TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

START
BOC2V7-TMA-786
0045603
JUL 1994 RECEIVED Data Log In

July 26, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope

Two water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on June 28, 1994 from TMA/Norcal. The samples were analyzed for the ICP metals. The analysis was performed under TMA/Skinner and Sherman work order S406227.

Methodology

The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion

All quality control requirements were met for the samples with the following exceptions:

The matrix spike recovery for aluminum exceeded the control limit requirement.

The laboratory duplicates for aluminum, iron and manganese exceeded the control limit requirements.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

OCT 1996 RECEIVED EDMC

8/9/96

9613503.0313

DON'T SAY IT --- *Write It!*

DATE: September 14, 1994

TO: B0C2V7-TMA-786

FROM: Pat Reich H4-19

Telephone: 372-2785

cc:

SUBJECT: FINAL VAL SUMMARY FOR 300-FF-5, 2ND QTR

THE FINAL VALIDATION SUMMARY FOR THIS DATA PACKAGE IS FILED IN SDG # W0106-ITC-095.

PAT REICH
DATA MANAGEMENT & VALIDATION

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0C2V7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V7

Matrix (soil/water): WATER Lab Sample ID: 06227-01S

Level (low/med): LOW Date Received: 06/28/94

% 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	93.6	B	N*	P
7440-36-0	Antimony	16.1	U		P
7440-39-3	Barium	34.0	B		P
7440-41-7	Beryllium	0.60	U		P
7440-43-9	Cadmium	0.80	U		P
7440-70-2	Calcium	16600			P
7440-47-3	Chromium	3.7	U		P
7440-48-4	Cobalt	2.3	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	96.0	B	*	P
7439-95-4	Magnesium	3870	B		P
7439-96-5	Manganese	7.2	B	*	P
7440-02-0	Nickel	7.9	U		P
7440-09-7	Potassium	769	B		P
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	2150	B		P
7440-62-2	Vanadium	2.5	U		P
7440-66-6	Zinc	5.6	B		P

Color Before: COLORLESS Clarity Before: CLOUDY Texture:

Color After: COLORLESS Clarity After: CLOUDY Artifacts:

Comments:

9613503.0315

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B0C2W0

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V7

Matrix (soil/water): WATER Lab Sample ID: 06227-02S

Level (low/med): LOW Date Received: 06/28/94

% 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	91.6	B	N*	P
7440-36-0	Antimony	16.1	U		P
7440-39-3	Barium	34.0	B		P
7440-41-7	Beryllium	0.60	U		P
7440-43-9	Cadmium	0.80	U		P
7440-70-2	Calcium	17000			P
7440-47-3	Chromium	3.7	U		P
7440-48-4	Cobalt	2.3	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	105		*	P
7439-95-4	Magnesium	3860	B		P
7439-96-5	Manganese	6.2	B	*	P
7440-02-0	Nickel	7.9	U		P
7440-09-7	Potassium	700	B		P
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	2210	B		P
7440-62-2	Vanadium	2.5	U		P
7440-66-6	Zinc	4.3	B		P

Color Before: COLORLESS Clarity Before: CLOUDY Texture:

Color After: COLORLESS Clarity After: CLOUDY Artifacts:

Comments:

003

9613503.0316

AIRBILL PACKAGE TRACKING NUMBER 9552162561

4125 9552162561

0941-5760-9 6-27-94

SAMPLE CONTROL 510-235-2633

TMA/NORCAL

2030 WRIGHT AVE

RICHMOND CA 94804

2340-6406

X

SAMPLE CONTROL 617 890-72

SKINNER & SHERMAN LAB.

300 SECOND AVE

WALTHAM MA. 02254

X X

1.48

1.48

REVISION DATE 3/94

158

Sample Login Sheet

Workorder 54-06-227 Client Hanford WCS Number/Type of Samples 2 waters
Protocol CLP Turnaround 33 days Cooler Temp: 3.0 °C or N/A Cooler Yes/No
Custodian: D Montoya Shipper & # Fedex SDG/Batch# NA
Custody Seal: Present/Absent/Intact/Not Client Case# N4-06-087
Purchase Order/Contract# N4-06-087 Client Contact D. Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 6/28/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	B0C2V7	water	6/28/94	1.64	ICP metals - unfiltered	
2	B0C2W0	↓	↓	1.61	↓ (DS)	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12					Complete	
13						
14						
15					DRM 6/28/94	
16						
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes No ✓

Subcontract: Yes/No, To: Date:

Reviewed Date

1161

* EPA/CLP required

Rev 1.7

 9613503.0318 TMA/Nortel CHAIN OF CUSTODY ORD # N4-06-087

RCVD: 06/27/94 DUE: 08/01/94 06/27/94 14:24:20 KEEP: 08/01/95 DISP: S

DASH	SAMPLE IDENTIFICATION		STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY
01A-W	B0C2V7	UNFILTERED	S&S	: WH007
02A-W	B0C2W0	UNFILTERED	S&S	: WH007
02B-W	B0C2W0 MS	UNFILTERED	S&S	: WH007
02C-W	B0C2W0 DUP	UNFILTERED	S&S	: WH007
02D-W	L C S		S&S	: WH007
03A-W	B0C2V8	FILTERED	S&S	: WH007
04A-W	B0C2W1	FILTERED	S&S	: WH007
04B-W	B0C2W1 MS	FILTERED	S&S	: WH007
04C-W	B0C2W1 DUP	FILTERED	S&S	: WH007
04D-W	L C S		S&S	: WH007

