W02417

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

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0049863

CASE NARRATIVE

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

July 10, 1998

Attention: Joan Kessner

OCT 1998 RECEIVED EDMC

JUL 1998 RECEIVED Data Log In

Project Number	:	550.260
SDG	:	W02417
Number of Samples	:	One (1)
Sample Matrix	:	Other Liquid
Data Deliverable	:	Summary
Date SDG Closed	:	June 9, 1998

II. Introduction

On June 9, 1998, one (1) "other liquid" sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. There are no comments or nonconformances associated with the shipping and receiving of these samples. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St. Louis ID	BHI ID	Richland ID	Matrix	Date of Receipt
18104-001	B0P0B9	80615501	Other Liquid	09-JUNE-98

III. Analytical Results/ Methodology

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

Analyses requested:
- Semivolatiles by EPA method 8270
- Flashpoint by EPA method 1010
- ICP (TCLP) metals EPA method 1311/6010
- Mercury (TCLP) EPA method 1311/7470

Analyses requested: (cont.) pH by EPA method 9045
Volatiles by EPA method 8260

Deviation from Request: No Deviation from requested methods.

IV. Definitions

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

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

V. Comments

General: No general comments were noted for this Sample Delivery Group.

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

Due to the matrix of the sample both the ICP and the Mercury digestions were prepped 1 mL to 100 mLs for the sample, the matrix spike, the matrix spike duplicate and the extraction blank.

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

Samples were prepped and analyzed as a waste dilution.

Bechtel Hanford Incorporated
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Semivolatiles:(Cont.) Sample was analyzed as a waste dilution.The last internal standard, Perylene-d12, had low recovery due to a large interfering peak.The surrogate, Phenol-d5, had high recovery in the MS. The spike compound, Pyrene, had high recovery in the MS.

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

The sample in this SDG was a methanol soluble liquid and was prepped as a waste dilution (2ml to 10ml). An additional 10x dilution was applied at the instrument, for a total dilution of 2500x. The MS/MSD were analyzed in the sample manner. Surrogates and spiking compounds were diluted out.

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

The "Y" flag associated with the Ignitability analysis designates that the sample did not ignite at the upper limit of 60°C.

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:

Robert E. White

Robert E. White
Project Manager

W02417

Quanterra June 18, 1998 10:12 am
Account: 10722 Project: 550.260 Quanterra-Richland QAS No. 550.26 Rev. 3
Master Sample Login: 18104

Project Manager: R. White

Draft: (Final:) Entered and Reviewed by: S. Sourwin PM Review: Robert E. White

Sample Header Template:

Sample No. / Comments / # / Data:	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
18104-001	B0P0B9	Liquid	05-JUN-98 10:30	09-JUN-98 08:30	24-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80615501								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-120ML	BNA/8270/Q4	S	COLD	22-JUN-98	19-JUN-98	T2C	(384943:100)
1		EXTMETAL/TCLP/Q4	S	COLD	22-JUN-98	03-JUL-98	T2C	(384947:98)
1		FLPT/1010/Q4	S	COLD	22-JUN-98	02-DEC-98	T2C	(384944:99)
1		HG/TCLP/Q4	S	COLD	22-JUN-98	03-JUL-98	T2C	(384947:98)
1		ICAP/TCLP/Q4	S	COLD	22-JUN-98	02-DEC-98	T2C	(384947:98)
1	AN - Amber Glass-60ML	VOA/8260/Q4	S	COLD	22-JUN-98	19-JUN-98	109A	(384940:100)
1	VI - Vial-20ml	HOLD//Q4	S	COLD	22-JUN-98	19-JUN-98	T2C	(384934:100)
1		PH/9045/Q4	S	COLD	22-JUN-98	06-JUN-98	T2C	(384935:99)

18104-001DUP	B0P0B9	Liquid	05-JUN-98 10:30	09-JUN-98 08:30	24-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80615501								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-120ML	FLPT/1010/Q4	S	COLD	22-JUN-98	02-DEC-98	T2C	(384944:99)
1	VI - Vial-20ml	PH/9045/Q4	S	COLD	22-JUN-98	06-JUN-98	T2C	(384935:99)

18104-001MS	B0P0B9	Liquid	05-JUN-98 10:30	09-JUN-98 08:30	24-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80615501								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-120ML	BNA/8270/Q4	S	COLD	22-JUN-98	19-JUN-98	T2C	(384943:100)
1		EXTMETAL/TCLP/Q4	S	COLD	22-JUN-98	03-JUL-98	T2C	(384947:98)
1		HG/TCLP/Q4	S	COLD	22-JUN-98	03-JUL-98	T2C	(384947:98)
1		ICAP/TCLP/Q4	S	COLD	22-JUN-98	02-DEC-98	T2C	(384947:98)
1	AN - Amber Glass-60ML	VOA/8260/Q4	S	COLD	22-JUN-98	19-JUN-98	109A	(384940:100)

18104-001MSD	B0P0B9	Liquid	05-JUN-98 10:30	09-JUN-98 08:30	24-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80615501								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-120ML	BNA/8270/Q4	S	COLD	22-JUN-98	19-JUN-98	T2C	(384943:100)
1		EXTMETAL/TCLP/Q4	S	COLD	22-JUN-98	03-JUL-98	T2C	(384947:98)
1		HG/TCLP/Q4	S	COLD	22-JUN-98	03-JUL-98	T2C	(384947:98)
1		ICAP/TCLP/Q4	S	COLD	22-JUN-98	02-DEC-98	T2C	(384947:98)
1	AN - Amber Glass-60ML	VOA/8260/Q4	S	COLD	22-JUN-98	19-JUN-98	109A	(384940:100)

3**-Sample has not been rad screened.

Chain of Custody Record

ST 10110 temp 4°c cm #015558

Quanterra

QUA 4124 0797

Client: Bechtel	Project Manager: A. Koprucki	Date: 6-9-98	Chain of Custody Number: 09717
Address	Telephone Number (Area Code)/Fax Number		Lab Number
			Page 1 of 1
City / State / Zip Code	Site Contact	Lab Contact	
Project Name: SAF B98-089	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.			

Analysis (Attach list if more space is needed): SEE COC

Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	
806155D1 B0F0B9	Chemical Analysis Bottles												

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal: ☒ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Due 6-24-98

QC Requirements (Specify): SDG-W0247

	Date	Time		Date	Time
1. Relinquished By: Heidelberg QES	6-9-98	16:00	1. Received By: Joe Tremin	6-11-98	0830
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-089-01	Page 1 of 1

Collector Nielson/St. John	**Company Contact** Tom Brown	**Telephone No.** 376-1547	**Project Coordinator** WEISS, RL
Project Designation 224B Waste Sampling	**Sampling Location** 200 West		**SAF No.** B98-089
Ice Chest No.	**Field Logbook No.** ~~EL-1281~~ RJN 6/5/98 EL-1424		**Method of Shipment** Hand deliver - Govt vehicle
Shipped To Quanterra Incorporated	**Offsite Property No.**		**Bill of Lading/Air Bill No.**
Waste Designation Client determined no waste codes associated with this project.			**COA**

