Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Quanterra Environmental Services

CASE NARRATIVE

0050090

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

August 7, 1998

Attention: Joan Kessner

DEC 1998 RECEIVED EDMC

AUG 1998 RECEIVED Data Log In

Project number	:	550.260
SDG	:	W02411, W02411A and W02411B
Number of Samples	:	Twenty (20)
Sample Type	:	Other Solid
Data Deliverable	:	Summary
Date SDG Closed	:	June 4, 1998

II. Introduction

On June 3 and 4, 1998, a total of twenty (20) other solid samples were received by Quanterra, Richland (806056 & 806080) and were transferred to Quanterra, St. Louis for chemical analysis. There are no comments or nonconformance memos 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:

St. Louis ID	BHI ID	SAF #	Matrix	Date of Receipt
18067-001	B0NVN1	B98-087	Other Solid	03-JUN-98
18067-002	B0NVN2	B98-087	Other Solid	03-JUN-98
18067-003	B0NVN3	B98-087	Other Solid	03-JUN-98
18070-001	B0NVR0	B98-087	Other Solid	04-JUN-98
18070-002	B0NVR1	B98-087	Other Solid	04-JUN-98
18070-003	B0NVR2	B98-087	Other Solid	04-JUN-98
18070-004	B0NVR3	B98-087	Other Solid	04-JUN-98
18070-005	B0NVN5	B98-087	Other Solid	04-JUN-98
18070-006	B0NVP7	B98-087	Other Solid	04-JUN-98
18070-007	B0NVN6	B98-087	Other Solid	04-JUN-98
18070-008	B0NVP8	B98-087	Other Solid	04-JUN-98
18070-009	B0NVP9	B98-087	Other Solid	04-JUN-98
18070-010	B0NVR7	B98-087	Other Solid	04-JUN-98

St. Louis ID	BHI ID	SAF #	Matrix	Date of Receipt
18070-011	B0NVR9	B98-087	Other Solid	04-JUN-98
18070-012	B0NVR4	B98-087	Other Solid	04-JUN-98
18070-013	B0NVR5	B98-087	Other Solid	04-JUN-98
18070-014	B0NVR6	B98-087	Other Solid	04-JUN-98
18070-015	B0NVR8	B98-087	Other Solid	04-JUN-98
18070-016	B0NVX6	B98-087	Other Solid	04-JUN-98
18070-017	B0NVX7	B98-087	Other Solid	04-JUN-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: Mercury by EPA method 7471.
ICP metals EPA method 6010 - Lead
PCBs EPA method 8080

Deviation from Request: No Deviation from requested method.

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

The Mercury analysis was requested after the hold time had expired. See the IRF issued on July 2, 1998.

PCBs: 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 daily standard for Aroclor 1221 and the continuing/closing Aroclor 1260 standards are above quality control limits but were used to quantify PCB levels. The data is reported "as is" and the analysts have been retrained in method criteria. See NCM 4485

Due to matrix interference, sample 18070-002 has a value of 1200 ug/Kg for AR1254 and is flagged with an E qualifier.

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

Reviewed and approved:

Robert E. White
Project Manager

REW 8/7/98

V. Comments

General:

On June 30, 1998 the Metals and PCB analyses requested for B0NVR6 were canceled per Andy Kopriva. Priority results were provided but the data is not included in the summary package or with the EDD.

Priority metals results were provided by facsimile on 07/07/98.

On 07/08/98 Bob White was notified by Andy Kopriva to change the client ID for 18070-012 from B0NVN4 to B0NVR4.

Preliminary PCB data was provided by facsimile on 07/09/98.

On 07/13/98 a second set (W02411A) of metals results were provided by facsimile.

On 07/14/98 a Lead data recheck was requested by Rich Weiss on sample 18070-008 and was confirmed. Quanterra, St. Louis was then instructed to re-analyzed 18070-008 for Lead only. The results were reported by facsimile 07/20/98 as W02411B and are included in the W02411 package.

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 late addition of samples to SDG W02411 two separate sets of data were submitted.
The following samples were submitted in SDG W02411 (18067-012, 18067-013,18067-014, 18067-015, 18067-016 and 18067-017). The remaining samples were submitted in SDG W02411A. The metal analyses for samples 18070-010 and 18070-011 were canceled by the client.

Percent solids were not determined for the samples in SDG W02411A. Due to software configuration, the CLP forms list solid sample result units as " dry weight" and % solids as " 100 ". The results on the forms are actually mg/Kg as is and are not corrected for percent solids. The figure of 100 was used as percent solids for calculation purposes only and does not represent measured solids content of the samples.

Log # 4485

LABORATORY NONCONFORMANCE MEMO (NCM)

Quanterra Incorporated

Project ID/Client: 550.260 / Hanford / WO2411

NCM Initiated by/Date: [illegible] 080398 Project Manager: Bob White

Sample Numbers/QC batch or lot numbers: 18067-001, 18070-001 → -013, -015 → -017; 174924

Tests: PCB/8080

Analytical Area (check appropriate area):

- ☐ Sample control
- ☒ GC
- ☐ Wet chemistry
- ☐ Data review
- ☐ Organic preparation
- ☐ HPLC
- ☐ Metals
- ☐ Radiochemistry
- ☐ Inorganic preparation
- ☐ GC/MS
- ☐ Reporting
- ☐ _____

Nonconformance (check appropriate area): *To be completed by analyst*

Holding Time Violations (exceeded by _____ days)

Category I: Laboratory Independent

- ☐ 1. Holding time expired in transit
- ☐ 2. Sample rec'd > 48 hrs after sampling, or ½ holding time has expired
- ☐ 3. Test added by client after expiration

Category II: Laboratory Dependent

- ☐ 4. Instrument failure
- ☐ 5. Analyst error
- ☐ 6. Log-in error
- ☐ 7. Miscommunication
- ☐ 8. Other (explanation required) _____

Category III: Analysis Reruns (QA/QC)

- ☐ 9. Surrogates
- ☐ 10. Internal standards
- ☐ 11. Spike recoveries
- ☐ 12. Blank contamination

Category IV: Analysis Reruns (Confirmation)

- ☐ 13. Second column
- ☐ 14. Contamination check
- ☐ 15. Confirmation of matrix effects
- ☐ 16. Other (explanation required) _____

Category V: Analysis Reruns (Dilution)

- ☐ 17. Over calibration
- ☐ 18. Under calibration
- ☐ 19. Other (explanation required) _____

Quality Assurance/Quality Control

- ☒ 20. QC data reported outside of controls
- ☐ 21. Incorrect procedure used
- ☐ 22. SOP intentionally modified with QA and tech approval
- ☐ 23. Invalid instrument calibration
- ☐ 24. Received insufficient sample for proper analysis

Incorrect or Incomplete Client Deliverable

- ☐ 25. Hardcopy deliverable error
- ☐ 26. Electronic deliverable error

Reported Detection Limits Elevated Due to:

- ☐ 27. Sample matrix: Does not include high analyte content
- ☐ 28. Insufficient sample volume
- ☐ 29. Other (explanation required)

Miscellaneous

- ☐ 30. Instrument/equipment Tag-out
- ☐ 31. Other (explanation required)

Notification (check appropriate area): ☐ **Required** ☐ **Not Required** *To be completed by project manager*

Client notified by (name and date): Bob White

- ☑ In writing
- ☐ By facsimile
- ☐ By telephone
- ☐ Other (explain)

Client's name and response: JOAN KESSNER

- ☑ Process "as is"
- ☐ Re-sample
- ☐ On hold until _____
- ☐ Other (explain)

Project manager (signature and date): Robert E. White 8/3/98 Note in case narrative

000004B

QUANTERRA LABORATORY NONCONFORMANCE MEMO

LOG # 4485

Corrective Action: *To be completed and reviewed by all associates involved*

Problem Description/Root Cause Author's initials and date: JA 080398

The daily standard for AR1221 and the continuing/closing AR 1260 standards are above quality control limits but were used to quantify PCB levels

Corrective Actions (Short Term) Author's initials and date: JA 080398

Report the data as is

Corrective Actions to Prevent Reoccurrence (Long Term) Analysts have been retrained in method criteria

Corrective Action approved by (Supervisor/Group Leader) and date:

Additional Comments:

Corrective Action to be completed by (if other than Supervisor/Group Leader):

Date Corrective Action is to be completed:

Quality Assurance Review *To be completed by a QA associate*

☐ Anomaly ☒ Deficiency ☐ Notified Ops/Sys Manager (Initials)

☐ Further action required:

Further action assigned to:

QA signature: Date: 8-3-98

Corrective Action Verification: *To be completed by a QA associate*

☐ Verification not required or requested

☐ Verified / CA completed on: by

☐ Cannot verify (specify reason)

Verified by: Date:

Nonconformance Memo Closure:

QA signature: Date:

The Office of Quality Assurance maintains a copy of this NCM indicating its final status.

000004C

August 3, 1998 Quanterra 01:48 pm
1-Organic Prep BATCH: '74924
Started: 26-JUL-98 by Jim Kleszczewski To finish: 26-JUL-98

Proj No.	QAS Nbr	Flg	Sample Id	SDG	Matrix	Product	Client Id	Samp Date	Prep Hold	Anls Hold	Due Date	Prep Stat	Anls Stat
000.01			QCBLK174924-1		Solid	PCB/8080/Q4	Blank Sample	06/12	--/--	07/12	07/22	DONE	HERE
000.01			QCSPK174924-1		Solid	PCB/8080/Q4	Spike Standard	06/12	--/--	07/12	07/22	DONE	HERE
550.260	550.26		18067-001	W02411	Solid	PCB/8080/Q4	B0NVN1	06/01	06/15	07/01	06/15	DONE	DONE
550.260	550.26		18067-001MS	W02411	Solid	PCB/8080/Q4	B0NVN1	06/01	06/15	07/01	06/15	DONE	DONE
550.260	550.26		18067-001MSD	W02411	Solid	PCB/8080/Q4	B0NVN1	06/01	06/15	07/01	06/15	DONE	DONE
550.260	550.26		18067-002	W02411	Solid	PCB/8080/Q4	B0NVN2	06/01	06/15	07/01	06/15	DONE	DONE
550.260	550.26		18067-003	W02411	Solid	PCB/8080/Q4	B0NVN3	06/01	06/15	07/01	06/15	DONE	DONE
550.260	550.26		18070-001	W02411	Solid	PCB/8080/Q4	B0NVR0	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-002	W02411	Solid	PCB/8080/Q4	B0NVR1	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-003	W02411	Solid	PCB/8080/Q4	B0NVR2	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-004	W02411	Solid	PCB/8080/Q4	B0NVR3	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-005	W02411	Solid	PCB/8080/Q4	B0NVN5	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-006	W02411	Solid	PCB/8080/Q4	B0NVP7	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-007	W02411	Solid	PCB/8080/Q4	B0NVN6	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-008	W02411	Solid	PCB/8080/Q4	B0NVP8	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-009	W02411	Solid	PCB/8080/Q4	B0NVP9	06/02	06/16	07/02	06/16	DONE	DONE
550.260	550.26		18070-010	W02411	Solid	PCB/8080/Q4	B0NVR7	06/03	06/17	07/03	06/16	DONE	DONE
550.260	550.26		18070-011	W02411	Solid	PCB/8080/Q4	B0NVR9	06/03	06/17	07/03	06/16	DONE	DONE
550.260	550.26		18070-012	W02411	Solid	PCB/8080/Q4	B0NVR4	06/03	06/17	07/03	06/16	DONE	DONE
550.260	550.26		18070-013	W02411	Solid	PCB/8080/Q4	B0NVR5	06/03	06/17	07/03	06/16	DONE	DONE
550.260	550.26		18070-015	W02411	Solid	PCB/8080/Q4	B0NVR8	06/03	06/17	07/03	06/16	DONE	DONE
550.260	550.26		18070-016	W02411	Solid	PCB/8080/Q4	B0NVX6	06/03	06/17	07/03	06/16	DONE	DONE
550.260	550.26		18070-017	W02411	Solid	PCB/8080/Q4	B0NVX7	06/03	06/17	07/03	06/16	DONE	DONE

000004 D

W02411

Quanterra July 06, 1998 08:15 am
Account: 10722 Project: 550.260 Quanterra-Richland QAS No. 550.26 Rev. 3
Master Sample Login: 18067

Revised
added QC to -001

Project Manager: R. White

Draft: Final: Entered and Reviewed by: Sue Nelson PM Review: Robert E. White

Sample Header Template:

Sample No. / Comments / # / Data:	Client ID / Container Type	C-Matrix / Analysis	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No. (Container Numbers:% Filled)
18067-001	BONVN1	Solid	01-JUN-98 10:15	03-JUN-98 09:11	18-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80605601 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S COLD	15-JUN-98	29-JUN-98	R13F		(384166:99)
1		HOLD//Q4	S COLD	15-JUN-98	13-JUN-98	R13F		(384167:98)
1		ICAP/6010/Q4	S COLD	15-JUN-98	28-NOV-98	R13F		(384166:99)
1		PCB/8080/Q4	S COLD	15-JUN-98	15-JUN-98	R13F		(384166:99)
18067-001MS	BONVN1	Solid	01-JUN-98 10:15	03-JUN-98 09:11	18-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80605601 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S COLD	15-JUN-98	29-JUN-98	R13F		(384166:99)
1		ICAP/6010/Q4	S COLD	15-JUN-98	28-NOV-98	R13F		(384166:99)
1		PCB/8080/Q4	S COLD	15-JUN-98	15-JUN-98	R13F		(384166:99)
18067-001MSD	BONVN1	Solid	01-JUN-98 10:15	03-JUN-98 09:11	18-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80605601 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S COLD	15-JUN-98	29-JUN-98	R13F		(384166:99)
1		ICAP/6010/Q4	S COLD	15-JUN-98	28-NOV-98	R13F		(384166:99)
1		PCB/8080/Q4	S COLD	15-JUN-98	15-JUN-98	R13F		(384166:99)
18067-002	BONVN2	Solid	01-JUN-98 10:33	03-JUN-98 09:11	18-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80605602 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S COLD	15-JUN-98	29-JUN-98	R13F		(384168:99)
1		HOLD//Q4	S COLD	15-JUN-98	13-JUN-98	R13F		(384169:98)
1		ICAP/6010/Q4	S COLD	15-JUN-98	28-NOV-98	R13F		(384168:99)
1		PCB/8080/Q4	S COLD	15-JUN-98	15-JUN-98	R13F		(384168:99)
18067-003	BONVN3	Solid	01-JUN-98 13:40	03-JUN-98 09:11	18-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80605603 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S COLD	15-JUN-98	29-JUN-98	R13F		(384170:99)
1		HOLD//Q4	S COLD	15-JUN-98	13-JUN-98	R13F		(384171:98)
1		ICAP/6010/Q4	S COLD	15-JUN-98	28-NOV-98	R13F		(384170:99)
1		PCB/8080/Q4	S COLD	15-JUN-98	15-JUN-98	R13F		(384170:99)

000002

3*=Sample has not been rad screened.

temp 4°C cal # 015741

ST LOUIS

Chain of Custody Record R13F

Quanterra

QUA-4124 0797

Client: Bechtel	Project Manager: A. Kopriva	Date: 6-4-98	Chain of Custody Number: 09702
Address:	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page 1 of 1
City: / State: / Zip Code:	Site Contact: / Lab Contact:	Analysis (Attach list if more space is needed): SEE COC	
Project Name: SAF B98-087	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

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	Analysis	Special Instructions/ Conditions of Receipt
80605601 BONVN1													*PCB anal only 15 day TAT
↓ 02 ↓ 2	Chemical Analysis Bottles												
↓ 03 ↓ 3													

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 6-18-98

QC Requirements (Specify): SDG W02411

	Date	Time		Date	Time
1. Relinquished By: Hudelberg QES	6-4-98	16:00	1. Received By: Joe Tremin	6-5-98	0900
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments: received samples on 6-4-98

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

temp 4°c cur # 015461

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-02	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No. CL449	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
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

SDG

WO2411

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	0	1	1	1								
Volume	60mL	60mL	60mL	60mL								
SAMPLE ANALYSIS	Activity Scan	PCBs - 8080	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)								

806056

Sample No.	Matrix *	Sample Date	Sample Time									
✓ ~~BONVM9~~ BONVN1	Other Solid	6.1.98	1015	X	X	X	X					BONVT3
✓ BONVN2		6-1-98	1033	X	X	X	X					BONVT4
✓ BONVN3		6.1.98	1340	X	X	X	X					BONVT5
~~BONVN4~~		~~6-1-98~~	~~1400~~	X	X	X	X					~~BONVT6~~
					100%		100%					

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

Relinquished By	Date/Time	Received By	Date/Time
Bruce Nelson	6/3/98 0911	Heidelberg	6/3/98 0911
Heidelberg	6-3-98 1600	<100cpm	
		Joe Tremin	6-4-98 0900

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 – Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

45 day prices / 21 day "official" TAT - begin for a 15 day TAT.