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
Yamamoto	6/27/94	Skinner	6/27/94	D Martineau	6/28/94

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Turnaround: [ ] Priority [X] Normal

Collector: Rick Mackley	Company Contact: LC Hulstrom	Telephone No.: (509) 376-4034
Project Designation: 300-FF-5	Sampling Location: 300-FF-5 S653	SAF No.: 94-083
Ice Chest No.: N/A	Field Logbook No.: BNW 55520	Method of Shipment: Fed Ex
Shipped To: TMA	Offsite Property No.: PNL-94-1311	Bill of Lading/Air Bill No.: 3123691502

Possible Sample Hazards/Remarks:

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

SAMPLE ANALYSIS			
Preservative	HNO_3	HNO_3	HNO_3
Type of Container	P	P	P
No. of Container(s)	1	1	1
Volume	1000 ml	1000 ml	1000 ml
	URAN	ICP	ICP(F)

Sample No.	Matrix*	Date Sampled	Time Sampled	URAN	ICP	ICP(F)
B0C2V7	V	6/23/94	1218	1	1	
B0C2V8	V	6/23/94	1218	~~1~~ 2		1
	V					
	V					
	V					
	V					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Rick Mac	6/23/94 1500	TL VanArsdale	6/23/94 1500
TL VanArsdale	6/24/94 1210	[illegible]	6/27/94 11:30

SPECIAL INSTRUCTIONS:

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 8000-820 (12/92)

96 5A

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Turnaround: [ ] Priority [X] Normal

Collector: Reck, Mackland	Company Contact: LC Hulstrom	Telephone No.: (509) 376-4034
Project Designation: 300-FF-5	Sampling Location: 300-FF-5 S11S10	SAF No.: 94-083
Ice Chest No.: N/A	Field Logbook No.: BNW 55520	Method of Shipment: FED EX
Shipped To: TMA	Offsite Property No.: PNL-94-1311	Bill of Lading/Air Bill No.: 3123691502

Possible Sample Hazards/Remarks:

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

SAMPLE ANALYSIS			
Preservative	HNO_3	HNO_3	HNO_3
Type of Container	P	P	P
No. of Container(s)	1	1	1
Volume	1000 ml	1000 ml	1000 ml
	URAN	ICP	ICP(F)
	✓	✓	✓

Sample No.	Matrix*	Date Sampled	Time Sampled	URAN	ICP	ICP(F)
BOC2W0	V	6/23/94	1108	1	1	
BOC2W1	V	6/23/94	1108			1
	V					
	V					
	V					
	V					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature] PNL	Date/Time: 6/23/94 1500	Received By: TL VanArsdale [signature]	Date/Time: 6/23/94 1500
Relinquished By: TL VanArsdale [signature]	Date/Time: 6/24/94 1210	Received By: [signature]	Date/Time: 6/27/94 11:50
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS:

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-80X0-820 (12/92)

9413504.0304

065B

9613503.0321

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

JUL 1994
RECEIVED
SDLA

RECORD COPY

July 26, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Two water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on June 28, 1994 from TMA/Norcal. The samples were analyzed for the ICP metals. The analysis was performed under TMA/Skinner and Sherman work order S406228.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The matrix spike recovery for aluminum exceeded the control limit requirement.

The ICP serial dilution for magnesium and sodium exceeded the control limit requirements.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

1 sw 8/9/96

SAMPLE NUMBER:

B0C2V8

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V8

Matrix (soil/water): WATER Lab Sample ID: 06228-01S

Level (low/med): LOW Date Received: 06/28/94

% 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	31.4	B	N	P
7440-36-0	Antimony	16.1	U		P
7440-39-3	Barium	31.9	B		P
7440-41-7	Beryllium	0.60	U		P
7440-43-9	Cadmium	0.80	U		P
7440-70-2	Calcium	16500			P
7440-47-3	Chromium	3.7	U		P
7440-48-4	Cobalt	2.3	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	15.0	U		P
7439-95-4	Magnesium	3860	B	E	P
7439-96-5	Manganese	0.70	U		P
7440-02-0	Nickel	7.9	U		P
7440-09-7	Potassium	617	B		P
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	2100	B	E	P
7440-62-2	Vanadium	2.5	U		P
7440-66-6	Zinc	3.2	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments.

SAMPLE NUMBER:

B0C2W1

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-0375AS No.: SDG No.: B0C2V8

Matrix (soil/water): WATER Lab Sample ID: 06228-025

Level (low/med): LOW Date Received: 06/28/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	23.8	U	N	P
7440-36-0	Antimony	16.1	U		P
7440-39-3	Barium	31.9	B		P
7440-41-7	Beryllium	0.60	U		P
7440-43-9	Cadmium	0.80	U		P
7440-70-2	Calcium	16200			P
7440-47-3	Chromium	3.7	U		P
7440-48-4	Cobalt	2.3	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	15.0	U		P
7439-95-4	Magnesium	3830	B	E	P
7439-96-5	Manganese	0.70	U		P
7440-02-0	Nickel	7.9	U		P
7440-09-7	Potassium	711	B		P
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	2110	B	E	P
7440-62-2	Vanadium	2.5	U		P
7440-66-6	Zinc	3.2	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613[illegible]