Data Turnaround 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage Cool 4C

Preservation	None	None	None	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	~~P~~ aG	~~P~~ G	~~P~~ G	aGs*	aG	aG	~~P~~ aG	~~P~~ aG	~~P~~ aG	~~P~~ aG
No. of Container(s)	0	1	1	1	1	1	1	1	1	1
Volume	500ml	20ml	20ml	40ml	125ml	125ml	125ml	250ml	500ml	1000ml
SAMPLE ANALYSIS	~~Technetium-99~~ 6/9/98	Activity Scan	pH (Soil) - 9045	VOA - 8260A (TCL)	Semi-VOA - 8270A (TCL)	Ignitability - 1010	Metals by ICP (TCLP) - 1311/6010A, Mercury (TCLP) - 1311/7470	Gross Alpha, Gross Beta	Strontium-89,90 -- Total Sr	See item (1) in Special Instructions
	806155 SDG W02417							80	6/9/98	601

Sample No.	Matrix *	Sample Date	Sample Time										
B0P0B9 01	Other Liquid	6/5/98	1030	X	X	X	X	X	X	X	X	X	X
~~B0P0C1~~	~~Other Liquid~~	RJN 6/5/98			100%	100%	100%	100%	100%	100%	B0P0B8		

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By	Date/Time	Received By	Date/Time
R Kelly / R.F. Kelly	~~6-10-98~~ 0830 / 6-9-98	Darrell Ackerman	6-9-98 0830
		2100 LPM / Joe Lemon	6-11-98 0830

SPECIAL INSTRUCTIONS

** Close SDG upon receipt of sample.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *

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

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

Post-it® Fax Note 7671

To Bob Fullerton		Date 6/9/98	# of pages ▶ 1
Co./Dept.		From Al Davis	
Phone #		Co.	
Fax # 376-8857		Phone # 373-9251	
		Fax #	

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

B0P0B9

Project	224B Waste sampling		
Customer ID	B0P0B9	Other Liquid	
RCF ID	RCF3493		
	Sample time, date	1060	6/5/98
	Analysis date		6/5/98

Isotope		Activity pCi/gm	2 s er	Ci/gm
K40	<	5.7e+00		5.7e-12
Co60	<	9.0e-01		9.0e-13
I129	<	5.8e+00		5.8e-12
Cs137	<	8.4e-01		8.4e-13
Eu152	<	4.2e+00		4.2e-12
Eu154	<	2.9e+00		2.9e-12
Eu155	<	1.6e+00		1.6e-12
Th232dau	<	5.0e+00		5.0e-12
U235	<	4.4e+00		4.4e-12
U238	<	9.1e+01		9.1e-11
U238dau	<	1.7e+02		1.7e-10
Np237	<	6.2e-01		6.2e-13
Am241	<	1.2e+00		1.2e-12
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	1.0e-01		1.0e-13
Gross Beta	<	2.9e-01		2.9e-13 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 1.0e+00
(Ci/gm) 1.0e-12

Note: 152-Eu is not a 100% Beta emitter.

1750 grams

Cat I

6/9/98

Definitions:

All errors reported at 2 standard deviations
A Assigned as residual beta from Gamma/Beta balance.
For soils and natural samples, the following applies:
The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of 232Th. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.

N/R means no result or analysis not requested.

Radiological analyst — Date 6-9-98

Albert I. Davis, Radiological Manager — Date 6/9/98

000008

Bechtel

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 6-9-98 830 SG#: W02417

Work Order Number: 806155 + 156 SAF #: B98-089

Shipping Container ID: SR 98001 Chain of Custody #: B98-089-01

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [ ] No [✓]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4 °C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 9
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - [✓] tape
   - [✓] custody seals
   - [ ] hazard labels
   - [ ] appropriate sample labels

9. Samples are:
   - [✓] in good condition
   - [ ] broken
   - [ ] leaking
   - [ ] have air bubbles

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

Sample Custodian/Laboratory: Karen [illegible] Date: 6-9-98

Telephoned To: _____ On _____ By _____

Quanterra Environmental Services

015558

Login No.: 18104

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: BHI (Richland)

Date: 6-11-98 Time: 0830

Project No: 550.260

Initiated by: Joe Tiemann

Shipper/No: Airborne

RFA/COC Numbers: 09717

Condition/Variance (Check all that apply):

1. ☐ Sample received broken/leaking.
2. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C
     Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
3. ☐ Sample received in improper container.
4. ☐ Sample received without proper paperwork. Explain: _____
5. ☐ Paperwork received without sample.
6. ☐ No sample ID on sample container.
7. ☐ Custody tape disturbed/broken/missing.
8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
9. ☐ All coolers on airbill not received with shipment.
10. ☐ Other (explain below): _____

☒ **No variances were noted during sample receipt.** **Cooler Temperature Upon Receipt:** 4°C

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) Joe Tiemann Date: 6-11-98

Project Management Review: Robert E. White Date: 6-16-98

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

SL-ADMIN-0004, Revised 11/24/95

000010

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: Volatiles 8260
Method: EPA 8260A
Matrix: LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/06/98

Quanterra ID : 18104-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK175595-1	06/18/98	06/18/98	25000	UG/L	U	25000	1250
Bromomethane	74-83-9	QCBLK175595-1	06/18/98	06/18/98	25000	UG/L	U	25000	1250
Vinyl Chloride	75-01-4	QCBLK175595-1	06/18/98	06/18/98	25000	UG/L	U	25000	1250
Chloroethane	75-00-3	QCBLK175595-1	06/18/98	06/18/98	25000	UG/L	U	25000	1250
Methylene Chloride	75-09-2	QCBLK175595-1	06/18/98	06/18/98	10000	UG/L	BJ	50000	1250
Acetone	67-64-1	QCBLK175595-1	06/18/98	06/18/98	320000	UG/L	B	12000	1250
Carbon Disulfide	75-15-0	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
1,1-Dichloroethene	75-35-4	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
1,1-Dichloroethane	75-34-3	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
1,2-Dichloroethene (total)	540-59-0	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Chloroform	67-66-3	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
1,2-Dichloroethane	107-06-2	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
2-Butanone (MEK)	78-93-3	QCBLK175595-1	06/18/98	06/18/98	80000	UG/L		50000	1250
1,1,1-Trichloroethane	71-55-6	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Carbon Tetrachloride	56-23-5	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Bromodichloromethane	75-27-4	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
1,2-Dichloropropane	78-87-5	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
cis-1,3-Dichloropropene	10061-01-5	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Trichloroethene	79-01-6	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Dibromochloromethane	124-48-1	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
1,1,2-Trichloroethane	79-00-5	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Benzene	71-43-2	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
trans-1,3-Dichloropropene	10061-02-6	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Bromoform	75-25-2	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
4-Methyl-2-Pentanone (MIBK)	108-10-1	QCBLK175595-1	06/18/98	06/18/98	50000	UG/L	U	50000	1250
2-Hexanone	591-78-6	QCBLK175595-1	06/18/98	06/18/98	49000	UG/L	J	50000	1250
Tetrachloroethene	127-18-4	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Toluene	108-88-3	QCBLK175595-1	06/18/98	06/18/98	3200	UG/L	J	12000	1250
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Chlorobenzene	108-90-7	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
EthylBenzene	100-41-4	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Styrene	100-42-5	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Xylene (total)	1330-20-7	QCBLK175595-1	06/18/98	06/18/98	12000	UG/L	U	12000	1250
Unknown-1	TIC-32	QCBLK175595-1	06/18/98	06/18/98	35051	UG/L	J		1250
3-Penten-2-one, 4-methyl-	141-79-7	QCBLK175595-1	06/18/98	06/18/98	62845	UG/L	JN		1250
2-Heptanone, 6-methyl-	928-58-7	QCBLK175595-1	06/18/98	06/18/98	30168	UG/L	JN		1250
Unknown-2	TIC-33	QCBLK175595-1	06/18/98	06/18/98	16216	UG/L	J		1250
Unknown-3	TIC-34	QCBLK175595-1	06/18/98	06/18/98	27031	UG/L	J		1250
Unknown-4	TIC-35	QCBLK175595-1	06/18/98	06/18/98	36192	UG/L	J		1250
Unknown-5	TIC-36	QCBLK175595-1	06/18/98	06/18/98	37559	UG/L	J		1250
Unknown-6	TIC-37	QCBLK175595-1	06/18/98	06/18/98	19352	UG/L	J		1250
Unknown-7	TIC-7	QCBLK175595-1	06/18/98	06/18/98	29052	UG/L	J		1250
Bromofluorobenzene	460-00-4	QCBLK175595-1	06/18/98	06/18/98	12	%REC	D		1250
Dibromofluoromethane	1868-53-7	QCBLK175595-1	06/18/98	06/18/98	15	%REC	D		1250
Toluene-d8	2037-26-5	QCBLK175595-1	06/18/98	06/18/98	12	%REC	D		1250

