	010		11.99		5.030			0.4870 -	- <1.02	/	
	011		22.08		5.041 -			0.2445	< 2.03		
	012		11.99		5.030			0.7301-	<0.681		
1	013		29.01		5.125		V	0.3907	<1.25	-	

of any accurate po our to vaccos < O. BICTION CIMIT All sample results were corrected for solid Braction.

# ITAS-ST. LOUIS

#### **NITRATE/NITRITE-N REPORT**

Pg. 2 of 2

Analyst:	S. POPPE	
Project No.:	550.56 522	05

Reviewed by:

Batch No.: \_ \$7497

Plue Analysis Date: 01.2495

Method No.: 353./ Date: 02-09-95

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
7357-014		7.582		5.133		0.05	0.3429	<1.42		
015		-6285.		5.087			0.4969 -	- <0.989		
016		17.04		5.030			0.7965	- <0.624		
V 017		15.78		5.052	1		07174 -	< 0.690		
BCBUSTET-2		-13.53		5.000				<0.5	·	
ACUSSIY97-2-	AW568-95	519.1		5.000		)		5.19	92	
7344-00		34.69.		5.174 -	1		0.9997 -	- <0.483		
00104		31.22		5.036			ers 950	<0.497		*
00/43	Aw569795	590.0 L		5.036			V	5.86	104	
002		607.2	- 5 -	5.028 -			0.5649 -	- 53.4	fort RPOD	-08-0
003		588.5	15 4	5.054			4787 -	60.8		
oat		573.3	12 1	5.019.	,		0.3228 -	- 35.4		1
1 205		588.1.		5.067	•		0.3004 -	- 19.3	/	
V 006		27.75		5.222			03010 -	- <1.59		
									the second second second second second	-

All sample results were corrected for salid foraction.

SL-91-INORG-0039

Category: Sulfide Method: EPA 9030 Matrix: SOLID Quanterra-Richland P.O. Box 1970 Richland, WA 99352

Project: 550.56



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Analys Date Date		Unit	Qual.	Detection Limit	
BODMT6	7344-001	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 10.8	3 UG/G		10.6	1
BODMT6	7344-001DUP	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 10.6	ug/G	U	10.6	1
BODMT6	7344-001MS	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 78	%REC			1
BODMT2	7344-002	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 21.0	UG/G		19.0	1
BODMT3	7344-004	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 44.7	7 UG/G		34.0	1
NA	QCBLK57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 10.6	S UG/G	U	10.6	1
NA	QCLCS57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95 01/23	3/95 84	%REC			1

# **ITAS - ST LOUIS SULFIDES**

(SOIL)

PREP DATE: 01-23-95 ANALYSIS DATE: 01-23-45 ANALYST: N. Harve BATCH NO .:

REVIEWED BY: R. Patterson /02-21-9
REVIEWED BY: R. Patterson /02-21-9 PROJECT NO.: 550,56

METHOD NO.: 9030

LAB I.D.		ACTUAL VOLUME TITRATED	SOLID FRACTION	IODINE ml of lodine		RET READ of Na <sub>2</sub> S <sub>2</sub> initial	0,	SULFIDE CONC. mg/L /µg/g
OCBLK57691-1	20.15g/200 m	188	N/A	10	10.00	0	10.00	410.6
IP0037-95 CLUS57691-1	20.099/		1		6.00		6.00	83.9
7344-001	20.169		0.9997		9.45		9.45	10.8
LOOLOUP	20.033/		0.9997		9.60		9.60	<10.6
IP0039-45 MIMS	20.049/	<b>V</b>	0.9997		5.80		5.80	88.4
002	20.249/	186	0.5649.		9.40		9.40	21.0
003	20.269/	184	0.4787		9.50		9.50	22.4
004	20.129/	182	0.3228		9.30		9.30	44.7
005	20.329	184	0.3004		9.40		9.40	40.0
006	20.259/		0.3010	-	9.45		9.45	36.4
V 007	20.189/	V	0.7019.	- 4	9.50	V	9.50	415.3
			,					
			女, 。	,				
			COX	invery)				
				1	Q1-,			
					01-2	-18-		
do la company								

Iodine Normality 0.0249 N

Na,S,O, Normality 0.0250

SULFIDE mg/L or  $(\mu g/g) = ((mL lodine \times N lodine) - (mL Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> × N Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>)) × 16,000$ 

(ml or (gram) of SAMPLE titrated)(SOLID Fraction)

LCS True Value = 99.4 49 Percent Recovery =

MS True Value = 100 4 Percent Recovery = Dup RPD = can't be calculated

SL-91-INORG 0026

9613477.13

Quanterra-Richland P.O. Box 1970 Richland, WA 99352 **Wuanterra**Environmental
Services

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.1 UG/G	U	47.1	1
BODMT6	7344-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	46.1 UG/G	U	46.1	1
BODMT6	7344-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	101 %REC			1
BODMT2	7344-002	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	86.8 UG/G	U	86.8	1
BODMT3	7344-004	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	150 UG/G	U	150	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0 UG/G	U	50.0	1
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99 %REC			1

# QUANTERRA, INC.

### **EOX ANALYSIS**

ANALYSIS DATE: 020695
ANALYST: J. OCE 6 BATCH #: 58657

143

APPROVED: R.Patting /02-22-95 METHOD: 9020

PROJECT #: SSO.56

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL,G A	VOLUME ETHYL ACETATE FREADENT WATER, ML B	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	GOX CONC JORGAN DILUTION F	FRACTION SOLID G	EOX FINAL CONC UG/G CL
CACK58657-1		1.000	5.0	50	0.01	1.0 -	<50		7
V	100 40/8				0.01		<50	/	<50
ccs5857-1	Aca499-95	1.000			1.00		[00]	/	Sant
V					0.98		98	·	99.09
344-00		1.061			0.13		<47.1	0.9997 -	-
V					0.12		<47.1		<47.1
1344 0010A		1.086 -			0.13		246.1		
V	10000/0				0111	-	< 46.1		<46.12
1344-001ms	A60500-95	1.039			1.08		104		,
V					1.02		98.2	W	10/10
344002		1.020			0.14		<86.8	0.5649	-
V					0:13		<86.8	V	<86.8
344003		1.082			0.08		1	0.4787 -	,
V					0.09		<96.5		196-5
7344 004		1.030			0.13		< 150	0.3228 -	
J. I					0.14 -		<150	1	<150
7344-005		1.080			0.09		<154	0.3004	
il I					0.09		<154	1	<154
7344-006		1.089	/		0.14		5153	0.3010 -	-
V	- 22.45		\V.		0.13	1	<153 A	1	<153

CALCULATION: BxDxf x 1000 = UG/G CL

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CACCUCATE RPD DUS TO VACUE

C. DETECTION CIMITS

SL-91-INORG-004

# QUANTERRA, INC.

#### **EOX ANALYSIS**

BATCH #: 38657

2053

APPROVED: R. Patterson/02-22-95

METHOD: 9672

PROJECT #: 550.56

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL,G A	VOLUME ETHYL ACETATE BEAGENT WESTER, ML	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	CONC CONC	FRACTION SOLID G	EOX FINAL CONC UG/G
7444-00/		1.090	5.0	50	0,08	1.0	(47.7	0.9616	- 3
V					0.09		<47.7		<47.7
7444-001ap		1.080	+		0.10		<48,1		
V	104 119/9				0.09		<4B.1 -		<48.17
7444-001ms	ALO 501-95	1.071	+		1.02		99.0	-	~ 95 901 <del>9</del>
V					1,01		98.1		10.6
7444-002		1.020	1		0.06		<567	0.8574	- 6A 02-2
V					0.07		<5607°		< 56.7
7444-003		1.020	}		0.07		<298	0.1630 -	
V					0.05		<298	4	<298
7444004		1.044			0.05		<52.5	0.9128 -	
4					0.03		×52.5	· V	<25.2
7444-005		1.013	+		0.05		<111	0.4446	-
V					0.04		<111		<111
7444-006		1.014	1		0.10		<52.2°	0.9445	
V					0.09		<52.2	V	<52.2
7444007		1.000			0.06		<56.9	0.8792 -	^
V					0.07		<56.9	. 4	156.9
7444-008		1.085	1	/	0.10	/		09354-	
V	PR02-22-95	7	V	V	0.09	Ú/	<49.3	iV	<49.3

CALCULATION: BxDxF x 1000 = UG/G CL

\* CANT CACCUCATE RPO DUE TO LACUES < DETECTION CIMITS

# QUANTERRA, INC.

### **EOX ANALYSIS**

ANALYSIS DATE: 0206-95
ANALYST: J. ARPro
BATCH #: 58657

3003

APPROVED: R. Patterson/02->2-95
METHOD: 9020,
PROJECT #: 550.56

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL,G A	VOLUME ETHYL ACETATE + REAGENT WATER, ML B	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	CONC SECUTION F	FRACTION SOLID G	EOX FINAL CONC UG/G CL
7444-009		1.077 -	5.0	20	0.07	1.0	<49.9	0.930	
V			. 1		0.06		<49.9 -	V	<49.9
7444010		1.000			0.07		C105	0.4744	- E
<u> </u>		1 -0 /			0.06 -		<105		<105
7444011		1.079			0.02		<46.4	0,9991	
2 (11 == 2		1.000			0.01		< 46.4	<i>V</i>	<46,4
1444012		1.083	/		0.06		<49.7	0,9285	CU9 2
V			V	V	0.07	V	<49.7	m 1/15 22	<49.7
								0.48937	
								0.400	
								17	
								34077	
			7	42 248		·		8/	
				- 6				6	
						/			
	RP02-22-95								

CALCULATION: BxDxF x 1000 = UG/G CL

SL-91-INORG-004





September 8, 1995

Ms. Doris Ayres
Bechtel Hanford Incorporated
345 Hills Street
Richland, WA 99352

#### Dear Doris:

This letter is sent to inform you of a change in analytical report sheets. Attached are radiochemical results for three SDGs (W0386, W0403 and W0429). Please remove and replace the appropriate pages. Please note for sample number B0DMT1 the sample had to be recounted in order to obtain the U-235 result.

If you have any questions I can be reached at 375-3131.

Sincerely,

Jodie Carnes

**Document Control Officer** 

i 6/20/96 M.H.



Quanterra Incorporated 2800 George Washington Way Richland, Washington 99352

509 375-3131 Telephone 509 375-5590 Fax

March 13, 1995

Joan Kessner
Buyer's Technical Representative
Bechtel Hanford
P.O. Box 1970
2355 Stevens Drive
Richland, WA 99352

Reference: Contract MPV-SVV-239000.

Dear Ms. Kessner:

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

<b>SDG NUMBER</b>	SAF NUMBER
W0383	B94-155
W0384	B94-023
W0386	B94-098
W0387	B94-125
W0388	B94-003
W0395	B95-017
W0401	B94-022
W0429	B94-098

The Radiochemical Diskette Deliverable was sent via modem on the WHC BBS earlier today.

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

Sincerely,

Jodie Carnes

Document Control Officer

Receipt of this letter and the package are acknowledged by:

- kandlkimmin

Date

773

4:00gm

XC:

Vicki Parr

Van Pettey

File

ii 6/20/96 M.H.



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: W0429



**CLIENT ID NUMBER** 

**QUANTERRA ID NUMBER** 

B0DMT2 B0DMT3 50132303 50132305



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 13, 1995

Attention: Joan Kessner



SAF Number

B94-098

Date SDG Closed

January 26, 1995

Number of Samples

Two (2) - See ROD-B95-013

Sample Type

Soil

SDG Number

W0429

Data Deliverable

Stand Alone

#### I. Introduction

On January 18, 1995, seven water 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:

<b>OTESRL ID</b>	BHI ID	<b>Matrix</b>	Date of Receipt
50132303	B0DMT2	Soil	1/18/95
50132305	B0DMT3	Soil	1/18/95

### 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 13, 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 W0429 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 in pCi/sample.

#### IV. Comments

BHI Off-site Property Control form W95-0-0204-3 identifies the samples as groundwater. The COC identifies the samples as soil.

Samples submitted as a single SDG, SDG W0386 (stand alone), were split into two SDGs after analysis had been started, W0386 (summary) and W0429 (stand alone), as per ROD-B95-013. The results are reported in two data packages, but were analyzed as a single batch with one set of QC.

#### Gamma Spectroscopy

#### Gamma Scan by method ITAS-RD-3219

The Fe-59 and Eu-154 RDLs were not met for sample B0DMT2. The Co-58, Fe-59, Eu-154, and Eu-155 RDLs was not met for sample B0DMT3. The blank met the RDL requirements, therefore, the batch data are accepted. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.



Bechtel Hanford, Inc. March 13, 1995 Page 3

#### **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 M013232S, 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 M013231S. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

#### Gross Beta by method ITAS-RD-3222

The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

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

Reviewed and approved:

Suzanne Gaines

Project Manager

## SAMPLE RESULTS

LAB NAME:

ITAS-RICHLAND

SDG:

W0429

LAB SAMPLE ID:

50132303

MATRIX:

SOIL

CLIENT ID:

B0DMT2

DATE RECEIVED:

1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
U-235	2.49E-01	1.1E-01	1.2E-01	N/A	pCi/g	N/A	RD3234
CO-58	1.65E-02	2.6E-02	2.6E-02	4.42E-02	pCi/g	N/A	RD3219
CO-60	9.29E-01	6.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	2.72E+00	7.0E-02	2.8E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.55E+00	1.2E-01	1.9E-01	N/A	pCi/g	N/A	RD3219
EU-154	3.31E-01	6.6E-02	7.4E-02	1.36E-01	pCi/g	N/A	RD3219
EU-155	7.90E-02	5.9E-02	6.0E-02	8.92E-02	pCi/g	N/A	RD3219
FE-59	-4.54E-02	6.8E-02	6.8E-02	1.07E-01	pCi/g	N/A	RD3219
K-40	9.57E+00	5.7E-01	1.1E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.63E-01	4.5E-02	9.7E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	8.13E-01	7.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	7.21E-01	1.3E-01	1.5E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	2.76E+00	1.2E+00	1.2E+00	N/A	pCi/g	N/A	RD3219
ALPHA	9.95E+00	4.8E+00	4.9E+00	5.93E+00	pCi/g	100.00%	RD3222
BETA	2.06E+01	3.3E+00	3.6E+00	3.58E+00	pCi/g	100.00%	RD3222

Number of Results: 15

### **SAMPLE RESULTS**

LAB NAME:

**ITAS-RICHLAND** 

SDG:

W0429

LAB SAMPLE ID:

50132305

**MATRIX:** 

SOIL

CLIENT ID:

B0DMT3

DATE RECEIVED:

1/18/95

RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
2.65E-01	1.9E-01	1.9E-01	N/A	pCi/g	N/A	RD3234
1.43E-02	4.2E-02	4.2E-02	7.22E-02	pCi/g	N/A	RD3219
2.43E+00	1.0E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
3.09E+00	1.0E-01	3.3E-01	N/A	pCi/g	N/A	RD3219
1.96E+00	1.7E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
4.60E-01	1.0E-01	1.1E-01	2.01E-01	pCi/g	N/A	RD3219
1.12E-01	7.6E-02	7.6E-02	1.29E-01	pCi/g	N/A	RD3219
-6.69E-02	1.1E-01	1.1E-01	1.78E-01	pCi/g	N/A	RD3219
6.77E+00	7.3E-01	9.9E-01	N/A	pCi/g	N/A	RD3219
1.05E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	RD3219
8.01E-01	1.1E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
1.51E+00	2.5E-01	2.9E-01	N/A	pCi/g	N/A	RD3219
5.90E+00	1.8E+00	1.9E+00	N/A	pCi/g	N/A	RD3219
2.50E+01	7.0E+00	7.5E+00	5.34E+00	pCi/g	100.00%	RD3222
2.11E+01	3.3E+00	3.6E+00	3.66E+00	pCi/g	100.00%	RD3222
	2.65E-01 1.43E-02 2.43E+00 3.09E+00 1.96E+00 4.60E-01 1.12E-01 -6.69E-02 6.77E+00 1.05E+00 8.01E-01 1.51E+00 5.90E+00 2.50E+01	RESULT       ERROR (2s)         2.65E-01       1.9E-01         1.43E-02       4.2E-02         2.43E+00       1.0E-01         3.09E+00       1.0E-01         1.96E+00       1.7E-01         4.60E-01       1.0E-01         1.12E-01       7.6E-02         -6.69E-02       1.1E-01         6.77E+00       7.3E-01         1.05E+00       8.0E-02         8.01E-01       1.1E-01         1.51E+00       2.5E-01         5.90E+00       1.8E+00         2.50E+01       7.0E+00	RESULT         ERROR (2s)         ERROR (2s)           2.65E-01         1.9E-01         1.9E-01           1.43E-02         4.2E-02         4.2E-02           2.43E+00         1.0E-01         2.6E-01           3.09E+00         1.0E-01         3.3E-01           1.96E+00         1.7E-01         2.6E-01           4.60E-01         1.0E-01         1.1E-01           1.12E-01         7.6E-02         7.6E-02           -6.69E-02         1.1E-01         1.1E-01           6.77E+00         7.3E-01         9.9E-01           1.05E+00         8.0E-02         1.3E-01           8.01E-01         1.1E-01         1.3E-01           1.51E+00         2.5E-01         2.9E-01           5.90E+00         1.8E+00         1.9E+00           2.50E+01         7.0E+00         7.5E+00	RESULT         ERROR (2s)         ERROR (2s)         MDA           2.65E-01         1.9E-01         1.9E-01         N/A           1.43E-02         4.2E-02         4.2E-02         7.22E-02           2.43E+00         1.0E-01         2.6E-01         N/A           3.09E+00         1.0E-01         3.3E-01         N/A           1.96E+00         1.7E-01         2.6E-01         N/A           4.60E-01         1.0E-01         1.1E-01         2.01E-01           1.12E-01         7.6E-02         7.6E-02         1.29E-01           -6.69E-02         1.1E-01         1.78E-01         N/A           1.05E+00         7.3E-01         9.9E-01         N/A           1.05E+00         8.0E-02         1.3E-01         N/A           1.51E+00         2.5E-01         2.9E-01         N/A           5.90E+00         1.8E+00         1.9E+00         N/A           2.50E+01         7.0E+00         7.5E+00         5.34E+00	RESULT         ERROR (2s)         ERROR (2s)         MDA         UNIT           2.65E-01         1.9E-01         1.9E-01         N/A         pCi/g           1.43E-02         4.2E-02         4.2E-02         7.22E-02         pCi/g           2.43E+00         1.0E-01         2.6E-01         N/A         pCi/g           3.09E+00         1.0E-01         3.3E-01         N/A         pCi/g           1.96E+00         1.7E-01         2.6E-01         N/A         pCi/g           4.60E-01         1.0E-01         1.1E-01         2.01E-01         pCi/g           1.12E-01         7.6E-02         7.6E-02         1.29E-01         pCi/g           -6.69E-02         1.1E-01         1.1E-01         1.78E-01         pCi/g           6.77E+00         7.3E-01         9.9E-01         N/A         pCi/g           8.01E-01         1.1E-01         1.3E-01         N/A         pCi/g           8.01E-01         1.1E-01         1.3E-01         N/A         pCi/g           5.90E+00         1.8E+00         1.9E+00         N/A         pCi/g           5.90E+01         7.0E+00         7.5E+00         5.34E+00         pCi/g	RESULT         ERROR (2s)         ERROR (2s)         MDA         UNIT         YIELD           2.65E-01         1.9E-01         1.9E-01         N/A         pCi/g         N/A           1.43E-02         4.2E-02         4.2E-02         7.22E-02         pCi/g         N/A           2.43E+00         1.0E-01         2.6E-01         N/A         pCi/g         N/A           3.09E+00         1.0E-01         3.3E-01         N/A         pCi/g         N/A           1.96E+00         1.7E-01         2.6E-01         N/A         pCi/g         N/A           4.60E-01         1.0E-01         1.1E-01         2.01E-01         pCi/g         N/A           1.12E-01         7.6E-02         7.6E-02         1.29E-01         pCi/g         N/A           4.609E-02         1.1E-01         1.78E-01         pCi/g         N/A           6.69E-02         1.1E-01         1.78E-01         pCi/g         N/A           6.77E+00         7.3E-01         9.9E-01         N/A         pCi/g         N/A           1.51E+00         2.5E-01         2.9E-01         N/A         pCi/g         N/A           5.90E+00         1.8E+00         1.9E+00         N/A         pCi/g         N/

Number of Results: 15





LOG #:	RD-95	page 1 of 2
		QUAN-Richland
LABOR.	ATORY NONC	ONFORMANCE MEMO (NCM)

OJECT ID (Name/Number): CM INITIATED BY (Name/Date):	(tamma		2-22-95	W0386/U2
ATRIX:	50132302,03	04,05	1,06,07	
SHIP/REC  DATA VERUF	REPORTING	COUNTING OTHER:	BIOJ	ISSAY
NONCONFORMANO	E [check appropriate it	em(s)]:		
Not enough sample recen     Holding time exceeded by		r [	Sample lost during extra no re-prep or re-analysi	
	of Laboratory Control	4 [	QC data reported to clie	ent outside of:
Holding time expi			method limits	internal limits
22 CATEGORY II: Lat			QAPP limits	contract limits
work backlog	instrument failure		regulatory limits	blank criteria
communication  2.3. CATEGORY III: Lai	other (see #10)	£ [	Incorrect procedure(s) u	sed. (See #10)
23.1. QA/QC;	internal standards		Invalid instrument calibr	ation. (See #10)
spike recoveries  2.3.2 CONFIRMATION:	blank contamination	7.	Incorrect/incomplete dat (See #10)	a reported to client.
second column	contamination check	. 🗷	Reported detection limit	(s) higher than:
other (see #10)			method limits	QAPP limits
over calibration	under calibration		contract limits	other (see #10)
other (see #10)			sample matrix	insufficient sample
214. OTHER: (see #10)			instrumentation	other (see #10)
o. Other (specify): # 0 #04 F259 #00 C05	2 Fe 59 EUISY #05 Co58, FE 8 FEST EUISY EUIS	En155 59, En15		59 Eulsy Esg. Eulsy Euls
19. Comments/Explanation:	# 4221 ZM121 ZMB		747.0091	- July Caroline
NOTIFICATION [che	ck appropriate item(s)]:		***	
1. Client notified by (name at	nd date):	2.	Client's name	and response:
_	Dy FAX		process "as is"	

CORRECTIVE ACTION	
ROOT CAUSE:	INITIALS/DATE 1772-22-95
Sample background counts in	rogions of interest
CORRECTIVE ACTION:	INITIALS/DATE 1770 2.22-95
met, therefore we have me	n'x moterial MDA for all 30 for I abbyations of contract
RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION	ASSIGNED TO:
ACTIONS TO PREVENT RECURRENCE:	INITIALS/DATE
1, 1, 1,	000 DATE: 2-22-95 000 DATE: 3/10/95
DC REVIEW	alca DATE: 3/10/9.5
DC REVIEW	
ESPONSIBLE MANAGER: / W Mark	alca DATE: 3/10/9.5
DC REVIEW  NONCONFORMANCE	esca DATE: 3/10/9.5  EFICIENCY TREPUN
CC REVIEW  NONCONFORMANCE  FURTHER ACTION REQUIRED:  QC COORDINATOR:  Dlack	esca DATE: 3/10/9.5  EFICIENCY TREPUN  ASSIGNED TO
CORRECTIVE ACTION VERIFICATION  CORRECTIVE ACTION VERIFICATION  OF THE STATE OF THE	esca DATE: 3/10/9.5  EFICIENCY TREPUN  ASSIGNED TO.
CORRECTIVE ACTION VERIFICATION	EFICIENCY TREFUN  ASSIGNED TO.  DATE: 3/3-95
CORRECTIVE ACTION VERIFICATION	EFICIENCY TREPUN  ASSIGNED TO.  DATE: 3/3-95

SIGNED ORIGINAL MUST BE RETAINED IN FILE:

QUALITY/OPERATIONS FILE

PROJECT FILE 0015





LOG #: RD-95	page 1 of 2			
	QUAN-Richland			
LABORATORY NONCOM	FORMANCE MEMO (NCM)			

		LABORATORY NON	CONFORMANCE MEMO (NO
PROJECT ID (Name/Number): BHI			W0386/46
NCM INITIATED BY (Name/Date): JOE IT Ke in pe in	a 2-	22-95	\$((
PARAMETERISI: Gamma			
SAMPLE NUMBERISI AFFECTED: MOI3231X, IIM 5013.	2301		
MATRIX:			
AREA: SHIP/REC RADIOCHEM	COUNTING	BIOA	SSAY
DATA VERIF REPORTING	OTHER:		
NONCONFORMANCE [check appropriate i	tem(s)]:	•	
Not enough sample received for proper analysis.	1 [	Sample lost during extra	ction/analysis;
2. Holding time exceeded by days due to:	_	no re-prep or re-analysis	
	4 [	QC data reported to cher	nt ourside of
2.1. CATEGORY I: Out of Laboratory Control		method limits	_
Holding time expired at receipt.			internal limits
22 CATEGORY II: Laboratory Dependent		QAPP limits	Contract limits
work backlog instrument failure		regulatory limits	biank chtens
communication other (see #10)			
2.3. CATEGORY III: Laboratory Reruns		Incorrect procedure(s) us	ed. (See #10)
233.			
surrogates internal standards		Invalid instrument calibra	tion. (See #10)
spike recoveries blank contamination			
2.12. CONFIRMATION:	7.	Incorrect/incomplete data (See #10)	reported to client.
second column contamination check			
other (see #10)	r [	Reported detection limit(s	s) higher than:
233 DILUTION:		method limits	QAPP limits
over calibration under calibration		contract limits	other (see #10)
	0	ue to:	
other (see #10)		sample matrix	insufficient sample
23.4. OTHER: (See #10)		instrumentation	other (see #10)
a Other (specify): Peaks marked detecte	Int no	ented 1	X= CA109, Amay
KYCRAZZYDA RAZZGDA 1.	M = CO	\$ 109	£109, Nazz
10. A Comments/Explanation: #03 = Nazz Cd1	09 V= 121	m #04	Nazz, C& 109
10. X Comments/Explanation: #05 = Nazz Call #05 Nazz - Callog - Xe 131m		Na22-122109	10012 (0101
#07= Na 22, Cd 109	Xe13/M	101	
NOTIFICATION [check appropriate item(s)]	<u>:</u>		
1. Ctient 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)
	vere Da	1 3/8/0x	- com (support)

JANTERRA CORPORATION	LOG #: RD-95	page 2 of 2
CORRECTIVE ACTION		
ROOT CAUSE:	INITIALS/DATE 4/17	2-22-95
1X- K40 Razzyon Razzoon - Hank me Amz41 - all sangles with this listed low level of contaminant on endea	mix is other and the Torthe over counter on Ger 2 which o Cd 109 - known pleants	1/
with care liners, Nazz interfe	rence from Eu 1546 1274KEV	
Xe13/M- interference from	UZ35 (0) 163 KEV amino	
Arta accepted note in	case manative	
RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION	ASSIGNED TO:	
ACTIONS TO PREVENT RECURRENCE:	INITIALS/DATE	
·		
FIRST LEVEL SUPERVISOR:  RESPONSIBLE MANAGER:  LIS Mac	Comme DATE: 2-	22-95
QC REVIEW		
MONCONFORMANCE  FURTHER ACTION REQUIRED:	EFICIENCY	RERUN
TOTTIES NOTICE CONC.	ASSIGNED TO	
ge coordinator: Black		13-55
CORRECTIVE ACTION VERIFICATION		
VERIFIED C	ANNOT VERIFY (specify reason)	



LOG #: RD-95	page 1 of 2
	QUAN-Richland
LABORATORY NONCOM	FORMANCE MEMO (NCM)

CM INITIATED BY (Name/Dote):  IRAMETERIS):  IMPLE NUMBERIS) AFFECTED:  ATRIX:	Foel T Keingen Alpha 501323 Soil				
SHIP/REC  DATA VERIF	RADIOCHEM	COUNTIL OTHER:	NG	BIOA	SSAY
NONCONFORMANO	E [check appropriate it	em(s)]:		•	
Not enough sample recent     Holding time exceeded by		1.		Sample lost during extra no re-prep or re-analysis	
		4.		QC data reported to clie	nt outside of:
	of Laboratory Control			method limits	internal limits
Holding time expir				QAPP limits	contract timits
work backlog	instrument failure			regulatory limits	blank criteria
communication  2.3. CATEGORY III: Lat	other (see #10)	5.		Incorrect procedure(s) us	sed. (See #10)
2.3.1. QA/QC: surrogates	internal standards	4.		Invalid instrument calibra	ation. (See #10)
spike recoveries  2.12. CONFIRMATION:	blank contamination	7.		Incorrect/incomplete data (See #10)	a reported to client.
second column	contamination check	5.		Reported detection limit(	s) higher than:
other (see #10)				method limits	QAPP limits
212 DILUTION:	The state of the state of			contract limits	other (see #10)
over calibration other (see #10)	under calibration		Du	a to:	
23.4 OTHER: (500 #10)				sample matrix	insufficient sample
				instrumentation	other (see #10)
9. Other (specify):	gikes recounte	Q de	e	to low bia	ک
10. Commenta/Explanation:					
NOTIFICATION [che	ck appropriate item(s)]:				
1. Client notified by (name ar	nd date):	;	- [	Client's name	and response:

# QUANTERRA CORPORATION

LOG #: RD-95-\_\_\_\_\_\_page 2 of 2

CORRECTIVE ACTION	
ROOT CAUSE:	INTIALS/DATE 1763-1-95
Uncestain why 15 except that the	e recount was flamed
and reweighted. 25 contain	is fe carrier added to
Shielding the alpha emission	covery but could be
	· · · · · · · · · · · · · · · · · · ·
CORRECTIVE ACTION:	INITIALS/DATE 17763-1-95
Count of 15 accepted	
RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO	TO: 1
ACTIONS TO PREVENT RECURRENCE:	INITIALS/DATE
FIRST LEVEL SUPERVISOR: Joel Hengeman	DATE: 3-1-95
FIRST LEVEL SUPERVISOR: Joel Memperson RESPONSIBLE MANAGER: W Markalla	DATE: 3/10/95
RESPONSIBLE MANAGER: / Warkellan	-1/-
11 = 21 /11 00	DATE: 3/10/95
QC REVIEW	DATE: 3/10/95
RESPONSIBLE MANAGER:  QC REVIEW  NONCONFORMANCE  FURTHER ACTION REQUIRED:	DATE: 3/10/95
RESPONSIBLE MANAGER:  QC REVIEW  NONCONFORMANCE  FURTHER ACTION REQUIRED:	DATE: 3/10/95
RESPONSIBLE MANAGER:  QC REVIEW  NONCONFORMANCE  FURTHER ACTION REQUIRED:	DATE: 3/10/95  RERUN  ASSIGNED TO
CORRECTIVE ACTION VERIFICATION	DATE: 3/10/95  RERUN  ASSIGNED TO  DATE: 3/3-95
CORRECTIVE ACTION VERIFICATION  CANNOT VERIFIED  CANNOT VERIFIED	DATE: 3/10/95  RERUN  ASSIGNED TO
CORRECTIVE ACTION VERIFICATION	DATE: 3/10/95  RERUN  DATE: 3/10/95  DATE: 3/3-95
QC REVIEW    NONCONFORMANCE   DEFICIENCY	DATE: 3/10/95  RERUN  ASSIGNED TO  DATE: 3/3-95

SIGNED ORIGINAL MUST BE RETAINED IN FILE: QUALITY/OPERATIONS FILE

PROJECT FIE 020



DATA REVIEWED

ANALYTICAL PREP STORED

DUE DATE 3/2/95

RC-048 12/92 REV

# REANALYSIS / RECOUNT CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

			THE CIT THE PARTY	,15		
	ANALYSIS Gross Alpha		NAME/	DATE 17 12-28-9		
	CUSTOMER BHI		SAMPLE	DELIVERY GROUP W\$38		
	MATRIX Soll			TCH NUMBER		
	ITAS ID	CUSTO	MER ID	COMMENTS		
	1) mc132315	EQEGGG9	9,9950±,0	90472 DPM		
	21 Mc/32325			90592 PM		
	3 )					
	4 )					
	5 )					
	6 )					
	7 )					
	8 )					
	9 )					
	10)					
MR2-2895	REANALYSIS			RECOUNT		
1.			ACTIONS (Initial & Date)			
	ITAS 10 - BLANK		COUNTI	NG/MEASUREMENT 2/2		
	ITAS ID - SPIKE		DATA R	DATA REVIEWED #3-195		
	CLIENT COPE		ANALYT	ICAL PREP STORED		
	ACTIONS (Initial &	Date)				
	PREP LAB RECEIVED		ADDITI	ONAL COMMENTS:		
	SAMPLE REMAINDER		15=3	589,		
	RETURNED TO SCE	CHECK CNE	15 = 3	nothing		
	NO SAMPLE REMAINING_			SOM Spiks, new weights		
	SEPARATION LAB		+ Cities			
	COUNTING/MEASUREMENT					
	\ \			0034		



Validation Reports 100-DR-1

# DATA VALIDATION SUMMARY REPORT FOR THE 100-DR-1 OPERABLE UNIT 100-D-PONDS PHASE II SAMPLING



Submitted To:

P.O. Box 1970 2355 Stevens Drive Richland, WA 99352

Submitted By:

A.T. Kearney, Inc. 2952 George Washington Way Richland, WA 99352

In Response To:

Purchase Order VSR-B95-009 Task Order No. SAF-B94-098

Document Control Number BHI-00405, Rev. 00

Validation Start Date: April 6, 1995 Validation Completion Date: April 21, 1995

May 4, 1995

#### DISCLAIMER

This report is designated as Revision 0. The report addresses the validation of the 100-DR-1 Operable Unit 100-D-Ponds Phase II sampling data. The report addresses only those samples that have been provided for data validation review.