TMA/Skinner & Sherman Laboratories
Sample Login Sheet

Workorder 54-06-228 Client Hanford Nes Number/Type of Samples 2 waters
Protocol CLP Turnaround 33 days Cooler Temp: 3.0 °C or N/A Cooler Yes/No
Custodian: D Martineau Shipper &# Fedex SDG/Batch# NA -
Custody Seal: Present/Absent/Intact/Not Client Case# N4 06-087
Purchase Order/Contract# N4-06-087 Client Contact D Sanchez
Tag#: Present/Absent/NA/(See COC) Chain of Custody: Present/Absent/NA,#

Sample Containers - Intact/Broken Comment:
Client Comment? Yes/No
Sample labels agree with Chain of Custody Information? Yes/No (Comment)
Client paperwork agrees with samples and Chain of Custody? Yes/No (Comment)
Shipment Dates: 6/28/94
List any date with paperwork/shipment problems & specify the problem:

	Client ID	Matrix	Received	pH*	Test(s) & QC	Holding Times
1	BOCW8	water	6/28/94	1.72	ICP metals - Filtered	
2	BOCW1	↓	↓	2.48	↓ (D,S)	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13			Complete			
14						
15						
16			DRM	6/28/94		
17						
18						
19						
20						

These samples are from a site known to have Radioactive Contamination: Yes ✓ No
These samples have detectable amounts of Radioactive Material: Yes No ✓

Subcontract: Yes/No, To: Date:

Reviewed Date

* EPA/CLP required

Rev 1.7

9613503.0325

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

AUG 1994
RECEIVED
SDLA

July 29, 1994

Ref: TMA/Norcal N4-06-089-7391

Ms. Briana Colley
Westinghouse Hanford Company
345 Hills Street
Richland, WA 99352

Dear Ms. Colley:

Enclosed is the data report for the two water samples received on June 27, 1994. The samples were designated as 300-FF-5.

Results are given for total uranium.

The data package is paginated 1 through 80.

Please call if you have any questions concerning this data.

Sincerely,

N. Joseph Verville

N. Joseph Verville
Nuclear Program Manager
TMA/Norcal

NJV/ss

Enclosure: Data Package

SW 8-9-96

TMA/Norcal

Report N4-06-089-7391
Sample Delivery Group 7391

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

July 29, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7391 is comprised of two water samples designated as SAF# 94-083.

There were no unique ID's to identify the Chain-of-Custody documents, however, the project designation on each document was SAF# 94-083.

One 1000 mL poly bottle containing each sample was received for analyses.

2.0 ANALYSIS NOTES

2.1 Total Uranium Analyses

The MDA of the laboratory control sample was greater than the RDL due to dilutions performed on the sample to achieve a response in the calibration range of the laser phosphorimeter (KPA). Both samples contained uranium concentrations greater than the RDL.

9615503.0327

N406089-01

TMA NORCAL

SAMPLE DELIVERY GROUP 7391

DATA SHEET

BOC2V7

SDG	7391	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N406089-01	Client sample id	BOC2V7
Dept sample id	7391-001	Location/Matrix	300-FF-5 S6S3 LIQUID
Received	06/27/94	Collected	06/23/94
		Chain of custody id	BNW55520

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Total Uranium (ug/L)	7440-61-1	0.48	0.10	0.05	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	3.00
Report date	07/28/94

TMA NORCAL

SAMPLE DELIVERY GROUP 7391

DATA SHEET

N406089-02

B0C2W0

SDG	7391	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N406089-02	Client sample id	B0C2W0
Dept sample id	7391-002	Location/Matrix	300-FF-5 S11S10 LIQUID
Received	06/27/94	Collected	06/23/94
		Chain of custody id	BNW55520

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Total Uranium (ug/L)	7440-61-1	0.44	0.093	0.05	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	3.00
Report date	07/28/94

9613503.0329

VALIDATION SUMMARY

9613503.0330

DON'T SAY IT --- *Write It!*

DATE: September 14, 1994

TO: BOC2V7-TMA-786

FROM: Pat Reich H4-19

Telephone: 372-2785

cc:

SUBJECT: FINAL VAL SUMMARY FOR 300-FF-5, 2ND QTR

THE FINAL VALIDATION SUMMARY FOR THIS DATA PACKAGE IS FILED IN SDG # W0106-ITC-095.

PAT REICH
DATA MANAGEMENT & VALIDATION

8/26/94

Data Validation Check List

for Project 300-FF-5

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N VOA	Y N SEMI VOA	Y N PEST/PCB	Y N WETCHEM	Y N METALS	COMMENTS	Y N RADCHEM	Date OSM Rcvd DP
B0C2V7		B0C2V7	786	TMA/NORCAL	N	N	N	N	Y 7/29/94	06/27/94 - SAF-94-083	Y 8/01/94	8/01/94
B0C2V8		B0C2V7	786	TMA/NORCAL	N	N	N	N	Y 7/29/94	06/27/94 - SAF-94-083	N	8/01/94
B0C2W0		B0C2V7	786	TMA/NORCAL	N	N	N	N	Y 7/29/94	06/27/94 - SAF-94-083	Y 8/01/94	8/01/94
B0C2W1		B0C2V7	786	TMA/NORCAL	N	N	N	N	Y 7/29/94	06/27/94 - SAF-94-083	N	7/29/94

Data Entry Complete: DP SKW

DATATRAC
8/26/94

Validation Rcvd 8/26/94

9613503.0332

MEMORANDUM

AUG 1994 RECEIVED 100

TO: 300-FF-5 Project QA Record

August 25, 1994

FR: Susan Manchester, Golder Associates Inc. sgm

RE: METALS DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0C2V7-TMA-786 (943-1610.001, Filename B0C2V7-M.FF5)

INTRODUCTION

This memo presents the results of data validation on data package B0C2V7-TMA-786 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

RECEIVED AUG 26 1994 VALIDATION DOCUMENTATION SDLA

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0C2V7	06/23/94	Water	See Note 1
B0C2V8	06/23/94	Water (Filtered)	
B0C2W0	06/23/94	Water	
B0C2W1	06/23/94	Water (Filtered)	

Note 1. Samples were analyzed for CLP metals analyzed by ICP.

