W0272-QES

Quanterra
Environmental Services

0045146

DEC 1994
RECEIVED
Data
Log In

December 23, 1994

Joan Kessner
Buyer's Technical Representative
Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352
Reference: Contract MPV-SVV-239000.

Dear Ms. Kessner:

Accompanying this letter are the Data Package Deliverable for Chemical analyses on the following BHI samples:

SDG NUMBER	SAF NUMBER
W0270	B94-041
W0271	B94-042
W0272	B94-036
W0284	B94-062
W0309	B94-022
W0319	B94-022
W0320	B94-079
W0326	B94-076
W0337	B94-121

The Chemical Diskette Deliverable will be provided later.

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

Sincerely,

Jodie Carnes
Document Control Officer

Receipt of this letter and the package are acknowledged by:

Name	Date	Time
Rachel L Weiss	12-23-94	2:10

XC: Vicki Parr
Van Pettey
Wade Price
File

MS
6/18/96

Analytical Data Package Prepared For

Bechtel Hanford

Chemical Analysis By

Quanterra Environmental Services
St. Louis Laboratory

Sample Delivery Group Number: W0272

DEC 1994
RECEIVED
Data
Log In

BHI IDENTIFICATION NUMBER	QUANTERRA ID NUMBER
B0D4M6	6630-001
B0D4P6	6630-002
B0D4P8	6630-003
B0D4M7	6630-004
B0D4P7	6630-005
B0D4P9	6630-006
B0D4F8	6646-001
B0D4F9	6646-002
B0D4G6	6666-001
B0D4G7	6666-002
B0D4K2	6687-001
B0D4K3	6687-002

RECORD COPY

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

DEC 1994
RECEIVED
Date
Log No

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

December 21, 1994

Attention: Joan Kessner

Project number	:	550.23
Date Received by Lab	:	October 27, 28 and 31, 1994
Number of Samples	:	Twelve (12)
Sample Type	:	Water
SDG Number	:	W0272
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

Between October 27 and 31, 1994, twelve (12) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with their specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
6630-001	B0D4M6	41054101	Water	10/27/94
6630-002	B0D4P6	41054103	Water	10/27/94
6630-003	B0D4P8	41054105	Water	10/27/94
6630-004	B0D4M7	41054102	Water	10/27/94
6630-005	B0D4P7	41054104	Water	10/27/94
6630-006	B0D4P9	41054106	Water	10/27/94
6646-001	B0D4F8	41056301	Water	10/27/94
6646-002	B0D4F9	41056302	Water	10/27/94
6666-001	B0D4G6	41058901	Water	10/28/94
6666-002	B0D4G7	41058902	Water	10/28/94
6687-001	B0D4K2	41062201	Water	10/31/94
6687-002	B0D4K3	41062202	Water	10/31/94

II. Analytical Results/ Methodology

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

Analyses requested: ICP, Cyanide and Selenium by CLP90 methodology. Chloride, Fluoride, Nitrite, Phosphate, and Sulfate by EPA method 300.0. Alkalinity by EPA method 310.1. Total Dissolved Solids by EPA method 160.1.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Sample Duplicate analyses were performed per the protocol for each analyte in this SDG.

IV. Definitions

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

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

V. Comments

Nitrite and Phosphate holding times were expired upon receipt of samples at laboratory.

The Relative Percent Difference could not be calculated for Phosphate and Nitrite because both values were less than the detection limit.

The Selenium Matrix Spike recoveries for 6666-001 and 6666-002 (60.0%) were less than 75%. The associated data was flagged with an "N".

Quanterra
Environmental Services

A pH of less than 12 was found on 6630-003, 6666-001, and 6687-001 for the Cyanide analysis.

The peaks heights for 6630-001, -002 and 6646-001 had to be hand calculated due to incorrect instrument integration for the Cyanide 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:

Wade H. Price
Project Manager
e:\\qstlmo01\price$\abbydave\hanford\hanw0272.nar

Quanterra October 27, 1994 02:28 pm
Account: 10722 Project: 550.23 Quanterra-Richland QAS No. 751 Rev. 0
Master Sample Login: 6630

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: M. Jackson PM Review: [illegible]

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)	
Date:								
6630-001	B004N6	Water	25-OCT-94 12:05	27-OCT-94 09:00	01-DEC-94	FED-EX	3*	Sample not Screened
QES, RICHLAND ID=41054101								
1 AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111823:100)	
1	SE/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111823:100)	
1 AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111824:100)	
1	FL/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111824:100)	
1	NO2/300.0/Q4	S	COLD	24-NOV-94	27-OCT-94	S3A	(111824:100)	
1	OPHOS/300.0/Q4	S	COLD	24-NOV-94	27-OCT-94	S3A	(111824:100)	
1	SO4/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111824:100)	
1 PN - Plastic-1L	CN/CLP/Q4	S	NAOH	24-NOV-94	08-NOV-94	S3A	(111827:100)	
1 PN - Plastic-250ml	ALK/310.1/Q4	S	COLD	24-NOV-94	08-NOV-94	S3A	(111825:100)	
1	TDS/160.1/Q4	S	COLD	24-NOV-94	01-NOV-94	S3A	(111826:99)	
6630-002	B004P6	Water	25-OCT-94 10:45	27-OCT-94 09:00	01-DEC-94	FED-EX	3*	Sample not Screened
QES, RICHLAND ID=41054103								
1 AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111828:100)	
1	SE/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111828:100)	
1 AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111829:100)	
1	FL/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111829:100)	
1	NO2/300.0/Q4	S	COLD	24-NOV-94	27-OCT-94	S3A	(111829:100)	
1	OPHOS/300.0/Q4	S	COLD	24-NOV-94	27-OCT-94	S3A	(111829:100)	
1	SO4/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111829:100)	
1 PN - Plastic-1L	CN/CLP/Q4	S	NAOH	24-NOV-94	08-NOV-94	S3A	(111832:100)	
1 PN - Plastic-250ml	ALK/310.1/Q4	S	COLD	24-NOV-94	08-NOV-94	S3A	(111830:100)	
1	TDS/160.1/Q4	S	COLD	24-NOV-94	01-NOV-94	S3A	(111831:99)	
6630-003	B004P8	Water	25-OCT-94 10:30	27-OCT-94 09:00	01-DEC-94	FED-EX	3*	Sample not Screened
QES, RICHLAND ID=41054105								
1 AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111833:100)	
1	SE/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111833:100)	
1 AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111834:100)	
1	FL/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111834:100)	
1	NO2/300.0/Q4	S	COLD	24-NOV-94	27-OCT-94	S3A	(111834:100)	
1	OPHOS/300.0/Q4	S	COLD	24-NOV-94	27-OCT-94	S3A	(111834:100)	
1	SO4/300.0/Q4	S	COLD	24-NOV-94	22-NOV-94	S3A	(111834:100)	
1 PN - Plastic-1L	CN/CLP/Q4	S	NAOH	24-NOV-94	08-NOV-94	S3A	(111837:100)	
1 PN - Plastic-250ml	ALK/310.1/Q4	S	COLD	24-NOV-94	08-NOV-94	S3A	(111835:100)	
1	TDS/160.1/Q4	S	COLD	24-NOV-94	01-NOV-94	S3A	(111836:99)	

3*=Sample has not been rad screened.

00010

Quanterra October 27, 1994 02:28 pm
Account: 10722 Project: 550.23 Quanterra-Richland QAS No. 751 Rev. 0
Master Sample Login: 6630

Project Manager: W. Price

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

Sample Header Template: _____

Sample No. / Client ID / Comments	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
6630-004 B004N7 QES, RICHLAND ID=41054102	Water	25-OCT-94 10:45	27-OCT-94 09:00	01-DEC-94	FED-EX	3*	Sample not Screened

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-1L	ICAPD/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111838:100)
1		SED/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111838:100)

6630-005 B004P7 QES, RICHLAND ID=41054104	Water	25-OCT-94 12:05	27-OCT-94 09:00	01-DEC-94	FED-EX	3*	Sample not Screened

1	AN - Amber Glass-1L	ICAPD/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111839:100)
1		SED/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111839:100)

6630-006 B004P9 QES, RICHLAND ID=41054106	Water	25-OCT-94 10:30	27-OCT-94 09:00	01-DEC-94	FED-EX	3*	Sample not Screened

1	AN - Amber Glass-1L	ICAPD/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111840:100)
1		SED/CLP90/Q4	S	HNO3	24-NOV-94	25-APR-95	S3A	(111840:100)

00011

3*=Sample has not been rad screened.

Temp 4° Cor 2161

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 453900
Page 1 of 2

Project Name/No. 1 B94-036
Sample Team Members 2
Profit Center No. 3 4632
Project Manager 4 V Pettey
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 10/26/94
Lab Destination 8 St Louis
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13

Bill to: 5 Quanterra Richland
Report to: 10

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	% Fill	Condition on Receipt 21	Disposal Record No. 22
41054101 A	BOD4M6 1/H20	10/25/94 1205 See WHC	Amber COC/SAR	1 Liter	4°C HNO3	Metals See WHC COC/SAR			2
B		10/25/94 1205	Amber	500 mL	Cold	Anions			
C		10/25/94 1205	Poly	250 mL	Cold	Alkalinity			
D		10/25/94 1205	Poly	250 mL	Cold	TDS			
E		10/25/94 1205	Poly	1 Liter	NaOH	Cyanide			9
2A	BOD4M7	10/25/94 1045	Amber	1 Liter	HNO3	Metals			2
3A	BOD4P6	10/25/94 1045	Amber	1 Liter	HNO3	Metals			2
B			Amber	500 mL	Cold	Anions	✓		

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal: 25
Return to Client ☑ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required: 26
Normal ☑ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0272

1. Relinquished by 28 (Signature/Affiliation) [signature]	Date: 10/26/94 Time: 1600	1. Received by 28 (Signature/Affiliation) Larry Phillips	Date: 10/27/94 Time: 09:00
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

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

00012

INTERNATIONAL TECHNOLOGY CORPORATION

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

Reference Document No.[30] 453900

Project Name W0272 Project No. B94-036 Samples Shipment Date 10/26/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	% Fil	Condition on[21] Receipt	pH	Disposal[22] Record No.
41054103C	BOD4P6 / H_2O	10/25/94 1045 See WHC	Poly LocSAR	250 mL	4°C Cold	Alkalinity See WHC LocSAR	100			
D		10/26/94 1045	Poly	250 mL	Cold	TDS				
E		10/25/94 1045	Poly	1 Liter	NaOH	Cyanide			9	
4A	BOD4P7	10/25/94 1205	Amber	1 Liter	HNO_3	Metals			2	
5A	BOD4P8	10/25/94 1030	Amber	1 Liter	HNO_3	Metals			2	
B		10/26/94 1030	Amber	500 mL	Cold	Anions				
C		10/25/94 1030	Poly	250 mL	Cold	Alkalinity				
D		10/25/94 1030	Poly	250 mL	Cold	TDS				
E		10/25/94 1030	Poly	1 Liter	NaOH	Cyanide			9	
6A	BOD4P9	10/25/94 1030	Amber	1 Liter	HNO_3	Metals			2	
10/26/94										

White: To accompany samples
Yellow: Field copy

*See back of form for special instructions.

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: L Setzer	Company Contact: PN BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: ER-8	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS	METALS (see S. I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALINITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S. I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED				
410541	A	B	C	D	E	410542					A				

Sample No.	Matrix*	Date Sampled	Time Sampled													
BO D4M6 01	W	10-25-94	1205	X	X	X	X	X	X	X	X	X				
BO D4M7 2	W	10-25-94	1205									X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	AG Pizzo	10/25/94 1300	B Whitten	1300 10-25-94
Relinquished By	B Whitten	1130 10-26-94	R Boyd Quaterra	10-26-94 1130
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original - Sample Yellow - Sampler

BC-6000-828 (12/92)

00014

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. Schrer, A. Rizzo	Company Contact: PN BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EMS	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-37	BM of Lading/Air BM No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SAMPLE ANALYSIS: 410541

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl,SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 410542	TRITIUM 0	Tc-99 2	ACTIVITY SCAN —		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
BO 04P6	3	W	10-25-94	1045	X	X	X	X	X	X	X	X	X					
BO 04P7	4	W	10-25-94	1045										X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	AG Rizzo	10/25/94 1300	Received By	1300 10-25-94
Relinquished By	Bill Whitten	1130 10-26-94	Received By	10-26-94 1130
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

00015

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: K.O Lee	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GGS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks:		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS 410541	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 41054203	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4P8 5	W	10/25/94	1030	X	X	X	X	X	X	X	X	X					
BO D4P9 6	W	10/25/94	1030										X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: K O Lee		10/25/94 1145
Received By: B Whitten		10-25-94 1145
Relinquished By: B. Whitten		10-26-94 1130
Received By: Q Boyd Quatrus		10-26-94 1130
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

00016

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: K. D. Lee	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: ER26	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-D-0001-37	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SAMPLE ANALYSIS: 410539

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl,SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 4105400	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	G	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
B0D4M0 01	W	10/25/94	~~1140~~ 0905	X	X	X	X	X	X	X	X	X						
B0D4M1 2	W	10/25/94	~~1140~~ 0905											X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: K.D. Lee	Received By: B.W. Hoa	10/25/94 1145
Relinquished By: B.W. Hoa	Received By: Q. Boyd Clinton	10-26-94 1130
Relinquished By	Received By	
Relinquished By	Received By	

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0267

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

000017

102694A.WQ2

TENNELEC #2

SCREENING CALCULATION SPREADSHEET

(1 R3) 10/26/94

Customer Code	Recieved Date		Screening Prep Date		Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
WHC	10/26/94		10/26		10/2	10	15	237	240

Customer ID	Sample Matrix	Residue Wght	Vol. Anal.	Sample Size	SMPLE CNT DATA Hldr	Total Counts		Net Sample Counts/Minute		DPM / Aliquot		uCi per Sample		pCi / Gm or L		1-sigma error pCi/ Gm or L		Category 1	Aliquot to Cat 1 Gm or L		
WHC	Solid/Liquid	mg	mg ml	Gm L	Num.	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Yes/No	Alpha	Beta	
BOD512	LIQUID	77.8	5.0	1.0	1	8	54	0.74	4.41	2.52E+00	8.83E+00	2.3E-04	8.0E-04	2.3E+02	8.0E+02	113.40	136.73	Yes	4.4E+01	1.3E+02	Cat I
BOD513	LIQUID	8.2	10.0	1.0	2	6	114	0.54	10.41	1.59E+00	2.18E+01	7.2E-05	9.8E-04	7.2E+01	9.8E+02	54.12	101.06	Yes	1.4E+02	1.0E+02	
BOD4M6	LIQUID	2.3	10.0	1.0	3	1	19	0.04	0.91	1.02E-01	1.92E+00	4.6E-06	8.6E-05	4.6E+00	8.6E+01	45.04	42.24	Yes	2.2E+03	1.2E+03	
;BOD4P6	LIQUID	0.0	10.0	1.0	4	2	13	0.14	0.31	5.22E-01	5.75E-01	2.4E-05	2.6E-05	2.4E+01	2.6E+01	47.78	34.85	Yes	4.3E+02	3.9E+03	
BOD4M0	LIQUID	5.5	10.0	1.0	5	14	281	1.34	27.11	3.90E+00	5.68E+01	1.8E-04	2.6E-03	1.8E+02	2.6E+03	65.77	158.32	Yes	5.7E+01	3.9E+01	
BOD4P6	LIQUID	0.0	10.0	1.0	6	3	18	0.24	0.81	8.88E-01	1.57E+00	4.0E-05	7.1E-05	4.0E+01	7.1E+01	50.04	40.48	Yes	2.5E+02	1.4E+03	
BOD549	SOLID	82.5	82.5	800.0	7	4	26	0.34	1.61	2.21E+00	3.56E+00	9.7E-03	1.6E-02	1.2E+01	1.9E+01	11.07	6.52	Yes	8.3E+02	5.1E+03	
BOD550	SOLID	84.1	84.1	950.0	8	0	19	-0.06	0.91	-5.0E-01	2.21E+00	0.0E+00	1.1E-02	-2.7E+00	1.2E+01	8.88	5.86	Yes	-3.7E+03	8.4E+03	
BOD542	SOLID	91.3	91.3	1150.0	9	3	31	0.24	2.11	1.56E+00	4.88E+00	8.9E-03	2.8E-02	7.7E+00	2.4E+01	10.03	6.55	Yes	1.3E+03	4.2E+03	
BOD551	SOLID	79.4	79.4	800.0	10	1	57	0.04	4.71	-9.5E-02	1.11E+01	0.0E+00	5.0E-02	-5.4E-01	6.3E+01	9.50	10.09	Yes	-1.9E+04	1.6E+03	
BOD543	SOLID	70.6	70.6	1300.0	11	4	66	0.34	5.61	1.77E+00	1.28E+01	1.5E-02	1.1E-01	1.1E+01	8.2E+01	11.79	11.96	No	8.9E+02	1.2E+03	Cat II

00018

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10/20/94 1130 Client Name BHI

Project/Client # B94-036 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) ER-8

1. Condition of shipping container? ok
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 19
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 2°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 10/26/94 1130

FORM NO. LS-042, Rev.0, 2/94

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10/26/94 1130 Client Name BHI

Project/Client # B94-036 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) EMS

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 19
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ✓ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 3°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 10/26/94 1130

FORM NO. LS-042, Rev.0, 2/94

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10/26/94 1130 Client Name BHI

Project/Client # B94-036 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) GWS 122

1. Condition of shipping container? ok
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 19
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 2°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 10/26/94 1130

FORM NO. LS-042, Rev.0, 2/94

SAMPLE STATUS REPORT FOR N 3122. RAD SCREEN EQBLANK2 TIME: 10/25/94 22: 9
DISPATCHED: 10/ 3/94 8:46 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/25/94 11:20

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

B0D4P8
B0D4P9
BW
10-26-94

SAMPLE STATUS REPORT FOR N 3105. RAD SCREEN 6996057 TIME: 10/25/94 22: 9
DISPATCHED: 9/28/94 16:31 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/25/94 12:50

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

B0D4M6
B0D4M7
BW
10-26-94

SAMPLE STATUS REPORT FOR N 3121. RAD SCREEN EQBLANK1 TIME: 10/25/94 22: 9
DISPATCHED: 10/ 3/94 8:46 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/25/94 12:50

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

B0D4P6
B0D4P7

BW
10-26-94

SAMPLE STATUS REPORT FOR N 3102. RAD SCREEN 6995557 TIME: 10/25/94 22: 9
DISPATCHED: 9/28/94 16:31 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/25/94 11:20

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

B0D4M0
B0D4M1
BW
10-26-94

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0001-36

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical Supp	ER Field Sampling

The following items are to be shipped from [X] Contractor [ ] Vendor

Routing [ ] Prepaid [ ] Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 George Washington Way
City: Richland, WA 99352
State / Zip Code
Country

Off-site Custodian

On-site Custodian — Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0D4M6 B0D4M7 Cooler ID: ER-8 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #; B0D4P8 B0D4P9 Cooler ID: GWS-122 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

[X] Required for Project Work. List Project No. 200-BP-5

[ ] Business Trip

[ ] Off-site Assignment

Bill of lading # N/A

[ ] Shipment to Subcontractor. List Subcontract No. N/A

[ ] Other (Please specify) Sampling supports RI/FS work in the 200 AREA

RECEIVED
OCT 26 1994
PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
S. Sikes	PS-OFF-0160	10-26-94

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/ (509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-26-94	ITE 2072 TL531	

Originated By	Date	Authorized By	Date
B.J. WHITTEN	10-26-94	Kim Whitten	10-26-94
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		J P Henkel	10/26/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-582-170/00029

Received [illegible] [illegible] 10/26/94 1130 00026

54-3000-479 (01/94)

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0001-37

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical Supp	ER Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 George Washington Way
City: Richland, WA 99352
State
Zip Code
Country

Off-site Custodian

On-site Custodian

Payroll No.

Qty.	Property No.	Description (Include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0D4M0 B0D4M1 Cooler ID: ER-26 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: B0D4P6 B0D4P7 Cooler ID: EMS Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 200-BP-5

☐ Business Trip

Bill of lading # N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 200 AREA

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[illegible]	[illegible]	[illegible]

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/ (509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-26-94	ITE 2072 PL531	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	10-26-94	[signature]	10-26-94
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		[signature]	10/26/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-592-170/00029

[illegible] 10/26/94 1130

Contractor BHI	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT) W95-0-0001-36

PART I - TO BE COMPLETED BY ORIGINATOR

Department ER Eng Support	Section Field & Analytical Supp	Unit ER Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to Quanterra (IT)
Company 2800 George Washington Way
Address Richland, WA 99352
City State Zip Code
Country

Off-site Custodian

On-site Custodian Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0D4M6 B0D4M7 Cooler ID: E5-8 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: B0D4P8 B0D4P9 Cooler ID: GWS-122 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 200-BP-5

☐ Business Trip

Bill of lading # N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 200 AREA

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[illegible]	[illegible]	[illegible]

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butchee/ (509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-26-94	ITE 2072 PL531	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	10-26-94	Bill Whitten	10-26-94
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		J P Hankel	10/26/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-502-170/00028 Received [illegible] return 10/26/94 1130 54-3000-479 (01/94)

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0001-37

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical Supp	ER Field Sampling

The following items are to be shipped from [X] Contractor [ ] Vendor

Routing [ ] Prepaid [ ] Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 George Washington Way
City: Richland, WA 99352
State / Zip Code
Country

Off-site Custodian

On-site Custodian / Payroll No.

Qty.	Property No.	Description (Include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0D4M0 B0D4M1 Cooler ID: ER-26 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: B0D4P6 B0D4P7 Cooler ID: EMS Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

[X] Required for Project Work. List Project No. 200-BP-5

[ ] Business Trip

[ ] Off-site Assignment

[ ] Shipment to Subcontractor. List Subcontract No. N/A

[ ] Other (Please specify) Sampling supports RI/FS work in the 200 AREA

Bill of lading # N/A

RECEIVED
OCT 26 1994
PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
S. Sides	PS- OFF-0160	10-26-94

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/ (509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-26-94	ITE 2072 PL531	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	10-26-94	[signature]	10-26-94
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		[signature]	10/26/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-592-170/00029

Received [signature] 10/26/94 1130

54-3000-479 (01/94)

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10/26/94 1130 Client Name BHI

Project/Client # B94-036 Batch or Case # 10/26/94

Cooler ID (if noted on the outside of cooler) ER-26

1. Condition of shipping container? ok
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 19
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 2°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) ____
    Request for analysis #(s) ____
    Airbill # ____ Carrier ____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 10/26/94 1130

FORM NO. LS-042, Rev.0, 2/94

Quanterra Environmental

C.U.R. and C.O.C.
COPIED TO: DR. WP
DATE: 10/27/94
TIME: 1140
BY: Larry Phillips

Work Order No.: 6630

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: QES, Richland
Date: 10/27/94
Project No: 550.23
Initiated by: Larry Phillips
Analysis Requested: Refer to RFA/COC
RFA/COC Numbers: B94-036
Client Sample Numbers Affected: Entire Login

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

1.	NA	Not enough sample received for proper analysis. Received approximately: _____	8.	☐	Custody tape disturbed/broken/missing.
			9.	NA	Sample splits performed by lab.
2.	☐	Sample received broken/leaking.	10.	NA	Volatile sample received with approximately _____ mm headspace.
3.	☐	Sample received without proper preservative.			
		☐ Cooler temperature not within 4°C ± 2°C. Record temperature: 40	11.	☐	Sample ID on container does not match sample ID on paperwork. Explain: _____
		☐ pH _____			
		☐ other: _____			
4.	☐	Sample received in improper container.	12.	☐	All coolers on airbill not received with shipment.
5.	☐	Sample received without proper paperwork. Explain: _____	13.	☐	Other (explain below): Shipping containers not rad surveyed.
6.	☐	Paperwork received without sample.			
7.	☐	No sample ID on sample container.			