All related quality assurance samples, including all field quality control samples, were reviewed and validated to verify that reported sample results were of sufficient quality to meet quality control objectives specified by Westinghouse-Hanford Corporation.

#### **ACRONYMS**

%D Percent difference
AA Atomic absorption
BFB Bromofluorobenzene
BNA Base/neutral and acid

CCB Continuing calibration blank
CV Coefficient of variation

CCV Continuing calibration verification CLP Contract laboratory program

CRA CRDL standard for AA

CRDL Contract Required Detection Limit

CRI CRDL standard for ICP

CRII CRDL standard for ICP initial CRIF CRDL standard for ICP final

CRQL Contract required quantitation limit

CVAA Cold vapor atomic absorption

DBC Dibutylchlorendate

DFTPP Decafluorotriphenylphosphine

DQO Data quality objectives

EPA U.S. environmental protection agency GC/MS Gas chromatography/mass spectrometry

GC Gas chromatography

GFAA Graphite furnace atomic absorption GPC Gel permeation chromatography

ICB Initial calibration blank

ICP Inductively coupled plasma emission spectrometry

ICS ICP interference check sample ICV Initial calibration verification IDL Instrument detection limit LCS Laboratory control sample LCSS Laboratory control sample soil LCSW Laboratory control sample water MDA Minimum detectable activity MSA Method of standard addition

MS/MSD Matrix spike/matrix spike duplicate

PBW Preparation blank water PCB Polychlorinated biphenyl

PEM Performance evaluation mixture

QA Quality assurance QC Quality control

RDL Required detection limit

BHI-00405 Rev. 00

RF Response factor

RIC Reconstructed ion chromatogram

RPD Relative percent difference
RRF Relative response factor
RRT Relative retention time
RSD Relative standard deviation

RT Retention time

SDG Sample delivery group SOW Statement of work TAL Target analyte list TCL Target compound list

TIC Tentatively identified compounds

TOC Total organic carbon
TOX Total organic halogen

V Validated

VOC Volatile organic compounds

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#### 1.0 INTRODUCTION

The information provided in this validation summary report includes data from the chemical analyses of samples from the 100-DR-1 Operable Unit 100-D-Ponds Phase II Sampling Investigation. All of the data from this sampling event and their related quality assurance samples were reviewed and validated to verify that the reported sample results were of sufficient quality to support decisions regarding remedial actions performed at this site.

Sample analyses included volatile organic, semi-volatile organic, pesticide/PCB, metals, general chemistry and radiochemistry. Three volatile organic samples were analyzed by Quanterra Environmental Services (QTES). The volatile organic samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All volatile organic data were qualified based on this guidance. The table below lists the volatile organic Sample Delivery Groups (SDGs) that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Volatile Organics
W0430	S	1	D	Volatile Organics

Three semi-volatile organic samples were analyzed by Quanterra Environmental Services (QTES). The semi-volatile organic samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All semi-volatile organic data were qualified based on this guidance. The table below lists the semi-volatile organic SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Semi-Volatiles
W0430	S	1	D	Semi-Volatiles

Three pesticide/PCB samples were analyzed by Quanterra Environmental Services (QTES). The pesticide/PCB samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All pesticide/PCB data were qualified based on this guidance. The table below lists the pesticide/PCB SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Pesticide/PCB
W0430	S	1	D	Pesticide/PCB

Three metals samples were analyzed by Quanterra Environmental Services (QTES). The metals samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All metals data were qualified based on this guidance. The table below lists the metals SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Metals
W0430	S	1	D	Metals

Three samples were analyzed for general chemistry parameters by QTES laboratories. General chemistry sample analyses included the following parameters:

- Fluoride
- Sulfate
- Chloride
- Sulfide
- Nitrate
- Nitrite
- Phosphate
- Nitrate/Nitrite
- TOX

The general chemistry samples were validated using the Westinghouse Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All general chemistry data were qualified based on this guidance. The table below lists the general chemistry SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	General Chem
W0430	S	1	D	General Chem

Three samples were analyzed for radiochemical parameters by QTES laboratories. Radiochemistry sample analyses included the following parameters:

- Gross alpha and gross beta determination
- Gamma spectroscopy

The radiochemical samples were validated using the Westinghouse-Hanford protocols specified in *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-SPP-001, Rev. 1. All radiochemical samples were qualified based on this guidance. The table below lists the radiochemistry SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Radiochemistry
W0430	S	1	D	Radiochemistry

The following report is broken down into sections for volatile organic, semi-volatile organic, pesticide/PCB, metals, general chemical and radiochemical analyses. Each volatile organic section includes:

- A general validation summary which addresses precision, accuracy, representativeness, completeness, and comparability;
- Holding times;
- GC/MS tuning and calibration;
- Blanks, including method blanks;
- Analytical accuracy including matrix spike samples, matrix spike duplicates, surrogates and internal standards performance;

- Analytical precision including matrix spike/matrix spike duplicates;
- Compound identification;
- Sample result quantitation, verification and reported detection limits;
   and
- System performance and overall assessment.

#### Each semi-volatile section includes:

- A general validation summary which addresses precision, accuracy, representativeness, completeness, and comparability;
- Holding times;
- GC/MS tuning and calibration;
- Blanks, including method blanks;
- Analytical accuracy including matrix spike samples, matrix spike duplicates, surrogates and internal standards performance;
- Analytical precision including matrix spike/matrix spike duplicates;
- Compound identification;
- Sample result quantitation, verification and reported detection limits;
   and
- System performance and overall assessment.

#### Each pesticide/PCB section includes:

- A general validation summary which addresses precision, accuracy, representativeness, completeness, and comparability;
- Holding times;
- GC/MS tuning and calibration;
- Blanks, including method blanks;
- Analytical accuracy including matrix spike samples, matrix spike duplicates, surrogates and internal standards performance;
- Analytical precision including matrix spike/matrix spike duplicates;
- Compound identification;
- Sample result quantitation, verification and reported detection limits;
   and
- System performance and overall assessment.

#### Each metals section includes:

- A general validation summary which addresses precision, accuracy, representativeness, completeness, and comparability;
- Holding times;
- Calibrations;
- Blanks, including calibration, preparation and field blanks;

- Analytical accuracy including spike samples, laboratory control samples and GFAA analytical spikes;
- Analytical precision including laboratory duplicates, ICP serial dilutions, field duplicates, field splits, and GFAA duplicate injections;
- Sample result quantitation, verification and reported detection limits;
   and
- System performance and overall assessment.

#### Each general chemistry section includes:

- A general validation summary which addresses precision, accuracy, representativeness, completeness, and comparability;
- Holding times;
- Calibrations;
- Blanks, including calibration, preparation and field blanks;
- Analytical accuracy including matrix spike samples and laboratory control samples;
- Analytical precision including laboratory duplicates, field duplicates and field splits;
- Sample result quantitation, verification and reported detection limits;
   and
- System performance and overall assessment.

#### Each radiochemistry section includes:

- A general validation summary which addresses precision, accuracy, representativeness, completeness, and comparability;
- Holding times;
- Calibrations;
- Blanks, including laboratory, method and field blanks;
- Analytical accuracy including chemical recoveries, matrix spike samples and laboratory control samples;
- Analytical precision including laboratory duplicates, field duplicates and field splits;
- Sample result quantitation, verification and reported detection limits;
   and
- System performance and overall assessment.

In addition, the appendices include the data summary tables as well as the validated laboratory report forms for volatile organic, semi-volatile organic, pesticide/PCB, metals, general chemistry and radiochemistry analyses.

Data validation personnel added qualifiers to the reported data based on specified data quality objectives. Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- 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.
- 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.
- 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).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (usable for decision-making purposes).

#### 1.1 OBJECTIVES AND SCOPE

Data validation is performed in order to determine the usability of analytical results to support programmatic decisions regarding the selection of cleanup remedies and investigative approach. Data validation is the process of reviewing a body of analytical data to determine if it meets the criteria defined in the WHC validation guidelines, and to assure that the data are acceptable for their intended use. The validation process consists of:

- Verifying the data packages for completeness using validation Level
   A;
- Editing and correcting reported results;
- Verifying compliance with quality assurance (QA) requirements;
- Checking quality control (QC) values against the defined limits;
- Applying qualifiers to analytical results for the purpose of defining the limitations of the reviewed data; and
- Determining correctness of qualitative identifications and quantitative results.

The result of data validation is the completion of narrative reports, checklists, and summary forms. The validation will be used to determine whether the analytical data are acceptable for their intended use.

The objectives of this data validation project is to provide Bechtel Hanford Inc. with reliable environmental data regarding the 100-DR-1 Operable Unit 100-D-Ponds Phase II Sampling Investigation.

# 1.2 SAMPLES AND ANALYSES

		SAMPL	ES AND ANA	LYSES				
Data Package No.	Sample Number	Sample Location	Sample Date	Sample Type	Level of Validation	Analyses <sup>1</sup>		
W0429-QES	BODMT2	Test Pit #2	01/17/95	Soil	D	1,2,3,4,5,6		
W0429-QES	вормтз	Test Pit #2	01/17/95	Soil	D	1,2,3,4,5,6		
W0430-QES	BODMT4	Test Pit #2	01/27/95	Soil	D	1,2,3,4,5,6		

<sup>&</sup>lt;sup>1</sup> 1 = Volatile Organic, 2 = Semi-Volatile Organic, 3 = Pesticide/PCB,

<sup>4 =</sup> Inorganics, 5 = General Chemistry, 6 = Radiochemistry

# 2.0 VOLATILE ORGANIC DATA VALIDATION SUMMARY

# 2.1 SUMMARY

Positive blank contamination was noted for one methylene chloride result in SDG No. W0429 and for one methylene chloride result in SDG No. W0430. Positive blank results were detected in two acetone results in SDG No. W0429. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, representaiveness, and comparability have been met.

# 2.2 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.

# 2.3 GC/MS TUNING AND CALIBRATION

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.

#### 2.4 BLANKS

# 2.4.1 Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or 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 numbers BODMT2 and BODMT3 in SDG No. W0429 were flagged "U" for acetone.

Due to the presence of positive blank results, sample number BODMT2 in SDG No. W0429 was flagged "U" for methylene chloride.

Due to the presence of positive blank results, sample number B0DMT4 in SDG No. W0430 was flagged "U" for methylene chloride.

All other method blank results were acceptable.

## 2.5 ANALYTICAL ACCURACY

# 2.5.1 Matrix Spikes

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.

# 2.5.2 Surrogates

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.

#### 2.5.3 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 standard 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.

## 2.6 ANALYTICAL PRECISION

# 2.6.1 Matrix spike/matrix spike duplicates

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  $\pm$ 1-35%. If RPD values are out of specification and the sample concentration is  $\pm$ 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  $\pm$ 5x the spike concentration, no qualification is required.

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

# 2.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

# 2.7 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.

# 2.8 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED 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.

#### 2.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Positive blank contamination was noted in two acetone results and in one methylene chloride result in SDG No. W0429. Positive blank contamination was noted in one methylene chloride result in SDG No. W0430. The associated sample results were flagged accordingly. Contamination, however, was not significantly high enough to affect the usability

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of the data. All other validated results are considered accurate within the standard error associated with the methods.

All data packages submitted for validation were found to be 100% complete.

#### 3.0 SEMI-VOLATILE ORGANIC DATA VALIDATION SUMMARY

#### 3.1 SUMMARY

Positive blank contamination was noted for all aldol condensate and butylbenzylphthalate results in both SDGs. Due to an internal standard recovery outside control limits, all results in SDG No. W0429 associated with internal standard perylene-d12 were qualified as estimates. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, representaiveness, and comparability have been met.

## 3.2 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, 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.

# 3.3 GC/MS TUNING AND CALIBRATION

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.

#### 3.4 BLANKS

#### 3.4.1 Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or 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 numbers B0DMT2 and B0DMT3 in SDG No. W0429 were flagged "U" for aldol condensate.

Due to the presence of positive blank results, sample number B0DMT4 in SDG No. W0430 was flagged "U" for aldol condensate.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 in SDG No. W0429 were flagged "U" for butylbenzylphthalate.

Due to the presence of positive blank results, sample number B0DMT4 in SDG No. W0430 was flagged "U" for butylbenzylphthalate.

All other method blank results were acceptable.

## 3.5 ANALYTICAL ACCURACY

# 3.5.1 Matrix Spikes

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.

# 3.5.2 Surrogates

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.

#### 3.5.3 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 standard 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".

Due to an internal standard recovery outside control limits, all results associated with internal standard perylene-d12 in SDG No. W0429 have been qualified as estimates and flagged "UJ/J".

All other internal standard recovery results were acceptable.

# 3.6 ANALYTICAL PRECISION

# 3.6.1 Matrix spike/matrix spike duplicates

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  $\pm$ 1-35%. If RPD values are out of specification and the sample concentration is  $\pm$ 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  $\pm$ 5x the spike concentration, no qualification is required.

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

# 3.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

## 3.7 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.

# 3.8 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED 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.

## 3.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Positive blank contamination was noted in all aldol condensate and butylbenzylphthalate results in both SDGs. The associated sample results were flagged accordingly. Due to an internal standard recovery outside control limits, all results in SDG No. W0429 associated with internal standard perylene-d12 were qualified as estimates and flagged "UJ/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.

All data packages submitted for validation were found to be 100% complete.

#### 4.0 PESTICIDE/PCB DATA VALIDATION SUMMARY

## 4.1 SUMMARY

Due to calibration verification results outside QC limits, twelve compounds in SDG No. W0429 and eleven compounds in SDG No. W0430 were qualified as estimates. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, representaiveness, and comparability have been met.

#### 4.2 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, 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.

#### 4.3 GC/MS TUNING AND CALIBRATION

#### 4.3.1 Initial Calibration

The laboratory performed an initial multipoint calibration for all target compounds at the concentration 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 non-detects are flagged "UJ".

All initial calibration results were acceptable.

# 4.3.2 Continuing Calibration

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 calibrations is >15%, all associated results for that compound are qualified as estimates (J for detects, UJ for nondetects).

Continuing calibration results for DBC exceeded the 15% QC limit for heptachlor, aldrin, heptachlor epoxide, dieldrin, 4,4-DDE, endrin, endosulfan II, endosulfan sulfate, 4,4-DDT, endrin aldehyde and methoxychlor and for sample numbers B0DMT2 and B0DMT3 in SDG No. W0429. All associated sample results were qualified as estimates (J for detects, UJ for non-detects).

Continuing calibration results for DBC 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 for sample B0DMT4 in SDG No. W0430. All associated sample results were qualified as estimates and flagged "UJ"

All other calibration verification results were acceptable.

## 4.4 BLANKS

#### 4.4.1 Method 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 concentrations > 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.

#### 4.5 ANALYTICAL ACCURACY

## 4.5.1 Matrix Spikes

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 % 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.

# 4.5.2 Surrogates

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 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.

# 4.6 ANALYTICAL PRECISION

# 4.6.1 Matrix spike/matrix spike duplicates

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  $\pm$ 1-35%. If RPD values are out of specification and the sample concentration is  $\pm$ 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  $\pm$ 5x the spike concentration, no qualification is required.

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

# 4.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

#### 4.7 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, results are qualified as unusable "R".

All compounds were identified correctly.

# 4.8 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED 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.

# 4.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Due to calibration verification results outside QC limits, twelve compounds in SDG No. W0429 and eleven compounds in SDG No. W0430 were qualified as estimates (J for detects, UJ for nondetects). 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.

All data packages submitted for validation were found to be 100% complete.

#### 5.0 METALS DATA VALIDATION SUMMARY

# 5.1 SUMMARY

Negative blank contamination was detected in one sample. Minor matrix spike recovery problems were noted for three analytes in one sample delivery group. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, representaiveness, and comparability have been met.

#### 5.2 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 times were met for all samples.

## 5.3 CALIBRATIONS

Performance of specific instrument quality assurance and quality control procedures, including deficiencies noted during the quality assurance review, are outlined below.

Three calibration standards and a blank were analyzed for arsenic, lead, selenium and thallium by GFAA. The correlation coefficient of a least squares linear regression met the requirements for calibration in all cases.

At least one standard and a blank were analyzed by ICP for all other elements.

The above calibrations were each immediately verified with an ICV standard and a calibration blank. The ICV was prepared from a source independent of the calibration standards, at a mid-calibration range concentration. The ICV percent recovery must fall within the control limits of 90% to 110% for metals analyzed by ICP and GFAA. Calibration linearity near the detection limit was verified with a standard prepared at a concentration near the CRDL.

The ICVs met the recommended control limits in all cases.

The calibrations were subsequently verified at regular intervals using a CCV standard. The control windows for percent recovery of CCV standards are the same as the ICV windows described above.

The CCVs met the recommended control limits in all cases.

## 5.3.1 ICP Calibration

An ICS was analyzed at the beginning and end of each ICP sample run to verify the laboratory interelement and background correction factors. Results for the ICS solution must fall within the control limit of  $\pm 20\%$  of the true value.

Under the ICP method, an ICS is required for lead at a concentration of 1.0 mg/L. Refer to Table 2, page E-14, of the USEPA CLP ILM01.0.

The ICS has been analyzed at the proper frequency and all ICSAB solution percent recovery values fell within the control limit.

# 5.3.2 Atomic Absorption Calibrations

Duplicate injections are required for all GFAA analyses. The duplicate injections establish the precision of the individual analytical determinations. For sample concentrations > CRDL, duplicate injections must agree within  $\pm 20\%$  RSD or CV.

All duplicate injection quality control requirements were met.

#### 5.4 BLANKS

## 5.4.1 Calibration Blanks

A calibration blank must be analyzed at each wavelength used for analysis immediately after every initial and continuing calibration verification, at a frequency of 10% or every two hours during the run. The blank must be analyzed at the beginning of the run and after the last analytical sample. A CCB must be run after the last CCV following the last analytical sample of the run. In the case of positive blank results, samples with results (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.

If the absolute value of any negative calibration blank exceeds the IDL, all non-detects are qualified as estimates and flagged "UJ". All associated positive results within (2x) the absolute blank value are qualified as estimates and flagged

"J". The qualification applies only to results generated between the associated calibration blank and the nearest acceptable calibration blank.

All calibration blank results were acceptable.

# 5.4.2 Preparation Blanks

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

If the absolute value of the negative preparation blank exceeds the CRDL, all associated undetected results are rejected and flagged "UR". All associated detects that are (<10x) the absolute value of the preparation blank result are qualified as estimates and flagged "J". If the sample results are (>10x) the absolute value of the preparation blank, no qualification is necessary. If the absolute value of the negative preparation blank is >IDL and <CRDL, all associated non-detected sample results are qualified as estimates and flagged "UJ". All associated detects (<10x) the absolute value of the preparation blank are qualified as estimates and flagged "J".

Due to the presence of a negative preparation blank result, sample number BODMT4 in SDG No. W0430 was flagged "BJ" for beryllium.

All other preparation blank results were acceptable.

## 5.5 ACCURACY

# 5.5.1 Matrix Spike Samples

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". All samples with a spike recovery > 125% and a sample result <IDL require no qualification.

The matrix spike recovery fell outside QC limits for antimony in sample number BODMT4 in SDG No. W0430. Therefore, the associated result was qualified as an estimate and flagged "BJ".

The matrix spike recovery fell outside QC limits for manganese in sample number B0DMT4 in SDG No. W0430. Therefore, the associated result was qualified as an estimate and flagged "J".

The matrix spike recovery fell outside QC limits for thallium in sample number B0DMT4 in SDG No. W0430. Therefore, the associated result was qualified as an estimate and flagged "UJ".

All other matrix spike recovery results were acceptable.

# 5.5.2 Laboratory Control Samples

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 LCS was digested and analyzed for each sample batch in this report.

All LCS results were acceptable.

# 5.5.3 GFAA Analytical Spikes

The post-digestion analytical spike is analyzed to determine the extent of interference in the sample matrix. The analytical spike recoveries establish the accuracy of the individual GFAA determinations.

Positive sample results whose analytical spike results are outside the 85% to 115% control limit, but whose absorbances are <50% of the analytical spike absorbance, are qualified as estimates and flagged "J". In cases where the analytical spike recovery was <10 percent, all non-detects are qualified as rejects and flagged "UR".

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

# 5.5.4 Method of Standard Addition (MSA) Results

For all samples whose analytical spike results are outside the 85% to 115% control limit and whose absorbances are >50% of the analytical spike absorbance, an MSA is required. In cases where the MSA correlation coefficient was <0.995, the MSA analysis was repeated once. If the correlation coefficient was still <0.995, samples were qualified as estimates and flagged "J". If a sample required MSA analysis but was not analyzed, all associated data must be qualified as estimates and flagged "J".

All MSA results were acceptable.

#### 5.6 ANALYTICAL PRECISION

# 5.6.1 Laboratory Duplicate Samples

The laboratory duplicate results assess the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. If the RPD of the original sample and its duplicate is >35% and the positive sample result is (>5x) the CRDL, the associated sample result is qualified as an estimate and flagged "J". Also, if the difference between the duplicate samples is  $>\pm$  CRDL and the positive sample result is (<5x) the CRDL, the associated sample result is qualified as an estimate and flagged "J".

All laboratory duplicate recovery results were acceptable.

#### 5.6.2 ICP Serial Dilution

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

No ICP serial dilution was analyzed with the SDGs in this report. 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.

# 5.6.3 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

# 5.6.4 Field Split Samples

A field split sample is a representative sample from a sampling event that is sent to a third party laboratory. The field split sample results are evaluated by comparing the corresponding sample results to the reference laboratory sample results. Data qualification is not required for field splits.

There were no field splits associated with the subject SDGs.

# 5.6.5 GFAA Duplicate Injections

Each GFAA analysis requires a minimum of two injections (burns), except for full MSAs. The RSD for the duplicate injections must be within the control limits of  $\pm 20\%$  for samples with concentrations > CRQL. 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.

# 5.7 SAMPLE RESULT QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The objective of reviewing analyte quantitation and detection limits is to verify that results are calculated and transcribed properly and that project-specific detection limits were met.

Twenty percent of 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. All sample detection limits were checked to meet the required detection limits.

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.

# 5.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Negative blank contamination was detected in one beryllium sample in SDG No. W0430. The associated sample result was flagged accordingly. Contamination, however, was not significantly high enough to affect the usability of the data. Due to matrix

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spike recovery problems, antimony, manganese and thallium results in SDG No. W0430 were qualified as estimates and flagged (BJ, J, or UJ). Data flagged "J" indicates that 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.

All data packages submitted for validation were found to be 100% complete.

# 6.0 GENERAL CHEMISTRY DATA VALIDATION SUMMARY

# 6.1 SUMMARY

The project-specific data quality objectives in terms of precision, accuracy, completeness, representativeness, and comparability have been met.

# 6.2 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 (>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 for all analytes met QC requirements.

#### 6.3 CALIBRATIONS

#### 6.3.1 Initial Calibration

The following calibration procedures must be conducted:

- At least one blank and three standards were used to establish the ion chromatography, ion selective electrode, and spectrophotometer calibrations prior to sample analysis with a correlation >0.995.
- At least two reference buffers or standards at a high and low concentration were used to calibrate the pH and conductivity meters.

If any of these initial calibration requirements are not met, all associated data are qualified "J" for detects and "UJ" for non-detects.

All initial calibration results were acceptable.

# 6.3.2 Continuing Calibration Verification

All CCV standards must be analyzed within the required frequency or every 20 samples. The % recoveries must fall within the 90%-110% acceptance windows. If the recoveries fell outside this window, then all associated detects are qualified as estimates and flagged "J" and all non-detects are flagged "UJ".

All continuing calibration results were acceptable.

# 6.4 BLANKS

# 6.4.1 Laboratory Blanks

At least one laboratory preparation blank must be analyzed with each sample batch. At least one initial calibration blank must be analyzed for every 20 samples. As per WHC guidelines, no qualification of data based on blank contamination and continuing calibration blanks is required.

All laboratory blank results were acceptable.

# 6.5 ACCURACY

# 6.5.1 Matrix Spike Recovery

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 <30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery between 30% and 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 recovery results were acceptable.

# 6.5.2 Laboratory Control Sample Recovery

The LCS monitors the overall performance of all steps in 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 by the manufacturer or the laboratory.

ICV results obtained from the raw data were used to calculate LCS results. All LCS results were found to be acceptable.

#### 6.6 PRECISION

# 6.6.1 Laboratory Duplicates

The laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Laboratory duplicate RPDs must fall below 20% for waters and 35% for soils. If an RPD for an aqueous sample is > 20% and the sample result is (>5x) the CRDL, all associated detects are qualified as estimates and flagged "J". If the range between duplicate aqueous samples is > +CRDL and the sample result is (<5x) the CRDL, all associated detects are qualified as estimates and flagged "J". If an RPD for soil samples is >35% and the sample result is (>5x) the CRDL, all associated detects are flagged "J". If the range between duplicate soil samples is > +2CRDL and the sample result is (<5x) the CRDL, then all detects are flagged "J".

All laboratory duplicate results were acceptable.

# 6.6.2 Field Duplicates

Field duplicate sample analyses are used to measure both the lab and field sampling procedure precision. Field duplicate results are compared using the same guidelines for determining the precision between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

# 6.6.3 Field Split Samples

A field split sample is a representative sample from a sampling event that is sent to a third party laboratory. Field split sample results are evaluated by comparing the corresponding sample results to the reference laboratory sample results. Data qualification is not required for field splits.

There were no field splits associated with the subject SDGs.

# 6.7 SAMPLE RESULT QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The data was reviewed to verify that the results were calculated properly. The sample results and detection limits were evaluated to ensure that all analytes were analyzed and reported accurately. Raw data were examined for anomalies,

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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.

## 6.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate. All validated results are considered accurate within the standard error associated with the methods.

All packages submitted for validation were found to be complete, resulting in an overall completeness of 100%.

# 7.0 RADIOCHEMISTRY DATA VALIDATION SUMMARY

#### 7.1 SUMMARY

Radium-228 results for all samples in SDG No. W0429 were qualified as estimates due to the lack of a duplicate analysis. Uranium-238 results for all samples in SDG No. W0429 were qualified as estimates due to a laboratory duplicate RPD of 39%. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, representaiveness, and comparability have been met.

# 7.2 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. Tritium sample preparation requires distillation. Tritium samples must be analyzed within seven days of distillation.

All holding times and sample preparation measures were acceptable.

## 7.3 CALIBRATIONS

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.

## 7.4 LABORATORY BLANKS

Laboratory 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 (<5x) 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 (>5x) the highest blank concentration were not qualified.

All laboratory blank results were acceptable.

# 7.5 ACCURACY

# 7.5.1 Laboratory Control and Matrix Spike Samples

Accuracy was evaluated by analyzing soil or 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%, while that for a matrix spike is 60% to 140%. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample.

All laboratory control and matrix spike sample results were acceptable.

# 7.6 PRECISION

# 7.6.1 Laboratory Duplicates

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 >5xCRDL and the RPD is <35% for soil samples and <20% for water samples, the results are acceptable. If either activities are <5xCRDL, a control limit of <2xCRDL is used for soil samples and <CRDL for water samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Radium-228 results for all samples in SDG No. W0429 were qualified as estimates and flagged "J" due to the lack of a duplicate analysis.

Uranium-238 results for all samples in SDG No. W0429 were qualified as estimates and flagged "J" due to a RPD of 39%.

All other laboratory duplicate results were acceptable.

# 7.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data qualification is not required for field duplicate RPDs.

There were no field duplicates associated with the subject SDGs.

# 7.6.3 Field Split Samples

A field split sample is a representative sample from a sampling event that is sent to a third party laboratory. The field split sample results are evaluated by comparing the corresponding sample results to the reference laboratory sample results. Data qualification is not required for field splits.

There were no field splits associated with the subject SDGs.

# 7.7 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

Twenty percent of 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 MDA for each analyte was assessed to ensure that it met the CRDL.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All data packages submitted for validation were found to be complete. All sample results and reported detection limits were acceptable.

# 7.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Due to the lack of a duplicate analysis, all radium-228 results in SDG No. W0429 were qualified as estimates and flagged "J". All uranium-238 results in SDG No. W0429 were qualified as estimates due to a laboratory duplicate RPD of 39%. 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.

All data packages submitted for validation were found to be 100% complete.

#### 8.0 REFERENCES

- EPA, 1987, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.
- EPA, 1988a, EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration, U.S. Environmental Protection Agency, Washington, D.C.
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- 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.
- EPA, 1991, EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration, 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.
- WHC, 1992b, *Data Validation Procedure for Radiological Analyses*, WHC-SD-EN-SPP-001, Rev. 2, Westinghouse Hanford Company, 1993.

