W02307

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

0049529

CASE NARRATIVE

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

May 28, 1998

Attention: Joan Kessner

AUG 1998 RECEIVED EDMC

JUN 1998 RECEIVED Data Log In

Project Number	:	550.260
SDG	:	W02307
Number of Samples	:	One (1)
Sample Matrix	:	Other Solid
Data Deliverable	:	Summary
Date SDG Closed	:	April 15, 1998

II. Introduction

On April 1, 1998, one (1) "other solid" sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The collection date on the three containers is March 30, 1998 and the collection date on the COC is March 3, 1998. The collection date on the containers was used for login purposes. Upon receipt, the sample was given the following laboratory ID numbers to correspond with the specific client ID:

St. Louis ID	BHI ID	Richland ID	Matrix	Date of Receipt
17383-001	B0N426	80401101	Other Solid	01-APR-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:
ICP (TCLP) Metals by EPA method 1311/6010
Mercury (TCLP) by EPA method 1311/7470
Semi-Volatiles by EPA method 8270
Volatiles by EPA method 8260 (TCL).

III. Analytical Results/ Methodology (continued)

Deviation from Request: No Deviation from requested methods.

IV. Definitions

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

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike
MS- Matrix Spike
MSD- Matrix Spike Duplicate

V. Comments

General: No general comments were noted.

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.

The results for the Silver LCSW169807 (110.7%) was greater than the upper control limit (94%). Since all the sample results were well below the TCLP regulatory limit of 5 mg/L for Silver the data was reported. See NCM# 4048

The percent differences for Barium (11.8) and Chromium (14.7) serial dilution were greater than 10 which were indicated on the form ones by the "E" flag.

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

No comments were noted during the analyses of these samples.

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

The sample in this SDG had low recovery of the surrogate DFM. The sample was also run as the MS/MSD pair and DFM was recovered low in both of those runs as well.

The samples in this SDG were run one day outside holding time. See NCM# 4171

The continuing calibration run on 4/14 with the samples in this SDG did not meet the twenty percent D criteria for compound 1,1-Dichloroethene. This compound had a %D of 30. The compound was recovered in QC range in the LCS, MS and MSD. The un-spiked sample showed no 1,1-Dichloroethene. Since samples were already outside holding time and re-running would be further outside hold time, the analyst reported the data with the non-compliant calibration. See NCM# 4172

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

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

Reviewed and approved:

Robert E. White

Robert E. White
Project Manager

Official Copy
MCW 4/14/98

LOG #: 4047

LABORATORY NONCONFORMANCE MEMO (NCM)

Quanterra Incorporated

Project ID/Client: 679.01 / 679.02 / 550.260

NCM Initiated by/Date: W. Lesko 4/14/98 Project Manager: J. Powell, B. White

Sample Numbers/QC batch or lot numbers: Batch 169807

Tests: ICAP/TCLP (Ag only)

Analytical Area (check appropriate area):

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

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 4/22/98

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

Client's name and response: Joan Kessner

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

Project manager (signature and date): Robert E. White 4/22/98 note in case narrative

000004A

QUANTERRA LABORATORY NONCONFORMANCE MEMO

LOG #: 4248

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

Problem Description/Root Cause Author's initials and date: M.P. 4-14-98

Ag LCS above upper control limit

LCS high bias samples below Reg. Limit

Corrective Actions (Short Term) Author's initials and date: M.P. 4-14-98

The batch had two LCSs and only LCS-1 was high the two LCSs were required for samples that did not get analysis for Ag. Since all the samples that were being analyzed for silver were no

Corrective Actions to Prevent Reoccurrence (Long Term) where near the TCLP Reg limit of 5mg/L and only one was above the RL of 0.010mg/l the data was accepted and not redigested.

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

Additional Comments: Will add out of control data point to control chart and continue gathering data points. At end of April will re-evaluate QC chart.

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

Date Corrective Action is to be completed: 5-1-98

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: M Wunder Date: 4/14/98

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.

000004B

Log # 4171

LABORATORY NONCONFORMANCE MEMO (NCM)

Quanterra Incorporated

Project ID/Client: 550.260

NCM Initiated by: Date: S. Louvier 5-28-98 Project Manager: Bob White.

Sample Numbers/QC batch or lot numbers: 17383-001, -001MS, -001MSD; 170000

Tests: VOA-8260

Analytical Area (check appropriate area):

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

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

Holding Time Violations (exceeded by 1 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) see explanation on back page

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 5/28/98 Noted in case narrative

000004C

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

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

Sample was ran 1 day outside HT

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

NONE AS IS

Corrective Actions to Prevent Reoccurrence (Long Term)

Bringing another MS on line to rerun samples in more timely manner

Corrective Action approved by (Supervisor/Group Leader) and date: Gillmans 5/28/98

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: M Writer Date: 5/28/98

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.

000004D

Log # 4172

LABORATORY NONCONFORMANCE MEMO (NCM)

Quanterra Incorporated

Project ID/Client: 550.260

NCM Initiated by/Date: S. Louvier 5-28-98 Project Manager: Bob White

Sample Numbers/QC batch or lot numbers: 17383-001, -001MS, -001MSD; 170000

Tests: VOA - 8260

Analytical Area (check appropriate area):

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

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 telephone
- ☐ By facsimile
- ☐ 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 5/28/98 Noted in case narrative

000004E

QUANTERRA LABORATORY NONCONFORMANCE MEMO LOG # 4172

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

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

Samples continuing cal for 1,1 Dichlorethen was greater than 30% D for continuing cal but no 1,1 Dichlorethene was found in any of the samples.

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

NONE AS IS.

Corrective Actions to Prevent Reoccurrence (Long Term) rerun sample with a valid continuing cal

Corrective Action approved by (Supervisor/Group Leader) and date: [signature] 5/28/98

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: M Winter Date: 5/28/98

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.