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. 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 with the exception of the deficiencies identified below.

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 as specified in the reference analytical method.

001

Completeness. The data package was complete for all requested analyses. A total of four samples were validated in this data package with a total of 72 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

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 as estimated.

Laboratory Blanks

- **Positive Blanks.** Aluminum, barium, and zinc were detected at positive concentrations in the associated calibration and/or preparation blanks. Attachments 2 and 5 provide a summary of the analytes detected, samples affected, data qualifications applied and supporting documentation.

- **Negative Blanks.** Chromium and iron were detected at negative 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

- The matrix spike percent recovery (MS %R) for aluminum was unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

Laboratory Duplicate

- Laboratory duplicate results for iron and manganese were unacceptable. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.

ICP Serial Dilution

- ICP serial dilution percent difference (%D) for magnesium and sodium were unacceptable. 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, Validation of 300-FF-5 Data, Statement of Work, Environmental and Waste Characterization Analytical Data Validation, Task Order MSH-SWV-315905, August 10, 1994, Westinghouse Hanford Company, Richland, Washington.

9613503.0335

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 data validation the concentration 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 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

SDG: B0C2V7-TMA-786	VALIDATOR:	DATE: August 25, 1994	PAGE 1 OF 1
COMMENTS: METALS ANALYSIS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ALUMINUM	U	B0C2V7 B0C2W0	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
BARIUM	U	B0C2V7 B0C2W0 B0C2V8 B0C2W1	PRESENT IN PREP. BLANK AT A POSITIVE CONCENTRATION
ZINC	U	B0C2V7 B0C2W0	PRESENT IN ICB, CCB AND PREP. BLANK AT POSITIVE CONCENTRATIONS
IRON	BJ J	B0C2V7 B0C2W0	DUPLICATE RESULT > ± CRDL AND SAMPLE RESULT < 5xCRDL
MANGANESE	BJ BJ	B0C2V7 B0C2W0	DUPLICATE RESULT > ± CRDL AND SAMPLE RESULT < 5xCRDL
CHROMIUM	UJ	B0C2V8 B0C2W1	PRESENT IN PREP. BLANK AT A NEGATIVE CONCENTRATION
IRON	UJ	B0C2V8 B0C2W1	PRESENT IN PREP. BLANK AT A NEGATIVE CONCENTRATION
MAGNESIUM	BJ	B0C2V8 B0C2W1	ICP SERIAL DILUTION %D > 10% AND SAMPLE CONCENTRATION > 50xIDL
SODIUM	BJ	B0C2V8 B0C2W1	ICP SERIAL DILUTION %D > 10% AND SAMPLE CONCENTRATION > 50xIDL
ALUMINUM	BJ	B0C2V8	MS %R > 125%

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: BOC2V7-TMA-786

	Samp#	BOC2V7		BOC2V8		BOC2W0		BOC2W1	
	Date	6-23-94		6-23-94		6-23-94		6-23-94	
	Location	SPRING 6,3 ft		SPRING 6,3 ft		SPRING 11,10 ft		SPRING 11,10 ft	
	Depth	3.17		3.17		5.00		5.00	
	Type	SPLIT		SPLIT		SPLIT		SPLIT	
	Comments	---		FILTERED		---		FILTERED	
Parameter	Units	Result	Q	Result	Q	Result	Q	Result	Q
ALUMINUM	UG/L	93.600	U	31.400	BJ	91.600	U	23.800	U
ANTIMONY	UG/L	16.100	U	16.100	U	16.100	U	16.100	U
BARIUM	UG/L	34.000	U	31.900	U	34.000	U	31.900	U
BERYLLIUM	UG/L	0.600	U	0.600	U	0.600	U	0.600	U
CADMIUM	UG/L	0.800	U	0.800	U	0.800	U	0.800	U
CALCIUM	UG/L	16600.000		16500.000		17000.000		16200.000	
CHROMIUM	UG/L	3.700	U	3.700	UJ	3.700	U	3.700	UJ
COBALT	UG/L	2.300	U	2.300	U	2.300	U	2.300	U
COPPER	UG/L	2.500	U	2.500	U	2.500	U	2.500	U
IRON	UG/L	96.000	BJ	15.000	UJ	105.000	J	15.000	UJ
MAGNESIUM	UG/L	3870.000	B	3860.000	BJ	3860.000	B	3830.000	BJ
MANGANESE	UG/L	7.200	BJ	0.700	U	6.200	BJ	0.700	U
NICKEL	UG/L	7.900	U	7.900	U	7.900	U	7.900	U
POTASSIUM	UG/L	769.000	B	617.000	B	700.000	B	711.000	B
SILVER	UG/L	3.700	U	3.700	U	3.700	U	3.700	U
SODIUM	UG/L	2150.000	B	2100.000	BJ	2210.000	B	2110.000	BJ
VANADIUM	UG/L	2.500	U	2.500	U	2.500	U	2.500	U
ZINC	UG/L	5.600	U	3.200	U	4.300	U	3.200	U