# **APPENDICES**

# APPENDIX A VOLATILE ORGANIC DATA SUMMARY TABLES

Project: WESTINGHOUSE-H Laboratory: QUANTERRA																			
Case: SDG: W0429																			
Sample Number		BODMT2		BODMT	3														
Location		Test Pit #2		Test Pit	#2														
Remarks			-																
Sample Date		01/17/95	5	01/17/95	5													-	
Analysis Date		01/25/95		01/26/95															
Volatile Organic Compound	CRQL			Result		Result	Q												
Chloromethane	10		U		U														T
Bromomethane	10		U		U														
Vinyl Chloride	10		U		U														
Chloroethane	10		U		U														
Methylene Chloride	10		U		U														
Acetone	10		U	51															
Carbon Disulfide	10	9	U	16	U														1
1,1-Dichloroethene	10	9	U	16	U														
1.1-Dichloroethane	10	9	U	16	U														1
1,2-Dichloroethene (total)	10		U	16															1
Chloroform	10		U		U														1
1.2-Dichloroethane	10		U	16					1		1								1
2-Butanone	10			310															1
1.1.1-Trichloroethane	10		U	16					-										1
Carbon Tetrachloride	10			16			1										-		1
Bromodichloromethane	10		Ū	16							_						-		+-
1,2-Dichloropropane	10		U		U						1								1
cis-1,3-Dichloropropene	10		U	16															1
Trichloroethene	10		U		U														1
Dibromochloromethane	10		U	16	U														
1,1,2-Trichloroethane	10		U		Ū														1
Benzene	10		Ū		Ū													-	1
trans-1,3-Dichloropropene	10		Ū		U														1
Bromoform	10		Ü	16			1				-					-			+
4-Methyl-2-pentanone	10	89		160															1
2-Hexanone	10	89		160			_								-				1
Tetrachloroethene	10		Ū	16															
1,1,2,2-Tetrachloroethane	10		Ü	16			1				1		-						1
Toluene	10	9		16			-		-										1
Chlorobenzene	10		Ü		U		1				-								1
Ethylbenzene	10		Ü	16			-				-						-		-
Styrene	10		Ü		Ü	1		-	-		1		_						1
Xylene (total)	10		Ü		Ü		-	-	-	-	-		-		-		-		1-

PJS 5/5/95

Laboratory: QUANTERRA				1															
Case:	SDG: V																		
Sample Number		B0DMT4																	
Location		Test Pit	#2																
Remarks																			
Sample Date		01/27/95																	
Analysis Date	10001	02/06/95		5 1		D 1		D 10		D 14	-	D 1	10	B 11		B 11	TA	B 1	18
Volatile Organic Compound				Hesult	Q	Result	Q	Hesult	Q	Hesult	Q	Hesuit	Q	Result	Q	Hesult	Q	Hesult	Q
Chloromethane	10	11	U		-		_				_		-		_		-		-
Bromomethane	10		U		_				_		_		-				_		-
Vinyl Chloride	10		U								_				_		_		_
Chloroethane	10		U								_						_		_
Methylene Chloride	10		U																
Acetone	10	110	U																
Carbon Disulfide	10		U												1				
1,1-Dichloroethene	10		U																
1,1-Dichloroethane	10		U																
1,2-Dichloroethene (total)	10		U																
Chloroform	10		U																
1,2-Dichloroethane	10	5	U																
2-Butanone	10	110																	
1,1,1-Trichloroethane	10		U																
Carbon Tetrachloride	10		U																
Bromodichloromethane	10		U																
1,2-Dichloropropane	10		U																
cis-1,3-Dichloropropene	10		U																
Trichloroethene	10		U																
Dibromochloromethane	10		U																
1,1,2-Trichloroethane	10		U																
Benzene	10		U																
rans-1,3-Dichloropropene	10		U																1_
Bromoform	10		U																
4-Methyl-2-pentanone	10	53	U																
2-Hexanone	10		U																
Tetrachloroethene	10	5	U																
1,1,2,2-Tetrachloroethane	10	5	U																
Toluene	10	5	U																
Chlorobenzene	10		U																
3 hylbenzene	10		Ū																
Styrene	10		Ū	1	1														
Xylene (total)	10		Ŭ	-	-		-		-						-			27	1

# APPENDIX B VOLATILE ORGANIC VALIDATED LABORATORY REPORT FORMS

BODMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column: (pack/cap) CAP Dilution Factor: 1.0

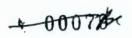
CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	UG/KG	Q	
74-87-3	Chloromethane			18	U	
74-83-9	Bromomethane			18	U	
75-01-4	Vinyl Chloride			18	U	
75-00-3	Chloroethane			18	U	10
	Methylene Chlori	de		20	BU	X
67-64-1	Acetone			43	182 N	
	Carbon Disulfide	2		9	DA N	
75-35-4	1,1-Dichloroethe	ene		9	U	
75-34-3	1,1-Dichloroetha	ane		9	U	
540-59-0	1,2-Dichloroethe	ene (total)		9	U	
67-66-3	Chloroform			9	U	
107-06-2	1,2-Dichloroetha	ane		9	U	
78-93-3	2-Butanone			180	U	
71-55-6	1,1,1-Trichloroe	ethane		9	U	
56-23-5	Carbon Tetrachlo	oride		9	U	
75-27-4	Bromodichloromet	hane		9	U	
78-87-5	1,2-Dichloroprop	pane		9	U	
10061-01-5	cis-1,3-Dichlore	propene		9	U	
79-01-6	Trichloroethene			9	U	
124-48-1	Dibromochloromet	hane		9	U	
79-00-5	1,1,2-Trichloroe	thane		9	U	
71-43-2	Benzene			9	U	
	trans-1,3-Dichlo	propropene		9	U	
75-25-2	Bromoform			9	U	
108-10-1	4-Methyl-2-Penta	none		89	U	
591-78-6	2-Hexanone			89	U	
	Tetrachloroether	ne	_	9	U	
79-34-5	1,1,2,2-Tetrach	loroethane		9	U	
108-88-3	Toluene			9	U	
	Chlorobenzene			9	U	
	Ethylbenzene			9	U	
100-42-5				9	U	
	Xylene (total)			9	U	

FORM I VOA

1/87 Rev.

3/27/95 SC



### VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT2

Lab Name: OUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: V34402

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID: F0621

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 44

Date Analyzed: 01/25/95

Column (pack/cap) CAP

Dilution Factor: 1.0

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

Number TICs found:

CAS NUMBER RT EST. CONC. COMPOUND NAME 0 ===== \_\_\_\_\_

3/27/95 SC

FORM I VOA-TIC

1/87 Rev

#### EPA SAMPLE NO.

#### VOLATILE ORGANICS ANALYSIS DATA SHEET

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/		Q
	Chloromethane_		31	U
	Bromomethane		31	U
75-01-4	Vinyl Chloride_		31	U
	Chloroethane		31	U,
75-09-2	Methylene Chlori	.de	74	B
	Acetone		51	BJV
	Carbon Disulfide		16	U
	1,1-Dichloroethe		16	U
	1,1-Dichloroetha		16	U
	1,2-Dichloroethe	ne (total)	16	U
	Chloroform_		16	U
107-06-2	1,2-Dichloroetha	ne	16	U
	2-Butanone		310	U
	1,1,1-Trichloroe		16	U
56-23-5	Carbon Tetrachlo	ride	16	U
75-27-4	Bromodichloromet	hane	16	U
78-87-5	1,2-Dichloroprop	ane	16	U
10061-01-5-	cis-1,3-Dichloro	propene	16	U
79-01-6	Trichloroethene		16	U
124-48-1	Dibromochloromet	hane	16	U
79-00-5	1,1,2-Trichloroe	thane	16	U
71-43-2	Benzene		16	U
10061-02-6-	trans-1,3-Dichlo	ropropene	16	U
75-25-2	Bromoform		16	U
108-10-1	4-Methyl-2-Penta	none	160	U
	2-Hexanone		160	U
127-18-4	Tetrachloroether	ie	16	U
	1,1,2,2-Tetrachl		16	U
	Toluene		16	U
	Chlorobenzene		16	U
100-41-4	Ethylbenzene		16	U
100-42-5	Styrene		16	U
1330-20-7	Xylene (total)		16	U

FORM I VOA

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1/87 Rev.

## 9613497-1384

#### VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

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

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

FORM I VOA-TIC

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## 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:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG O

CAS NO.	COMPOUND	(ug/L or ug/kg	) UG/KG	Q
74-87-3	Chloromethane		11	U
	Bromomethane		11	U
	Vinyl Chloride		11	U -
75-00-3	Chloroethane		11.	U
	Methylene Chloride		11 1	BU
67-64-1	Acetone		110	U
	Carbon Disulfide		5	U
	1,1-Dichloroethene		5	U
	1,1-Dichloroethane		5	U
	1,2-Dichloroethene		5	U
	Chloroform	(60642)	5	U
	1,2-Dichloroethane		5	U
	2-Butanone		110	U
	1,1,1-Trichloroetha	ne	5	U
	Carbon Tetrachloric		5	U
75-27-4	Bromodichloromethar	ne .	5	U
	1,2-Dichloropropane		5	U
0061-01-5	cis-1,3-Dichloropro	pene	5	U
79-01-6	Trichloroethene	pene	5	U
	Dibromochloromethar	ne .	5	U
	1,1,2-Trichloroetha		5	U
	Benzene		5	U
	trans-1,3-Dichlorop	ropene	5	U
	Bromoform	J. Opene	5	U
	4-Methyl-2-Pentanor	10	53	Ū
	2-Hexanone		53	U
	Tetrachloroethene		5	Ū
	1,1,2,2-Tetrachloro	ethane	5	U
	Toluene	Je chane	5	U
	Chlorobenzene		5	U
100-30-7	Ethylbenzene		5	U
	Styrene		5	U
	Xylene (total)		5	U
1330-20-7	xyrene (cocar)		3	

FORM I VOA

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### 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

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

Number TICs found: 0

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

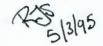
FORM I VOA-TIC

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# APPENDIX C SEMI-VOLATILE ORGANIC DATA SUMMARY TABLES

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Laboratory: QUANTERRA																					
Case:	SDG:	W0429		1																	
Sample Number		BODMT2	1	BODMT	3																
Location		Test Pit	#2	Test Pit	#2																
Remarks																-					
Sample Date		01/17/95	,	01/17/95	5																
Extraction Date		01/20/95		01/20/95	5																
Analysis Date		01/23/95		01/23/95																	
Semivolatile Compound				Result		Result	Q														
Phenol	330	1200			U																
bis(2-Chloroethyl)ether	330	1200		2100	U																
2-Chlorophenol	330	1200		2100	U																
1,3-Dichlorobenzene	330	1200		2100																	
1,4-Dichlorobenzene	330	1200		2100	U													1			
1,2-Dichlorobenzene	330	1200		2100											-						
2-Methyl phenol	330	1200		2100																	
2,2'-oxybis(1-Chloropropane)	330	1200		2100																	
4-Methylphenol	330	1200	U	2100	U																
N-Nitroso-di-n-propylamine	330	1200	U	2100	U																
Hexachloroethane	330	1200	U	2100	U																
Nitrobenzene	330	1200	U	2100	U																
Isophorone	330	1200	U	2100	U																
2-Nitrophenol	330	1200	U	2100	U											,					
2,4-Dimethylphenol	330	1200		2100	U																
bis(2-Chloroethoxy) methane	330	1200		2100	U																
2,4-Dichlorophenol	330	1200	U	2100																	
1,2,4-Trichlorobenzene	330	1200		2100																	
Naphthalene	330	1200	U	2100	U																
4-Chloroaniline	1700	2300	U	4100	U																
Hexachlorobutadiene	330	1200	U	2100	U									7							
4-Chloro-3-methylphenol	1700	2300	U	4100	U																
2-Methylnaphthalene	330	1200		2100																	1
Hexachlorocyclopentadiene	330	1200		2100	U																
2,4,6-Trichlorophenol	330	1200		2100																	
2,4,5—Trichlorophenol	330	1200		2100			-														1
2-Chloronaphthalene	330	1200		2100																	1
2-Nitroaniline	1700	5900		10000					-		-						-				1
Dimethyl phthalate	330	1200		2100		-	-		-								-				+
Acenaphthylene	330	1200		2100			-		-		-		-				1		-		1
2,6-Dinitrotoluene	330	1200		2100			-		-		-				-		-		-		-



Laboratory: QUANTERRA	1000	1410.405		-																	
Case:	SDG:	W0429		5051150																	
Sample Number		BODMT2		BODMT																	
Location		Test Pit	#2	Test Pit	#2																
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/23/95		01/23/95			_				,										
Semivolatile Compound	CRQL	Result				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1700	5900		10000																	
Acenaphthene	330	1200		2100			-														1
2,4-Dinitrophenol	1700	5900		10000																	
4-Nitrophenol .	1700	5900		10000			1														
Dibenzofuran	330	1200		2100																	
2,4-Dinitrotoluene	330	1200		2100			-														
Diethylphthalate	330	1200		2100																	
4 – Chlorophenyl – phenyl ether	330	1200		2100		THE STATE OF THE STATE OF	_			A116 m4 m1 110				At 100							
Fluorene	330	1200		2100																	
4-Nitroaniline	1700	2300		4100																	
4,6-Dinitro-2-methylphenol	1700	5900	U	10000														,			
N-Nitrosodiphenylamine	330	1200		2100																	
4 - Bromophenyl - phenylether	330	1200		2100																	
Hexachlorobenzene	330	1200	U	2100																	
Pentachlorophenol	1700	5900		10000																	
Phenanthrene	330	440	J	470																	
Anthracene	330	430		460																	
Carbazole	330	1200	U	2100																	
Di-n-butylphthalate	330	170	J	2100	U																
Fluoranthene	330	590	J	940	J																
Pyrene	330	570	J	820	J																
Butylbenzylphthalate	330	1200	U	2100	U																
3,3'-Dichlorobenzidine	330	2300		4100																	
Benzo(a)anthracene	330	180		340																	
Chrysene	330	220		400																	
bis(2 – Ethylhexyl) phthalate	330	81		130					1												1
Di-n-octylphthalate	330	1200																			1
Benzo(b)fluoranthene	330	420		580																	1
Benzo(k)fluoranthene	330	130		220		-	1					1			1						+
Benzo(a) pyrene	330	1200					1						1								+
Indeno(1,2,3-cd)pyrene	330	1200					-		1		1		1		1				-		-
Dibenz(a,h)anthracene	330	1200					1		1						1		1				1
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Laboratory: QUANTERRA																					
Case:	SDG:	W0430		1																	
Sample Number		BODMT4																			
Location		Test Pit	#2																		
Remarks																					
Sample Date		01/27/95	5																		
Extraction Date		02/02/95																			
Analysis Date		02/06/95																			
Semivolatile Compound				Result	Q																
Phenol	330	700																	1		
bis(2-Chloroethyl)ether	330	700	U																		
2-Chlorophenol	330	700																			
1,3-Dichlorobenzene	330	700																			T
1,4-Dichlorobenzene	330	700																			
1,2-Dichlorobenzene	330	700																			
2-Methylphenol	330	7.00																			
2,2'-oxybis(1-Chloropropane)	330	700																			
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																			1
2,4-Dimethylphenol	330	700																			
bis(2-Chloroethoxy) methane	330	700																	-		+
2,4-Dichlorophenol	330	700							-		_										-
1,2,4—Trichlorobenzene	330	700	U														_				+
Naphthalene	330	700					-		-										_		1
4-Chloroaniline	1700	1400		-	-		-														_
Hexachlorobutadiene	330	700			-		-						-				-				+
4-Chloro-3-methylphenol	1700	1400		-	1		-						-		-				-		1
2-Methylnaphthalene	330	700		-	-		-		-					-	-		-		-		1
Hexachlorocyclopentadiene	330	700			-		-				-		-				-		-		-
2,4,6-Trichlorophenol	330	700			-		-		-								-		-		$\vdash$
2,4,5—Trichlorophenol	330	700			-		-		-		-	-			-		-		-		+
2-Chloronaphthalene	330	700		-	-		-		-				-						-		+
2-Nitroaniline	1700	3500			-		-				-						-				1
Dimethyl phthalate	330	700			-		-		-			-					-	-	-		+
Acenaphthylene	330	700			-		-		-		-		-				-		-		+
2,6-Dinitrotoluene	330	700			-		-		-		-		-		-		-		-		-



SDG: W0430

1700

B0DMT4

01/27/95 02/02/95

02/06/95

3500 U

Test Pit #2

Project: WESTINGHOUSE-HANFORD

Laboratory: QUANTERRA

Semivolatile Compound

Case:

Location

Remarks Sample Date

Sample Number

Extraction Date Analysis Date

3-Nitroaniline

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						
Diethylphthalate	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			1			
Anthracene	330	700 U						
Carbazole	330	700 U						
Di-n-butylphthalate	330	700 U						
Fluoranthene	330	700 U						
Pyrene	330	700 U						
Butylbenzylphthalate	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						

CRQL Result | Q | Result | Q |

PJS 13/95

# APPENDIX D SEMI-VOLATILE ORGANIC VALIDATED LABORATORY REPORT FORMS

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS:

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

CAS NO.	COMPOUND (ug/L c	or ug/kg) UG/kG	Q
108-95-2	Phenol	1200	U
111-44-4	bis(2-Chloroethyl)Ether	1200	U
95-57-8	2-Chlorophenol	1200	U
541-73-1	1,3-Dichlorobenzene		U
106-46-7	1,4-Dichlorobenzene	1200	U
95-50-1	1,2-Dichlorobenzene	1200	U
95-48-7	2-Methylphenol	1200	U
L08-60-1	2,2'-oxybis(1-Chloropropa	ne) 1200	U
106-44-5	4-Methylphenol	1200	U
521-64-7	N-Nitroso-Di-n-Propylamin	e 1200	U
67-72-1	Hexachloroethane	1200	U
98-95-3	Nitrobenzene	1200	U
78-59-1	Isophorone	1200	U
88-75-5	2-Nitrophenol	1200	U
	2,4-Dimethylphenol	1200	U
	bis(2-Chloroethoxy) Methan	e 1200	U
120-83-2	2,4-Dichlorophenol	1200	U
120-82-1	1,2,4-Trichlorobenzene	1200	U
91-20-3	Naphthalene	1200	U
106-47-8	4-Chloroaniline	2300	U
87-68-3	Hexachlorobutadiene	1200	U
	4-Chloro-3-Methylphenol	2300	U
	2-Methylnaphthalene	1200	U
77-47-4	Hexachlorocyclopentadiene	1200	U
88-06-2	2,4,6-Trichlorophenol	1200	U
95-95-4	2,4,5-Trichlorophenol	1200	U
91-58-7	2-Chloronaphthalene	1200	U
	2-Nitroaniline	5900	U
131-11-3	Dimethyl Phthalate	1200	U
208-96-8	Acenaphthylene	1200	U
506-20-2	2,6-Dinitrotoluene	1200	U

FORM I SV-1

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3/27/95 SC

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	UG/KG	Q	
99-09-2	3-Nitroaniline			5900	U	
	Acenaphthene			1200	U	
51-28-5	2,4-Dinitrophe	enol		5900	U	
100-02-7	4-Nitrophenol			5900	U	
132-64-9	Dibenzofuran			1200	U	
121-14-2	2,4-Dinitrotol	uene		1200	U	
84-66-2	Diethylphthala	te		1200	U	
	4-Chlorophenyl			1200	U	
86-73-7	Fluorene			1200	U	
	4-Nitroaniline			2300	U	1
534-52-1	4,6-Dinitro-2-	Methylphenol		5900	U	
	N-Nitrosodiphe			1200	U	
101-55-3	4-Bromophenyl-	phenylether		1200	U	
118-74-1	Hexachlorobenz	ene		1200	U	
87-86-5	Pentachlorophe	enol		5900	U	
85-01-8	Phenanthrene			440	J	
	Anthracene			430	J	
86-74-8	Carbazole			1200	U	
84-74-2	Di-n-Butylphth	nalate		170	J	
	Fluoranthene	****		590	J	
129-00-0	Pyrene			570	J	
	Butylbenzylpht	halate		1200 820	Bo	u
91-94-1	3,3'-Dichlorob	enzidine		2300	U	
	Benzo(a)Anthra			180	J	
	Chrysene			220	J	
	bis(2-Ethylhex	cvl)Phthalate		81	J	
	Di-n-Octyl Pht			1200	IF	U
	Benzo(b) Fluora			420	J	J
207-08-9	Benzo(k)Fluora	anthene		130	July	7
	Benzo (a) Pyrene			1200	5	U:
	Indeno(1,2,3-c			1200	444	UZ
53-70-3	Dibenz (a, h) Ant	hracene		1200	0	. U:
	Benzo(g,h,i)Pe			1200	B	U
) - Cannot	be separated from I	Diphenylamine		DS S	18/95	!

FORM I SV-2 0000**61** 

#### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID: A7716

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 44 dec.

Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N

pH:

Dilution Factor: 1.00

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

Number TICs found: 22

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	4.64	25000	ABJ
2.	Aldol Condensation	4.70	2600	ABJIA
3.	UNKNOWN	16.77	240	J
4.	UNKNOWN	18.59	2800	J
5.	Unknown Alkane	18.84	1200	J
6.	Unknown Alkane	18.94	320	J
7.	Unknown Alkane	19.44	290	J
8.	UNKNOWN	20.50	390	J
9.	Unknown C12H6Cl4	22.92	220	J J
10.	Unknown C12H6Cl4	23.02	340	J
11.	Unknown C12H5C15	23.53	1400	J
12.	Unknown C12H5C15	24.07	590	J
13.	Unknown C12H4C16	24.46	560	J
14.	Unknown C12H4Cl6	24.70	990	J
15.	Unknown C12H5C15	24.79	900	J
16.	Unknown C12H4Cl6	25.22	1100	J
17.	Unknown Cl2H4Cl6	25.75	1200	J
18.	Unknown C12H3Cl7	26.02	500	J
19.	Unknown C12H3Cl7	27.03	650	J
20.	UNKNOWN	28.32	610	J
21.	UNKNOWN	29.60	1000	J
22.	UNKNOWN	29.88	1100	J

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### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3

Name: QUANTERRA MO Contract: 550-56

Rab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Lab Sample ID: 7344-004

3ample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS:

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

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

108-95-2	-Phenol	2100	U
111-44-4	-bis(2-Chloroethyl)Ether	2100	U
05-57-8	-2-Chlorophenol	2100	U
541-73-1	-1,3-Dichlorobenzene	2100	U
106-46-7	-1,4-Dichlorobenzene	2100	U
95-50-1	-1,2-Dichlorobenzene	2100	U
05-48-7	-2-Methylphenol	2100	U
108-60-1	-2,2'-oxybis(1-Chloropropane)	2100	U
106-44-5	-4-Methylphenol	2100	U
621-64-7	-N-Nitroso-Di-n-Propylamine	2100	U
67-72-1	-Hexachloroethane	2100	U
98-95-3	-Nitrobenzene	2100	U
78-59-1	-Isophorone	2100	U
98-75-5	-2-Nitrophenol	2100	U
105-67-9	-2,4-Dimethylphenol	2100	U
111-91-1	-bis(2-Chloroethoxy)Methane	2100	U
120-83-2	-2,4-Dichlorophenol	2100	U
120-82-1	-1,2,4-Trichlorobenzene	2100	U
01-20-3	-Naphthalene	2100	U
106-47-8	-4-Chloroaniline	4100	U
97-68-3	-Hexachlorobutadiene	2100	U
50-50-7	-4-Chloro-3-Methylphenol	4100	U
01-57-6	-2-Methylnaphthalene	2100	U
77-17-4	-Hexachlorocyclopentadiene	2100	U
98-06-2	-2,4,6-Trichlorophenol	2100	U
05-95-4	-2,4,5-Trichlorophenol	2100	U
01-58-7	-2-Chloronaphthalene	2100	U
09-74-4	-2-Nitroaniline	10000	U
121-11-3	-Dimethyl Phthalate	2100	U
208-96-8	-Acenaphthylene	2100	U
606-20-2	-2,6-Dinitrotoluene	2100	U

FORM I SV-1

3/27/95 5 1/87 Rev.

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## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: QUANTERRA MO Contract: 550-56

Tab Gada IMMO Gara Na GOMAGO GARA

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

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

99-09-2----3-Nitroaniline 10000 U 83-32-9-----Acenaphthene 2100 U -51-28-5----2,4-Dinitrophenol 10000 U 100-02-7----4-Nitrophenol 10000 U 132-64-9-----Dibenzofuran 2100 U 121-14-2----2,4-Dinitrotoluene 2100 U 84-66-2-----Diethylphthalate U 2100 7005-72-3----4-Chlorophenyl-phenylether 2100 U 86-73-7----Fluorene U 2100 100-01-6----4-Nitroaniline 4100 U 534-52-1----4,6-Dinitro-2-Methylphenol 10000 U 86-30-6----N-Nitrosodiphenylamine (1) U 2100 101-55-3----4-Bromophenyl-phenylether U 2100 118-74-1-----Hexachlorobenzene 2100 U 87-86-5----Pentachlorophenol U 10000 85-01-8-----Phenanthrene 470 J 120-12-7-----Anthracene 460 J 86-74-8-----Carbazole 2100 U 84-74-2-----Di-n-Butylphthalate 2100 U 206-44-0-----Fluoranthene J 940 J 129-00-0-----Pyrene 820 2100 1400 85-68-7-----Butylbenzylphthalate BU 91-94-1----3,3'-Dichlorobenzidine 4100 U 56-55-3-----Benzo(a) Anthracene 340 J 218-01-9-----Chrysene J 400 117-81-7-----bis(2-Ethylhexyl)Phthalate J 130 VJ V 117-84-0-----Di-n-Octyl Phthalate 2100 205-99-2----Benzo (b) Fluoranthene 580 7 207-08-9-----Benzo(k)Fluoranthene 200 220 50-32-8-----Benzo (a) Pyrene 290 193-39-5-----Indeno(1,2,3-cd)Pyrene 2100 **U**3 V 53-70-3-----Dibenz(a,h)Anthracene 2100 UJ 191-24-2----Benzo(g,h,i) Perylene D 2100

(1) - Cannot be separated from Diphenylamine

000064

BODMT3

#### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS. No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS: Number TICs found: 18 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	4.65	36000	ABJ U
2.	UNKNOWN	16.77	240	J
3.	UNKNOWN	18.59	4600	J
4.	Unknown Alkane	18.85	2100	J
5.	UNKNOWN	18.94	260	J
6.	Unknown Alkane	19.45	230	J
7.	UNKNOWN	20.50	620	J
8.	UNKNOWN	20.97	360	J
9.	UNKNOWN	21.82	230	J
10.	UNKNOWN	26.55	230	J
11.	UNKNOWN	28.12	270	J
12.	UNKNOWN	28.30	280	J
13.	UNKNOWN	29.56	600	J
14.	UNKNOWN	30.48	440	J
15.	UNKNOWN	31.19	360	J
16.	UNKNOWN	31.39	490	J
17.	UNKNOWN	31.75	410	J
18.	UNKNOWN	32.01	700	J

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FORM I SV-TIC

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000065

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:

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

.08-95-2Phenol	700	U
11-44-4bis(2-Chloroethyl)Ether	700	U
95-57-82-Chlorophenol	700	U
541-73-11,3-Dichlorobenzene	700	U
.06-46-71,4-Dichlorobenzene	700	U
95-50-11,2-Dichlorobenzene	700	U
95-48-72-Methylphenol	700	U
.08-60-12,2'-oxybis(1-Chloropropane)	700	U
.06-44-54-Methylphenol	700	U
521-64-7N-Nitroso-Di-n-Propylamine	700	U
57-72-1Hexachloroethane	700	U
98-95-3Nitrobenzene	700	U
78-59-1Isophorone	700	U
38-75-52-Nitrophenol	700	U
.05-67-92,4-Dimethylphenol	700	U
11-91-1bis(2-Chloroethoxy)Methane	700	U
20-83-22,4-Dichlorophenol	700	U
20-82-11,2,4-Trichlorobenzene	700	U
91-20-3Naphthalene	700	U
106-47-84-Chloroaniline	1400	U
37-68-3Hexachlorobutadiene	700	U
59-50-74-Chloro-3-Methylphenol	1400	U
91-57-62-Methylnaphthalene	700	U
77-47-4Hexachlorocyclopentadiene	700	U
38-06-22,4,6-Trichlorophenol	700	U
95-95-42,4,5-Trichlorophenol	700	U
91-58-72-Chloronaphthalene	700	U
38-74-42-Nitroaniline	3500	U
131-11-3Dimethyl Phthalate	700	U
208-96-8Acenaphthylene	700	U
506-20-22,6-Dinitrotoluene	700	U

FORM I SV-1

3/20/95 50

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### SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

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:

CAS NO.	COMPOUND (ug/L	or ug/Kg) UG/KG (	2
99-09-2	3-Nitroaniline	3500 U	
	Acenaphthene	700 U	1
	2,4-Dinitrophenol	3500 U	
	4-Nitrophenol	3500 U	- 1
	Dibenzofuran	700 U	
	2,4-Dinitrotoluene	700 U	
84-66-2	Diethylphthalate	700 U	
7005-72-3	4-Chlorophenyl-phenyleth	er 700 U	- 1
86-73-7	Fluorene	700 U	
	4-Nitroaniline	1400 U	
	4,6-Dinitro-2-Methylphen	ol 3500 U	
	N-Nitrosodiphenylamine (		
101-55-3	4-Bromophenyl-phenylethe	r 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	
	Carbazole	700 U	
84-74-2	Di-n-Butylphthalate	700 U	
206-44-0	Fluoranthene	700 U	
129-00-0		700 U	
85-68-7	Butylbenzylphthalate	700,300 80	u
91-94-1	3,3'-Dichlorobenzidine		
	Benzo (a) Anthracene	700 U	
	Chrysene	700 U	
117-81-7	bis(2-Ethylhexyl)Phthala	te 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	

Cannot be separated from Diphenylamine

3/20/95 5

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### 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

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

Number TICs found: 2

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

3/30/955

# APPENDIX E PESTICIDE/PCB DATA SUMMARY TABLES

000070

Project: WESTINGHOUS Laboratory: QUANTERF																					
Case:		W0429														•					
Sample Number		BODMT2		BODMT3	3																
Location		Test Pit	#2	Test Pit	#2														-		
Remarks																					
Sample Date		01/17/95	;	01/17/95	5												-		-		
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/25/95	_	01/25/95																	
Pesticide/PCB	CRQL	Result		Result		Result	Q														
alpha-BHC	1.7	1.8		3.1				-												_	
beta-BHC	1.7	3.5		6.2																	
delta – BHC	1.7	5.3	U	9.3																	
gamma-BHC (Lindane)	1.7	4.5		4.1																	
Heptachlor	1.7		UJ	3.1																	
Aldrin	1.7	8.2		36																	
Heptachlor epoxide	1.7		UJ		UJ										1						
Endosulfan I	1.7	8.3		14																	
Dieldrin	3.3	1.2		2.1														,			
4,4'-DDE	3.3		UJ		UJ																
Endrin	3.3	140		440																	
Endosulfan II	3.3		UJ	55																•	
4,4'-DDD	3.3	6.5		24																	
Endosulfan sulfate	3.3	39	UJ		UJ							U.T.									
4,4'-DDT	3.3	170		190																	
Methoxychlor	17.0	100		180																	
Endrin Aldehyde	3.3		UJ	110																	
Tech. Chlordane	1.7	8.3	U	14		3															
Toxaphene	170.0	140	1	250	-																
Arochlor-1221	33.0	59	U	100	U																
Arochlor-1232	67.0	59	U	100																	
Arochlor-1242/1016	33.0	39		68																	
Arochlor-1248	33.0	59	U	100	U																
Arochlor-1254	33.0	2300		9800																	
Arochlor-1260	33.0	1800		7500													-				

PAS 5/3/95

0	-
-	-
7	
-	
-	
-	1

Laboratory: QUANTERR	A																				
Case:		W0430		1																	
Sample Number		BODMT4	1																		
Location		Test Pit	#2																		
Remarks																					
Sample Date		01/27/95	5																		
Extraction Date	-	02/03/95	5																		
Analysis Date		02/08/95																			
Pesticide/PCB		Result		Result	Q																
alpha-BHC	1.7		UJ																		
beta-BHC	1.7		UJ																		
delta-BHC	1.7		UJ																		
gamma-BHC (Lindane)	1.7	1.4																			
Heptachlor	1.7		UJ																		
Aldrin '	1.7	1.4																			
Heptachlor epoxide	1.7		U																		
Endosulfan I	1.7	5.0																			
Dieldrin	3.3	0.71																			
4,4'-DDE	3.3		UJ															,			
Endrin	3.3	2.1	UJ																		
Endosulfan II	3.3	1.4	U																		T
4,4'-DDD	3.3	3.9	UJ																		
Endosulfan sulfate	3.3	24	U																		1
4,4'-DDT	3.3	4.3	UJ																		
Methoxychlor	17.0	63	UJ											2.5							
Endrin Ketone	3.3	8.2	U																		
Tech. Chlordane	1.7	5.0	U																		
Toxaphene	170.0	85	U																		1
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		U																		
Arochlor-1260	33.0		U																		T

## APPENDIX F

PESTICIDE/PCB VALIDATED LABORATORY REPORT FORMS

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: <u>QUANTERRA, MO</u> Cont	ract:	550.56		BODMT2		
Lab Code: ITMO Case No.:				W0429		
Matrix: (soil/water)SOIL	_	· Lab Sa	mple ID: _	7344-00	2	
Sample wt/vol: <u>30.0</u> (g/ml)	g .	Lab Fi	le ID:			
Level: (low/med) LOW		Date S	ampled : _	01-17	-95	
% Moisture: not dec. 44 de	c	Date E	xtracted: _	01-20	-95	
Extraction: (SepF/Cont/Sonc)	SONC	Date A	nalyzed: _	01-25	-95	
GPC Cleanup: (Y/N) N pH			on Factor:	1		
CAS NO. Compound	(	CONCENTRATION (ug/L or ug/K	UNITS: g) uq/Kq	_	Q	
319-84-6	r epoxide n I n II n sulfate dehyde ordane 221 232 242/1016 248 254		1.8 3.5 5.3 4.5 1.8 8.2 49 8.3 1.2 25 140 45 6.5 39 170 100 54 8.3 140 59 59 59 59		U U U U U U U U U U U U U U U SD SD	८८० ८८० ८५५

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

See dilution SD:

Elevated detection limit due to PCB interference. X:

FORM I PEST

1/87 Rev.