000004F

W02307

Quanterra April 03, 1998 01:09 pm
Account: 10722 Project: 550.260 Quanterra-Richland QAS No. 550.26 Rev. 3
Master Sample Login: 17383

Project Manager: W. Price

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

Sample Header Template:

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Rad Category / Site	Rad Sample No. / (Container Numbers:% Filled)
17383-001	BON426	Solid	30-MAR-98 09:50	01-APR-98 11:30	21-APR-98	AIRBORNE	2	R7095-001
	RICHLAND I.D. 80401101							
1	AN - Amber Glass-250ML	EXTMETAL/TCLP/Q4	S	COLD	15-APR-98	27-APR-98	R1C	(367499:99)
1		HG/TCLP/Q4	S	COLD	15-APR-98	27-APR-98	R1C	(367499:99)
1		ICAP/TCLP/Q4	S	COLD	15-APR-98	26-SEP-98	R1C	(367499:99)
1	AN - Amber Glass-120ML	BNA/8270/Q4	S	COLD	15-APR-98	13-APR-98	R1C	(367498:99)
1	AN - Amber Glass-60ML	VOA/8260/Q4	S	COLD	15-APR-98	13-APR-98	109H	(367497:99)
17383-001MS	BON426	Solid	30-MAR-98 09:50	01-APR-98 11:30	21-APR-98	AIRBORNE	2	R7095-001
	RICHLAND I.D. 80401101							
1	AN - Amber Glass-250ML	EXTMETAL/TCLP/Q4	S	COLD	15-APR-98	27-APR-98	R1C	(367499:99)
1		HG/TCLP/Q4	S	COLD	15-APR-98	27-APR-98	R1C	(367499:99)
1		ICAP/TCLP/Q4	S	COLD	15-APR-98	26-SEP-98	R1C	(367499:99)
1	AN - Amber Glass-120ML	BNA/8270/Q4	S	COLD	15-APR-98	13-APR-98	R1C	(367498:99)
1	AN - Amber Glass-60ML	VOA/8260/Q4	S	COLD	15-APR-98	13-APR-98	109H	(367497:99)
17383-001MSD	BON426	Solid	30-MAR-98 09:50	01-APR-98 11:30	21-APR-98	AIRBORNE	2	R7095-001
	RICHLAND I.D. 80401101							
1	AN - Amber Glass-250ML	EXTMETAL/TCLP/Q4	S	COLD	15-APR-98	31-MAR-98	R1C	(367499:99)
1		HG/TCLP/Q4	S	COLD	15-APR-98	31-MAR-98	R1C	(367499:99)
1		ICAP/TCLP/Q4	S	COLD	15-APR-98	30-AUG-98	R1C	(367499:99)
1	AN - Amber Glass-120ML	BNA/8270/Q4	S	COLD	15-APR-98	17-MAR-98	R1C	(367498:99)
1	AN - Amber Glass-60ML	VOA/8260/Q4	S	COLD	15-APR-98	17-MAR-98	109H	(367497:99)

000005

3*=Sample has not been rad screened.

R/C Temp 2°c curr# 14707
ST Louis

Chain of Custody Record

Quanterra

QUA-4124 0797

Client: Bechtel	Project Manager: A. Koprwa	Date: 4-1-98	Chain of Custody Number: 10494
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 058	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	Special Instructions/ Conditions of Receipt
80401101 BON426	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

QC Requirements (Specify): SDG W02307

	Date	Time		Date	Time
1. Relinquished By: Heidelberg QES	4-1-98	16:00	1. Received By: [signature]	4-2-98	0830
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments

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

900006

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-058-04	Page 1 of 1

Collector R Fahlberg	**Company Contact** Tom Pickett	**Telephone No.** 373-4630	**Project Coordinator** TRENT, SJ	**Data Turnaround** 45 Days
Project Designation Purgewater Truck Repair and Cleanout	**Sampling Location** 100N		**SAF No.** B98-058	
Ice Chest No.	**Field Logbook No.** EL-1309-1		**Method of Shipment** Hand Delivered	
Shipped To Quanterra Incorporated	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	
Waste Designation F003			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	None	Cool 4C	None	None	
Type of Container	P	P	P	aG	aG	aG	aG	P	
No. of Container(s)	1	1	1	1	1	1	1	1	
Volume	20ml	20ml	20ml	60ml	60ml	120ml	250ml	1000ml	
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	Isotopic Plutonium	VOA - 8260A (TCL)	Strontium-89,90 -- Total Sr	Semi-VOA - 8270A (TCL)	Metals by ICP (TCLP) - 1311/6010A; Mercury (TCLP) - 1311/7470	See item (1) in Special Instructions	
804011 SDG W02307		804	012		804012			804012	

Sample No.	Matrix *	Sample Date	Sample Time									
B0N426 01	Other Solid	3.3.98	0950	X	X	X	X 1 100	X	X 1 100	X 1 100	X	

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bryant for Fahlberg	1130 4-1-98	[signature]	1130 4/1/98
		<100cpm	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241)

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

000007

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 4/1 1130 SG#: W02307

Work Order Number: 804011 +012 SAF #: B98-058

Shipping Container ID: 96-071 Chain of Custody # B98-058-04

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°
5. Vermiculite/packing materials is Wet [ ] Dry [✓] n/a
6. Number of samples in shipping container: 8
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: 4/1/98

Telephoned To: _____ On _____ By _____

600000

Post-it® Fax Note 7671	Date 9/31	# of pages ▶
To Bob Goldberg	From Albert I. Davis	
Co./Dept.	Co.	
Phone #	Phone # 373-9731	
Fax # 376-8851	Fax #	

for BON426

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	100N	Purge Water Truck	
Customer ID	BON425	Other Solid	
RCF ID	RCF3028		
	Sample time, date	950	3/30/98
	Analysis date		3/30/98

1700g Solid

Isotope		Activity pCi/gm		2 s err	Ci/gm
K40		1.7e+01	+/-	6.7e+00	1.7e-11
Co60		1.5e+00	+/-	8.2e-01	1.5e-12
I129	<	6.8e+00			6.8e-12
Cs137		2.1e+01	+/-	2.4e+00	2.1e-11
Eu152	<	4.0e+00			4.0e-12
Eu154	<	2.0e+00			2.0e-12
Eu155	<	1.8e+00			1.8e-12
Th232dau	<	4.8e+00			4.8e-12
U235	<	4.4e+00			4.4e-12
U238	<	2.0e+02			2.0e-10
U238dau	<	2.0e+00			2.0e-12
Np237	<	1.1e+00			1.1e-12
Am241	<	1.0e+00			1.0e-12
Tot Act Gam (pCi/gm)		4.0e+01		Ci/gm	4.0e-11
Y/Sr-90	<	N/R			
Gross Alpha	<	3.1e+00			3.1e-12
Gross Beta		7.6e+01	+/-	1.7e+01	7.6e-11
AEA total	<	N/R			

Cat II Beta

CK 4/1/98

5270 pCi < 10k pCi

Reported as 137-Cs Betas. 129,200 pCi > 100k pCi Cat II

129,200 pCi < 1M pCi Cat III

Total Activity (pCi/gm) 7.6e+01
(Ci/gm) 7.6e-11 < 2k pCi/g

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.

JLD by AID 3-31-98
Radiological analyst Date

Albert I. Davis 3/31/98
Albert I. Davis Date
Radiological Manager

Quanterra
Environmental Services

014707

BW & SL

Login No.: 17383

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richland
Date: 4-2-98 Time: 0830
Project No: 550.260
Initiated by: 2nd M [illegible]
Shipper/No: A BR Borne
RFA/COC Numbers: 10494

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): ~~hold time has expired for VOA, SemiVOA, & Mercury~~ 4/03/98 REW sample date on container is 3-30-98, on the COC the sample date is 3-3-98.