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: Volatiles 8260
Method: EPA 8260A
Matrix: LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK175595-1	06/18/98	06/18/98	13	%REC	*		1250
Trichloroethene	79-01-6	QCBLK175595-1	06/18/98	06/18/98	10	%REC	*		1250
Benzene	71-43-2	QCBLK175595-1	06/18/98	06/18/98	11	%REC	*		1250
Toluene	108-88-3	QCBLK175595-1	06/18/98	06/18/98	9	%REC	*		1250
Chlorobenzene	108-90-7	QCBLK175595-1	06/18/98	06/18/98	10	%REC	*		1250
Bromofluorobenzene	460-00-4	QCBLK175595-1	06/18/98	06/18/98	11	%REC	D		1250
Dibromofluoromethane	1868-53-7	QCBLK175595-1	06/18/98	06/18/98	13	%REC	D		1250
Toluene-d8	2037-26-5	QCBLK175595-1	06/18/98	06/18/98	11	%REC	D		1250

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: Volatiles 8260
Method: EPA 8260A
Matrix: LIQUID

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Client ID: B0P0B9

Quanterra ID : 18104-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK175595-1	06/18/98	06/18/98	15	%REC			1250
Trichloroethene	79-01-6	QCBLK175595-1	06/18/98	06/18/98	10	%REC	*		1250
Benzene	71-43-2	QCBLK175595-1	06/18/98	06/18/98	11	%REC	*		1250
Toluene	108-88-3	QCBLK175595-1	06/18/98	06/18/98	9	%REC	*		1250
Chlorobenzene	108-90-7	QCBLK175595-1	06/18/98	06/18/98	10	%REC	*		1250
Bromofluorobenzene	460-00-4	QCBLK175595-1	06/18/98	06/18/98	10	%REC	D		1250
Dibromofluoromethane	1868-53-7	QCBLK175595-1	06/18/98	06/18/98	12	%REC	D		1250
Toluene-d8	2037-26-5	QCBLK175595-1	06/18/98	06/18/98	10	%REC	D		1250

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0P0B9

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02417

Matrix: (soil/water) WATER Lab Sample ID: 18104-001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: BSMP3714

Level: (low/med) MED Date Received: 06/09/98

% Moisture: not dec. _____ Date Analyzed: 06/18/98

Column: (pack/cap) CAP Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	25000	U
74-83-9	Bromomethane	25000	U
75-01-4	Vinyl Chloride	25000	U
75-00-3	Chloroethane	25000	U
75-09-2	Methylene Chloride	10000	JB
67-64-1	Acetone	320000	B
75-15-0	Carbon Disulfide	12000	U
75-35-4	1,1-Dichloroethene	12000	U
75-34-3	1,1-Dichloroethane	12000	U
540-59-0	1,2-Dichloroethene (total)	12000	U
67-66-3	Chloroform	12000	U
107-06-2	1,2-Dichloroethane	12000	U
78-93-3	2-Butanone	80000	
71-55-6	1,1,1-Trichloroethane	12000	U
56-23-5	Carbon Tetrachloride	12000	U
75-27-4	Bromodichloromethane	12000	U
78-87-5	1,2-Dichloropropane	12000	U
10061-01-5	cis-1,3-Dichloropropene	12000	U
79-01-6	Trichloroethene	12000	U
124-48-1	Chlorodibromomethane	12000	U
79-00-5	1,1,2-Trichloroethane	12000	U
71-43-2	Benzene	12000	U
10061-02-6	trans-1,3-Dichloropropene	12000	U
75-25-2	Bromoform	12000	U
108-10-1	4-Methyl-2-pentanone	50000	U
591-78-6	2-Hexanone	49000	J
127-18-4	Tetrachloroethene	12000	U
108-88-3	Toluene	3200	J
79-34-5	1,1,2,2-Tetrachloroethane	12000	U
108-90-7	Chlorobenzene	12000	U
100-41-4	Ethylbenzene	12000	U
100-42-5	Styrene	12000	U
1330-20-7	Xylenes (total)	12000	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0P0B9

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02417

Matrix: (soil/water) WATER Lab Sample ID: 18104-001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: BSMP3714

Level: (low/med) MED Date Received: 06/09/98

% Moisture: not dec. _____ Date Analyzed: 06/18/98

Column: (pack/cap) CAP Dilution Factor: 10.0

Number TICs found: 9

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	7.389	35051	J
2. 141-79-7	3-Penten-2-one, 4-methyl-	12.490	62845	NJ
3. 928-68-7	2-Heptanone, 6-methyl-	19.331	30168	NJ
4.	Unknown	22.795	16216	J
5.	Unknown	23.857	27031	J
6.	Unknown	24.049	36192	J
7.	Unknown	24.501	37559	J
8.	Unknown	24.884	19352	J
9.	Unknown	25.006	29052	J
10.				
11.				
12.				
13.				
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21.				
22.				
23.				
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25.				
26.				
27.				
28.				
29.				
30.				