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract: 550.56	BODMT2DL
Lab Code: ITMO Case No.: SAS No.: SDG	No.: W0429
Matrix: (soil/water)SOIL Lab Sample	ID: 7344-002DL
Sample wt/vol: 30.0 (g/ml) q Lab File ID:	
Level: (low/med) LOW Date Sampled	01-17-95
Moisture: not dec. 44 dec. Date Extract	ed: 01-20-95
Extraction: (SepF/Cont/Sonc) SONC Date Analyze	ed: 02-02-95
GPC Cleanup: (Y/N) N pH: Dilution Fac	tor: 10
CAS NO. Compound (ug/L or ug/Kg) ug/L	
11104-28-2Aroclor-1221 590	U
11141-28-2Aroclor-1232 590	U
53469-21-9/12674-11-2-Aroclor-1242/1016390	
	U
11097-57-4Aroclor-1254 2300	
11096-82-5Aroclor-12601800	

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

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FORM I PEST

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: OUANTERRA, MO Contract:	50.56	BODMT3	
Lab Code: ITMO Case No.: SAS No.: _	SDG No.:	W0429	
Matrix: (soil/water)SOIL I	ab Sample ID:	7344-004	_
Sample wt/vol: 30.0 (g/ml) g	ab File ID:		
Level: (low/med) LOW	Date Sampled :	01-17-95	
% Moisture: not dec. 68 dec. 1	ate Extracted: _	01-20-95	
Extraction: (SepF/Cont/Sonc) SONC	ate Analyzed:	01-25-95	
GPC Cleanup: (Y/N) N pH:	ilution Factor:	1	_
CAS NO. Compound (ug/L or	ATION UNITS: ug/Kg) ug/Kg	Q	
319-84-6	6.2 9.3 4.1 3.1 36 86 14 2.1 82 440 55 24	で で が メ / ア	33 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5

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

SD: See dilution

X: Elevated detection limit due to PCB interference.
FORM I PEST

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1/87 Rev.

U1-0 B

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA	A SHEET -	BODMT3DL
Lab Name:QUANTERRA,MO Contract:	550.56	
Lab Code: ITMO Case No.: SAS No	o.: SDG No.:	W0429
Matrix: (soil/water)SOIL	Lab Sample ID:	7344-004DL
Sample wt/vol: 30.0 (g/ml) g	Lab File ID:	
Level: (low/med) LOW	Date Sampled : _	01-17-95
Moisture: not dec. 68 dec.	Date Extracted:	01-20-95
Extraction: (SepF/Cont/Sonc) SONC	Date Analyzed:	01-24-95
GPC Cleanup: (Y/N) N pH:	Dilution Factor:	25
	CENTRATION UNITS: /L or ug/Kg) ug/Kq	Q
319-84-6alpha-BHC 319-85-7beta-BHC	77150	U U
319-86-8delta-BHC	230	U
58-89-9gamma-BHC (Lindane)		
76-44-8Heptachlor	77	U
309-00-2Aldrin		U
1024-57-3Heptachlor epoxide		
959-98-8Endosulfan I	360	
60-57-1Dieldrin	52	
72-55-94,4'-DDE	100	U
72-20-8Endrin	780	
33213-65-9Endosulfan II	100	
72-54-84,4'-DDD	280	
1031-07-8Endosulfan sulfate	1700	
50-29-34,4'-DDT	340	
72-43-5Methoxychlor	4500	
53494-70-5Endrin Aldehyde	590	
57-74-9Tech. Chlordane	360	U
8001-35-2Toxaphene	6200	U
11104-28-2Aroclor-1221	2600	U
11141-28-2Aroclor-1232	2600	U
53469-21-9/12674-11-2-Aroclor-1242/1016		<u>U</u>
12672-29-6Aroclor-1248	2600	U
11097-57-4Aroclor-1254	9800	
11096-82-5Aroclor-1260	7500	

Concentration of analyte is less than the value given. Elevated detection limit is due to PCB interference. U:

X:

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FORM I PEST

1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract:	550-56	BODMT4	
Lab Code: ITMO Case No.:		W0430	
Matrix: (soil/water) SOIL	Lab Sample ID:	7444-008	3
Sample wt/vol: 30.0 (g/ml) g	Lab File ID:		
Level: (low/med) LOW	Date Sampled:	01-27-95	
% Moisture: not dec6 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	
CAS NO. Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		2
319-84-6alpha-BHC_	1.1		5 UJ
319-85-7beta-BHC	2.1	T.	Y UJ
319-86-8delta-BHC	3.2	1	03
58-89-9gamma-BHC (Lindane)	1.4	T	J
76-44-8Heptachlor	1.1	7	2 05
309-00-2Aldrin	1.4	7	J
1024-57-3Heptachlor epoxide	30		J
959-98-8Endosulfan I	5.0	7	J
60-57-1Dieldrin	0.71		J
72-55-94,4'-DDE	1.4	7	15
72-20-8Endrin	2.1	1	UJ
33213-65-9Endosulfan II	1.4		J
72-54-84,4'-DDD	3.9		V3
1031-07-8Endosulfan sulfate	24		J
50-29-34,4'-DDT	4.3		3UJ
72-43-5Methoxychlor	63		8UJ
7421-93-4Endrin Aldehyde	8.2	t	J
57-74-9Chlordane (technical)	5.0		J
8001-35-2Toxaphene	85		J
11104-28-2Aroclor-1221	36		1 UZ
11141-16-5Aroclor-1232	36		J
53469-21-9/12674-11-2-Arochlor-1242/10			J
12672-29-6Aroclor-1248_	36		5 02
11097-69-1Aroclor-1254	36		J
11096-82-5Aroclor-1260	36		J

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

4/22/98

FORM I PEST

# APPENDIX G METALS DATA SUMMARY TABLES

Laboratory: Quant																					
Case	SDG: W	0429																			
Sample Number		BODMT	2	BODMT3	3																
Location		Test Pit	#2	Test Pit	#2																
Remarks	MG/KG	Soll		Soil																	-
Sample Date		01/17/	95	01/17/9	5																
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	20	53700		63400																	T
Antimony	10	7.8		10.1	U																T
Arsenic	1	14.4		41.1																	
Barium	20	74.3		107																	$\vdash$
Beryllium	0.7	0.59		0.76																	$\vdash$
Cadmium	2	2.6		4.7																	
Calcium	500	3630		4200																	
Chromium	2	66.4		77.1																	T
Cobalt	5	7.3		9.4																	
Copper	2.5	68.6		55.8																	$\vdash$
Iron	10	20100		21000																	
Lead	0.3	104		197															1		1
Magnesium	500	3090		4180						-											
Manganese	1.5	140		201																	1
Nickel	4	14.7		18.8																	
Potassium	500	654		970							-										
Selenium	0.5	0.18	U	0.31	U								-	·····							
Silver	20	0.76		1.3	-				1												
Sodium	100	244		286	_													-			
Thallium	1	0.28		0.32			1		1												
Vanadium	5	45.0	-	46.5			1		1												
Zinc	2	450		1030			1														-
21110		100		1000					1	-											
			-			-	-														1
						-	-		1		1						-				-
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Laboratory: Quante																					
Case	SDG: W	0430																			
Sample Number		BODMT4																			
Location		Test Pit	#2																		
Remarks	MG/KG	Soil																			
Sample Date		01/27/95	5																		
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	20	4010																			
Antimony	10		BJ																		
Arsenic	1	0.68																			
Barium	20	93.5																			
Beryllium	0.7	0.45																			
Cadmium	2	0.41																			
Calcium	500	4020																			
Chromium	2	4.9																			
Cobalt	5	13.0																			
Copper	2.5	14.5																			
Iron	10	13400																			
Lead	0.3	1.7																			
Magnesium	500	4060																			
Manganese	1.5	311	J																		
Nickel	4	7.1																			
Potassium	500	477																			
Selenium	0.5	0.11	U																		
Silver	20	0.41	U																		
Sodium	100	129																			
Thallium	1		UJ																		
Vanadium	5	68.7																			
Zinc	2	56.2			-														-		-
			-												1		-				
															-		-		-		-
							-		-	-	-				-		-				-
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PK 5/5/95

## APPENDIX H METALS VALIDATED LABORATORY REPORT FORMS

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		BODMT2
Contract:	550.56	

Name: ITAS\_ST.\_LOUIS\_ Code: ITMO\_\_\_ Case No.:\_ SDG No.: W0429 SAS No.:

Lab Sample ID: 7344-002

rix (soil/water): SOIL\_el (low/med): LOW\_olids: \_56.5

Date Received: 01/18/95

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	53700	-		P
7440-36-0	Antimony	7.8	B		P
7440-38-2	Arsenic	14.4	В		F
7440-39-3	Barium	74.3			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	2.6	В		P
7440-70-2	Calcium	3630			P
7440-47-3	Chromium	66.4	-		P
7440-48-4	Cobalt	7.3	B		P
7440-50-8	Copper	68.6			F
7439-89-6	Iron	20100			P
7439-92-1	Lead	104			_   P
7439-95-4	Magnesium	3090			- P
7439-96-5	Manganese	140		1.16	P
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	654	B		F
7782-49-2	Selenium	0.18	U		F
7440-22-4	Silver	0.76	В		F
7440-23-5	Sodium	244			_ P
7440-28-0	Thallium	0.28	B		_ F
7440-62-2	Vanadium	45.0			_ P
7440-66-6	Zinc	450			_ P
					_ _
			_		
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			_		
			_		_   _
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lor Before:	Clarity Before:	Texture:
mments:		
	EODM T TW	4/24/95
	FORM I - IN	7275 SW-846

-00951 RS

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## U.S. EPA - CLP

		INORGANIC	ANALYSES DATA :	SHE	ET	1	BODMT4
Name: OUA	NTERRA MO		Contract: 550	0.5	6		DODIT 4
Code: ITM	O Case N	0.:	SAS No.:		SDG	No	.: W0430
rix (soil/	water): SOIL			lab	Sampl	e T	D: 7444-008
el (low/me	ed): LOW	-	i	Dat	e Rece	ive	d: 01/30/95
olids:	93.	5		Juc			01/30/33
32.200							
	concentration	Units (ug	/L or mg/kg dry	v w	eight)	: M	G/KG
	1	(49)	, = -=5,5				.,
	CAS No.	Analyte	Concentration	С	Q	M	
	7429-90-5	Aluminum	4010	-		P	
	7440-36-0		6.3	D)		P	BJ
	7440-38-2	Arsenic	0.68	B		F	
	7440-39-3	Barium	93.5			P	
	7440-41-7					P	BJ
	7440-43-9		0.41			P	.   65
	7440-70-2	Calcium	4020			P P	1
	7440-47-3		4.9			P	1
	7440-48-4		13.0			P	
	7440-50-8	Copper	14.5			P P F	
	7439-89-6	Iron	13400			P	
	7439-92-1	Lead	1.7			F	1
	7439-95-4	Magnesium	4060			P.	1
	7439-96-5		311	7		P	1
	7440-02-0	Nickel	7.1			P	
	7440-09-7	Potassium	477	B		P	
	7782-49-2		0.11			F	
	7440-22-4	Silver	0.41	U		P	
	7440-23-5		129			P	
	7440-28-0		0.10	B		F	105
	7440-62-2	Vanadium	68.7			P	
	7440-66-6	Zinc	56.2	$  \equiv  $		P	
				_			
				1-1	-		

Color Before: Color After: Comments:	Clarity Before:	Texture: Artifacts:
		715 4/24/95
	FORM I - IN	CM -046

## APPENDIX I GENERAL CHEMISTRY DATA SUMMARY TABLES

Project: WESTINGHOUS		FORD																			
Laboratory: QUANTERR	A																				
Case	SDG: W																				
Sample Number		BODMT2	2	BODMT3	3																
Location		Test Pit	#2	Test Pit	#2																
Remarks	UG/G	Soil		Soil																	
Sample Date Wet Chemistry Analytes	-	01/17/9	5	01/17/9	5																
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	C
Fluoride	300.0	1.70	U	6.25											1						
Sulfate	300.0			4040																	
Chloride	300.0			20.3																	
Sulfide	9030			44.7																	
Nitrate	300.0			50.3																	
Nitrite	300.0		U	0.61																	T
Phosphate	300.0		U	30.6	U																
Nitrate/Nitrite	353.1	53.4		35.4																	
TOX	9020	86.8	U	150	U																
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0430 B0DMT4 Test Pit # Soil 01/27/95 Result	#2						_									~		_	
Soil 01/27/95 Result									***										
01/27/95 Result																			
01/27/95 Result																			
Result																			
	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
0.96	U																		
54.1																			
	U																		
0.19	U																		
9.60	U																		
49.3	U																		
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	2.40 11.8 1.03 0.19 9.60 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00 49.3 U	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00 49.3 U	2.40 U 11.8 1.03 0.19 U 9.60 U 1.00 49.3 U			

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## APPENDIX J GENERAL CHEMISTRY VALIDATED LABORATORY REPORT FORMS

Quanterra Environmental Services

Project: 550.56

Category: Nitrate Method: EPA 300.0 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrate	14797-55-8	QCBLK57444-2	01/20/99	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001DUP	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	106	XREC			1
BODMT2	7344-002	Nitrate	14797-55-8	QCBLK57444-2	01/20/99	01/20/95	69.5	UG/G		1.70	5
BODMT3	7344-004	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	50.3	UG/G		1.22	2
NA	QC8LK57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	100	<b>XREC</b>			1

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### 9613497.1422

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

Project: 550.56

Category: Nitrite Method: EPA 300.0 Matrix: SOLID wuanterra
Environmental
Services

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client	Quanterra			Blank Sample	Prep.	Analyses				Detection	n
ID	ID	Analyte	CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dil.
BODHT6	7344-001	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001DUP	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	103	%REC			5
BODMT2	7344-002	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.34	UG/G	U	0.34	1
BODMT3	7344-004	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.61	UG/G	U	0.61	1
NA	QCBLK57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
NA	QCLC\$57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	104	%REC			1

RDC 1/1/95

9613497-1423

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

Project: 550.56

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Category: Orthophosphate Method: EPA 300.0 Matrix: SOLID

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	
BODNT6	7344-001	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	102	%REC			1
BODMT2	7344-002	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	17.0	UG/G	U	17.0	1
BODMT3	7344-004	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	30.6	UG/G	U	30.6	1
NA	QCBLK57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	96	KREC			1

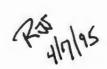
**Wuanterra**Emironmental
Services

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

Project: 550.56

Category: Chloride Method: EPA 300.0 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/61/95

Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	n Dil.
BODMT6	7344-001	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.47	1
BODMT6	7344-001DUP	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.46	1
BODMT6	7344-001MS	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	102	%REC			5
BODMT2	7344-002	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	15.4	UG/G		4.25	1
BODMT3	7344-004	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	20.3	UG/G		7.66	1
NA	QCBLK57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.50	UG/G	U	2.50	1
NA	QCLCS57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	94	%REC			1







Category: Fluoride Method: EPA 300.0 Matrix: SOLID

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

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Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.99	UG/G	U	0.99	1
BODMT6	7344-001DUP	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.98	UG/G	U	0.98	1
BODMT6	7344-001MS	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	107	%REC			1
BODMT2	7344-002	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.70	UG/G	U	1.70	1
BODMT3	7344-004	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	6.25	UG/G		3.06	1
NA	QCBLK57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.00	UG/G	U	1.00	1
NA	QCLCS57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	103	%REC			1

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9613497-1426

Quanterra-Richland P.O. Box 1970 Richland, WA 99352 **Wuanterra**Environmental
Services

Project: 550.56

Category: Sulfate Method: EPA 300.0 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	101	XREC			5
BODMT2	7344-002	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	2230	UG/G		170	10
BODMT3	7344-004	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	4040	UG/G		306	10
NA	QCBLK57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	97	%REC			1

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**Wuanterra**Environmental
Services

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
BODNT6	7344-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.1	UG/G	U	47.1	
BODMT6	7344-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	46.1	UG/G	U	46.1	4
BODMT6	7344-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	101	*REC			1
BODMT2	7344-002	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	86.8	UG/G	U	86.8	1
BODMT3	7344-004	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	150	UG/G	U	150	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	<b>XREC</b>			1

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**Quanterra**Environmental
Services

Project: 550.56

Category: Sulfide Method: EPA 9030 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	n Dil.
BODMT6	7344-001	Sulfide	18496-25-8	QCBLK57691-1	01/23/99	01/23/95	10.8	UG/G		10.6	1
BODMT6	7344-001DUP	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
BODMT6	7344-001MS	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	78	<b>XREC</b>			1
BODMT2	7344-002	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	21.0	UG/G		19.0	1
BODMT3	7344-004	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	44.7	UG/G		34.0	1
NA	QCBLK57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	บ	10.6	1
NA	QCLCS57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	84	%REC			1

R35 4/1/95

012 ++25

9613497-1429

Category: NO2-NO3 Method: EPA 353.1 Matrix: SOLID Quanterra-Richland P.O. Box 1970 Richland, WA 99352

Project: 550.56



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

				•							
Client	Quanterra ID	Analyte	CAS Number	Blank Sample . Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODNT6	7344-001	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.48	UG/G	U	0.48	1
BODMT6	7344-001DUP	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
BODMT6	7344-001MS	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	104	XREC			1
BODMT2	7344-002	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	53.4	UG/G		4.40	5
BODMT3	7344-004	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	35.4	UG/G		3.09	2
NA AP	QCBLK57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
₹A.	QCLCS57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	92	XREC			1

RBC for RJS 4/7/95

000097

CHAHSC

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	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	02/03/99	02/03/95	5.42	UG/G		0.21	1
30DMS4	7444-001DUP	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.34	UG/G		0.21	1
30DMS4	7444-001MS	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	93	<b>XREC</b>			1
BODMT4	7444-008	Nitrate	14797-55-8	QCBLK58660-1	02/03/99	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
4A	QCLCS58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/99	02/03/95	98	ZREC			1

Als to S PIN/95 9613497.1431

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	02/03/99	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	QCLCS58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

p for

9613497.1432

Ortho-Phosphate 7778-77-0

Ortho-Phosphate 7778-77-0

Ortho-Phosphate 7778-77-0

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

Project: 550.56

Category: Orthophosphate Method: EPA 300.0

7444-008

QCBLK58660-1

QCLCS58660-1

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

9.60 UG/G

10.0 UG/G

93 %REC

9.60

10.0

Matrix: SOLID

BODMT4

NA

NA

Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit		Detection Limit	Dil.
BODMS4	7444-001	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/99	02/03/95	10.4	UG/G	Ü	10.4	1
30DMS4	7444-001DUP	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	5 02/03/95	10.3	UG/G	U	10.3	1
30DMS4	7444-001MS	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/99	5 02/03/95	104	REC			1

QCBLK58660-1

QCBLK58660-1

QCBLK58660-1

02/03/95 02/03/95

02/03/95 02/03/95

02/03/95 02/03/95

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

Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
7444-001	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.59	UG/G	U	2.59	1
7444-001DUP	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.58	UG/G	U	2.58	1
7444-001MS	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	100	XREC			5
7444-008	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.40	UG/G	U	2.40	1
QCBLK58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.50	UG/G	U	2.50	1
QCLCS58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	90	XREC			1
	7444-001 7444-001DUP 7444-001MS 7444-008 QCBLK58660-1	7444-001 Chloride 7444-001DUP Chloride 7444-001MS Chloride 7444-008 Chloride QCBLK58660-1 Chloride	1D Analyte CAS Number 7444-001 Chloride 16887-00-6 7444-001DUP Chloride 16887-00-6 7444-001MS Chloride 16887-00-6 7444-008 Chloride 16887-00-6 QCBLK58660-1 Chloride 16887-00-6	TD Analyte CAS Number Name  7444-001 Chloride 16887-00-6 QCBLK58660-1  7444-001DUP Chloride 16887-00-6 QCBLK58660-1  7444-001MS Chloride 16887-00-6 QCBLK58660-1  7444-008 Chloride 16887-00-6 QCBLK58660-1  QCBLK58660-1 Chloride 16887-00-6 QCBLK58660-1	TD Analyte CAS Number Name Date  7444-001 Chloride 16887-00-6 QCBLK58660-1 02/03/95  7444-001DUP Chloride 16887-00-6 QCBLK58660-1 02/03/95  7444-001MS Chloride 16887-00-6 QCBLK58660-1 02/03/95  7444-008 Chloride 16887-00-6 QCBLK58660-1 02/03/95  QCBLK58660-1 Chloride 16887-00-6 QCBLK58660-1 02/03/95	ID         Analyte         CAS Number         Name         Date         Date           7444-001         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95           7444-001DUP         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95           7444-001MS         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95           7444-008         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95           QCBLK58660-1         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95	ID Analyte CAS Number Name Date Date Result 7444-001 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.59 7444-001DUP Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.58 7444-001MS Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 100 7444-008 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.40 QCBLK58660-1 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.50	ID         Analyte         CAS Number         Name         Date         Date         Result         Unit           7444-001         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95         2.59 UG/G           7444-001DUP         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95         2.58 UG/G           7444-001MS         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95         100 XREC           7444-008         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95         2.40 UG/G           QCBLK58660-1         Chloride         16887-00-6         QCBLK58660-1         02/03/95         02/03/95         2.50 UG/G	ID Analyte CAS Number Name Date Date Result Unit Qual.  7444-001 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.59 UG/G U  7444-001DUP Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.58 UG/G U  7444-001MS Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 100 %REC  7444-008 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.40 UG/G U  QCBLK58660-1 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.50 UG/G U	ID Analyte CAS Number Name Date Date Result Unit Qual. Limit  7444-001 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.59 UG/G U 2.59  7444-001DUP Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.58 UG/G U 2.58  7444-001MS Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 100 XREC  7444-008 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.40 UG/G U 2.40  QCBLK58660-1 Chloride 16887-00-6 QCBLK58660-1 02/03/95 02/03/95 2.50 UG/G U 2.50

REC PUS 4/11/55

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	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
300MS4	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
IA	QCLC\$58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	103	%REC			1

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

RISC

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	02/03/99	02/03/95	11.1	UG/G	U	11.1	1
BODMS4	7444-001DUP	Sulfide	18496-25-8	QCBLK58516-1	02/03/99	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	KREC			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	02/03/99	02/03/95	10.6	UG/G	U	10.6	1
NA	QCLCS58516-1	Sulfide	18496-25-8	QC8LK58516-1	02/03/95	02/03/95	105	%REC			1

P25 4/11/95

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	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	QC8LK59558-1	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

RBC BJ 1 11 95

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	Di
BODMS4	7444-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.7	UG/G	U	47.7	_
BODMS4	7444-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	48.1	UG/G	U	48.1	
BODMS4	7444-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	95	*REC			
BODMT4	7444-008	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	49.3	UG/G	U	49.3	
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	XREC			

RBC

## APPENDIX K RADIOCHEMISTRY DATA SUMMARY TABLES

Project: WESTINGHOUSE-HAI	NFORD																
Laboratory: QES																	
	W0429																
Sample Number	B0DMT2	BODMT3															
Location	Test Pit #2	Test Pit #2															-
Remarks pCi/g	Soil	Soil															
Sample Date	01/17/95	01/17/95															_
Radiochemistry Analysis	Result Q	Q	Result	Q Result	Q	Result	C										
Gross Alpha	9.95	25.0															T
Gross Beta	20.6	21.1															I
Cobalt-58	0.0165 U	0.0143 U															
Cobalt-60	0.929	2.43															T
Cesium – 137DA	2.72	3.09															T
Europium – 152	1.55	1.96															T
Europium – 154	0.331	0.46															1
Europium – 155	0.0790 U	0.112 U															
lron-59	-0.0454 U	-0.0669 U									-						
Potassium – 40	9.57	6.77															T
Radium-224DA	0.863	1.05															T
Radium - 226DA	0.813	0.801															
Radium-228DA	0.721 J	1.51 J															T
Uranium-238DLP	2.76 J	5.90 J															$\top$
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775 S/3/95

000168

Laboratory: QES																			
Case SDG:	WO430																		
Sample Number	BODMT4	1																	
Location	100-D																		
Remarks pCi/g	Soil																		
Sample Date Radiochemistry Analysis	01/27/95																		
Radiochemistry Analysis	Result	Q	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	1,90																		
Gross Beta	15.9																		
Cobalt - 58	0.00435	U																	
Cobalt-60	0.0119																		
Cesium - 137DA	0.0254																		
Europium - 152	0.0186																		
Europium – 154	-0.0058																		
Europium - 155	0.0301	U																	
Iron-59	-0.0477																		
Potassium - 40	9.42																		
Radium - 224DA	0.414																		
Radium - 226DA	0.367																		
Radium - 228DA	0.442																		
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RDS 5/3/95

GOTOO

#### APPENDIX L

RADIOCHEMISTRY VALIDATED LABORATORY REPORT FORMS



#### SAMPLE RESULTS

LAB NAME:

ITAS-RICHLAND

SDG:

W0429

LAB SAMPLE ID:

50132303

MATRIX:

SOIL

**CLIENT ID:** 

B0DMT2

DATE RECEIVED:

1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	
CO-58	1.65E-02 (	J 2.6E-02	2.6E-02	4.42E-02	pCi/g	N/A	RD3219	
CO-60	9.29E-01	6.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219	
CS-137DA	2.72E+00	7.0E-02	2.8E-01	N/A	pCi/g	N/A	RD3219	
EU-152	1.55E+00	1.2E-01	1.9E-01	N/A	pCi/g	N/A	RD3219	
EU-154	3.31E-01	6.6E-02	7.4E-02	1.36E-01	pCi/g	N/A	RD3219	
EU-155	7.90E-02 C	5.9E-02	6.0E-02	8.92E-02	pCi/g	N/A	RD3219	
FE-59	-4.54E-02 \	ク 6.8E-02	6.8E-02	1.07E-01	pCi/g	N/A	RD3219	
K-40	9.57E+00	5.7E-01	1.1E+00	N/A	pCi/g	N/A	RD3219	
RA-224DA	8.63E-01	4.5E-02	9.7E-02	N/A	pCi/g	N/A	RD3219	
RA-226DA	8.13E-01	7.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219	
RA-228DA	7.21E-01	プ 1.3E-01	1.5E-01	N/A	pCi/g	N/A	RD3219	
U-238DLP	2.76E+00	J 1.2E+00	1.2E+00	N/A	pCi/g	N/A	RD3219	
ALPHA	9.95E+00	4.8E+00	4.9E+00	5.93E+00	pCi/g	100.00%	RD3222	
BETA	2.06E+01	3.3E+00	3.6E+00	3.58E+00	pCi/g	100.00%	RD3222	

Number of Results: 14

X15-95



#### SAMPLE RESULTS

LAB NAME:

ITAS-RICHLAND

SDG:

W0429

LAB SAMPLE ID:

50132305

MATRIX:

SOIL

CLIENT ID:

BODMT3

DATE RECEIVED:

1/18/95

ISOTOPE		OUNTING RROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	
CO-58	1.43E-02 U	4.2E-02	4.2E-02	7.22E-02	pCi/g	N/A	RD3219	
CO-60	2.43E+00	1.0E-01	2.6E-01	N/A	pCi/g	N/A	RD3219	
CS-137DA	3.09E+00	1.0E-01	3.3E-01	N/A	pCi/g	N/A	RD3219	
EU-152	1.96E+00	1.7E-01	2.6E-01	N/A	pCi/g	N/A	RD3219	
EU-154	4.60E-01	1.0E-01	1.1E-01	2.01E-01	pCi/g	N/A	RD3219	
EU-155	1.12E-01 U	7.6E-02	7.6E-02	1.29E-01	pCi/g	N/A	RD3219	
FE-59	-6.69E-02 U	1.1E-01	1.1E-01	1.78E-01	pCi/g	N/A	RD3219	
K-40	6.77E+00	7.3E-01	9.9E-01	N/A	pCi/g	N/A	RD3219	
RA-224DA	1.05E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	RD3219	
RA-226DA	8.01E-01	1.1E-01	1.3E-01	N/A	pCi/g	N/A	RD3219	
RA-228DA	1.51E+00 J	2.5E-01	2.9E-01	N/A	pCi/g	N/A	RD3219	
U-238DLP	5.90E+00 J	1.8E+00	1.9E+00	N/A	pCi/g	N/A	RD3219	
ALPHA	2.50E+01	7.0E+00	7.5E+00	5.34E+00	pCi/g	100.00%	RD3222	
BETA	2.11E+01	3.3E+00	3.6E+00	3.66E+00	pCi/g	100.00%	RD3222	

Number of Results: 14

J. 4-18-91



#### SAMPLE RESULTS

LAB NAME:

ITAS-RICHLAND

SDG:

W0430

LAB SAMPLE ID:

50151812

MATRIX:

SOIL

CLIENT ID:

B0DMT4

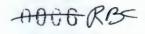
DATE RECEIVED:

1/30/95

ISOTOPE	DECILI T	OUNTING RROR (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 ∪	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 ∪	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 ∪	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 38-35-95



#### 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 9613497, 1447

Date:

To:

RECORD COPY

April 21, 1995
Westinghouse Hanford Company (technical representative)
A.T. Kearney, Inc.