☐ No variances were noted during sample receipt. Cooler Temperature Upon Receipt: 2°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) 2nd M [illegible] Date: 4-2-98

Project Management Review: Robert E. White Date: 4-3-98

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

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

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

Project: 550.260

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

Client ID: B0N426

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 05/26/98

Quanterra ID : 17383-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK170000-1	04/14/98	04/14/98	10	UG/KG	U	10	1
Bromomethane	74-83-9	QCBLK170000-1	04/14/98	04/14/98	10	UG/KG	U	10	1
Vinyl Chloride	75-01-4	QCBLK170000-1	04/14/98	04/14/98	10	UG/KG	U	10	1
Chloroethane	75-00-3	QCBLK170000-1	04/14/98	04/14/98	10	UG/KG	U	10	1
Methylene Chloride	75-09-2	QCBLK170000-1	04/14/98	04/14/98	7	UG/KG	B	5	1
Acetone	67-64-1	QCBLK170000-1	04/14/98	04/14/98	21	UG/KG	B	20	1
Carbon Disulfide	75-15-0	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
1,1-Dichloroethene	75-35-4	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
1,1-Dichloroethane	75-34-3	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
1,2-Dichloroethene (total)	540-59-0	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Chloroform	67-66-3	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
1,2-Dichloroethane	107-06-2	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
2-Butanone (MEK)	78-93-3	QCBLK170000-1	04/14/98	04/14/98	20	UG/KG	U	20	1
1,1,1-Trichloroethane	71-55-6	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Carbon Tetrachloride	56-23-5	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Bromodichloromethane	75-27-4	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
1,2-Dichloropropane	78-87-5	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
cis-1,3-Dichloropropene	10061-01-5	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Trichloroethene	79-01-6	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Dibromochloromethane	124-48-1	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
1,1,2-Trichloroethane	79-00-5	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Benzene	71-43-2	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
trans-1,3-Dichloropropene	10061-02-6	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Bromoform	75-25-2	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
4-Methyl-2-Pentanone (MIBK)	108-10-1	QCBLK170000-1	04/14/98	04/14/98	20	UG/KG	U	20	1
2-Hexanone	591-78-6	QCBLK170000-1	04/14/98	04/14/98	20	UG/KG	U	20	1
Tetrachloroethene	127-18-4	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Toluene	108-88-3	QCBLK170000-1	04/14/98	04/14/98	2	UG/KG	J	5	1
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Chlorobenzene	108-90-7	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
EthylBenzene	100-41-4	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Styrene	100-42-5	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Xylene (total)	1330-20-7	QCBLK170000-1	04/14/98	04/14/98	5	UG/KG	U	5	1
Unknown Alkane	TIC-40	QCBLK170000-1	04/14/98	04/14/98	9	UG/KG	J		1
Bromofluorobenzene	460-00-4	QCBLK170000-1	04/14/98	04/14/98	83	%REC			1
Dibromofluoromethane	1868-53-7	QCBLK170000-1	04/14/98	04/14/98	4	%REC	*		1
Toluene-d8	2037-26-5	QCBLK170000-1	04/14/98	04/14/98	96	%REC			1

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

Project: 550.260

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

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 05/04/98

Client ID: BON426

Quanterra ID : 17383-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK170000-1	04/14/98	04/14/98	91	%REC			1
Trichloroethene	79-01-6	QCBLK170000-1	04/14/98	04/14/98	93	%REC			1
Benzene	71-43-2	QCBLK170000-1	04/14/98	04/14/98	83	%REC			1
Toluene	108-88-3	QCBLK170000-1	04/14/98	04/14/98	93	%REC			1
Chlorobenzene	108-90-7	QCBLK170000-1	04/14/98	04/14/98	93	%REC			1
Bromofluorobenzene	460-00-4	QCBLK170000-1	04/14/98	04/14/98	83	%REC			1
Dibromofluoromethane	1868-53-7	QCBLK170000-1	04/14/98	04/14/98	3	%REC	*		1
Toluene-d8	2037-26-5	QCBLK170000-1	04/14/98	04/14/98	94	%REC			1

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

Project: 550.260

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

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 05/04/98

Client ID: BON426

Quanterra ID : 17383-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK170000-1	04/14/98	04/14/98	86	%REC			1
Trichloroethene	79-01-6	QCBLK170000-1	04/14/98	04/14/98	74	%REC			1
Benzene	71-43-2	QCBLK170000-1	04/14/98	04/14/98	83	%REC			1
Toluene	108-88-3	QCBLK170000-1	04/14/98	04/14/98	84	%REC			1
Chlorobenzene	108-90-7	QCBLK170000-1	04/14/98	04/14/98	91	%REC			1
Bromofluorobenzene	460-00-4	QCBLK170000-1	04/14/98	04/14/98	82	%REC			1
Dibromofluoromethane	1868-53-7	QCBLK170000-1	04/14/98	04/14/98	4	%REC	*		1
Toluene-d8	2037-26-5	QCBLK170000-1	04/14/98	04/14/98	91	%REC			1

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BON426

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02307

Matrix: (soil/water) SOIL Lab Sample ID: 17383-001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ESMP1657

Level: (low/med) LOW Date Received: 03/31/98

% Moisture: not dec. _____ Date Analyzed: 04/14/98

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	7	B
67-64-1	Acetone	21	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	20	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Chlorodibromomethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	20	U
591-78-6	2-Hexanone	20	U
127-18-4	Tetrachloroethene	5	U
108-88-3	Toluene	2	J
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylenes (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BON426

Lab Name: QUANTERRA MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02307

Matrix: (soil/water) SOIL Lab Sample ID: 17383-001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: ESMP1657

Level: (low/med) LOW Date Received: 03/31/98

% Moisture: not dec. _____ Date Analyzed: 04/14/98

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

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Alkane	22.116	9	J
2.				
3.				
4.				
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29.				
30.				