6/3/98

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

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

B0NVN3

Project	105 C Phase II
Customer ID	B0NVT5
RCF ID	RCF3434
Sample time, date	1340 6/1/98
Analysis date	6/2/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40		8.2e+00	+/-	3.7e+00	8.2e-12	
Co60	<	4.6e-01			4.6e-13	
I129	<	7.1e+00			7.1e-12	
Cs137		1.9e+01	+/-	1.7e+00	1.9e-11	
Eu152	<	1.8e+00			1.8e-12	
Eu154	<	1.2e+00			1.2e-12	
Eu155	<	1.3e+00			1.3e-12	
Th232dau	<	1.4e+00			1.4e-12	
U235	<	5.2e-01			5.2e-13	
U238	<	5.3e+01			5.3e-11	
U238dau	<	1.0e+00			1.0e-12	
Np237	<	9.6e-01			9.6e-13	
Am241	<	9.8e-01			9.8e-13	
Tot Act Gam (pCi/gm)		2.7e+01		Ci/gm	2.7e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	1.8e+00			1.8e-12	
Gross Beta		2.4e+01	+/-	8.5e+00	2.4e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 2.7e+01
(Ci/gm) 2.7e-11

Definitions:

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

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, transuranic and daughter products. The results must then be balanced for the gross alpha analysis.

N/R means no result or analysis not requested.

SEH & JLD 6-2-98
Radiological analyst Date

6-2-98
Albert I. Davis
Radiological Manager Date

000003

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility TH - RCF

B0NVN2

Project	105 C Phase II		
Customer ID	B0NVT4		
RCF ID	RCF3433		
	Sample time, date	1033	6/1/98
	Analysis date		6/2/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40		1.6e+01	+/-	5.5e+00	1.6e-11	
Co60	<	9.4e-01			9.4e-13	
I129	<	5.6e+00			5.6e-12	
Cs137		6.6e+01	+/-	3.5e+00	6.6e-11	
Eu152	<	4.1e+00			4.1e-12	
Eu154	<	1.4e+00			1.4e-12	
Eu155	<	1.4e+00			1.4e-12	
Th232dau	<	3.2e+00			3.2e-12	
U235	<	3.3e+00			3.3e-12	
U238	<	7.1e+01			7.1e-11	
U238dau	<	1.4e+00			1.4e-12	
Np237	<	8.5e-01			8.5e-13	
Am241	<	9.1e-01			9.1e-13	
Tot Act Gam (pCi/gm)		8.3e+01		Ci/gm	8.3e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	3.2e+00			3.2e-12	
Gross Beta		4.9e+01	+/-	1.3e+01	4.9e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 8.6e+01
(Ci/gm) 8.6e-11

Definitions:

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

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.

SEH & JLD by KID 6-2-98
Radiological analyst Date

Albert L. Davis 6/2/98
Radiological Manager Date

000005

010000

Post-it® Fax Note 7671 | Date 6/2/98 | # of pages ▶ 4
To Bob Fahlberg | From Al Davis
Co./Dept. | Co.
Phone # | Phone # 373-9731
Fax # 376-8851 | Fax #

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONV N1

Project	105 C Phase II		
Customer ID	BONVT3		
RCF ID	RCF3432		
	Sample time, date	1015	6/1/98
	Analysis date		6/2/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	6.8e+00			6.8e-12	
Co60	<	5.2e-01			5.2e-13	
I129	<	6.6e+00			6.6e-12	
Cs137		1.3e+02	+/-	1.0e+01	1.3e-10	
Eu152		1.4e+01	+/-	3.2e+00	1.4e-11	
Eu154		4.1e+00	+/-	1.3e+00	4.1e-12	
Eu155	<	2.3e+00			2.3e-12	
Th232dau	<	1.3e+00			1.3e-12	
U235	<	1.4e+00			1.4e-12	
U238	<	1.0e+02			1.0e-10	
U238dau	<	1.8e+00			1.8e-12	
Np237	<	1.8e+00			1.8e-12	
Am241	<	9.0e-01			9.0e-13	
Tot Act Gam (pCi/gm)		1.5e+02		Ci/gm	1.5e-10	
Y/Sr-90	<	N/R				
Gross Alpha	<	4.1e+00			4.1e-12	
Gross Beta		9.6e+01	+/-	1.9e+01	9.6e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 1.5e+02
(Ci/gm) 1.5e-10

Definitions:

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

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.

SEH - JLD [signature] 6-2-98
Radiological analyst Date

[signature] 6/2/98
Albert I. Davis Date
Radiological Manager

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 6/3 0910 SG#: W02411

Work Order Number: 806056 SAF #: B98-087

Shipping Container ID: CL 449 Chain of Custody #: B98-087-02

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 3°
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: [illegible] Date: 6/3/98

Telephoned To: _____ On _____ By _____

000011

Quanterra Environmental Services

015461

Login No.: 18067

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: WMH

Date: 6-4-98 Time: 0900

Project No: 550.260

Initiated by: Joe Tiemann

Shipper/No: Airborne

RFA/COC Numbers: B98-087-02

09702

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: 6-4-98

Project Management Review: Robert E White Date: 6-13-98

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

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

000012

W02411

Quanterra July 08, 1998 11:16 am
Account: 10722 Project: 550.260 Quanterra-Richland QAS No. 550.26 Rev. 3
Master Sample Login: 18070

Revised: changed client ID on -012

Project Manager: R. White

Draft: Final: Entered and Reviewed by: Sue Wilson PM Review: Robert E. White

Sample Header Template:

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Site	Rad Category	Rad Sample No. / (Container Numbers:% Filled)
18070-001	BONVR0	Solid	02-JUN-98 09:40	04-JUN-98 08:40	19-JUN-98	AIRBORNE		1	Screening not Required
	RICHLAND ID 80608006/ ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	30-JUN-98	R13F		(384184:99)
1		HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384185:98)
1		ICAP/6010/Q4	S	COLD	16-JUN-98	29-NOV-98	R13F		(384184:99)
1		PCB/8080/Q4	S	COLD	16-JUN-98	16-JUN-98	R13F		(384184:99)
18070-002	BONVR1	Solid	02-JUN-98 10:00	04-JUN-98 08:40	19-JUN-98	AIRBORNE		1	Screening not Required
	RICHLAND ID 80608007 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	30-JUN-98	R13F		(384187:99)
1		HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384188:98)
1		ICAP/6010/Q4	S	COLD	16-JUN-98	29-NOV-98	R13F		(384187:99)
1		PCB/8080/Q4	S	COLD	16-JUN-98	16-JUN-98	R13F		(384187:99)
18070-003	BONVR2	Solid	02-JUN-98 10:17	04-JUN-98 08:40	19-JUN-98	AIRBORNE		1	Screening not Required
	RICHLAND ID 80608008 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	30-JUN-98	R13F		(384189:99)
1		HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384190:98)
1		ICAP/6010/Q4	S	COLD	16-JUN-98	29-NOV-98	R13F		(384189:99)
1		PCB/8080/Q4	S	COLD	16-JUN-98	16-JUN-98	R13F		(384189:99)
18070-004	BONVR3	Solid	02-JUN-98 12:50	04-JUN-98 08:40	19-JUN-98	AIRBORNE		1	Screening not Required
	RICHLAND ID 80608009 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	30-JUN-98	R13F		(384191:99)
1		HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384192:98)
1		ICAP/6010/Q4	S	COLD	16-JUN-98	29-NOV-98	R13F		(384191:99)
1		PCB/8080/Q4	S	COLD	16-JUN-98	16-JUN-98	R13F		(384191:99)
18070-005	BONVN5	Solid	02-JUN-98 08:35	04-JUN-98 08:40	19-JUN-98	AIRBORNE		1	Screening not Required
	RICHLAND ID 80608001 ICAP=PB								
1	AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	30-JUN-98	R13F		(384194:99)
1		HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384195:98)
1		ICAP/6010/Q4	S	COLD	16-JUN-98	29-NOV-98	R13F		(384194:99)
1		PCB/8080/Q4	S	COLD	16-JUN-98	16-JUN-98	R13F		(384194:99)
18070-006	BONVP7	Solid	02-JUN-98 09:02	04-JUN-98 08:40	19-JUN-98	AIRBORNE		1	Screening not Required
	RICHLAND ID 80608003 ICAP=PB								

3*-Sample has not been rad screened.

Quanterra July 08, 1998 11:16 am
Account: 10722 Project: 550.260 Quanterra-Richland QAS No. 550.26 Rev. 3
Master Sample Login: 18070

ject Manager: R. White

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

ple Header Template: _____

ple No. / Comments / Container Type	Client ID	Analysis	C-Matrix	Class	Preservative	Date: Collected	Anal. Due Date	Received	Hold Date	Due	Site	Shipper	Rad Category	Rad Sample No. (Container Numbers:% Filled)
1 AN - Amber Glass-60ML		HG/7471/Q4		S	COLD		16-JUN-98		30-JUN-98		R13F			(384196:99)
1		HOLD//Q4		S	COLD		16-JUN-98		14-JUN-98		R13F			(384197:98)
1		ICAP/6010/Q4		S	COLD		16-JUN-98		29-NOV-98		R13F			(384196:99)
1		PCB/8080/Q4		S	COLD		16-JUN-98		16-JUN-98		R13F			(384196:99)
70-007 RICHLAND ID 80608002 ICAP=PB	BONVN6		Solid			02-JUN-98 08:45	04-JUN-98 08:40		19-JUN-98		AIRBORNE		1	Screening not Required
1 AN - Amber Glass-60ML		HG/7471/Q4		S	COLD		16-JUN-98		30-JUN-98		R13F			(384198:99)
1		HOLD//Q4		S	COLD		16-JUN-98		14-JUN-98		R13F			(384199:98)
1		ICAP/6010/Q4		S	COLD		16-JUN-98		29-NOV-98		R13F			(384198:99)
1		PCB/8080/Q4		S	COLD		16-JUN-98		16-JUN-98		R13F			(384198:99)
70-008 RICHLAND ID 80608004 ICAP=PB	BONVP8		Solid			02-JUN-98 09:10	04-JUN-98 08:40		19-JUN-98		AIRBORNE		1	Screening not Required
1 AN - Amber Glass-60ML		HG/7471/Q4		S	COLD		16-JUN-98		30-JUN-98		R13F			(384200:99)
1		HOLD//Q4		S	COLD		16-JUN-98		14-JUN-98		R13F			(384201:98)
1		ICAP/6010/Q4		S	COLD		16-JUN-98		29-NOV-98		R13F			(384200:99)
1		PCB/8080/Q4		S	COLD		16-JUN-98		16-JUN-98		R13F			(384200:99)
70-009 RICHLAND ID 80608005 ICAP=PB	BONVP9		Solid			02-JUN-98 09:30	04-JUN-98 08:40		19-JUN-98		AIRBORNE		1	Screening not Required
1 AN - Amber Glass-60ML		HG/7471/Q4		S	COLD		16-JUN-98		30-JUN-98		R13F			(384202:99)
1		HOLD//Q4		S	COLD		16-JUN-98		14-JUN-98		R13F			(384203:98)
1		ICAP/6010/Q4		S	COLD		16-JUN-98		29-NOV-98		R13F			(384202:99)
1		PCB/8080/Q4		S	COLD		16-JUN-98		16-JUN-98		R13F			(384202:99)
70-010 RICHLAND ID 80608013 ICAP=PB	BONVR7		Solid			03-JUN-98 13:05	04-JUN-98 14:15		19-JUN-98		AIRBORNE		1	Screening not Required
2 AN - Amber Glass-60ML		HOLD//Q4		S	COLD		16-JUN-98		14-JUN-98		R13F			(384204:99 384205:98)
1		PCB/8080/Q4		S	COLD		16-JUN-98		17-JUN-98		R13F			(384204:99)
70-011 RICHLAND ID 80608015 ICAP=PB	BONVR9		Solid			03-JUN-98 13:25	04-JUN-98 14:20		19-JUN-98		AIRBORNE		1	Screening not Required
1 AN - Amber Glass-60ML		HOLD//Q4		S	COLD		16-JUN-98		14-JUN-98		R13F			(384207:98)
1		PCB/8080/Q4		S	COLD		16-JUN-98		17-JUN-98		R13F			(384206:99)
70-012 RICHLAND ID 80608010 / ICAP = PB ONLY	BONVR4		Solid			03-JUN-98 12:30	04-JUN-98 14:15		19-JUN-98		AIRBORNE		1	Screening not Required

Sample has not been rad screened.