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352 1613

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
bis(2-Chloroethyl)Ether	111-44-4	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2-Chlorophenol	95-57-8	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
1,3-Dichlorobenzene	541-73-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
1,4-Dichlorobenzene	106-46-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
1,2-Dichlorobenzene	95-50-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2-Methylphenol	95-48-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,2'-oxybis (1-Chloropropane)	108-60-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
4-Methylphenol	106-44-5	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
N-nitroso-di-n-propylamine	621-64-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Hexachloroethane	67-72-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Nitrobenzene	98-95-3	QCBLK175585 1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Isophorone	78-59-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2-Nitrophenol	88-75-5	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,4-Dimethylphenol	105-67-9	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
bis(2-Chloroethoxy)Methane	111-91-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,4-Dichlorophenol	120-83-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
1,2,4-Trichlorobenzene	120-82-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Naphthalene	91-20-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
4-Chloroaniline	106-47-8	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Hexachlorobutadiene	87-68-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
4-Chloro-3-Methylphenol	59-50-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2-Methylnaphthalene	91-57-6	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Hexachlorocyclopentadiene	77-47-4	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
2,4,6-Trichlorophenol	88-06-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,4,5-Trichlorophenol	95-95-4	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2-Chloronaphthalene	91-58-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2-Nitroaniline	88-74-4	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
DimethylPhthalate	131-11-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Acenaphthylene	208-96-8	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,6-Dinitrotoluene	606-20-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
3-Nitroaniline	99-09-2	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
Acenaphthene	83-32-9	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,4-Dinitrophenol	51-28-5	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
4-Nitrophenol	100-02-7	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
Dibenzofuran	132-64-9	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
2,4-Dinitrotoluene	121-14-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Diethylphthalate	84-66-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
4-Chlorophenyl-PhenylEther	7005-72-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Fluorene	86-73-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
4-Nitroaniline	100-01-6	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
4,6-Dinitro-2-Methylphenol	534-52-1	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
n-Nitrosodiphenylamine	86-30-6	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
4-Bromophenyl-Phenyl Ether	101-55-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Hexachlorobenzene	118-74-1	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Pentachlorophenol	87-86-5	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
Phenanthrene	85-01-8	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Anthracene	120-12-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Carbazole	86-74-8	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Di-N-Butylphthalate	84-74-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Fluoranthene	206-44-0	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Pyrene	129-00-0	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
ButylBenzylPhthalate	85-68-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
3,3'-Dichlorobenzidine	91-94-1	QCBLK175585-1	06/19/98	06/25/98	500000	UG/L	U	500000	1
Benzo(a)Anthracene	56-55-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Chrysene	218-01-9	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
bis(2-Ethylhexyl)Phthalate	117-81-7	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
di-N-OctylPhthalate	117-84-0	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Benzo(b)Fluoranthene	205-99-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Benzo(k)Fluoranthene	207-08-9	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Benzo(a)Pyrene	50-32-8	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001

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	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Dibenz(a,h)Anthracene	53-70-3	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Benzo(g,h,i)Perylene	191-24-2	QCBLK175585-1	06/19/98	06/25/98	100000	UG/L	U	100000	1
Unknown-1	TIC-32	QCBLK175585-1	06/19/98	06/25/98	3700000	UG/L	J		1
Unknown-2	TIC-33	QCBLK175585-1	06/19/98	06/25/98	190000	UG/L	J		1
Hexadecanoic acid	57-10-3	QCBLK175585-1	06/19/98	06/25/98	240000	UG/L	JN		1
Eicosane	112-95-8	QCBLK175585-1	06/19/98	06/25/98	240000	UG/L	JN		1
Heneicosane	629-94-7	QCBLK175585-1	06/19/98	06/25/98	210000	UG/L	JN		1
Unknown-3	TIC-34	QCBLK175585-1	06/19/98	06/25/98	160000	UG/L	J		1
Unknown-4	TIC-35	QCBLK175585-1	06/19/98	06/25/98	160000	UG/L	J		1
Unknown-5	TIC-36	QCBLK175585-1	06/19/98	06/25/98	120000	UG/L	J		1
Unknown-6	TIC-37	QCBLK175585-1	06/19/98	06/25/98	140000	UG/L	J		1
Unknown-7	TIC-7	QCBLK175585-1	06/19/98	06/25/98	140000	UG/L	J		1
Unknown-8	TIC-8	QCBLK175585-1	06/19/98	06/25/98	120000	UG/L	J		1
Unknown-9	TIC-9	QCBLK175585-1	06/19/98	06/25/98	260000	UG/L	J		1
Unknown-10	TIC-10	QCBLK175585-1	06/19/98	06/25/98	160000	UG/L	J		1
Unknown-11	TIC-11	QCBLK175585-1	06/19/98	06/25/98	240000	UG/L	J		1
Unknown-12	TIC-12	QCBLK175585-1	06/19/98	06/25/98	210000	UG/L	J		1
Unknown-13	TIC-13	QCBLK175585-1	06/19/98	06/25/98	390000	UG/L	J		1
Unknown-14	TIC-14	QCBLK175585-1	06/19/98	06/25/98	180000	UG/L	J		1
Unknown-15	TIC-15	QCBLK175585-1	06/19/98	06/25/98	140000	UG/L	J		1
Unknown-16	TIC-16	QCBLK175585-1	06/19/98	06/25/98	120000	UG/L	J		1
Unknown-17	TIC-17	QCBLK175585-1	06/19/98	06/25/98	130000	UG/L	J		1
Unknown-18	TIC-18	QCBLK175585-1	06/19/98	06/25/98	200000	UG/L	J		1
Unknown-19	TIC-19	QCBLK175585-1	06/19/98	06/25/98	170000	UG/L	J		1
Nitrobenzene-d5	4165-60-0	QCBLK175585-1	06/19/98	06/25/98	82	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK175585-1	06/19/98	06/25/98	82	%REC			1
Terphenyl-d14	1718-51-0	QCBLK175585-1	06/19/98	06/25/98	108	%REC			1
Phenol-d5	4165-62-2	QCBLK175585-1	06/19/98	06/25/98	97	%REC			1
2-Fluorophenol	367-12-4	QCBLK175585-1	06/19/98	06/25/98	91	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK175585-1	06/19/98	06/25/98	82	%REC			1

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK175585-1	06/19/98	06/25/98	99	%REC			1
2-Chlorophenol	95-57-8	QCBLK175585-1	06/19/98	06/25/98	71	%REC			1
1,4-Dichlorobenzene	106-46-7	QCBLK175585-1	06/19/98	06/25/98	83	%REC			1
N-nitroso-di-n-propylamine	621-64-7	QCBLK175585-1	06/19/98	06/25/98	111	%REC			1
1,2,4-Trichlorobenzene	120-82-1	QCBLK175585-1	06/19/98	06/25/98	81	%REC			1
4-Chloro-3-Methylphenol	59-50-7	QCBLK175585-1	06/19/98	06/25/98	76	%REC			1
Acenaphthene	83-32-9	QCBLK175585-1	06/19/98	06/25/98	70	%REC			1
4-Nitrophenol	100-02-7	QCBLK175585-1	06/19/98	06/25/98	61	%REC			1
2,4-Dinitrotoluene	121-14-2	QCBLK175585-1	06/19/98	06/25/98	53	%REC			1
Pentachlorophenol	87-86-5	QCBLK175585-1	06/19/98	06/25/98	87	%REC			1
Pyrene	129-00-0	QCBLK175585-1	06/19/98	06/25/98	118	%REC	*		1
Nitrobenzene-d5	4165-60-0	QCBLK175585-1	06/19/98	06/25/98	78	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK175585-1	06/19/98	06/25/98	76	%REC			1
Terphenyl-d14	1718-51-0	QCBLK175585-1	06/19/98	06/25/98	120	%REC			1
Phenol-d5	4165-62-2	QCBLK175585-1	06/19/98	06/25/98	118	%REC	*		1
2-Fluorophenol	367-12-4	QCBLK175585-1	06/19/98	06/25/98	98	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK175585-1	06/19/98	06/25/98	82	%REC			1