From:

Project:

100-DR-1 100-D Ponds Phase II Sampling

Subject:

Inorganics - Data Package No. W0429-QES (SDG No. W0429

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
вормтз	01/17/95	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.

# April 21, 1995 Westinghouse Hanford Company (technical representative) A T. Kearney, Inc.

Date:

To:

From:

Project: 100-DR-1 100-D Ponds Phase II Sampling

Subject: Wet Chemistry - Data Package No. W0429-QES (SDG No. W0429)

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
вормтз	01/17/95	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 > 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. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage 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.

## Appendix 1 Glossary of Data Reporting Qualifiers

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

- 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.
- 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.
- 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).
- 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

#### DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: RJS	DATE: 4/7/95	PAGE_1_OF_1
COMMENTS: No qu	uaification required		
COMPOUND	QUALIFIERS	SAMPLES AFFECTED	REASON
- 100 M M M M M M M M M M M M M M M M M M			
	+		

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUS Laboratory: QUANTERR	A			1																	
Case	SDG: W	0429	_																		
Sample Number		BODMT	2	BODMT3																	
Location		Test Pit		Test Pit																	
Domarke	UG/G	Soil		Soil																	
Sample Date		01/17/9	5	01/17/9	5														-		
Sample Date Wet Chemistry Analytes Fluoride	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	1.70	U	6.25		U															
Sulfate	300.0	2230		4040																	
Chloride	300.0			20.3																	
Sulfide	9030	21.0		44.7																	
Nitrate	300.0			50.3															l		
Nitrite	300.0			0.61																	
Phosphate	300.0			30.6	U																
Nitrate/Nitrite	353.1	53.4		35.4																	
TOX	9020	86.6	U	150	U						-			-	-		-		-	,	-
																					1
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							-								_		-				-



9613497.1458

Quanterra-Richland P.O. Box 1970 Richland, WA 99352 Cuanterra
Environmental
Services

Project: 550.56

ategory: Nitrate Method: EPA 300.0 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

ient	Quanterra			Blank Sample	Prep.	Analyses				Detection	n
ID	10	Analyte	CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dil.
DMT6	7344-001	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001DUP	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001MS	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	106	%REC			1
DMT2	7344-002	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	69.5	UG/G		1.70	5
DMT3	7344-004	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	50.3	UG/G		1.22	2
	QCBLK57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
	QCLCS57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	100	<b>XREC</b>			1

PJS 19195

-HBC

# 9613497-1459

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

Project: 550.56

Method: EPA 300.0
Matrix: SOLID



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit		Detection Limit	Dil.
DNT6	7344-001	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001DUP	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001MS	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	103	%REC			5
DMT2	7344-002	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.34	UG/G	U	0.34	1
DMT3	7344-004	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.61	UG/G	U	0.61	1
	QCBLK57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
	QCLCS57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	104	XREC			1

P35 | 45

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

Project: 550.56



Category: Orthophosphate Method: EPA 300.0

Matrix: SOLID

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
DMT6	7344-001	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
DDMT6	7344-001DUP	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
DNT6	7344-001MS	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	102	%REC			1
DNT2	7344-002	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	17.0	UG/G	U	17.0	1
DMT3	7344-004	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	30.6	UG/G	U	30.6	1
	QCBLK57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
	QCLCS57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	96	%REC			1

**Quanterra**Environmental
Services

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

Project: 550.56

Category: Chloride Method: EPA 300.0 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.47	1
BODMT6	7344-001DUP	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.46	- 1
BODMT6	7344-001MS	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	102	%REC			5
BODMT2	7344-002	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	15.4	UG/G		4.25	1
BODMT3	7344-004	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	20.3	UG/G		7.66	1
NA	QCBLK57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.50	UG/G	U	2.50	1
NA	QCLCS57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	94	%REC			- 1

P554/1/95

Category: Fluoride Method: EPA 300.0

Matrix: SOLID

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

Project: 550.56



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection	Dil.
BODMT6	7344-001	Fluoride	16984-48-8	QCBLK57444-2	01/20/99	5 01/20/95	0.99	UG/G	U	0.99	1
BODMT6	7344-001DUP	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.98	UG/G	U	0.98	1
BODMT6	7344-001MS	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	107	*REC			1
BODMT2	7344-002	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.70	UG/G	U	1.70	1
BODMT3	7344-004	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	6.25	UG/G		3.06	1
NA	QCBLK57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.00	UG/G	U	1.00	1
NA	QCLCS57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	103	%REC			1

P354/7/95

**Quanterra**Environmental
Services

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

Project: 550.56

Category: Sulfate Method: EPA 300.0 Matrix: SOLID Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfate	14808-79-8	QC8LK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	101	%REC			5
BODMT2	7344-002	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	2230	UG/G		170	10
BODMT3	7344-004	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	4040	UG/G		306	10
NA	QCBLK57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	97	%REC			1

735 4/1/95

Quanterra-Richland P.O. Box 1970 Richland, WA 99352 **Wuanterra**Environmental
Services

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Client	Quanterra			Blank Sample	Prep.	Analyses				Detection	n
ID	ID	Analyte	CAS Number	Name	Date	Date	Result	Unit	Qual.	Limit	Dil.
BODMT6	7344-001	EOX	IT-EOX	QCBLK58657-1	02/06/99	02/06/95	47.1	UG/G	U	47.1	1
BODMT6	7344-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	46.1	UG/G	U	46.1	1
BODMT6	7344-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	101	<b>XREC</b>			1
BODMT2	7344-002	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	86.8	UG/G	U	86.8	1
BODMT3	7344-004	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	150	UG/G	U	150	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/99	02/06/95	99	XREC			1

P35

9613497-1465

Category: Sulfide Method: EPA 9030 Matrix: SOLID Quanterra-Richland P.O. Box 1970 Richland, WA 99352

Project: 550.56



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
7344-001	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.8	UG/G		10.6	1
7344-001DUP	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
7344-001MS	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	78	*REC			1
7344-002	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	21.0	UG/G		19.0	1
7344-004	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	44.7	UG/G		34.0	1
QCBLK57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
QCLCS57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	84	%REC			1
	7344-001 7344-001DUP 7344-001HS 7344-002 7344-004 QCBLK57691-1	TD Analyte  7344-001 Sulfide  7344-001DUP Sulfide  7344-001MS Sulfide  7344-002 Sulfide  7344-004 Sulfide  QCBLK57691-1 Sulfide	TD Analyte CAS Number  7344-001 Sulfide 18496-25-8  7344-001DUP Sulfide 18496-25-8  7344-001MS Sulfide 18496-25-8  7344-002 Sulfide 18496-25-8  7344-004 Sulfide 18496-25-8  QCBLK57691-1 Sulfide 18496-25-8	TD Analyte CAS Number Name  7344-001 Sulfide 18496-25-8 QCBLK57691-1  7344-001DUP Sulfide 18496-25-8 QCBLK57691-1  7344-001MS Sulfide 18496-25-8 QCBLK57691-1  7344-002 Sulfide 18496-25-8 QCBLK57691-1  7344-004 Sulfide 18496-25-8 QCBLK57691-1  QCBLK57691-1 Sulfide 18496-25-8 QCBLK57691-1	TD Analyte CAS Number Name Date  7344-001 Sulfide 18496-25-8 QCBLK57691-1 01/23/95  7344-001DUP Sulfide 18496-25-8 QCBLK57691-1 01/23/95  7344-001MS Sulfide 18496-25-8 QCBLK57691-1 01/23/95  7344-002 Sulfide 18496-25-8 QCBLK57691-1 01/23/95  7344-004 Sulfide 18496-25-8 QCBLK57691-1 01/23/95  QCBLK57691-1 Sulfide 18496-25-8 QCBLK57691-1 01/23/95	ID         Analyte         CAS Number         Name         Date         Date           7344-001         Sulfide         18496-25-8         QCBLK57691-1         01/23/95         01/23/95           7344-001DUP         Sulfide         18496-25-8         QCBLK57691-1         01/23/95         01/23/95           7344-001MS         Sulfide         18496-25-8         QCBLK57691-1         01/23/95         01/23/95           7344-002         Sulfide         18496-25-8         QCBLK57691-1         01/23/95         01/23/95           7344-004         Sulfide         18496-25-8         QCBLK57691-1         01/23/95         01/23/95           QCBLK57691-1         Sulfide         18496-25-8         QCBLK57691-1         01/23/95         01/23/95	ID Analyte CAS Number Name Date Date Result 7344-001 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.8 7344-001DUP Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 7344-001MS Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 78 7344-002 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 21.0 7344-004 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 44.7 QCBLK57691-1 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6	ID Analyte CAS Number Name Date Date Result Unit 7344-001 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.8 UG/G 7344-001DUP Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 UG/G 7344-001MS Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 78 %REC 7344-002 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 21.0 UG/G 7344-004 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 44.7 UG/G QCBLK57691-1 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 UG/G	ID Analyte CAS Number Name Date Date Result Unit Qual.  7344-001 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.8 UG/G  7344-001DUP Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 UG/G U  7344-001MS Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 78 %REC  7344-002 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 21.0 UG/G  7344-004 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 44.7 UG/G  QCBLK57691-1 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 UG/G U	ID Analyte CAS Number Name Date Date Result Unit Qual. Limit  7344-001 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.8 UG/G 10.6  7344-001DUP Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 UG/G U 10.6  7344-001MS Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 78 %REC  7344-002 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 21.0 UG/G 19.0  7344-004 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 44.7 UG/G 34.0  QCBLK57691-1 Sulfide 18496-25-8 QCBLK57691-1 01/23/95 01/23/95 10.6 UG/G U 10.6

R35 4/1/95

01211

9613497.1466

Category: NO2-NO3 Method: EPA 353.1 Matrix: SOLID Quanterra-Richland P.O. Box 1970 Richland, WA 99352

Project: 550.56



Sample Date : 01/17/95 Receipt Date : 01/18/95 Report Date : 03/01/95

				-	···						
Client	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	n Dil.
BODMT6	7344-001	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.48	UG/G	U	0.48	1
BODMT6	7344-001DUP	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
BODMT6	7344-001MS	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	104	XREC			1
BODMT2	7344-002	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	53.4	UG/G		4.40	5
BODMT3	7344-004	Nitrate/Nitrite	c-005	QCBLK57497-2	01/24/95	01/24/95	35.4	UG/G		3.09	2
NA	QCBLK57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
NA	QCLCS57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	92	%REC			1

R35 4/1/95

### Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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 1, 1995

Attention: Joan Kessner

Project number : 550.56

Date Received by Lab : January 18, 1995

Number of Samples : Two (2)
Sample Type : Soil
SDG Number : W0429
Data Deliverable : Standalone

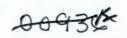
#### I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

#### 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.





Bechtel Hanford Incorporated March 1, 1995 Project Number: 550.56

SDG: W0429

Page 2

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

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.

#### III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

#### IV. Definitions

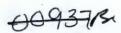
The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank QCLCS- Quality Control Laboratory Control Sample, Blank Spike

#### V. Comments

Samples arrived in St. Louis at  $0^{\circ}$ C which is not within the recommended  $4^{\circ}$ C  $\pm 2^{\circ}$ C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.





Bechtel Hanford Incorporated March 1, 1995 Project Number: 550.56

SDG: W0429

Page 3

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

00938 K



Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

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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:\\sqrmlo01\price\$\abbydave\hanford\hanw0429.nar

Westinghouse Company	Hanford				HAIN OF	F CU	STOE	Y/SA	AMPI	E AN	IALY	SIS F	REQU	EST		•	Data Tu	1 imaround	W	
Sollector St. Tow Project Designation	n, Doug	Bow	1	Dar	Company Cont RC SMITH/MT Sampling Loca	STANKOV	ICH					(509)37 SAF No.	2-2537/	(509)37	6-2493			Y Norma		17-9
100-D PONDS PHASE I	I SAMPLING	и	know		100-D							B94-098	3							
SML 457 and	ER 14		Th	tompsa	Field Logbook	No.						HAND DE	of Shipme	ent						
Shipped To					Offsite Propert	y No.						Bill of La	ding/Air i	BIII No.						
QUANTERRA Possible Sample Hazard	s/Remarks				Preservative	4 1000	C001 4	COO! 4	COOL 4	cool 4	C001 4	N/A COOL 4	COOL 4	Cory 4°	1001	em 110				
					Type of Container	aG	Gs Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G			
					No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1			6
Special Handling and/or					Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950m	e		2
	SAMPI	LE ANAL	.YSIS			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	ACTIVI- TY SCAN	Total alpha beta Gamm	total alpha beta agamn	Α		10
	50132					A	В	_	D	5	,	6	4			Spec	Spec	5013	23	
Sample No.	M	atrix *	Date	Sampled	Time Sampled		~ 7	<del></del>	<del></del>							<b>K</b>			i	
COOMR4 BODM	176 01	s	111	7)95	6902	X	X	$\times$	$\times$	$\times$	$\times$	X	$\sim$	30	X	X		10		
C BODM	159 2	5	1/17	195	0907	X			X	35				(((	$\geq$	$\times$	$\geq$	2		
E DODA			1/17	195	0935	X	$\geq$	$\geq$	$\geq$	$\geq$		X	$\geq$	TAY?	$\geq$	$\times$	X	.3		
C T BODN			1/17	195	0935	$\geq$	>	X	$\times$	$\geq$	$\geq$	$\geq$	$\times$	X.	$\times$			4		
UKCY BODI	MT3 5	5	1/17	195	1047	$\geq$	<b>&gt;</b>	$\geq$	$\geq$	$\geq$	$\geq$	$\geq$	$\geq $		$\geq$	$\times$	$\times$	5		
BODMR	3 6	5	1/17	42	1047	X	X	X	$\times$	$\times$	$\times$	$\times$	X	$\times$	$\times$			6		
Relinquished By  Doug Bowe  Relinquished By  Relinquished By  Relinquished By	on 1-18 EAC O	-95/Cate/Time	0830	Received 3	oy Que	nc h. Hen les	Date/Tir	795 795 550	DATA DI LABORA "INFORI HOLDIN	TORY ANA MATION O G TIME N	LE-STAN LYSIS F DNLY." T	HE ERC	PHATE, I	FOR ACKN	OWLEDGE	S THE 4	QUESTED B-HOUR	SO SL W O	Matrix*  = Soll  = Sedin  = Solid  = Solid  = Sludg  = Wate  = Oil  = Air  = Drum  = Drum  = Tissu	ment ge er Solids
Relinquished By  LABORATORY Received SECTION	D Ived By	ate/Time	8	Received	i By Title		Date/Ti	me	BO	DMT;	w-fo	tala/	pha/be			Date/Tile	me	WI L V X	= Wipa = Liquid = Vegat = Other	d tation
FINAL SAMPLE DIsposition DISTRIBUTION: Original	al- Sample	Yellow -	Sample	r					Dispo	eed By						Date/III		BC-6	9000-828	(12/92)

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

11/1/95

REV. 3 . DATE: 01/17/95
PROJECT NUMBER <u>B94-098</u> PROJECT TITLE <u>100-D Ponds Phase II Sampling</u>
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 WATER VEGETATION OILS SLUDGE CONCRETE OTHER
LABORATORY SERVICES   ON-SITE  OFF-SITE
LABORATORY LABORATORY CONTACT TELEPHONE
Quanterra (Main) Not Applicable N/A
Lockheed (Split) Not Applicable N/A
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 1

# 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, BODMS3, 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.

batch should be duplicated and reported in both data packages	•
APPROVAL SIGNATURES:	
R. C. Smith/ Robert fronts	1/3/195
OSM Project Coordinator (Print/sign Name)	/ Date
M.T. Stankovich/ MILL	2/13/95 Date
Technical Representative (Print/Sign Name)	Date
N/A	
Quality Assurance (Print/Sign Name)	Date

Contractor

BHI

#### OFF-SITE PROPERTY CONTROL

CONTROL NO.
(To be obtained from PROPERTY MANAGEMENT) W95-0-0304-3

		P.	ART 1 - TO BE C	OMPLETED BY ORIGINATOR		
Departr	ment ER En	g. Support	Field	& Analytical Supp	Unit Field Sampling	1
	The follow	ing items are to be shipped fr		X Contractor		
	Routing			Prepeid Col	lect	
Shipped Compan Address City	Quant 2800	erra (IT) Geo Wash Way and, Washington 9	9352 Code	Off-site Custodian On-site Custodian		Payroll No.
Country						
Qty.	Property No.	Desc	ription <i>(include !</i>	Manufacture Name, Model, S	erial No.)	Acquisition Cost
1 1bs		Cooler ID: SML-	457 € 6	P BODMTA BODM R41 BODMTS er samples packed	RA BODMT3 BODMR3	N/A
1 lbs		Sample #: Cooler ID: Polycooler with vermiculite	groundwate	r samples packed	in wet ice and	N/A
	Classified	Unclassified  ☐ Ship	pped Under DOE	Contract Ship	ped Under Contractor's Use Pen	mit Contract
.0		ubcontractor. List Subcontractors. Sampling S			HECEI	
					'.IAN 1 8	
CERTI	FICATION OF TH	E RADIATION MONITORING	RELEASE MUST	T BE SECURED THE SAME D	AY THAT MATERIAL IS DELIVE	
-)	erance for Public		R	MSURVEY NO. RARA - 0051		Date 1-18-95
В.	T. Whitten	for Property (Name/Phone N (509) 376-7777				
Date Re	eady for Shipmen	-18-95	Cost Code to	TE 2072 PV3AA	Approximate Date This Property will be Returned	
Origina	ted By	T. WHITTEN	Dete 1-18-9	Authorized By	W.	Date 1-15-95
Propert	y Representative	Signature	Date	Property Management	Seldou RIVES	Data 1/18/95
			PART II - TO BE	COMPLETED BY SHIPPING		, .
Authori	zed Shipping Sig	nature			-602 BK	Date
			DISTRIBUTION (	AFTER FINAL SIGNATURES)		

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

Gratera 1/18/95

000028

54-3000-479 (01/94)

# Appendix 5

**Data Validation Supporting Documentation** 

# 9613497 WHQ-SD-EN-SPP-002, Rev. 2

#### GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	С	(1)	E			
PROJECT:	WHC/BHI		DATA PACKAG	E: W042	9-025			
VALIDATOR:	RJS	LAB: Qu						
CASE: 100	-DR-1			W0429	1			
		ANALYSE	S PERFORMED					
Anions/IC	Отос	<b>Х</b> тох	☐ TPH-418.1	Oil and Grease	Alkalinity			
☐ Ammonia	□ BOD/COD	Chloride	☐ Chromium-VI	□рН	X No,No,			
Sulfate	□ TDS	□ TKN	Phosphate	0	A Nitrate			
& Fluoride	& Sulfide	0	0	0	A Nitrite			
SAMPLES/MATE	RIX							
	0	DMTZ	(soi)					
		ODMT3	(30.1	)				
S a case nar	rative prese	nt?		(	Yes) No N/A			
		•						
. HOLDING T	TIMES				~ RC			
re sample ho	olding times	acceptable?		(	Yes N/A			
omments:			-1	_				
Chloride -	28 days v		Sulfat	e -28 days	· ~			
fluoride -	-28 days "	106	NO3/N	102 - 28 da	ys ~			
Nitrate -	2days - (3)	1311	Sulfi	de - 7 das	yer			
Vitrite	2 days (3)	7.16	TOX	- 28 day	2			
)-Phosphate	•	"7"PB						
		W/	)					
		5/5/95	111					
		11.	A-2377					

9613497 whc-sp-en-spp-002, Rev. 2

# 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?	No	N/A
Was a calibration check performed for all applicable analyses?	No	N/A
Are calibration check results acceptable? (Yes)	No	N/A
Comments:		
	4	
4. BLANKS		
Were laboratory blanks analyzed? Yes	No	N/A
Are laboratory blank results acceptable?	No	N/A
Were field/trip blanks analyzed? Yes	No	NIN
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?	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?	No	N/A
	No	N/A
Are field duplicate RPD values acceptable? Yes	No	N/A
Are field split RPD values acceptable? Yes	No	(N/A

A-24/5/

96/3497 WHC-SD-EN-SPP-002, Rev. 2

#### GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:		
7. ANALYTE QUANTITATION		
Was analyte quantitation performed properly? Yes  Comments:	No	N/A
8. REPORTED RESULTS AND DETECTION LIMITS		
Are results reported for all requested analyses?	No	N/A
Are results supported in the raw data?	No	N/A
Are results calculated properly?	No	N/A
Do results meet the CRDLs?	No	N/A
Comments:		

A-25/50

000033

# HOLDING TIME SUMMARY

SDG: WO4	29	VALIDATOR:	567		DATE:	GE OF	
COMMENTS:							
FIELD SAMPLE	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BODMT2 BODMT3	Nitrate	1/17/95	1/20/95	1/20/95	~	3	7
BODMT2 BODMT3	Nitrite	1/17/95	1/20/95	1/20/95		3	02
BODMTZ BODMT3	Phasphote	1/0/55	1/20/95	1/20/95		3	0.7
				,			

#### 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. W0429-QES (SDG No. W0429)

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
BODMT3	01/17/95	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 qualifed 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 numbers BODMT2 and BODMT3 were flagged "U" for acetone.

Due to the presence of positive blank results, sample number BODMT2 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  $\pm$ 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  $\pm$ 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 identitiy 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.

# 9613497.1485

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. W0429-QES (SDG No. W0429) 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 two acetone results and in one methylene chloride result. All results were flagged acordingly. 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:

- 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.
- 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).
- 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

#### DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE_1_0F_1_
COMMENTS:	1		
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	BODMT2	Lab Blank Contamination
Acetone	U	BODMT2, BODMT3	Lab Blank Contamination
	·		

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUSE-H	ANFORD			]															
Laboratory: QUANTERRA																			
Case:	SDG: V																		
Sample Number		BODMT2		BODMT3															
Location			#2	Test Pit	#2														
Remarks																			
Sample Date		01/17/95	,	01/17/95	5														
Analysis Date		01/25/95		01/26/95															
Volatile Organic Compound				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10		U	31	U														
Bromomethane	10			31	U														
Vinyl Chloride	10				U														
Chloroethane	10			31															
Methylene Chloride	10			74															
Acetone	10			51									100						
Carbon Disulfide	10		U	16															
1,1-Dichloroethene	10	9	U	16	U														
1,1-Dichloroethane	10	9	U	16	U														
1,2-Dichloroethene (total)	10	9	U	16	U														
Chloroform	10		U	16	U														
1,2-Dichloroethane	10		U	16	U														
2-Butanone	10			310	U														
1,1,1-Trichloroethane	10		U	16															
Carbon Tetrachloride	10		Ū	16	U														
Bromodichloromethane	10		Ü	16	ŭ														
1,2-Dichloropropane	10		Ū	16									_				1		1
cis-1,3-Dichloropropene	10		Ü	16						_									
Trichloroethene	10			16															
Dibromochloromethane	10			16							-						1		1
1,1,2-Trichloroethane	10		Ü	16		-	-				1		-				-		-
Benzene	10		Ü	16							-		-				-		1
trans-1,3-Dichloropropene	10		Ü	16				-	-		-	-	1						1
Bromoform	10		Ü	16					-	-	-		-				-		+-
	10			160		-			-		-	-	-				-		-
4-Methyl-2-pentanone							-	-	-		$\vdash$		-		-		-		-
2-Hexanone	10			160			_		-		-		-		_		-		-
Tetrachloroethene	10		U	16	U		_		-		-		-				-		-
1,1,2,2-Tetrachloroethane	10		U	16			_				-		-		_				-
Toluene	10			16							-		-				-		-
Chlorobenzene	10			16	U				_		_								-
Ethylbenzene	10			16					_										_
Styrene	10		U		U														
Xylene (total)	10	9	U	16	U														

RBC 4/18/95

### VOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: V34402

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID: F0621

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 44

Date Analyzed: 01/25/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND

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

CAS NO.	COMPOUND (ug/L o	r ug/kg) UG	/ KG	Q
74-87-3	Chloromethane		18	U
	Bromomethane		18	U
	Vinyl Chloride		18	U
75-00-3	Chloroethane		18	U
	Methylene Chloride		20	B. U
67-64-1	Acetone		43	182 N
75-15-0	Carbon Disulfide		9	Ú
75-35-4	1,1-Dichloroethene		9	U
75-34-3	1,1-Dichloroethane		9	U
	1,2-Dichloroethene (total	)	9	U
67-66-3	Chloroform		9	U
	1,2-Dichloroethane		9	U
	2-Butanone		180	U
	1,1,1-Trichloroethane		9	U
56-23-5	Carbon Tetrachloride		9	U
75-27-4	Bromodichloromethane		9	U
	1,2-Dichloropropane		9	U
10061-01-5-	cis-1,3-Dichloropropene		9	U
	Trichloroethene		9	U
	Dibromochloromethane		9	U
	1,1,2-Trichloroethane		9	U
71-43-2	Benzene		9	U
	trans-1,3-Dichloropropene		9	U
	Bromoform		9	U
_	4-Methyl-2-Pentanone		89	U
	2-Hexanone		89	U
	Tetrachloroethene		9	U
	1,1,2,2-Tetrachloroethane		9	U
	Toluene		9	U
	Chlorobenzene		9	U
	Ethylbenzene		9	U
	Styrene		9	U
	Xylene (total)		9	U

FORM I VOA

1/87 Rev

+ 00077

3/27/95 SC



# 9613497.1423

### VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO

Case No.: V34402

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

Sample wt/vol:

5.00 (g/mL) G

Lab File ID: F0621

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 44

Date Analyzed: 01/25/95

Column (pack/cap) CAP

Dilution Factor: 1.0

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

Number TICs found:

CAC MIMDED	COMPOUND NAME	DW	EST. CONC.	0
CAS NUMBER	COMPOUND NAME	RT	ESI. CONC.	2
		=======	===========	=====

3/27/95 SC

= +0080BC

1/87 Rev.

# VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0

BODMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Lab File ID: F0635 Sample wt/vol: 5.00 (g/mL) G

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Dilution Factor: 1.0 Column: (pack/cap) CAP

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

74-87-3-----Chloromethane 31 U 31 74-83-9-----Bromomethane 75-01-4-----Vinyl Chloride 31 U U 75-00-3-----Chloroethane 31 B 75-09-2-----Methylene Chloride 74 BJ M 51 67-64-1-----Acetone U 75-15-0-----Carbon Disulfide 16 U 75-35-4-----1,1-Dichloroethene 16 16 U 75-34-3-----1,1-Dichloroethane 16 U 540-59-0----1,2-Dichloroethene (total) U 16 67-66-3-----Chloroform 16 U 107-06-2----1,2-Dichloroethane U 310 78-93-3----2-Butanone 71-55-6----1,1,1-Trichloroethane 16 U 16 U 56-23-5-----Carbon Tetrachloride 16 U 75-27-4-----Bromodichloromethane U 78-87-5----1,2-Dichloropropane 16 16 U 10061-01-5----cis-1,3-Dichloropropene 16 U 79-01-6-----Trichloroethene 16 U 124-48-1-----Dibromochloromethane 16 U 79-00-5-----1,1,2-Trichloroethane\_ U 16 71-43-2----Benzene 10061-02-6----trans-1,3-Dichloropropene 16 IJ 16 U 75-25-2-----Bromoform 160 U 108-10-1----4-Methyl-2-Pentanone 591-78-6----2-Hexanone 160 U 16 U 127-18-4-----Tetrachloroethene 16 U 79-34-5-----1,1,2,2-Tetrachloroethane U 16 108-88-3-----Toluene U 108-90-7-----Chlorobenzene 16 U 100-41-4-----Ethylbenzene 16 100-42-5----Styrene 16 U 1330-20-7-----Xylene (total) 16 U

FORM I VOA

3/27/95 5

000014

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### VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: V34402

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 68

Date Analyzed: 01/26/95

Column (pack/cap) CAP

Dilution Factor: 1.0

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

Number TICs found: 0

	. CONC.	Q
_=======   =====   =====   =====   =====   =====   =====		=====

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# Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

9613197.1497



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 1, 1995

Attention: Joan Kessner

Project number : 550.56

Date Received by Lab : January 18, 1995

Number of Samples : Two (2)

Sample Type : Soil SDG Number : W0429 Data Deliverable : Standalone

### I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	<b>Matrix</b>	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	501322.05	Soil	01/18/95

### 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.



Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

Page 2

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.

### III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

### IV. Definitions

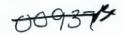
The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank QCLCS- Quality Control Laboratory Control Sample, Blank Spike

#### V. Comments

Samples arrived in St. Louis at  $0^{\circ}$ C which is not within the recommended  $4^{\circ}$ C  $\pm 2^{\circ}$ C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.





Bechtel Hanford Incorporated March 1, 1995 Project Number: 550.56 SDG: W0429 Page 3

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.



Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

Page 4

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:\\sqtmlo01\price\$\abbydave\hanford\hanw0429.nar

Company			7	Company Cont	act						Telephor	ne No	···				urnaround Priort	y	15t -17-4
Ewist John )	oug bou	verst	to	RC SMITH/MT		/ICH							(509)37	6-2493		1	X Norm	al	
ect Designation -D PONDS PHASE II SAMP		ilende		Sampling Loca 100-D	tion						SAF No. B94-098								
Chost No. ML 457 and ER			empson	Field Logbook	No.						Method	of Shipm	ent						
ML 45 / and CK	14	170	crique	Offsite Propert	v No.						HAND DE	LIVER ding/Air	Bill No.						
NTERRA											N/A						,		
sible Sample Hazards/Remark	ke			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cox 4°	COOL 4	roay				
				Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	6			
				No. of Container(s)	au	us	au	au .	4	aus	au	au	au _	- 7.9	1	1			
ocial Handling and/or Storage				Volume	1	1			-	1			_ 5		1	000	4		
L TO 4 DEGREES CENTIGE	ADE			1	125ml ICP	VOA-TCL	125ml	PCB/	40ml SULFIDE	40ml	125ml ANIONS-	125ml	500ml*	20ml ACTIVI-	500ml		K		-
					METALS.		VOA-TCL	PEST	SOLI IOL	l ox	IC(F,		ALPHA/	TY SCAN	Total	total			
9	AMPLE ANA	LYSIS			TAL/AA MATALS						CL, SO4,		BETA, GEA		beta	beta			
					(As, Pb,				-		NO2,				Gamm	agamn	4		
501	322				se, il)	B	2	D	E	F	6	4			Spec	Spec	5013	23	
Sample No.	Matrix*	Date :	Sampled	Time Sampled									(						
HR4 BODMT6	ol s	111	1195	6000	$\times$	X	X	$\times$	$\times$	$\times$	X	$\times$	XXX	X	$\geq$	$\times$	01		
BODMS9	35	1/17	195	0907	X	4		X	×				((X)	$\times$	$\rightarrow$	$\times$	2		
1 BODMT2	35	1)17	195	0935	X	X	X	X	X	X	X	X		X	X	X	3		
+ BODMR2	45	1117	95	0935	X	X	X	X	X	X	X	X	X.	X			4		
BODMT3			195	1047	>	1	<b>/</b>	5		X	X	X		X	X	X	5		
BODMR3	65	1/17	1	1047	X	X	X	X	X	X	X	X	X	X			6		
HAIN OF POSSESSION		11:		n/Print Names	1/	4/	1_/	SPECIA	L INSTRU	CTIONS					-			Matrix	x*
inguished By	Date/Tin	10	Received		nc	Date/Ti	me ,		ELIVERA								S	= Soll	
oug Bowers 1	18-951	0830	1.9	Illet.	uh. Hey	10	8-95	"INFOR	MATION C	NLYSIS F	HE ERC	CONTRACT	OR ACKN	OWLEDGE	S THE 4	B-HOUR	FOR SE	= Sedi	iment d
brightened By & FAC		10/058	Received	By x on 7/as	166	Date/Ti			G TIME V								SL	= Slud = Wat	
1.1/1/19 2011		. ,	10 B	and Qui	tun		550										0	= Oil	
III Walla B. Wh.H.	Date/Tin	8-95	Received		-0.0	Date/Ti			TOTAL VO	DLUME RE	QUIRED	FOR TOTA	AL ALPHA	/BETA,	GEA ANA	LYSIS IS	DS DL		
								1500g									T	= Tiest	ue
linguished By	Date/Tin	ne	Received	Ву		Date/Ti	me	TON	DMT	7-43	10/2	Made	tralau	mma	וסיום	rded	r.	m Llqui	ıld
								De	12, 16	70	LUSA	Dung O	0,0	Iva	Oug	rded	×	= Vege	
Received By				Title						OV	170	- 100	ww	12	Date/Ti	ne			
ABORATORY NOCEIVED BY													*********	SDG	- Wo	386		.=0.6.7	
NAL SAMPLE Disposal Met	nod		A					Diepo	sed By						Date/Ti	me			

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

11/1/95

REV. 3 . DATE: 01/17/95
PROJECT NUMBER 894-098 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 WATER VEGETATION OILS SLUDGE CONCRETE OTHER
LABORATORY SERVICES / ON-SITE / OFF-SITE
LABORATORY LABORATORY CONTACT TELEPHONE
Quanterra (Main) Not Applicable N/A
Lockheed (Split) Not Applicable N/A
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.

# 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, BODMSO, 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:**

- Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples BODMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 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:	
101 - 0.1	
OSM Project Coordinator (Print/Sign Name)	7/3/95 Date
M.T. Stankovich/ MILLE	2/13/95 Date
Technical Representative (Print/Sign Name)	Date
N/A	
Quality Assurance (Print/Sign Name)	Date

20 Hyte

Contractor	

BHI

## **OFF-SITE** PROPERTY CONTROL

CONTROL NO. (To be obtained from PROPERTY MANAGEMENT) 14195-0-03041-3

		PART 1 - TO BE CO	OMPLETED BY ORIGIN	ATOR						
Department	R Eng. Support	Section Field	& Analytical	Supp Unit Field Samplin	q					
	following items are to be shippe			Vendor						
Rou	ting		Prepaid .	Collect						
Address	Quanterra (IT) 2800 Geo Wash Way Richland, Washington	99352 Zip Code	Off-site Custodian On-site Custodian		Payroll No.					
Qty. Propert	y No. D	Description <i>Unclude Manufacture Name, Model, Serial No.</i> )								
1 lbs	Cooler ID: 50	Sample #:BODMT& GODMS9 BODMTA BODMRA BODMRA BODMRA Cooler ID: SML-457 & ER41 BODMTS Polycooler with groundwater samples packed in wet ice and vermiculite								
1 1bs	Sample #: Cooler ID: Polycooler with vermiculite	th groundwate	r sam <del>ples</del> pack	ed in wet ice and	N/A					
Classifi	ed X Unclassified	Shipped Under DOE	Contract	Shipped Under Contractor's Use Pe	mit Contract					
. Shipme	Assignment  Int to Subcontrector. List Subco  Please specify)Sampling		M(A) /FS work in th	e IOC AREA RECE	8 1995					
CERTIFICATION	OF THE RADIATION MONITOR	ING RELEASE MUST	BE SECURED THE SA	ACDERTY ME DAY THAT MATERIAL IS DELIV	EPEN IN SHIPPING					
RM Clearance for	Public Release	R	M Survey No. RARA — Q		Date 1-18-95					
	tten (509) 376-7777 hipment	Cost Code to I	be Charged TE 2072 PV3AI	Approximate Date This Property will be Returned						
Originated By	BJ. WHITTEN	Date 1-18-95	Authorized Be	Litter)	Date 1-15-95					
Property Represe	ntative Signature	Date	Property Manage	Debbu KIVES	Date 1/18/95					
Authorized Shipp	ing Signature	PART II - TO BE	COMPLETED BY SHIP	-CO280	Date					
		DISTRIBUTION (A	AFTER FINAL SIGNATU	JRES)						

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

1050

°U.S. GPO: 1994-592-170/00029 Paratona 1/18/95

000024

54-3000-479 (01/94)

# Appendix 5

**Data Validation Supporting Documentation** 

9613497.1506

WHC-SD-EN-SPP-002, Rev. 2

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

PROJECT /	A	В	c	0	E
PROJECT: //	Destinationse	- Hanford	DATA PACKAG	E: SAF-BO	14-098
VALIDATOR:		LAB: QUAN	ema	DATE: 3/6	7/95
CASE: V34	4402		SDG: WC	429	
		ANALYSES	PERFORMED		
CLP Volatiles	SW-846 8240 (cap column)	SW-846 8260 (packed column)	CLP Semivolatiles	SW-846 8270 (cap column)	SW-846 (pecked column)
s technical	verification rative presen	ESS AND CASE documentation t?	present? .	_	es No N//

AIP

# 9613497. 1507 GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION	
Is the GC/MS tuning/performance check acceptable? Yes No N	I/A
Are initial calibrations acceptable? Yes No N	I/A
	I/A
Comments:	
4. BLANKS	
Were laboratory blanks analyzed? Yes No N	I/A
	I/A
Were field/trip blanks analyzed? Yes No (N	LA
	I/A
Comments: VBLKO1 (Sample associated: BODMTZ):	_
Acetone detect: 20, Methylene chlorido: 5	_
(common contamenants: 10x Acotone: 200, MC: 50)	W F7
Flagged "U" in sample. VBCK02 (Sample associated Bol	
acetorio: 12, methylane chloride: 12-10x: Samples flagget "	
5. ACCURACY for accetone only	
Were surrogates/System Monitoring Compounds analyzed? Yes No N	I/A
	I/A
Were MS/MSD samples analyzed?	I/A
Are MS/MSD results acceptable? Yes No	I/A
Comments:	
	_
	_
	_
	_
	_
	_

Ato

9613497.1508

# WHC-SD-EN-SPP-002, Rev. 2

# 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
Comm	ments:	(	
	SYSTEM PERFORMANCE		
Were	e internal standards analyzed? Yes	No	N/A
Are	internal standard areas acceptable? Yes	No	N/A
	internal standard retention times acceptable? Yes	) No	N/A
	COMPOUND IDENTIFICATION AND QUANTITATION		
Is c	compound identification acceptable?	No	N/A
	ompound quantitation acceptable? Yes	) No	N/A
Comm	ments:		
	REPORTED RESULTS AND QUANTITATION LIMITS	)	
	results reported for all requested analyses? Yes	No	N/A
	all results supported in the raw data? Yes	No	N/A
	esults meet the CRQLs?	No	N/A
	the laboratory properly identified and coded all TIC?	No	N/A

A-3/K

# 96 3497 MH09SD-EN-SPP-002, Rev. 2

# GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):
Cab blank contamination
BODMT2: "U" for acetore s'hetherlene chloride. BODMT3: "U" for acetore

A-4 BC

# 000030

## **BLANK AND SAMPLE DATA SUMMARY**

REVIEWER: SC			DAT	E: 3/27/	95	PAGE_1	PAGE_1_0F_1_				
COMPOUND	RESULT	a	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER			
Methylene Chloride	5			ug/Kg	25	50	BODMT2	U			
Acetone	20	J		ug/Kg	100	200	BODMT2	U			
Methylene Chloride	5			ug/Kg	25	50	вормтз	None			
Acetone	12	J		ug/Kg	60	120	BODMT3	U			
								,			
	COMPOUND  Methylene Chloride  Acetone  Methylene Chloride	COMPOUND RESULT  Methylene Chloride 5  Acetone 20  Methylene Chloride 5	COMPOUND RESULT Q  Methylene Chloride 5  Acetone 20 J  Methylene Chloride 5	COMPOUND RESULT Q RT  Methylene Chloride 5  Acetone 20 J  Methylene Chloride 5	COMPOUND RESULT Q RT UNITS  Methylene Chloride 5 ug/Kg  Acetone 20 J ug/Kg  Methylene Chloride 5 ug/Kg	COMPOUND         RESULT         Q         RT         UNITS         5X RESULT           Methylene Chloride         5         ug/Kg         25           Acetone         20         J         ug/Kg         100           Methylene Chloride         5         ug/Kg         25	COMPOUND         RESULT         Q         RT         UNITS         5X RESULT         10X RESULT           Methylene Chloride         5         ug/Kg         25         50           Acetone         20         J         ug/Kg         100         200           Methylene Chloride         5         ug/Kg         25         50	COMPOUND         RESULT         Q         RT         UNITS         5X RESULT         10X RESULT         SAMPLES AFFECTED           Methylene Chloride         5         ug/Kg         25         50         BODMT2           Acetone         20         J         ug/Kg         100         200         BODMT2           Methylene Chloride         5         ug/Kg         25         50         BODMT3			

# 000031

## HOLDING TIME SUMMARY

SDG: W0429	REVIEWER:	SC		DATE: 3/27/	95	PAGE_1	_OF_1_
COMMENTS: No	problems. A	II within limits	3				
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
							,
		•					

# 000032

## **CALIBRATION DATA SUMMARY**

SDG: W0429	REVIEWER: SC		DATE:	3/27/95	PAGE_	PAGE 1 OF 1								
COMMENTS: No	problems.													
CALIB. TYPE:	INITIAL	CONTINUING	INSTRUMENT:											
CALIB. DATE	COMPOUND		RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER								
				•										
					· · · · · · · · · · · · · · · · · · ·									

# 000033

# ACCURACY DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAG	E_1_0F_1_
COMMENTS: No p	problems.			
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
				,
- <del> </del>				

# 9613497-1514

# PRECISION DATA SUMMARY

SDG: W0429	REVIEWER: SC		DATE: 3/27/95		PAGE_1_0F_1						
COMMENTS: N	lo problems.										
COMPOUND		SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER					
						,					
					·						
1434-0											

# 9613497-1515

# RECORD COPY

Date:

April 21, 1995

To:

121314151677 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. W0429-QES (SDG No. W0429)

### INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
BODMT3	01/17/95	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.

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 numbers BODMT2 and BODMT3 were flagged "U" for aldol condensate.

Due to the presence of positive blank results, sample numbers BODMT2 and BODMT3 were 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  $\pm$ 1-35%. If RPD values are out of specification and the sample concentration is  $\pm$ 5x the spike concentration, all

0000**02**A

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 > +/-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".

Due to an internal standard recovery outside control limits, all results associated with internal standard perylene-d12 have been qualified as estimates and flagged "UJ".

All other internal standard recovery results were acceptable.

### Compound Identification

The identitiy 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 indentifications 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. W0429-QES (SDG No. W0429) 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 two butylbenzylphthalate results and in two aldol condensate results. All results were flagged acordingly. Due to an internal standard recovery outside control limits, all results associated with internal standard perylene-d12 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:

- 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.
- 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).
- 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

## DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1
COMMENTS:		•	
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Butylbenzylphthalate	U	BODMT2, BODMT3	Lab Blank Contamination
Aldol Condensate	U	BODMT2, BODMT3	Lab Blank Contamination
All results associated with internal std. perylene-d12	UJ	BODMT2, BODMT3	Internal standard and recovery outside of limits
,,			

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUSE-HANFORD

0000010

Laboratory: QUANTERRA																					
		W0429																			
Sample Number		B0DMT2		BODMT3																	
Location		Test Pit	#2	Test Pit	#2																
Remarks																					
Sample Date		01/17/95	5	01/17/95																	
Extraction Date		01/20/95	5	01/20/95																	
Analysis Date		01/23/95		01/23/95																	
Semivolatile Compound				Result		Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	1200					$\perp$														
bis(2-Chloroethyl)ether	330	1200		2100																	
2-Chlorophenol	330	1200		2100																	
1,3-Dichlorobenzene	330	1200		2100																	
1,4-Dichlorobenzene	330	1200		2100																	
1,2-Dichlorobenzene	330	1200		2100																	
2-Methylphenol	330	1200		2100																	
2,2'-oxybis(1-Chloropropane)	330	1200		2100																	
4-Methylphenol	330	1200		2100																	
N-Nitroso-di-n-propylamine	330	1200		2100																	
Hexachloroethane	330	1200		2100	U																
Nitrobenzene	330	1200		2100																	
Isophorone	330	1200	U	2100																	
2-Nitrophenol	330	1200	U	2100	U																
2,4-Dimethylphenol	330	1200	U	2100																	
bis(2-Chloroethoxy) methane	330	1200	U	2100	U																
2.4-Dichlorophenol	330	1200	U	2100	U																
1,2,4-Trichlorobenzene	330	1200	U	2100	U																
Naphthalene	330	1200	U	2100	U																
4-Chloroaniline	1700	2300	U	4100	U																
Hexachlorobutadiene	330	1200	U	2100	U													1			
4-Chloro-3-methylphenol	1700	2300	U	4100	U																
2-Methylnaphthalene	330	1200	U	2100	U																
Hexachlorocyclopentadiene	330	1200	U	2100	U																
2,4,6-Trichlorophenol	330	1200	U	2100	U																1
2,4,5-Trichlorophenol	330	1200	U	2100	U																
2-Chloronaphthalene	330	1200		2100																	
2-Nitroaniline	1700	5900		10000			1														
Dimethyl phthalate	330	1200		2100																	
Acenaphthylene	330	1200		2100					1		1										
2,6-Dinitrotoluene	330	1200		2100						-	$\vdash$										

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Laboratory: QUANTERRA Case:	lene.	W0429	_	1																	
	SDG:	BODMT2		DODLATO		T		_										· · · · · · · · · · · · · · · · · · ·			
Sample Number				BODMTS				-													
Location		Test Pit	#2	Test Pit	#2													_			
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date	-	01/20/95		01/20/95															-		
Analysis Date	T===.	01/23/95		01/23/95			T =						T-2-								
Semivolatile Compound				Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1700			10000																	
Acenaphthene	330		U	2100	U																
2,4-Dinitrophenol	1700			10000																	
4-Nitrophenol	1700			10000																	
Dibenzofuran	330			2100	U																
2,4-Dinitrotoluene	330	1200		2100	U																
Diethylphthalate	330	1200		2100																	
4-Chlorophenyl-phenyl ether	330	1200		2100																	
Fluorene	330	1200		2100																	T
4-Nitroaniline	1700	2300		4100																	
4,6-Dinitro-2-methylphenol	1700	5900	U	10000																	
N-Nitrosodiphenylamine	330	1200	U	2100	U																
4-Bromophenyl-phenylether	330	1200	U	2100	U			1													
Hexachlorobenzene	330	1200	U	2100	U																
Pentachlorophenol	1700	5900	U	10000																	
Phenanthrene	330	440		470	J																
Anthracene	330	430		460																	+
Carbazole	330	1200		2100		-															1
Di-n-butylphthalate	330	170		2100																	+
Ruoranthene	330	590		940																	1
Pyrene	330	570		820																	1
Butylbenzylphthalate	330	1200		2100																	+
3.3'-Dichlorobenzidine	330	2300		4100																	+
Benzo(a) anthracene	330	180		340																	1
Chrysene	330	220		400																	1
bis(2-Ethylhexyl) phthalate	330	81		130											Н						+
Di-n-octylphthalate	330	1200		2100																	+
Benzo(b) fluoranthene	330			580											$\Box$						+
Benzo(k) fluoranthene	330	130		220			1		-												+
Benzo(a) pyrene	330	1200					_						1		-						+
Indeno(1,2,3-cd)pyrene	330	1200					_			-										-	+
Dibenz(a,h)anthracene	330	1200		2100			$\vdash$														+
Benzo(g,h,i)perylene	330	1200		2100			+								$\vdash$	-					+

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## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

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

CONCENTRATION UNITS:

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

108-95-2Phenol	1200	U
111-44-4bis(2-Chloroethyl)Ether	1200	ū
	1200	ū
95-57-82-Chlorophenol	1200	ū
541-73-11,3-Dichlorobenzene	1200	ū
106-46-71,4-Dichlorobenzene		
95-50-11,2-Dichlorobenzene	1200	U
95-48-72-Methylphenol	1200	U
.08-60-12,2'-oxybis(1-Chloropropane)_	1200	U
.06-44-54-Methylphenol	1200	U
21-64-7N-Nitroso-Di-n-Propylamine	1200	U
57-72-1Hexachloroethane	1200	U
98-95-3Nitrobenzene	1200	U
78-59-1Isophorone	1200	U
38-75-52-Nitrophenol	1200	U
105-67-92,4-Dimethylphenol	1200	U
111-91-1bis(2-Chloroethoxy)Methane	1200	U
120-83-22,4-Dichlorophenol	1200	U
L20-82-11,2,4-Trichlorobenzene	1200	U
91-20-3Naphthalene	1200	U
106-47-84-Chloroaniline	2300	U
37-68-3Hexachlorobutadiene	1200	U
59-50-74-Chloro-3-Methylphenol	2300	U
91-57-62-Methylnaphthalene	1200	U
77-47-4Hexachlorocyclopentadiene	1200	U
38-06-22,4,6-Trichlorophenol	1200	U
95-95-42,4,5-Trichlorophenol	1200	U
91-58-72-Chloronaphthalene	1200	U
38-74-42-Nitroaniline	5900	U
131-11-3Dimethyl Phthalate	1200	U
208-96-8Acenaphthylene	1200	U
506-20-22,6-Dinitrotoluene	1200	U

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. -00285

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.:

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID:

A7716

Level: (low/med) LOW

% Moisture: not dec. 44 dec.

Date Received: 01/18/95

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 01/20/95 Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N

pH:

Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) · UG/KG 0

CAS NO.	COMPOUND (ug/L or ug/	/kg) · 0G/kG	Q	
99-09-2	3-Nitroaniline	5900	U	
	Acenaphthene	1200	U	
	2,4-Dinitrophenol	5900	U	
	4-Nitrophenol	5900	U	
	Dibenzofuran	1200	U	
	2,4-Dinitrotoluene	1200	U	
	Diethylphthalate	1200	U	
7005-72-3	4-Chlorophenyl-phenylether	1200	U	1
86-73-7	Fluorene	1200	U	
	4-Nitroaniline	2300	U	
	4,6-Dinitro-2-Methylphenol	5900	U	
	Nitrosodiphenylamine (1)	1200	U	
101-55-3	4-Bromophenyl-phenylether	1200	U	
118-74-1	Hexachlorobenzene	1200	U	
	Pentachlorophenol	5900	Ū	
	Phenanthrene	440	J	
	Anthracene	430	J	
	Carbazole	1200	U	
	Di-n-Butylphthalate	170	J	
	Fluoranthene	590	J	lab
129-00-0		570	Т.	
0E 60 7	Butylbenzylphthalate	1200_820	BG U	blan
01 04 1	3,3'-Dichlorobenzidine	2300	U	
	Benzo(a) Anthracene	180	J	
	Chrysene	220	J	
218-01-9	bis(2-Ethylhexyl)Phthalate	81	J	,
	Dis(2-EthyThexyT)Phthalate	1200	UJ	interr
	Benzo(b) Fluoranthene	420	J	24
		130	J	1 . 1-
	Benzo(k) Fluoranthene	1200	UJ	inte
	Benzo(a) Pyrene	1200	70 70	St
	Indeno(1,2,3-cd)Pyrene	1200	0,3	
53-/0-3	Dibenz(a,h)Anthracene	1200	U	
191-24-2	Benzo(g,h,i)Perylene	1200	0	1
				_

## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-002

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

Lab File ID: A7716

Level: (low/med) LOW

Date Received: 01/18/95

Date Extracted: 01/20/95

% Moisture: not dec. 44 dec. Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1.00

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

Number TICs found: 22

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	7777			377
1. 0	Aldol Condensation	4.64	25000	ABJ U
2.	Aldol Condensation	4.70	2600	ABJN
3.	UNKNOWN	16.77	240	J
4.	UNKNOWN	18.59	2800	J
5.	Unknown Alkane	18.84	1200	J
6.	Unknown Alkane	18.94	320	J
7.	Unknown Alkane	19.44	290	J
8.	UNKNOWN	20.50	390	J
9.	Unknown C12H6Cl4	22.92	220	J
10.	Unknown C12H6Cl4	23.02	340	J
11.	Unknown C12H5Cl5	23.53	1400	J
12.	Unknown C12H5Cl5	24.07	590	J
13.	Unknown C12H4Cl6	24.46	560	J
14.	Unknown C12H4Cl6	24.70	990	J
15.	Unknown C12H5C15	24.79	900	J
16.	Unknown C12H4Cl6	25.22	1100	J
17.	Unknown C12H4Cl6	25.75	1200	J
18.	Unknown C12H3Cl7	26.02	500	J
19.	Unknown C12H3C17	27.03	650	J
20.	UNKNOWN	28.32	610	J
21.	UNKNOWN	29.60	1000	J
22.	UNKNÓMN	29.88	1100	J

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## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BODMT3

161b Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.:

SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-004

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

Lab File ID: A7718

Level: (low/med) LOW

Date Received: 01/18/95

\* Moisture: not dec. 68 dec.

Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO.

COMPOUND

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

108-95-2Phenol	2100	U
111-44-4bis(2-Chloroethyl)Ether	2100	U
95-57-82-Chlorophenol	2100	U
541-73-11,3-Dichlorobenzene	2100	U
106-46-71,4-Dichlorobenzene	2100	U
95-50-11,2-Dichlorobenzene	2100	U
95-48-72-Methylphenol	2100	U
108-60-12,2'-oxybis(1-Chloropropane)	2100	U
106-44-54-Methylphenol	2100	U
321-64-7N-Nitroso-Di-n-Propylamine	2100	U
37-72-1Hexachloroethane	2100	U
98-95-3Nitrobenzene	2100	U
78-59-1Isophorone	2100	U
38-75-52-Nitrophenol	2100	U
05-67-92,4-Dimethylphenol	2100	U
111-91-1bis(2-Chloroethoxy)Methane	2100	U
20-83-22,4-Dichlorophenol	2100	U
20-82-11,2,4-Trichlorobenzene	2100	U
01-20-3Naphthalene	2100	U
06-47-84-Chloroaniline	4100	U
37-68-3Hexachlorobutadiene	2100	U
39-50-74-Chloro-3-Methylphenol	4100	U
01-57-62-Methylnaphthalene	2100	U
77-47-4Hexachlorocyclopentadiene	2100	U
88-06-22,4,6-Trichlorophenol	2100	U
5-95-42,4,5-Trichlorophenol	2100	U
11-58-72-Chloronaphthalene	2100	U
8-74-42-Nitroaniline	10000	U
31-11-3Dimethyl Phthalate	2100	U
08-96-8Acenaphthylene	2100	U
06-20-22,6-Dinitrotoluene	2100	U

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

BODMT3

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-004

Lab File ID: A7718

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

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 68 dec.

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 01/20/95 Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO.		L or ug/Kg		Q
99-09-2	3-Nitroaniline		10000	U
83-32-9	Acenaphthene		2100	U
51-28-5	2,4-Dinitrophenol		10000	U
100-02-7	4-Nitrophenol		10000	U
132-64-9	Dibenzofuran		2100	U
121-14-2	2,4-Dinitrotoluene		2100	U
84-66-2	Diethylphthalate		2100	U
7005-72-3	4-Chlorophenyl-phenyle	ther	2100	U
86-73-7	Fluorene		2100	U
	4-Nitroaniline		4100	U
	4,6-Dinitro-2-Methylph	enol	10000	U
86-30-6	N-Nitrosodiphenylamine	(1)	2100	U
101-55-3	4-Bromophenyl-phenylet	her	2100	U
118-74-1	Hexachlorobenzene		2100	U
87-86-5	Pentachlorophenol		10000	U
85-01-8	Phenanthrene		470	J
120-12-7	Anthracene		460	J
	Carbazole		2100	U
84-74-2	Di-n-Butylphthalate		2100	U
206-44-0	Fluoranthene		940	J
129-00-0			820	J
85-68-7	Butylbenzylphthalate		21013400	BaU
91-94-1	3,3'-Dichlorobenzidine		4100	Ū
56-55-3	Benzo(a) Anthracene		340	J
218-01-9	Chrysene		400	J
117-81-7	bis(2-Ethylhexyl)Phtha	late	130	J
117-84-0	Di-n-Octyl Phthalate		2100	UJ
205-99-2	Benzo(b) Fluoranthene		580	J
207-08-9	Benzo(k)Fluoranthene		220	J
	Benzo(a) Pyrene		290	J
	Indeno(1,2,3-cd)Pyrene		2100	02
53-70-3	Dibenz (a, h) Anthracene_		2100	U
191-24-2	Benzo(g,h,i)Perylene_		2100	n 1
) - Cannot l	oe separated from Diphenyla	mine	_1	m 165

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## SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA MO

Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL

Lab Sample ID: 7344-004

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

Lab File ID: A7718

Level: (low/med) LOW

Date Received: 01/18/95

% Moisture: not dec. 68 dec.

Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N

pH:

Dilution Factor: 1.00

CONCENTRATION UNITS: Number TICs found: 18 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1 0	71del Condensation	4 65	36000	ABJ U
1. 0	Aldol Condensation	4.65		J
2.	UNKNOWN	16.77	240	
3.	UNKNOWN	18.59	4600	J
4.	Unknown Alkane	18.85	2100	J
5.	UNKNOWN	18.94	260	J
6.	Unknown Alkane	19.45	230	J
7.	UNKNOWN	20.50	620	J
8.	UNKNOWN	20.97	360	J
9.	UNKNOWN	21.82	230	J
10.	UNKNOWN	26.55	230	J
11.	UNKNOWN	28.12	270	J
12.	UNKNOWN	28.30	280	J
13.	UNKNOWN	29.56	600	J
14.	UNKNOWN	30.48	440	J
15.	UNKNOWN	31.19	360	J
16.	UNKNOWN	31.39	490	J
17.	UNKNOWN	31.75	410	J
18.	UNKNOWN	32.01	700	J

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## Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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 1, 1995

Attention: Joan Kessner

Project number : 550.56

Date Received by Lab : January 18, 1995

Number of Samples : Two (2)
Sample Type : Soil
SDG Number : W0429
Data Deliverable : Standalone

## I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra. Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

## 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.





Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

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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.

## III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 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 arrived in St. Louis at  $0^{\circ}$ C which is not within the recommended  $4^{\circ}$ C  $\pm 2^{\circ}$ C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

00937BC



Bechtel Hanford Incorporated March 1, 1995

Project Number: 550.56

SDG: W0429

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Sample 7344-001 is included in this package <u>only</u> for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

00938



Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

Page 4

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:\\squmlo01\price\$\abbydave\hanford\hanw0429.nar

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ossible Sample Hazards/Ren	arks			Preservative	C001 4	COOL 4	COOL 4	COOL 4	C001 4	COO! 4	COOL 4	C001 4	Cory 4º	C001 4	con 110				
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Special Handling and/or Stor				Volume	425-1	405.1	425.1	405 .	10.1		405.1	407 1	500 10	-	500ml	an	0		
OOL TO 4 DEGREES CENT	GRADE			1	125ml ICP	VOA-TCI		PCB/	40ml SULFIDE	40ml TOX	ANIONS-	NO2-NO3	500ml*	20ml			-		
					METALS	-	VOA-TCI	PEST			IC(F,	-	ALPHA/	TY SCA	alpha	total			
	SAMPLE AN	NALYSIS			TAL/AA MATALS					i	Cl, SO4,		BETA, GEA		beta	beta	1		
					(As, Pb						NO2,				Gamm	gamm			
50	1322				se, il)	B	2	D	E	F	NO3)	4			Spec	Spec	5013	23	
Sample No.	Matrix*	Date	Sampled	Time Sampled									- (					,	
541-17-95 DOMRA BODMT	ols	111	7195	6902	×	X	X	X	X	$\times$	X	$\sim$	XXX	X	X	X	01		
BODMSO		1/17	1/95	0907	X	4		X	X				1(20	X	X	X	2		
+ BODMT		111-	195	0935	X	$\times$	X	X	X	X	X	X	THE STATE OF THE S	X	X	X	3		
BODMR		1117	195	0935	X	1	X	X	X	X	X	X	IV.	X			4		
BODMT		1117	195	1047	>	<b>*</b>		X	X	X	X	X		X	X	X	5		
1 BODMR3	65	1/17	45	1047	X	X	X	X	X	X	X	X	X	X			6		
CHAIN OF POSSESSION			Sig	n/Print Names					L INSTRU									Matrix	•
Relinquished By	Date/T	Ime	Received	184/12 E	nc	Date/Ti	mg 6				OR PHOS		NITRATE.	NITRIT	E IS REC	DUESTED	FOR SE	= Soit	mant
Doug Bowers	1-18-95	10830	Kir 1	Sten Bu	whitten	1-1	8-95	"INFOR	MATION (	MLY." T	HE ERC	CONTRAC	TOR ACK	OWLEDGE	S THE 4	B-HOUR	SO	= Solld	
Rolling Ulshed By 50	Date/T	ime / 058	Received	By Jan 7/20		Date/TI	mº 95	HOLDIN	G TIME I	ILL NOT	BE MET	•					SL W	= Slud = Wate	
Ill Walter B. Wh	Her 1-	-18-95	L.D	ay & Gu	-lun		50	*=THE	TOTAL VI	NIME DE	OUTPED	END TOTA	Al Al DUA	/RETA	GEA ANAI	vete te	A DS	= Alr = Drun	o Salld
felinquished By	Date/I	Time	Received	d By		Date/TI	me	1500g	IOIAL W	JEONE RE	HOIKED	rok TOTA	ME METER	ADEIN,	GEN MAN	1919 19	DL	= Drun	n Liquid
Relinquished By	Date/T	îme	Received	f By		Date/Ti	me	TON	DMT	7-6:	101.	hall	tolan	mma	יסיימי	rded	L	= Wipe	d
								Do	121 16	W W	1450	on me	and	129	Dul.		×	= Vege	r
LABORATORY Received E	1			Title											Date/III	me			
									15					200	- Wo:	-			
FINAL SAMPLE Disposal M	ethod							Dispos	eed By						Date/Tit	me .			