Notes: _____

Corrective Action:

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

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

☐ Sample(s) processed "as is". Comments: _____

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

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Quanterra October 31, 1994 02:50 pm

Account: 10722 Project: 550.23 Quanterra-Richland QAS No. 751 Rev. 0

Master Sample Login: 6646

Project Manager: W. Price

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

Sample Header Template:

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	Date: Collected	Received	Due	Shipper	Rad Category / Class	Rad Sample No. / Preservative	Comments / Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
6646-001	B0D4F8	Water	27-OCT-94 11:30	27-OCT-94 11:30	01-DEC-94	FED-EX	1					Screening not Required
QUANTERRA RICHLAND I.D. 41056301												
1	AN - Amber Glass-1L	ICAP/CLP90/Q4					S	HNO3	23-NOV-94	25-APR-95	R17A	(112047:100)
1		SE/CLP90/Q4					S	HNO3	23-NOV-94	25-APR-95	R17A	(112047:100)
1	AN - Amber Glass-500ml	CL/300.0/Q4					S	COLD	23-NOV-94	24-NOV-94	R17A	(112048:100)
1		FL/300.0/Q4					S	COLD	23-NOV-94	24-NOV-94	R17A	(112048:100)
1		NO2/300.0/Q4					S	COLD	23-NOV-94	29-OCT-94	R17A	(112048:100)
1		OPHOS/300.0/Q4					S	COLD	23-NOV-94	29-OCT-94	R17A	(112048:100)
1		SO4/300.0/Q4					S	COLD	23-NOV-94	24-NOV-94	R17A	(112048:100)
1	PN - Plastic-1L	CN/CLP/Q4					S	NAOH	23-NOV-94	10-NOV-94	R17A	(112051:100)
1	PN - Plastic-250ml	ALK/310.1/Q4					S	COLD	23-NOV-94	10-NOV-94	R17A	(112050:99)
1		TDS/160.1/Q4					S	COLD	23-NOV-94	03-NOV-94	R17A	(112049:100)
6646-002	B0D4F9	Water	27-OCT-94 11:30	27-OCT-94 11:30	01-DEC-94	FED-EX	1					Screening not Required
QUANTERRA RICHLAND I.D. 41056302												
1	AN - Amber Glass-1L	ICAPD/CLP90/Q4					S	HNO3	23-NOV-94	25-APR-95	R17A	(112076:100)
1		SED/CLP90/Q4					S	HNO3	23-NOV-94	25-APR-95	R17A	(112076:100)

00032

3*=Sample has not been rad screened.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CUR 2374

Reference Document No. 453917

Page 1 of 1

Project Name/No. 1 B94-036

Sample Team Members 2

Profit Center No. 3 4632

Project Manager 4 V Pelley

Purchase Order No. 6

Required Report Date 11

Samples Shipment Date 7 10/27/94

Lab Destination 8 St Louis

Lab Contact 9

Project Contact/Phone 12

Carrier/Waybill No. 13

Bill to: 5 Quanterra Richland

Report to: 10

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Preservative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
4105630 1A	BOD4F8 / H_2O	102694 1025 See WHC	Amber LOC/SAR	1L	HNO3 4°C	metals unfiltered See WHC LOC/SAR	Temp 4 pH /	
B		"	"	500		Anions	4	
C		"	Poly	250	–	Alkalinity	"	
D		"	"	250		TDS	4	–
E		"	"	1L	NaOH	CN	4 pH 12	
02A	BOD4F9	"	Amber	1L	HNO3	metals Filtered	5	
10/27/94								

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal: 25
Return to Client ☑ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required: 26
Normal ☑ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG-W0272

1. Relinquished by 28 (Signature/Affiliation) [signature]	Date: 10/27/94 Time: 1600	1. Received by 28 (Signature/Affiliation) Rob Cavart	Date: 10-28-94 Time: 0900
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

White: To accompany samples

Yellow: Field copy

*See back of form for special instructions.

00033

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GWS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-38	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS 410563	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 410	TRITIUM 564	Tc-99 01	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4F8 01	W	102694	1025	X	X	X	X	X	X	X	X	X					
BO D4F9 2	W	102694	1025											X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: AG Gilpo	Date/Time: 10/26/94 1210	Received By: Buth Hon	Date/Time: 1210 10-26-94
Relinquished By: Buth Hon	Date/Time: 102894 1130	Received By: <100 LPM	Date/Time: 10/27/94 1130
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

00034

TENNELEC #1

SCREENING CALCULATION SPREADSHEET

Correct. JRN
27 Oct. 94

Customer Code	Recieved Date		Screening Prep Date		Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
WHC	10-27-94		10-27		10-2	10	15	223	240

Customer ID	Sample Matrix	Residue Wght	Vol. Anal	Sample Size	SMPLE CNT DATA Hldr	Total Counts		Net Sample Counts/Minute		DPM / Aliquot		uCi per Sample		pCi / Gm or L		1-sigma error pCi/ Gm or L		Category 1	Aliquot to Cat 1 Gm or L	
WHC	Solid/Liquid	mg	mg ml	Gm L	Num	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Yes/No	Alpha	Beta
B0D4F8	LIQUID	1 5	10.0	1.0	56	9	24	0 84	1.47	2.93E+00	2.67E+00	1.3E-04	1.2E-04	1.3E+02	1.2E+02	57.60	45 60	Yes	7.6E+01	8.3E+02

00035

SAMPLE STATUS REPORT FOR N 3069. RAD SCREEN 299E3307 TIME: 10/26/94 21:44
DISPATCHED: 9/28/94 16:28 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/26/94 21:32

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

B0D4F8
B0D4F9
BW
10-27-94

Contractor BHI	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT) W95-0-0001-38

PART I - TO BE COMPLETED BY ORIGINATOR

Department ER Eng Support	Section Field & Analytical Supp	Unit ER Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 George Washington Way
City: Richland, WA 99352 State Zip Code
Country

Off-site Custodian

On-site Custodian Payroll No.

BEST COPY AVAILABLE

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs.		Sample #: B0D4F8 B0D4F9 B0D4Q0 Cooler ID; GWS-172 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.		Sample #: B0D552 B0D5K6 B0D553 B0D5M7 B0D5N6 B0D5[illegible] B0D[illegible] Cooler ID: EK-32 Polycooler with groundwater samples packed in wet ice vermiculite	

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 200-BP-5

☐ Business Trip

☐ Off-site Assignment

Bill of lading # N/A

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 200 AREA

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS TO BE SHIPPED

RM Clearance for Public Release	RM Survey No.	
[illegible]	[illegible]-LEE-0170	10-27-94

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/(509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Property Value
10-27-94	ITE2072/ FL531	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	10-27-94	[signature]	10-27-94

Property Representative Signature	Date	Property Management Approval	Date
		[signature]	10/27/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO. 1994-592-170/00029 Record [signature] quitter 10/27/94 1130 DOE-479 (01/84)

00037

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11/27/94 1130 Client Name BHI

Project/Client # B94-036, B94-037 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) GWS 122

1. Condition of shipping container? _____
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 24
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 4°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 10/27/94 1130

FORM NO. LS-042, Rev.0, 2/94

Quanterra
Environmental Services

C.U.R. and C.O.C.
COPIED TO: DK + WP
DATE: 10-28-94
TIME: 10:10
BY: Bob Cowart

Work Order No.: 6646

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richland
Date: 10-28-94 10:10
Project No: 550.23
Initiated by: Bob Cowart
Analysis Requested: Refer to RFA/COC
RFA/COC Numbers: 453917
Client Sample Numbers Affected: Entire Login

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

(1) NA Not enough sample received for proper analysis.
Received approximately: _____

(2) ☐ Sample received broken/leaking.

(3) ☐ Sample received without proper preservative.
☐ Cooler temperature not within 4°C ± 2°C
Record temperature: 4°C + 5°C after 1 hr
☐ pH _____
☐ other: _____

(4) ☐ Sample received in improper container.

(5) ☐ Sample received without proper paperwork. Explain:
_____

(6) ☐ Paperwork received without sample.

(7) ☐ No sample ID on sample container.

(8) ☐ Custody tape disturbed/broken/missing.

9. NA Sample splits performed by lab.

10. (NA) Volatile sample received with approximately _____ mm headspace.

(11) ☐ Sample ID on container does not match sample ID on paperwork. Explain:
_____
_____

(12) ☐ All coolers on airbill not received with shipment.

(13) ☐ Other (explain below):
Shipping containers not rad surveyed.
_____
_____

Notes:
_____
_____

Corrective Action:

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

☐ Sample(s) processed "as is". Comments: _____
☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Quanterra November 03, 1994 08:41 am
Account: 10722 Project: 550.23 Quanterra-Richland QAS No. 751 Rev. 0
Master Sample Login: 6666

Project Manager: W. Price

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

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 / (Container Numbers:% Filled)	Rad Sample No.
6666-001	B00406	Water	27-OCT-94 10:00	28-OCT-94 10:45	02-DEC-94	FED-EX	1	Screening not Required	
QES, RICHLAND ID=41058901									
1	AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112319:100)	
1		SE/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112319:100)	
1	AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1		FL/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1		NO2/300.0/Q4	S	COLD	23-NOV-94	29-OCT-94	R2A	(112320:100)	
1		OPHOS/300.0/Q4	S	COLD	23-NOV-94	29-OCT-94	R2A	(112320:100)	
1		SO4/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1	PN - Plastic-1L	CN/CLP/Q4	S	NAOH	23-NOV-94	10-NOV-94	R2A	(112325:100)	
1	PN - Plastic-250ml	ALK/310.1/Q4	S	COLD	23-NOV-94	10-NOV-94	R2A	(112321:100)	
1		TDS/160.1/Q4	S	COLD	23-NOV-94	03-NOV-94	R2A	(112322:99)	
6666-001DUP	B00406	Water	27-OCT-94 10:00	28-OCT-94 10:45	02-DEC-94	FED-EX	1	Screening not Required	
QES, RICHLAND ID=41058901									
1	AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112319:100)	
1		SE/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112319:100)	
1	AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1		FL/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1		NO2/300.0/Q4	S	COLD	23-NOV-94	29-OCT-94	R2A	(112320:100)	
1		OPHOS/300.0/Q4	S	COLD	23-NOV-94	29-OCT-94	R2A	(112320:100)	
1		SO4/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1	PN - Plastic-1L	CN/CLP/Q4	S	NAOH	23-NOV-94	10-NOV-94	R2A	(112325:100)	
1	PN - Plastic-250ml	ALK/310.1/Q4	S	COLD	23-NOV-94	10-NOV-94	R2A	(112321:100)	
1		TDS/160.1/Q4	S	COLD	23-NOV-94	03-NOV-94	R2A	(112322:99)	
6666-001MS	B00406	Water	27-OCT-94 10:00	28-OCT-94 10:45	02-DEC-94	FED-EX	1	Screening not Required	
QES, RICHLAND ID=41058901									
1	AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112319:100)	
1		SE/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112319:100)	
1	AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1		FL/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1		NO2/300.0/Q4	S	COLD	23-NOV-94	29-OCT-94	R2A	(112320:100)	
1		OPHOS/300.0/Q4	S	COLD	23-NOV-94	29-OCT-94	R2A	(112320:100)	
1		SO4/300.0/Q4	S	COLD	23-NOV-94	24-NOV-94	R2A	(112320:100)	
1	PN - Plastic-1L	CN/CLP/Q4	S	NAOH	23-NOV-94	10-NOV-94	R2A	(112325:100)	
6666-002	B00407	Water	27-OCT-94 10:00	28-OCT-94 10:45	02-DEC-94	FED-EX	1	Screening not Required	
QES, RICHLAND ID=41058902									

3*=Sample has not been rad screened.

0004

Quanterra November 03, 1994 08:41 am
Account: 10722 Project: 550.23 Quanterra-Richland QAS No. 751 Rev. 0
Master Sample Login: 6666

Project Manager: W. Price

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.
6666-002DUP	B0D4G7	Water	27-OCT-94 10:00	28-OCT-94 10:45	02-DEC-94	FED-EX	1	Screening not Required
QES, RICHLAND ID=41058902								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:								
1	AN - Amber Glass-1L	ICAPD/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112326:100)
1		SED/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112326:100)

Sample No. / Comments	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
6666-002MS	B0D4G7	Water	27-OCT-94 10:00	28-OCT-94 10:45	02-DEC-94	FED-EX	1	Screening not Required
QES, RICHLAND ID=41058902								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-1L	ICAPD/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112326:100)
1		SED/CLP90/Q4	S	HNO3	23-NOV-94	26-APR-95	R2A	(112326:100)

00041

3*=Sample has not been rad screened.

Temp. 2° Cor 2336

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 453921
Page 1 of 1

Project Name/No. 1 894-036
Sample Team Members 2
Profit Center No. 3 4632
Project Manager 4 V Pelkey
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 10/28/94
Lab Destination 8 St Louis
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13

Bill to: 5 Pantera Richland
Report to: 10

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Preservative 19	Requested Testing Program 20	% Fill	Condition on Receipt 21	Disposal Record No. 22
41058901A	BOD4G6 / H_2O	10/27/94 1000 See WHC	Amber COCSAR	1 Liter	HNO3 4°C	Metals See WHC LocSAR	100		2
B		10/27/94 1000	Amber	500 mL	Cold	Ammonia		FOR LAB USE ONLY	
C		10/27/94 1000	Poly	250 mL	Cold	Alkalinity			
D		10/27/94 1000	Poly	250 mL	Cold	TDS			
E		10/27/94 1000	Poly	1 Liter	NaOH	Cyanide			9
2A	BOD4G7	10/27/94 1000	Amber	1 Liter	HNO3	Metals		FOR LAB USE ONLY	
35 10/28/94									

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal: 25
Return to Client ☑ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required: 26
Normal ☑ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0272

1. Relinquished by 28 (Signature/Affiliation) [signature]	Date: 10/28/94 Time: 1600	1. Received by 28 (Signature/Affiliation) Larry Phillips	Date: 10/29/94 Time: 09:15
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

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

00042

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. Setzer	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-92	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 410589

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl,SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 5105	TRITIUM 9001	Tc-99 —	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	G	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
BO D4G6	01	W	10/27/94	1000	X	X	X	X	X	X	X	X	X					
BO D4G7	2	W	10/27/94	1000										X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: AJ SIMPSON	Date/Time: AJ Simpson 10/28/94 0900	Received By: Buth Hen	Date/Time: 10-28-94 0900
Relinquished By: Buth Hen	Date/Time: 10-28-94 1045	Received By: [signature]	Date/Time: 10/28/94 1045
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

000043

102694A.WO2

TENNELEC #2

SCREENING CALCULATION SPREADSHEET

All are Cat. I.
JRM 28 Oct. 94

Customer Code	Recieved Date		Screening Prep Date		Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
WHC	10/28/94		10/28/9		10/2	10	12	123	120

Customer ID WHC	Sample Matrix Solid/Liquid	Residue Wght mg	Vol. Anal. mg ml	Sample Size Gm L	SMPLE CNT DATA Hldr Num.	Total Counts Alpha	Beta	Net Sample Counts/Minute Alpha	Beta	DPM / Aliquot Alpha	Beta	uCi per Sample Alpha	Beta	pCi / Gm or L Alpha	Beta	1-sigma error pCi/ Gm or L Alpha	Beta	Category 1 Yes/No	Aliquot to Cat 1 Gm or L Alpha	Beta
BODOD2	LIQUID	0.0	10.0	1.0	24	0	32	-0.10	2.18	-5.0E-01	4.69E+00	0.0E+00	2.1E-04	-2.2E+01	2.1E+02	43.50	55.43	Yes	-4.5E+02	4.7E+02
BODOD3	LIQUID	0.0	10.0	1.0	25	0	13	-0.10	0.28	-4.0E-01	6.50E-01	0.0E+00	2.9E-05	-1.8E+01	2.9E+01	44.14	36.85	Yes	-5.5E+02	3.4E+03
BODOD4	LIQUID	0.0	10.0	1.0	26	0	13	-0.10	0.28	-4.0E-01	6.50E-01	0.0E+00	2.9E-05	-1.8E+01	2.9E+01	44.14	36.85	Yes	-5.5E+02	3.4E+03
BOD4G6	LIQUID	2.9	10.0	1.0	27	3	30	0.20	1.98	6.85E-01	4.07E+00	3.1E-05	1.8E-04	3.1E+01	1.8E+02	51.05	53.00	Yes	3.2E+02	5.5E+02

00044

SAMPLE STATUS REPORT FOR N 3073. RAD SCREEN 299E3315 TIME: 10/28/94 7:56
DISPATCHED: 9/28/94 16:29 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/28/94 1:23

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

B0D4G6
B0D4G7
BW
10-28-94

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0001-42

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical supp	ER Field Sampling

The following items are to be shipped from [X] Contractor [ ] Vendor

Routing [ ] Prepaid [ ] Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 George Washington Way
City: Richland, WA 99352
State / Zip Code
Country

Off-site Custodian

On-site Custodian / Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: BOD466 BOD467 Cooler ID; SML-503 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		~~Sample #:~~ Cooler ID: Polycooler with groundwater ~~samples~~ packed in wet ice and vermiculite	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

[ ] Required for Project Work. List Project No. 200-BP-5

[ ] Business Trip

[ ] Off-site Assignment

Bill of lading # N/A

[ ] Shipment to Subcontractor. List Subcontract No. N/A

[ ] Other (Please specify) Sampling supports RI/FS work in the 200 AREA

RECEIVED
OCT 28 1994
PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[signature]	P.S. off - 0175	10/28/94

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/ (509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-28-94	ITE 2072 PL531	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	10-28-94	[signature]	10-28-94

Property Representative Signature	Date	Property Management Approval	Date
		[signature]	10/28/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-592-170/00029

Received [signature] 10/28/94 1045 00046

54-3000-479 (01/94)

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0001-42

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical supp	ER Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 George Washington Way
City: Richland, WA 99352
State / Zip Code
Country

Off-site Custodian

On-site Custodian / Payroll No.

Qty.	Property No.	Description (Include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: BOD466 BOD467 Cooler ID; SML-503 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		~~Sample #:~~ ~~Cooler ID:~~ ~~Polycooler with groundwater samples packed in wet ice and vermiculite~~	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☐ Required for Project Work. List Project No. 200-BP-5

☐ Business Trip

Bill of lading # N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 200 AUFA

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/ (509) 376-4388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-28-94	ITE 2072 PL531	

Originated By	Date	Authorized By	Date
B.T. WHITEN	10-28-94	[signature]	10-28-94
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		[signature]	10/28/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-592-170/00029

Received [signature] 10/28/94 1045

00047

54-3000-479 (01/94)

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10/28/94 1045 Client Name BHI

Project/Client # B94-036 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) SML 503

1. Condition of shipping container? ok
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 19
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 3°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature Tom Gilmore [signature] Date/Time 10/28/94 1045

FORM NO. LS-042, Rev.0, 2/94

Quanterra Environmental

C.U.R. and C.O.C.
COPIED TO: DK-WP
DATE: 10/29/94
TIME: 0 1130
BY: Larry Phillips

Work Order No.: 6666

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: QES, Richland

Date: 10/29/94

Project No: 550.23

Initiated by: Larry Phillips

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: B94-036

Client Sample Numbers Affected: Entire Login

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

(1)	NA	Not enough sample received for proper analysis. Received approximately: _____
(2)	☐	Sample received broken/leaking.
(3)	☐	Sample received without proper preservative.
	☐	Cooler temperature not within 4°C ± 2°C Record temperature: 2° Water Bottle 3°
	☐	pH _____
	☐	other: _____
(4)	☐	Sample received in improper container.
(5)	☐	Sample received without proper paperwork. Explain: _____
(6)	☐	Paperwork received without sample.
(7)	☐	No sample ID on sample container.
(8)	☐	Custody tape disturbed/broken/missing.
9.	NA	Sample splits performed by lab.
10.	NA	Volatile sample received with approximately _____ mm headspace.
(11)	☐	Sample ID on container does not match sample ID on paperwork. Explain: _____
(12)	☐	All coolers on airbill not received with shipment.
13.	☐	Other (explain below): Shipping containers not rad surveyed.

Notes:

Corrective Action:

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

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

☐ Sample(s) processed "as is". Comments: _____

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

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Quanterra November 02, 1994 01:26 pm

Account: 10722 Project: 550.23 Quanterra-Richland QAS No. 751 Rev. 0

Master Sample Login: 6687

Project Manager: W. Price

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

Sample Header Template:

Sample No. / Comments / # / Data:	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)
6687-001	B0D4K2	Water	28-OCT-94 09:40	31-OCT-94 09:45	05-DEC-94	FED-EX		1	Screening not Required
QUANTERRA RICHLAND I.D. 41062201									
1	AN - Amber Glass-1L	ICAP/CLP90/Q4	S	HNO3	28-NOV-94	29-APR-95	S13C		(112852:100)
1		SE/CLP90/Q4	S	HNO3	28-NOV-94	29-APR-95	S13C		(112852:100)
1	AN - Amber Glass-500ml	CL/300.0/Q4	S	COLD	28-NOV-94	25-NOV-94	S13C		(112853:100)
1		FL/300.0/Q4	S	COLD	28-NOV-94	25-NOV-94	S13C		(112853:100)
1		NO2/300.0/Q4	S	COLD	28-NOV-94	30-OCT-94	S13C		(112853:100)
1		OPHOS/300.0/Q4	S	COLD	28-NOV-94	30-OCT-94	S13C		(112853:100)
1		SO4/300.0/Q4	S	COLD	28-NOV-94	25-NOV-94	S13C		(112853:100)
1	PN - Plastic-1L	CN/CLP/Q4	S	NAOH	28-NOV-94	11-NOV-94	S13C		(112856:100)
1	PN - Plastic-250ml	ALK/310.1/Q4	S	COLD	28-NOV-94	11-NOV-94	S13C		(112854:100)
1		TDS/160.1/Q4	S	COLD	28-NOV-94	04-NOV-94	S13C		(112855:99)
6687-002	B0D4K3	Water	28-OCT-94 09:40	31-OCT-94 09:45	05-DEC-94	FED-EX		1	Screening not Required
QUANTERRA RICHLAND I.D. 41062202									
1	AN - Amber Glass-1L	ICAPD/CLP90/Q4	S	HNO3	28-NOV-94	29-APR-95	S13C		(112857:100)
1		SED/CLP90/Q4	S	HNO3	28-NOV-94	29-APR-95	S13C		(112857:100)

00050

3*=Sample has not been rad screened.

Temp. 2° Cor 2260

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 453923
Page 1 of 1

Project Name/No. 1: B94-036
Sample Team Members 2:
Profit Center No. 3: 4632
Project Manager 4: V Petley
Purchase Order No. 6:
Required Report Date 11:

Samples Shipment Date 7: 10/31/94
Lab Destination 8: St Louis
Lab Contact 9:
Project Contact/Phone 12:
Carrier/Waybill No. 13:

Bill to: 5 Quanterra Richland
Report to: 10

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Preservative 19	Requested Testing Program 20	% Fill	Condition on Receipt 21	Disposal Record No. 22
L.P. 2 4106220 1A	BOD4k2 / H_2O	10/28/94 0940 See WHC	Amber COC/SAR	1 Liter	4°C HNO3	Metals See WHC COC/SAR	100%		2
B		10/28/94 0940	Amber	500 mL	Cold	Anions		FOR LAB USE ONLY	
C		10/28/94 0940	Poly	250 mL	Cold	Alk.			
D		10/28/94 0940	Poly	250 mL	Cold	TDS			
E		10/28/94 0940	Poly	1 Liter	NaOH	CN			
2A	BOD4k3	10/28/94 0940	Amber	1 Liter	HNO3	Metals	✓	FOR LAB USE ONLY	
10/31/94									

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal: 25
Return to Client ☑ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required: 26
Normal ☑ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0272 L.P.