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK175585-1	06/19/98	06/25/98	89	%REC			1
2-Chlorophenol	95-57-8	QCBLK175585-1	06/19/98	06/25/98	98	%REC			1
1,4-Dichlorobenzene	106-46-7	QCBLK175585-1	06/19/98	06/25/98	77	%REC			1
N-nitroso-di-n-propylamine	621-64-7	QCBLK175585-1	06/19/98	06/25/98	100	%REC			1
1,2,4-Trichlorobenzene	120-82-1	QCBLK175585-1	06/19/98	06/25/98	87	%REC			1
4-Chloro-3-Methylphenol	59-50-7	QCBLK175585-1	06/19/98	06/25/98	78	%REC			1
Acenaphthene	83-32-9	QCBLK175585-1	06/19/98	06/25/98	75	%REC			1
4-Nitrophenol	100-02-7	QCBLK175585-1	06/19/98	06/25/98	56	%REC			1
2,4-Dinitrotoluene	121-14-2	QCBLK175585-1	06/19/98	06/25/98	43	%REC			1
Pentachlorophenol	87-86-5	QCBLK175585-1	06/19/98	06/25/98	87	%REC			1
Pyrene	129-00-0	QCBLK175585-1	06/19/98	06/25/98	113	%REC			1
Nitrobenzene-d5	4165-60-0	QCBLK175585-1	06/19/98	06/25/98	79	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK175585-1	06/19/98	06/25/98	81	%REC			1
Terphenyl-d14	1718-51-0	QCBLK175585-1	06/19/98	06/25/98	116	%REC			1
Phenol-d5	4165-62-2	QCBLK175585-1	06/19/98	06/25/98	102	%REC			1
2-Fluorophenol	367-12-4	QCBLK175585-1	06/19/98	06/25/98	82	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK175585-1	06/19/98	06/25/98	86	%REC			1

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0P0B9

Lab Name: QUANTERRA MO Contract: 550-260

Lab Code: ITLS Case No.: S10401 SAS No.: SDG No.: W02417

Matrix: (soil/water) WATER Lab Sample ID: 18104-001

Sample wt/vol: 1.00 (g/mL) ML Lab File ID: H7493

Level: (low/med) LOW Date Received: 06/09/98

% Moisture: decanted: (Y/N) Date Extracted: 06/19/98

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/25/98

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	100000	U
111-44-4	bis(2-Chloroethyl)Ether	100000	U
95-57-8	2-Chlorophenol	100000	U
541-73-1	1,3-Dichlorobenzene	100000	U
106-46-7	1,4-Dichlorobenzene	100000	U
95-50-1	1,2-Dichlorobenzene	100000	U
95-48-7	2-Methylphenol	100000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	100000	U
106-44-5	4-Methylphenol	100000	U
621-64-7	N-Nitroso-Di-n-Propylamine	100000	U
67-72-1	Hexachloroethane	100000	U
98-95-3	Nitrobenzene	100000	U
78-59-1	Isophorone	100000	U
88-75-5	2-Nitrophenol	100000	U
105-67-9	2,4-Dimethylphenol	100000	U
111-91-1	bis(2-Chloroethoxy)Methane	100000	U
120-83-2	2,4-Dichlorophenol	100000	U
120-82-1	1,2,4-Trichlorobenzene	100000	U
91-20-3	Naphthalene	100000	U
106-47-8	4-Chloroaniline	100000	U
87-68-3	Hexachlorobutadiene	100000	U
59-50-7	4-Chloro-3-Methylphenol	100000	U
91-57-6	2-Methylnaphthalene	100000	U
77-47-4	Hexachlorocyclopentadiene	500000	U
88-06-2	2,4,6-Trichlorophenol	100000	U
95-95-4	2,4,5-Trichlorophenol	100000	U
91-58-7	2-Chloronaphthalene	100000	U
88-74-4	2-Nitroaniline	500000	U
131-11-3	Dimethyl Phthalate	100000	U
208-96-8	Acenaphthylene	100000	U
606-20-2	2,6-Dinitrotoluene	100000	U
99-09-2	3-Nitroaniline	500000	U
83-32-9	Acenaphthene	100000	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0P0B9

Lab Name: QUANTERRA MO Contract: 550-260

Lab Code: ITLS Case No.: S10401 SAS No.: SDG No.: W02417

Matrix: (soil/water) WATER Lab Sample ID: 18104-001

Sample wt/vol: 1.00 (g/mL) ML Lab File ID: H7493

Level: (low/med) LOW Date Received: 06/09/98

% Moisture: decanted: (Y/N) Date Extracted: 06/19/98

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/25/98

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	500000	U
100-02-7	4-Nitrophenol	500000	U
132-64-9	Dibenzofuran	100000	U
121-14-2	2,4-Dinitrotoluene	100000	U
84-66-2	Diethylphthalate	100000	U
7005-72-3	4-Chlorophenyl-phenylether	100000	U
86-73-7	Fluorene	100000	U
100-01-6	4-Nitroaniline	500000	U
534-52-1	4,6-Dinitro-2-Methylphenol	500000	U
86-30-6	N-Nitrosodiphenylamine (1)	100000	U
101-55-3	4-Bromophenyl-phenylether	100000	U
118-74-1	Hexachlorobenzene	100000	U
87-86-5	Pentachlorophenol	500000	U
85-01-8	Phenanthrene	100000	U
120-12-7	Anthracene	100000	U
86-74-8	Carbazole	100000	U
84-74-2	Di-n-Butylphthalate	100000	U
206-44-0	Fluoranthene	100000	U
129-00-0	Pyrene	100000	U
85-68-7	Butylbenzylphthalate	100000	U
91-94-1	3,3'-Dichlorobenzidine	500000	U
56-55-3	Benzo(a)Anthracene	100000	U
218-01-9	Chrysene	100000	U
117-81-7	bis(2-Ethylhexyl)Phthalate	100000	U
117-84-0	Di-n-Octyl Phthalate	100000	U
205-99-2	Benzo(b)Fluoranthene	100000	U
207-08-9	Benzo(k)Fluoranthene	100000	U
50-32-8	Benzo(a)Pyrene	100000	U
193-39-5	Indeno(1,2,3-cd)Pyrene	100000	U
53-70-3	Dibenz(a,h)Anthracene	100000	U
191-24-2	Benzo(g,h,i)Perylene	100000	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0P0B9

Lab Name: QUANTERRA MO Contract: 550-260

Lab Code: ITLS Case No.: S10401 SAS No.: SDG No.: W02417

Matrix: (soil/water) WATER Lab Sample ID: 18104-001

Sample wt/vol: 1.00 (g/mL) ML Lab File ID: H7493

Level: (low/med) LOW Date Received: 06/09/98

% Moisture: decanted: (Y/N) Date Extracted: 06/19/98

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 06/25/98

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 22

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.15	3700000	J
2.	UNKNOWN	19.55	190000	J
3. 57103	Hexadecanoic acid	20.20	240000	JN
4. 112958	Eicosane	20.62	240000	JN
5. 629947	Heneicosane	21.64	210000	JN
6.	UNKNOWN	22.27	160000	J
7.	UNKNOWN	22.91	160000	J
8.	UNKNOWN	22.98	120000	J
9.	UNKNOWN	23.68	140000	J
10.	UNKNOWN	23.88	140000	J
11.	UNKNOWN	24.62	120000	J
12.	UNKNOWN	24.80	260000	J
13.	UNKNOWN	26.19	160000	J
14.	UNKNOWN	26.46	240000	J
15.	UNKNOWN	26.61	210000	J
16.	UNKNOWN	27.25	390000	J
17.	UNKNOWN	27.48	180000	J
18.	UNKNOWN	27.98	140000	J
19.	UNKNOWN	28.17	120000	J
20.	UNKNOWN	28.46	130000	J
21.	UNKNOWN	28.92	200000	J
22.	UNKNOWN	31.79	170000	J