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

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: SOLID

Client ID: BON426

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 04/21/98

Quanterra ID : 17383-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
bis(2-Chloroethyl)Ether	111-44-4	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2-Chlorophenol	95-57-8	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
1,3-Dichlorobenzene	541-73-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
1,4-Dichlorobenzene	106-46-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
1,2-Dichlorobenzene	95-50-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2-Methylphenol	95-48-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,2'-oxybis (1-Chloropropane)	108-60-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
4-Methylphenol	106-44-5	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
N-nitroso-di-n-propylamine	621-64-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Hexachloroethane	67-72-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Nitrobenzene	98-95-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Isophorone	78-59-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2-Nitrophenol	88-75-5	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,4-Dimethylphenol	105-67-9	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
bis(2-Chloroethoxy)Methane	111-91-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,4-Dichlorophenol	120-83-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
1,2,4-Trichlorobenzene	120-82-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Naphthalene	91-20-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
4-Chloroaniline	106-47-8	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Hexachlorobutadiene	87-68-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
4-Chloro-3-Methylphenol	59-50-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2-Methylnaphthalene	91-57-6	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Hexachlorocyclopentadiene	77-47-4	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
2,4,6-Trichlorophenol	88-06-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,4,5-Trichlorophenol	95-95-4	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2-Chloronaphthalene	91-58-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2-Nitroaniline	88-74-4	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
DimethylPhthalate	131-11-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Acenaphthylene	208-96-8	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,6-Dinitrotoluene	606-20-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
3-Nitroaniline	99-09-2	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
Acenaphthene	83-32-9	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,4-Dinitrophenol	51-28-5	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
4-Nitrophenol	100-02-7	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
Dibenzofuran	132-64-9	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
2,4-Dinitrotoluene	121-14-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Diethylphthalate	84-66-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
4-Chlorophenyl-PhenylEther	7005-72-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Fluorene	86-73-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
4-Nitroaniline	100-01-6	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
4,6-Dinitro-2-Methylphenol	534-52-1	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
n-Nitrosodiphenylamine	86-30-6	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
4-Bromophenyl-Phenyl Ether	101-55-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Hexachlorobenzene	118-74-1	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Pentachlorophenol	87-86-5	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
Phenanthrene	85-01-8	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Anthracene	120-12-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Carbazole	86-74-8	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Di-N-Butylphthalate	84-74-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Fluoranthene	206-44-0	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Pyrene	129-00-0	QCBLK169784-1	04/13/98	04/14/98	150	UG/KG	J	330	1
ButylBenzylPhthalate	85-68-7	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
3,3'-Dichlorobenzidine	91-94-1	QCBLK169784-1	04/13/98	04/14/98	1600	UG/KG	U	1600	1
Benzo(a)Anthracene	56-55-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Chrysene	218-01-9	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
bis(2-Ethylhexyl)Phthalate	117-81-7	QCBLK169784-1	04/13/98	04/14/98	220	UG/KG	BJ	330	1
di-N-OctylPhthalate	117-84-0	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Benzo(b)Fluoranthene	205-99-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Benzo(k)Fluoranthene	207-08-9	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Benzo(a)Pyrene	50-32-8	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1

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

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: SOLID

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 04/21/98

Client ID: BON426

Quanterra ID : 17383-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Indeno(1,2,3-CD)Pyrene	193-39-5	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Dibenz(a,h)Anthracene	53-70-3	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Benzo(g,h,i)Perylene	191-24-2	QCBLK169784-1	04/13/98	04/14/98	330	UG/KG	U	330	1
Unknown-1	TIC-32	QCBLK169784-1	04/13/98	04/14/98	700	UG/KG	J		1
Aldol Condensation	TIC-4	QCBLK169784-1	04/13/98	04/14/98	27000	UG/KG	J		1
Unknown-2	TIC-33	QCBLK169784-1	04/13/98	04/14/98	120	UG/KG	J		1
Unknown-3	TIC-34	QCBLK169784-1	04/13/98	04/14/98	160	UG/KG	J		1
Unknown-4	TIC-35	QCBLK169784-1	04/13/98	04/14/98	110	UG/KG	J		1
Unknown-5	TIC-36	QCBLK169784-1	04/13/98	04/14/98	92	UG/KG	J		1
Unknown-6	TIC-37	QCBLK169784-1	04/13/98	04/14/98	100	UG/KG	J		1
Unknown-7	TIC-7	QCBLK169784-1	04/13/98	04/14/98	310	UG/KG	J		1
Unknown-8	TIC-8	QCBLK169784-1	04/13/98	04/14/98	120	UG/KG	J		1
Unknown-9	TIC-9	QCBLK169784-1	04/13/98	04/14/98	100	UG/KG	J		1
Unknown-10	TIC-10	QCBLK169784-1	04/13/98	04/14/98	150	UG/KG	J		1
Unknown-11	TIC-11	QCBLK169784-1	04/13/98	04/14/98	120	UG/KG	J		1
Unknown-12	TIC-12	QCBLK169784-1	04/13/98	04/14/98	89	UG/KG	J		1
Unknown-13	TIC-13	QCBLK169784-1	04/13/98	04/14/98	96	UG/KG	J		1
Unknown-14	TIC-14	QCBLK169784-1	04/13/98	04/14/98	350	UG/KG	J		1
Unknown-15	TIC-15	QCBLK169784-1	04/13/98	04/14/98	120	UG/KG	J		1
Unknown-16	TIC-16	QCBLK169784-1	04/13/98	04/14/98	110	UG/KG	J		1
Unknown-17	TIC-17	QCBLK169784-1	04/13/98	04/14/98	99	UG/KG	J		1
Unknown-18	TIC-18	QCBLK169784-1	04/13/98	04/14/98	360	UG/KG	J		1
Unknown-19	TIC-19	QCBLK169784-1	04/13/98	04/14/98	130	UG/KG	J		1
Unknown-20	TIC-20	QCBLK169784-1	04/13/98	04/14/98	170	UG/KG	J		1
Unknown-21	TIC-21	QCBLK169784-1	04/13/98	04/14/98	110	UG/KG	J		1
Nitrobenzene-d5	4165-60-0	QCBLK169784-1	04/13/98	04/14/98	63	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK169784-1	04/13/98	04/14/98	61	%REC			1
Terphenyl-d14	1718-51-0	QCBLK169784-1	04/13/98	04/14/98	63	%REC			1
Phenol-d5	4165-62-2	QCBLK169784-1	04/13/98	04/14/98	66	%REC			1
2-Fluorophenol	367-12-4	QCBLK169784-1	04/13/98	04/14/98	36	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK169784-1	04/13/98	04/14/98	56	%REC			1