1. Relinquished by 28 (Signature/Affiliation) [signature]	Date: 10/31/94 Time: 1600	1. Received by 28 (Signature/Affiliation) Larry Phillips	Date: ~~08:50~~ 11/01/94 Time: 08:150
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

0001

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

MCA 3/18/91

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EK 40	Field Logbook No.: EFL- 1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W950-0001-44	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS 410622	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 410	TRITIUM 623	Tc-99 01	ACTIVITY SCAN —		METALS (see S. I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4K2 01	W	10-28-94	0940	X	X	X	X	X	X	X	X	X					
BO D4K3 2	W	10-28-94	0940											X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AJ SIMPSON AJSimpson	10/28/94 1125	B Witten	10-28-94 1125
B Witten	10/31/94	B Brumfield Quanterra	10/31/94 9:45

SPECIAL INSTRUCTIONS
#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0005 2

103194B.WQ2

TENNELEC #2

SCREENING CALCULATION SPREADSHEET

All are Cat. I.
DRM 31 Oct. 94

Customer Code WHC	Recieved Date		Screening Prep Date		Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
	10/31/94		10/31		10/31	10	10	256	240

Customer ID WHC	Sample Matrix Solid/Liquid	Residue Wght mg	Vol. Anal. mg ml	Sample Size Gm L	SMPLE CNT DATA Hldr Num.	Total Counts Alpha	Beta	Net Sample Counts/Minute Alpha	Beta	DPM / Aliquot Alpha	Beta	uCi per Sample Alpha	Beta	pCi / Gm or L Alpha	Beta	1-sigma error pCi/ Gm or L Alpha	Beta	Category 1 Yes/No	Aliquot to Cat 1 Gm or L Alpha	Beta
BOD330	LIQUID	19.4	10.0	1.0	21	54	1009	5.36	99.63	1.61E+01	2.09E+02	7.2E-04	9.4E-03	7.2E+02	9.4E+03	106.64	299.37	Yes	1.4E+01	1.1E+01
BOD331	LIQUID	20.8	10.0	1.0	22	1	21	0.06	1.03	1.78E-01	2.14E+00	8.0E-06	9.6E-05	8.0E+00	9.6E+01	46.90	44.06	Yes	1.2E+03	1.0E+03
BOD4K2	LIQUID	10.6	10.0	1.0	23	12	365	1.16	37.43	2.70E+00	7.88E+01	1.2E-04	3.5E-03	1.2E+02	3.5E+03	61.03	185.69	Yes	8.2E+01	2.8E+01

L.P.
~~B94-027~~
B94-036

00053

SAMPLE STATUS REPORT FOR N 3093. RAD SCREEN 6995053A TIME: 10/29/94 0:2
DISPATCHED: 9/28/94 16:30 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 10/29/94 0:17

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARG CODE
****	********	**********	***	***	*****
4271	TOT-ACT	< 5.00000E 01 pCi/G .	N	Y	J12UP

END OF REPORT

B004K2
B004K3
BW
10-31-94

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0001-414

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng Support	Field & Analytical Supp	ER Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to
Company Quanterra (TT)
Address 2800 George Washington Way
City Richland, WA 99352 State Zip Code
Country

Off-site Custodian

On-site Custodian Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0D330 B0D331 Cooler ID: ER-41 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: B0D4K2 W0D4K3 B0D6Z2 B0D6Z3 Cooler ID: ER-40 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☐ Required for Project Work. List Project No. 200-BP-5 200-BP-PET

☐ Business Trip

☐ Off-site Assignment

Bill of lading # / NIA

☐ Shipment to Subcontractor. List Subcontract No. NIA

☐ Other (Please specify) Sampling supports RI/FS work in the 200 AREA

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date

Location of and Contact for Property (Name/Phone No./Bldg./Area)
P. H. Butcher/ (509) 376-8388

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10-31-94	ITE 2072 PT5BB	

Originated By	Date	Authorized By	Date
BT WHITTEN	10-31-94	Rue Whitten	10-31-94

Property Representative Signature	Date	Property Management Approval	Date
		J P Hankel	10/31/94

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

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

*U.S. GPO: 1994-592-170/00028 Rue E. Brenfield Quanterra 10/31/94 9:45 54-3000-479 (01/94)

00055

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 10/31/94 0945 Client Name BHI

Project/Client # B94-068, B94-036 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) ER40

1. Condition of shipping container? Ok
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☐ No ☑
7. Number of sample containers in cooler: 28
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 4°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☐
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature B. Brumfield Quantera Date/Time 10/31/94 09:45

BAB
L# L100

FORM NO. LS-042, Rev.0, 2/94

Quanterra

C.U.R. and Environmental Services

COPIED TO: DK-WP
DATE: 11/01/99
TIME: 1035
BY: Larry Phillips

Work Order No.: 6687

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Quanterra Richland

Date: 11/01/99

Project No: 550.23

Initiated by: Larry Phillips

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: B94-036

Client Sample Numbers Affected: Entire Login

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

1	NA	Not enough sample received for proper analysis. Received approximately: _____
2	☐	Sample received broken/leaking.
3	☐	Sample received without proper preservative.
	☐	Cooler temperature not within 4°C ± 2°C. Record temperature: 2°
	☐	pH _____
	☐	other: _____
4	☐	Sample received in improper container.
5	☐	Sample received without proper paperwork. Explain: _____
6	☐	Paperwork received without sample.
7	☐	No sample ID on sample container.
8	☐	Custody tape disturbed/broken/missing.
9	NA	Sample splits performed by lab.
10	NA	Volatile sample received with approximately _____ mm headspace.
11	☐	Sample ID on container does not match sample ID on paperwork. Explain: _____
12	☐	All coolers on airbill not received with shipment.
13	☐	Other (explain below): Shipping containers not rad surveyed.

Notes: 41062202A (BOOK43) is labled as 41062201A

Corrective Action:

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

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

☐ Sample(s) processed "as is". Comments: _____

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

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: _____ Date: _____

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4F8

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____
Lab Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6646-001
Level (low/med): LOW__ Date Received: 10/27/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	28.2	B		P
7440-70-2	Calcium__	50600			P
7439-89-6	Iron____	1220			P
7439-95-4	Magnesium	13800			P
7439-96-5	Manganese	18.6			P
7440-09-7	Potassium	5950			P
7782-49-2	Selenium_	1.7	U	WN	F
7440-23-5	Sodium___	26100			P
	Cyanide__	24.2			AS
7440-21-3	Silicon__	18400			P
7440-69-9	Bismuth__	74.2	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SILICATE_=_60300_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4F9

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23_____

Lab Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____

Matrix (soil/water): WATER Lab Sample ID: 6646-002

Level (low/med): LOW__ Date Received: 10/27/94

% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40.9	B		P
7440-70-2	Calcium	50300			P
7439-89-6	Iron	629			P
7439-95-4	Magnesium	13700			P
7439-96-5	Manganese	8.2	B		P
7440-09-7	Potassium	7070			P
7782-49-2	Selenium	1.7	U	WN	F
7440-23-5	Sodium	25400			P
	Cyanide				NR
7440-21-3	Silicon	18100			P
7440-69-9	Bismuth	69.7	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

SILICATE_=_59300_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4G6

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____
Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6666-001
Level (low/med): LOW__ Date Received: 10/28/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	24.9	U		P
7440-70-2	Calcium__	38400			P
7439-89-6	Iron____	63.9	B		P
7439-95-4	Magnesium	11800			P
7439-96-5	Manganese	4.9	B		P
7440-09-7	Potassium	6140			P
7782-49-2	Selenium_	1.7	U	WN	F
7440-23-5	Sodium___	20100			P
	Cyanide__	1.2	U		AS
7440-21-3	Silicon__	17100			P
7440-69-9	Bismuth__	78.6	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SILICATE_=_56100_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4G7

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6666-002
Level (low/med): LOW Date Received: 10/28/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	28.9	B		P
7440-70-2	Calcium	40600			P
7439-89-6	Iron	40.5	B		P
7439-95-4	Magnesium	12400			P
7439-96-5	Manganese	3.7	B		P
7440-09-7	Potassium	5650			P
7782-49-2	Selenium	1.7	U	WN	F
7440-23-5	Sodium	21200			P
	Cyanide				NR
7440-21-3	Silicon	18100			P
7440-69-9	Bismuth	52.4	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SILICATE = 59300 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4K2

Lab Name: ITAS_ST._LOUIS Contract: 550.23

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272

Matrix (soil/water): WATER Lab Sample ID: 6687-001

Level (low/med): LOW Date Received: 10/31/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	49.9	B		P
7440-70-2	Calcium	158000			P
7439-89-6	Iron	289			P
7439-95-4	Magnesium	42300			P
7439-96-5	Manganese	9.5	B		P
7440-09-7	Potassium	9870			P
7782-49-2	Selenium	24.3		SN	F
7440-23-5	Sodium	41600			P
	Cyanide	189			AS
7440-21-3	Silicon	18100			P
7440-69-9	Bismuth	159			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SILICATE = 59300 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4K3

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____
Lab Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6687-002
Level (low/med): LOW__ Date Received: 10/31/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.9	U		P
7440-70-2	Calcium	159000			P
7439-89-6	Iron	195			P
7439-95-4	Magnesium	42500			P
7439-96-5	Manganese	8.8	B		P
7440-09-7	Potassium	12900			P
7782-49-2	Selenium	26.8		SN	F
7440-23-5	Sodium	40800			P
	Cyanide				NR
7440-21-3	Silicon	18200			P
7440-69-9	Bismuth	193			P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SILICATE_=_59700_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4M6

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____
Lab Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6630-001
Level (low/med): LOW___ Date Received: 10/27/94
% Solids: ___0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	24.9	U		P
7440-70-2	Calcium__	19400			P
7439-89-6	Iron____	179			P
7439-95-4	Magnesium	5730			P
7439-96-5	Manganese	44.6			P
7440-09-7	Potassium	8040			P
7782-49-2	Selenium_	1.7	U	WN	F
7440-23-5	Sodium___	40400			P
	Cyanide__	1.7	B		AS
7440-21-3	Silicon__	19900			P
7440-69-9	Bismuth__	38.0	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SILICATE_=_65200_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4M7

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23_____
Lab Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6630-004
Level (low/med): LOW___ Date Received: 10/27/94
% Solids: ___0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	24.9	U		P_
7440-70-2	Calcium__	71.2	B		P_
7439-89-6	Iron____	60.6	B		P_
7439-95-4	Magnesium	102	B		P_
7439-96-5	Manganese	2.9	B		P_
7440-09-7	Potassium	1940	U		P_
7782-49-2	Selenium_	1.7	U	WN	F_
7440-23-5	Sodium___	235	B		P_
	Cyanide__				NR
7440-21-3	Silicon__	27.3	B		P_
7440-69-9	Bismuth__	49.7	B		P_

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SILICATE_=_89.5_UG/L_B

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P6

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6630-002
Level (low/med): LOW Date Received: 10/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.9	U		P
7440-70-2	Calcium	153	B		P
7439-89-6	Iron	88.6	B		P
7439-95-4	Magnesium	119	B		P
7439-96-5	Manganese	1.7	B		P
7440-09-7	Potassium	1940	U		P
7782-49-2	Selenium	1.7	U	N	F
7440-23-5	Sodium	355	B		P
	Cyanide	2.4	B		AS
7440-21-3	Silicon	104			P
7440-69-9	Bismuth	38.0	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SILICATE = 341 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P7

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6630-005
Level (low/med): LOW Date Received: 10/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.9	U		P
7440-70-2	Calcium	19600			P
7439-89-6	Iron	44.0	B		P
7439-95-4	Magnesium	5790			P
7439-96-5	Manganese	46.1			P
7440-09-7	Potassium	8180			P
7782-49-2	Selenium	1.7	U	WN	F
7440-23-5	Sodium	42100			P
	Cyanide				NR
7440-21-3	Silicon	20100			P
7440-69-9	Bismuth	38.0	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SILICATE = 65900 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P8

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6630-003
Level (low/med): LOW Date Received: 10/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.9	U		P
7440-70-2	Calcium	125	B		P
7439-89-6	Iron	430			P
7439-95-4	Magnesium	104	B		P
7439-96-5	Manganese	3.6	B		P
7440-09-7	Potassium	1940	U		P
7782-49-2	Selenium	1.7	U	N	F
7440-23-5	Sodium	248	B		P
	Cyanide	1.2	U		AS
7440-21-3	Silicon	81.2	B		P
7440-69-9	Bismuth	38.0	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SILICATE = 266 UG/L

FORM I - IN

ILM03.0

INTERNATIONAL TECHNOLOGY CORPORATION

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Work Order Number(s):	550.23
	W0272
Lab Sample Numbers or SDG:	6630-001, -002, -003, 6646-001, 6666-001, 6687-001
Method/Test/Parameter:	ALK / 310.1 / QY

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration				
1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?			✓	✓
2. Is the initial calibration correlation coefficient ≥ 0.995?			✓	✓
B. Continuing Calibration				
1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?			✓	✓
C. Sample Analysis				
1. Were all sample holding times met?	✓			✓
D. QC Samples				
1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	✓			✓
3. When MS/MSD analyzed, is RPD within QC limits?			✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits (± 20 %)?	✓			✓
E. Other				
1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?				✓

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Comments on any "No" response:

Analyst: Steven Pm Date: 11-22-94

Second-Level Review: R. Patterson Date: 11-23-94

00343

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

Project: 550.23

Category: Alkalinity
Method: EPA 310.1
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	138	MG/L		10.0	1
B0D4P6	6630-002	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	6.60	MG/L		5.00	1
B0D4P8	6630-003	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	6.60	MG/L		5.00	1
B0D4F8	6646-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	118	MG/L		10.0	1
B0D4G6	6666-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	115	MG/L		10.0	1
B0D4G6	6666-001DUP	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	117	MG/L		10.0	1
B0D4K2	6687-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	100	MG/L		10.0	1
NA	QCBLK50217-1	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	5.00	MG/L	U	5.00	1
NA	QCLCS50217-1	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	95	%REC			1

ITAS - ST. LOUIS
ALKALINITY

PREP DATE: 11-02-94
ANALYSIS DATE: 11-02-94
ANALYST: S. Poppe
BATCH NO.: 50217

REVIEWED BY: R. Patterson / 11-23-94
REVIEWED BY: R. Patterson / 11-23-94
METHOD: 310.1
PROJECT: 340.05 SX 23

LAB ID	VOL/WT (ml/g)	Titrated VOL(ml)	SAMPLE pH	Solid Fraction	STD ACID BURET READING (ml) FINAL 4.5pH	FINAL 4.2pH	FINAL 8.3pH	INITIAL 4.5pH	INITIAL 4.2pH	INITIAL 8.3pH	NET 4.5pH	NET 4.2pH	NET 8.3pH	ALKALINITY (mg/L OR µg/g) CaCO3 Total at 4.5pH	Low at 4.2pH	Phenol 8.3pH	ALKALINITY Carb mg/L µg/g	Bicarb mg/L µg/g
EPC145-94 CAL BUFFER 4.0	—	—	4.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
EPC327-93 CAL BUFFER 12.0	—	—	12.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
EPC002-94 CHK BUFFER 7.0	—	—	7.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
QC BLK 50217-1	100	100	5.90	N/A	0.15	0.22	—	0	0	—	0.15	0.22	-	—	<5.00	—	—	—
EP0310-94 QC LCS 50217-1	20	20	11.07		18.99	—	—	0	—	—	18.99	—	—	950	—	—	—	—
6602-001	SP 11-02-94 ~~50~~ 25	25	8.24		8.61	—	—	0	—	—	8.61	—	—	344	—	—	—	—
-004	25		8.90		6.83	—	0.30	0	—	0	6.83	—	0.30	273	—	—	—	—
-005	25		8.29		9.02	—	—	0	—	—	9.02	—	—	361	—	—	—	—
-006	25		8.29		8.71	—	—	0	—	—	8.71	—	—	348	—	—	—	—
6616-001	50	50	9.15		5.70	—	0.54	0	—	0	5.70	—	0.54	114	—	—	—	—
-002	50		9.07		5.41	—	0.42	0	—	0	5.41	—	0.42	108	—	—	—	—
-003	50		8.07		2.30	—	—	0	—	—	2.30	—	—	46.0	—	—	—	—
6630-001	50		9.17		6.91	—	0.39	0	—	0	6.91	—	0.39	138	—	—	—	—
-002	100	100	6.60		1.39	2.12	—	0	0	—	1.39	2.12	—	—	6.60	—	—	—
-003	100	SP 11-02-94	7.41		1.42	2.18	—	0	0	—	1.42	2.18	—	—	6.60	—	—	—
6631-001	50	50	8.77		5.70	—	0.30	0	—	0	5.70	—	0.30	114	—	—	—	—
6646-001	50		8.94		5.91	—	0.34	0	—	0	5.91	—	0.34	118	—	—	—	—
6666-001	50		8.93		5.75	—	0.33	0	—	0	5.75	—	0.33	115	—	—	—	—
-001 DUP	50		8.93		5.87	—	0.31	0	—	0	5.87	—	0.31	117	—	—	—	—
6687-001	50		8.91		5.00	—	0.31	0	—	0	5.00	—	0.31	100	—	—	—	—

LCS True Value = 100mg/L
Percent Recovery = 95
DUP RPD = 2

Alkalinity mg/L or µg/g = $\frac{\text{ml Std Acid} \times \text{Nstd Acid} \times 50{,}000}{\text{ml or g of Titrated Sample} \times \text{Solid Fraction}}$ N Titrant = 0.02

Low Alkalinity mg/L or µg/g = $\frac{(2B - C) \times N \times 50{,}000}{\text{ml of Titrated Sample}}$ where: B = ml of titrant to reach pH 4.5
C = ml of titrant from initial to pH 4.2
N = Normality of titrant

SL-91-INORG-0052, Rev. 1

00345

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

Project: 550.23

Category: Chloride
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	6.10	MG/L		1.25	5
B0D4P6	6630-002	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	0.25	MG/L	U	0.25	1
B0D4P8	6630-003	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	0.25	MG/L	U	0.25	1
B0D4F8	6646-001	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	7.09	MG/L		2.50	10
B0D4G6	6666-001	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	5.45	MG/L		2.50	10
B0D4G6	6666-001DUP	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	5.38	MG/L		2.50	10
B0D4G6	6666-001MS	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	94	%REC			10
B0D4K2	6687-001	Chloride	16887-00-6	QCBLK52504-1	11/22/94	11/22/94	52.0	MG/L		6.25	25
NA	QCBLK51910-2	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	0.25	MG/L	U	0.25	1
NA	QCBLK52046-1	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	0.25	MG/L	U	0.25	1
NA	QCBLK52504-1	Chloride	16887-00-6	QCBLK52504-1	11/22/94	11/22/94	0.25	MG/L	U	0.25	1
NA	QCLCS51910-2	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	93	%REC			1
NA	QCLCS52046-1	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	93	%REC			1
NA	QCLCS52504-1	Chloride	16887-00-6	QCBLK52504-1	11/22/94	11/22/94	90	%REC			1

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

Project: 550.23

Category: FLUORIDE
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	1.75	MG/L		0.10	1
B0D4P6	6630-002	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	0.10	MG/L	U	0.10	1
B0D4P8	6630-003	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	0.10	MG/L	U	0.10	1
B0D4F8	6646-001	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.62	MG/L		0.10	1
B0D4G6	6666-001	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.33	MG/L		0.10	1
B0D4G6	6666-001DUP	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.34	MG/L		0.10	1
B0D4G6	6666-001MS	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	100	%REC			1
B0D4K2	6687-001	Fluoride	16984-48-8	QCBLK52504-1	11/22/94	11/22/94	0.25	MG/L		0.10	1
NA	QCBLK51910-2	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	0.10	MG/L	U	0.10	1
NA	QCBLK52046-1	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.10	MG/L	U	0.10	1
NA	QCBLK52504-1	Fluoride	16984-48-8	QCBLK52504-1	11/22/94	11/22/94	0.10	MG/L	U	0.10	1
NA	QCLCS51910-2	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	93	%REC			1
NA	QCLCS52046-1	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	91	%REC			1
NA	QCLCS52504-1	Fluoride	16984-48-8	QCBLK52504-1	11/22/94	11/22/94	93	%REC			1

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

Project: 550.23

Category: Nitrite
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U	0.020	1
B0D4P6	6630-002	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U	0.020	1
B0D4P8	6630-003	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U	0.020	1
B0D4F8	6646-001	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U	0.020	1
B0D4G6	6666-001	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U	0.020	1
B0D4G6	6666-001DUP	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U	0.020	1
B0D4G6	6666-001MS	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	105	%REC			5
B0D4K2	6687-001	Nitrite	7632-00-0	QCBLK52504-1	11/22/94	11/22/94	0.020	MG/L	U	0.020	1
NA	QCBLK51910-2	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U	0.020	1
NA	QCBLK52046-1	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U	0.020	1
NA	QCBLK52504-1	Nitrite	7632-00-0	QCBLK52504-1	11/22/94	11/22/94	0.020	MG/L	U	0.020	1
NA	QCLCS51910-2	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	100	%REC			1
NA	QCLCS52046-1	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	98	%REC			1
NA	QCLCS52504-1	Nitrite	7632-00-0	QCBLK52504-1	11/22/94	11/22/94	100	%REC			1

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

Project: 550.23

Category: ORTHOPHOSPHATE
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOD4M6	6630-001	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
BOD4P6	6630-002	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
BOD4P8	6630-003	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
BOD4F8	6646-001	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
BOD4G6	6666-001	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
BOD4G6	6666-001DUP	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
BOD4G6	6666-001MS	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	94	%REC			1
BOD4K2	6687-001	Ortho-Phosphate	7778-77-0	QCBLK52504-1	11/22/94	11/22/94	1.00	MG/L	U	1.00	1
NA	QCBLK51910-2	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
NA	QCBLK52046-1	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
NA	QCBLK52504-1	Ortho-Phosphate	7778-77-0	QCBLK52504-1	11/22/94	11/22/94	1.00	MG/L	U	1.00	1
NA	QCLCS51910-2	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	96	%REC			1
NA	QCLCS52046-1	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	96	%REC			1
NA	QCLCS52504-1	Ortho-Phosphate	7778-77-0	QCBLK52504-1	11/22/94	11/22/94	96	%REC			1

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

Project: 550.23

Category: Sulfate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	14.1	MG/L		1.00	1
B0D4P6	6630-002	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
B0D4P8	6630-003	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
B0D4F8	6646-001	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	41.4	MG/L		10.0	10
B0D4G6	6666-001	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	26.2	MG/L		10.0	10
B0D4G6	6666-001DUP	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	26.5	MG/L		10.0	10
B0D4G6	6666-001MS	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	90	%REC			5
B0D4K2	6687-001	Sulfate	14808-79-8	QCBLK52504-1	11/22/94	11/22/94	308	MG/L		25.0	25
NA	QCBLK51910-2	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
NA	QCBLK52046-1	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
NA	QCBLK52504-1	Sulfate	14808-79-8	QCBLK52504-1	11/22/94	11/22/94	1.00	MG/L	U	1.00	1
NA	QCLCS51910-2	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	95	%REC			1
NA	QCLCS52046-1	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	94	%REC			1
NA	QCLCS52504-1	Sulfate	14808-79-8	QCBLK52504-1	11/22/94	11/22/94	92	%REC			1

INTERNATIONAL TECHNOLOGY CORPORATION

Batch #52046

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Work Order Number(s): 262.01, 340.05, 550.23, 519.118

1176.0, 1175.0, W0267, W0280, W0272, S800

Lab Sample Numbers or SDG: 6751-003,004 (504); 6603-002 (504); 6722-001,003,004; 6631-001; 6652-001, ~~002~~ 24,11,12,14; 6696-001; 6646-001; 6666-001

Method/Test/Parameter: IC 300.0

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?	✓			✓
2. Is the initial calibration correlation coefficient ≥ 0.995?	✓			✓
B. Continuing Calibration 1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?	✓			✓
C. Sample Analysis 1. Were all sample holding times met?		✓		✓
D. QC Samples 1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	✓			✓
3. When MS/MSD analyzed, is RPD within QC limits?		~~TUR FLAG~~	✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits (± 20 %)?		✓		✓
E. Other 1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?	✓			✓

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Comments on any "No" response:

NO_2, NO_3, OPO_4 hold times expired at receipt

RPD-can't calculate because both values less than d.l.: 6652-001 Fl, Cl, SO_4
6696-001 SO_4, NO_3, OPO_4, NO_2, Br, Cl
6666-001 OPO_4, NO_2.