Quanterra July 08, 1998 11:16 am
Account: 10722 Project: 550.260 Quanterra-Richland QAS No. 550.26 Rev. 3
Master Sample Login: 18070

Project Manager: R. White

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

Sample Header Template: _____

Sample No. / Comments	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site		(Container Numbers:% Filled)
Data:								
1 AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	01-JUL-98	R13F		(384208:99)
1	HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384209:98)
1	ICAP/6010/Q4	S	COLD	16-JUN-98	30-NOV-98	R13F		(384208:99)
1	PCB/8080/Q4	S	COLD	16-JUN-98	17-JUN-98	R13F		(384208:99)
18070-013	BONVR5	Solid	03-JUN-98 12:40	04-JUN-98 14:15	19-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80608011 / ICAP = PB ONLY								
1 AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	01-JUL-98	R13F		(384210:99)
1	HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384211:98)
1	ICAP/6010/Q4	S	COLD	16-JUN-98	30-NOV-98	R13F		(384210:99)
1	PCB/8080/Q4	S	COLD	16-JUN-98	17-JUN-98	R13F		(384210:99)
18070-014	BONVR6	Solid	03-JUN-98 12:50	04-JUN-98 14:15	19-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80608012 / ICAP = PB ONLY								
2 AN - Amber Glass-60ML	HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384212:99 384213:98)
18070-015	BONVR8	Solid	03-JUN-98 13:15	04-JUN-98 14:15	19-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80608014 / ICAP = PB ONLY								
1 AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	01-JUL-98	R13F		(384214:99)
1	HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384215:98)
1	ICAP/6010/Q4	S	COLD	16-JUN-98	30-NOV-98	R13F		(384214:99)
1	PCB/8080/Q4	S	COLD	16-JUN-98	17-JUN-98	R13F		(384214:99)
18070-016	BONVX6	Solid	03-JUN-98 13:45	04-JUN-98 14:20	19-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80608016 / ICAP = PB ONLY								
1 AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	01-JUL-98	R13F		(384216:99)
1	HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384217:98)
1	ICAP/6010/Q4	S	COLD	16-JUN-98	30-NOV-98	R13F		(384216:99)
1	PCB/8080/Q4	S	COLD	16-JUN-98	17-JUN-98	R13F		(384216:99)
18070-017	BONVX7	Solid	03-JUN-98 13:56	04-JUN-98 14:20	19-JUN-98	AIRBORNE	1	Screening not Required
RICHLAND ID 80608017 / ICAP = PB ONLY								
1 AN - Amber Glass-60ML	HG/7471/Q4	S	COLD	16-JUN-98	01-JUL-98	R13F		(384218:99)
1	HOLD//Q4	S	COLD	16-JUN-98	14-JUN-98	R13F		(384219:98)
1	ICAP/6010/Q4	S	COLD	16-JUN-98	30-NOV-98	R13F		(384218:99)
1	PCB/8080/Q4	S	COLD	16-JUN-98	17-JUN-98	R13F		(384218:99)

3*=Sample has not been rad screened.

R13F

[redacted]

Chain of Custody Record

temp 4°C cu# 015473

ST 10110

Quanterra

QUA 4124 0797

Client: Bechtel	Project Manager: A. Koprowa	Date: 6-5-98	Chain of Custody Number: 09704
Address:	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page 1 of 2
City: / State: / Zip Code:	Site Contact: / Lab Contact:	Analysis (Attach list if more space is needed): SEE COC	
Project Name: SAF B98-087	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

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	HNOS	HCl	NaOH	ZnAc/NaOH	Special Instructions/ Conditions of Receipt
80608001 BONVN5 *												* PCB Anal.
2 6 *												only 15 da
3 P7 *												TAT.
4 8 *												
5 9 *												
6 R0 *												
7 1 *												
8 3 *												
9 3 *												
10 N4												Run all anal on COC
11 R5												
12 6												

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 6-19-98

QC Requirements (Specify): SDG W02411

	Date	Time		Date	Time
1. Relinquished By: Heidelberg QES	6-5-98	1600	1. Received By: Joe Tremain	6-6-98	0900
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

[redacted]

Chain of Custody Record

Quanterra

QUA-4124 0797

Client	Project Manager	Date 6-5-98	Chain of Custody Number 09705
Address	Telephone Number (Area Code)/Fax Number	Lab Number	Page 2 of 2

City	State	Zip Code	Site Contact	Lab Contact

Project Name	Carrier/Waybill Number

Contract/Purchase Order/Quote No.

Chemical analysis Bottles

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	HNOS	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
80608013 BONVR7*												SEE COC	*PCB Anal Only (run all anal. on CO
14 8													
15 9*													
16 X6													(Run all analysis on Chains
17 7													

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 6-19-98

QC Requirements (Specify): SDG 2411

1. Relinquished By	Date	Time	1. Received By	Date	Time
Heidelberg QES	6-5-98	16:00	Joe Tiemann	6-6-98	0900
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

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

temp 4°C uu#015473

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-05	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No. CL449	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
Shipped To Quanterra Incorporated	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	Activity Scan	PCBs - 8080	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							

	Sample No	Matrix *	Sample Date	Sample Time										
001	BONVW2 RO	Other Solid	6-2-98	0940	X	X	X	X					BON	VV2
002	BONVR1 X	other solid	6-2-98	1000	X	X	X	X					BON	VV3
003	BONVR2 X	other solid	6-2-98	1017	X	X	X	X					BON	VV4
004	BONVR3 X	other solid	6-2-98	1250	X	X	X	X					BON	VV5
						100%		100%						

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

Relinquished By	Date/Time	Received By	Date/Time
[signature]	6/1/98 0840	[signature]	6-4-98 0840
[signature]	6-4-98 1400	[signature]	6-5-98 0900

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

ICAP/6010/Q4
Hg/7471/Q4

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-04	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No. CL449	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
Shipped To Quanterra Incorporated	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	Activity Scan	PCBs - 8080 100%	See item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV) 100%							

	Sample No	Matrix *	Sample Date	Sample Time										
005	BONVN4-5	Other Solid	6-2-98	0835	X	X	X	X					BONV	T7
007	BONVN6	other solid	6-2-98	0845	X	X	X	X					BONV	T8
006	BONVP7	other solid	6-2-98	0902	X	X	X	X					BONV	T9
008	BONVP8	other solid	6-2-98	0910	X	X	X	X					BONV	V0
009	BONVP9	other solid	6-2-98	0930	X	X	X	X					BONV	V1

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

Relinquished By	Date/Time	Received By	Date/Time
[signature]	6/4/98 0840	[signature]	6-4-98 0840
[signature]	6/4/98 1600	Joe Tomi	6-5-98 0900

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-07	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No.	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
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

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	Activity Scan	PCBs - 8080	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							

	Sample No.	Matrix *	Sample Date	Sample Time										
011	BONVW4 R9 *	Other Solid	6-3-98	1325	X	X	X	X					BONVW1	
016	BONVX6	↓	6-3-98	1345	X	X	X	X					BONVW2	
017	BONVX7	↓	6-3-98	1356	X	X	X	X					BONVW3	
						100%		100%						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg / R Fahlberg	Date/Time: 6-4-98 1420	Received By: Karen Hollenbeck	Date/Time: 6-4-98 1420
Relinquished By: Karen Hollenbeck	Date/Time: 6-4-98 1420	Received By: [illegible]	Date/Time: 6-5-98 0900
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr, ~~Technetium-99, Nickel-63, Carbon-14~~

* BONVR9 Analysis of PCBs only until instructed by ERC

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-06	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No.	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
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

Preservation	None	Cool 4C	None	None							
Type of Container	sG	sG	sG	sG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	Activity Scan	PCBs - 8080 100%	See item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV) 100%							

	Sample No.	Matrix *	Sample Date	Sample Time										
012	BONVR4	Other Solid	6-3-98	1230	X	X	X	X						BONVV6
013	BONVR5	↓	6-3-98	1240	X	X	X	X						BONVV7
014	BONVR6		6-3-98	1250	X	X	X	X						BONVV8
010	BONVR7 *		6-3-98	1305	X	X	X	X						BONVV9
015	BONVR8	↓	6-3-98	1315	X	X	X	X						BONVW0

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

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	6-4-98 1415	Karen Deltenburg	6-4-98 1415
Karen Deltenburg	6-4-98 1600	[illegible]	6-5-98 0900

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 – Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

BONVR7 Analysis of PCBs only until notified by ERC

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

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVNS

Project	106 C-Phase II			
Customer :C	BONVT7	Other Solid		
RCF :C	RCF3449			
	Sample time, date		835	6/2/98
	Analysis date			6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	5.2e+00			5.2e-12	
Co60	<	4.8e-01			4.8e-13	
I129	<	1.1e+01			1.1e-11	
Cs137		5.1e+00	+/-	9.5e-01	5.1e-12	
Eu152	<	3.5e+00			3.5e-12	
Eu154	<	2.4e+00			2.4e-12	
Eu155	<	1.8e+00			1.8e-12	
Th232dau	<	8.4e-01			8.4e-13	
U235	<	6.8e-01			6.8e-13	
U238	<	4.2e+01			4.2e-11	
U238dau	<	1.7e+00			1.7e-12	
Np237	<	1.4e+00			1.4e-12	
Am241	<	1.6e+00			1.6e-12	
Tot Act Gam (pCi/gm)		5.1e+00		Ci/gm	5.1e-12	
Y/Sr-90	<	N/R				
Gross Alpha	<	8.6e-01			8.6e-13	
Gross Beta		1.3e+01	+/-	6.6e+00	1.3e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 1.4e+01
(Ci/gm) 1.4e-11

Cat I

B 6/4/98

Definitions:

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

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.

SEH-TLD 6/1/98
Radiological analyst

6-1-98
Date

Albert I. Davis
Radiological Manager

6/3/98
Date

000022

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project: 105 C-Phase II
Customer ID: B0NVT8 Other Solid BONVN6
RCF ID: RCF3450
Sample time, date 845 6/2/98
Analysis date 6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm
K40		8.9e+00	+/-	4.0e+00	8.9e-12
Co60	<	4.0e-01			4.0e-13
I129	<	4.5e+00			4.5e-12
Cs137		1.1e+01	+/-	1.3e+00	1.1e-11
Eu152	<	2.8e+00			2.8e-12
Eu154	<	1.4e+00			1.4e-12
Eu155	<	1.1e+00			1.1e-12
Th232dau	<	3.2e+00			3.2e-12
U235	<	3.2e+00			3.2e-12
U238	<	6.3e+01			6.3e-11
U238dau	<	3.6e+00			3.6e-12
Np237	<	5.4e-01			5.4e-13
Am241	<	7.8e-01			7.8e-13
Tot Act Gam (pCi/gm)		2.0e+01		Ci/gm	2.0e-11
Y/Sr-90	<	N/R			
Gross Alpha	<	1.5e+00			1.5e-12
Gross Beta		1.8e+01	+/-	6.8e+00	1.8e-11 Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 2.1e+01
(Ci/gm) 2.1e-11

Cat I
B 6/4/98

Definitions:

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

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 6/3/98

Albert I. Davis
Radiological Manager — Date 6/3/98

000023

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C-Phase II		
Customer ID	B0NVT9	Other Solid	B0NVP7
RCF ID	RCF3451		
	Sample time, date	902	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	7.8e+00			7.8e-12	
Co60	<	5.3e-01			5.8e-13	
I129	<	8.7e+00			8.7e-12	
Cs137		3.2e+01	+/-	2.6e+00	3.2e-11	
Eu152	<	2.9e+00			2.9e-12	
Eu154	<	1.9e+00			1.9e-12	
Eu155	<	1.5e+00			1.5e-12	
Th232dau	<	8.5e-01			8.5e-13	
U235	<	5.3e-01			5.3e-13	
U238	<	5.9e+01			5.9e-11	
U238dau	<	8.4e-01			8.4e-13	
Np237	<	1.1e+00			1.1e-12	
Am241	<	1.2e+00			1.2e-12	
Tot Act Gam (pCi/gm)		3.2e+01		Ci/gm	3.2e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	1.4e+00			1.4e-12	
Gross Beta		2.6e+01	+/-	8.6e+00	2.6e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 3.3e+01
(Ci/gm) 3.3e-11

Cat I
6/4/98

Definitions:

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

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.

[signature] 6/3/98
Radiological analyst Date

[signature] 6/3/98
Albert I. Davis
Radiological Manager Date

000024

GAMMA-RAY ENERGY ANALYSIS REPORT

Therme Hanford Inc.
Radiological Counting Facility THI - RCF

BONVP8

Project	105 C-Phase II	
Customer ID	BONVV0 Other Solid	
RCF ID	RCF3452	
	Sample time, date	910 6/2/98
	Analysis date	6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	1.4e+01			1.4e-11	
Co60		2.1e+00	+/-	5.0e-01	2.1e-12	
I129	<	3.7e+00			3.7e-12	
Cs137		7.0e+01	+/-	3.3e+00	7.0e-11	
Eu152	<	2.5e+00			2.5e-12	
Eu154	<	1.0e+00			1.0e-12	
Eu155	<	9.7e-01			9.7e-13	
Th232dau	<	2.7e+00			2.7e-12	
U235	<	2.2e+00			2.2e-12	
U238	<	4.7e+01			4.7e-11	
U238dau	<	1.3e+00			1.3e-12	
Np237	<	1.0e+00			1.0e-12	
Am241	<	5.2e-01			5.2e-13	
Tot Act Gam (pCi/gm)		7.2e+01		Ci/gm	7.2e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	4.0e+00			4.0e-12	
Gross Beta		5.2e+01	+/-	1.3e+01	5.2e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 7.6e+01
(Ci/gm) 7.6e-1.

Cat I

6/7/98.

Definitions:

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

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 presently 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.

SLHIJLD hgIU 6-3-98
Radiological analyst Date

Albert I. Davis 6/3/98
Albert I. Davis Date
Radiological Manager

000025

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project: 105 C-Phase II
Customer ID B0NVV1 Other Solid
RCF ID RCF3453
Sample time, date 930 6/2/98
Analysis date 6/3/98

B0NVP9

Isotope		Activity pCi/gm		2 s err	Ci/gm
K40	<	5.9e+01			5.9e-11
Co60	<	8.8e+00			8.8e-12
I129	<	6.4e+02			6.4e-10
Cs137		1.9e+01	+/-	8.1e+00	1.9e-11
Eu152	<	3.8e+01			3.8e-11
Eu154	<	1.6e+01			1.6e-11
Eu155	<	2.0e+01			2.0e-11
Th232dau	<	2.3e+01			2.3e-11
U235	<	8.2e+00			8.2e-12
U238	<	6.9e+02			6.9e-10
U238dau	<	1.3e+01			1.3e-11
Np237	<	1.4e+01			1.4e-11
Am241	<	2.3e+01			2.3e-11
Tot Act Gam (pCi/gm)		1.9e+01		Ci/gm	1.9e-11
Y/Sr-90	<	N/R			
Gross Alpha	<	2.4e+00			2.4e-12
Gross Beta		3.8e+01	+/-	1.1e+01	3.8e-11 Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 4.1e+01
(Ci/gm) 4.1e-11

Cat I

B 6/4/98

Definitions.

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

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 6-3-98

Albert L. Davis, Radiological Manager — Date 6/3/98

000020

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVRO

Project	105 C-Phase II		
Customer ID	B0NVV2	Other Solid	
RCF ID	RCF3454		
	Sample time, date	940	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm	2 s err	Ci/gm	
K40	<	5.8e+01		5.8e-11	
Co60	<	8.8e+00		8.8e-12	
I129	<	2.2e+01		2.2e-11	
Cs137	<	3.4e+00		3.4e-12	
Eu152	<	1.8e+01		1.8e-11	
Eu154	<	7.5e+00		7.5e-12	
Eu155	<	5.9e+00		5.9e-12	
Th232dau	<	1.8e+01		1.8e-11	
U235	<	1.6e+01		1.6e-11	
U238	<	3.8e+02		3.8e-10	
U238dau	<	5.9e+00		5.9e-12	
Np237	<	4.6e+00		4.6e-12	
Am241	<	4.5e+00		4.5e-12	
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00	
Y/Sr-90	<	N/R			
Gross Alpha	<	9.1e-01		9.1e-13	
Gross Beta		1.0e+01	+/- 5.6e+00	1.0e-11	Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 1.1e+01
(Ci/gm) 1.1e-11

Cat I
6/4/98

Definitions:

All errors reported at 2 standard deviations
A Assigned as residual beta from Gamma/Beta balance.