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category : TCLP Metals
Matrix : LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	06/23/98	06/24/98	06/24/98	0.010	MG/L	U	0.020	0.20	100
Arsenic	EPA 6010	06/23/98	06/24/98	06/25/98	0.19	MG/L	U	1.0	5.0	100
Barium	EPA 6010	06/23/98	06/24/98	06/25/98	0.10	MG/L	B	20.0	100	100
Cadmium	EPA 6010	06/23/98	06/24/98	06/25/98	0.086	MG/L	B	0.50	1.0	100
Chromium	EPA 6010	06/23/98	06/24/98	06/25/98	1.7	MG/L		1.0	5.0	100
Lead	EPA 6010	06/23/98	06/24/98	06/25/98	32.7	MG/L		0.30	5.0	100
Selenium	EPA 6010	06/23/98	06/24/98	06/25/98	0.31	MG/L	U	0.50	1.0	100
Silver	EPA 6010	06/23/98	06/24/98	06/25/98	0.070	MG/L	U	1.0	5.0	100

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category : TCLP Metals
Matrix : LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001MS

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	06/23/98	06/24/98	06/24/98	94	%REC				100
Arsenic	EPA 6010	06/23/98	06/24/98	06/25/98	99	%REC				100
Barium	EPA 6010	06/23/98	06/24/98	06/25/98	98	%REC				100
Cadmium	EPA 6010	06/23/98	06/24/98	06/25/98	99	%REC				100
Chromium	EPA 6010	06/23/98	06/24/98	06/25/98	97	%REC				100
Lead	EPA 6010	06/23/98	06/24/98	06/25/98	96	%REC				100
Selenium	EPA 6010	06/23/98	06/24/98	06/25/98	101	%REC				100
Silver	EPA 6010	06/23/98	06/24/98	06/25/98	98	%REC				100

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category : TCLP Metals
Matrix : LIQUID

Client ID: B0P0B9

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Quanterra ID : 18104-001MSD

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	06/23/98	06/24/98	06/24/98	96	%REC				100
Arsenic	EPA 6010	06/23/98	06/24/98	06/25/98	98	%REC				100
Barium	EPA 6010	06/23/98	06/24/98	06/25/98	96	%REC				100
Cadmium	EPA 6010	06/23/98	06/24/98	06/25/98	98	%REC				100
Chromium	EPA 6010	06/23/98	06/24/98	06/25/98	96	%REC				100
Lead	EPA 6010	06/23/98	06/24/98	06/25/98	96	%REC				100
Selenium	EPA 6010	06/23/98	06/24/98	06/25/98	100	%REC				100
Silver	EPA 6010	06/23/98	06/24/98	06/25/98	98	%REC				100

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: QUANTERRA_MO_____ Contract: 550.260___

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W02417_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
_B0P0B9_____	_P18104-001___
_B0P0B9SD_____	_P18104-001SD_
_B0P0B9S_____	_P18104-001S__
_PBT175895____	_PBT175895____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____

Date: _____ Title: _____

COVER PAGE - IN TCLP

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0P0B9

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02417

Matrix (soil/water): WATER Lab Sample ID: P18104-001

Level (low/med): LOW Date Received: 06/09/98

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	190	U		P
7440-39-3	Barium	104	B		P
7440-43-9	Cadmium	86.0	B		P
7440-47-3	Chromium	1700			P
7439-92-1	Lead	32700			P
7439-97-6	Mercury	10.0	U		CV
7782-49-2	Selenium	310	U		P
7440-22-4	Silver	70.0	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

Quanterra
Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352 1613

Project: 550.260

Category: Flashpoint
Method: EPA 1010
Matrix: LIQUID

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0P0B9	18104-001	Flashpoint	IGNITABLTY	QCBLK175740-1	06/19/98	06/19/98	60.0	DEG C	Y		1
B0P0B9	18104-001DUP	Flashpoint	IGNITABLTY	QCBLK175740-1	06/19/98	06/19/98	60	DEG C	Y		1
NA	QCLCS175740-1	Flashpoint	IGNITABLTY	QCBLK175740-1	06/19/98	06/19/98	28	DEG C			1

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: pH
Method: EPA 9045
Matrix: LIQUID

Sample Date : 06/05/98
Receipt Date : 06/09/98
Report Date : 07/01/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0P0B9	18104-001	pH	PH	QCBLK175696-1	06/19/98	06/19/98	3.65	PH			1
B0P0B9	18104-001DUP	pH	PH	QCBLK175696-1	06/19/98	06/19/98	3.76	PH			1

Quanterra Environmental Services

Quanterra-Richland
3350 George Washington Way
Richland, WA 99352-1613

Project: 550.260

Category: pH
Method: EPA 9045
Matrix: LIQUID

Sample Date : NA
Receipt Date : NA
Report Date : 07/01/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
NA	QCBLK175696-1	pH	PH	QCBLK175696-1	06/19/98	06/19/98	5.83	PH			1

W02417

Quanterra

CERTIFICATE OF ANALYSIS

JUN 1998
RECEIVED
Data
Log In

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

June 24, 1998

Attention: Joan Kessner

SAF Number	:	B98-089
Date SDG Closed	:	June 9, 1998
Number of Samples	:	One (1)
Sample Type	:	Other-Liquid
SDG Number	:	W02417
Data Deliverable	:	Summary

I. Introduction

On June 9, 1998, one-other liquid sample was received by the Quanterra, Inc., Richland Laboratory (QRL) for radiochemical analysis to be completed in fifteen days. Upon receipt, this sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford (BHI) specific ID:

QTESRL ID#	BHI ID#	MATRIX	RECEIPT DATE
80615601	B0P0B9	Other-Liquid	6/09/98

II. Analytical Results/Methodology

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

The requested analyses were:

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017
Gas Proportional Counting
Gross Alpha by method RICH-RC-5014
Gross Beta by method RICH-RC-5014
Total Strontium by method RICH-RC-5006
Liquid Scintillation Counting

Technetium-99 by method RICH-RC-5078

III. Quality Control

The analytical results for each analysis performed under SDG W02417 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section. Quality control sample results are reported in the same units as sample results.

IV. Comments

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

MDA values are not provided for in the contract for other-liquid samples. The MDA values acheive were slightly greater than the contractual values established for water samples.The LCS, batch blank, sample duplicate and sample results met the requirements of the contract.

Gas Proportional Counting

Gross Alpha by method RICH-RC-5014

The LCS, batch blank, sample and sample duplicate (B0P0B9) results are within contractual requirements.

Gross Beta by method RICH-RC-5014

The LCS, batch blank and sample duplicate (B0P0B9) results are within contractual requirements. The MDA value was greater than the sample result due to the reduced amount of sample used on account of the sample matrix.