6696-001 DUP, Cl, ~~p~~ integration shows a hit for chloride but peak area is < that of the low cal standard so it was reported as a non-detect.

Analyst: J. Flanders **Date:** 11-23-94

Second-Level Review: R. Patterson **Date:** 11-28-94

00359

INTERNATIONAL TECHNOLOGY CORPORATION

Batch #51910

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Work Order Number(s): 525.02, 388.01, 550.23	
W0015 W0267 W0272	
Lab Sample Numbers or SDG: 6553-001→003; 6579-001→006; 6862-010,011 (001,002)(002); 6586-001,002; 6607-001,002; 6628-001,002; 6645-001; 6661-001; 6680-001; 6603-003; 6616-001→003; 6630-001→003	
Method/Test/Parameter: IC 300.0	

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?	✓			✓
2. Is the initial calibration correlation coefficient ≥ 0.995?	✓			✓
B. Continuing Calibration 1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?	✓			✓
C. Sample Analysis 1. Were all sample holding times met?		✓		✓
D. QC Samples 1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	✓	✓		✓
3. When MS/MSD analyzed, is RPD within QC limits?			✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits (± 20 %)?		✓		✓
E. Other 1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?	✓			✓

00360

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Comments on any "No" response:

NO_2, OPO_4 hold times expired at receipt

JMF 11-18-94 ~~69~~ 6579-001 MS SO_4 55% recovery outside limits of ±25% (75-125%) but sample concentration greatly exceeds spike concentration.

RPD - can't calculate because both values less than d.l. : 6579-001 Fl, Br

Integration shows hit, but peak area less than low cal std and reported as less than d.l.

6645-001 Fl, SO_4

6661-001 }
6680-001 } Fl
6616-003 }

Analyst: J. Flandre **Date:** 11-18-94

Second-Level Review: R. Patterson **Date:** 11-18-94

INTERNATIONAL TECHNOLOGY CORPORATION

Batch #52504

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Work Order Number(s):	550.23, 578.02, 550.29
	W0272, W0284, W0293, W0295
Lab Sample Numbers or SDG:	6687-001; 6767-001 (001,004); 6808-002→004; 6732-001; 6749-001→006; 6759-001→003; 6794-001→003; 6802-001→003; 6822-001→003
Method/Test/Parameter:	IC 300.0

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?	✓			✓
2. Is the initial calibration correlation coefficient ≥ 0.995?	✓			✓
B. Continuing Calibration 1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?	✓			✓
C. Sample Analysis 1. Were all sample holding times met?		✓		✓
D. QC Samples 1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	✓	✓		✓
3. When MS/MSD analyzed, is RPD within QC limits?			✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits (± 20 %)?	✓			✓
E. Other 1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?	✓			✓

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Comments on any "No" response:

6687-001 NO_2, OPO_4 out of holdtime at receipt

6767-001 MS SO_4 65% Recovery outside limits of 75-125%
sample concentration exceeds spike concentration
by more than 5 x.

Analyst: J. Flanders Date: 11-28-94

Second-Level Review: R. Patterson Date: 11-29-94

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

Project: 550.23

Category: TDS
Method: EPA 160.1
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOD4M6	6630-001	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	179	MG/L		5.00	1
BOD4P6	6630-002	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	188	MG/L		5.00	1
BOD4P8	6630-003	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	21.0	MG/L		5.00	1
BOD4F8	6646-001	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	323	MG/L		5.00	1
BOD4G6	6666-001	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	248	MG/L		5.00	1
BOD4G6	6666-001DUP	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	242	MG/L		5.00	1
BOD4K2	6687-001	Total Dissolved	10-33-3	QCBLK50198-1	11/02/94	11/02/94	937	MG/L		5.00	1
NA	QCBLK50055-1	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	5.00	MG/L	U	5.00	1
NA	QCBLK50198-1	Total Dissolved	10-33-3	QCBLK50198-1	11/02/94	11/02/94	5.00	MG/L	U	5.00	1
NA	QCLCS50055-1	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	95	%REC			1
NA	QCLCS50198-1	Total Dissolved	10-33-3	QCBLK50198-1	11/02/94	11/02/94	99	%REC			1

INTERNATIONAL TECHNOLOGY CORPORATION

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Work Order Number(s):	550.23
	W0272
Lab Sample Numbers or SDG:	6687-001
Method/Test/Parameter:	TDS / 160.1 / QY

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?			✓	✓
2. Is the initial calibration correlation coefficient ≥ 0.995?			✓	
B. Continuing Calibration 1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?			✓	✓
C. Sample Analysis 1. Were all sample holding times met?	✓			✓
D. QC Samples 1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	✓			✓
3. When MS/MSD analyzed, is RPD within QC limits?			✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits (± 20 %)?			✓	✓
E. Other 1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?	✓			✓

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Comments on any "No" response:

Analyst: Steven Pope Date: 11-23-94

Second-Level Review: R. Patterson Date: 11-23-94

INTERNATIONAL TECHNOLOGY CORPORATION

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Work Order Number(s):	550.23
	W0272
Lab Sample Numbers or SDG:	6630-001,-002,-003 6646-001, 6666-001
Method/Test/Parameter:	TDS/160.1/Q4

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Does the standard curve consist of a Blank (when required) and the required minimum number of calibration standards?			✓	✓
2. Is the initial calibration correlation coefficient ≥ 0.995?			✓	✓
B. Continuing Calibration 1. Is the Continuing Calibration Verification (CCV) percent recovery within QC limits?			✓	✓
C. Sample Analysis 1. Were all sample holding times met?	✓			✓
D. QC Samples 1. Is the Method Blank concentration less than the reporting limit?	✓			✓
2. Is the Laboratory Control Sample (LCS) AND/OR the Matrix Spike (MS) % recovery within QC limits?	✓			✓
3. When MS/MSD analyzed, is RPD within QC limits?			✓	✓
4. When duplicate sample analysis performed, is RPD within QC limits (± 20 %)?	✓			✓
E. Other 1. Are all nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was correct methodology used?	✓			✓
4. Transcriptions checked?	✓			✓
5. Were all calculations checked at minimum frequency?	✓			✓
6. Did the analyst sign and date the front page of the analytical run?	✓			✓
7. Units checked?	✓			

St. Louis Laboratory
ITAS Data Review Check List
GENERAL CHEMISTRY

Comments on any "No" response:

Analyst: Steven Rose Date: 11-22-94

Second-Level Review: R. Patterson Date: 11-23-94

ITAS-ST. LOUIS

Total Dissolved Solids

Analyst: S. Bope
Checked by: R. Patterson
Method No.: 160.2
Batch No.: 50055

Date: 11-01-94
Date: 11-23-94
Oven No.: 1
Oven No.: 2

Project No.: [illegible]
Balance No.: [illegible]
Drying Temp.: 103 C
Drying Temp.: 180 C

LAB ID	Crucible Number	Initial Wt. (gm)	Volume (ml)	Dried Wt. (gm)	Dissolved Solids mg/L
QC Blk 50055-1	19	107.7492	100	107.7493	<5
QC LCS 50055-1	66	109.4116		109.4452	336
6630-001	32	94.5740		94.5919	179
-002	15	109.9186		109.9374	188
-003	30	106.1676		106.1697	21.0
6631-001	6	111.5860		111.6308	448
6652-001	4	111.7320		111.7336	16
-001 Dup	69	106.6649		106.6665	16
6645-001	24	106.5300		106.5380	80
6646-001	3	109.1111		109.1434	323
6661-001	13	109.1623		109.1866	243
6666-001	25	106.2093		106.2341	248
-001 Dup	47	107.7166		107.7408	242
6615-001	57	106.5631	50	106.5760	11-22 ~~11~~ 29 258
-001 Dup	64	105.5981		105.6099	SP ~~118~~ 236
-002	40	108.4081	100	108.4124	43
				LCS True Value =	352 mg/L
				% Recovery =	95
				DUP RPD 1 =	0
				DUP RPD 2 =	2
				DUP RPD 3 =	9

Steven Bope 11-22-94

$$\text{mg/L TOTAL DISSOLVED SOLIDS} = \frac{(\text{DRIED WT} - \text{INITIAL WT}) \times 10^6}{\text{mL SAMPLE}}$$

SL-91-INORG-0007

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

Analytical Data Package Prepared For

Westinghouse/Bechtel Hanford

Radiochemical Analysis By

Quanterra Environmental Services
Richland Laboratory

DEC 1994
RECEIVED
Data
Log In

Sample Delivery Group Number: W0272

CLIENT ID NUMBER	QUANTERRA ID NUMBER
B0D4M6	41054201
B0D4P6	41054202
B0D4P8	41054203
B0D4F8	41056401
B0D4G6	41059001
B0D4K2	41062301

RECORD COPY

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

December 21, 1994

Attention: Joan Kessner

DEC 1994
RECEIVED
Data
Log In

SAF Number	:	B94-036
Date SDG Closed	:	November 9, 1994
Number of Samples	:	Six (6)
Sample Type	:	Water
SDG Number	:	W0272
Data Deliverable	:	Stand Alone

RECORD COPY

I. Introduction

On October 26, 27, 28, and 31, 1994, a total of six water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
41054201	B0D4M6	Water	10/26/94
41054202	B0D4P6	Water	10/26/94
41054201	B0D4P8	Water	10/26/94
41056401	B0D4F8	Water	10/27/94
41059001	B0D4G6	Water	10/28/94
41062301	B0D4K2	Water	10/31/94

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 ITAS-RD-3209
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Technetium-99 by method ITAS-IT-RS-0001
Tritium by method ITAS-RD-3205
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0272 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

Results from the initial radioactivity screening of these samples classified them as Category I.

Alpha Spectroscopy

Plutonium-238, -239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4M6) results are within contractual limits.

12/21/94 ~~CC~~
0003

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Pb-212 is detected but not reported for sample B0D4P6 because it is a false positive caused by Eu-152. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4K2) results are within contractual limits.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
Analysis volumes were reduced for sample B0D4K2 and the duplicate of sample B0D4K2 due to high precipitate weights. The LCS, batch blank, sample and sample duplicate results are within contractual limits.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4K2) results are within contractual limits.

Strontium-90 by method ITAS-RD-3204
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4F8) results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by method ITAS-IT-RS-0001
The matrix spike yield for sample B0D4K2 is outside of acceptable limits due to the activity in the sample. The sample activity is more than 40 times the activity of the spike that was added. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4P8) results are within contractual requirements.

Tritium by method ITAS-RD-3205
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4M6) results are within contractual requirements.

Total Uranium

Total Uranium by method ITAS-RD-4200
The matrix spike, LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4F8) results are within contractual requirements.

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

Reviewed and approved:

Suzanne Gaines
Project Manager

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41054201	MATRIX:	WATER
CLIENT ID:	B0D4M6	DATE RECEIVED:	10/26/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	0.0E+00	2.6E-01	2.31E-01	pCi/L	48.80%	RD3209
PU239/40	6.83E-02	1.7E-01	1.8E-01	4.09E-01	pCi/L	48.80%	RD3209
CO-58	-5.28E-01	6.4E+00	6.4E+00	1.14E+01	pCi/L	N/A	RD3219
CO-60	-4.47E+00	6.3E+00	6.3E+00	1.03E+01	pCi/L	N/A	RD3219
CS-137DA	7.58E-01	4.6E+00	4.6E+00	8.25E+00	pCi/L	N/A	RD3219
EU-152	3.88E+00	1.1E+01	1.1E+01	2.08E+01	pCi/L	N/A	RD3219
EU-154	3.22E+00	1.3E+01	1.3E+01	2.68E+01	pCi/L	N/A	RD3219
EU-155	-4.66E+00	7.6E+00	7.7E+00	1.29E+01	pCi/L	N/A	RD3219
FE-59	1.23E+01	1.1E+01	1.2E+01	2.73E+01	pCi/L	N/A	RD3219
RU-106DA	6.06E+00	3.6E+01	3.6E+01	6.95E+01	pCi/L	N/A	RD3219
ALPHA	1.46E-01	5.3E-01	5.3E-01	1.42E+00	pCi/L	100.00%	RD3214
BETA	9.22E+00	1.9E+00	2.0E+00	2.80E+00	pCi/L	100.00%	RD3214
STRONTIUM	3.55E-01	2.1E-01	2.3E-01	6.95E-01	pCi/L	93.90%	RD3204
TC-99	-7.84E-01	9.2E-01	4.1E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	2.78E+02	1.1E+02	2.0E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	2.05E-01	N/A	3.1E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41054202	MATRIX:	WATER
CLIENT ID:	B0D4P6	DATE RECEIVED:	10/26/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	4.77E-02	1.7E-01	1.7E-01	4.49E-01	pCi/L	52.50%	RD3209
PU239/40	6.36E-02	1.6E-01	1.6E-01	3.81E-01	pCi/L	52.50%	RD3209
CO-58	-6.85E-01	5.3E+00	5.3E+00	9.75E+00	pCi/L	N/A	RD3219
CO-60	-3.43E+00	5.3E+00	5.3E+00	8.77E+00	pCi/L	N/A	RD3219
CS-137DA	2.29E+00	4.0E+00	4.0E+00	8.05E+00	pCi/L	N/A	RD3219
EU-152	-1.12E+01	1.2E+01	1.2E+01	1.78E+01	pCi/L	N/A	RD3219
EU-154	7.87E+00	1.3E+01	1.3E+01	2.79E+01	pCi/L	N/A	RD3219
EU-155	7.28E+00	7.5E+00	7.5E+00	1.47E+01	pCi/L	N/A	RD3219
FE-59	3.37E+00	1.5E+01	1.5E+01	2.82E+01	pCi/L	N/A	RD3219
RU-106DA	-9.34E-01	4.0E+01	4.0E+01	7.16E+01	pCi/L	N/A	RD3219
ALPHA	-2.03E-02	2.2E-01	2.2E-01	7.93E-01	pCi/L	100.00%	RD3214
BETA	1.24E+00	1.2E+00	1.3E+00	2.55E+00	pCi/L	100.00%	RD3214
STRONTIUM	3.74E-01	2.4E-01	2.6E-01	8.07E-01	pCi/L	91.20%	RD3204
TC-99	1.76E+00	9.7E-01	4.3E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	1.53E+02	1.1E+02	2.0E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	3.00E-03	N/A	1.0E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41054203	MATRIX:	WATER
CLIENT ID:	B0D4P8	DATE RECEIVED:	10/26/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	0.0E+00	2.2E-01	2.02E-01	pCi/L	56.00%	RD3209
PU239/40	-1.49E-02	3.0E-02	3.0E-02	3.56E-01	pCi/L	56.00%	RD3209
CO-58	-2.64E-01	4.6E+00	4.6E+00	8.81E+00	pCi/L	N/A	RD3219
CO-60	-2.09E+00	5.0E+00	5.0E+00	8.84E+00	pCi/L	N/A	RD3219
CS-137DA	7.64E+00	3.9E+00	3.9E+00	9.48E+00	pCi/L	N/A	RD3219
EU-152	-3.99E+00	8.9E+00	8.9E+00	1.53E+01	pCi/L	N/A	RD3219
EU-154	1.05E+01	1.2E+01	1.2E+01	2.78E+01	pCi/L	N/A	RD3219
EU-155	-7.41E+00	8.6E+00	8.6E+00	1.39E+01	pCi/L	N/A	RD3219
FE-59	-2.18E+00	1.3E+01	1.3E+01	2.34E+01	pCi/L	N/A	RD3219
RU-106DA	3.47E+01	3.5E+01	3.5E+01	7.43E+01	pCi/L	N/A	RD3219
ALPHA	2.20E-01	3.5E-01	3.5E-01	6.88E-01	pCi/L	100.00%	RD3214
BETA	2.19E-01	1.3E+00	1.3E+00	2.93E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.80E-01	2.2E-01	2.3E-01	7.70E-01	pCi/L	92.40%	RD3204
TC-99	-1.70E+00	9.0E-01	4.0E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	8.83E+01	1.0E+02	2.0E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	0.00E+00	N/A	1.0E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41056401	MATRIX:	WATER
CLIENT ID:	B0D4F8	DATE RECEIVED:	10/27/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	0.0E+00	2.6E-01	2.37E-01	pCi/L	47.70%	RD3209
PU239/40	0.00E+00	0.0E+00	2.6E-01	2.36E-01	pCi/L	47.70%	RD3209
CO-58	-4.00E-01	5.3E+00	5.3E+00	9.65E+00	pCi/L	N/A	RD3219
CO-60	3.87E+00	6.6E+00	6.6E+00	1.31E+01	pCi/L	N/A	RD3219
CS-137DA	-1.90E+00	4.7E+00	4.7E+00	7.92E+00	pCi/L	N/A	RD3219
EU-152	-8.50E+00	9.1E+00	9.1E+00	1.42E+01	pCi/L	N/A	RD3219
EU-154	1.94E+01	1.1E+01	1.1E+01	2.91E+01	pCi/L	N/A	RD3219
EU-155	2.48E+00	7.2E+00	7.2E+00	1.26E+01	pCi/L	N/A	RD3219
FE-59	0.00E+00	1.4E+01	1.4E+01	2.66E+01	pCi/L	N/A	RD3219
RU-106DA	3.59E+01	4.1E+01	4.1E+01	8.06E+01	pCi/L	N/A	RD3219
ALPHA	1.69E+00	1.2E+00	1.3E+00	1.42E+00	pCi/L	100.00%	RD3214
BETA	2.17E+02	7.3E+00	1.7E+01	2.96E+00	pCi/L	100.00%	RD3214
STRONTIUM	1.08E-01	2.3E-01	2.3E-01	8.70E-01	pCi/L	91.00%	RD3204
TC-99	7.01E+02	4.8E+00	7.9E+01	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	6.81E+03	2.4E+02	6.4E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	2.28E+00	N/A	3.4E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41059001	MATRIX:	WATER
CLIENT ID:	B0D4G6	DATE RECEIVED:	10/28/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-2.99E-02	4.2E-02	4.3E-02	4.23E-01	pCi/L	55.80%	RD3209
PU239/40	-1.50E-02	3.0E-02	3.0E-02	3.58E-01	pCi/L	55.80%	RD3209
CO-58	1.57E+00	2.9E+00	2.9E+00	6.72E+00	pCi/L	N/A	RD3219
CO-60	7.71E-01	5.3E+00	5.3E+00	1.02E+01	pCi/L	N/A	RD3219
CS-137DA	6.38E-01	4.0E+00	4.0E+00	7.74E+00	pCi/L	N/A	RD3219
EU-152	-2.78E+01	1.4E+01	1.5E+01	1.78E+01	pCi/L	N/A	RD3219
EU-154	6.48E+00	1.3E+01	1.3E+01	2.70E+01	pCi/L	N/A	RD3219
EU-155	5.66E+00	7.7E+00	7.7E+00	1.48E+01	pCi/L	N/A	RD3219
FE-59	8.96E+00	1.2E+01	1.2E+01	2.49E+01	pCi/L	N/A	RD3219
RU-106DA	3.12E+01	3.7E+01	3.7E+01	7.44E+01	pCi/L	N/A	RD3219
ALPHA	1.29E+00	1.1E+00	1.1E+00	1.42E+00	pCi/L	100.00%	RD3214
BETA	8.65E+00	1.9E+00	2.0E+00	2.74E+00	pCi/L	100.00%	RD3214
STRONTIUM	3.99E-02	2.0E-01	2.0E-01	7.93E-01	pCi/L	96.20%	RD3204
TC-99	1.10E+01	1.1E+00	5.0E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	3.18E+03	1.8E+02	3.9E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	1.70E+00	N/A	2.6E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41062301	MATRIX:	WATER
CLIENT ID:	B0D4K2	DATE RECEIVED:	10/31/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-6.93E-03	9.8E-03	9.9E-03	2.90E-01	pCi/L	60.20%	RD3209
PU239/40	-1.04E-02	1.2E-02	1.2E-02	3.12E-01	pCi/L	60.20%	RD3209
CO-58	1.09E+00	4.9E+00	4.9E+00	9.37E+00	pCi/L	N/A	RD3219
CO-60	4.92E+01	1.3E+01	1.4E+01	N/A	pCi/L	N/A	RD3219
CS-137DA	-6.32E-01	4.2E+00	4.2E+00	7.69E+00	pCi/L	N/A	RD3219
EU-152	-2.73E+00	1.1E+01	1.1E+01	1.85E+01	pCi/L	N/A	RD3219
EU-154	-1.27E+01	1.5E+01	1.5E+01	2.40E+01	pCi/L	N/A	RD3219
EU-155	0.00E+00	8.2E+00	8.2E+00	1.35E+01	pCi/L	N/A	RD3219
FE-59	4.44E+00	1.3E+01	1.3E+01	2.39E+01	pCi/L	N/A	RD3219
RU-106DA	3.47E+00	3.8E+01	3.8E+01	6.90E+01	pCi/L	N/A	RD3219
ALPHA	5.11E+00	3.5E+00	3.6E+00	3.81E+00	pCi/L	100.00%	RD3214
BETA	6.12E+02	1.3E+01	4.5E+01	3.14E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.21E-01	2.6E-01	2.6E-01	9.38E-01	pCi/L	79.90%	RD3204
TC-99	3.80E+03	1.1E+01	4.2E+02	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	4.59E+02	1.2E+02	2.2E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	5.89E+00	N/A	8.8E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

RECORD COPY

MEMORANDUM

JAN 1995
RECEIVED
Validation
Log In

TO: 200-BP-5 Project QA Record January 25, 1995

FR: Dennis K. Robinson, Golder Federal Services, Inc. DKR

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: WO272-QES (943-1610.063)

INTRODUCTION

This memo presents the results of data validation on six water samples analyzed by Quanterra Laboratory. The sample validated along with the analyses reported and the methods of analyses is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
BOD4M6	10/25/94	Water	See Note 1
BOD4P6	10/25/94	Water	See Note 1
BOD4P8	10/25/94	Water	See Note 1
BOD4F8	10/26/94	Water	See Note 1
BOD4G6	10/27/94	Water	See Note 1
BOD4K2	10/28/94	Water	See Note 1
Note 1:Sample was analyzed for chloride, fluoride, nitrite, phosphate, and sulfate by EPA method 300.0, alkalinity by EPA Method 310.1, and total dissolved solids by EPA Method 160.1.			

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

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

Samples BOD4P6 and BOD4P8 are equipment blanks collected from the BOD4M6 sample location.

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Detection Limits. Target goals for sample detection limit were met.

Completeness. A total of 6 samples were validated in this data package with a total of 42 determinations, 12 of which were deemed unusable. This results in a completeness of 71.4 percent which does not meet the objective of 90 percent.

MAJOR DEFICIENCIES

The following major deficiency was identified during data validation which required qualification of data as unusable.

- **Holding Times.** The 2 day holding time for nitrite and phosphate analysis by ion chromatography was grossly exceeded for all samples (22-25 days), requiring the qualification of the data as unusable for all results. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied, and supporting documentation.

MINOR DEFICIENCIES

The following minor deficiency was identified during data validation, however qualification of data as estimated or undetected was not required.