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

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.

CEH + JLD 6-9-98
Radiological analyst Date

Albert I. Davis 6/3/98
Radiological Manager Date

000027

JUN-08-1998 17:02 QUANTERRA,RICHLAND 509 375 5590 P.18

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVR1

Project	105 C-Phase II		
Customer ID	BONVV3	Other Solid	
RCF ID	RCF3455		
	Sample time, date	1000	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm	2 s err	Ci/gm	
K40	<	6.9e+01		6.9e-11	
Co60	<	7.5e+00		7.5e-12	
I129	<	6.8e+02		6.8e-10	
Cs137	<	6.9e+00		6.9e-12	
Eu152	<	4.0e+01		4.0e-11	
Eu154	<	2.7e+01		2.7e-11	
Eu155	<	2.2e+01		2.2e-11	
Th232dau	<	2.4e+01		2.4e-11	
U235	<	8.7e+00		8.7e-12	
U238	<	9.4e+02		9.4e-10	
U238dau	<	1.6e+01		1.6e-11	
Np237	<	1.5e+01		1.5e-11	
Am241	<	2.7e+01		2.7e-11	
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00	
Y/Sr-90	<	N/R			
Gross Alpha	<	1.7e+00		1.7e-12	
Gross Beta	<	9.2e+00		9.2e-12	Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 9.0e+00
(Ci/gm) 9.0e-12

Cut I
B 6/4/98

Definitions:

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

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.

SEH · TLD [signature] 6-3-98
Radiological analyst Date

[signature] 6/3/98
Albert L Davis Date
Radiological Manager

000025

JUN-08-1998 17:01 QUANTERRA,RICHLAND 509 375 5590 P.17

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVR2

Project	105 C-Phase II		
Customer ID	B0NVV4	Other Solid	
RCF ID	RCF345B		
	Sample Rec. date	1017	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm	2 s err	Ci/gm
K40	<	5.6e+01		5.6e-11
Co60	<	9.1e+00		9.1e-12
I129	<	6.4e+02		6.4e-10
Cs137	<	5.8e+00		5.8e-12
Eu152	<	4.3e+01		4.3e-11
Eu154	<	2.3e+01		2.3e-11
Eu155	<	2.1e+01		2.1e-11
Th232dau	<	2.3e+01		2.3e-11
U235	<	8.3e+00		8.3e-12
U238	<	7.1e+02		7.1e-10
U238dau	<	1.4e+01		1.4e-11
Np237	<	1.4e+01		1.4e-11
Am241	<	2.6e+01		2.6e-11
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	1.6e+00		1.6e-12
Gross Beta	<	1.2e+01		1.2e-11 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 1.3e+01
(Ci/gm) 1.3e-11

Cs+I
B3 6/4/98

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.

N/R means no result or analysis not requested.

SEH-JLD 6-3-98
Radiological analyst Date

Albert L. Davis 6/3/98
Radiological Manager Date

000029

JUN-08-1998 17:01 QUANTERRA,RICHLAND 509 375 3596 P.16

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project 105 C-Phase II
Customer ID B0NVV5 Other Solid BONVR3
RCF ID RCF3457
Sample time, date 1250 6/2/98
Analysis date 6/3/98

Isotope		Activity pCi/gm	2 s er	Ci/gm
K40	<	5.3e+01		5.3e-11
Co60	<	2.4e+00		2.4e-12
I129	<	2.6e+01		2.6e-11
Cs137	<	4.8e+00		4.8e-12
Eu152	<	2.4e+01		2.4e-11
Eu154	<	8.7e+00		8.7e-12
Eu155	<	7.3e+00		7.3e-12
Th232dau	<	2.1e+01		2.1e-11
U235	<	2.1e+01		2.1e-11
U238	<	4.9e+02		4.9e-10
U238dau	<	2.7e+01		2.7e-11
Np237	<	6.5e+00		6.5e-12
Am241	<	4.3e+00		4.3e-12
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	1.1e+00		1.1e-12
Gross Beta	<	7.7e+00		7.7e-12 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 9.0e+00
(Ci/gm) 9.0e-12

Cat I
6/4/98

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.

N/R means no result or analysis not requested.

SEH & THOMAS 6-3-98
Radiological analyst Date

Albert I. Davis 6/3/98
Radiological Manager Date

000030

JUN-08-1998 17:01 JOHNTERRY KUCHLHNE 509 375 3596

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 6/4 0840 SG#: W02411

Work Order Number: 806080 SAF #: B98-087

Shipping Container ID: CL 449 Chain of Custody #: B98-087-04 +05

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 30
5. Vermiculite/packing materials is Wet [ ] Dry [✓] n/a
6. Number of samples in shipping container: 27
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: Heidelberg Date: 6/4/98

Telephoned To: _____ On _____ By _____

000031

JUN-08-1998 16:59 QUANTERRA,RICHLAND 509 375 3556 P.03

Bucket

Figure 1

KIS SAMPLE CHECK-IN LIST

Date/Time Received: ~~6-3-98~~ 6-4-98 SG#: W02411

Work Order Number: 806080 +110 SAF #: B98-087

Shipping Container ID: NOT Marked Chain of Custody #: B98-087-06 +07

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: 24
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: [signature] Date: 6-4-98

Telephoned To: _____ On _____ By _____

000032

Quanterra Environmental Services

015473

Login No.: 18070

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: BHI

Date: 6-5-98 Time: 0900

Project No: 550.260

Initiated by: Joe Tiemann

Shipper/No: Airborne

RFA/COC Numbers: B98-087-05

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: Received Hanford C-O-C - 6-5-98 and Richland C-O-C 6-6-98

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: 6-5-98

Project Management Review: Robert E. White Date: 6-12-98

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

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

000003

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 08/03/98

Client ID: B0NVN1

Quanterra ID : 18067-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	32	UG/KG	U	32	.2
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	32	UG/KG	U	32	.2
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	32	UG/KG	U	32	.2
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	32	UG/KG	U	32	.2
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	32	UG/KG	U	32	.2
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	110	UG/KG		32	.2
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	32	UG/KG	U	32	.2
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	132	%REC			.2
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	116	%REC			.2

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 08/06/98

Client ID: B0NVN1

Quanterra ID : 18067-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	88	%REC			.2
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	112	%REC			.2
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	132	%REC			.2
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	91	%REC			.2

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVN1

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 08/03/98

Quanterra ID : 18067-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	68	%REC			.2
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	84	%REC			.2
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	140	%REC			.2
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	57	%REC			.2

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVN2

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 08/03/98

Quanterra ID : 18067-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	150	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	112	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	68	%REC			1

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVN3

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 08/03/98

Quanterra ID : 18067-003

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	52	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	100	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	71	%REC			1

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR0

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	520	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	48	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	115	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	86	%REC			1

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR1

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	1200	UG/KG	E	33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	87	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	106	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	74	%REC			1

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR2

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-003

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	310	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	100	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	85	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	73	%REC			1

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR3

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	.5
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	.5
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	.5
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	.5
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	.5
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	600	UG/KG		33	.5
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	140	UG/KG		33	.5
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	98	%REC			.5
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	54	%REC			.5

Quanterra-Richland
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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVN5

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-005

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	104	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	69	%REC			1

Quanterra-Richland
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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVP7

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Quanterra ID : 18070-006

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	42	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	92	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	73	%REC			1

Quanterra-Richland
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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVN6

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Quanterra ID : 18070-007

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	61	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	95	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	69	%REC			1

Quanterra-Richland
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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVP8

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Quanterra ID : 18070-008

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	38	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	116	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	77	%REC			1

Quanterra-Richland
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Richland, WA 99352-1613

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVP9

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-009

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	160	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	34	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	111	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	85	%REC			1

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Richland, WA 99352-1613

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR7

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Quanterra ID : 18070-010

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	100	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	64	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	75	%REC			1

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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR9

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-011

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	700	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	100	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	72	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	71	%REC			1

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

Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR4

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Quanterra ID : 18070-012

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	200	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	63	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	46	%REC			1

Quanterra-Richland
3350 George Washington Way
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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR5

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-013

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	260	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	42	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	79	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	59	%REC			1

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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVR8

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-015

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	105	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	77	%REC			1

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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVX6

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-016

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	240	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	63	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	97	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	77	%REC			1

Quanterra-Richland
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Project: 550.260

Category: PCB's
Method: EPA 8080
Matrix: SOLID

Client ID: B0NVX7

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/03/98

Quanterra ID : 18070-017

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1221	11104-28-2	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1232	11141-16-5	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1242	53469-21-9	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1248	12672-29-6	QCBLK174924-1	06/15/98	07/02/98	33	UG/KG	U	33	1
Aroclor-1254	11097-69-1	QCBLK174924-1	06/15/98	07/02/98	200	UG/KG		33	1
Aroclor-1260	11096-82-5	QCBLK174924-1	06/15/98	07/02/98	43	UG/KG		33	1
DCB	2051-24-3	QCBLK174924-1	06/15/98	07/02/98	86	%REC			1
TCMX	877-09-8	QCBLK174924-1	06/15/98	07/02/98	95	%REC			1

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVN1

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18067-001

Sample wt/vol: 6.3 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-01-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 0.2

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

CAS NO.	Compound		Q
12674-11-2	Aroclor-1016	32	U
11104-28-2	Aroclor-1221	32	U
11141-16-5	Aroclor-1232	32	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	110	
11096-82-5	Aroclor-1260	32	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVN2

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18067-002

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

Level: (low/med) LOW Date Sampled: 06-01-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	150	
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVN3

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18067-003

Sample wt/vol: 30.3 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-01-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	52	
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVRO

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-001

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec._____ dec._____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

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

CAS NO.	Compound		Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	520	
11096-82-5	Aroclor-1260	48	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR1

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-002

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

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

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

CAS NO.	Compound		Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	1200 E	
11096-82-5	Aroclor-1260	87	

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

E: Estimated value.

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR2

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-003

Sample wt/vol: 30.4 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec._____ dec._____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	310	
11096-82-5	Aroclor-1260	100	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR3

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-004

Sample wt/vol: 15.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 0.5

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	600	
11096-82-5	Aroclor-1260	140	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVN5

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-005

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVP7

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-006

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	42	
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVN6

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-007

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	61	
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVP8

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-008

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	38	
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVP9

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-009

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-02-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	160	
11096-82-5	Aroclor-1260	34	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR7

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-010

Sample wt/vol: 30.5 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2------	Aroclor-1016	33	U
11104-28-2------	Aroclor-1221	33	U
11141-16-5------	Aroclor-1232	33	U
53469-21-9------	Aroclor-1242	33	U
12672-29-6------	Aroclor-1248	33	U
11097-69-1------	Aroclor-1254	100	
11096-82-5------	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR9

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-011

Sample wt/vol: 30.3 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	700	
11096-82-5	Aroclor-1260	100	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR4

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-012

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

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

CAS NO.	Compound		Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	200	
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR5

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-013

Sample wt/vol: 30.3 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	260	
11096-82-5	Aroclor-1260	42	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVR8

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-015

Sample wt/vol: 30.4 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec._____ dec._____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVX6

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-016

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	240	
11096-82-5	Aroclor-1260	63	

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

FORM I PEST

1D
PCB ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BONVX7

Lab Name: QUANTERRA,MO Contract: 550.260

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W02411

Matrix: (soil/water) SOIL Lab Sample ID: 18070-017

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 06-03-98

% Moisture: not dec. _____ dec. _____ Date Extracted: 06-15-98

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07-02-98

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	200	
11096-82-5	Aroclor-1260	43	

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

FORM I PEST

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

Project: 550.260

Category: ICAP Metals
Method: EPA 6010
Matrix: SOLID

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0NVR4	18070-012	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	70.1	MG/KG	N	10.0	1
B0NVR5	18070-013	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	4.4	MG/KG	UN	10.0	1
B0NVR8	18070-015	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	4.4	MG/KG	BN	10.0	1
B0NVX6	18070-016	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	4.4	MG/KG	UN	10.0	1
B0NVX7	18070-017	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	6.2	MG/KG	BN	10.0	1
NA	QCLCS175647-1	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	100	%REC			1
NA	QCBLK175647-1	Lead	7439-92-1	QCBLK175647-1	06/19/98	06/19/98	4.4	MG/KG	U	10.0	1

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

Project: 550.260

Category: Mercury
Method: EPA 7471
Matrix: SOLID

Sample Date : 06/03/98
Receipt Date : 06/04/98
Report Date : 08/06/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0NVR4	18070-012	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	5.0	MG/KG		0.33	10
B0NVR5	18070-013	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	0.48	MG/KG		0.033	1
B0NVR8	18070-015	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	0.06	MG/KG		0.033	1
B0NVX6	18070-016	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	0.16	MG/KG		0.033	1
B0NVX7	18070-017	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	0.07	MG/KG		0.033	1
NA	QCLCS175686-1	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	107	%REC			10
NA	QCBLK175686-1	Mercury	7439-97-6	QCBLK175686-1	06/19/98	06/19/98	0.017	MG/KG	U	0.033	1

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

Project: 550.260

Category: ICAP Metals
Method: EPA 6010
Matrix: SOLID

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 07/06/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0NVN1	18067-001	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	50.2	MG/KG		10.0	1
B0NVN1	18067-001MS	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	97	%REC			1
B0NVN1	18067-001MSD	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	101	%REC			1
B0NVN2	18067-002	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	19.1	MG/KG		10.0	1
B0NVN3	18067-003	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	8.1	MG/KG	B	10.0	1
B0NVR0	18070-001	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	12.3	MG/KG		10.0	1
B0NVR1	18070-002	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	6.4	MG/KG	B	10.0	1
B0NVR2	18070-003	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	3.9	MG/KG	B	10.0	1
B0NVR3	18070-004	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	15.7	MG/KG		10.0	1
B0NVN5	18070-005	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	10.4	MG/KG		10.0	1
B0NVP7	18070-006	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	79.0	MG/KG		10.0	1
B0NVN6	18070-007	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	172	MG/KG		10.0	1
B0NVP8	18070-008	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	760	MG/KG		10.0	1
B0NVP9	18070-009	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	17.0	MG/KG		10.0	1
NA	QCLCS176765-1	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	104	%REC			1
NA	QCBLK176765-1	Lead	7439-92-1	QCBLK176765-1	07/01/98	07/01/98	3.0	MG/KG	U	10.0	1