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

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: SOLID

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 04/21/98

Client ID: BON426

Quanterra ID : 17383-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK169784-1	04/13/98	04/14/98	62	%REC			1
2-Chlorophenol	95-57-8	QCBLK169784-1	04/13/98	04/14/98	30	%REC			1
1,4-Dichlorobenzene	106-46-7	QCBLK169784-1	04/13/98	04/14/98	64	%REC			1
N-nitroso-di-n-propylamine	621-64-7	QCBLK169784-1	04/13/98	04/14/98	91	%REC			1
1,2,4-Trichlorobenzene	120-82-1	QCBLK169784-1	04/13/98	04/14/98	63	%REC			1
4-Chloro-3-Methylphenol	59-50-7	QCBLK169784-1	04/13/98	04/14/98	56	%REC			1
Acenaphthene	83-32-9	QCBLK169784-1	04/13/98	04/14/98	68	%REC			1
4-Nitrophenol	100-02-7	QCBLK169784-1	04/13/98	04/14/98	32	%REC			1
2,4-Dinitrotoluene	121-14-2	QCBLK169784-1	04/13/98	04/14/98	63	%REC			1
Pentachlorophenol	87-86-5	QCBLK169784-1	04/13/98	04/14/98	21	%REC			1
Pyrene	129-00-0	QCBLK169784-1	04/13/98	04/14/98	58	%REC			1
Nitrobenzene-d5	4165-60-0	QCBLK169784-1	04/13/98	04/14/98	69	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK169784-1	04/13/98	04/14/98	61	%REC			1
Terphenyl-d14	1718-51-0	QCBLK169784-1	04/13/98	04/14/98	65	%REC			1
Phenol-d5	4165-62-2	QCBLK169784-1	04/13/98	04/14/98	68	%REC			1
2-Fluorophenol	367-12-4	QCBLK169784-1	04/13/98	04/14/98	30	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK169784-1	04/13/98	04/14/98	39	%REC			1

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

Project: 550.260

Category: Semivolatile
Method: EPA 8270
Matrix: SOLID

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 04/21/98

Client ID: BON426

Quanterra ID : 17383-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK169784-1	04/13/98	04/14/98	64	%REC			1
2-Chlorophenol	95-57-8	QCBLK169784-1	04/13/98	04/14/98	36	%REC			1
1,4-Dichlorobenzene	106-46-7	QCBLK169784-1	04/13/98	04/14/98	67	%REC			1
N-nitroso-di-n-propylamine	621-64-7	QCBLK169784-1	04/13/98	04/14/98	95	%REC			1
1,2,4-Trichlorobenzene	120-82-1	QCBLK169784-1	04/13/98	04/14/98	66	%REC			1
4-Chloro-3-Methylphenol	59-50-7	QCBLK169784-1	04/13/98	04/14/98	62	%REC			1
Acenaphthene	83-32-9	QCBLK169784-1	04/13/98	04/14/98	71	%REC			1
4-Nitrophenol	100-02-7	QCBLK169784-1	04/13/98	04/14/98	40	%REC			1
2,4-Dinitrotoluene	121-14-2	QCBLK169784-1	04/13/98	04/14/98	67	%REC			1
Pentachlorophenol	87-86-5	QCBLK169784-1	04/13/98	04/14/98	25	%REC			1
Pyrene	129-00-0	QCBLK169784-1	04/13/98	04/14/98	66	%REC			1
Nitrobenzene-d5	4165-60-0	QCBLK169784-1	04/13/98	04/14/98	67	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK169784-1	04/13/98	04/14/98	61	%REC			1
Terphenyl-d14	1718-51-0	QCBLK169784-1	04/13/98	04/14/98	65	%REC			1
Phenol-d5	4165-62-2	QCBLK169784-1	04/13/98	04/14/98	70	%REC			1
2-Fluorophenol	367-12-4	QCBLK169784-1	04/13/98	04/14/98	35	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK169784-1	04/13/98	04/14/98	45	%REC			1

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0N426

Lab Name: QUANTERRA MO Contract: 550-260

Lab Code: ITSL Case No.: S38301 SAS No.: SDG No.: W02307

Matrix: (soil/water) SOIL Lab Sample ID: 17383-001

Sample wt/vol: 30.10 (g/mL) G Lab File ID: A1579

Level: (low/med) LOW Date Received: 04/01/98

% Moisture: decanted: (Y/N) N Date Extracted: 04/13/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/14/98

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)Ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-Propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy)Methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-Methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	1600	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	330	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	1600	U
131-11-3	Dimethyl Phthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	1600	U
83-32-9	Acenaphthene	330	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0N426

Lab Name: QUANTERRA MO Contract: 550-260

Lab Code: ITSL Case No.: S38301 SAS No.: SDG No.: W02307

Matrix: (soil/water) SOIL Lab Sample ID: 17383-001

Sample wt/vol: 30.10 (g/mL) G Lab File ID: A1579

Level: (low/med) LOW Date Received: 04/01/98

% Moisture: decanted: (Y/N) N Date Extracted: 04/13/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/14/98

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1600	U
100-02-7	4-Nitrophenol	1600	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	1600	U
534-52-1	4,6-Dinitro-2-Methylphenol	1600	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	1600	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
86-74-8	Carbazole	330	U
84-74-2	Di-n-Butylphthalate	330	U
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	150	J
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	1600	U
56-55-3	Benzo(a)Anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)Phthalate	220	BJ
117-84-0	Di-n-Octyl Phthalate	330	U
205-99-2	Benzo(b)Fluoranthene	330	U
207-08-9	Benzo(k)Fluoranthene	330	U
50-32-8	Benzo(a)Pyrene	330	U
193-39-5	Indeno(1,2,3-cd)Pyrene	330	U
53-70-3	Dibenz(a,h)Anthracene	330	U
191-24-2	Benzo(g,h,i)Perylene	330	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0N426

Lab Name: QUANTERRA MO Contract: 550-260

Lab Code: ITSL Case No.: S38301 SAS No.: SDG No.: W02307

Matrix: (soil/water) SOIL Lab Sample ID: 17383-001

Sample wt/vol: 30.10 (g/mL) G Lab File ID: A1579

Level: (low/med) LOW Date Received: 04/01/98

% Moisture: decanted: (Y/N) N Date Extracted: 04/13/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/14/98

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 22

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	2.47	700	J
2.	UNKNOWN ALDOL CONDENSATION	3.58	27000	J
3.	UNKNOWN	13.45	120	J
4.	UNKNOWN	14.71	160	J
5.	UNKNOWN	15.90	110	J
6.	UNKNOWN	17.03	92	J
7.	UNKNOWN	18.11	100	J
8.	UNKNOWN	18.81	310	J
9.	UNKNOWN	19.14	120	J
10.	UNKNOWN	20.26	100	J
11.	UNKNOWN	20.55	150	J
12.	UNKNOWN	21.42	120	J
13.	UNKNOWN	21.68	89	J
14.	UNKNOWN	22.12	96	J
15.	UNKNOWN	23.71	350	J
16.	UNKNOWN	24.75	120	J
17.	UNKNOWN	24.96	110	J
18.	UNKNOWN	25.48	99	J
19.	UNKNOWN	25.92	360	J
20.	UNKNOWN	26.27	130	J
21.	UNKNOWN	28.28	170	J
22.	UNKNOWN	28.52	110	J