- **Field Blanks.** Total dissolved solids were measured in equipment blank sample BOD4P6 at a concentration of 188 mg/l. The TDS concentration of the equipment blank sample BOD4P8 was measured at 21.0 mg/l. No qualification of the data was made based upon the field blank results in accordance with the data validation procedures (WHC 1993). Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied, and supporting documentation.

REFERENCES

WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994, Westinghouse Hanford Company, Richland, Washington.

Attachment 1

Glossary of Data Reporting Qualifiers

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during the data validation the concentration reported may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during the data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

Attachment 2

Summary of Data Qualifications

Data Qualification Summary

Project: 200-BP-5	Validator: D. Robinson	Date: 1/24/95	Page 1 of 1
Comments: General chemistry analysis			
Analyte	Qualifier	Samples Affected	Reason
Nitrite-N	UR	BOD4M6 BOD4P6 BOD4P8 BOD4F8 BOD4G6 BOD4K2	Sample holding time was exceeded.
Phosphate	UR	BOD4M6 BOD4P6 BOD4P8 BOD4F8 BOD4G6 BOD4K2	Sample holding time was exceeded.

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: W0272-QES

	Samp#	B0D4F8		B0D4G6		B0D4K2		B0D4M6		B0D4P6		B0D4P8	
	Date	10-26-94		10-27-94		10-28-94		10-25-94		10-25-94		10-25-94	
	Location	299-E33-7		299-E33-15		699-50-53A		699-60-57		699-60-57		699-60-57	
	Depth	---		---		---		---		---		---	
	Type	WATER		WATER		WATER		WATER		WATER		WATER	
	Comments									EQUIP BLANK		EQUIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
CHLORIDE	MG/L	7.090		5.450		52.000		6.100		0.250	U	0.250	U
FLUORIDE	MG/L	0.620		0.330		0.250		1.750		0.100	U	0.100	U
NITRITE	MG/L	0.020	UR	0.020	UR	0.020	UR	0.020	UR	0.020	UR	0.020	UR
ORTHO PHOSPHATE	MG/L	1.000	UR	1.000	UR	1.000	UR	1.000	UR	1.000	UR	1.000	UR
SULFATE	MG/L	41.400		26.200		308.000		14.100		1.000	U	1.000	U
TOTAL DISSOLVED SOLIDS	MG/L	323.000		248.000		937.000		179.000		188.000		21.000	
ALKALINITY	MG/L	118.000		115.000		100.000		138.000		6.600		6.600	

The decimal places shown do not reflect the precision reported by the laboratory

verified aj
1/26/95

008

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

Project: 550.23

Category: Alkalinity
Method: EPA 310.1
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30D4M6	6630-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	138	MG/L		10.0	1
30D4P6	6630-002	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	6.60	MG/L		5.00	1
30D4P8	6630-003	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	6.60	MG/L		5.00	1
30D4F8	6646-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	118	MG/L		10.0	1
30D4G6	6666-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	115	MG/L		10.0	1
30D4G6	6666-001DUP	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	117	MG/L		10.0	1
30D4K2	6687-001	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	100	MG/L		10.0	1
IA	QCBLK50217-1	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	5.00	MG/L	U	5.00	1
IA	QCLCS50217-1	Alkalinity, Tot	T-005	QCBLK50217-1	11/02/94	11/02/94	95	%REC			1

DKX
1/20/95

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

Project: 550.23

Category: Chloride
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30D4M6	6630-001	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	6.10	MG/L		1.25	5
30D4P6	6630-002	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	0.25	MG/L	U	0.25	1
30D4P8	6630-003	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	0.25	MG/L	U	0.25	1
30D4F8	6646-001	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	7.09	MG/L		2.50	10
30D4G6	6666-001	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	5.45	MG/L		2.50	10
30D4G6	6666-001DUP	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	5.38	MG/L		2.50	10
30D4G6	6666-001MS	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	94	%REC			10
30D4K2	6687-001	Chloride	16887-00-6	QCBLK52504-1	11/22/94	11/22/94	52.0	MG/L		6.25	25
IA	QCBLK51910-2	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	0.25	MG/L	U	0.25	1
IA	QCBLK52046-1	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	0.25	MG/L	U	0.25	1
IA	QCBLK52504-1	Chloride	16887-00-6	QCBLK52504-1	11/22/94	11/22/94	0.25	MG/L	U	0.25	1
IA	QCLCS51910-2	Chloride	16887-00-6	QCBLK51910-1	11/16/94	11/16/94	93	%REC			1
IA	QCLCS52046-1	Chloride	16887-00-6	QCBLK52046-1	11/18/94	11/18/94	93	%REC			1
IA	QCLCS52504-1	Chloride	16887-00-6	QCBLK52504-1	11/22/94	11/22/94	90	%REC			1

DK
1/24/95

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

Project: 550.23

Category: FLUORIDE
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30D4M6	6630-001	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	1.75	MG/L		0.10	1
30D4P6	6630-002	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	0.10	MG/L	U	0.10	1
30D4P8	6630-003	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	0.10	MG/L	U	0.10	1
30D4F8	6646-001	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.62	MG/L		0.10	1
30D4G6	6666-001	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.33	MG/L		0.10	1
30D4G6	6666-001DUP	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.34	MG/L		0.10	1
30D4G6	6666-001MS	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	100	%REC			1
30D4K2	6687-001	Fluoride	16984-48-8	QCBLK52504-1	11/22/94	11/22/94	0.25	MG/L		0.10	1
IA	QCBLK51910-2	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	0.10	MG/L	U	0.10	1
IA	QCBLK52046-1	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	0.10	MG/L	U	0.10	1
IA	QCBLK52504-1	Fluoride	16984-48-8	QCBLK52504-1	11/22/94	11/22/94	0.10	MG/L	U	0.10	1
IA	QCLCS51910-2	Fluoride	16984-48-8	QCBLK51910-1	11/16/94	11/16/94	93	%REC			1
IA	QCLCS52046-1	Fluoride	16984-48-8	QCBLK52046-1	11/18/94	11/18/94	91	%REC			1
IA	QCLCS52504-1	Fluoride	16984-48-8	QCBLK52504-1	11/22/94	11/22/94	93	%REC			1

DKK
1/24/95

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

Project: 550.23

Category: Nitrite
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U UR	0.020	1
B0D4P6	6630-002	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U UR	0.020	1
B0D4P8	6630-003	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U UR	0.020	1
B0D4F8	6646-001	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U UR	0.020	1
B0D4G6	6666-001	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U UR	0.020	1
B0D4G6	6666-001DUP	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U UR	0.020	1
B0D4G6	6666-001MS	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	105	%REC			5
B0D4K2	6687-001	Nitrite	7632-00-0	QCBLK52504-1	11/22/94	11/22/94	0.020	MG/L	U UR	0.020	1
NA	QCBLK51910-2	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	0.020	MG/L	U	0.020	1
NA	QCBLK52046-1	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	0.020	MG/L	U	0.020	1
NA	QCBLK52504-1	Nitrite	7632-00-0	QCBLK52504-1	11/22/94	11/22/94	0.020	MG/L	U	0.020	1
NA	QCLCS51910-2	Nitrite	7632-00-0	QCBLK51910-1	11/16/94	11/16/94	100	%REC			1
NA	QCLCS52046-1	Nitrite	7632-00-0	QCBLK52046-1	11/18/94	11/18/94	98	%REC			1
NA	QCLCS52504-1	Nitrite	7632-00-0	QCBLK52504-1	11/22/94	11/22/94	100	%REC			1

DLR
1/24/95

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

Project: 550.23

Category: ORTHOPHOSPHATE
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Di
B0D4M6	6630-001	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U UR	1.00	
B0D4P6	6630-002	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U UR	1.00	
B0D4P8	6630-003	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U UR	1.00	
B0D4F8	6646-001	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U UR	1.00	
B0D4G6	6666-001	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U UR	1.00	
B0D4G6	6666-001DUP	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U UR	1.00	
B0D4G6	6666-001MS	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	94	%REC			1
B0D4K2	6687-001	Ortho-Phosphate	7778-77-0	QCBLK52504-1	11/22/94	11/22/94	1.00	MG/L	U UR	1.00	1
NA	QCBLK51910-2	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
NA	QCBLK52046-1	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
NA	QCBLK52504-1	Ortho-Phosphate	7778-77-0	QCBLK52504-1	11/22/94	11/22/94	1.00	MG/L	U	1.00	1
NA	QCLCS51910-2	Ortho-Phosphate	7778-77-0	QCBLK51910-1	11/16/94	11/16/94	96	%REC			1
NA	QCLCS52046-1	Ortho-Phosphate	7778-77-0	QCBLK52046-1	11/18/94	11/18/94	96	%REC			1
NA	QCLCS52504-1	Ortho-Phosphate	7778-77-0	QCBLK52504-1	11/22/94	11/22/94	96	%REC			1

DKK 1/24/95

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

Project: 550.23

Category: Sulfate
Method: EPA 300.0
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
B0D4M6	6630-001	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	14.1	MG/L		1.00	1
B0D4P6	6630-002	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
B0D4P8	6630-003	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
B0D4F8	6646-001	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	41.4	MG/L		10.0	10
B0D4G6	6666-001	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	26.2	MG/L		10.0	10
B0D4G6	6666-001DUP	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	26.5	MG/L		10.0	10
B0D4G6	6666-001MS	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	90	%REC			5
B0D4K2	6687-001	Sulfate	14808-79-8	QCBLK52504-1	11/22/94	11/22/94	308	MG/L		25.0	25
NA	QCBLK51910-2	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	1.00	MG/L	U	1.00	1
NA	QCBLK52046-1	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	1.00	MG/L	U	1.00	1
NA	QCBLK52504-1	Sulfate	14808-79-8	QCBLK52504-1	11/22/94	11/22/94	1.00	MG/L	U	1.00	1
NA	QCLCS51910-2	Sulfate	14808-79-8	QCBLK51910-1	11/16/94	11/16/94	95	%REC			1
NA	QCLCS52046-1	Sulfate	14808-79-8	QCBLK52046-1	11/18/94	11/18/94	94	%REC			1
NA	QCLCS52504-1	Sulfate	14808-79-8	QCBLK52504-1	11/22/94	11/22/94	92	%REC			1

DKK
1/24/95

~~00356~~

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

Project: 550.23

Category: TDS
Method: EPA 160.1
Matrix: LIQUID

Sample Date : 10/25/94
Receipt Date : 10/27/94
Report Date : 12/20/94

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0D4M6	6630-001	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	179	MG/L		5.00	1
B0D4P6	6630-002	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	188	MG/L		5.00	1
B0D4P8	6630-003	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	21.0	MG/L		5.00	1
B0D4F8	6646-001	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	323	MG/L		5.00	1
B0D4G6	6666-001	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	248	MG/L		5.00	1
B0D4G6	6666-001DUP	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	242	MG/L		5.00	1
B0D4K2	6687-001	Total Dissolved	10-33-3	QCBLK50198-1	11/02/94	11/02/94	937	MG/L		5.00	1
NA	QCBLK50055-1	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	5.00	MG/L	U	5.00	1
NA	QCBLK50198-1	Total Dissolved	10-33-3	QCBLK50198-1	11/02/94	11/02/94	5.00	MG/L	U	5.00	1
NA	QCLCS50055-1	Total Dissolved	10-33-3	QCBLK50055-1	11/01/94	11/01/94	95	%REC			1
NA	QCLCS50198-1	Total Dissolved	10-33-3	QCBLK50198-1	11/02/94	11/02/94	99	%REC			1

DKP
1/24/95

~~00496~~

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

DEC 1994
RECEIVED
Data
Log In

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

December 21, 1994

Attention: Joan Kessner

Project number	:	550.23
Date Received by Lab	:	October 27, 28 and 31, 1994
Number of Samples	:	Twelve (12)
Sample Type	:	Water
SDG Number	:	W0272
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

Between October 27 and 31, 1994, twelve (12) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with their specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
6630-001	B0D4M6	41054101	Water	10/27/94
6630-002	B0D4P6	41054103	Water	10/27/94
6630-003	B0D4P8	41054105	Water	10/27/94
6630-004	B0D4M7	41054102	Water	10/27/94
6630-005	B0D4P7	41054104	Water	10/27/94
6630-006	B0D4P9	41054106	Water	10/27/94
6646-001	B0D4F8	41056301	Water	10/27/94
6646-002	B0D4F9	41056302	Water	10/27/94
6666-001	B0D4G6	41058901	Water	10/28/94
6666-002	B0D4G7	41058902	Water	10/28/94
6687-001	B0D4K2	41062201	Water	10/31/94
6687-002	B0D4K3	41062202	Water	10/31/94

II. Analytical Results/ Methodology

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

Analyses requested: ICP, Cyanide and Selenium by CLP90 methodology. Chloride, Fluoride, Nitrite, Phosphate, and Sulfate by EPA method 300.0. Alkalinity by EPA method 310.1. Total Dissolved Solids by EPA method 160.1.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Sample Duplicate analyses were performed per the protocol for each analyte in this SDG.

IV. Definitions

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

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

V. Comments

Nitrite and Phosphate holding times were expired upon receipt of samples at laboratory.

The Relative Percent Difference could not be calculated for Phosphate and Nitrite because both values were less than the detection limit.

The Selenium Matrix Spike recoveries for 6666-001 and 6666-002 (60.0%) were less than 75%. The associated data was flagged with an "N".

Quanterra
Environmental Services

A pH of less than 12 was found on 6630-003, 6666-001, and 6687-001 for the Cyanide analysis.

The peaks heights for 6630-001, -002 and 6646-001 had to be hand calculated due to incorrect instrument integration for the Cyanide 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:

Wade H. Price
Project Manager
e:\\qstlmo01\price$\abbydave\hanford\hanw0272.nar

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: W Setzer	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: 894-036
Ice Chest No.: ER-8	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 410541

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	G	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 41054201	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled													
BO D4M6 01	W	10-25-94	1205	X	X	X	X	X	X	X	X	X				
BO D4M7 2	W	10-25-94	1205									X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: AG Ferro	Date/Time: 10/25/94 1300	Received By: Kirk Butcher	Date/Time: 1300 10-25-94
Relinquished By: Kirk Butcher	Date/Time: 1130 10-26-94	Received By: R Boyd Quatere	Date/Time: 10-26-94 1130
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

Matrix*
S = Soil
SE = Sediment
SO = Solid
SL = Sludge
W = Water
O = Oil
A = Air
DS = Drum Solids
DL = Drum Liquid
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

DISTRIBUTION: Original- Sample Yellow - Sampler

PC-0000-835 (12/93)

020

00011

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: L. Setzer, A. Rizzo	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EMS	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-37	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS	METALS (see S. I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALI-NITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S. I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED				
410541	A	B	C	D	E	410542					A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO 04P6 3	W	10-25-94	1045	X	X	X	X	X	X	X	X	X					
BO 04P7 4	W	10-25-94	1045									X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: J. Butcher / A. Rizzo	Date/Time: 10/25/94 1300	Received By: [signature]	Date/Time: 1300 10-25-94
Relinquished By: [signature] B. Whitten	Date/Time: 1130 10-26-94	Received By: R. Bond Austin	Date/Time: 10-26-94 1130
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

EC-6000-828 (12/92)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: K.O. Lee	Company Contact: PH. BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: 894-036
Ice Chest No.: GWS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: 1W95-0-0001-36	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Ga	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS	METALS (see S.I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALINITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S.I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED				
410541	A	B	C	D	E	41054203					A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4P8 5	W	10/25/94	1030	X	X	X	X	X	X	X	X	X					
BO D4P9 6	W	10/25/94	1030										X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
K.O. Lee	10/25/94 1145	B.Whitten	1145 10-25-94
B.Whitten	1130 10-26-94	Q.Board Quatrro	10-26-94 1130

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-826 (12/92)

022

910016

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GWS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-398	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 410563

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 410564 01	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4F8 01	W	10-26-94	1025	X	X	X	X	X	X	X	X	X					
BO D4F9 2	W	10-26-94	1025										X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AG Lizo	10/26/94 1240	B.W. Hoy	10-26-94 1210
		<10> LPA	
B.W. Hoy	10/27/94 1130		10/27/94 1130

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. V. Setzer	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: 896-036
Ice Chest No.	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-92	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl,SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 5105	TRITIUM 9001	Tc-99 —	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
410589																		
BD D4G6	01	W	10/27/94	1000	X	X	X	X	X	X	X	X		X				
BD D4G7	2	W	10/27/94	1000										X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By AJ SIMPSON	Date/Time 10/28/94 0900	Received By B Wh Hen	Date/Time 0900 10-28-94
Relinquished By B Wh Hen	Date/Time 10-28-94 1045	Received By	Date/Time 1045 10/28/94
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

DC-C000-820 (12/92)

024

9400043

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4386
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EK40	Field Logbook No.: EFC-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W950-0001-44	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS 410622	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 410	TRITIUM 623	Tc-99 01	ACTIVITY SCAN —		METALS (see S.I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4K2 01	W	10-28-94	0940	Y	X	X	X	X	X	X	X	X					
BO D4K3 2	W	10-28-94	0940											X			

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	AJSIMPSON			1125
Relinquished By	AJSimpson	10/28/94 1125	B Butcher	10-28-94
Relinquished By	B Butcher	10/31-94	Received By Quanterra B Brumfield	10/31/94 9:45
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

EC-0000-828 (12/92)

Attachment 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: 200-BP-5			DATA PACKAGE: W0272-QES		
VALIDATOR: D. Robinson		LAB: Gianferra		DATE: 1/23/95	
CASE:			SDG: W0272		
ANALYSES PERFORMED					
[X] Anions/IC	[ ] TOC	[ ] TOX	[ ] TPH-418.1	[ ] Oil and Grease	[X] Alkalinity
[ ] Ammonia	[ ] BOD/COD	[ ] Chloride	[ ] Chromium-VI	[ ] pH	[ ] NO_3/NO_2
[ ] Sulfate	[X] TDS	[ ] TKN	[ ] Phosphate	[ ]	[ ]
SAMPLES/MATRIX water					
	BCD4ML			BCD4FE	
	BCD4PL } Equip. Blanks			BCD4GL	
	BCD4PE			BCD4KL	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? ..... (Yes) No N/A

Is a case narrative present? ..... (Yes) No N/A

Comments: Data package is complete

2. HOLDING TIMES

Are sample holding times acceptable? ..... Yes (No) N/A

Comments: All holding times were met except for nitrite and phosphate analyses. ~~All~~ The two day holding time exceeded by a minimum of 20 days. All Nitrite/Phos results are qualified as unusable, UCL. See attached holding time summary.

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Was initial calibration performed for all applicable analyses? ..... (Yes) No N/A

Are initial calibration results acceptable? ..... (Yes) No N/A

Was a calibration check performed for all applicable analyses? ..... (Yes) No N/A

Are calibration check results acceptable? ..... (Yes) No N/A

Comments: No qualification of data is necessary.

4. BLANKS

Were laboratory blanks analysed? ..... (Yes) No N/A

Are laboratory blank results acceptable? ..... (Yes) No N/A

Were field blanks analyzed? ..... (Yes) No N/A

Are field blank results acceptable? ..... Yes (No) N/A

Comments: The result for BOD4ML is slightly higher than the result for BOD4ML and 9X the result for BOD4ML. BOD4ML & BOD4S are equipment blanks collected at the BOD4ML sample location. No qualification of the data was made based on field blank results.

5. ACCURACY

Were spike samples analyzed at the required frequency? ..... (Yes) No N/A

Are spike sample recoveries acceptable? ..... (Yes) No N/A

Were laboratory control samples (LCS) analyzed at the required frequency? ..... (Yes) No N/A

Are LCS recoveries acceptable? ..... (Yes) No N/A

Comments: No qualification of the data is necessary.

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed at the required frequency? ..... Yes No N/A

Are laboratory duplicate samples RPD values acceptable? ..... Yes No N/A

Are field duplicate RPD values acceptable? ..... Yes No N/A

Are field split RPD values acceptable? ..... Yes No N/A

Comments: No qualification of the data is necessary.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? ..... Yes No N/A

Comments: No errors found in reported results.

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? ..... Yes No N/A

Are results supported in the raw data? ..... Yes No N/A

Are results calculated properly? ..... Yes No N/A

Do results meet the CRDLs? ..... Yes No N/A

Comments: All reported results were supported in the raw data, no errors found.

HOLDING TIME SUMMARY

SDG: WO272-QES	VALIDATOR: D. Robinson				DATE: 1/23/95	PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Alkalinity	10/25/94	NA	11/02/94	NA	8	None
BOD4P6	Alkalinity	10/25/94	NA	11/02/94	NA	8	None
BOD4P8	Alkalinity	10/25/94	NA	11/02/94	NA	8	None
BOD4F8	Alkalinity	10/26/94	NA	11/02/94	NA	7	None
BOD4G6	Alkalinity	10/27/94	NA	11/02/94	NA	6	None
BOD4K2	Alkalinity	10/28/94	NA	11/02/94	NA	5	None
BOD4M6	IC Anions	10/25/94	NA	11/17/94	NA	22	UR - NO_2/PO_4
BOD4P6	IC Anions	10/25/94	NA	11/17/94	NA	22	UR - NO_2/PO_4
BOD4P8	IC Anions	10/25/94	NA	11/17/94	NA	22	UR - NO_2/PO_4
BOD4F8	IC Anions	10/26/94	NA	11/18/94	NA	23	UR - NO_2/PO_4
BOD4G6	IC Anions	10/27/94	NA	11/18/94	NA	22	UR - NO_2/PO_4
BOD4K2	IC Anions	10/28/94	NA	11/22/94	NA	25	UR - NO_2/PO_4
BOD4M6	TDS	10/25/94	NA	11/01/94	NA	7	None
BOD4P6	TDS	10/25/94	NA	11/01/94	NA	7	None
BOD4P8	TDS	10/25/94	NA	11/01/94	NA	7	None
BOD4F8	TDS	10/26/94	NA	11/01/94	NA	6	None
BOD4G6	TDS	10/27/94	NA	11/01/94	NA	5	None
BOD4K2	TDS	10/28/94	NA	11/02/94	NA	5	None

DON'T SAY IT - - WRITE IT!

Date:

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

Subject: Correction of Validation Date Received Stamp

The date stamped on this validation report is the date the final correction documents were received in the completion of the Validation Review Process.

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

Thank You,

Pat Reich
Sample Management

RECORD COPY

MEMORANDUM

JAN 1995
RECEIVED
Validation
Log In

TO: 200-BP-5 Project QA Record January 26, 1995

FR: Dennis K. Robinson, Golder Federal Services, Inc. DKR

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0272-QES (943-1610.063)

INTRODUCTION

This memo presents the results of data validation on 12 water samples analyzed by Quanterra Laboratory. The samples validated along with the analyses reported and the methods of analyses are provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
BOD4M6	10/25/94	Water	CLP Metals*/Cyanide
BOD4M7	10/25/94	Water (Filtered)	CLP Metals*
BOD4P6	10/25/94	Water	CLP Metals*/Cyanide
BOD4P7	10/25/94	Water (Filtered)	CLP Metals*
BOD4P8	10/25/94	Water	CLP Metals*/Cyanide
BOD4P9	10/25/94	Water (Filtered)	CLP Metals*
BOD4F8	10/26/94	Water	CLP Metals*/Cyanide
BOD4F9	10/26/94	Water (Filtered)	CLP Metals*
BOD4G6	10/27/94	Water	CLP Metals*/Cyanide
BOD4G7	10/27/94	Water (Filtered)	CLP Metals*
BOD4K2	10/28/94	Water	CLP Metals*/Cyanide
BOD4K3	10/28/94	Water (Filtered)	CLP Metals*
			*See Note 1

Note 1: Metals analyzed were calcium, magnesium, sodium, potassium, iron, manganese, silicon, aluminum, bismuth, and selenium.