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

Project: 550.260

Category: Mercury
Method: EPA 7471
Matrix: SOLID

Sample Date : 06/01/98
Receipt Date : 06/03/98
Report Date : 08/06/98

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0NVN1	18067-001	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.07	MG/KG		0.033	1
B0NVN1	18067-001MS	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	95	%REC			1
B0NVN1	18067-001MSD	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	92	%REC			1
B0NVN2	18067-002	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.03	MG/KG	B	0.033	1
B0NVN3	18067-003	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.02	MG/KG	B	0.033	1
B0NVR0	18070-001	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.05	MG/KG		0.033	1
B0NVR1	18070-002	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.02	MG/KG	B	0.033	1
B0NVR2	18070-003	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.30	MG/KG		0.033	1
B0NVR3	18070-004	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.80	MG/KG		0.033	1
B0NVN5	18070-005	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.03	MG/KG		0.033	1
B0NVP7	18070-006	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.04	MG/KG		0.033	1
B0NVN6	18070-007	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.07	MG/KG		0.033	1
B0NVP8	18070-008	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.017	MG/KG	U	0.033	1
B0NVP9	18070-009	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.07	MG/KG		0.033	1
NA	QCLCS176745-1	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	100	%REC			10
NA	QCBLK176745-1	Mercury	7439-97-6	QCBLK176745-1	07/01/98	07/01/98	0.017	MG/KG	U	0.033	1

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

Project: 550.260

Category: ICAP Metals
Method: EPA 6010
Matrix: SOLID

Client ID: B0NVP8

Sample Date : 06/02/98
Receipt Date : 06/04/98
Report Date : 07/20/98

Quanterra ID : 18070-008RD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Lead	7439-92-1	QCBLK178381-1	07/16/98	07/16/98	1220	MG/KG		10.0	1

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: QUANTERRA_MO_____ Contract: 550.260___

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W02411_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
B0NVR4	18070-012
B0NVR5	18070-013
B0NVR8	18070-015
B0NVX6	18070-016
B0NVX7	18070-017

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: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR4

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-012

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	70.1			P
7439-97-6	Mercury	5.0			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR5

Lab Name: QUANTERRA_MO Contract: 550.260
Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411
Matrix (soil/water): SOIL Lab Sample ID: 18070-013
Level (low/med): LOW Date Received: 06/04/98
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	4.4	U	N	P
7439-97-6	Mercury	0.48			CV

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR8

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-015

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	4.4	B	N	P
7439-97-6	Mercury	0.06			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVX6

Lab Name: QUANTERRA_MO Contract: 550.260
Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411
Matrix (soil/water): SOIL Lab Sample ID: 18070-016
Level (low/med): LOW Date Received: 06/04/98
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	4.4	U	N	P
7439-97-6	Mercury	0.16			CV

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVX7

Lab Name: QUANTERRA MO Contract: 550.260
Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411
Matrix (soil/water): SOIL Lab Sample ID: 18070-017
Level (low/med): LOW Date Received: 06/04/98
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	6.2	B	N	P
7439-97-6	Mercury	0.07			CV

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: QUANTERRA_MO_____ Contract: 550.260___

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W02411_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
B0NVN1	18067-001
B0NVN1SD	18067-001SD
B0NVN1S	18067-001S
B0NVN2	18067-002
B0NVN3	18067-003
B0NVN5	18070-005
B0NVN6	18070-007
B0NVP7	18070-006
B0NVP8	18070-008
B0NVP9	18070-009
B0NVR0	18070-001
B0NVR1	18070-002
B0NVR2	18070-003
B0NVR3	18070-004

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: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVN1

Lab Name: QUANTERRA MO Contract: 550.260
Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411
Matrix (soil/water): SOIL Lab Sample ID: 18067-001
Level (low/med): LOW Date Received: 06/03/98
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	50.2			P
7439-97-6	Mercury	0.07			CV

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVN2

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18067-002

Level (low/med): LOW Date Received: 06/03/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	19.1			P
7439-97-6	Mercury	0.03	B		CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVN3

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18067-003

Level (low/med): LOW Date Received: 06/03/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	8.1	B		P
7439-97-6	Mercury	0.02	B		CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVN5

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-005

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	10.4			P
7439-97-6	Mercury	0.03			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVN6

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-007

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	172			P
7439-97-6	Mercury	0.07			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVP7

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-006

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	79.0			P
7439-97-6	Mercury	0.04			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVP8

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-008

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	760			P
7439-97-6	Mercury	0.02	U		CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVP9

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-009

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	17.0			P
7439-97-6	Mercury	0.07			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR0

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-001

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	12.3			P
7439-97-6	Mercury	0.05			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR1

Lab Name: QUANTERRA_MO Contract: 550.260
Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411
Matrix (soil/water): SOIL Lab Sample ID: 18070-002
Level (low/med): LOW Date Received: 06/04/98
% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	6.4	B		P
7439-97-6	Mercury	0.02	B		CV

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR2

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-003

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	3.9	B		P
7439-97-6	Mercury	0.30			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVR3

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411

Matrix (soil/water): SOIL Lab Sample ID: 18070-004

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	15.7			P
7439-97-6	Mercury	0.80			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: QUANTERRA_MO_____ Contract: 550.260___

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W02411B_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
_B0NVP8_____	_18070-008____

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: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0NVP8

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02411B

Matrix (soil/water): SOIL Lab Sample ID: 18070-008

Level (low/med): LOW Date Received: 06/04/98

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	1220			P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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W02411-GS

Quanterra

CERTIFICATE OF ANALYSIS

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

June 24, 1998

Attention: Joan Kessner

JUN 1998 RECEIVED Data Log In

SAF Number	:	B98-087
SDG Closed	:	June 4, 1998
Number of Samples	:	Six (6)
Sample Type	:	Concrete
SDG Number	:	W02411
Data Deliverable	:	21 Day Priority / 45 Day Summary

I. Introduction

On June 4, 1998, six 21-day priority TAT concrete samples were received by the Quanterra Environmental Services Richland Laboratory (QESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QESRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
80611001	B0NVR4	Concrete	6/4/98
80611002	B0NVR5	Concrete	6/4/98
80611003	B0NVR6	Concrete	6/4/98
80611004	B0NVR8	Concrete	6/4/98
80611005	B0NVX6	Concrete	6/4/98
80611006	B0NVX7	Concrete	6/4/98

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:

Alpha Spectroscopy
Americium-241 by method RICH-RC-5057
Plutonium-238, -239/40 by method RICH-RC-5010
Uranium-234, -235, -238 by method RICH-RC-5030
Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017
Gas Proportional Counting
Total Strontium by method RICH-RC-5006

III. Quality Control

The analytical results for each analysis performed under SDG W02411 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

Alpha Spectroscopy

Americium-241 by method RICH-RC-5057
The LCS from the original analysis had a high tracer recovery of 121% that contributed to a low spike recovery of 74%. We recounted the LCS and the tracer recovery from the recount was 90% and the spike recovery was 95.5%. The batch blank, sample duplicate (B0NVR5) and sample results are within contractual requirements.

Plutonium-238, -239/40 by method RICH-RC-5010
The LCS, batch blank, sample duplicate (B0NVR5) and sample results are within contractual requirements.

Uranium-234, -235, -238 by method RICH-RC-5030
The LCS, batch blank, sample duplicate (B0NVR5) and sample results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017
Due to a reduced sample volume available for analysis, some of the contractual MDA values were not met. In an attempt to meet the contractual MDA values we increased the count times to 1000 minutes. The LCS, batch blank and sample duplicate (B0NVX7) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006
The LCS, batch blank, sample duplicate (B0NVR5) 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
Environmental Services

SAMPLE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	**W02411 / 5458**
LAB SAMPLE ID:	**80611001**	**MATRIX:**	**OTHER**
CLIENT ID:	**B0NVR4**	**DATE RECEIVED:**	**6/4/1998 2:15:00 PM**

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	4.00E-03	U	8.7E-03	8.7E-03	1.75E-02	pCi/g	86.80%	RICHRC5057
U-234	3.56E-01	J	8.5E-02	1.0E-01	2.51E-02	pCi/g	84.80%	RICHRC5030
U-235	1.47E-02	U	1.7E-02	1.8E-02	2.02E-02	pCi/g	84.80%	RICHRC5030
U-238	3.66E-01		8.6E-02	1.0E-01	2.84E-02	pCi/g	84.80%	RICHRC5030
PU-238	-1.13E-03	U	1.3E-03	1.3E-03	2.36E-02	pCi/g	89.20%	RICHRC5010
PU239/40	4.73E-03	U	9.5E-03	9.5E-03	1.28E-02	pCi/g	89.20%	RICHRC5010
CO-60	5.05E-03	U	3.9E-02	3.9E-02	6.60E-02	pCi/g	N/A	RICHRC5017
CS-137DA	5.38E-02	U	3.5E-02	3.5E-02	6.11E-02	pCi/g	N/A	RICHRC5017
EU-152	-8.15E-03	U	7.3E-02	7.3E-02	1.21E-01	pCi/g	N/A	RICHRC5017
EU-154	1.40E-01	U	9.4E-02	9.5E-02	1.74E-01	pCi/g	N/A	RICHRC5017
EU-155	6.13E-02	U	6.1E-02	6.1E-02	1.02E-01	pCi/g	N/A	RICHRC5017
K-40	9.30E+00		1.1E+00	1.4E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.80E-01		7.2E-02	8.6E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.52E+00		9.1E-01	9.2E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	1.12E-02	U	3.3E-02	3.3E-02	1.18E-01	pCi/g	92.40%	RICHRC5006

Number of Results: 15

Result = IDL When Not Detected
(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W02411 / 5458
LAB SAMPLE ID:	80611002	**MATRIX:**	OTHER
CLIENT ID:	B0NVR5	**DATE RECEIVED:**	6/4/1998 2:15:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	8.25E-03	U	1.2E-02	1.2E-02	1.12E-02	pCi/g	92.90%	RICHRC5057
U-234	4.40E-01	J	1.0E-01	1.2E-01	3.33E-02	pCi/g	72.40%	RICHRC5030
U-235	8.08E-03	U	1.6E-02	1.6E-02	3.47E-02	pCi/g	72.40%	RICHRC5030
U-238	4.03E-01		9.5E-02	1.2E-01	2.26E-02	pCi/g	72.40%	RICHRC5030
PU-238	-1.32E-03	U	1.5E-03	1.5E-03	2.73E-02	pCi/g	78.30%	RICHRC5010
PU239/40	-4.38E-04	U	8.8E-04	8.8E-04	2.20E-02	pCi/g	78.30%	RICHRC5010
CO-60	3.56E-02	U	3.3E-02	3.3E-02	5.97E-02	pCi/g	N/A	RICHRC5017
CS-137DA	1.14E-01		5.3E-02	5.5E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	-3.02E-02	U	7.4E-02	7.4E-02	1.15E-01	pCi/g	N/A	RICHRC5017
EU-154	2.91E-03	U	9.2E-02	9.2E-02	1.54E-01	pCi/g	N/A	RICHRC5017
EU-155	2.27E-03	U	6.5E-02	6.5E-02	1.09E-01	pCi/g	N/A	RICHRC5017
K-40	9.42E+00		1.1E+00	1.4E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.48E-01		7.2E-02	9.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226	2.98E-01		1.1E-01	1.2E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	6.90E-02	U	4.1E-02	4.7E-02	1.14E-01	pCi/g	89.80%	RICHRC5006

Number of Results: 15

Result = IDL When Not Detected
(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	SDG: /RPT GRP:	W02411 / 5458
LAB SAMPLE ID:	80611003	MATRIX:	OTHER
CLIENT ID:	B0NVR6	DATE RECEIVED:	6/4/1998 2:15:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	6.73E-01	J	1.1E-01	1.3E-01	2.11E-02	pCi/g	94.30%	RICHRC5057
U-234	3.68E-01	J	8.9E-02	1.1E-01	3.28E-02	pCi/g	77.30%	RICHRC5030
U-235	2.12E-02	J	2.1E-02	2.1E-02	1.43E-02	pCi/g	77.30%	RICHRC5030
U-238	4.02E-01		9.2E-02	1.1E-01	1.43E-02	pCi/g	77.30%	RICHRC5030
PU-238	0.00E+00	U	0.0E+00	1.1E-02	9.54E-03	pCi/g	91.50%	RICHRC5010
PU239/40	1.37E-01		4.4E-02	4.7E-02	1.61E-02	pCi/g	91.50%	RICHRC5010
CO-60	7.43E-02	U	3.6E-02	3.7E-02	6.77E-02	pCi/g	N/A	RICHRC5017
CS-137DA	3.47E-02	J	4.0E-02	4.0E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	5.36E-02	U	6.2E-02	6.2E-02	1.04E-01	pCi/g	N/A	RICHRC5017
EU-154	-5.60E-02	U	9.2E-02	9.2E-02	1.50E-01	pCi/g	N/A	RICHRC5017
EU-155	2.91E-02	U	5.0E-02	5.1E-02	8.48E-02	pCi/g	N/A	RICHRC5017
K-40	1.29E+01		1.1E+00	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.75E-01		6.5E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226	6.04E-01		1.2E-01	1.4E-01	N/A	pCi/g	N/A	RICHRC5017
RA-228	4.23E-01		2.5E-01	2.6E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	1.24E-02	U	3.3E-02	3.4E-02	1.16E-01	pCi/g	89.40%	RICHRC5006

Number of Results: 16

Result = IDL When Not Detected
(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W02411 / 5458
LAB SAMPLE ID:	80611004	**MATRIX:**	OTHER
CLIENT ID:	B0NVR8	**DATE RECEIVED:**	6/4/1998 2:15:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	1.19E-02	J	1.4E-02	1.4E-02	1.08E-02	pCi/g	97.90%	RICHRC5057
U-234	3.22E-01	J	9.1E-02	1.1E-01	4.32E-02	pCi/g	72.60%	RICHRC5030
U-235	-1.51E-03	U	1.7E-03	1.8E-03	3.14E-02	pCi/g	72.60%	RICHRC5030
U-238	3.36E-01		9.2E-02	1.1E-01	4.04E-02	pCi/g	72.60%	RICHRC5030
PU-238	0.00E+00	U	0.0E+00	1.3E-02	1.21E-02	pCi/g	74.90%	RICHRC5010
PU239/40	4.10E-03	U	8.9E-03	9.0E-03	1.79E-02	pCi/g	74.90%	RICHRC5010
CO-60	6.76E-03	U	3.0E-02	3.0E-02	5.09E-02	pCi/g	N/A	RICHRC5017
CS-137DA	9.80E-02	J	4.8E-02	4.9E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	9.87E-04	U	6.4E-02	6.4E-02	1.06E-01	pCi/g	N/A	RICHRC5017
EU-154	9.15E-02	U	8.5E-02	8.6E-02	1.51E-01	pCi/g	N/A	RICHRC5017
EU-155	1.22E-01	U	4.8E-02	5.0E-02	8.04E-02	pCi/g	N/A	RICHRC5017
K-40	1.05E+01		1.2E+00	1.6E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.71E-01		7.4E-02	8.8E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226	4.24E-01		1.3E-01	1.4E-01	N/A	pCi/g	N/A	RICHRC5017
RA-228	3.81E-01		2.7E-01	2.8E-01	N/A	pCi/g	N/A	RICHRC5017
U-238	1.47E+00		5.6E-01	5.8E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	4.75E-02	U	4.4E-02	4.7E-02	1.36E-01	pCi/g	84.60%	RICHRC5006