Total Strontium by method RICH-RC-5006

The LCS, batch blank and sample duplicate (B0P0B9) results are within contractual requirements. The MDA value was greater than the sample result due to the reduced amount of sample used on account of the sample matrix.

Liquid Scintillation Counting

Technetium-99 by method RICH-RC-5078
The LCS, matrix spike (B0P0B9), batch blank and sample duplicate (B0P0B9) and sample results are within contractual requirements.

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

Reviewed and approved:

Andy Kopriva
Project Manager

Quanterra

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W02417 / 5457
LAB SAMPLE ID:	80615601	**MATRIX:**	OTHER
CLIENT ID:	B0P0B9	**DATE RECEIVED:**	6/9/1998 8:30:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
TC-99	5.35E+02	U	3.3E+02	1.0E+03	7.29E+02	pCi/L	95.10%	RICHRC5078
CO-60	-7.73E+00	U	1.8E+01	1.8E+01	3.27E+01	pCi/L	N/A	RICHRC5017
CS-137DA	7.45E+00	U	1.9E+01	1.9E+01	3.40E+01	pCi/L	N/A	RICHRC5017
EU-152	2.62E+01	U	5.6E+01	5.6E+01	9.17E+01	pCi/L	N/A	RICHRC5017
EU-154	-2.74E+01	U	5.2E+01	5.2E+01	8.90E+01	pCi/L	N/A	RICHRC5017
EU-155	2.87E+00	U	6.2E+01	6.2E+01	9.33E+01	pCi/L	N/A	RICHRC5017
ALPHA	5.75E+02		2.2E+02	2.5E+02	2.06E+02	pCi/L	100.00%	RICHRC5014
BETA	6.05E+02	U	4.2E+02	4.3E+02	8.36E+02	pCi/L	100.00%	RICHRC5014-B
STRONTIUM	-1.30E+01	U	3.6E+01	3.6E+01	1.21E+02	pCi/L	92.30%	RICHRC5006

Number of Results: 9

Result = IDL When Not Detected

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

Quanterra Analytical Services, Inc
rptChemRadSample; v3.41

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s): 806156

Client ID: BHI

Due Date: 6-24-98

Lab Sample Number or SDG: W9.2417

Method Test Parameters: Gamma

Matrix: Other

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

Comments on any "No" response: _____

First Level Review: Joel Kempema Date: 6-23-98

Second Level Review: [illegible] Date: 6/24/98

Form #: LS-038.2/96, Rev. 4

Report BHI "5"

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	806156
Client ID:	BHI
Due Date:	6-24-98
Lab Sample Number or SDG:	WO2417
Method Test Parameters:	Alpha
Matrix:	Other

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

Comments on any "No" response: _____

First Level Review: Joel Kempson Date: 6-18-98

Second Level Review: [illegible] Date: 6/24/98

Form #: LS-038.2 /96, Rev.4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s): 806156

Client ID: BNI

Due Date: 6-24-98

Lab Sample Number or SDG: W02417

Method Test Parameters: Beta

Matrix: Other

Review Item	Yes (✓)	No (✓)	NA (✓)	1st Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples				
1. Is the blank yield within acceptance criteria			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Is the blank result < 1/2 the Contract Detection Limit?	✓			✓
4. Is the blank > 1/2 the Contract Detection Limit but < Contract Detection Limit?			✓	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. MS/MSD results and yield meet acceptance criteria?			✓	
10. Duplicate sample results and yield meet acceptance criteria?	✓			✓
D. Other				
1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filed out?	✓			✓
3. Correct methodology used?	✓			✓
4. Transcription checked? 2M 6-17-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Joel Klingelman Date: 6-24-98

Second Level Review: AM Date: 6/24/98

Form #: LS-038.2 /96, Rev.4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s): 806156

Client ID: BHI

Due Date: 6-24-98

Lab Sample Number or SDG: WQ2417

Method Test Parameters: Total Sr

Matrix: Other

Review Item	Yes (✓)	No (✓)	NA (✓)	2nd Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples				
1. Is the blank yield within acceptance criteria	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Is the blank result < 1/2 the Contract Detection Limit?	✓			✓
4. Is the blank > 1/2 the Contract Detection Limit but < Contract Detection Limit?			✓	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. MS/MSD results and yield meet acceptance criteria?			✓	
10. Duplicate sample results and yield meet acceptance criteria?	✓			✓
D. Other				
1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filed out?	✓			✓
3. Correct methodology used?	✓			✓
4. Transcription checked? JM 6-19-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Joel T Kongsma Date: 6-22-98

Second Level Review: NJA Date: 6/24/98

Form #: LS-038.2/96, Rev 4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number(s): 806156

Client ID: BNI

Due Date: 6-24-98

Lab Sample Number or SDG: WQ2417

Method Test Parameters: Tc-99

Matrix: Other

Review Item	Yes (✓)	No (✓)	NA (✓)	2nd Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples				
1. Is the blank yield within acceptance criteria			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Is the blank result < 1/2 the Contract Detection Limit?	✓			✓
4. Is the blank > 1/2 the Contract Detection Limit but < Contract Detection Limit?			✓	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. MS/MSD results and yield meet acceptance criteria?	✓			✓
10. Duplicate sample results and yield meet acceptance criteria?	✓			✓
D. Other				
1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filed out?	✓			✓
3. Correct methodology used?	✓			✓
4. Transcription checked? JM 6-22-98	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Joel Nemgema Date: 6-23-98

Second Level Review: [signature] Date: 6/24/98

Form #: LS-038.2 /96, Rev. 4

CHAIN OF

CUSTODY FORMS

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-089-01	Page 1 of 1

Collector Nielson/St. John	**Company Contact** Tom Brown	**Telephone No.** 376-1547	**Project Coordinator** WEISS, RL	**Data Turnaround** 15 Days
Project Designation 224B Waste Sampling	**Sampling Location** 200 West		**SAF No.** B98-089	
Ice Chest No.	**Field Logbook No.** ~~EL-1281~~ RJN 6/5/98 EL-1424		**Method of Shipment** Hand deliver - Govt vehicle	
Shipped To Quanterra Incorporated	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage Cool 4C

SAMPLE ANALYSIS SDG W02417 806155

Preservation	None	None	None	Cool 4C	Cool 4C	None	None	None	None	None
Type of Container	~~P~~ aG	~~P~~ G	~~P~~ G	aGs*	aG	aG	~~P~~ aG	~~P~~ aG	~~P~~ aG	~~P~~ aG
No. of Container(s)	0	1	1	1	1	1	1	1	1	1
Volume	500ml	20ml	20ml	40ml	125ml	125ml	125ml	250ml	500ml	1000ml
	~~Technetium-99~~ 6-9-98	Activity Scan	pH (Soil) - 9045	VOA - 8260A (TCL)	Semi-VOA - 8270A (TCL)	Ignitability - 1010	Metals by ICP (TCLP) - 1311/6010A; Mercury (TCLP) - 1311/7470	Gross Alpha; Gross Beta	Strontium-89,90 -- Total Sr	See item (1) in Special Instructions
								806155	806155	

Sample No.	Matrix *	Sample Date	Sample Time										
B0P0B9 01	Other Liquid	6/5/98	1030	X	X	X	X	X	X	X	X	X	X
~~B0P0C1~~	~~Other Liquid~~	RJN 6/5/98									B0P0B8		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
RS ~~6-10-98~~ R.S. Albany	0830 6-9-98	Bruce Hitchenberg	0830 6-9-98
		2100 pm	