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

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

Samples BOD4P6/BOD4P7 and BOD4P8/BOD4P9 are equipment blanks collected from the BOD4M6/BOD4M7 sample location. It should be noted that sample BOD4M7 and BOD4P7 were mislabeled, as the results for sample BOD4P7 are very similar to the results for sample BOD4M6 and very dissimilar to the other equipment blank. In addition, the results for BOD4M7 are similar to the equipment blank results and much less than the results for sample BOD4M6.

RECORD COPY

FEB 1995
RECEIVED
Log In

MEMORANDUM

TO: 200-BP-5 Project QA Record February 2, 1995

FR: Dennis K. Robinson, Golder Federal Services, Inc.

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: W0272-QES (943-1610.063, filename 272INO.BP5)

INTRODUCTION

This memo presents the results of data validation on 12 water samples analyzed by Quanterra Laboratory. The samples validated along with the analyses reported and the methods of analyses are provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
BOD4M6	10/25/94	Water	CLP Metals*/Cyanide
BOD4M7	10/25/94	Water (Filtered)	CLP Metals*
BOD4P6	10/25/94	Water	CLP Metals*/Cyanide
BOD4P7	10/25/94	Water (Filtered)	CLP Metals*
BOD4P8	10/25/94	Water	CLP Metals*/Cyanide
BOD4P9	10/25/94	Water (Filtered)	CLP Metals*
BOD4F8	10/26/94	Water	CLP Metals*/Cyanide
BOD4F9	10/26/94	Water (Filtered)	CLP Metals*
BOD4G6	10/27/94	Water	CLP Metals*/Cyanide
BOD4G7	10/27/94	Water (Filtered)	CLP Metals*
BOD4K2	10/28/94	Water	CLP Metals*/Cyanide
BOD4K3	10/28/94	Water (Filtered)	CLP Metals*
			*See Note 1

Note 1: Metals analyzed were calcium, magnesium, sodium, potassium, iron, manganese, silicon, aluminum, bismuth, and selenium.

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

Attachment 1. Glossary of Data Reporting Qualifiers
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Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of the deficiencies identified below.

Detection Limits. Target goals for sample detection limit were met.

Completeness. A total of 12 samples were validated in this data package with a total of 126 determinations reported, all of which were deemed usable. This results in a completeness of 100 percent which meets the objective of 90 percent.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Metals

- **Positive Blanks.** Aluminum, calcium, iron, magnesium, manganese, sodium, and cyanide were detected at positive concentrations in the associated calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied, and supporting documentation.

- **Matrix Spike Recovery.** The percent recovery of the unfiltered and filtered spike sample was outside the control limits for selenium (57.5% and 60.0% respectively). Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied, and supporting documentation.

- **Graphite Furnace Quality Control.** The percent recovery of the analytical spike was outside the control limits for the following samples for the selenium analysis: BOD4M6, BOD4M7, BOD4P7, BOD4F8, BOD4F9, BOD4G6, BOD4G7, BOD4K2, and BOD4K3. Samples BOD4K2 and BOD4K3 were analyzed by MSA as required, other samples did not require MSA analysis. Attachments 2 and 5 provide a summary of the data qualifications applied and supporting documentation.

FIELD QC

Samples BOD4P6, BOD4P7, BOD4P8 and BOD4P9 were identified as equipment blanks. The results for equipment blank BOD4P7 appear to be very similar to sample BOD4M6, and dissimilar to the other equipment blanks. There exists a possibility that B0D4P7 may have been mislabeled.

In addition, the results for BOD4M7 are comparable to the equipment blank results, and dissimilar to sample BOD4M6. There exists a possibility that B0D4M7 may have been mislabeled.

Revised 2-06-95

REFERENCES

WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905, Validation Statement of Work, Revision 1.0, September 7, 1994, Westinghouse Hanford Company, Richland, Washington.

Attachment 1

Glossary of Data Reporting Qualifiers

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.

U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during the data validation the concentration reported may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.

BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during the data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

Attachment 2

Summary of Data Qualifications

Data Qualification Summary

Project: 200-BP-5	Validator: D. Robinson	Date: 1/23/95	Page 1 of 1
Comments: Metals analysis			
Analyte	Qualifier	Samples Affected	Reason
Aluminum	U	BOD4F8 BOD4F9 BOD4G7 BOD4K2	Present in associated preparation blank at a positive concentration
Calcium	U	BOD4P8 BOD4M7 BOD4P9	Present in associated preparation blank at a positive concentration
Iron	U	BOD4P6 BOD4M7 BOD4P7 BOD4G6 BOD4G7	Present in associated preparation blank at a positive concentration
Magnesium	U	BOD4P6 BOD4P8 BOD4M7 BOD4P9	Present in associated preparation blank at a positive concentration
Magnesium	U	BOD4P6 BOD4P8 BOD4M7 BOD4P9	Present in associated ICB or CCB at a positive concentration
Manganese	U	BOD4P6 BOD4M7 BOD4P9	Present in associated preparation blank at a positive concentration
Manganese	U	B0D4G6 B0D4G7	Present in associated CCB at a positive concentration
Sodium	U	BOD4P8 BOD4M7 BOD4P9	Present in associated preparation blank at a positive concentration
Cyanide	U	BOD4M6 BOD4P6	Present in associated CCB at a positive concentration.
Selenium	J or UJ	BOD4M6 BOD4M7 BOD4P7 BOD4F8 BOD4F9 BOD4G6 BOD4G7	Percent recovery of analytical spike below the specified control limits of 85 to 115%.
Selenium	J or UJ	All	Percent recovery of spike sample less than 75% but greater than 30%.

Revised 2-06-95

Attachment 3

Qualified Data Summary and Annotated Laboratory Reports

Validated Data Summary, Data Package: W0272-QES

	Samp#	B0D4M6		B0D4M7		B0D4P6		B0D4P7		B0D4P8		B0D4P9	
	Date	10-25-94		10-25-94		10-25-94		10-25-94		10-25-94		10-25-94	
	Location	699-60-57		699-60-57		699-60-57		699-60-57		699-60-57		699-60-57	
	Depth	---		---		---		---		---		---	
	Type	WATER		WATER		WATER		WATER		WATER		WATER	
	Comments					EQUIP BLANK		EQUIP BLANK		EQUIP BLANK		EQUIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	UG/L	24.900	U	24.900	U	24.900	U	24.900	U	24.900	U	24.900	U
CALCIUM	UG/L	19400.000		71.200	U	153.000	B	19600.000		125.000	U	49.600	U
IRON	UG/L	179.000		60.600	U	88.600	U	44.000	U	430.000		145.000	
MAGNESIUM	UG/L	5730.000		102.000	U	119.000	U	5790.000		104.000	U	127.000	U
MANGANESE	UG/L	44.600		2.900	U	1.700	U	46.100		3.600	B	1.700	U
POTASSIUM	UG/L	8040.000		1940.000	U	1940.000	U	8180.000		1940.000	U	1940.000	U
SELENIUM	UG/L	1.700	UJ	1.700	UJ	1.700	UJ	1.700	UJ	1.700	UJ	1.700	UJ
SODIUM	UG/L	40400.000		235.000	U	355.000	B	42100.000		248.000	U	254.000	U
CYANIDE	UG/L	1.700	U	---		2.400	U	---		1.200	U	---	
SILICON	UG/L	19900.000		27.300	B	104.000		20100.000		81.200	B	63.700	B
BISMUTH	UG/L	38.000	U	49.700	B	38.000	U	38.000	U	38.000	U	39.500	B

The decimal places shown do not reflect the precision reported by the laboratory

verified gj
1/25/95

Validated Data Summary, Data Package: W0272-QES

	Samp#	B0D4F8		B0D4F9		B0D4G6		B0D4G7		B0D4K2		B0D4K3	
	Date	10-26-94		10-26-94		10-27-94		10-27-94		10-28-94		10-28-94	
	Location	299-E33-7		299-E33-7		299-E33-15		299-E33-15		699-50-53A		699-50-53A	
	Depth	---		---		---		---		---		---	
	Type	WATER		WATER		WATER		WATER		WATER		WATER	
	Comments												
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	UG/L	28.200	U	40.900	U	24.900	U	28.900	U	49.900	U	24.900	U
CALCIUM	UG/L	50600.000		50300.000		38400.000		40600.000		158000.000		159000.000	
IRON	UG/L	1220.000		629.000		63.900	U	40.500	U	289.000		195.000	
MAGNESIUM	UG/L	13800.000		13700.000		11800.000		12400.000		42300.000		42500.000	
MANGANESE	UG/L	18.600		8.200	B	4.900	U	3.700	U	9.500	B	8.800	B
POTASSIUM	UG/L	5950.000		7070.000		6140.000		5650.000		9870.000		12900.000	
SELENIUM	UG/L	1.700	UJ	1.700	UJ	1.700	UJ	1.700	UJ	24.300	J	26.800	J
SODIUM	UG/L	26100.000		25400.000		20100.000		21200.000		41600.000		40800.000	
CYANIDE	UG/L	24.200		---		1.200	U	---		189.000		---	
SILICON	UG/L	18400.000		18100.000		17100.000		18100.000		18100.000		18200.000	
BISMUTH	UG/L	74.200	B	69.700	B	78.600	B	52.400	B	159.000		193.000	

The decimal places shown do not reflect the precision reported by the laboratory

verified aj
1/25/95

010

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4M6

ab Name: ITAS_ST._LOUIS Contract: 550.23

ab Code: ITMO Case No.: SAS No.: SDG No.: W0272

atrix (soil/water): WATER Lab Sample ID: 6630-001

evel (low/med): LOW Date Received: 10/27/94

Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.9	U		P
7440-70-2	Calcium	19400			P
7439-89-6	Iron	179			P
7439-95-4	Magnesium	5730			P
7439-96-5	Manganese	44.6			P
7440-09-7	Potassium	8040			P
7782-49-2	Selenium	1.7	U	WN	F
7440-23-5	Sodium	40400			P
	Cyanide	1.7	B		AS
7440-21-3	Silicon	19900			P
7440-69-9	Bismuth	38.0	U		P

DAN 11/23/95

olor Before: COLORLESS Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

SILICATE = 65200 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P6

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____
Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6630-002
Level (low/med): LOW__ Date Received: 10/27/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_	24.9	U		P_	
7440-70-2	Calcium__	153	B		P_	
7439-89-6	Iron____	88.6	B		P_	u
7439-95-4	Magnesium	119	B		P_	u
7439-96-5	Manganese	1.7	B		P_	u
7440-09-7	Potassium	1940	U		P_	
7782-49-2	Selenium_	1.7	U	N	F_	uJ
7440-23-5	Sodium___	355	B		P_	
	Cyanide__	2.4	B		AS	u
7440-21-3	Silicon__	104			P_	
7440-69-9	Bismuth__	38.0	U		P_	

DKA 1/23/95

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
SILICATE_=_341_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P8

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6630-003
Level (low/med): LOW Date Received: 10/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	24.9	U		P	
7440-70-2	Calcium	125	~~B~~		P	u
7439-89-6	Iron	430			P	
7439-95-4	Magnesium	104	~~B~~		P	u
7439-96-5	Manganese	3.6	B		P	
7440-09-7	Potassium	1940	U		P	
7782-49-2	Selenium	1.7	U	N	F	u J
7440-23-5	Sodium	248	~~B~~		P	u
	Cyanide	1.2	U		AS	
7440-21-3	Silicon	81.2	B		P	
7440-69-9	Bismuth	38.0	U		P	

DLX 1/23/95

olor Before: COLORLESS Clarity Before: CLEAR Texture:
olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:
SILICATE = 266 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4M7

b Name: ITAS_ST._LOUIS_____ Contract: 550.23____
b Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
trix (soil/water): WATER Lab Sample ID: 6630-004
vel (low/med): LOW___ Date Received: 10/27/94
Solids: ___0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_	24.9	U		P_	
7440-70-2	Calcium__	71.2	~~B~~		P_	"
7439-89-6	Iron_____	60.6	~~B~~		P_	"
7439-95-4	Magnesium	102	~~B~~		P_	"
7439-96-5	Manganese	2.9	~~B~~		P_	"
7440-09-7	Potassium	1940	U		P_	
7782-49-2	Selenium_	1.7	U	WN	F_	UJ
7440-23-5	Sodium___	235	~~B~~		P_	"
	Cyanide__				NR	
7440-21-3	Silicon__	27.3	B		P_	
7440-69-9	Bismuth__	49.7	B		P_	

DKK 1/23/95

olor Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
olor After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

omments:
SILICATE_=_89.5_UG/L_B

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P7

.b Name: ITAS_ST._LOUIS_____ Contract: 550.23____
.b Code: ITMO___ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
.trix (soil/water): WATER Lab Sample ID: 6630-005
vel (low/med): LOW__ Date Received: 10/27/94
Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum_	24.9	U		P_	
7440-70-2	Calcium__	19600			P_	
7439-89-6	Iron____	44.0	B		P_	LL
7439-95-4	Magnesium	5790			P_	
7439-96-5	Manganese	46.1			P_	
7440-09-7	Potassium	8180			P_	
7782-49-2	Selenium_	1.7	U	WN	F_	WJ
7440-23-5	Sodium___	42100			P_	
	Cyanide__				NR	
7440-21-3	Silicon__	20100			P_	
7440-69-9	Bismuth__	38.0	U		P_	

DKK 1/23/95

olor Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
olor After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

omments:
SILICATE_=_65900_UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4P9

ab Name: ITAS_ST._LOUIS Contract: 550.23
ab Code: ITMO Case No.: SAS No.: SDG No.: W0272
atrix (soil/water): WATER Lab Sample ID: 6630-006
evel (low/med): LOW Date Received: 10/27/94
Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	24.9	U		P	
7440-70-2	Calcium	49.6	B		P	"
7439-89-6	Iron	145			P	
7439-95-4	Magnesium	127	B		P	"
7439-96-5	Manganese	1.7	B		P	"
7440-09-7	Potassium	1940	U		P	
7782-49-2	Selenium	1.7	U	N	F	" J
7440-23-5	Sodium	254	B		P	"
	Cyanide				NR	
7440-21-3	Silicon	63.7	B		P	
7440-69-9	Bismuth	39.5	B		P	

DK 11/23/95

olor Before: COLORLESS Clarity Before: CLEAR Texture:
olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:
SILICATE = 209 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4F8

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6646-001
Level (low/med): LOW Date Received: 10/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	28.2	B		P	u
7440-70-2	Calcium	50600			P	
7439-89-6	Iron	1220			P	
7439-95-4	Magnesium	13800			P	
7439-96-5	Manganese	18.6			P	
7440-09-7	Potassium	5950			P	
7782-49-2	Selenium	1.7	U	WN	F	u5
7440-23-5	Sodium	26100			P	
	Cyanide	24.2			AS	
7440-21-3	Silicon	18400			P	
7440-69-9	Bismuth	74.2	B		P	

DKA 1/23/95

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SILICATE = 60300 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4F9

Lab Name: ITAS_ST._LOUIS Contract: 550.23
Lab Code: ITMO Case No.: SAS No.: SDG No.: W0272
Matrix (soil/water): WATER Lab Sample ID: 6646-002
Level (low/med): LOW Date Received: 10/27/94
% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	40.9	B		P	
7440-70-2	Calcium	50300			P	
7439-89-6	Iron	629			P	
7439-95-4	Magnesium	13700			P	
7439-96-5	Manganese	8.2	B		P	
7440-09-7	Potassium	7070			P	
7782-49-2	Selenium	1.7	U	WN	F	J
7440-23-5	Sodium	25400			P	
	Cyanide				NR	
7440-21-3	Silicon	18100			P	
7440-69-9	Bismuth	69.7	B		P	

DKL 11/23/95

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
SILICATE = 59300 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4G6

ab Name: ITAS_ST._LOUIS Contract: 550.23
ab Code: ITMO Case No.: SAS No.: SDG No.: W0272
atrix (soil/water): WATER Lab Sample ID: 6666-001
evel (low/med): LOW Date Received: 10/28/94
Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	24.9	U		P	
7440-70-2	Calcium	38400			P	
7439-89-6	Iron	63.9	~~B~~		P	u
7439-95-4	Magnesium	11800			P	
7439-96-5	Manganese	4.9	~~B~~		P	u
7440-09-7	Potassium	6140			P	
7782-49-2	Selenium	1.7	U	WN	F	u.j
7440-23-5	Sodium	20100			P	
	Cyanide	1.2	U		AS	
7440-21-3	Silicon	17100			P	
7440-69-9	Bismuth	78.6	B		P	

DKK 1/23/95

olor Before: COLORLESS Clarity Before: CLEAR Texture:
olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:
SILICATE = 56100 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4G7

Name: ITAS_ST._LOUIS Contract: 550.23
Code: ITMO Case No.: SAS No.: SDG No.: W0272
rix (soil/water): WATER Lab Sample ID: 6666-002
el (low/med): LOW Date Received: 10/28/94
olids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	28.9	~~B~~		P	u
7440-70-2	Calcium	40600			P	
7439-89-6	Iron	40.5	~~B~~		P	u
7439-95-4	Magnesium	12400			P	
7439-96-5	Manganese	3.7	~~B~~		P	u
7440-09-7	Potassium	5650			P	
7782-49-2	Selenium	1.7	U	WN	F	UJ
7440-23-5	Sodium	21200			P	
	Cyanide				NR	
7440-21-3	Silicon	18100			P	
7440-69-9	Bismuth	52.4	B		P	

DKK 1/23/95

olor Before: COLORLESS Clarity Before: CLEAR Texture:
olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:
SILICATE = 59300 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4K2

ab Name: ITAS_ST._LOUIS Contract: 550.23

ab Code: ITMO Case No.: SAS No.: SDG No.: W0272

atrix (soil/water): WATER Lab Sample ID: 6687-001

evel (low/med): LOW Date Received: 10/31/94

Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	49.9	B		P	u
7440-70-2	Calcium	158000			P	
7439-89-6	Iron	289			P	
7439-95-4	Magnesium	42300			P	
7439-96-5	Manganese	9.5	B		P	
7440-09-7	Potassium	9870			P	
7782-49-2	Selenium	24.3		~~SN~~	F	J
7440-23-5	Sodium	41600			P	
	Cyanide	189			AS	
7440-21-3	Silicon	18100			P	
7440-69-9	Bismuth	159			P	

DEL 1/23/95

olor Before: COLORLESS Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

SILICATE = 59300 UG/L

FORM I - IN

ILM03.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0D4K3

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____
Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W0272_____
Matrix (soil/water): WATER Lab Sample ID: 6687-002
Level (low/med): LOW__ Date Received: 10/31/94
% Solids: __0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	24.9	U		P_
7440-70-2	Calcium__	159000			P_
7439-89-6	Iron____	195			P_
7439-95-4	Magnesium	42500			P_
7439-96-5	Manganese	8.8	B		P_
7440-09-7	Potassium	12900			P_
7782-49-2	Selenium_	26.8		~~SN~~	F_
7440-23-5	Sodium___	40800			P_
	Cyanide__				NR
7440-21-3	Silicon__	18200			P_
7440-69-9	Bismuth__	193			P_

J

JCH 11/23/95

olor Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
olor After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

omments:
SILICATE_=_59700_UG/L

FORM I - IN

ILM03.0

Attachment 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

DEC 1994
RECEIVED
Data
Log In

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

December 21, 1994

Attention: Joan Kessner

Project number	:	550.23
Date Received by Lab	:	October 27, 28 and 31, 1994
Number of Samples	:	Twelve (12)
Sample Type	:	Water
SDG Number	:	W0272
Data Deliverable	:	Standalone

RECORD COPY

I. Introduction

Between October 27 and 31, 1994, twelve (12) water samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with their specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
6630-001	B0D4M6	41054101	Water	10/27/94
6630-002	B0D4P6	41054103	Water	10/27/94
6630-003	B0D4P8	41054105	Water	10/27/94
6630-004	B0D4M7	41054102	Water	10/27/94
6630-005	B0D4P7	41054104	Water	10/27/94
6630-006	B0D4P9	41054106	Water	10/27/94
6646-001	B0D4F8	41056301	Water	10/27/94
6646-002	B0D4F9	41056302	Water	10/27/94
6666-001	B0D4G6	41058901	Water	10/28/94
6666-002	B0D4G7	41058902	Water	10/28/94
6687-001	B0D4K2	41062201	Water	10/31/94
6687-002	B0D4K3	41062202	Water	10/31/94

II. Analytical Results/ Methodology

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

Analyses requested: ICP, Cyanide and Selenium by CLP90 methodology. Chloride, Fluoride, Nitrite, Phosphate, and Sulfate by EPA method 300.0. Alkalinity by EPA method 310.1. Total Dissolved Solids by EPA method 160.1.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Sample Duplicate analyses were performed per the protocol for each analyte in this SDG.

IV. Definitions

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

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

V. Comments

Nitrite and Phosphate holding times were expired upon receipt of samples at laboratory.

The Relative Percent Difference could not be calculated for Phosphate and Nitrite because both values were less than the detection limit.

The Selenium Matrix Spike recoveries for 6666-001 and 6666-002 (60.0%) were less than 75%. The associated data was flagged with an "N".

Quanterra
Environmental Services

A pH of less than 12 was found on 6630-003, 6666-001, and 6687-001 for the Cyanide analysis.