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

Project: 550.260

Category : TCLP Metals
Matrix : SOLID

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 05/04/98

Client ID: BON426

Quanterra ID : 17383-001

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	04/10/98	04/13/98	04/13/98	0.0002	MG/L		0.0002	0.20	1
Arsenic	EPA 6010	04/10/98	04/13/98	04/13/98	0.0020	MG/L	B	0.30	5.0	1
Barium	EPA 6010	04/10/98	04/13/98	04/13/98	1.3	MG/L	E	0.20	100	1
Cadmium	EPA 6010	04/10/98	04/13/98	04/13/98	0.0006	MG/L	U	0.005	1.0	1
Chromium	EPA 6010	04/10/98	04/13/98	04/13/98	0.11	MG/L	E	0.010	5.0	1
Lead	EPA 6010	04/10/98	04/13/98	04/13/98	0.034	MG/L	B	0.10	5.0	1
Selenium	EPA 6010	04/10/98	04/13/98	04/13/98	0.0047	MG/L	B	0.25	1.0	1
Silver	EPA 6010	04/10/98	04/13/98	04/13/98	0.0007	MG/L	U	0.010	5.0	1

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

Project: 550.260

Category : TCLP Metals
Matrix : SOLID

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 05/04/98

Client ID: BON426

Quanterra ID : 17383-001MS

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	04/10/98	04/13/98	04/13/98	105	%REC				1
Arsenic	EPA 6010	04/10/98	04/13/98	04/13/98	98	%REC				1
Barium	EPA 6010	04/10/98	04/13/98	04/13/98	94	%REC				1
Cadmium	EPA 6010	04/10/98	04/13/98	04/13/98	86	%REC				1
Chromium	EPA 6010	04/10/98	04/13/98	04/13/98	92	%REC				1
Lead	EPA 6010	04/10/98	04/13/98	04/13/98	88	%REC				1
Selenium	EPA 6010	04/10/98	04/13/98	04/13/98	101	%REC				1
Silver	EPA 6010	04/10/98	04/13/98	04/13/98	94	%REC				1

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

Project: 550.260

Category : TCLP Metals
Matrix : SOLID

Sample Date : 03/30/98
Receipt Date : 04/01/98
Report Date : 05/04/98

Client ID: BON426

Quanterra ID : 17383-001MSD

Analyte	Method	Extract Date	Prep Date	Analyses Date	Result	Units	Qual.	Detection Limit	Regulatory Level	Dilution
Mercury	EPA 7470	04/10/98	04/13/98	04/13/98	104	%REC				1
Arsenic	EPA 6010	04/10/98	04/13/98	04/13/98	98	%REC				1
Barium	EPA 6010	04/10/98	04/13/98	04/13/98	94	%REC				1
Cadmium	EPA 6010	04/10/98	04/13/98	04/13/98	88	%REC				1
Chromium	EPA 6010	04/10/98	04/13/98	04/13/98	93	%REC				1
Lead	EPA 6010	04/10/98	04/13/98	04/13/98	90	%REC				1
Selenium	EPA 6010	04/10/98	04/13/98	04/13/98	101	%REC				1
Silver	EPA 6010	04/10/98	04/13/98	04/13/98	101	%REC				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.: W02307_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
_B0N426_____	_P17383-001___
_B0N426SD_____	_P17383-001SD_
_B0N426S_____	_P17383-001S__
_PBT169744____	_PBT169744____

Were ICP interelement corrections applied ? Yes/No YES

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

Comments:

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

Signature: _____ Name: _____

Date: _____ Title: _____

COVER PAGE - IN TCLP

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0N426

Lab Name: QUANTERRA_MO Contract: 550.260

Lab Code: ITMO Case No.: SAS No.: SDG No.: W02307

Matrix (soil/water): WATER Lab Sample ID: P17383-001

Level (low/med): LOW Date Received: 04/01/98

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.0	B		P
7440-39-3	Barium	1320		E	P
7440-43-9	Cadmium	0.60	U		P
7440-47-3	Chromium	114		E	P
7439-92-1	Lead	33.5	B		P
7439-97-6	Mercury	0.25			CV
7782-49-2	Selenium	4.7	B		P
7440-22-4	Silver	0.70	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

TCLP

W02307

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

MAY 1998
RECEIVED
Data
Log In

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

May 22, 1998

Attention: Joan Kessner

SAF Number	:	B98-058
Date First Sample Received	:	April 1, 1998
Number of Samples	:	One (1)
Sample Type	:	Other (solid)
SDG Number	:	W02307
Data Deliverable	:	45 Day Summary

I. Introduction

On April 1, 1998, one 45-day TAT other-solid sample was received by the Quanterra Environmental Services Richland Laboratory (QESRL) for radiochemical and chemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

QESRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
80401201	B0N426	Other	4/1/98

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
Plutonium-238, -239/40 by method RICH-RC-5010
Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017

Gas Proportional Counting
Gross Alpha by method RICH-RC-5014
Gross Beta by method RICH-RC-5014
Total Strontium by method RICH-RC-5006

III. Quality Control

The analytical results for each analysis performed under SDG W02307 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

Plutonium-238, -239/40 by method RICH-RC-5010
The LCS, batch blank, sample and sample duplicate (B0N426) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017
The LCS, batch blank, sample and sample duplicate (B0N426) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method RICH-RC-5014
The LCS, batch blank, sample and sample duplicate (B0N426) results are within contractual requirements.

Gross Beta by method RICH-RC-5014
The LCS, batch blank, sample and sample duplicate (B0N426) results are within contractual requirements.

Total Strontium by method RICH-RC-5006
The LCS, batch blank, sample and sample duplicate (B0N426) 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:**	W02307 / 5193
LAB SAMPLE ID:	80401201	**MATRIX:**	OTHER
CLIENT ID:	B0N426	**DATE RECEIVED:**	4/1/1998 11:30:00 AM