Number of Results: 17

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W02411 / 5458
LAB SAMPLE ID:	80611005	**MATRIX:**	OTHER
CLIENT ID:	B0NVX6	**DATE RECEIVED:**	6/4/1998 2:15:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	8.38E-02	J	4.2E-02	4.3E-02	1.42E-02	pCi/g	74.40%	RICHRC5057
U-234	2.43E-01	J	7.2E-02	8.2E-02	4.05E-02	pCi/g	79.40%	RICHRC5030
U-235	1.91E-02	U	2.1E-02	2.1E-02	2.77E-02	pCi/g	79.40%	RICHRC5030
U-238	3.03E-01		8.0E-02	9.3E-02	3.34E-02	pCi/g	79.40%	RICHRC5030
PU-238	4.55E-03	U	1.1E-02	1.1E-02	2.48E-02	pCi/g	72.70%	RICHRC5010
PU239/40	9.97E-03	U	1.5E-02	1.5E-02	2.47E-02	pCi/g	72.70%	RICHRC5010
CO-60	6.28E-02	U	2.8E-02	2.9E-02	5.51E-02	pCi/g	N/A	RICHRC5017
CS-137DA	1.98E-01		6.4E-02	6.7E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.58E-02	U	5.9E-02	5.9E-02	9.99E-02	pCi/g	N/A	RICHRC5017
EU-154	4.25E-02	U	8.1E-02	8.1E-02	1.42E-01	pCi/g	N/A	RICHRC5017
EU-155	6.93E-02	U	4.3E-02	4.3E-02	7.43E-02	pCi/g	N/A	RICHRC5017
K-40	9.58E+00		9.7E-01	1.4E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.69E-01		6.0E-02	7.6E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226	2.79E-01		1.2E-01	1.2E-01	N/A	pCi/g	N/A	RICHRC5017
RA-228	3.80E-01		1.7E-01	1.8E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	2.08E-01	J	5.6E-02	9.3E-02	1.10E-01	pCi/g	91.30%	RICHRC5006

Number of Results: 16

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	QUANTERRA, Richland	**SDG: /RPT GRP:**	W02411 / 5458
LAB SAMPLE ID:	80611006	**MATRIX:**	OTHER
CLIENT ID:	B0NVX7	**DATE RECEIVED:**	6/4/1998 2:15:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	3.81E-03	U	8.3E-03	8.3E-03	1.66E-02	pCi/g	94.20%	RICHRC5057
U-234	3.51E-01	J	9.1E-02	1.1E-01	2.93E-02	pCi/g	73.00%	RICHRC5030
U-235	5.40E-03	U	1.2E-02	1.2E-02	2.36E-02	pCi/g	73.00%	RICHRC5030
U-238	2.41E-01		7.5E-02	8.5E-02	1.59E-02	pCi/g	73.00%	RICHRC5030
PU-238	-8.39E-04	U	1.2E-03	1.2E-03	2.40E-02	pCi/g	81.00%	RICHRC5010
PU239/40	5.24E-03	U	1.0E-02	1.1E-02	1.42E-02	pCi/g	81.00%	RICHRC5010
CO-60	9.36E-02	U	3.5E-02	3.7E-02	6.99E-02	pCi/g	N/A	RICHRC5017
CS-137DA	3.31E-01		5.8E-02	6.7E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	-4.10E-02	U	8.2E-02	8.2E-02	1.35E-01	pCi/g	N/A	RICHRC5017
EU-154	1.05E-02	U	1.1E-01	1.1E-01	1.83E-01	pCi/g	N/A	RICHRC5017
EU-155	9.90E-03	U	5.6E-02	5.6E-02	9.02E-02	pCi/g	N/A	RICHRC5017
K-40	9.90E+00		1.2E+00	1.5E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	6.05E-01		9.7E-02	1.1E-01	N/A	pCi/g	N/A	RICHRC5017
RA-226	4.45E-01	U	7.8E-02	9.0E-02	1.48E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	1.61E-01	J	5.2E-02	7.9E-02	1.19E-01	pCi/g	90.60%	RICHRC5006

Number of Results: 15

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	806110
Client ID:	BHI
Due Date:	6-19-98
Lab Sample Number or SDG:	WQ2411
Method Test Parameters:	Am241
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?	1 NCM			✓
2. Are all required forms filed out?	✓			✓
3. Correct methodology used?	✓			✓
4. Transcription checked? sm 6-19-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

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

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

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

Report recount result for 20611015

0017

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QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG #: RD-98-_____

Project ID: BHI
Sample Numbers: J061101S
Tests: Am241
Matrix: Other

NCM Initiated by: JTK 6-23-98

WO 2411

Analytical Area (check appropriate area):

- ☐ Sample control
- ☐ Organic preparation
- ☐ Inorganic preparation
- ☐ GC
- ☐ HPLC
- ☐ GC/MS
- ☐ Wet chemistry
- ☐ Metals
- ☐ Reporting
- ☒ Data review
- ☒ Radiochemistry
- ☐ Bioassay

Nonconformance (check appropriate area):

Holding Time Violations (exceeded by _____ days)

Category I: Laboratory Independent

- ☐ 1. Holding time expired in transit
- ☐ 2. Sample received > 48 hrs. or 1/2 holding time has expired
- ☐ 3. Test added by client after expiration

Category II: Laboratory Dependent

- ☐ 4. Instrument failure
- ☐ 5. Analyst error
- ☐ 6. Login error
- ☐ 7. Miscommunication
- ☐ 8. Other (complete description required)

Category III: Analysis Reruns (QA/QC)

- ☐ 9. Surrogates
- ☐ 10. Internal Standards
- ☐ 11. Spike Recoveries
- ☐ 12. Blank Contamination

Category IV: Analysis Reruns (Confirmation)

- ☐ 13. Second column
- ☐ 14. Contamination check
- ☐ 15. Confirmation of matrix effects
- ☐ 16. Other (complete description required)

Quality Assurance/Quality Control

- ☐ 17. QC data reported outside of controls
- ☐ 18. Incorrect procedure used
- ☐ 19. SOP intentionally modified with QA and Tech. approval
- ☐ 20. Invalid instrument calibration
- ☐ 21. Insufficient sample received for proper analysis

Incorrect or Incomplete Client Deliverable

- ☐ 22. Hardcopy deliverable error
- ☐ 23. Electronic deliverable error

Reported detection limits elevated due to:

- ☐ 24. Sample matrix
- ☐ 25. Insufficient sample volume
- ☐ 26. Other (complete description required)
- ☒ 27. *Other (specify):* LCS Recounted

Comments/Explanation: _____

Notification (check appropriate area):

Client notified by (name and date): _____

- ☑ in writing CN
- ☐ by telephone
- ☐ by facsimile
- ☐ other (explain)

Client's name and response: _____

- ☐ process "as is"
- ☐ on hold until _____
- ☐ re-sample
- ☐ other (explain)

Project Manager (signature and date): [signature] 6/24/98

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG#: RD-98-

Corrective Action

Root Cause Initial and date: MK 6-23-98

initial count low bias + high yield at 121% tracer recovery + 74% LCS recovery

Corrective Action Initial and Date: MK 6-23-98

Recount data accepted with a tracer recovery of 90% and a radiochemical recovery of 95.5%

Responsibility for performing CA assigned to:

Actions to prevent recurrence Initial and Date:

First Level Supervisor: Joel Nemeema Date: 6-23-98

Responsible Manager: Jacqueline Waddell Date: 6/25/98

Quality Assurance Review

☐ Anomaly ☐ Deficiency ☒ Rerun

☐ Further action required:

Assigned to:

QA signature: CBlack Date: 6-25-98

Corrective Action Verification

☐ Verified

☐ Cannot Verify (specify reason): N/A

Nonconformance Memo Closure

QA signature/date: CBlack 6-25-98

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number/s:	806110
Client ID:	BNI
Due Date:	6-19-98
Lab Sample Number or SDG:	W92411
Method Test Parameters:	Plutonium
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? AM 6-19-98	—			
5. Were all calculations checked at a minimum frequency?	—			
6. Units checked?	—			—

Comments on any "No" response: _____

First Level Review: [signature] Date: 6-19-98

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

Form #: LS-038.2/90, Rev.4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	806110
Client ID:	BHI
Due Date:	6-19-98
Lab Sample Number or SDG:	W02411
Method Test Parameters:	UISO
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 6-18-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: [signature] Date: 6-18-98

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

Form #: LS-038.2/96, Rev 4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	806110
Client ID:	BHI
Due Date:	6-19-98
Lab Sample Number or SDG:	W02411
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?	—	— NCM		—
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?	1 NCM			—
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: No add on isotopes

First Level Review: [signature] Date: 6-18-98

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

Form #: LS-038.2 /96, Rev 4

Report BHI "5" + additional isotopes listed on last page of each summary report.

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QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG #: RD-98-_____

Project ID: BHI NCM Initiated by: MK 6-28-98

Sample Numbers: 80611001-06

Tests: Gamma

Matrix: Other (Concrete) W02411

Analytical Area (check appropriate area):

- ☐ Sample control
- ☐ Organic preparation
- ☐ Inorganic preparation
- ☐ GC
- ☐ HPLC
- ☐ GC/MS
- ☐ Wet chemistry
- ☐ Metals
- ☐ Reporting
- ☒ Data review
- ☒ Radiochemistry
- ☐ Bioassay

Nonconformance (check appropriate area):

Holding Time Violations (exceeded by _____ days)

Category I: Laboratory Independent

- ☐ 1. Holding time expired in transit
- ☐ 2. Sample received > 48 hrs. or 1/2 holding time has expired
- ☐ 3. Test added by client after expiration

Category II: Laboratory Dependent

- ☐ 4. Instrument failure
- ☐ 5. Analyst error
- ☐ 6. Login error
- ☐ 7. Miscommunication
- ☐ 8. Other (complete description required)

Category III: Analysis Reruns (QA/QC)

- ☐ 9. Surrogates
- ☐ 10. Internal Standards
- ☐ 11. Spike Recoveries
- ☐ 12. Blank Contamination

Category IV: Analysis Reruns (Confirmation)

- ☐ 13. Second column
- ☐ 14. Contamination check
- ☐ 15. Confirmation of matrix effects
- ☐ 16. Other (complete description required)

Quality Assurance/Quality Control

- ☐ 17. QC data reported outside of controls
- ☐ 18. Incorrect procedure used
- ☐ 19. SOP intentionally modified with QA and Tech. approval
- ☐ 20. Invalid instrument calibration
- ☐ 21. Insufficient sample received for proper analysis

Incorrect or Incomplete Client Deliverable

- ☐ 22. Hardcopy deliverable error
- ☐ 23. Electronic deliverable error

Reported detection limits elevated due to:

- ☒ 24. Sample matrix
- ☒ 25. Insufficient sample volume
- ☐ 26. Other (complete description required)
- ☐ 27. *Other (specify):* _____

Comments/Explanation: _____

Notification (check appropriate area):

Client notified by (name and date): _____

- ☑ in writing CN
- ☐ by telephone
- ☐ by facsimile
- ☐ other (explain)

Client's name and response: _____

- ☐ process "as is"
- ☐ on hold until _____
- ☐ re-sample
- ☐ other (explain)

Project Manager (signature and date): [signature] 6/24/98

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG#: RD-98-_____

Corrective Action

Root Cause Initial and date: MK 6-18-98

/

Corrective Action Initial and Date: MK 6-18-98

Data accepted with MDAs achieved, MDAs are near the Contract detection limit. Blank used was Ottawa sand matrix material + for the blank all MDAs were less than the CRDL. Count times for samples + QC were increased to 1000 min to attempt to meet CRDL.

Responsibility for performing CA assigned to: _____

Actions to prevent recurrence Initial and Date: _____

First Level Supervisor: Joel Klemzema Date: 6-18-98

Responsible Manager: Jacqueline Waddell Date: 6/25/98

Quality Assurance Review

☒ Anomaly ☐ Deficiency ☐ Rerun

☐ Further action required: _____

Assigned to: _____

QA signature: CBlack Date: 6-25-98

Corrective Action Verification

☐ Verified

☐ Cannot Verify (specify reason): NA

Nonconformance Memo Closure

QA signature/date: CBlack 6-25-98

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number(s): 806110

Client ID: BHI

Due Date: 6-19-98

Lab Sample Number or SDG: W 92411

Method Test Parameters: Total Sr

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? JM 6-15-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: [signature] Date: 6-15-98

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	B98-087-04	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No. CL449	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
Shipped To Quanterra Incorporated	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS SDG W02411 806080	Activity Scan	PCBs - 8080	See item (1) in Special Instructions. ~~806110~~ 2/6/5/98	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							

Sample No.	Matrix *	Sample Date	Sample Time										
✓ BONVN~~1~~5 01	Other Solid	6-2-98	0835	x	x	x	x					BONV	T7
✓ BONVN6 02	other solid	6-2-98	0845	x	x	x	x					BONV	T8
✓ BONVP7 03	other solid	6-2-98	0902	x	x	x	x					BONV	T9
✓ BONVP8 04	other solid	6-2-98	0910	x	x	x	x					BONV	V0
✓ BONVP9 05	other solid	6-2-98	0930	x	x	x	x					BONV	V1

CHAIN OF POSSESSION — **Sign/Print Names** 0840

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielsen	6/4/98 0840	[signature]	6-4-98
		2100 cpm	

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 – Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-05	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No. CL449	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
Shipped To Quanterra Incorporated	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS 806080	Activity Scan	PCBs - 8080	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							

Sample No.	Matrix *	Sample Date	Sample Time										
BONVN2 RO 06	Other Solid	6-2-98	0940	X	X	X	X					BON	VV2
BONVR1 07	other solid	6-2-98	1000	X	X	X	X					BON	VV3
BONVR2 08	other solid	6-2-98	1017	X	X	X	X					BON	VV4
BONVR3 09	other solid	6-2-98	1250	X	X	X	X					BON	VV5

CHAIN OF POSSESSION — **Sign/Print Names** 0840

Relinquished By	Date/Time	Received By	Date/Time
Bence Nielsen	6/4/98 0840	[signature]	6-4-98
		L100 [signature]	

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 – Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

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

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-06	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No.	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
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

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS	Activity Scan	PCBs - 8080	See item (1) in Special Instructions. 806110	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							

806080

Sample No.	Matrix *	Sample Date	Sample Time									
BONVR4 10	Other Solid	6.3.98	1230	X	X	X 01	X					BONV V6
BONVR5 11	↓	6.3.98	1240	X	X	X 02	X					BONV V7
BONVR6 12	↓	6.3.98	1250	X	X	X 03	X					BONV V8
BONVR7 * 13	↓	6.3.98	1305	X	X	X —	X					BONV V9
BONVR8 14	↓	6.3.98	1315	X	X	X 04	X					BONV W0

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

Relinquished By	Date/Time	Received By	Date/Time
R Fahlberg / R Fahlberg	6-4-98 1415	Karen Achterburg	6-4-98 1415
			2100 CH 97

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 – Total Sr; ~~Technetium-99, Nickel-63, Carbon-14~~

* BONVR7 Analysis of PCBs only until notified by ERC

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

0029

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-07	Page 1 of 1

Collector R Fahlberg	**Company Contact** S Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ	**Data Turnaround** 21 Days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 100 C		**SAF No.** B98-087	
Ice Chest No.	**Field Logbook No.** EL 1309-2		**Method of Shipment** HAND DELIVERED	
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

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS 806080	Activity Scan	PCBs - 8080	See item (1) in Special Instructions. 806110	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)							
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
BONVW1 R9 * 15	Other Solid	6-3-98	1325	X	X	X	X				BONVW1
BONVX6 16	↓	6-3-98	1345	X	X	X 05	X				BONVW2
BONVX7 17	↓	6-3-98	1356	X	X	X 06	X				BONVW3

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

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R Fahlberg	6-4-98 1420	Karen Dellacollina	6-4-98 1420

SPECIAL INSTRUCTIONS

** Quanterra is to analyze samples for PCBs only upon receipt. All additional sample material is to be held for potential analyses at a later date.