The peaks heights for 6630-001, -002 and 6646-001 had to be hand calculated due to incorrect instrument integration for the Cyanide 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:

Wade H. Price
Project Manager
e:\\qstlmo01\price$\abbydave\hanford\hanw0272.nar

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: L Setzer	Company Contact: PN BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: ER-8	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS	METALS (see S. I. #1) UNFILTERED	IC ANIONS-F,Cl,SO4,NO2 PO4	ALKALINITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S. I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED				
Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
	A	B	C	D	E	41054201					A				
410541															

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4M6 01	W	10-25-94	1205	X	X	X	X	X	X	X	X	X					
BO D4M7 2	W	10-25-94	1205									X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AG Ferro	10/25/94 1300	D.G. Butler	1300 10-25-94
D.G. Butler	1130 10-26-94	R Boyd Quaterra	10-26-94 1130

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

Matrix*
S = Soil
SE = Sediment
SO = Solid
SL = Sludge
W = Water
O = Oil
A = Air
DS = Drum Solids
DL = Drum Liquid
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

DISTRIBUTION: Original- Sample Yellow - Sampler

027

00014

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: W. Setzer, A. Rizzo	Company Contact: PN BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EMS	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-37	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		NCL <2			HNO3<2
Type of Container	P/G	G	P/G	P	P	G/P	G	G/P	G/P		P/G
No. of Container(s)	1	1	1	1	1	8	2	2	1		1
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml
SAMPLE ANALYSIS 410541	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 410542	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED A

Sample No.	Matrix*	Date Sampled	Time Sampled															
B0 D4P6 3	W	10-25-94	1045	X	X	X	X	X	X	X	X	X						
B0 D4P7 4	W	10-25-94	1045											X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: A. Rizzo		10/25/94 1300
Received By:		1300 10-25-94
Relinquished By:		1130 10-26-94
Received By:		10-26-94 1130
Relinquished By:		
Received By:		
Relinquished By:		
Received By:		

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original - Sample Yellow - Sampler

RO-8000 F28 (12/92)

028

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: K.O. Lee	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GUS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS 410541	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 41054203	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED A				

Sample No.	Matrix*	Date Sampled	Time Sampled															
BO D4P8 5	W	10/25/94	1030	X	X	X	X	X	X	X	X	X						
BO D4P9 6	W	10/25/94	1030										X					

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: K.O. Lee 10/25/94 1145	Received By: B. Whitten 10-25-94 1145	Date/Time
Relinquished By: B. Whitten 10-26-94 1130	Received By: D. Boyd Quatrus 10-26-94 1130	Date/Time
Relinquished By	Received By	Date/Time
Relinquished By	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

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

DISTRIBUTION: Original- Sample Yellow - Sampler

EC-0000-028 (12/92)

029

00016

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GWS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-398	BM of Lading/Air BM No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SAMPLE ANALYSIS: 410563

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl,SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 410	TRITIUM 564	Tc-99 01	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
80 D4F8	01	W	10-26-94	1025	X	X	X	X	X	X	X	X						
80 D4F9	2	W	10-26-94	1025										X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	A G Simpson	10/26/94 1210	Received By	1210 10-26-94
Relinquished By		1130 10-27-94	Received By	10/27/94 1130
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDGW0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W. V. Setzer	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-92	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 410589

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G
No. of Container(s)	1	1	1	1	1	8	2	2	1		1
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml
SAMPLE ANALYSIS	METALS (see S. I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALI-NITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S. I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED
	A	B	C	D	E	5105	9001	—			A

Sample No.	Matrix*	Date Sampled	Time Sampled													
BO D4G6 01	W	10/27/94	1000	X	X	X	X	X	X	X	X	X				
BO D4G7 2	W	10/27/94	1000											X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AJ SIMPSON	10/28/94 0900	BWHHan	10-28-94 0900
BWHHan	10-28-94 1045	[illegible]	10/28/94 1045

SPECIAL INSTRUCTIONS
#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: ER 40	Field Logbook No.: EFL- 1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W950-001-44	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G
No. of Container(s)	1	1	1	1	1	8	2	2	1		1
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml
SAMPLE ANALYSIS	METALS (see S. I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALINITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S. I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED
410622	A	B	C	D	E	410	623	01	—		A

Sample No.	Matrix*	Date Sampled	Time Sampled														
BO D4K2 01	W	10-28-94	0940	X	X	X	X	X	X	X	X	X					
BO D4K3 2	W	10-28-94	0940											X			

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	AJ SIMPSON			
	AJ Simpson	10/28/94 1125	B Wilthey	10-28-94 1125
Relinquished By	B Wilthey	10-28-94	Received By Quanterra	10/31/94 9:45
			B Brumfield	
Relinquished By		Date/Time	Received By	Date/Time
Relinquished By		Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDGW0272

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

DISTRIBUTION: Original - Sample; Yellow - Sampler

BC-6000-828 (12/92)

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Attachment 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: 200BP-5			DATA PACKAGE: WC272 - GES		
VALIDATOR: D. Robinson		LAB: Cincinnati		DATE: 1/23/95	
CASE:			SDG: WC272		
ANALYSES PERFORMED					
[X] CLP/ICP	[X] CLP/GFAA	[ ] CLP/Hg	[X] CLP/Cyanide	[ ]	[ ]
[ ] SW-846/ICP	[ ] SW-846/GFAA	[ ] SW-846/Hg	[ ] SW-846/ Cyanide	[ ]	[ ]
SAMPLES/MATRIX [illegible]					
	BCD4M6 - BCD4M7		BCD4F5 - BCD4F9		
Equip S	BCD4P6 - BCD4P7		BCD4H6 - BCD4G7		
Blanks	BCD4F8 - BCD4P5		BCD4K2 - BCD4K3		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? ..... (Yes) No N/A

Is a case narrative present? ..... (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? ..... (Yes) No N/A

Comments: See chart at holding time summaries. Qualification of the data as not required.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? ..... Yes No N/A

Are initial calibrations acceptable? ..... Yes No N/A

Are ICP interference checks acceptable? ..... Yes No N/A

Were ICV and CCV checks performed on all instruments? ..... Yes No N/A

Were ICV and CCV checks acceptable? ..... Yes No N/A

Comments: Qualification of the data is not required.

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? ..... Yes No N/A

Are ICB and CCB results acceptable? ..... SEE NOTES ..... Yes No N/A RK 2-6-95

Were preparation blanks analyzed? ..... Yes No N/A

Are preparation blank results acceptable? ..... SEE NOTES ..... Yes No N/A RK 2-6-95

Were field blanks analyzed? ..... Yes No N/A

Are field blank results acceptable? ..... Yes No N/A

Comments: Minor concentrations of target analytes were detected in ICB's, CCB's and in prep blanks, See attached "Blank and Sample Data Summary" and Form III. Samples BCD416/BCD417 and BCD415/BCD419 were field blanks (equip. blanks) collected at well 699-60-57. Comments qualified on document sheet attached.

5. ACCURACY

Were spike samples analyzed? ..... Yes No N/A

Are spike sample recoveries acceptable? ..... Yes No N/A

Were laboratory control samples (LCS) analyzed? ..... Yes No N/A

Are LCS recoveries acceptable? ..... Yes No N/A

Comments: Matrix spike sample recoveries for the selenium spikes were outside the control limits BCD416 (57.1%) and BCD417 (60.0%). Selenium results for all samples are qualified as estimated, J or UJ.

Revised RK 2-6-95

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

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

Comments: Qualification of data was not required.

7. FURNACE AA QUALITY CONTROL

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

Comments: Selenium analytical spike recoveries were outside control limits for samples: BCD4M6, BCD4M7, BCD4P7, BCD4F8, BCD4F9, BCD4G6, BCD4G7, BCD4K2, and BCD4K3. Samples BCD4K2 and BCD4K3 were analyzed by MSA as required. The other samples listed above were qualified as estimated, J in U.J.

8. REPORTED RESULTS AND DETECTION LIMITS

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

Comments: Qualification of data was not required.

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary): *4) It would appear that DKT 1123KR ~~some~~ at least sample BED4M7 and BED4P7 were mislabeled in the field. Clearly sample BED4P7 is ~~the filtered~~ TKB 3/15 associated with the sample BED4M6, and it would appear that sample BED4M6 was the filtered fraction of the field as the results are lower in BED4M6. The CCC indicates that BED4M7 is the filtered location of BED4M6 but the results do not support this.

HOLDING TIME SUMMARY

SDG: WO272-QES	VALIDATOR: D. Robinson				DATE: 1/20/95	PAGE 1 OF 2	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	ICP Metals	10/25/94	NA	11/30/94	NA	36	None
BOD4M7	ICP Metals	10/25/94	NA	11/30/94	NA	36	None
BOD4P6	ICP Metals	10/25/94	NA	11/30/94	NA	36	None
BOD4P7	ICP Metals	10/25/94	NA	11/30/94	NA	36	None
BOD4P8	ICP Metals	10/25/94	NA	11/30/94	NA	36	None
BOD4P9	ICP Metals	10/25/94	NA	11/30/94	NA	36	None
BOD4F8	ICP Metals	10/26/94	NA	11/30/94	NA	35	None
BOD4F9	ICP Metals	10/26/94	NA	11/30/94	NA	35	None
BOD4G6	ICP Metals	10/27/94	NA	11/30/94	NA	34	None
BOD4G7	ICP Metals	10/27/94	NA	11/30/94	NA	34	None
BOD4K2	ICP Metals	10/28/94	NA	11/30/94	NA	33	None
BOD4K3	ICP Metals	10/28/94	NA	11/30/94	NA	33	None

HOLDING TIME SUMMARY

SDG: WO272-QES	VALIDATOR: D. Robinson				DATE: 1/20/95	PAGE 2 OF 2	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	GFAA	10/25/94	NA	11/30/94	NA	36	None
BOD4M7	GFAA	10/25/94	NA	11/30/94	NA	36	None
BOD4P6	GFAA	10/25/94	NA	11/30/94	NA	36	None
BOD4P7	GFAA	10/25/94	NA	11/30/94	NA	36	None
BOD4P8	GFAA	10/25/94	NA	11/30/94	NA	36	None
BOD4P9	GFAA	10/25/94	NA	11/30/94	NA	36	None
BOD4F8	GFAA	10/26/94	NA	11/30/94	NA	35	None
BOD4F9	GFAA	10/26/94	NA	11/30/94	NA	35	None
BOD4G6	GFAA	10/27/94	NA	11/30/94	NA	34	None
BOD4G7	GFAA	10/27/94	NA	11/30/94	NA	34	None
BOD4K2	GFAA	10/28/94	NA	11/30/94	NA	33	None
BOD4K3	GFAA	10/28/94	NA	11/30/94	NA	33	None
BOD4M6	Cyanide	10/25/94	NA	11/03/94	NA	9	None
BOD4P6	Cyanide	10/25/94	NA	11/03/94	NA	9	None
BOD4P8	Cyanide	10/25/94	NA	11/08/94	NA	14	None
BOD4F8	Cyanide	10/26/94	NA	11/03/94	NA	8	None
BOD4G6	Cyanide	10/27/94	NA	11/08/94	NA	12	None
BOD4K2	Cyanide	10/28/94	NA	11/08/94	NA	11	None

BLANK AND SAMPLE DATA SUMMARY

SDG: W0272	VALIDATOR: D. Robinson	DATE: 1/23/95	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
Prep Blank	Aluminum	43.5	B	–	ug/L	217.	NA	BCD4F6, BCD4F7,	U
52633	↓	↓	↓	–	↓	↓	↓	BCD4G7, BCD4K2	
	Calcium	27.3	B	–	ug/L	136.5	NA	BCD4F6, BCD4M7	
	↓	↓	↓	–	↓	↓	↓	BCD4F7,	
	Iron	22.25	B	–	ug/L	111.4	NA	BCD4F6, BCD4M7	
	↓	↓	↓	–	↓	↓	↓	BCD4R7, BCD4G6	
	↓	↓	↓	–	↓	↓	↓	BCD4G7,	
	Magnesium	94.34	B	–	ug/L	471.7	NA	BCD4M7, BCD4P6	
	↓	↓	↓	–	↓	↓	↓	BCD4M7, BCD4P7	
	Manganese	0.7	B	–	ug/L	3.5	NA	BCD4P6, BCD4M7	
	↓	↓	↓	–	↓	↓	↓	BCD4P7,	
	Sodium	69.67	B	–	ug/L	348.4	NA	BCD4P6, BCD4M7	
↓	↓	↓	↓	–	↓	↓	↓	BCD4P7,	
ICB	Magnesium	63.1	B	–	ug/L	315.5	NA	BCD4P6, BCD4P8	
↓	↓	↓	↓	–	↓	↓	↓	BCD4M7, BCD4P7	
CCB2	Magnesium	45.9	B	–	ug/L	229.5	NA	Same as for ICB	
CCB3	Magnesium	81.0	B	–	ug/L	405.0	NA	Same as for ICB	
CCB3	Manganese	1.0	B	–	ug/L	5.0	NA	BCD4G6, BCD4G7	
CCB2	Cyanide	2.9	B	–	ug/L	14.5	NA	BCD4M6, BCD4P6	
CCB3	Cyanide	5.1	B	–	ug/L	25.5	NA	BCD4M6, BCD4P6, ~~BCD4F6~~	

DLR 1/23/95

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.23____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0272_____

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	24.9	U	24.9	U	24.9	U	24.9	U	43.800	B	P
Calcium	20.6	U	20.6	U	20.6	U	20.6	U	27.300	B	P
Iron	11.4	U	11.4	U	11.4	U	11.4	U	22.280	B	P
Magnesium	63.1	B	44.9	U	45.9	B	81.0	B	94.340	B	P
Manganese	0.7	U	0.7	U	0.7	U	1.0	B	0.700	B	P
Potassium	1944.0	U	1944.0	U	1944.0	U	1944.0	U	1944.000	U	P
Selenium	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	F
Sodium	42.4	U	42.4	U	42.4	U	51.5	B	69.670	B	P
Cyanide	2.4	U	2.4	U	2.9	B	5.1	B	1.200	U	AS
Silicon	13.9	U	13.9	U	13.9	U	13.9	U	13.900	U	P
Bismuth	38.0	U	38.0	U	38.0	U	38.0	U	38.000	U	P

FORM III - IN

ILM03.0

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JAN 1995
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Validation
Log In

MEMORANDUM

TO: 200-BP-5 Round 2 Groundwater Project QA Record January 25, 1995

FR: Anne Jensen, Golder Associates Inc. aj

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE W0272-QES (943-1610.063 272RAD.BP5)

INTRODUCTION

This memo presents the results of data validation on data package W0272-QES prepared by Quanterra Environmental Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
BOD4M6		RADIOCHEMISTRY	WATER
BOD4P6*	EQUIPMENT BLANK		WATER
BOD4P8	EQUIPMENT BLANK	SEE ATTACHMENT 4	WATER
BOD4F8			WATER
BOD4G6*			WATER
BOD4K2			WATER
* - Indicates sample results which were 100% recalculated.			

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

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

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met, with the exception of the deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results. The laboratory indicated in the case narrative that the analysis volume for gross alpha was reduced for sample BOD4K2 due to a high precipitate weight. Therefore, the RDL for this sample is 6 pCi/L. Data qualification is not required. Attachment 5 provides supporting documentation.

Completeness. The data package was complete for all requested analyses. A total of six samples were validated in this data package with a total of ninety-six determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Matrix Spike

- A matrix spike was not analyzed for tritium. Attachments 2 and 5 provide a summary of samples affected and data qualifications applied.

FIELD QC

- Samples BOD4P6 and BOD4P8 were identified as equipment blanks. There were no target analytes detected in these samples. Attachment 3 provides a summary of the results.

DATA REPORTING

- Reported sample results which are less than the minimum detectable activity (MDA) have been qualified as undetected (U) on the laboratory results form (see Attachment 3).

REFERENCES

WHC 1993, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.

UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.

J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.

UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

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

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: W0272-QES	REVIEWER: A. JENSEN	DATE: 1-25-95	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
TRITIUM	J/UJ	ALL	NO MATRIX SPIKE RUN

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: W0Z72-QES

	Samp#	B0D4F8		B0D4G6		B0D4K2		B0D4M6		B0D4P6		B0D4P8	
	Date	10-26-94		10-27-94		10-28-94		10-25-94		10-25-94		10-25-94	
	Location	299-E33-7		299-E33-15		699-50-53A		699-60-57		699-60-57		699-60-57	
	Depth	---		---		---		---		---		---	
	Type	WATER		WATER		WATER		WATER		WATER		WATER	
	Comments									EQUIP BLANK		EQUIP BLANK	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
PLUTONIUM-238	pCi/L	0.000	U	-0.030	U	-0.007	U	0.000	U	0.048	U	0.000	U
PLUTONIUM-239/240	pCi/L	0.000	U	-0.015	U	-0.010	U	0.068	U	0.064	U	-0.015	U
COBALT-58	pCi/L	-0.400	U	1.570	U	1.090	U	-0.528	U	-0.685	U	-0.264	U
COBALT-60	pCi/L	3.870	U	0.771	U	49.200		-4.470	U	-3.430	U	-2.090	U
CESIUM-137	pCi/L	-1.900	U	0.638	U	-0.632	U	0.758	U	2.290	U	7.640	U
EUROPIUM-152	pCi/L	-8.500	U	-27.800	U	-2.730	U	3.880	U	-11.200	U	-3.990	U
EUROPIUM-154	pCi/L	19.400	U	6.480	U	-12.700	U	3.220	U	7.870	U	10.500	U
EUROPIUM-155	pCi/L	2.480	U	5.660	U	0.000	U	-4.660	U	7.280	U	-7.410	U
IRON-59	pCi/L	0.000	U	8.960	U	4.440	U	12.300	U	3.370	U	-2.180	U
RUTHENIUM-106	pCi/L	35.900	U	31.200	U	3.470	U	6.060	U	-0.934	U	34.700	U
GROSS ALPHA	pCi/L	1.690		1.290	U	5.110		0.146	U	-0.020	U	0.220	U
GROSS BETA	pCi/L	217.000		8.650		612.000		9.220		1.240	U	0.219	U
STRONTIUM	pCi/L	0.108	U	0.040	U	0.221	U	0.355		0.374	U	0.280	U
TECHNETIUM-99	pCi/L	701.000		11.000		3800.000		-0.784		1.760	U	-1.700	U
TRITIUM	pCi/L	6810.000	J	3180.000	J	459.000	J	278.000	J	153.000	UJ	88.300	UJ
TOTAL URANIUM	UG/L	2.280		1.700		5.890		0.205		0.003	U	0.000	U

The decimal places shown do not reflect the precision reported by the laboratory

Verified 2-14-95

Revised 2-14-95

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Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41054202	MATRIX:	WATER
CLIENT ID:	B0D4P6	DATE RECEIVED:	10/26/94

ISOTOPE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	4.77E-02	U	1.7E-01	1.7E-01	4.49E-01	pCi/L	52.50%	RD3209
PU239/40	6.36E-02		1.6E-01	1.6E-01	3.81E-01	pCi/L	52.50%	RD3209
CO-58	-6.85E-01		5.3E+00	5.3E+00	9.75E+00	pCi/L	N/A	RD3219
CO-60	-3.43E+00		5.3E+00	5.3E+00	8.77E+00	pCi/L	N/A	RD3219
CS-137DA	2.29E+00		4.0E+00	4.0E+00	8.05E+00	pCi/L	N/A	RD3219
EU-152	-1.12E+01		1.2E+01	1.2E+01	1.78E+01	pCi/L	N/A	RD3219
EU-154	7.87E+00		1.3E+01	1.3E+01	2.79E+01	pCi/L	N/A	RD3219
EU-155	7.28E+00		7.5E+00	7.5E+00	1.47E+01	pCi/L	N/A	RD3219
FE-59	3.37E+00		1.5E+01	1.5E+01	2.82E+01	pCi/L	N/A	RD3219
RU-106DA	-9.34E-01		4.0E+01	4.0E+01	7.16E+01	pCi/L	N/A	RD3219
ALPHA	-2.03E-02		2.2E-01	2.2E-01	7.93E-01	pCi/L	100.00%	RD3214
BETA	1.24E+00		1.2E+00	1.3E+00	2.55E+00	pCi/L	100.00%	RD3214
STRONTIUM	3.74E-01		2.4E-01	2.6E-01	8.07E-01	pCi/L	91.20%	RD3204
TC-99	1.76E+00		9.7E-01	4.3E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	1.53E+02	UJ	1.1E+02	2.0E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	3.00E-03	U	N/A	1.0E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

verified aj
1/25/95

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41059001	MATRIX:	WATER
CLIENT ID:	B0D4G6	DATE RECEIVED:	10/28/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-2.99E-02 U	4.2E-02	4.3E-02	4.23E-01	pCi/L	55.80%	RD3209
PU239/40	-1.50E-02	3.0E-02	3.0E-02	3.58E-01	pCi/L	55.80%	RD3209
CO-58	1.57E+00	2.9E+00	2.9E+00	6.72E+00	pCi/L	N/A	RD3219
CO-60	7.71E-01	5.3E+00	5.3E+00	1.02E+01	pCi/L	N/A	RD3219
CS-137DA	6.38E-01	4.0E+00	4.0E+00	7.74E+00	pCi/L	N/A	RD3219
EU-152	-2.78E+01	1.4E+01	1.5E+01	1.78E+01	pCi/L	N/A	RD3219
EU-154	6.48E+00	1.3E+01	1.3E+01	2.70E+01	pCi/L	N/A	RD3219
EU-155	5.66E+00	7.7E+00	7.7E+00	1.48E+01	pCi/L	N/A	RD3219
FE-59	8.96E+00	1.2E+01	1.2E+01	2.49E+01	pCi/L	N/A	RD3219
RU-106DA	3.12E+01	3.7E+01	3.7E+01	7.44E+01	pCi/L	N/A	RD3219
ALPHA	1.29E+00	1.1E+00	1.1E+00	1.42E+00	pCi/L	100.00%	RD3214
BETA	8.65E+00	1.9E+00	2.0E+00	2.74E+00	pCi/L	100.00%	RD3214
STRONTIUM	3.99E-02 U	2.0E-01	2.0E-01	7.93E-01	pCi/L	96.20%	RD3204
TC-99	1.10E+01	1.1E+00	5.0E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	3.18E+03 J	1.8E+02	3.9E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	1.70E+00	N/A	2.6E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

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1/25/95

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Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41054203	MATRIX:	WATER
CLIENT ID:	B0D4P8	DATE RECEIVED:	10/26/94

ISOTOPE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	U	0.0E+00	2.2E-01	2.02E-01	pCi/L	56.00%	RD3209
PU239/40	-1.49E-02		3.0E-02	3.0E-02	3.56E-01	pCi/L	56.00%	RD3209
CO-58	-2.64E-01		4.6E+00	4.6E+00	8.81E+00	pCi/L	N/A	RD3219
CO-60	-2.09E+00		5.0E+00	5.0E+00	8.84E+00	pCi/L	N/A	RD3219
CS-137DA	7.64E+00		3.9E+00	3.9E+00	9.48E+00	pCi/L	N/A	RD3219
EU-152	-3.99E+00		8.9E+00	8.9E+00	1.53E+01	pCi/L	N/A	RD3219
EU-154	1.05E+01		1.2E+01	1.2E+01	2.78E+01	pCi/L	N/A	RD3219
EU-155	-7.41E+00		8.6E+00	8.6E+00	1.39E+01	pCi/L	N/A	RD3219
FE-59	-2.18E+00		1.3E+01	1.3E+01	2.34E+01	pCi/L	N/A	RD3219
RU-106DA	3.47E+01		3.5E+01	3.5E+01	7.43E+01	pCi/L	N/A	RD3219
ALPHA	2.20E-01		3.5E-01	3.5E-01	6.88E-01	pCi/L	100.00%	RD3214
BETA	2.19E-01		1.3E+00	1.3E+00	2.93E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.80E-01		2.2E-01	2.3E-01	7.70E-01	pCi/L	92.40%	RD3204
TC-99	-1.70E+00		9.0E-01	4.0E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	8.83E+01	UJ	1.0E+02	2.0E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	0.00E+00	U	N/A	1.0E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

verified aj
1/25/95

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Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41056401	MATRIX:	WATER
CLIENT ID:	B0D4F8	DATE RECEIVED:	10/27/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00 U	0.0E+00	2.6E-01	2.37E-01	pCi/L	47.70%	RD3209
PU239/40	0.00E+00	0.0E+00	2.6E-01	2.36E-01	pCi/L	47.70%	RD3209
CO-58	-4.00E-01	5.3E+00	5.3E+00	9.65E+00	pCi/L	N/A	RD3219
CO-60	3.87E+00	6.6E+00	6.6E+00	1.31E+01	pCi/L	N/A	RD3219
CS-137DA	-1.90E+00	4.7E+00	4.7E+00	7.92E+00	pCi/L	N/A	RD3219
EU-152	-8.50E+00	9.1E+00	9.1E+00	1.42E+01	pCi/L	N/A	RD3219
EU-154	1.94E+01	1.1E+01	1.1E+01	2.91E+01	pCi/L	N/A	RD3219
EU-155	2.48E+00	7.2E+00	7.2E+00	1.26E+01	pCi/L	N/A	RD3219
FE-59	0.00E+00	1.4E+01	1.4E+01	2.66E+01	pCi/L	N/A	RD3219
RU-106DA	3.59E+01	4.1E+01	4.1E+01	8.06E+01	pCi/L	N/A	RD3219
ALPHA	1.69E+00	1.2E+00	1.3E+00	1.42E+00	pCi/L	100.00%	RD3214
BETA	2.17E+02	7.3E+00	1.7E+01	2.96E+00	pCi/L	100.00%	RD3214
STRONTIUM	1.08E-01 U	2.3E-01	2.3E-01	8.70E-01	pCi/L	91.00%	RD3204
TC-99	7.01E+02	4.8E+00	7.9E+01	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	6.81E+03 J	2.4E+02	6.4E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	2.28E+00	N/A	3.4E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

verified aj
1/25/95

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Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41062301	MATRIX:	WATER
CLIENT ID:	B0D4K2	DATE RECEIVED:	10/31/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-6.93E-03 U	9.8E-03	9.9E-03	2.90E-01	pCi/L	60.20%	RD3209
PU239/40	-1.04E-02	1.2E-02	1.2E-02	3.12E-01	pCi/L	60.20%	RD3209
CO-58	1.09E+00	4.9E+00	4.9E+00	9.37E+00	pCi/L	N/A	RD3219
CO-60	4.92E+01	1.3E+01	1.4E+01	N/A	pCi/L	N/A	RD3219
CS-137DA	-6.32E-01 U	4.2E+00	4.2E+00	7.69E+00	pCi/L	N/A	RD3219
EU-152	-2.73E+00	1.1E+01	1.1E+01	1.85E+01	pCi/L	N/A	RD3219
EU-154	-1.27E+01	1.5E+01	1.5E+01	2.40E+01	pCi/L	N/A	RD3219
EU-155	0.00E+00	8.2E+00	8.2E+00	1.35E+01	pCi/L	N/A	RD3219
FE-59	4.44E+00	1.3E+01	1.3E+01	2.39E+01	pCi/L	N/A	RD3219
RU-106DA	3.47E+00	3.8E+01 aj 1/25/95	3.8E+01	6.90E+01	pCi/L	N/A	RD3219
ALPHA	5.11E+00 U	3.5E+00	3.6E+00	3.81E+00	pCi/L	100.00%	RD3214
BETA	6.12E+02	1.3E+01	4.5E+01	3.14E+00	pCi/L	100.00%	RD3214
STRONTIUM	2.21E-01 U	2.6E-01	2.6E-01	9.38E-01	pCi/L	79.90%	RD3204
TC-99	3.80E+03	1.1E+01	4.2E+02	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	4.59E+02 J	1.2E+02	2.2E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	5.89E+00	N/A	8.8E-01	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

verified aj 1/25/95

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Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0272
LAB SAMPLE ID:	41054201	MATRIX:	WATER
CLIENT ID:	B0D4M6	DATE RECEIVED:	10/26/94