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

pcs 11/1/95

14. 5 . DATE. 01/11/95
PROJECT NUMBER <u>B94-098</u> PROJECT TITLE <u>100-D Ponds Phase II Sampling</u>
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 WATER VEGETATION OILS SLUDGE CONCRETE OTHER
LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE
LABORATORY LABORATORY CONTACT TELEPHONE
Quanterra (Main) Not Applicable N/A
Lockheed (Split) Not Applicable N/A
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

## 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, BODMSO, 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/ My Smith Sign Name)	1/3/95 Date
M.T. Stankovich/ Technical Representative (Print/Sign Name)	2/13/95 Date
N/A Quality Assurance (Print/Sign Name)	Date

Contractor

BHI

## OFF-SITE PROPERTY CONTROL

CONTROL NO. (To be obtained from PROPERTY MANAGEMENT) W95-0-03041-3

Department ER Eng. Support Section Field & Analytical Supp Unit Field Sampling  The following items are to be shipped from X Contractor Vendor  Routing Prepaid Collect	ng
Routing Prepaid Collect	
mounty	
Shipped to Company Quanterra (IT) 2800 Geo Wash Way Richland, Washington 99352 City State Zip Code Off-site Custodian Off-site Custodian	Payroll No.
City State Zip Code Country	
Oty. Property No. Description Unclude Manufacture Name, Model, Serial No.)	Acquisition Cost
Sample #: BODMTG BODMS9 BODMTA BODMR3 BODMR3 Cooler ID: SML-457 E ER41 BODMTS Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
Classified Nunclassified Shipped Under DOE Contract Shipped Under Contractor's Use P	ermit Contract
Off-site Assignment  Shipment to Subcontractor. List Subcontract No	8 1995
	DECODOR
CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIV	
RM Clearance for Public Release RM Survey No. RARA - 0051	1-18-95
Location of and Contact for Property (Name/Phone No./Bldg./Area)  B.T. Whitten (509) 376-7777	
Date Ready for Shipment  1-15-75  Cost Code to be Charged  ITE 2072 PV3AA  Approximate Date This Property will be Returned	
Originated By B.J. WHITTEN Date 1-18-95 Kill Whitten	Date 1-15-95
Property Representative Signature  Date Property Management Approval Debut RIVES	Date 1/18/95
PART II - TO BE COMPLETED BY SHIPPING	,
Authorized Shipping Signature	Date
DISTRIBUTION (AFTER FINAL SIGNATURES)	

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

a. Brel Grantena 1/18/95 1050 000026

54-3000-479 (01/94)

## Appendix 5

**Data Validation Supporting Documentation** 

96 3497 WHC SD-EN-SPP-002, Rev. 2

## GC/MS ORGANIC DATA VALIDATION CHECKLIST

	A	В	С	0	E
PROJECT: W	Pestropous	-Hanford	DATA PACKA	E: 40042	
VALIDATOR:			nterra	DATE: 3/2	7/95
CASE:			SDG: W	1429	
		ANALYSES	PERFORMED	· .	
CLP Volatiles	SW-846 8240 (cap column)	SW-846 8260 (packed column)	CLP Semivolatiles	SW-846 8270 (cap column)	SW-846 (packed column)
s technical	verification rative presen	ESS AND CASE documentation	present? .		es No N/A

ATK

## 9613497 1544GC/MS ORGANIC DATA VALIDATION CHECKLIST INSTRUMENT TUNING AND CALIBRATION Is the GC/MS tuning/performance check acceptable? . . . . . Are initial calibrations acceptable? . . . No Mes Are continuing calibrations acceptable? . . . . . No Comments:\_ 4. BLANKS Were laboratory blanks analyzed? . . . . . Are laboratory blank results acceptable? . . . . Were field/trip blanks analyzed? . . . . . . . Are field/trip blank results acceptable? . . . Comments: ato deterted: Buti ACCURACY Were surrogates/System Monitoring Compounds analyzed? . . . . No Are surrogate/System Monitoring Compound recoveries acceptable? Yes No Were MS/MSD samples analyzed? . . . . . No Are MS/MSD results acceptable? Comments:

A=2000

96/3497 1545 WHC-SD-EN-SPP-002, Rev. 2

## 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:
·
·
7. SYSTEM PERFORMANCE
Were internal standards analyzed? Yes No N/A
Are internal standard areas acceptable?
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?
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?
Do results meet the CRQLs?
Has the laboratory properly identified and coded all TIC? Yes No
Comments:
· · · · · · · · · · · · · · · · · · ·

## 9613497. 1546 SD-EN-SPP-002, Rev. 2 GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):
MS-pyrene slightly below limits. No qualiferation necessary since MS raw data looked time.  MSD secrety win limits & surrogate recovery win limits & surrogate recovery
ufin limits upin which is surrogate treater
Internal std problem for Penglone-diz
BODUTZ ] - Pag - 3×476 BODUT3 J 79564
g all associated sample results qualified

A-482

# 9613497-1547

## 000032

## **ACCURACY DATA SUMMARY**

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE_	1_OF_1
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
BODMT6MS	Pyrene	51	BODMT2, BODMT3	None
				,

## 9613497, 1548

## 000033

## BLANK AND SAMPLE DATA SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/27/95			PAGE_1_OF_1_		
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	a	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK01	Butylbenzylphthalate	290	J		ug/Kg		2900	BODMT2	U
SBLK01	Butylbenzylphthalate	290	J		ug/Kg		2900	вормтз	U
SBLK01	Aldol Condensate	14000	J	4.62	ug/Kg		140000	BODMT2	U
SBLK01	Aldol Condensate	14000	J	4.62	ug/Kg		140000	вормтз	U
									· · · · · · · · · · · · · · · · · · ·

# 9613497, 1549

## 000034

## PRECISION DATA SUMMARY

SDG: W0429	0429 REVIEWER: SC		DATE: 3/27/95		PAGE_1_0F_1_	
COMMENTS: N	lo problems.					
COMPOUND		SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
A/O E 2	-					
-						

## 9613497, 1550

## CALIBRATION DATA SUMMARY

SDG: W0429	REVIEWER: SC		DATE:	3/27/95	PAGE_	1_OF_1_
COMMENTS: Al	within limits.					
CALIB. TYPE:	INITIAL (	CONTINUING	INSTRUI	MENT:		
CALIB. DATE	COMPOUND		RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
						·
		.,				
				-		
The same of the sa		V de sente				

# 9613497: 1551

## HOLDING TIME SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/27	/95	PAGE_1	_OF_1_
COMMENTS: N	o problems. A	all within limits	3				
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
							,
***************************************							

## 9613497, 1552 RECORD COPY

Date:

To:

April 21, 1995
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. W0429-QES (SDG No. W0429)

## INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
вормтз	01/17/95	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 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 heptachlor, aldrin, heptachlor epoxide, dieldrin, 4,4-DDE, endrin, endosulfan II, endosulfan sulfate, 4,4-DDT, endrin aldehyde, methoxychlor and DBC in sample numbers BODMT2 and BODMT3. All associated samples were qualified as estimates (J for detects, UJ for nondetects).

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

9613497.1554

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 identitiy 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. W0429-QES (SDG No. W0429) 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, twelve compounds in sample numbers BODMT2 and BODMT3 were qualified as estimates (J for detects, UJ for nondetects). 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:

- 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.
- 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.
- 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).
- 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

## DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/28/95	PAGE_1_0F_1_
COMMENTS:			
COMPOUND	QUALIFIER SAMPLES AFFECTED		REASON
Heptachlor	UJ	BODMT2, BODMT3	Continuing Calibration
Aldrin	J	BODMT2, BODMT3	Continuing Calibration
Heptachlor epoxide	UJ	BODMT2, BODMT3	Continuing Calibration
Dieldrin	UJ	BODMT2, BODMT3	Continuing Calibration
4,4-DDE	UJ	BODMT2, BODMT3	Continuing Calibration
Endrin	UJ	BODMT2, BODMT3	Continuing Calibration
Endosulfan II	UJ	BODMT2, BODMT3	Continuing Calibration
Endosulfan sulfate	UJ	BODMT2, BODMT3	Continuing Calibration
4,4-DDT	UJ	BODMT2, BODMT3	Continuing Calibration
Endrin aldehyde	UJ	BODMT2, BODMT3	Continuing Calibration
Methoxychlor	UJ	BODMT2, BODMT3	Continuing Calibration
DBC	UJ	BODMT2, BODMT3	Continuing Calibration

## Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WESTINGHOUS		11 0110		$\dashv$																	
Laboratory: QUANTERR		W0429		-																	
Case:	SDG:	BODMT2		B0DMT3	_												-				
Sample Number						-		-				_		-				-		-	
Location		Test Pit	#2	Test Pit #	#2																
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95		-						-					_	-		-	
Analysis Date Pesticide/PCB	CROL	Result			Q	Result	0	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	1.8		3.1		Result	u	nesuit	u	nesuit	u	nesuit	u	nesuit	u	nesuit	4	Hesuit	u	nesuit	- 4
beta - BHC	1.7			6.2		-	+-	-	1		-	-	1		-		-				+-
delta - BHC	1.7			9.3		+	-		-		-						-				+
gamma-BHC (Lindane)	1.7			4.1		-		-	+		-		-		-		1		+-		+-
Heptachlor	1.7		UJ	3.1			+		-		-				-				-		1
Aldrin	1.7	8.2		36		1	1		-					-			-				+
Heptachlor epoxide	1.7		UJ		UJ	1	-		-		-		-						-		+
Endosulfan I	1.7	8.3			UJ		-				_						-				1
Dieldrin	3.3		UJ	2.1																	+
4,4'-DDE	3.3		UJ		UJ	1			+									· ·			
Endrin	3.3		UJ	440	UJ		-						-			Combine or planter to street a c			-		-
Endosulfan II	3.3		UJ		UJ	-	1		+				-		-			-	1		+
4,4'-DDD	3.3	6.5		24					1						-		_		-		+
Endosulfan sulfate	3.3		UJ		UJ		+		1			-							-		+
4,4'-DDT	3.3		UJ	190			-		-								-		-		+
Methoxychlor	17.0		UJ	180			1						1				-				1
Endrin Aldehyde	3.3		UJ	110		-	+		1										-		+
Tech. Chlordane	1.7	8.3		14		-		1			_										
Toxaphene	170.0	140		250		-	1		1				1	-							+
Arochlor – 1221	33.0		U	100			1		1			***	1								+
Arochlor - 1232	67.0		U	100	-	1		1											1		1
Arochlor - 1242/1016	33.0		U	68		1	-		1												1
Arochlor-1248	33.0		U	100															1		1
Arochlor-1254	33.0	2300		9800	-				1						1						1
Arochlor-1260	33.0	1800		7500		-			1				1				-				

ROS 5/3/95

000011

1024-57-3	PESTICIDE ORGANICS ANALYSIS DATA S	SHEET	
Matrix:         (soil/water)         SOIL         Lab Sample ID:         7344-002           Sample wt/vol:         30.0         (g/ml)         q         Lab File ID:           Level:         (low/med)         LOW         Date Sampled:         01-17-95           & Moisture:         not dec.         44         dec.         Date Extracted:         01-20-95           Extraction:         (SepF/Cont/Sonc)         SONC         Date Analyzed:         01-25-95           GPC Cleanup:         (Y/N)         pH:         Dilution Factor:         1           CAS NO.         Compound         (ug/L or ug/Kg)         ug/Kq         Q           319-84-6	Lab Name: QUANTERRA, MO Contract:	550.56	BODMT2
Lab File ID:   Level: (low/med)   LOW   Date Sampled:   01-17-95	Lab Code: ITMO Case No.: SAS No.	: SDG No.:	W0429
Date Sampled : 01-17-95	Matrix: (soil/water) SOIL	Lab Sample ID:	7344-002
# Moisture: not dec44	Sample wt/vol: 30.0 (g/ml) q	Lab File ID:	
Concentration: (SepF/Cont/Sonc)   SONC   Date Analyzed:   01-25-95	Level: (low/med) LOW	Date Sampled : _	01-17-95
CONCENTRATION UNITS:   CAS NO.   Compound   Cug/L or ug/Kg)   ug/Kg   Q	Moisture: not dec. 44 dec. dec.	Date Extracted:	01-20-95
CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kq Q  319-84-6	Extraction: (SepF/Cont/Sonc) SONC	Date Analyzed: _	01-25-95
CAS NO.       Compound       (ug/L or ug/Kg) ug/Kg       Q         319-84-6	GPC Cleanup: (Y/N) N pH:	Dilution Factor:	1
319-86-8	CAS NO. Compound (ug/L	NTRATION UNITS: or ug/Kg) ug/Kg	Q
53494-70-5Endrin Aldehyde 54 UK V V V V V V V V V V V V V V V V V V	319-85-7	5.3 4.5 1.8 8.2 49 8.3 1.2 25 140 45 6.5 39 170 100 54 8.3	
57-74-9Tech. Chlordane	8001-35-2Toxaphene	140	U

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

SD: See dilution

Elevated detection limit due to PCB interference. X: FORM I PEST

11141-28-2------Aroclor-1232

12672-29-6------Aroclor-1248

11097-57-4------Aroclor-1254

11096-82-5------Aroclor-1260

53469-21-9/12674-11-2-Aroclor-1242/1016

1/87 Rev.

SD SD

59

39

59

9613497.1564

EPA SAMPLE NO.

Lab Name: OUANTERRA, MO Contract:		BODMT2DL
Lab Code: ITMO Case No.:	SAS No.: SDG No.:	W0429
Matrix: (soil/water) SOIL	Lab Sample ID:	7344-002DL
Sample wt/vol: 30.0 (g/ml) g	Lab File ID:	
Level: (low/med) LOW	Date Sampled :	01-17-95
Moisture: not dec. 44 dec.	Date Extracted: _	01-20-95
Extraction: (SepF/Cont/Sonc) SONC	_ Date Analyzed:	02-02-95
GPC Cleanup: (Y/N) N pH:	Dilution Factor:	10
CAS NO. Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	
11104-28-2Aroclor-1221	590	U
11141-28-2Aroclor-1232	590	U
53469-21-9/12674-11-2-Aroclor-1242/1016		U
12672-29-6Aroclor-1248	590	U
11097-57-4Aroclor-1254		
11096-82-5Aroclor-1260	1800	

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

R8 4/3.195

FORM I PEST

1/87 Rev.

### 9613497.1565 1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract: 55	50.56	BODMT3
Lab Code: ITMO Case No.: SAS No.:		W0429
Matrix: (soil/water) SOIL La	ab Sample ID:	7344-004
Sample wt/vol: 30.0 (g/ml) g	ab File ID:	
Level: (low/med) LOW Da	ate Sampled :	01-17-95
% Moisture: not dec. 68 dec. Da	ate Extracted: _	01-20-95
Extraction: (SepF/Cont/Sonc) SONC Da	ate Analyzed:	01-25-95
GPC Cleanup: (Y/N) N pH: D	ilution Factor:	1
	ATION UNITS: ug/Kg) <u>ug/Kg</u>	Q
319-84-6	3.1 6.2 9.3 4.1 3.1 36 86 14 2.1 82 440 55 24 68 190 180 110 14 250 100 100 68 100	

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

SD: See dilution

X: Elevated detection limit due to PCB interference.

FORM I PEST

1/87 Rev.

## 9613497. 1566 1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

	550.56	BODWL3DT
ab Code: ITMO Case No.: SAS No.	: SDG No.:	W0429
atrix: (soil/water) SOIL	Lab Sample ID:	7344-004DL
ample wt/vol: 30.0 (g/ml) q	Lab File ID:	
evel: (low/med) LOW	Date Sampled :	01-17-95
Moisture: not dec. 68 dec.	Date Extracted:	01-20-95
traction: (SepF/Cont/Sonc) SONC	Date Analyzed:	01-24-95
PC Cleanup: (Y/N) N pH:	Dilution Factor:	25
CAS NO. Compound (ug/I	ENTRATION UNITS: L or ug/Kg) ug/Kg	Q
319-84-6	150 230 100 77 100 • 2100 360 52 100 780 100 280	U U U U U U U U U U U U U U U U U U U

Concentration of analyte is less than the value given. Elevated detection limit is due to PCB interference. U:

X:

28 4/30/95

1/87 Rev.

FORM I PEST

### Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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 1, 1995

Attention: Joan Kessner

Project number : 550.56

Date Received by Lab : January 18, 1995

Number of Samples : Two (2)
Sample Type : Soil
SDG Number : W0429
Data Deliverable : Standalone

### I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

### 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.





Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

Page 2

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.

### III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 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
OCLCS- Quality Control Laboratory Control Sample, Blank Spike

#### V. Comments

Samples arrived in St. Louis at  $0^{\circ}$ C which is not within the recommended  $4^{\circ}$ C  $\pm 2^{\circ}$ C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.





Bechtel Hanford Incorporated March 1, 1995 Project Number: 550.56 SDG: W0429

Page 3

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

009388



Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

Page 4

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:\\sqtmlo01\price\$\abbydave\hanford\hanw0429.nar

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roject Designation 00-D PONDS PHASE 11 SAMPL	ING L	ilend	L)	Sampling Loca 100-D	tion						SAF No. 894-098								
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hipped To JANTERRA				Olisite Pioperi	y 140.						N/A	aing/Air	DIII NO.						
ossible Sample Hazards/Remarks				Preservative			Dags /				COOL 4		Down (10		110	,			
				Type of												G	-		
				No. of	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	6	1			
pecial Handling and/or Storage				Container(s)	11_	1_	1	1_	1	1_	1	_1_	3	1_	1	1			
OL TO 4 DEGREES CENTIGRA	DE			Volume	125ml	125ml	125ml	125ml	40mt	40ml	125ml	125ml	500ml*	20ml	500ml	95Dm	l		~
					ICP METALS-	VOA-TCL	NOA-TCL	PCB/ PEST	SULFIDE	TOX	ANIONS-	NO2-NO3	ALPHA/	ACTIVI-	. IUIVI	total			
	44PV F 4414	12/010			TAL/AA						Cl, SO4,		BETA,		aiping	alpha			
SA	MPLE ANA	LYSIS			MATALS (As,Pb,						P04,		GEA		beta	beta			
F-17	-				Se,Tl)	В	1	D	E	F	NO3)				Spec	agamn	5-17		
5013 Sample No.	Matrix*	Data	Sampled	Time Sampled	A	<u> </u>	1				<u>_</u>	17			Sher	Spec	5013	<u> </u>	*******
CL1-17-95	· ·			6000			N	abla	<b>K</b> /	K /		<b>K</b>	V W			<del>1</del> ▽′		Ī	
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	35	1/17		0907	- CA			(3)		~	~		3/4	$\langle \rangle$			2		
\$ BODMT2	35	1/17	195	0935	X	$\geq$	$ \times $	Z	X			$\geq$	TAK!	$\geq$	$\times$	X	3		
P BODMR2	45	117	95	0935	$\geq$	$\geq$	<u>&gt;</u>	$\times$	$\geq$	$\geq$	$\geq$	$\geq$	X.	$\times$			4		
SU BODMT3	55	1/17	195	1047	$\geq$	>	$\geq$	$\geq$	$\geq$	$\geq$	$\geq$	$\geq \leq$		$\times$	$\times$	$\times$	5		
1BODMR3	65	1/17	45	1047	X	$\times$	X	X	$\times$	$\times$	$\times$	X	$\times$	X			6		
CHAIN OF POSSESSION			Sig	n/Print Names	,				L INSTRU									Matrix*	
elinquished By	Date/Tim	•	Received	BY,12, E	RC	Date/Tip	mg 6	LABORAT	ELIVERAS TORY ANA	LE-STAN	OR PHOSE	PHATE.	ITRATE.	NITRIT	F IS RE	QUESTED	FOR S	= Soll	
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LABORATORY Received By				Title											Date/Ti	me			
SECTION														SDG	- WO	386			

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

11/1/95

EV. 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 WATER VEGETATION OILS  SLUDGE CONCRETE OTHER								
LABORATORY SERVICES   ON-SITE  OFF-SITE								
LABORATORY LABORATORY CONTACT TELEPHONE								
Quanterra (Main) Not Applicable N/A								
Lockheed (Split) Not Applicable N/A								
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 72

### 613497-1574

### 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, BODMS6, BODMS3, BODMS8, BODMT7, BODMS4, BODMS4, 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/ My (Print/Sign Name)	1/3/95 Date
M.T. Stankovich/ Technical Representative (Print/Sign Name)	2/13/95 Date
N/A Quality Assurance (Print/Sign Name)	Date

223498

9613497, 1575 CONTROL NO. Contractor OFF-SITE (To be obtained from PROPERTY MANAGEMENT) BHI PROPERTY CONTROL W95-0-03041-3 PART I - TO BE COMPLETED BY ORIGINATOR Department Field & Analytical Supp Field Sampling ER Eng. Support X Contractor Vendor The following Items are to be shipped from Prepaid Collect Routing Shipped to Off-site Custodian Quanterra (IT) Company 2800 Geo Wash Way Address Richland, Washington 99352 On-site Custodian Payroll No. City Country Description Unclude Manufacture Name, Model, Serial No.) **Acquisition Cost** Qtv. Property No. Sample #: BODMT6 BODMS9 BODMTA BODMRA BODMT3 BODMR3 1 Cooler ID: SML-457 & ER41 BODMT5 Polycooler with groundwater samples packed in wet ice and N/A vermiculite 169 Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and N/A vermiculite 165 Classified X - Unclassified Shipped Under DOE Contract Shipped Under Contractor's Use Permit Contract Necessity for the off-site use of this property Required for Project Work. List Project No. 100-D-PONDS PHASE III Business Trip Bill of Lading #: W/R Off-site Assignment Shipment to Subcontractor. List Subcontract No. V(?) Other (Please specify) Sampling supports RI/FS work in the IOC AREA ' IAN 1 8 1995 CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING. RM Clearance for Public Release RM Survey No. Date 1-18-95 and Lascon Location of and Contact for Property (Name/Phone No./Bldg./Area) B.T. Whitten (509) 376-7777 **Date Ready for Shipment** Cost Code to be Charged Approximate Date This Property will be Returned ITE 2072 PV3AA 1-18-95 Originated By 1-18-95 BJ. WHITTEN 1-18-95 Property Representative Signature Property Management Approval Date

Authorized Shipping Signature

PART II - TO BE COMPLETED BY SHIPPING

Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

### Appendix 5

Data Validation Supporting Documentation

9613497.1577

### WHC-SD-EN-SPP-002, Rev. 2

### PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	А	В	С	(D)	E						
PROJECT:	WHC		DATA PACK	AGE: SAF-B	94-098						
VALIDATOR:	Schari	LAB: QUAN		DATE: 3	28/95						
CASE: V34			SDG:	W0429							
		ANALYSES	PERFORMED								
☐ CLP3/90	☐ SW-846 8080	☐ SW-846 8081	0	0	0						
Is technical	verification rrative preser	MESS AND CASE documentation	present?		Yes No N/A Yes No N/A						
	olding times a	acceptable? .		(	Yes No N/A						
3.1 INSTRUME Are DDT reter Are calibrati	ENT PERFORMANC ntion times ac on standard r	retention time owns acceptabl	AND 8081	le?	Yes No N/A						

9613497,1578 WHC-SD-EN-SPP-002, Rev. 2

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į	
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: Ale 7.0 on wp tables	
·	
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? (es) No	N/A
Comments:	
3.4 CALIBRATION VERIFICATION (3/90 SOW)	
Vere the analytical sequence requirements met? Yes No	N/A
s resolution acceptable in the PEMs?	N/A

1. c.K.l.

Are initial calibrations acceptable? . . . . . .

N/A

### 9613497.1579 WHC-SD-EN-SPP-002, Rev. 2

### PESTICIDE/PCB DATA VALIDATION CHECKLIST

re retention times acceptable in the PEMs, INDA and INDB mixes? Yes No N/A	
re RPD values in the PEMs acceptable? Yes No N/A	
re the DDT and endrin breakdowns acceptable?	
as GPC cleanup performed? Yes No WA	170
s the GPC calibration check acceptable? Yes No N/A	3/00
as Florisil cleanup performed? Yes No N/A	
s the Florisil performance check acceptable? Yes No N/A	
omments:	
. BLANKS	
ere laboratory blanks analyzed?	
re laboratory blank results acceptable?	
ere field/trip blanks analyzed? Yes No N/A	
re field/trip blank results acceptable? Yes No N/A	
. ACCURACY	
ere surrogates analyzed? Yes No N/A	
re surrogate recoveries acceptable?	
ere MS/MSD samples analyzed?	
re MS/MSD results acceptable? Yes No N/A	
ere LCS samples analyzed? Yes No WA	
re LCS results acceptable? Yes No (N/A)	
omments:	

ATBC

### 961349HC-59HEN-SPP-002, Rev. 2

### PESTICIDE/PCB DATA VALIDATION CHECKLIST

/ 11 ··	
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	A/N c
Comments:	
7. SYSTEM PERFORMANCE	
Is chromatographic performance acceptable? Yes No	N/A
Are positive results resolved acceptably?	A/N c
Comments:	
8. COMPOUND IDENTIFICATION AND QUANTITATION	
Is compound identification acceptable? Yes No	N/A
Is compound quantitation acceptable? Yes No	A/N c
Comments:	
	-
9. REPORTED RESULTS AND QUANTITATION LIMITS	
Are results reported for all requested analyses? Yes No	,
Are all results supported in the raw data? Yes No	
Do results meet the CRQLs?	o N/A

ABBC

9613 WHC-SOLEN-SPP-002, Rev. 2

### PESTICIDE/PCB DATA VALIDATION CHECKLIST

Comments:
·
·
Note: the Aroclor 12\$2/10/RT-Standards & gn Form IX: Selva
an Form IX : Selva
The RTW should be reported as 21 3.65 - 3.77 not 2.77  as reported in form ix (pages 58)
21 3,65 - 3,77 not 2,77
as reported in form IX/Dages 58
0 58

A-9 /81

### CALIBRATION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/28/95		PAGE_1_OF_1_		
COMMENTS:						
CALIB. TYPE:	INITIAL <u>CONTINUING</u>	INSTRUMENT:				
CALIB. DATE	COMPOUND	RF	RSD/ <u>%D</u> /%R	SAMPLES AFFECTED	QUALIFIER	
1/25/95	Heptachlor		16	BODMT2, BODMT3	UJ	
1/25/95	Aldrin		19	BODMT2, BODMT3	J	
1/25/95	Heptachlor epoxide		19	BODMT2, BODMT3	UJ	
1/25/95	Dieldrin		20	вормт2, вормт3	UJ .	
1/25/95	4,4-DDE		17	BODMT2, BODMT3	UJ	
1/25/95	Endrin		24	BODMT2, BODMT3	UJ	
1/25/95	Endosulfan II		26	BODMT2, BODMT3	UJ .	
1/25/95	Endosulfan sulfate		20	BODMT2, BODMT3	UJ	
1/25/95	4,4-DDT		17	BODMT2, BODMT3	UJ	
1/25/95	Endrin aldehyde		19	BODMT2, BODMT3	UJ	
1/25/95	DBC		17	BODMT2, BODMT3	UJ	
1/25/95	4,4-DDE		16	BODMT2, BODMT3	UJ	
1/25/95	4,4-DDT		30	BODMT2, BODMT3	UJ	
1/25/95	Methoxychlor		23	BODMT2, BODMT3	UJ	

## 000032

### **BLANK AND SAMPLE DATA SUMMARY**

SDG: W0429	REVIEWER: SC			DATE: 3/28/95			PAGE_1_OF_1		
COMMENTS: N	No problems.								
SAMPLE ID	COMPOUND	RESULT	a	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
									,
					/				
								A 1000 (3000)	

## 00

### **ACCURACY DATA SUMMARY**

SDG: W0429	REVIEWER: SC	DATE: 3/28/95	PAG	E_1_OF_1_			
COMMENTS: No problems.							
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED			
Harry State of the							
				,			

# 9615497. 1585

## 000034

### PRECISION DATA SUMMARY

SDG: W0429			DATE: 3/28/95		PAGE_1_OF_1_	
COMMENTS: N	o problems.					
COMPOUND		SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
						·
						,

### HOLDING TIME SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/28/	DATE: 3/28/95		PAGE_1_0F_1_	
COMMENTS: N	o problems. A	II within limits	3					
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER	
·								
							,	

## 9613497. ISBT 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. W0429-QES (SDG No. W0429)

### INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
BODMT3	01/17/95	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 <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.

All 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.

All 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 spike 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. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage 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.