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; ~~Technetium-99; Nickel-63; Carbon-14~~

* BONVR9 Analysis of PCBs only until instructed by ERC

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

Bechtel

Figure 1

KIT SAMPLE CHECK-IN LIST

Date/Time Received: ~~6-3-98~~ 6-4-98 SG#: W02411

Work Order Number: 806080 +110 SAF #: B98-087

Shipping Container ID: NOT Marked Chain of Custody # B98-087-06 +07

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: 24
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: [signature] Date: 6-4-98

Telephoned To: _____ On _____ By _____

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 6/4 0840 SG#: W02411

Work Order Number: 806080 SAF #: B98-087

Shipping Container ID: CL449 Chain of Custody # B98-087-04 +05

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 3°
5. Vermiculite/packing materials is Wet [ ] Dry [✓] n/a
6. Number of samples in shipping container: 27
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: Heidelberg Date: 6/4/98

Telephoned To: _____ On _____ By _____

BON VR5

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase II			
Customer ID	B0NVV7	Other Solid		
RCF ID	RCF3464			
	Sample time, date		1249	6/3/98
	Analysis date			6/4/98

Isotope		Activity pCi/gm	2 s err	Ci/gm	
K40	<	3.0e+01		3.0e-11	
Co60	<	3.2e+00		3.2e-12	
I129	<	1.3e+03		1.3e-09	
Cs137	<	3.1e+00		3.1e-12	
Eu152	<	1.6e+01		1.6e-11	
Eu154	<	9.9e+00		9.9e-12	
Eu155	<	1.4e+01		1.4e-11	
Th232dau	<	4.7e+00		4.7e-12	
U235	<	4.0e+00		4.0e-12	
U238	<	2.7e+02		2.7e-10	
U238dau	<	6.1e+00		6.1e-12	
Np237	<	6.4e+00		6.4e-12	
Am241	<	2.4e+01		2.4e-11	
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00	
Y/Sr-90	<	N/R			
Gross Alpha	<	4.2e-01		4.2e-13	
Gross Beta		1.0e+01	+/- 4.1e+00	1.0e-11	Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 1.1e+01
(Ci/gm) 1.1e-11

Cat I
6/5/98
B

Definitions:

All errors reported at 2 standard deviations
A Assigned as residual beta from Gamma/Beta balance.

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

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.

SEH S JLD by [illegible] 6 4 98
Radiological analyst Date

Albert I. Davis 6/4/98
Albert I. Davis
Radiological Manager Date

0033

Post-it® Fax Note 7671 Date 6/4 # of pages ▶ 6
To Al Gallegos From Al Gallegos
Co./Dept. Co.
Phone # Phone # 373-9751
Fax # 376-6851 Fax #

BONVN4

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase II		
Customer ID	B0NVV6	Other Solid	
RCF ID	RCF3463		
	Sample time, date	1230	6/3/98
	Analysis date		6/4/98

Isotope		Activity pCi/gm	2 s err	Ci/gm
K40	<	3.8e+01		3.8e-11
Co60	<	2.8e+00		2.8e-12
I129	<	1.8e+01		1.8e-11
Cs137	<	2.6e+00		2.6e-12
Eu152	<	1.3e+01		1.3e-11
Eu154	<	1.4e+01		1.4e-11
Eu155	<	5.4e+00		5.4e-12
Th232dau	<	1.4e+01		1.4e-11
U235	<	1.3e+01		1.3e-11
U238	<	3.5e+02		3.5e-10
U238dau	<	5.6e+00		5.6e-12
Np237	<	4.5e+00		4.5e-12
Am241	<	3.8e+00		3.8e-12
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	1.3e+00		1.3e-12
Gross Beta		9.8e+00	+/- 4.7e+00	9.8e-12 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 1.0e+01
(Ci/gm) 1.0e-11

Cat I
6/5/98

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 refined 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.

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

SEH + JLD 6-4-98
Radiological analyst Date

Albert I. Davis
Albert I. Davis 6/4/98
Radiological Manager Date

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

B0NVR6

Project	105 C Phase II			
Customer ID	B0NVV8	Other Solid		
RCF ID	RCF3465			
	Sample time, date		1250	6/3/98
	Analysis date			6/4/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40		1.4e+01	+/-	4.6e+00	1.4e-11	
Co60	<	7.8e-01			7.8e-13	
I129	<	3.9e+00			3.9e-12	
Cs137	<	5.6e-01			5.6e-13	
Eu152	<	2.7e+00			2.7e-12	
Eu154	<	1.1e+00			1.1e-12	
Eu155	<	1.1e+00			1.1e-12	
Th232dau	<	2.7e+00			2.7e-12	
U235	<	2.8e+00			2.8e-12	
U238	<	6.7e+01			6.7e-11	
U238dau	<	4.8e+00			4.8e-12	
Np237	<	8.0e-01			8.0e-13	
Am241	<	7.4e-01			7.4e-13	
Tot Act Gam (pCi/gm)		1.4e+01		Ci/gm	1.4e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	1.1e+00			1.1e-12	
Gross Beta		1.1e+01	+/-	5.4e+00	1.1e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 1.2e+01
(Ci/gm) 1.2e-11

Cat I
6/5/98

Definitions:

All errors reported at 2 standard deviations
A Assigned as residual beta from Gamma/Beta balance.

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

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.

[signature] 6-4-98
Radiological analyst Date

[signature] 6/4/98
Albert L. Davis Date
Radiological Manager

0035

B0NVR8

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase II		
Customer ID	B0NVW0	Other Solid	
RCF ID	RCF3467		
	Sample time, date	1315	6/3/98
	Analysis date		6/4/98

Isotope		Activity pCi/gm	2 s err	Ci/gm
K40	<	3.6e+00		3.6e-12
Co60	<	4.8e-01		4.8e-13
I129	<	7.5e+00		7.5e-12
Cs137	<	3.9e-01		3.9e-13
Eu152	<	3.0e+00		3.0e-12
Eu154	<	1.3e+00		1.3e-12
Eu155	<	1.2e+00		1.2e-12
Th232dau	<	5.0e-01		5.0e-13
U235	<	4.5e-01		4.5e-13
U238	<	5.3e+01		5.3e-11
U238dau	<	6.8e-01		6.8e-13
Np237	<	8.2e-01		8.2e-13
Am241	<	8.5e-01		8.5e-13
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	9.0e-01		9.0e-13
Gross Beta	<	7.5e+00		7.5e-12 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 8.0e+00
(Ci/gm) 8.0e-12

Cat I
B 6/5/98

Definitions:

All errors reported at 2 standard deviations
A Assigned as residual beta from Gamma/Beta balance.

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

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.

SEH SBLD 6/4/98
Radiological analyst Date

Albert I. Davis 6/4/98
Radiological Manager Date

0036

BONVX6

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase II			
Customer ID	B0NVW2	Other Solid		
RCF ID	RCF3469			
	Sample time, date		1345	6/3/98
	Analysis date			6/4/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40		1.7e+01	+/-	4.7e+00	1.7e-11	
Co60	<	3.9e-01			3.9e-13	
I129	<	3.6e+00			3.6e-12	
Cs137	<	5.1e-01			5.1e-13	
Eu152	<	2.9e+00			2.9e-12	
Eu154	<	2.7e+00			2.7e-12	
Eu155	<	1.1e+00			1.1e-12	
Th232dau	<	2.8e+00			2.8e-12	
U235	<	2.4e+00			2.4e-12	
U238	<	6.9e+01			6.9e-11	
U238dau	<	2.0e+00			2.0e-12	
Np237	<	3.5e-01			3.5e-13	
Am241	<	6.9e-01			6.9e-13	
Tot Act Gam (pCi/gm)		1.7e+01		Ci/gm	1.7e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	5.5e+01			5.5e-11	
Gross Beta		1.0e+01	+/-	4.4e+00	1.0e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 1.7e+01
(Ci/gm) 1.7e-11

Cat I

(B) 6/5/98

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.

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

[signature] 6-4-98
Radiological analyst Date

[signature] 6/4/98
Albert I. Davis Date
Radiological Manager

0037

B0NVX7

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase II			
Customer ID	B0NVW3	Other Solid		
RCF ID	RCF3470			
	Sample time, date		1356	6/3/98
	Analysis date			6/4/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	3.3e+00			3.3e-12	
Co60	<	5.8e-01			5.8e-13	
I129	<	6.9e+00			6.9e-12	
Cs137	<	3.8e-01			3.8e-13	
Eu152	<	3.0e+00			3.0e-12	
Eu154	<	1.4e+00			1.4e-12	
Eu155	<	1.2e+00			1.2e-12	
Th232dau	<	5.4e-01			5.4e-13	
U235	<	4.1e-01			4.1e-13	
U238	<	5.1e+01			5.1e-11	
U238dau	<	5.6e-01			5.6e-13	
Np237	<	7.7e-01			7.7e-13	
Am241	<	8.7e-01			8.7e-13	
Tot Act Gam (pCi/gm)		0.0e+00		Ci/gm	0.0e+00	
Y/Sr-90	<	N/R				
Gross Alpha	<	8.3e-01			8.3e-13	
Gross Beta		1.0e+01	+/-	4.4e+00	1.0e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 1.1e+01
(Ci/gm) 1.1e-11

Cat I
R3 6/5/98

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.

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

SEH: TAD [signature] 6-4-98
Radiological analyst Date

[signature] 6/4/98
Albert I. Davis Date
Radiological Manager

0038

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase II		
Customer ID	B0NVW1	Other Solid	
RCF ID	RCF3468		
	Sample time, date	1325	6/3/98
	Analysis date		6/4/98

Isotope		Activity pCi/gm		2 s err	Ci/gm
K40	<	2.0e+01			2.0e-11
Co60	<	3.6e+00			3.6e-12
I129	<	1.5e+03			1.5e-09
Cs137	<	3.3e+00			3.3e-12
Eu152	<	1.9e+01			1.9e-11
Eu154	<	1.1e+01			1.1e-11
Eu155	<	1.4e+01			1.4e-11
Th232deu	<	4.5e+00			4.5e-12
U235	<	4.5e+00			4.5e-12
U238	<	2.5e+02			2.5e-10
U238deu	<	4.9e+00			4.9e-12
Np237	<	7.0e+00			7.0e-12
Am241	<	2.7e+01			2.7e-11
Tot Act Gam (pCi/gm)		0.0e+00		Ci/gm	0.0e+00
Y/Sr-90	<	N/R			
Gross Alpha	<	3.7e-01			3.7e-13
Gross Beta		1.0e+01	+/-	4.6e+00	1.0e-11 Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 1.1e+01
(Ci/gm) 1.1e-11

Cat I
6/5/98

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

U238deu 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.

Th32deu 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.

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

Radiological analyst — Date 6-4-98

Albert I. Davis — Date 6/4/98
Radiological Manager

0039

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C-Phase II			
Customer ID	B0NVV1	Other Solid		B0NVP9
RCF ID	RCF3453			
	Sample time, date		930	6/2/98
	Analysis date			6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	5.9e+01			5.9e-11	
Co60	<	8.8e+00			8.8e-12	
I129	<	6.4e+02			6.4e-10	
Cs137		1.9e+01	+/-	8.1e+00	1.9e-11	
Eu152	<	3.6e+01			3.6e-11	
Eu154	<	1.6e+01			1.6e-11	
Eu155	<	2.0e+01			2.0e-11	
Th232dau	<	2.3e+01			2.3e-11	
U235	<	8.2e+00			8.2e-12	
U238	<	6.9e+02			6.9e-10	
U238dau	<	1.3e+01			1.3e-11	
Np237	<	1.4e+01			1.4e-11	
Am241	<	2.3e+01			2.3e-11	
Tot Act Gam (pCi/gm)		1.9e+01		Ci/gm	1.9e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	2.4e+00			2.4e-12	
Gross Beta		3.8e+01	+/-	1.1e+01	3.8e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Cat I

B 6/4/98

Total Activity (pCi/gm) 4.1e+01
(Ci/gm) 4.1e-11

Definitions:

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

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.

CEH + TLD by AID 6-3-98
Radiological analyst Date

Albert I. Davis 6/3/98
Albert I. Davis
Radiological Manager Date

0040

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVP8

Project	105 C-Phase II		
Customer ID	B0NVV0	Other Solid	
RCF ID	RCF3452		
	Sample time, date	910	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	1.4e+01			1.4e-11	
Co60		2.1e+00	+/-	5.0e-01	2.1e-12	
I129	<	3.7e+00			3.7e-12	
Cs137		7.0e+01	+/-	3.3e+00	7.0e-11	
Eu152	<	2.5e+00			2.5e-12	
Eu154	<	1.0e+00			1.0e-12	
Eu155	<	9.7e-01			9.7e-13	
Th232dau	<	2.7e+00			2.7e-12	
U235	<	2.2e+00			2.2e-12	
U238	<	4.7e+01			4.7e-11	
U238dau	<	1.3e+00			1.3e-12	
Np237	<	1.0e+00			1.0e-12	
Am241	<	5.2e-01			5.2e-13	
Tot Act Gam (pCi/gm)		7.2e+01		Ci/gm	7.2e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	4.0e+00			4.0e-12	
Gross Beta		5.2e+01	+/-	1.3e+01	5.2e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 7.6e+01
(Ci/gm) 7.6e-11

Cat I

6/2/98

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.

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

SLHS JLD [illegible] 6-3-98
Radiological analyst Date

Albert I. Davis 6/3/98
Albert I. Davis Date
Radiological Manager

0041

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project: 105 C-Phase II
Customer ID: B0NWT9 Other Solid B0NVP7
RCF ID: RCF3451
Sample time. date 902 6/2/98
Analysis date 6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	7.8e+00			7.8e-12	
Co60	<	5.8e-01			5.8e-13	
I129	<	8.7e+00			8.7e-12	
Cs137		3.2e+01	+/-	2.6e+00	3.2e-11	
Eu152	<	2.9e+00			2.9e-12	
Eu154	<	1.9e+00			1.9e-12	
Eu155	<	1.5e+00			1.5e-12	
Th232dau	<	8.5e-01			8.5e-13	
U235	<	5.3e-01			5.3e-13	
U238	<	5.9e+01			5.9e-11	
U238dau	<	8.4e-01			8.4e-13	
Np237	<	1.1e+00			1.1e-12	
Am241	<	1.2e+00			1.2e-12	
Tot Act Gam (pCi/gm)		3.2e+01		Ci/gm	3.2e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	1.4e+00			1.4e-12	
Gross Beta		2.6e+01	+/-	8.6e+00	2.6e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 3.3e+01
(Ci/gm) 3.3e-11

Cat I
6/4/98

Definitions:

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

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 6/3/98

Albert I. Davis
Radiological Manager — Date 6/3/98

0042

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C-Phase II			
Customer ID	B0NVT8	Other Solid	BONVN6	
RCF ID	RCF3450			
	Sample time. date		845	6/2/98
	Analysis date			6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40		8.9e+00	+/-	4.0e+00	8.9e-12	
Co60	<	4.0e-01			4.0e-13	
I129	<	4.5e+00			4.5e-12	
Cs137		1.1e+01	+/-	1.3e+00	1.1e-11	
Eu152	<	2.8e+00			2.8e-12	
Eu154	<	1.4e+00			1.4e-12	
Eu155	<	1.1e+00			1.1e-12	
Th232dau	<	3.2e+00			3.2e-12	
U235	<	3.2e+00			3.2e-12	
U238	<	6.3e+01			6.3e-11	
U238dau	<	3.6e+00			3.6e-12	
Np237	<	5.4e-01			5.4e-13	
Am241	<	7.8e-01			7.8e-13	
Tot Act Gam (pCi/gm)		2.0e+01		Ci/gm	2.0e-11	
Y/Sr-90	<	N/R				
Gross Alpha	<	1.5e+00			1.5e-12	
Gross Beta		1.8e+01	+/-	6.8e+00	1.8e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 2.1e+01
(Ci/gm) 2.1e-11

Cat I

6/4/98

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.