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00 U	0.0E+00	2.6E-01	2.31E-01	pCi/L	48.80%	RD3209
PU239/40	6.83E-02	1.7E-01	1.8E-01	4.09E-01	pCi/L	48.80%	RD3209
CO-58	-5.28E-01	6.4E+00	6.4E+00	1.14E+01	pCi/L	N/A	RD3219
CO-60	-4.47E+00	6.3E+00	6.3E+00	1.03E+01	pCi/L	N/A	RD3219
CS-137DA	7.58E-01	4.6E+00	4.6E+00	8.25E+00	pCi/L	N/A	RD3219
EU-152	3.88E+00	1.1E+01	1.1E+01	2.08E+01	pCi/L	N/A	RD3219
EU-154	3.22E+00	1.3E+01	1.3E+01	2.68E+01	pCi/L	N/A	RD3219
EU-155	-4.66E+00	7.6E+00	7.7E+00	1.29E+01	pCi/L	N/A	RD3219
FE-59	1.23E+01	1.1E+01	1.2E+01	2.73E+01	pCi/L	N/A	RD3219
RU-106DA	6.06E+00	3.6E+01	3.6E+01	6.95E+01	pCi/L	N/A	RD3219
ALPHA	1.46E-01	5.3E-01	5.3E-01	1.42E+00	pCi/L	100.00%	RD3214
BETA	9.22E+00	1.9E+00	2.0E+00	2.80E+00	pCi/L	100.00%	RD3214
STRONTIUM	3.55E-01	2.1E-01	2.3E-01	6.95E-01	pCi/L	93.90%	RD3204
TC-99	-7.84E-01	9.2E-01	4.1E+00	2.13E+00	pCi/L	95.10%	ITAS-IT-RS-0001
TRITIUM	2.78E+02 J	1.1E+02	2.0E+02	2.36E+02	pCi/L	97.30%	RD3205
TOTAL-URANIUM	2.05E-01	N/A	3.1E-02	3.54E-03	ug/L	100.00%	RD4200

Number of Results: 16

Verified aj
1/25/95

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ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

December 21, 1994

Attention: Joan Kessner

DEC 1994
RECEIVED
Data
Log In

SAF Number	:	B94-036
Date SDG Closed	:	November 9, 1994
Number of Samples	:	Six (6)
Sample Type	:	Water
SDG Number	:	W0272
Data Deliverable	:	Stand Alone

RECORD COPY

I. Introduction

On October 26, 27, 28, and 31, 1994, a total of six water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
41054201	B0D4M6	Water	10/26/94
41054202	B0D4P6	Water	10/26/94
41054201	B0D4P8	Water	10/26/94
41056401	B0D4F8	Water	10/27/94
41059001	B0D4G6	Water	10/28/94
41062301	B0D4K2	Water	10/31/94

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 ITAS-RD-3209
Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222
Strontium-90 by method ITAS-RD-3204
Liquid Scintillation Counting
Technetium-99 by method ITAS-IT-RS-0001
Tritium by method ITAS-RD-3205
Total Uranium
Total Uranium by method ITAS-RD-4200

III. Quality Control

The analytical results for each analysis performed under SDG W0272 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

Results from the initial radioactivity screening of these samples classified them as Category I.

Alpha Spectroscopy

Plutonium-238, -239/40 by method ITAS-RD-3209
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4M6) results are within contractual limits.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
Pb-212 is detected but not reported for sample B0D4P6 because it is a false positive caused by Eu-152. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4K2) results are within contractual limits.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
Analysis volumes were reduced for sample B0D4K2 and the duplicate of sample B0D4K2 due to high precipitate weights. The LCS, batch blank, sample and sample duplicate results are within contractual limits.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4K2) results are within contractual limits.

Strontium-90 by method ITAS-RD-3204
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4F8) results are within contractual requirements.

Liquid Scintillation Counting

Technetium-99 by method ITAS-IT-RS-0001
The matrix spike yield for sample B0D4K2 is outside of acceptable limits due to the activity in the sample. The sample activity is more than 40 times the activity of the spike that was added. The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4P8) results are within contractual requirements.

Tritium by method ITAS-RD-3205
The LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4M6) results are within contractual requirements.

Total Uranium

Total Uranium by method ITAS-RD-4200
The matrix spike, LCS, batch blank, sample and sample duplicate (duplicate of sample B0D4F8) results are within contractual requirements.

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

Reviewed and approved:

Suzanne Gaines
Project Manager

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: W Setzer	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: ER-8	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl,SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 41054201	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS				410541														
BD D4M6 01	W	10-25-94	1205	X	X	X	X	X	X	X	X	X						
BD D4M7 2	W	10-25-94	1205											X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: AG Pizzo	Date/Time: 10/25/94 1300	Received By: Kel Whitten	Date/Time: 1300 10-25-94
Relinquished By: Kel Whitten	Date/Time: 1130 10-26-94	Received By: R Boyd Quaterra	Date/Time: 10-26-94 1130
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

020

0040

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: L. Setzer, A. Rizzo	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EMS	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-37	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 410541

Preservative			HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2			
Type of Container			P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G			
No. of Container(s)			1	1	1	1	1	8	2	2	1		1			
Volume			1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml			
SAMPLE ANALYSIS			METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 410542	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED A				
Sample No.	Matrix*	Date Sampled	Time Sampled													
BD 04P6 3	W	10-25-94	1045	X	X	X	X	X	X	X	X	X				
BD 04P7 4	W	10-25-94	1045										X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: AG 1220	Date/Time: 10/25/94 1300	Received By:	Date/Time: 1300 10-25-94
Relinquished By:	Date/Time: 1130 10-26-94	Received By: R. Boyd Austin	Date/Time: 10-26-94 1130
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0221

0041

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: K.O. Lee	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GWS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-36	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS	METALS (see S.I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALINITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S.I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED				
410541	A	B	C	D	E	41054203					A				

Sample No.	Matrix*	Date Sampled	Time Sampled														
BD D4P8 5	W	10/25/94	1030	X	X	X	X	X	X	X	X	X					
BD D4P9 6	W	10/25/94	1030										X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
K.O. Lee	10/25/94 1145	B. Whitten	10-25-94 1145
B. Whitten	10-26-94 1130	Q. Boyd Quatrano	10-26-94 1130

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

022

0042

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priorty [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: GWS-122	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-395	BIN of Lading/Air BIN No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)	1	1	1	1	1	8	2	2	1		1				
Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
SAMPLE ANALYSIS 410563	METALS (see S. I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALI-NITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S. I. #2) 410	TRITIUM 564	Tc-99 01	ACTIVI-TY SCAN		METALS (see S. I. #3) FILTERED A				
Sample No.	Matrix*	Date Sampled	Time Sampled												
BO D4F8 01	W	10-26-94	1025	X	X	X	X	X	X	X	X	X			
BO D4F9 2	W	10-26-94	1025									X			

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: AG Simpson		10/26/94 1210
Received By: B.Whitten		10-26-94 1210
Relinquished By: B.Whitten		10-27-94 1130
Received By: LPA		10/27/94 1130
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS
#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

Matrix*
S = Soil
SO = 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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

023

0052

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround: [ ] Priority [X] Normal

Collector: W. V. Setzer	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.	Field Logbook No.: EFL-1125	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W95-0-0001-92	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		

SAMPLE ANALYSIS																	
			Preservative	HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2			
			Type of Container	P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G			
			No. of Container(s)	1	1	1	1	1	8	2	2	1		1			
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE			Volume	1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml			
				METALS (see S. I. #1) UNFILTERED	IC ANIONS-F,Cl, SO4,NO2 PO4	ALKALINITY	TDS	CLP-CYANIDE	GROSS ALPHA/BETA, (see S. I. #2)	TRITIUM	Tc-99	ACTIVITY SCAN		METALS (see S. I. #3) FILTERED			
410589				A	B	C	D	E	5105	9001	—	—		A			
Sample No.	Matrix*	Date Sampled	Time Sampled														
BD D4G6 01	W	10/27/94	1000	X	X	X	X	X	X	X	X	X					
BD D4G7 2	W	10/27/94	1000											X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
AJ SIMPSON AJ Simpson	10/28/94 0900	Butcher	10-28-94 0900
Butcher	10-28-94 1045	Quantera	10/28/94 1045

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priority [X] Normal

Collector: A Simpson	Company Contact: PH BUTCHER	Telephone No.: 509-376-4388
Project Designation: 200-BP-5	Sampling Location: 200 Areas	SAF No.: B94-036
Ice Chest No.: EK40	Field Logbook No.: EFL-1020	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: W950-0001-44	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks:		

Sample No.	Matrix*	Date Sampled	Time Sampled	METALS (see S.I. #1) UNFILTERED A	IC ANIONS-F,Cl, SO4,NO2 PO4 B	ALKALINITY C	TDS D	CLP-CYANIDE E	GROSS ALPHA/BETA, (see S.I. #2) 410623	TRITIUM 01	Tc-99 —	ACTIVITY SCAN		METALS (see S.I. #3) FILTERED A				
Preservative				HNO3<2	COOL 4	COOL 4	COOL 4	NaOH>12	HNO3 <2		HCl <2			HNO3<2				
Type of Container				P/G	G	P/G	P	P	G/P	Gs	G/P	G/P		P/G				
No. of Container(s)				1	1	1	1	1	8	2	2	1		1				
Volume				1000ml	500ml	250ml	250ml	1000ml	1000ml	1000ml	1000ml	40ml		1000ml				
BD D4K2	01	W	10-28-94	0940	X	X	X	X	X	X	X	X	X					
BD D4K3	2	W	10-28-94	0940										X				

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS: 410622

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: AJ SIMPSON AJSimpson		10/28/94 1125
Received By: BWHitt		10-28-94 1125
Relinquished By: BWHitt		10-31-94
Received By: Quantera B Brumfield		10/31/94 9:45
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

#1: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(UNFILTERED)
#2: GROSS ALPHA/BETA;GAMMA SCAN-Cs-137,Co-60,Ru-106;Pu238/239/240, Sr-90,TOTAL URANIUM
#3: METALS-Ca,Mg,Na,K,Fe,Mn,Si,Al,Bi; AA METALS-Selenium(FILTERED)

NOTE: DATA DELIVERABLE-STANDALONE

SDG W0272

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

025

0062

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 200-BP-5	DATA PACKAGE: W0272-QES	
VALIDATOR: A. Jensen	LAB: Quanterra	DATE: 1/25/95
CASE:	SDG:	

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☐ Gamma Spectroscopy	
☒ Total Uranium	☐ Radium-22	☒ Tritium	☐		

SAMPLES/MATRIX	
	B0D4M6
	B0D4P6
	B0D4P8
	B0D4F8
	B0D4G6
	B0D4K2 / ALL WATER

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

2. Initial Calibration . . . . . ☐ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . (Yes) No N/A

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . . (Yes) No N/A
Calibration check acceptable? . . . . . (Yes) No N/A
Calibration check standards NIST traceable? . . . . . (Yes) No N/A
Calibration check standards expired? . . . . . Yes (No) N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . (Yes) No N/A
Method blank results acceptable? . . . . . (Yes) No N/A
Analytes detected in method blank? . . . . . Yes (No) N/A
Field blank(s) analyzed? . . . . . (Yes) No N/A
Field blank results acceptable? . . . . . (Yes) No N/A
Analytes detected in field blank(s)? . . . . . Yes (No) N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments:

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . see note . . . . . Yes (No) N/A
Spike recoveries acceptable? . . . . . (Yes) No N/A
Spike source traceable? . . . . . (Yes) No N/A
Spike source expired? . . . . . Yes (No) N/A
Transcription/Calculation Errors? . . . . . Yes (No) N/A

Comments: A matrix spike was not analyzed for tritium. Data qualification required: "J/UJ"

028

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments:_____

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No (N/A)
Field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Field split sample(s) analyzed? . . . . . Yes No (N/A)
Field split RPD values acceptable? . . . . . Yes No (N/A)
Performance audit sample(s) analyzed? . . . . . Yes No (N/A)
Performance audit sample results acceptable? . . . . . Yes No (N/A)

Comments: _____

10. Holding Times

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: see attached Holding Time Summary

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? . see note . . . . . (Yes) No N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments: The laboratory has stated that the analysis volume for gross alpha was reduced for sample B0D4K2 due to a high precipitate weight. Therefore, the RDL for this sample is 6 pCi/L. ~~and the sample result has been qualified as undetected: "U"~~. aj 11/25/95 Data qualification is not required.
see attached "Gross Alpha Raw Data" form

030

HOLDING TIME SUMMARY

SDG: W0272-QES	VALIDATOR: A. Jensen	DATE: 1/24/95	PAGE 1 OF 7
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Strontium90	10/25/94	N/A	11/15/94	N/A	≤ 180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY

SDG: W0272-QES	VALIDATOR: A. Jensen	DATE: 1/24/95	PAGE 2 OF 7

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Gross B	10/25/94	N/A	11/21/94	N/A	≤ 180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY

SDG: W0272-QES	VALIDATOR: A. Jensen	DATE: 1/24/95	PAGE 3 OF 7

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Tritium	10/25/94	~~N/A~~ 11/18/94	11/22/94	≤ 7	≤ 180	NONE
BOD4P6	↓	10/25/94	11/18/94	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY

SDG: W0272-QES | VALIDATOR: A. Jensen | DATE: 1/24/95 | PAGE 4 OF 7

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Gamma spec	10/25/94	N/A	11/26/94	N/A	≤ 180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY

SDG: W0272-QES	VALIDATOR: A. Jensen	DATE: 1/24/95	PAGE 5 OF 7

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Gross α	10/25/94	N/A	11/27/94	N/A	≤ 180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY

SDG: W0272-QES | VALIDATOR: A. Jensen | DATE: 1/24/95 | PAGE 6 OF 7

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Technetium-99	10/25/94	N/A	12/07/94	N/A	≤180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

HOLDING TIME SUMMARY

SDG: W0272-QES | VALIDATOR: A. Jensen | DATE: 1/24/95 | PAGE 7 OF 7

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOD4M6	Alpha spec	10/25/94	N/A	12/08/94	N/A	≤180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓
BOD4M6	Total Uranium	10/25/94	N/A	11/28/94	N/A	≤180	NONE
BOD4P6	↓	10/25/94	↓	↓	↓	↓	↓
BOD4P8	↓	10/25/94	↓	↓	↓	↓	↓
BOD4F8	↓	10/26/94	↓	↓	↓	↓	↓
BOD4G6	↓	10/27/94	↓	↓	↓	↓	↓
BOD4K2	↓	10/28/94	↓	↓	↓	↓	↓

Plutonium		
HEIS No.:	BOD4P6	BOD4G6
Lab ID:	410454202	41059001
Aliquot:	2.00E-01	2.00E-01
Pu238 net cpm:	0.003	-0.002
Pu238 bkg cpm:	0.002	0.002
Spl count time:	200	200
Bkg count time:	1000	1000
Pu238 Eff d/c:	3.703	3.703
Decay:	1	1.001
Yield:	0.525	0.558
Pu238 calc:	4.77E-02	-2.99E-02
Pu238 rptd:	4.77E-02	-2.99E-02
Pu238 MDA calc:	4.49E-01	4.23E-01
Pu238 MDA rptd:	4.49E-01	4.23E-01
Pu239 net cpm:	0.004	-0.001
Pu239 bkg cpm:	0.001	0.001
Pu239 d/c:	3.703	3.703
Pu239 decay:	1	1
Pu239 calc:	6.35E-02	-1.49E-02
Pu239 rptd:	6.36E-02	-1.50E-02
Pu239 MDA calc:	3.80E-01	3.58E-01
Pu239 MDA rptd:	3.80E-01	3.58E-01

Gross Alpha		
HEIS No.:	BOD4P6	BOD4G6
Lab ID:	41054202	41059001
Aliquot:	2.00E-01	2.00E-01
Net counts:	-0.004	0.138
Bkg counts:	0.024	0.022
Spl count time:	50	50
Bkg count time:	500	500
d/c:	2.257	4.143
Calc.:	-2.03E-02	1.29E+00
Rptd:	-2.03E-02	1.29E+00
MDA calc:	7.93E-01	1.42E+00
MDA rptd:	7.93E-01	1.42E+00

Gross Beta		
HEIS No.:	B0D4P6	B0D4G6
Lab ID:	41054202	41059001
Aliquot:	2.00E-01	2.00E-01
Net counts:	0.226	1.466
Bkg counts:	0.884	0.884
Spl count time:	100	100
Bkg count time:	500	500
d/c:	2.432	2.618
Calc.:	1.24E+00	8.64E+00
Rptd:	1.24E+00	8.65E+00
MDA calc:	2.55E+00	2.74E+00
MDA rptd:	2.55E+00	2.74E+00

Strontium 90		
HEIS No.:	BOD4P6	BOD4G6
Sample:	41054202	41059001
Sep date:	11/11/94	11/11/94
Sep time:	16:00	16:00
Count date:	11/15/94	11/15/94
Count time:	11:45	13:30
Hours:	91.75	93.5
Sample amt:	1.01E+00	1.03E+00
Net, cpm:	0.578	0.066
Count time:	50	50
Bkg, cpm:	1.062	1.154
Count time:	500	500
D/C 1:	2.254	2.294
D/C 2:	1.864	1.879
D/C 3:	2.016	2.021
Yield:	0.912	0.962
Calc:	3.74E-01	3.99E-02
Rptd:	3.74E-01	3.99E-02
MDA, Calc:	8.07E-01	7.92E-01
MDA, rptd:	8.07E-01	7.93E-01

Technetium-99		
HEIS No.:	BOD4P6	BOD4G6
Sample:	41054202	41059001
Bkg cpm:	25.67	25.67
Spl, amt:	5.00E-01	5.00E-01
Spl cpm:	28.02	36.81
Count time:	125	125
Spl dpm:	30.13	39.92
d/c:	1.055	1.055
Yield:	0.951	0.951
Blk, dpm:	2.97E+01	2.97E+01
Calc:	1.76E+00	1.10E+01
Rptd:	1.76E+00	1.10E+01
MDA, calc:	2.13E+00	2.13E+00
MDA, rptd:	2.13E+00	2.13E+00

Tritium		
HEIS NO.:	BOD4P6	BOD4G6
Sample:	41054202	41059001
BLANK Bkg cpm:	5.92	5.92
Spl,amt:	5.00E-03	5.00E-03
Spl,cpm:	6.62	19.94
Count time:	125	125.00
Spl, dpm:	16.24	48.79
d/c:	2.466	2.466
Yield:	0.973	0.973
BLANK,dpm:	15.01	15.01
Calc:	1.51E+02	3.17E+03
Rptd:	1.53E+02	3.18E+03
MDA, calc:	2.33E+02	2.33E+02
MDA, rptd:	2.36E+02	2.36E+02

Total Uranium		
HEIS No.:	B0D4P6	B0D4G6
Lab ID:	41054202	41059001
ng, raw:	3.00E-02	1.70E+01
L, sample:	1.00E-01	1.00E-01
Dil. vol:	10	10
Yield, corr:	1	1
Calc.:	3.00E-03	1.70E+00
Rptd:	3.00E-03	1.70E+00

Gross Alpha Raw Data

✓ WEM 11/28/94

DATE 28-Nov-94 CALCULATED RESULTS SUMMARY dir$era_caldat:410623-ALPHA PAGE 1

(NUM)	IT #	ISOTOPE	RESULT	ERROR*	COUNT ERROR*	YIELD	CALC MDA	UNITS	COMMENTS	DIAGNOSTICS
(1)	L106231B	ALPHA	9.972E-03	1.041E-01	1.041E-01	1.000	7.10E-01	PCI/L		
(2)	L106231B	ALPHA	9.972E-03	1.041E-01	1.041E-01	1.000	7.10E-01	PCI/L	AVER	
(3)	L106231S	ALPHA	2.062E+01	2.257E+00	1.443E+00	1.000	6.90E-01	PCI/L		
(4)	L106231S	ALPHA	2.062E+01	2.257E+00	1.443E+00	1.000	6.90E-01	PCI/L	AVER	21.72 ok WEM 11/28/94
			22.484 ± .2032							
(5)	41062301	ALPHA	5.110E+00	1.781E+00	1.763E+00	1.000	3.81E+00	PCI/L		
(6)	41062301	ALPHA	5.110E+00	1.781E+00	1.763E+00	1.000	3.81E+00	PCI/L	AVER	
(7)	F1062301	ALPHA	4.448E+00	1.713E+00	1.699E+00	1.000	4.27E+00	PCI/L		
(8)	F1062301	ALPHA	4.448E+00	1.713E+00	1.699E+00	1.000	4.27E+00	PCI/L	AVER	
(9)	41054201	ALPHA	1.455E-01	2.650E-01	2.649E-01	1.000	1.42E+00	PCI/L		
(10)	41054201	ALPHA	1.455E-01	2.650E-01	2.649E-01	1.000	1.42E+00	PCI/L	AVER	
(11)	41054202	ALPHA	-2.034E-02	1.076E-01	1.076E-01	1.000	7.93E-01	PCI/L		
(12)	41054202	ALPHA	-2.034E-02	1.076E-01	1.076E-01	1.000	7.93E-01	PCI/L	AVER	
(13)	41054203	ALPHA	2.203E-01	1.767E-01	1.757E-01	1.000	6.88E-01	PCI/L		
(14)	41054203	ALPHA	2.203E-01	1.767E-01	1.757E-01	1.000	6.88E-01	PCI/L	AVER	
(15)	41056401	ALPHA	1.693E+00	6.299E-01	6.221E-01	1.000	1.42E+00	PCI/L		
(16)	41056401	ALPHA	1.693E+00	6.299E-01	6.221E-01	1.000	1.42E+00	PCI/L	AVER	
(17)	41059001	ALPHA	1.288E+00	5.376E-01	5.314E-01	1.000	1.42E+00	PCI/L		
(18)	41059001	ALPHA	1.288E+00	5.376E-01	5.314E-01	1.000	1.42E+00	PCI/L	AVER	

deep within 35 MDA's meet adjusted CL of 6 pCi/l. WEM 11/28/94

WEM 11/28/94

EQEG 526 $\frac{4.4968 \pm 0.040640 \text{ dpm}}{0.2\ l}$ pCi = 22.484 ± 0.2032 pCi/l

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