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	U	0.0E+00	7.7E-02	6.92E-02	pCi/g	21.00%	RICHRC5010
PU239/40	7.46E-02	U	8.9E-02	9.0E-02	1.03E-01	pCi/g	21.00%	RICHRC5010
AM-241	1.02E-02	U	4.2E-02	4.2E-02	6.91E-02	pCi/g	N/A	RICHRC5017
CO-60	5.58E-02		3.4E-02	3.4E-02	N/A	pCi/g	N/A	RICHRC5017
CS-137DA	1.58E+01		1.6E-01	1.6E+00	N/A	pCi/g	N/A	RICHRC5017
EU-152	5.31E-02	U	8.1E-02	8.1E-02	1.33E-01	pCi/g	N/A	RICHRC5017
EU-154	-5.96E-03	U	4.5E-02	4.5E-02	7.67E-02	pCi/g	N/A	RICHRC5017
EU-155	4.66E-02	U	6.3E-02	6.3E-02	1.01E-01	pCi/g	N/A	RICHRC5017
K-40	9.53E+00		6.6E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	6.64E-01		7.5E-02	1.0E-01	N/A	pCi/g	N/A	RICHRC5017
RA-226	6.85E-01		9.2E-02	1.1E-01	N/A	pCi/g	N/A	RICHRC5017
RA-228	5.90E-01		1.4E-01	1.6E-01	N/A	pCi/g	N/A	RICHRC5017
U-238	1.73E+00		6.3E-01	6.6E-01	N/A	pCi/g	N/A	RICHRC5017
ALPHA	6.54E+00	J	4.0E+00	4.1E+00	5.59E+00	pCi/g	100.00%	RICHRC5014
BETA	1.21E+02		9.4E+00	1.4E+01	6.01E+00	pCi/g	100.00%	RICHRC5014-B
STRONTIUM	2.59E+01		7.4E-01	9.7E+00	1.89E-01	pCi/g	98.40%	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 Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	804012
Client ID:	BH1
Due Date:	5-30-98
Lab Sample Number or SDG:	W02307
Method Test Parameters:	PU-150
Matrix:	OTHER

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

Comments on any "No" response: _____

First Level Review: Jacqueline Waddell Date: 5/26/98

Second Level Review: [illegible] Date: 5/26/98

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

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s):	804012
Client ID:	BHI
Due Date:	5-30-98
Lab Sample Number or SDG:	W02307
Method Test Parameters:	Gamma
Matrix:	Other

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

Comments on any "No" response: _____

First Level Review: [signature] Date: 5-21-98

Second Level Review: [signature] Date: 5/22/98

Form #: LS-038.2 /96 Rev.4

γ add on Am 241 HP per Client COC

0010

Report BHI "S" + K40, Ra224, Ra226DA, Ra228DA, U238DHP, Am241
009, 067 DA, 032, 420, 603

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s): 804012

Client ID: BHI

Due Date: 5-30-98

Lab Sample Number or SDG: W02307

Method Test Parameters: Alpha

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? DM 5-18-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Jacqueline Wadell Date: 5/20/98

Second Level Review: [signature] Date: 5/20/98

Form #: LS-038.2 /96, Rev 4

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number(s): 804012

Client ID: BHI

Due Date: 5-30-98

Lab Sample Number or SDG: W02307

Method Test Parameters: Beta

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? SM 5-12-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: [signature] Date: 5-18-98

Second Level Review: [signature] Date: 5/20/98

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

Quanterra Data Review Checklist
RADIOCHEMISTRY

Work Order number (s): 804012

Client ID: BHI

Due Date: 5-30-98

Lab Sample Number or SDG: W02307

Method Test Parameters: Total Sr

Matrix: Other

Review Item	Yes (✓)	No (✓)	NA (✓)	2nd Level Review (✓)
A. Calibration				
1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis				
1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples				
1. Is the blank yield within acceptance criteria	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Is the blank result < 1/2 the Contract Detection Limit?	✓			✓
4. Is the blank > 1/2 the Contract Detection Limit but < Contract Detection Limit?			✓	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. MS/MSD results and yield meet acceptance criteria?			✓	
10. Duplicate sample results and yield meet acceptance criteria?	✓			✓
D. Other				
1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filed out?	✓			✓
3. Correct methodology used?				✓
4. Transcription checked? SM 4-28-98	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Jacqueline Waddell Date: 5/6/98

Second Level Review: [signature] Date: 5/20/98

Form #: LS-038.2 /96, Rev 4

CHAIN OF

CUSTODY FORMS

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-058-04	Page 1 of 1

Collector R Fahlberg	**Company Contact** Tom Pickett	**Telephone No.** 373-4630	**Project Coordinator** TRENT, SJ	**Data Turnaround** 45 Days
Project Designation Purgewater Truck Repair and Cleanout	**Sampling Location** 100N		**SAF No.** B98-058	
Ice Chest No.	**Field Logbook No.** EL-1309-1		**Method of Shipment** Hand Delivered	
Shipped To Quanterra Incorporated	**Offsite Property No.**		**Bill of Lading/Air Bill No.**	
Waste Designation F003			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	None	Cool 4C	None	None		
Type of Container	P	P	P	aG	aG	aG	aG	P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20ml	20ml	20ml	60ml	60ml	120ml	250ml	1000ml		
SAMPLE ANALYSIS SDG W02307 804011	Activity Scan	Gross Alpha, Gross Beta 804012	Isotopic Plutonium 804012	VOA - 8260A (TCL)	Strontium-89,90 – Total Sr 804012	Semi-VOA - 8270A (TCL)	Metals by ICP (TCLP) - 1311/6010A, Mercury (TCLP) - 1311/7470	See item (1) in Special Instructions 804012		
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
B0N426 01	Other Solid	3-3-98	0950	X	X	X	X	X	X	X	X

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

Relinquished By	Date/Time	Received By	Date/Time
Ray Boyd for Fahlberg	4-1-98 1130	[illegible]	4/1/98 1130
		2100 [illegible]	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}

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

0015

For
BON426

GAMMA-RAY ENERGY ANALYSIS REPORT

Thermo Hanford Inc.
Radiological Counting Facility THI - RCF

Project	100N	Purge Water Truck	
Customer ID	86N425	Other Solid	
RCF ID	RCF3028		
	Sample time, date	950	3/30/98
	Analysis date		3/30/98

1700g Solid

Isotope		Activity pCi/gm		2 s err	Ci/gm
K40		1.7e+01	+/-	6.7e+00	1.7e-11
Co60		1.5e+00	+/-	6.2e-01	1.5e-12
I129	<	6.6e+00			6.6e-12
Cs137		2.1e+01	+/-	2.4e+00	2.1e-11
Eu152	<	4.0e+00			4.0e-12
Eu154	<	2.0e+00			2.0e-12
Eu155	<	1.8e+00			1.8e-12
Th232dau	<	4.6e+00			4.6e-12
U235	<	4.4e+00			4.4e-12
U238	<	2.0e+02			2.0e-10
U238dau	<	2.0e+00			2.0e-12
Np237	<	1.1e+00			1.1e-12
Am241	<	1.0e+00			1.0e-12
Tot Act Gam (pCi/gm)		4.0e+01		Ci/gm	4.0e-11
Y/Sr-90	<	N/R			
Gross Alpha	<	3.1e+00			3.1e-12
Gross Beta		7.6e+01	+/-	1.7e+01	7.6e-11
AEA total	<	N/R			

Cat II Beta

Ck 4/1/98

5270 pCi < 10k pCi

Reported as 137-Cs Betas. 129,200 pCi > 100k pCi Cat II

129,200 pCi < 1M pCi Cat III

Total Activity (pCi/gm) 7.6e+01

(Ci/gm) 7.6e-11 < 2k pCi/g

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.