N/R means no result or analysis not requested

Radiological analyst — Date 6/3/98

Albert I. Davis
Radiological Manager — Date 6/3/98

0043

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C-Phase II		
Customer ID	B0NVV5	Other Solid	BONVR3
RCF ID	RCF3457		
	Sample time, date	1250	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm	2 s err	Ci/gm
K40	<	5.3e+01		5.3e-11
Co60	<	2.4e+00		2.4e-12
I129	<	2.6e+01		2.6e-11
Cs137	<	4.8e+00		4.8e-12
Eu152	<	2.4e+01		2.4e-11
Eu154	<	8.7e+00		8.7e-12
Eu155	<	7.3e+00		7.3e-12
Th232dau	<	2.1e+01		2.1e-11
U235	<	2.1e+01		2.1e-11
U238	<	4.9e+02		4.9e-10
U238dau	<	2.7e+01		2.7e-11
Np237	<	6.5e+00		6.5e-12
Am241	<	4.3e+00		4.3e-12
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	1.1e+00		1.1e-12
Gross Beta	<	7.7e+00		7.7e-12 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 9.0e+00
(Ci/gm) 9.0e-12

Cat I
6/4/98

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.

N/R means no result or analysis not requested.

SEH & TLD [illegible] 6-3-98
Radiological analyst Date

Albert I. Davis 6/3/98
Albert I. Davis Date
Radiological Manager

0044

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVR2

Project	105 C-Phase II		
Customer ID	B0NVV4	Other Solid	
RCF ID	RCF3456		
	Sample time, date	1017	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm	2 s err	Ci/gm	
K40	<	5.6e+01		5.6e-11	
Co60	<	9.1e+00		9.1e-12	
I129	<	6.4e+02		6.4e-10	
Cs137	<	5.8e+00		5.8e-12	
Eu152	<	4.3e+01		4.3e-11	
Eu154	<	2.3e+01		2.3e-11	
Eu155	<	2.1e+01		2.1e-11	
Th232dau	<	2.3e+01		2.3e-11	
U235	<	8.3e+00		8.3e-12	
U238	<	7.1e+02		7.1e-10	
U238dau	<	1.4e+01		1.4e-11	
Np237	<	1.4e+01		1.4e-11	
Am241	<	2.6e+01		2.6e-11	
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00	
Y/Sr-90	<	N/R			
Gross Alpha	<	1.8e+00		1.8e-12	
Gross Beta	<	1.2e+01		1.2e-11	Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 1.3e+01
(Ci/gm) 1.3e-11

Cat I
6/4/98

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.

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N/R means no result or analysis not requested.

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

SEH-JLD 6-3-98
Radiological analyst Date

Albert I. Davis 6/3/98
Radiological Manager Date

0045

GAMMA-RAY ENERGY ANALYSIS REPORT
Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C-Phase II		BONVR1
Customer ID	B0NVV3	Other Solid	
RCF ID	RCF3455		
	Sample time, date	1000	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm	2 s err	Ci/gm	
K40	<	6.9e+01		6.9e-11	
Co60	<	7.5e+00		7.5e-12	
I129	<	6.8e+02		6.8e-10	
Cs137	<	6.9e+00		6.9e-12	
Eu152	<	4.0e+01		4.0e-11	
Eu154	<	2.7e+01		2.7e-11	
Eu155	<	2.2e+01		2.2e-11	
Th232dau	<	2.4e+01		2.4e-11	
U235	<	8.7e+00		8.7e-12	
U238	<	9.4e+02		9.4e-10	
U238dau	<	1.6e+01		1.6e-11	
Np237	<	1.5e+01		1.5e-11	
Am241	<	2.7e+01		2.7e-11	
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00	
Y/Sr-90	<	N/R			
Gross Alpha	<	1.7e+00		1.7e-12	
Gross Beta	<	9.2e+00		9.2e-12	Reported as 137-Cs Betas.
AEA total	<	N/R			

Total Activity (pCi/gm) 9.0e+00
(Ci/gm) 9.0e-12

Cat I
B 6/4/98

Definitions:

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

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.

SEH · TLH [signature] 6-3-98
Radiological analyst Date

[signature] 6/3/98
Albert I. Davis Date
Radiological Manager

0046

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

BONVRO

Project	105 C-Phase II		
Customer ID	B0NVV2	Other Solid	
RCF ID	RCF3454		
	Sample time, date	940	6/2/98
	Analysis date		6/3/98

Isotope		Activity pCi/gm		2 s err	Ci/gm	
K40	<	5.8e+01			5.8e-11	
Co60	<	8.8e+00			8.8e-12	
I129	<	2.2e+01			2.2e-11	
Cs137	<	3.4e+00			3.4e-12	
Eu152	<	1.8e+01			1.8e-11	
Eu154	<	7.5e+00			7.5e-12	
Eu155	<	5.9e+00			5.9e-12	
Th232dau	<	1.8e+01			1.8e-11	
U235	<	1.6e+01			1.6e-11	
U238	<	3.8e+02			3.8e-10	
U238dau	<	5.9e+00			5.9e-12	
Np237	<	4.6e+00			4.6e-12	
Am241	<	4.5e+00			4.5e-12	
Tot Act Gam (pCi/gm)		0.0e+00		Ci/gm	0.0e+00	
Y/Sr-90	<	N/R				
Gross Alpha	<	9.1e-01			9.1e-13	
Gross Beta		1.0e+01	+/-	5.6e+00	1.0e-11	Reported as 137-Cs Betas.
AEA total	<	N/R				

Total Activity (pCi/gm) 1.1e+01
(Ci/gm) 1.1e-11

Cat I

6/4/98

Definitions:

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

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.

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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 6-3-98

Albert I. Davis
Radiological Manager — Date 6/3/98

0047

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	105 C Phase 8			
Customer ID	B0NVV8	Other Solid		
RCF ID	RCF3466			
	Sample time, date		1305	6/3/98
	Analysis date			6/4/98

Isotope		Activity pCi/gm	2 s err	Ci/gm
K40	<	3.7e+01		3.7e-11
Co60	<	1.9e+00		1.9e-12
I129	<	1.6e+01		1.6e-11
Cs137	<	5.6e+00		5.6e-12
Eu152	<	1.8e+01		1.8e-11
Eu154	<	5.9e+00		5.9e-12
Eu155	<	5.2e+00		5.2e-12
Th232dau	<	1.3e+01		1.3e-11
U235	<	1.3e+01		1.3e-11
U238	<	2.7e+02		2.7e-10
U238dau	<	1.6e+01		1.6e-11
Np237	<	4.2e+00		4.2e-12
Am241	<	3.4e+00		3.4e-12
Tot Act Gam (pCi/gm)		0.0e+00	Ci/gm	0.0e+00
Y/Sr-90	<	N/R		
Gross Alpha	<	9.0e-01		9.0e-13
Gross Beta		9.3e+00	+/- 4.5e+00	9.3e-12 Reported as 137-Cs Betas.
AEA total	<	N/R		

Total Activity (pCi/gm) 1.8e+01
(Ci/gm) 1.8e-11

Cat I

RB 6/5/98

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.

N/R means no result or analysis not requested.

SETH FLAD 6-4-98
Radiological analyst Date

Albert I. Davis 6/4/98
Radiological Manager Date

0048

Due 6-17-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

5-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02411

MATRIX : OTHER B98-087

BATCH NUMBER 06-110

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80611001		BHI	BONVN4	
2)	80611002 D0611002		BHI	BONVR5	
3)	80611003		BHI	BONVR6	
4)	80611004		BHI	BONVR8	
5)	80611005		BHI	BONVX6	
6)	80611006 J0611018 T 15		BHI	BONVX7	

ACTIONS (Initial & Date)

1) INITIATED JH 6/5/98

SOP(S) # RDXUV

2) PREP LAB RECEIVED JN 6-9-98

SOP(S) # RICHRC5013

3) SAMPLE REMAINDER STORED JN 6-10-98

SOP(S) # N/A

4) SEPARATION LAB RECEIVED 6-12-98 KC

SOP(S) # RICHRC5057

5) COUNTING/MEASUREMENT LAB (R) 6/18/98

SOP(S) # RICHRC00008 R.0

6) DATA REVIEWED AND ANALYTICAL PREP STORED MK 6-22-98 ~~6-19-98~~

SOP(S) # RICHRC0002 Rev V2

Prep 2 rec'd: 6-10-98 DRC
RICHRC5013-0

Coppt. 6-18-98 RICHRC5003.1

Quanterra Environmental Services

DUE DATE 6-19-98

*** RECOUNT REQUEST ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

CUSTOMER BHI

MATRIX Other

ANALYSIS Am241

SAMPLE DELIVERY GROUP W0241C

BATCH NUMBER

	LAB SAMPLE ID	CUSTOMER ID	COMMENTS
1)	~~[illegible]~~ J061101S		200 min
2)	MC 6-22-98		
3)			
4)			
5)			
6)			
7)			
8)			
9)			
10)			
11)			
12)			
13)			
14)			
15)			
16)			
17)			
18)			
19)			
20)			

MC 6-22-98

ACTIONS (Initial & Date)

1) INITIATED MC 6-~~19~~ 22-98

SOP(S) # ~~RECHRC0002~~ Rev 2

2) COUNTING/MEASUREMENT LAB RECEIVED 6/22/98

SOP(S) # HCHRD0008

3) DATA REVIEWED AND ANALYTICAL PREP STORED MC 6-~~22~~ 23-98 MC 6-23-98

SOP(S) # ~~RECHRC0002~~ Rev 2

RC-126 10/96 REV 0

Due 6-19-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

5-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02411

MATRIX : OTHER B98-087

BATCH NUMBER 06-110

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80611001		BHI	BONVN4	
2)	80611002 D06110 02		BHI	BONVR5	
3)	80611003		BHI	BONVR6	
4)	80611004		BHI	BONVR8	
5)	80611005		BHI	BONVX6	
6)	80611006 J06110 18		BHI	BONVX7	

J06 110 15

ACTIONS (Initial & Date)

1) INITIATED JH 6/5/98

SOP(S) # RO 8600

2) PREP LAB RECEIVED JW 6-9-98

SOP(S) # RICHRC5013

3) SAMPLE REMAINDER STORED JW 6-10-98

SOP(S) # N4

4) SEPARATION LAB RECEIVED 6-12-98 KC

SOP(S) # RICHRC5057

5) COUNTING/MEASUREMENT LAB (R) 6/18/98

SOP(S) # RICHRD0008 R.0

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

SOP(S) # RICHRC0002 Rev2

prep 2 need: 6-10-98 DOR RKHRC5013-0

E.D. 6-18-98 RICHRC5039.1

Due 6-19-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

5-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02411

MATRIX : OTHER B98-087

BATCH NUMBER 06-110

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80611001		BHI	BONVN4	
2)	80611002 D0611002		BHI	BONVR5	
3)	80611003		BHI	BONVR6	
4)	80611004		BHI	BONVR8	
5)	80611005		BHI	BONVX6	
6)	80611006 J061101B J061101S		BHI	BONVX7	

ACTIONS (Initial & Date)

1) INITIATED JH 6/5/98
SOP(S) # RD2800

2) PREP LAB RECEIVED JN 6-9-98
SOP(S) # RICHRC5013

3) SAMPLE REMAINDER STORED JN 6-10-98
SOP(S) # NA

4) SEPARATION LAB RECEIVED 06-11-98 Eve
SOP(S) # RICHRC5030

5) COUNTING/MEASUREMENT LAB (R3) 6/16/98
SOP(S) # RICHRD0008 R0

6) DATA REVIEWED AND ANALYTICAL PREP STORED MK 6-18-98
SOP(S) # RICHRC0002 RW2

prep 2 rec'd: 6-10-98 DR
RICHRC5013-0

1st + 2nd Ext RB 6/15/98
RICHRC5030
ED RB 6/16/98 RICHRC5039

Due 6-19-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

5-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02411

MATRIX : OTHER B98-087

BATCH NUMBER 06-110

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80611001		BHI	BONVN4	
2)	80611002		BHI	BONVR5	
3)	80611003		BHI	BONVR6	
4)	80611004		BHI	BONVR8	
5)	80611005		BHI	BONVX6	
6)	80611006		BHI	BONVX7	
	D0611006				
	J0611001X		FWE OTTAWA SAND		
	J0611001M		CAL 790		

ACTIONS (Initial & Date)

1) INITIATED JH 6/5/98
SOP(S) # RD8800

2) PREP LAB RECEIVED JW 6-9-98
SOP(S) # RICHRC5013/RICHRC5017

3) SAMPLE REMAINDER STORED JW 6-10-98
SOP(S) # NA

4) SEPARATION LAB RECEIVED _____
SOP(S) # _____

5) COUNTING/MEASUREMENT LAB 6/10/98
SOP(S) # RICHRD0007

6) DATA REVIEWED AND ANALYTICAL PREP STORED JTK 6-18-98
SOP(S) # RICHRC0002
RW2

No add on isotopes listed client COC, JTK 6-18-98

Due 6-19-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

5-Jun-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02411

MATRIX : OTHER

BATCH NUMBER 06-110

	QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
1)	80611001		BHI	BONVN4	
2)	80611002 D06 11002		BHI	BONVR5	
3)	80611003		BHI	BONVR6	
4)	80611004		BHI	BONVR8	
5)	80611005		BHI	BONVX6	
6)	80611006 J06 110 1B J06 110 1S		BHI	BONVX7	

ACTIONS (Initial & Date)

1) INITIATED JH 6/5/98
SOP(S) # RD88V0

2) PREP LAB RECEIVED JW 6-9-98
SOP(S) # RICHRC5013

3) SAMPLE REMAINDER STORED JW 6-10-98
SOP(S) # NA

4) SEPARATION LAB RECEIVED RTM 6/11/98
SOP(S) # RichRC5004

5) COUNTING/MEASUREMENT LAB DD 6/13/98
SOP(S) # RICHRD0003 Rev1

6) DATA REVIEWED AND ANALYTICAL PREP STORED MK 6-15-98
SOP(S) # RICHRC0002 Rev2

prep 2 rec'd: 6-10-98 DVC
RICHRC5013-0