Verified
Sgw 8/25/94

96135503.0340

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0C2V7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V7

Matrix (soil/water): WATER 300-FF-5 Spring #6 Site 3 ft. Bottom Depth, Split Lab Sample ID: 06227-01S

Level (low/med): LOW Date Received: 06/28/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	93.6	~~B~~	N*	P	U
7440-36-0	Antimony	16.1	U		P	
7440-39-3	Barium	34.0	~~B~~		P	U
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	0.80	U		P	
7440-70-2	Calcium	16600			P	
7440-47-3	Chromium	3.7	U		P	
7440-48-4	Cobalt	2.3	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	96.0	~~B~~	*	P	BJ
7439-95-4	Magnesium	3870	B		P	
7439-96-5	Manganese	7.2	~~B~~	*	P	BJ
7440-02-0	Nickel	7.9	U		P	
7440-09-7	Potassium	769	B		P	
7440-22-4	Silver	3.7	U		P	
7440-23-5	Sodium	2150	B		P	
7440-62-2	Vanadium	2.5	U		P	
7440-66-6	Zinc	5.6	~~B~~		P	U

Color Before: COLORLESS Clarity Before: CLOUDY Texture:

Color After: COLORLESS Clarity After: CLOUDY Artifacts:

Comments:

Verified sgm 8/24/94

~~002~~

010

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0C2V8
Filtered

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V8

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 06228-01S

Level (low/med): LOW ~~Split Spring #6~~ Date Received: 06/28/94

% Solids: 0.0 Site 3 ft, Bottom Depth, Filtered Split, ~~Filter~~ sgm 8/25/94

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	31.4	~~B~~	N	P	BJ
7440-36-0	Antimony	16.1	U		P	
7440-39-3	Barium	31.9	~~B~~		P	J
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	0.80	U		P	
7440-70-2	Calcium	16500			P	
7440-47-3	Chromium	3.7	~~U~~		P	UJ
7440-48-4	Cobalt	2.3	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	15.0	~~U~~		P	UJ
7439-95-4	Magnesium	3860	~~B~~	E	P	BJ
7439-96-5	Manganese	0.70	U		P	
7440-02-0	Nickel	7.9	U		P	
7440-09-7	Potassium	617	B		P	
7440-22-4	Silver	3.7	U		P	
7440-23-5	Sodium	2100	~~B~~	E	P	BJ
7440-62-2	Vanadium	2.5	U		P	
7440-66-6	Zinc	3.2	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Verified sgm 8/25/94

~~002~~

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0C2W0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V7

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 06227-02S

Level (low/med): LOW Spring #11 Date Received: 06/28/94

% Solids: 0.0 Site 10 Sat., Bottom Depth Split

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

CAS No.	Analyte	Concentration	C	Q	M	Q
7429-90-5	Aluminum	91.6	~~B~~	N*	P	U
7440-36-0	Antimony	16.1	U		P	
7440-39-3	Barium	34.0	~~B~~		P	U
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	0.80	U		P	
7440-70-2	Calcium	17000			P	
7440-47-3	Chromium	3.7	U		P	
7440-48-4	Cobalt	2.3	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	105	~~-~~	*	P	J
7439-95-4	Magnesium	3860	B		P	
7439-96-5	Manganese	6.2	~~B~~	*	P	BJ
7440-02-0	Nickel	7.9	U		P	
7440-09-7	Potassium	700	B		P	
7440-22-4	Silver	3.7	U		P	
7440-23-5	Sodium	2210	B		P	
7440-62-2	Vanadium	2.5	U		P	
7440-66-6	Zinc	4.3	~~B~~		P	U

Color Before: COLORLESS Clarity Before: CLOUDY Texture:

Color After: COLORLESS Clarity After: CLOUDY Artifacts:

Comments:

Verified
sgm 8/24/94

~~003~~

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B0C2W1
~~Spl: Filtered~~
sgm 8/25/94

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V8

Matrix (soil/water): WATER 300-FF-5 Lab Sample ID: 06228-02S

Level (low/med): LOW Spring #11 Date Received: 06/28/94

% Solids: 0.0 Site 1.5 ft, Bottom Depth, Filtered Split

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	23.8	U	N	P	
7440-36-0	Antimony	16.1	U		P	
7440-39-3	Barium	31.9	~~B~~		P	u
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	0.80	U		P	
7440-70-2	Calcium	16200			P	
7440-47-3	Chromium	3.7	~~U~~		P	us
7440-48-4	Cobalt	2.3	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	15.0	~~U~~		P	us
7439-95-4	Magnesium	3830	~~B~~	E	P	BS
7439-96-5	Manganese	0.70	U		P	
7440-02-0	Nickel	7.9	U		P	
7440-09-7	Potassium	711	B		P	
7440-22-4	Silver	3.7	U		P	
7440-23-5	Sodium	2110	~~B~~	E	P	BS
7440-62-2	Vanadium	2.5	U		P	
7440-66-6	Zinc	3.2	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Verified
sgm 8/25/94

~~003~~

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

9613503.0346

July 26, 1994

Assoc. with Samples BOC2U7 and BOC2W0. sgm 8/25/94

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Two water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on June 28, 1994 from TMA/Norcal. The samples were analyzed for the ICP metals. The analysis was performed under TMA/Skinner and Sherman work order S406227.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The matrix spike recovery for aluminum exceeded the control limit requirement.