JLD by AID 3-31-98
Radiological analyst Date

Albert I. Davis 3/31/98
Radiological Manager Date

Page 1

Date 1/31 # of pages ▶ 7671
From Albert I. Davis
Co.
Phone # 373-9731
Fax # 376-8851
Co./Dept.
Phone #
Fax #

0016

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 4/1 1130 SG#: W02307

Work Order Number: 804011 +012 SAF #: B98-058

Shipping Container ID: 96-071 Chain of Custody # B98-058-04

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°
5. Vermiculite/packing materials is Wet [ ] Dry [✓] n/a
6. Number of samples in shipping container: 8
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: Hendelberg Date: 4/1/98

Telephoned To: _____ On _____ By _____

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD 1-Apr-1998
Page 1

CUSTOMER: BHI SAMPLE DELIVERY GROUP W02307

MATRIX : OTHER B98-058 BATCH NUMBER 04-012

QES ID	DUR	SA ANAL ACCOUNT (6)	CUSTOMER ID	COMMENTS
J0401218	ESH27126 Pr.12/13/97 Ex.12/13/98	2		
J0401215	IQHI355 Pr. 4/6/98 Ex.4/6/99	2		
1) 80401201	ESH27127 Pr.12/13/97 Ex.12/13/98	HI ~~2.08~~	BON426 1.2289 g dry wt	40.9169% Moisture
D0401201	ESH27128 Pr.12/13/97 Ex.12/13/98	~~2.02~~	1.1935 g	

7 RCS 21-98

ACTIONS (Initial & Date)

1) INITIATED JH 4/1/98
SOP(S) # RD 8800

2) PREP LAB RECEIVED 4-21-98 DOC
SOP(S) # RICHRC5016-1

3) SAMPLE REMAINDER STORED 4-22-98 DOC
SOP(S) # N/A

4) SEPARATION LAB RECEIVED 04/21/98 [illegible]
SOP(S) # RICHRC 5010

5) COUNTING/MEASUREMENT LAB 4/24/98
SOP(S) # RICHRD0008

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5/6/98
SOP(S) # RICHRC0002/1

SA appears to be concrete & rocks E.D. [illegible] 4-24-98 RICHRC5039.1

RPT units = pCi/G

ct time = 200

ct INST = ASPEC

*** GAMMA ***

Due 5/30

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

1-Apr-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02307

MATRIX : OTHER B98-058

BATCH NUMBER 04-012

	GES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	J040121B	OSBK			
	J040121S	CAL 491			
1)	80401201		BHI	BON426	
	D040201				

ACTIONS (Initial & Date)

1) INITIATED JH 4/1/98

SOP(S) # RD 8800

2) PREP LAB RECEIVED JN 5-7-98

SOP(S) # RICHRC5013/RICHRC5017

3) SAMPLE REMAINDER STORED JN 5-11-98

SOP(S) # NA

4) SEPARATION LAB RECEIVED

SOP(S) #

5) COUNTING/MEASUREMENT LAB 5/11/98

SOP(S) # RICHRC0001

6) DATA REVIEWED AND ANALYTICAL PREP STORED JMC 5-21-98

SOP(S) # RICHRC0002 Rev 2

*** ALPHA ***

DUE 5-30-98

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

1-Apr-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02307

MATRIX : OTHER B98-058

BATCH NUMBER 04-012

QES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
J0401218	JM 5-18-98			
J0401215	EQEG ~~EQHG~~ 1970			
1) 80401201		BHI	BON426	
D0401201				

ACTIONS (Initial & Date)

1) INITIATED JH 4/1/98

SOP(S) # RD3000

2) PREP LAB RECEIVED ~~4-21-98~~ 5-7-98 JN

SOP(S) # RLCHRC5012/RD3222

3) SAMPLE REMAINDER STORED JN 5-11-98

SOP(S) # N/A

4) SEPARATION LAB RECEIVED

SOP(S) #

5) COUNTING/MEASUREMENT LAB 5/11/98

SOP(S) # RLCHRD0003

6) DATA REVIEWED AND ANALYTICAL PREP STORED JN 5/20/98

SOP(S) # RLCHRC0002/2

SA appears to be concrete

*** BETA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

1-Apr-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02307

MATRIX : OTHER B98-058

BATCH NUMBER 04-012

	GES ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	J040127B				
	J040121S	EQAU 649		30.29 ± 0.37801 DPM	
1)	80401201		BHI	BON426	
	D040120I				

ACTIONS (Initial & Date)

1) INITIATED JH 4/1/98

SOP(S) # RD8500

2) PREP LAB RECEIVED JW 5-7-98

SOP(S) # RICHRC5013/RD3222

3) SAMPLE REMAINDER STORED JW 5-11-98

SOP(S) # NA

4) SEPARATION LAB RECEIVED ✓

SOP(S) # ✓

5) COUNTING/MEASUREMENT LAB 5/11/98

SOP(S) # RICHRD0003

6) DATA REVIEWED AND ANALYTICAL PREP STORED 5-18-98

SOP(S) # RICHRG0002 Rev

DUE 5-30-98

*** TOTAL-SR ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

1-Apr-1998
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W02307

MATRIX : OTHER B98-058

BATCH NUMBER 04-012

	QES ID	DUP	ACCOUNT	PPT WT (mG)	CUSTOMER ID	SA ANAL (G)		COMMENTS
	J0401218	ESF14304 Pr.12/31/97 Ex.11/12/98	93.2		6		6A	28APR98 1055
80.241 ± 1.1441 DPM	J0401215	EQGF271 Pr.2/31/98 Ex.2/19/99	94.6		6		6B	
1)	80401201	ESF14305 Pr.12/31/97 Ex.11/12/98	98.4	BON426	6.06		6C	3.586g dry wt
	D0401201	ESF14306 Pr.12/31/97 Ex.11/12/98	93.3		6.07		6D	3.586g dry wt

ACTIONS (Initial & Date)

MK 5-21-98 40.9169 mo

1) INITIATED JH 4/1/98

SOP(S) # RD 8800

2) PREP LAB RECEIVED 4-21-98 DK

SOP(S) # RichRC5013-0

3) SAMPLE REMAINDER STORED 4-22-98 DK

SOP(S) # ~~~

4) SEPARATION LAB RECEIVED RTM 4/22/98

SOP(S) # RichRC5006/2

5) COUNTING/MEASUREMENT LAB 4/27/98

SOP(S) # RICHRC0003

6) DATA REVIEWED AND ANALYTICAL PREP STORED JW 5/6/98

SOP(S) # RICHRC0002/1

SA appears to be cement DOC 4-22-98

T-SR sep time 4/23/98 14:55-RTM
80401201 had to be refumed. Sep time 4/27/98 13:55-RTM

0022