### Appendix 1

Glossary of Data Reporting Qualifiers

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

- 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.
- 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).
- 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

### DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: RJS	DATE: 4/4/95	PAGE 1 OF 1
COMMENTS: No	Data Qualified	-	
COMPOUND	QUALIFIERS	SAMPLES AFFECTED	REASON

### Appendix 3

**Qualified Data Summary and Annotated Laboratory Reports** 

Project: WESTING! Laboratory: Quant		TIME OF		-																	
Case	SDG: W	10420		-																	
	SUG: W	BODMT	2	BODMTS											-	1			_		
Sample Number						-				-		-		-				-			
Location	110/1/0	Test Pit	#2	Test Pit	#2							-									
	MG/KG	Soil		Soil		-		-													
Sample Date	CODDI	01/17/	95	01/17/9	5	Daniella	10	Describ	10	Describ		D	-	D	10	D 1	-		T.A.		
Inorganic Analytes Aluminum	20		u	Result 63400	u	Result	u	Result	u	Hesuit	u	Result	u	Hesuit	Q	Hesuit	Q	Hesuit	Q	Hesult	Q
Antimony	10	7.8		10.1			+		+		-	-	-		-				-		+
Arsenic	10	14.4		41.1	U		-		-		-		-		-		-		-		+
Barium	20	74.3		107			-	-	-	-	-	-	$\vdash$		-			-	-		-
	0.7	0.59		0.76	-	-	-		-	-	-	-	-		-		-		-		-
Beryllium		2.6		4.7	-	-	+		$\vdash$		-	-	-		-	-	-		-		+
Cadmium	2	3630	-			-	+-		-	-	-		-		-		-		-		-
Calcium	500			4200	-		-				-	ļ	-		-		-		-		-
Chromium	2	66.4		77.1	-		-		-				-		_		_				-
Cobalt	5	7.3		9.4			-		-								_				_
Copper	2.5	68.6		55.8	_				-												
Iron	10	20100		21000			-		-								-				
Lead	0.3	104		197					_												
Magnesium	500	3090		4180																	
Manganese	1.5	140		201																	
Nickel	4	14.7		18.8																	
Potassium	500	654		970																	
Selenium	0.5	0.18		0.31	U																
Silver	20	0.76		1.3				-													
Sodium	100	244		286																	
Thallium	1	0.28		0.32																	
Vanadium	5	45.0		46.5																	
Zinc	2	450		1030																	
							1		1										1		1
									1									-		***************************************	1
								1	1						1				1		1

5/3/95

#### U.S. EPA - CLP

		0.5.	EPA - CLP			
		INORGANIC A	1 ANALYSES DATA :	SHEET	EPA	SAMPLE NO.
ab Name: ITAS ab Code: ITMO atrix (soil/w evel (low/med Solids:	Case Nater): SOII	_	Contract: 550 SAS No.:	Si Lab Sam	OG No.: ole ID:	W0429 7344-002 01/18/95
Co	ncentration	Units (ug	/L or mg/kg dry	y weight	t): MG/	KG
	1	(-3/				
	CAS No.	Analyte	Concentration	C Q	M	
	7429-90-5	Aluminum	53700	-	- P	
	7440-36-0	Antimony	7.8	B	P P	
	7440-38-2	Arsenic	14.4	В	F	
	7440-39-3	Barium	74.3		P	
	7440-41-7	Beryllium	0.59	B	- P-	
	7440-43-9	Cadmium	2.6	В	P P P P	
	7440-70-2	Calcium	3630		P	
	7440-47-3	Chromium	66.4	-	P P P	
	7440-48-4	Cobalt	7.3	B	P	
	7440-50-8	Copper	68.6		- P	
	7439-89-6	Iron	20100		- P	
	7439-92-1	Lead	104		P_P	
	7439-95-4	Magnesium	3090	-	P_P_	
	7439-96-5	Manganese	140		-   B-	
	7440-02-0	Nickel	14.7	-	P_	
	7440-02-0	Potassium	654	=	- p-	
	7782-49-2	Selenium	0.18		P_F	
	7440-22-4	Silver	0.76	В	- D-	
	7440-23-5	Sodium	244		P_P_F_	
	7440-28-0	Thallium	0.28	B	- F-	
	7440-62-2	Vanadium	45.0		- B-	
	7440-62-2		45.0	-	P_P_	
	7440-66-6	Zinc	450	-	-   -	
				-		
				-		
				- -		
		-				
				-		
				-		
				-	_ _	
				_		
lor Before:		Clari	ty Before:		Text	
or After:		Clari	ty After:		Arti	facts:
mments:						
		-				
						1124/45
		T/	ORM I - IN			42773
		F	OLUI I – IN			SW-84
					. 1/	

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-00951 es

#### U.S. EPA - CLP

## 1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

INORGANIC	ANALYSES DATA SHEET	-,
ab Name: ITAS_STLOUISab Code: ITMO Case No.:	Contract: 550.56  SAS No.:  BODMT3  SDG No.: W0429	_
atrix (soil/water): SOIL_ evel (low/med): LOW	Lab Sample ID: 7344-004 Date Received: 01/18/95	
Solids: _32.3	// or mg/kg dry weight): MG/VG	

Concentration Units (ug/L or mg/kg dry weight): MG/KG

01 0 VI-					
CAS No.	Analyte	Concentration	С	Q	M
7429-90-5	Aluminum	63400	-		P
7440-36-0	Antimony -	10.1	Ū		P
7440-38-2	Arsenic	41.1			F
7440-39-3	Barium	107	_		P
7440-41-7	Beryllium	0.76	B		P
7440-43-9	Cadmium	4.7	В		P
7440-70-2	Calcium	4200			P
7440-47-3	Chromium	77.1	_		P
7440-48-4	Cobalt	9.4	B		P
7440-50-8	Copper	55.8		****	P
7439-89-6	Iron	21000	_		P
7439-92-1	Lead	197			P
7439-95-4	Magnesium	4180	_		P
7439-96-5	Manganese	201	_		P
7440-02-0	Nickel	18.8			P
7440-09-7	Potassium	970	$\overline{B}$		P
7782-49-2	Selenium	0.31	U		F
7440-22-4	Silver -	1.3	В		P
7440-23-5	Sodium	286	В		P
7440-28-0	Thallium	0.32	В		F
7440-62-2	Vanadium	46.5			P
7440-66-6	Zinc	1030			P
			_		_
			_		
			_		
			_		
			_		
			_		
			_		
			_		

	FORM I - IN	CW_0.46
Comments:		क्रिक्ट मीम्मीवड
Color Before:	 Clarity Before:	Texture: Artifacts:

000014

-00956K

## Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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 1, 1995

Attention: Joan Kessner

Project number

550.56

Date Received by Lab

January 18, 1995

Number of Samples

Two (2)

Sample Type

Soil

SDG Number

W0429

Data Deliverable

Standalone

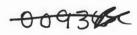
#### I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132:203	Soil	01/18/95
7344-004	B0DMT3	50132,205	Soil	01/18/95

#### 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.





Bechtel Hanford Incorporated March 1, 1995

Project Number: 550.56

SDG: W0429

Page 2

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.

#### III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

#### IV. Definitions

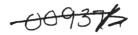
The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank QCLCS- Quality Control Laboratory Control Sample, Blank Spike

#### V. Comments

Samples arrived in St. Louis at  $0^{\circ}$ C which is not within the recommended  $4^{\circ}$ C  $\pm 2^{\circ}$ C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.



9615497 1614



Bechtel Hanford Incorporated March 1, 1995 Project Number: 550.56

SDG: W0429 Page 3

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

00938E

9813497, 1608



Bechtel Hanford Incorporated

March 1, 1995

Project Number: 550.56

SDG: W0429

Page 4

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:\\sqtmlo01\price\$\abbydave\hanford\hanw0429.nar

009398

			1-17-95		CO	91 OL	)Y/S/	AMPI	.E Ar	NALY	'SIS I	REQU	JEST				umaround Priorty	WS	- 1
Sellector St. Jahr. D	HIG BOT	wersA	20 6	Company Cont		TCH					Telepho		(509)37	6-2493			X Norma	Let 1	7-9
Project Designation	)	Wendy	8	Sampling Local		1011					SAF No.		1,507,751	0 24/3					
100-D PONDS PHASE II SAMP	1			00-D ield Logbook	No.	,					B94-09 Method	of Shipm	ent	-					
SML 457 and CK	14	114		Offsite Propert	. No						HAND D	ELIVER eding/Air	DIN No.						
Shipped To Offsite Prope											N/A	iding/Air	DIII NO.						
Possible Sample Hazards/Remark	<b>(8</b>			Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cory 4º	COOL 4	reary				
				Type of	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	····	COOL 4	C	G			
			-	Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	6	6			-
				No. of Container(s)	1	1	1	1	1	. 1	1	1	3	1	1				
Special Handling and/or Storage				Volume	125-1	125-1	125-1	425-1	/0-1	10-1	125-1	125-1	E00-14	20-1	500ml	950m	0		
OOL TO 4 DEGREES CENTIGE	AMPLE AN	ALYSIS			METALS- TAL/AA MATALS	125ml VOA-TCL		PCB/	40ml SULFIDE	40ml TOX	IC(F, Cl,S04, P04,	NO2-NO3	500ml* TOTAL ALPHA/ BETA, GEA	ACTIVI-	Total	total			
					(As,Pb, Se,Tl)				-	-	NO2, NO3)				Gamm	agamn	4		
5017	322				A	В	_	D	E	F	6	4			Spec	Spec	5013	23	
Sample No.	Matrix*	Date S	ampled 3	ime Sampled							,		(	·~	,			<del></del>	
CHR4 BODMT6	el s	1117	195 0	SOPO	×	X	X	$\times$	X	X	X	$\sim$	XX	X	X	$\times$	10		
BODMS9	35	1/17/	195 0	907	X			X	X				1(00	X	X	X	2,		
BODMT2	35	1/17		0935	X	X	X	X	X	X	X	X	THE STATE OF THE S	X	X	X	3		
BODMRA	45	11 1		0935	$\searrow$	X	X	X	X	X	X	X	1	X		-	4		
GODMT3	1	11111		047	<b>X</b>	X	<b>/</b>	5		X	X	X		X	X	X	5		
	65	1-1,1-1-1	-	10u7	X	X	X	X	X	X	X	X	X	X			6		
CHAIN OF POSSESSION		1111	12	rint Names	/		1/	SPECIAL	INSTRU	CTIONS								Matrix*	
Relinquished By	Date/Tin	0830	Received By	West .	k.Hew	Date/Tip	73 6 3-95	LABORA1	ORY ANA	LYSIS F	OR PHOSE	PHATE, I	ITRATE,	NITRIT	E IS REC	UESTED 3-HOUR	FOR SE SO	= Soil = Sedime = Solid	nt
Relinguished By FAC	Date/Tin		Received By	Out Du	1860	Date/Tir	1095	HOLDING	TIME W	ILL NOT	BE MET						SL W O A	= Sludge = Water = Oil = Air	
KUL WALLEY B. Wh.H.	Date/Tir	100.00	Received By		<u> </u>	Date/Tir		1500g							GEA ANAL		DS DL T WI	= Drum S = Drum L = Tissue = Wipe	
Relinquished By	Date/Tir	ne	Received By			Date/Tir	ne	BO	DMT	)-to	tala/1	phalbe	talquand	1495	Dul.	rided	X X	= Liquid = Vegetar = Other	ion
LABORATORY SECTION Received By				Title											- Wo	86			
FINAL SAMPLE Disposal Methodisposition	od							Dispos	ed By						Date/Tin	ne		000-828 (1	

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

NS 11/1/95

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 CEO21 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 WATER VEGETATION OILS  SLUDGE CONCRETE OTHER									
LABORATORY SERVICES   ON-SITE   OFF-SITE									
LABORATORY LABORATORY CONTACT TELEPHONE									
Quanterra (Main) Not Applicable N/A									
Lockheed (Split) Not Applicable N/A									
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 OF

## 613497 1608

#### SAMPLE AND DATA MANAGEMENT

#### RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

.

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, BODMS6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, BODMV2 (1 SDG, summary deliverable)

LABORATORY: Quanterra

#### **DESCRIPTION OF EVENT:**

DATE: 01/31/95

- 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 B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 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/ May (Print/sign Name)	1/3/95 Date
M.T. Stankovich/ MITALIAN Name)  Technical Representative (Print/Sign Name)	2/13/95 Date
N/A Quality Assurance (Print/Sign Name)	Date

000022

2294950

Contractor

#### OFF-SITE PROPERTY CONTROL

CONTROL NO.
(To be obtained from PROPERTY MANAGEMENT)

-					1 0045-0-0000	2				
				APLETED BY ORIGINATOR						
Departm	ER En	g. Support	Field	& Analytical Supp	Field Sampline	9				
	The follows	ing items are to be shipped f	rom .	Contractor	ndor					
	Routing		[	Prepaid . Col	lect					
Shipped Compar Address City	Quant 2800	erra (IT) Geo Wash Way and, Washington S	9352 Code	Off-site Custodian On-site Custodian		Payroll No.				
Country										
Qty.	Property No.	Desc	nption (include Ma	nufecture Name, Model, S	erial No.)	Acquisition Cost				
1 Ibs		Cooler ID: SML-	457 E ER	BODMTA BODM 41 BODMTS samples packed	Ra BODMT3 BODMR3	N/A				
1 1bs		Sample #: Cooler ID: Polycooler with vermiculite	groundwater	samples packed	in wet ice and	N/A				
	Classified	Unclassified Shi	pped Under DOE C	ontract Ship	ped Under Contrector's Use Per	mit Contract				
	Business Trip Off-site Assign Shipment to So Other (Please :	ubcontractor. List Subcontra			Lading #: W/A  IOC AREA  RECEI	VED 3 1995				
					PODERTY					
CERTII	FICATION OF TH	E RADIATION MONITORING	RELEASE MUST E	E SECURED THE SAME D	AY THAT MATERIAL IS DELIVE					
Sa	arance for Public	· ·	1	Survey No. CARA — 0051		Date 1-18-95				
		for Property (Name/Phone N (509) 376-7777	lo./Bldg./Area)							
	ady for Shipmen		Cost Code to be	Charged E 2072 PV3AA	Approximate Date This Property will be Returned					
Originat	ed By	T. WHITTEN	Date 1-18-95	1-18-95 Authorized By						
Property	Representative	Signatura	Date	Property Management Approval  Debou RIVES 1/18/05						
			PART II - TO BE C	OMPLETED BY SHIPPING		7				
Authoria	zed Shipping Sig	nature			-602BS	Date				
				TER FINAL SIGNATURES)						
Whi	te - Property Mai	nagement Yellow - Shippin	ng Green - Acco	unts Pavable Pink - Original	ginator Goldenrod - Property	Management				

000023

54-3000-479 (01/94)

### Appendix 5

**Data Validation Supporting Documentation** 

## 961349 He SDLEN-SPP-002, Rev. 2

## INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	С	6	E
PROJECT:	NHC/BH	F	DATA PACKAG	E: W0429	- QES
VALIDATOR:	R73	LAB: Quar	iterra	DATE: 3/6	24/95
CASE: /00-	DR-1	D-Ponds	SDG:	W0429	
		ANALYSES	PERFORMED		
□ CLP/ICP	CLP/GFAA	□ CLP/Hg	☐ CLP/Cyanide	0	0
<b>★</b> SW-846/ICP	₩ SW-846/GFAA	☐ SW-846/Hg	SW-846 Cyanide	0	0
SAMPLES/MATR	IX Bod	MT2	(soil	)	
	BOD	MT3			
Is technical	AGE COMPLETEN verification rative presen	documentation	present? .		Yes No N/A
2. HOLDING T Are sample ho Comments:	lding times a				Yes No N//

AIS

## 961349HC150LEN-SPP-002, Rev. 2

## 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?	No	N/A
Are ICP interference checks acceptable? Yes	No	N/A
Were ICV and CCV checks performed on all instruments? (es)	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? (e)	No	N/A
Are ICB and CCB results acceptable?	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	NA
Comments:		$\overline{}$
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?	No	N/A
Comments:		

000026

# 9613497 WHE SO-EN-SPP-002, Rev. 2

#### 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	(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	N7A)
Comments:	$\underline{\hspace{0.1cm}}$
* No ICP Serial Dilution analysis with 500 . the	re fore
well results for all analytes are qualified as estimated	ated 4
and flagged (Just + No qualification of da	ta
since SW-846 methods do not require delution and	
7. FURNACE AA QUALITY CONTROL UNless sample concentration are	greater th
Were duplicate injections performed as required? (es) 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	WA
Are MSA results acceptable? Yes No	N/A)
Comments:	
NO GFAA Analytical Spike. No action taken since	٠
SW-846 AA criteria references lab specific OAP;P or	
contract SOW - which do not require a FFAA spike.	
8. REPORTED RESULTS AND DETECTION LIMITS	
Are results reported for all requested analyses? (es) No	N/A
Are all results supported in the raw data?	N/A
Are results calculated properly? Yes No	N/A
Do results meet the CRDLs?	N/A
Comments:	

AZIBL

0000%7

### 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. W0429-QES (SDG No. W0429-QES)

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-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
BODMT2	01/17/95	Soil	D	See Note 1
вормт3	01/17/95	Soil	D	See Note 1

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

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. W0429-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 <5xCRDL, a control limit of  $\le2x$ CRDL is used for soil samples and  $\le$ CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are  $\le$ CRDL for water samples and  $\le$ 2xCRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Radium-228 results for all samples were qualified as estimates and flagged "J" due to the lack of a duplicate analysis.

Uranium-238 results for all samples were qualified as estimates and flagged "J" due to a RPD of 39%.

All other 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 dectection levels (CRDL).

The reviewer verified that the results and detection limits fell within the linear range of the instrument. The MDA for Eu-154 and Fe-59 exceeded the CRDL. In accordance with WHC guidelines, no qualification was required.

All sample results were acceptable.

#### Completeness

Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

#### MAJOR DEFICIENCIES

None found.

#### MINOR DEFICIENCIES.

All Ra-228 sample results were qualified as estimates and flagged "J" due to the lack of a duplicate analysis.

#### **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:

- 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.
- 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.
- 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.

# Appendix 2 Summary of Data Qualification

## DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: RBC	DATE: 14/04/95	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Radium-228	J	BODMT2, BODMT3	No Duplicate
Uranium-238	J	BODMT2, BODMT3	RPD 38.7%
	-		
		·	

### Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Laboratory: QES																				
Case SDG:	W0429																			
Sample Number	BODMT2	2	BODMT3																	
Location	Test Pit	#2	Test Pit #2	2																
Remarks pCi/g	Soil		Soil																	
Sample Date Radiochemistry Analysis	01/17/95	5	01/17/95					24.74.7												
Radiochemistry Analysis	Result			3	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	9.95		25.0							1										
Gross Beta	20.6		21.1					_		_										
Cobalt - 58	0.0165	U	0.0143 L	1																
Cobalt-60	0.929		2.43		-															
Cesium-137DA	2.72		3.09																	
Europium 152	1.55		1.96																	
Europium – 154	0.331		0.46																	
Europium – 155	0.0790	U	0.112 L																	
Iron-59	-0.0454		-0.0669 L	J																
Potassium-40	9.57	1	6.77																	
Radium - 224DA	0.863		1.05																	
Radium - 226DA	0.813		0.801																	
Radium - 228DA	0.721	J	1.51 J	1																T
Uranium-238DLP	2.76	J	5.90 J	1																T
						1														
		_		+																
		-		-		-			-							1		_		
	-	-		+				1				_		-		1				1
		-		-		-				-						+		+		+
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		-		-		-		-		-		-		-		-	-	1		+
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		-	-	+		-				+		-		-	-	-		-		+
		-	-	-		-			-			-		-	-	-		-		-

775 S/3/95



#### SAMPLE RESULTS

LAB NAME:

ITAS-RICHLAND

SDG:

W0429

LAB SAMPLE ID:

50132303

MATRIX:

SOIL

CLIENT ID:

B0DMT2

DATE RECEIVED:

1/18/95

ISOTOPE		COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	
CO-58	1.65E-02 U	2.6E-02	2.6E-02	4.42E-02	pCi/g	N/A	RD3219	
CO-60	9.29E-01	6.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219	
CS-137DA	2.72E+00	7.0E-02	2.8E-01	N/A	pCi/g	N/A	RD3219	
EU-152	1.55E+00	1.2E-01	1.9E-01	N/A	pCi/g	N/A	RD3219	
EU-154	3.31E-01	6.6E-02	7.4E-02	1.36E-01	pCVg	N/A	RD3219	
EU-155	7.90E-02 U	5.9E-02	6.0E-02	8.92E-02	p <b>Ci/</b> g	N/A	RD3219	
FE-59	-4.54E-02 U	6.8E-02	6.8E-02	1.07E-01	pCi/g	N/A	RD3219	
K-40	9.57E+00	5.7E-01	1.1E+00	N/A	pCi/g	N/A	RD3219	
<b>RA-224DA</b>	8.63E-01	4.5E-02	9.7E-02	N/A	pCi/g	N/A	RD3219	
RA-226DA	8.13E-01	7.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219	
RA-228DA	7.21E-01 J	1.3E-01	1.5E-01	N/A	pCi/g	N/A	RD3219	
U-238DLP	2.76E+00 J	1.2E+00	1.2E+00	N/A	pCi/g	N/A	RD3219	
ALPHA	9.95E+00	4.8E+00	4.9E+00	5.93E+00	pCi/g	100.00%	RD3222	
BETA	2.06E+01	3.3E+00	3.6E+00	3.58E+00	pCi/g	100.00%	RD3222	

Number of Results: 14

X15-99



#### SAMPLE RESULTS

LAB NAME:

ITAS-RICHLAND

SDG:

W0429

LAB SAMPLE ID:

50132305

MATRIX:

SOIL

CLIENT ID:

B0DMT3

DATE RECEIVED:

1/18/95

ISOTOPE	DECLUIT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	1.43E-02 U	4.2E-02	4.2E-02	7.22E-02	pCi/g	N/A	RD3219
CO-60	2.43E+00	1.0E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	3.09E+00	1.0E-01	3.3E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.96E+00	1.7E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
EU-154	4.60E-01	1.0E-01	1.1E-01	2.01E-01	pCi/g	N/A	RD3219
EU-155	1.12E-01 U	7.6E-02	7.6E-02	1.29E-01	pCi/g	N/A	RD3219
FE-59	-6.69E-02 U	1.1E-01	1.1E-01	1.78E-01	pCi/g	N/A	RD3219
K-40	6.77E+00	7.3E-01	9.9E-01	N/A	pCi/g	N/A	RD3219
<b>RA-224DA</b>	1.05E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-226DA	8.01E-01	1.1E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	1.51E+00 J	2.5E-01	2.9E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	5.90E+00 J	1.8E+00	1.9E+00	N/A	pCi/g	N/A	RD3219
ALPHA	2.50E+01	7.0E+00	7.5E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	2.11E+01	3.3E+00	3.6E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 14

J. 4-18-91

## Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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 13, 1995

Attention: Joan Kessner



SAF Number

B94-098

Date SDG Closed

January 26, 1995

Number of Samples

Two (2) - See ROD-B95-013

Sample Type

Soil

SDG Number

W0429

Data Deliverable

Stand Alone

#### I. Introduction

On January 18, 1995, seven water 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:

 OTESRL ID
 BHI ID
 Matrix
 Date of Receipt

 50132303
 B0DMT2
 Soil
 1/18/95

 50132305
 B0DMT3
 Soil
 1/18/95

#### II. Analytical Results/Methodology

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





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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 W0429 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 in pCi/sample.

#### IV. Comments

BHI Off-site Property Control form W95-0-0204-3 identifies the samples as groundwater. The COC identifies the samples as soil.

Samples submitted as a single SDG, SDG W0386 (stand alone), were split into two SDGs after analysis had been started, W0386 (summary) and W0429 (stand alone), as per ROD-B95-013. The results are reported in two data packages, but were analyzed as a single batch with one set of QC.

#### Gamma Spectroscopy

#### Gamma Scan by method ITAS-RD-3219

The Fe-59 and Eu-154 RDLs were not met for sample B0DMT2. The Co-58, Fe-59, Eu-154, and Eu-155 RDLs was not met for sample B0DMT3. The blank met the RDL requirements, therefore, the batch data are accepted. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

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#### **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 M013232S, 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 M013231S. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

Gross Beta by method ITAS-RD-3222

The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

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

Reviewed and approved:

Suzanne Gaines Project Manager

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

pcs 1/1/95

DATE: 01/11/95
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 WATER VEGETATION OILS SLUDGE CONCRETE OTHER
LABORATORY SERVICES  ON-SITE  OFF-SITE
LABORATORY LABORATORY CONTACT TELEPHONE
Quanterra (Main) Not Applicable N/A
Lockheed (Split) Not Applicable N/A
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 <u>information only</u> . The ERC Contractor acknowledges the 48-hour holding time will not be met.

Westinghouse Hanfo Company	ord			CHAIN O	F CU	sтог	DY/S	AMP	LE AI	VALY	SIS	REQU	JEST			Data T	urnamund	of 7	st	
Sellector St. John Do	ughor	ive	11	Company Cont							Telepho					Priorty 1-17				
Project Designation				RC SMITH/MT Sampling Loca		/ICH					(509)3 SAF No	72-2537 <sub>.</sub>	(509)37	6-2493		1				
00-D PONDS PHASE II SAMPI	LING	wend		100-D							B94-09									
SML 457 and ER	14	TV	rempso	Field Logbook	No.						HAND D	of Shipm	ent							
Shipped To				Offsite Propert	y No.						Bill of L	ading/Air	Bill No.							
UANTERRA Possible Sample Hazards/Remark				1							N/A		41.							
				Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cecx 4	COOL 4	coay					
				Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	6	G				
				No. of Container(s)	,						1				1	1				
Special Handling and/or Storage				-	1	1	1	1	1	1	1	1	3	1	1	0-				
OOL TO 4 DEGREES CENTIGE	ADE			Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950m	l			
5013	AMPLE ANA	ALYSIS			TAL/AA MATALS (As,Pb, Se,Tl)		VOA-TCI	PCB/ PEST	SULFIDE	F	ANIONS IC(F, Cl, SO4, PO4, NO2, NO3)		ALPHA/ BETA, GEA	ACTIVI- TY SCAM	alpha	total alpha beta agamn Spec	4	2.3		
Sample No.	Matrix*	Date	Sampled	Time Sampled	***************************************		1		1		-	1.7			77-0	Jaco				
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BODMS9	35	1/1-	1/95	0907	X	3		8	X				(()	X	$\times$	X	2,			
D BODMT2	35	11-	7195	0935	X	X	$\sim$	X	X	X	X	X		X	X	X	3			
BODMRA	45	11-	195	0935		1	X	X	X	X	X	X				1	W.			
	-	117	1			KZ	K		$\Rightarrow$			$\Leftrightarrow$	1	$\Diamond$		V	-			
CO BODMT3		1,11	195	1047			K		$\leftarrow$	$\leftrightarrow$	$\longleftrightarrow$			$\Leftrightarrow$			5		-	
RBODMR3	65	1 17	1A5	1047	1X	X	X	X	X	X	×	1X					6			
CHAIN OF POSSESSION			SI	gn/Print Names					L INSTRU									Matrix	•	
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								1500g									T	= Tiset	ue	
Relinquished By	Date/Tir	me	Receive	d By		Date/Ti	lme	BC	DMT	2-tu	tala/ 145	phalbe	talquand	1×9	20mg	rded	X	= Liqui = Vege = Othe	station	
LABORATORY SECTION Received By				Title											- Wo	me 386				
FINAL SAMPLE Disposal Meth	od							Dispo	sed By						Date/Ti	mė				

°U.S. GPO: 1994-592-170/00029

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Contractor	ні	OFF- PROPERTY	SITE	CONTROL I	RTY MANAGEMENT
				W95-0-0304	-3
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Department ER E	ng. Support	Section Field	d & Analytical Sur	pp Unit Field Samplin	g
The follo	wing items are to be shipped	d from	□ V     □ V	endor	
Routing			Prepaid . C	ollect	40
Shipped to	terra (IT)		Off-site Custodian		
	Geo Wash Way				
City	land, Washington	99352	On-site Custodian		Payroli No.
Country					
Qty. Property No.	De	scription <i>linclude</i>	Manufacture Name, Model,	Serial No.)	Acquisition Cost
1	Sample #-BODI	DIE BODDS	בשחת בשחתים פי	NRA BODMES BODMES	
1	Cooler ID: 5M				
		h groundwat	er samples packed	in wet ice and	N/A
1bs	vermiculite				
1	Sample #:				
	Cooler ID:	h amound of	and an analysis	in wat ica and	N/A
1bs	vermiculite	n groundwat	er sa <del>mples</del> packed	Th wet ice and	N/A
Classified		Shipped Under DO	E Contract Shi	ipped Under Contractor's Use Per	rmit Contract
	ite use of this property Project Work. List Project f	im-	D-PONDS PHA	SF TT	
T		10			
☐ Business Trip			B111 OT	Lading #: W/R	
Off-site Assi					
	Subcontractor. List Subcon			VOC 8850	
Other (Please	specify) Samping	supports k	I/FS work in the	IDC REA	VED
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				11AN 1	8 1995
				- JROBERTY-	DEPART
CERTIFICATION OF T	THE RADIATION MONITORI			DAY THAT MATERIAL IS DELIVE	ERED TO SHIPPING.
RM Clearance for Publ			RM Survey No.	•	Date
Jane Kar	ct for Property (Name/Phone	No (Bld= (Assa)	RARA - 005		11-18-95
	(509) 376-7777	140./Bidg./Area)			
Date Ready for Shipme		Cost Code to	o be Charged	Approximate Date This	
	1-18-95		ITE 2072 PV3AA	Property will be Returned	
Originated By	J. WHITTEN	1-18-9	5 Authorized By	22	Date 1-15-95
Property Representative	re Signature	Date	Property Managemen		Data
			X	Debbu KIVES	11/18/02
Authorized Shipping S	ignatura	PART II - TO BI	E COMPLETED BY SHIPPING		Dete
remonized suithbing 2	gradus	-		-6026B	Date
		DISTRIBUTION	(AFTER FINAL SIGNATURES	3)	
White - Property M	lanagement Yellow - Ship	ping Green - A	ccounts Payable Pink - O	riginator Goldenrod - Property	Management

1.019

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54-3000-479 (01/94)

# SAMPLE AND DATA MANAGEMENT RECORD OF DISPOSITION

Quality Assurance (Print/Sign Name)

11. Tata Man Made Suzi Vicki

ROD-895-013
Record of Disposition No.

Date

000022

DATE: 01/31/95	LABORATORY: Quanterra	
PROJECT TITLE/NO.: 100-D Panda/204-099		NCR NO.: N/A
SAMPLE IDENTIFICATION NUMBERS:  DO P HASSOL 5013220 \$ +05 3.  1) BODMT2, BODMT3 (1 SDG, standalone deliverable) woods  DISPERATE 50151712 + 51812  2) BODMT4 (1 SDG, standalone deliverable); BODMS0, BODMS7, BODMR6, BODMS3, BODM BOSMX5, BODMV0, BODMV1, BODMV2 (1 SDG)	prable); BODMT6, BODMS9 DDMR4, BODMR9, BODMS6 IS8, BODMT7, BODMR7, BO	, BODMT1, BODMR5, DMS4, BODMT0, BODMT9,
DESCRIPTION OF EVENT:		
<ol> <li>These samples were collected in the first phatogether in one batch with one set of QC.</li> </ol>	ase of the sampling event.	They were analyzed
2) These samples were collected in the second together in one batch with one set of QC.	phase of the sampling even	t. They were analyzed
SAF requests all data packages be standalone;	two should be standalone a	nd two should be summary.
DISPOSITION OF SAMPLES:		
1) Results for samples BODMT2 and BODMT3 s Results for samples BODMT6, BODMS9, BODMI summary data package. Results from common reported in both data packages.	R2, BODMR3, and BODMT5	should be reported in one
2) Results from sample BODMT4 should be reposamples BODMR4, BODMR9, BODMS6, BODMT BODMS8, BODMT7, BODMR7, BODMS4, BODM BODMV2 should be reported in one summary databatch should be duplicated and reported in both	1, BODMR5, BODMSO, BOD TO, BODMT9, BOSMX5, BO ata package. Results from o	MS7, BODMR6, BODMS3, DMV0, BODMV1, and
APPROVAL SIGNATURES:		
R. C. Smith/ Megh fund		1/3/95
OSM Project Coordinator (Print/Sign Name)	•	/ Date
M.T. Stankovich/ MILL		2/13/95
Technical Representative (Print/Sign Name)		Date
N/A	603	HBC.

## Appendix 5

**Data Validation Supporting Documentation** 

## 96 SHC-SD-EN-3PP-001, Rev. 1

#### RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	Α	. В	С	D	E
PROJECT: [C	10-DR-1	D Ponds.	DATA PACKAGE	: W0429	-aes
VALIDATOR:		LAB: QE		DATE: 30 A	
CASE:				429	
		ANALYSES	PERFORMED		
Grose Alpha/Beta	☐ Strontium-90	☐ Technetium-89	m-99 Alpha Germa Spectroscopy Spectros		
☐ Total Uranium	☐ Redium-22	□ Tritium			
1. Completen Technical ver Comments:		ms present? .		Yes	□ N/A ) No N/A
Instruments/d one yea Initial calib	etectors cali r of sample a ration accept T traceable?	brated within analysis?		· · · · Yes	NO N/A NO N/A NO N/A

K-1BC

# 96|3497-sb-20-spp-001, Rev. 1

3. Continuing Calibration $\square$ 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 ralibration data. No qualification
required.
4. Blanks
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
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:
•

AZP

## 9613497 1639 WHC=SD-EN-SPP-001, Rev. 1

6. Laboratory Control Samples
LCS analyzed?
LCS recoveries acceptable? Yes No N/A
LCS traceable? Yes No N/A
Transcription/Calculation Errors? Yes (No) N/A
Comments: U-238 % recovery 37.790 'J'
7. Chemical Recovery
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
Duplicates Analyzed? Yes No N/A
RPD Values Acceptable? Yes No N/A
Transcription/Calculation Errors? Yes (No N/A
comments: Ra-228 -No duplicate 'J'

ASK

# 96 3402 soleN SPP-001, Rev. 1

9. Field QC Samples
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?
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:
Both Samples EUISY + Fe-59 MDA > CRDL

A-APS