The laboratory duplicates for aluminum, iron and manganese exceeded the control limit requirements.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal
Steven R. Provencal
Lead Chemist

TMA
Thermo Analytical Inc.

9613503.0347

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

JUL 1994
RECEIVED
SDLA

RECORD COPY

July 26, 1994

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Assoc. with samples 8OC2V8 and 8OC2W1.
sgm 8/25/94

Quality Control Narrative

Scope
Two water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on June 28, 1994 from TMA/Norcal. The samples were analyzed for the ICP metals. The analysis was performed under TMA/Skinner and Sherman work order S406228.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The matrix spike recovery for aluminum exceeded the control limit requirement.

The ICP serial dilution for magnesium and sodium exceeded the control limit requirements.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal
Steven R. Provencal
Lead Chemist

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Data Turnaround: [ ] Priority [X] Normal

Collector: Rick Mackliet	Company Contact: LC Hulstrom	Telephone No.: (509) 376-4034
Project Designation: 300-FF-5	Sampling Location: 300-FF-5 5653	SAF No.: 94-083
Ice Chest No.: N/A	Field Logbook No.: BNW 55520	Method of Shipment: Fed Ex
Shipped To: TMA	Offsite Property No.: PNL-94-1311	Bill of Lading/Air Bill No.: 3123691502

Possible Sample Hazards/Remarks

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

SAMPLE ANALYSIS

Sample No.	Matrix*	Date Sampled	Time Sampled	URAN	ICP	ICP(F)
			Preservative	HNO_3	HNO_3	HNO_3
			Type of Container	P	P	P
			No. of Container(s)	1	1	1
			Volume	1000 ml	1000 ml	1000 ml
BOC2V7	V	6/23/94	1218	1	1	
BOC2V8	V	6/23/94	1218	~~1~~		1
	V					
	V					
	V					
	V					

017

76

94150703.0408

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Rick Mac	6/23/94 1500	TL Van Arsdale	6/23/94 1500
TL Van Arsdale	6/24/94 1210	[illegible]	6/27/94 11:20

SPECIAL INSTRUCTIONS

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 8000-820 (12/92)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transmitted

☐ Priority
☒ Normal

Collector: Reck, Michael	Company Contact: LC Hulstrom	Telephone No.: (509) 376-4034
Project Designation: 300-FF-5	Sampling Location: 300-FF-5 S11S10	SAF No.: 94-083
Ice Chest No.: N/A	Field Logbook No.: BNW 55520	Method of Shipment: FED EX
Shipped To: TMA	Offsite Property No.: PNL-94-1311	Bill of Lading/Air Bill No.: 3123691502

Possible Sample Hazards/Remarks

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

SAMPLE ANALYSIS			
Preservative	HNO_3	HNO_3	HNO_3
Type of Container	P	P	P
No. of Container(s)	1	1	1
Volume	1000 ml	1000 ml	1000 ml
	URAN	ICP	ICP(F)

018

Sample No.	Matrix*	Date Sampled	Time Sampled	URAN	ICP	ICP(F)
B0C2W0	V	6/23/94	1108	1	1	
B0C2W1	V	6/23/94	1108			1
	V					
	V					
	V					
	V					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
PNL	6/23/94 1500	TL VanArsdale	6/23/94 1500
TL VanArsdale	6/24/94 1210		6/27/94 11:50

SPECIAL INSTRUCTIONS

36

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-8000-820 (12/92)

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 300-FF-5		DATA PACKAGE: 8OC2V7-TMA-786
VALIDATOR: sgm	LAB: TMA	DATE: 8/24/94
CASE:		SDG: 8OC2V7-TMA-786

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Water

8OC2V7

8OC2W0

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

sgm 8/24/94

Comments: Samples 8OC2V7 and 8OC2W0 were collected on 6/23/94 and analyzed on 7/22/94

sgm 8/24/94

020

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
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: See attached lab blank summary and Form R-7 for blank contaminants and qualifications.

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: MSR for aluminum is 195%. However, since the Al results in samples BCC217 and BXC2W0 are nondetects, no qualification is required.

JGM 8/24/94

021

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

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

Comments: See attached field split precision calc. sheet.
- refer to attached lab dup summary and Form B-7 for unacceptable lab dup RPDs and assoc. qualifications. AGM 9/6/94

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:

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:

Revised AGM 9/06/94

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V7

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	23.8	U	23.8	U	23.8	U	23.8	U	26.840	B	P
Antimony	16.1	U	16.1	U	16.1	U	16.1	U	16.100	U	P
Barium	3.1	U	3.1	U	3.1	U	3.1	U	13.180	B	P
Beryllium	0.6	U	0.6	U	0.6	U	0.6	U	0.600	U	P
Cadmium	0.8	U	1.3	B	1.0	B	1.4	B	1.070	B	P
Calcium	63.7	B	76.4	B	83.8	B	156.6	B	36.200	U	P
Chromium	3.7	U	3.7	U	3.7	U	3.7	U	3.700	U	P
Cobalt	2.3	U	2.3	U	2.3	U	2.3	U	2.300	U	P
Copper	2.5	U	2.5	U	2.5	U	2.6	B	2.500	U	P
Iron	15.0	U	15.0	U	15.0	U	15.0	U	15.000	U	P
Magnesium	34.4	U	34.4	U	34.4	U	34.4	U	34.400	U	P
Manganese	0.7	U	0.7	U	0.7	U	0.8	B	1.230	B	P
Nickel	7.9	U	7.9	U	7.9	U	7.9	U	7.900	U	P
Potassium	111.0	U	111.0	U	111.0	U	111.0	U	111.000	U	P
Silver	3.7	U	3.7	U	3.7	U	3.7	U	3.700	U	P
Sodium	31.2	U	31.2	U	31.2	U	31.2	U	43.000	B	P
Vanadium	2.5	U	2.5	U	2.5	U	2.5	U	2.500	U	P
Zinc	3.8	B	4.0	B	3.8	B	6.3	B	3.320	B	P

Assoc. with
B0C2V7
B0C2W0

sgm 8/24/94

~~007~~

6

DUPLICATES

SAMPLE NUMBER: B0C2W0D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V7

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum	200.0	91.5700	B	2060.9000		183.0	*	P
Antimony		16.1000	U	16.1000	U			P
Barium		34.0500	B	45.0400	B	27.8		P
Beryllium		0.6000	U	0.6000	U			P
Cadmium		0.8000	U	0.8000	U			P
Calcium	5000.0	16973.0000		19504.0000		13.9		P
Chromium		3.7000	U	3.7000	U			P
Cobalt		2.3000	U	2.3000	U			P
Copper		2.5000	U	4.0100	B	200.0		P
Iron	100.0	105.0300		238.3400		77.6	*	P
Magnesium		3856.8000	B	4346.1000	B	11.9		P
Manganese	15.0	6.1600	B	69.4300		167.4	*	P
Nickel		7.9000	U	7.9000	U			P
Potassium		700.1500	B	830.0800	B	17.0		P
Silver		3.7000	U	3.7000	U			P
Sodium		2208.1000	B	2637.6000	B	17.7		P
Vanadium		2.5000	U	2.5000	U			P
Zinc		4.3200	B	11.9200	B	93.6		P

Qualify iron and manganese results as estimated (BJ/J). No qualification is required for Al results since they are nondetects.

sgm 8/25/94

~~012~~

024

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 300-FF-5		DATA PACKAGE: BOC2U7-TMA786
VALIDATOR: sgm	LAB: TMA	DATE: 8/25/94
CASE:		SDG: BOC2U7-TMA-786

ANALYSES PERFORMED

☒ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX Water

BOC2118

BOC2W1

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: Samples BOC2U8 and BOC2W1 were ~~analyzed or~~ collected on 6/23/94 and analyzed on 7/22/94.

sgm 8/25/94

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
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes ~~No~~ N/A sgm 8/25/94
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments: See attached lab blank summary and Form B-7

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: MS %R for aluminum is 222.4%.
~~However, since both Al results are~~ sgm 8/25/94
~~qualified, nondetects, no qualification~~ sgm 8/25/94 sgm 8/25/94
~~is required.~~
Therefore, the Al result for sample B0CJU8 sgm 8/25/94
has been qualified as estimated (RT). ~~Sample~~ The Aluminum
~~B0CJW0~~ result for sample B0CJW0 did not sgm 8/25/94
~~require~~ qualification since it is a nondetect

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

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

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

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

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

Comments: ICP serial dilution %D for Mg and Na are >10% and the sample result >50x IDL. The assoc. results have been qualified as estimated (RJ).
- Refer to attached field split precision calc. worksheet.

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:

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:

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V8

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	Preparation Blank	C	M
Aluminum	23.8	U	23.8	U	23.8	U	23.8	U	23.800	U	P
Antimony	16.1	U	16.1	U	16.1	U	16.1	U	16.100	U	P
Barium	3.1	U	3.1	U	3.1	U	3.1	U	10.980	B	P
Beryllium	0.6	U	0.6	U	0.6	U	0.6	U	0.600	U	P
Cadmium	0.8	U	1.3	B	1.0	B	1.4	B	0.800	U	P
Calcium	63.7	B	76.4	B	83.8	B	156.6	B	36.200	U	P
Chromium	3.7	U	3.7	U	3.7	U	3.7	U	-7.240	B	P
Cobalt	2.3	U	2.3	U	2.3	U	2.3	U	2.300	U	P
Copper	2.5	U	2.5	U	2.5	U	2.6	B	2.500	U	P
Iron	15.0	U	15.0	U	15.0	U	15.0	U	-20.130	B	P
Magnesium	34.4	U	34.4	U	34.4	U	34.4	U	34.400	U	P
Manganese	0.7	U	0.7	U	0.7	U	0.8	B	0.700	U	P
Nickel	7.9	U	7.9	U	7.9	U	7.9	U	7.900	U	P
Potassium	111.0	U	111.0	U	111.0	U	111.0	U	111.000	U	P
Silver	3.7	U	3.7	U	3.7	U	3.7	U	3.700	U	P
Sodium	31.2	U	31.2	U	31.2	U	31.2	U	49.280	B	P
Vanadium	2.5	U	2.5	U	2.5	U	2.5	U	2.500	U	P
Zinc	3.8	B	4.0	B	3.8	B	6.3	B	3.200	U	P