SPECIAL INSTRUCTIONS

** Close SDG upon receipt of sample.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

Matrix *

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

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

0016

Post-it Fax Note 7671	Date 6/9/98	# of pages ▶ 1
To Bob Gallivan	From A L Davis	
Co./Dept.	Co.	
Phone #	Phone # 373-9731	
Fax # 376-8857	Fax #	

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

B0P0B9

Project	224B Waste sampling		
Customer ID	B0P0B8 Other Liquid		
RCF ID	RCF3493		
	Sample time, date	1060	6/5/98
	Analysis date		6/5/98

Isotope		Activity pCi/gm	2 s err	Ci/gm
K40	<	5.7e+00		5.7e-12
Co60	<	9.0e-01		9.0e-13
I129	<	5.8e+00		5.8e-12
Cs137	<	8.4e-01		8.4e-13
Eu152	<	4.2e+00		4.2e-12
Eu154	<	2.9e+00		2.9e-12
Eu155	<	1.8e+00		1.8e-12
Th232dau	<	5.0e+00		5.0e-12
U235	<	4.4e+00		4.4e-12
U238	<	9.1e+01		9.1e-11
U238dau	<	1.7e+02		1.7e-10
Np237	<	6.2e-01		6.2e-13
Am241	<	1.2e+00		1.2e-12
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	NIR		
Gross Alpha	<	1.0e-01		1.0e-13
Gross Beta	<	2.9e-01		2.9e-13 Reported as 137-Cs Betas.
AEA total	<	NIR		

Total Activity (pCi/gm) 1.0e+00
(Ci/gm) 1.0e-12

1750grams

Cat I

6/9/98

Note! 152-Eu is not a 100% Beta emitter.

Definitions:

All errors reported at 2 standard deviations
A Assigned as residual beta from Gamma/Beta balance.
For soils and natural samples, the following applies:
The analysis of U238 is based on the activity of Pa234m

The analysis of Np237 is based on the activity of Pa233

U238dau is the activity of Pb214 and Bi214, short lived daughter products of U238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.

Th32dau is the activity of Ac228, Pb212, and Tl208, short lived daughter products of 232Th. Equilibrium between parent and daughter products may not exist in disturbed materials.

Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products. The results must then be balanced for the gross alpha analysis.

NIR means no result or analysis not requested.

Radiological analyst — Date 6-9-98

Albert L Davis, Radiological Manager — Date 6/9/98

0017

Bechtel

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 6-9-98 830 SG#: W02417

Work Order Number: 806155 + 156 SAF #: B98-089

Shipping Container ID: SR 98001 Chain of Custody # B98-089-01

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [ ] No [✓]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4 °C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 9
7. Sample holding times exceeded? Yes [ ] No [✓]

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

9. Samples are:
   - ✓ in good condition
   - ____ broken
   - ____ leaking
   - ____ have air bubbles

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

Sample Custodian/Laboratory: Karen [illegible] Date: 6-9-98

Telephoned To: _____ On _____ By _____

Due 6-24-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

10-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02417

MATRIX : OTHER B98-089

BATCH NUMBER 06-156

	GES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80615601		BHI	BOP0H9	
	D0615601				
	J0615618				
	J0615615				

ACTIONS (Initial & Date)

1) INITIATED JH 6/10/98

SOP(S) # RD8802

2) PREP LAB RECEIVED 6-11-98 DOR

SOP(S) # RICHRC5017-1

3) SAMPLE REMAINDER STORED 6-12-98 DOR

SOP(S) # N/A

4) SEPARATION LAB RECEIVED

SOP(S) #

5) COUNTING/MEASUREMENT LAB 6/12/98

SOP(S) # RICHRD0007

6) DATA REVIEWED AND ANALYTICAL PREP STORED JK 6-23-98

SOP(S) # RICHRC0002 Rev 1

Radon Isotopes - None

Due 6-24-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

10-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02417

MATRIX : OTHER B98-089

BATCH NUMBER 06-156

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80615601		BHI	RCP089	
	D0615601				
	J0615601B				
	I			15	

ACTIONS (Initial & Date)

1) INITIATED 6/10/98

SOP(S) # RD 28002

2) PREP LAB RECEIVED 6-11-98 DRC

RLHRC 50140

SOP(S) # RLHRC 5016-1

3) SAMPLE REMAINDER STORED 6-15-98 DRC

SOP(S) # NA

4) SEPARATION LAB RECEIVED

SOP(S) #

5) COUNTING/MEASUREMENT LAB 6/15/98

SOP(S) # RICHRD0003

6) DATA REVIEWED AND ANALYTICAL PREP STORED JRC 6-18-98

SOP(S) # RICHRC0002 Rev 2

Due 6-24-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

10-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02417

MATRIX : OTHER B98-089

BATCH NUMBER 06-156

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80615601		BHI	BOPOB9	
	D0615601				
	J0615618				

ACTIONS (Initial & Date)

1) INITIATED JH 6/10/98

SOP(S) # RD7800

2) PREP LAB RECEIVED 6-11-98 DR

RICHRC5014-0

SOP(S) # RICHRC5016-1

3) SAMPLE REMAINDER STORED 6-15-98 DR

SOP(S) # NA

4) SEPARATION LAB RECEIVED

SOP(S) #

5) COUNTING/MEASUREMENT LAB 6/15/98

SOP(S) # RICHRD0003

6) DATA REVIEWED AND ANALYTICAL PREP STORED JK 6-18-98

SOP(S) # RICHRC0002 Rev 2

Due 6-24-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

10-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02417

MATRIX : OTHER B98-089

BATCH NUMBER 06-156

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80615601		BHI	KOPOR9	
	D06156 01				
	J06156 18				
	T LS				

ACTIONS (Initial & Date)

1) INITIATED JH 6/10/98

SOP(S) # RD 3500

2) PREP LAB RECEIVED 6-11-98 DOC

SOP(S) # RICHRC5016-1

3) SAMPLE REMAINDER STORED 6-15-98 DOC

SOP(S) # N/A

4) SEPARATION LAB RECEIVED RJM 6/16/98

SOP(S) # RichRC5006/2

5) COUNTING/MEASUREMENT LAB 6/17/98

SOP(S) # RICHRD0003

6) DATA REVIEWED AND ANALYTICAL PREP STORED 6-22-98

SOP(S) # RICHRC0002 RWC

Due 6-24-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

10-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02417

MATRIX : OTHER B98-089

BATCH NUMBER 06-156

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	J0615618 J0615615				
1)	80615601 D0615601 W0615601		BHI	BOPOH9	

ACTIONS (Initial & Date)

1) INITIATED JH 6/10/98

SOP(S) # RD8802

2) PREP LAB RECEIVED _____

SOP(S) # _____

3) SAMPLE REMAINDER STORED _____

SOP(S) # _____

4) SEPARATION LAB RECEIVED RTM 6/12/98

SOP(S) # RichRC5078

5) COUNTING/MEASUREMENT LAB 6/19/98

SOP(S) # RICHRD0001

6) DATA REVIEWED AND ANALYTICAL PREP STORED MK 6-23-98

SOP(S) # RICHRC0002 Rev2