Assoc. w/ B0C2U8

Assoc. w/ B0C2W1

AGM 8/25/94

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9613503.0568 WESTINGHOUSE/HANFORD

5A

SAMPLE NUMBER:

SPIKE SAMPLE RECOVERY

B0C2W1S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V8

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	4048.6000		23.8000	U	2000.00	202.4	N	P
Antimony	75-125	464.4600		16.1000	U	500.00	92.9		P
Barium	75-125	1977.6000		31.8600	B	2000.00	97.3		P
Beryllium	75-125	48.8500		0.6000	U	50.00	97.7		P
Cadmium	75-125	47.3500		0.8000	U	50.00	94.7		P
Calcium									NR
Chromium	75-125	190.5000		3.7000	U	200.00	95.2		P
Cobalt	75-125	469.2600		2.3000	U	500.00	93.9		P
Copper	75-125	246.8900		2.5000	U	250.00	98.8		P
Iron	75-125	1132.6000		15.0000	U	1000.00	113.3		P
Magnesium									NR
Manganese	75-125	540.7600		0.7000	U	500.00	108.2		P
Nickel	75-125	463.7900		7.9000	U	500.00	92.8		P
Potassium									NR
Silver	75-125	46.0100		3.7000	U	50.00	92.0		P
Sodium									NR
Vanadium	75-125	479.0300		2.5000	U	500.00	95.8		P
Zinc	75-125	480.7900		3.2000	U	500.00	96.2		P

Comments:

Qualify Al result ~~for~~ sample B0C2V8 as estimated (BJ). No qual. is required ~~for~~ sample B0C2W1, ~~Al result~~ since the Al result is a nondetect. sgm 8/25/94

~~010~~

FORM V (Part 1) - IN

029

ILM02.1

SAMPLE NUMBER: B0C2W1L

ICP SERIAL DILUTIONS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N4-06-087SAS No.: SDG No.: B0C2V8

Matrix (soil/water): WATER Assoc. w/ B0C2V8 and B0C2W1. Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	23.80	U	119.00	U			P
Antimony	16.10	U	80.50	U			P
Barium	31.86	B	38.45	B	20.7		P
Beryllium	0.60	U	3.00	U			P
Cadmium	0.80	U	4.00	U			P
Calcium	16185.00		15117.50	B	6.6		P
Chromium	3.70	U	18.50	U			P
Cobalt	2.30	U	11.50	U			P
Copper	2.50	U	12.50	U			P
Iron	15.00	U	75.00	U			P
Magnesium	3832.30	B	3424.65	B	10.6	E	P
Manganese	0.70	U	3.50	U			P
Nickel	7.90	U	39.50	U			P
Potassium	710.98	B	555.00	U	100.0		P
Silver	3.70	U	18.50	U			P
Sodium	2110.00	B	1836.00	B	13.0	E	P
Vanadium	2.50	U	12.50	U			P
Zinc	3.20	U	16.00	U			P

Qualify Mg and Na results as estimated (EJ).

sgm 8/25/94

~~015~~

SDG NO.: B0C2V7-TMA-786

SAMPLE LOCATION: SPRING #6, SITE 3 FT., BOTTOM DEPTH

SAMPLE ID: B0C2R4 FROM SDG W0109-ITC-097
FIELD SPLIT SAMPLE ID: B0C2V7

MEDIA: WATER

PARAMETER	CRDL	B0C2R4 RESULT	B0C2V7 RESULT	RPD
BARIUM	200	29.4	ND	200
CALCIUM	5000	19800	16600	18
IRON	100	106	96	10
MAGNESIUM	5000	4460	3870	14
MANGANESE	15	ND	7.2	200
POTASSIUM	5000	ND	769	200
SODIUM	5000	2530	2150	16

SAMPLE ID: B0C2R5 FROM SDG W0109-ITC-097
FIELD SPLIT SAMPLE ID: B0C2V8

MEDIA: FILTERED WATER

PARAMETER	CRDL	B0C2R5 RESULT	B0C2V8 RESULT	RPD
ALUMINUM	200	ND	31.4	200
BARIUM	200	26.6	ND	200
CALCIUM	5000	18500	16500	11
MAGNESIUM	5000	4160	3860	7
POTASSIUM	5000	ND	617	200
SODIUM	5000	2240	2100	6

SAMPLE LOCATION: SPRING #11, SITE 10 FT., BOTTOM DEPTH

SAMPLE ID: B0C2V1 FROM SDG W0109-ITC-097
FIELD SPLIT SAMPLE ID: B0C2W0

MEDIA: WATER

PARAMETER	CRDL	B0C2V1 RESULT	B0C2W0 RESULT	RPD
BARIUM	200	28.1	ND	200
CALCIUM	5000	18200	17000	7
IRON	100	122	105	15
MAGNESIUM	5000	4320	3860	11
MANGANESE	15	ND	6.2	200
POTASSIUM	5000	ND	700	200
SODIUM	5000	2290	2210	4

SAMPLE ID: B0C2V2 FROM SDG W0109-ITC-097
FIELD SPLIT SAMPLE ID: B0C2W1

MEDIA: FILTERED WATER

PARAMETER	CRDL	B0C2V2 RESULT	B0C2W1 RESULT	RPD
BARIUM	200	27.9	ND	200
CALCIUM	5000	18300	16200	12
MAGNESIUM	5000	4160	3830	8
POTASSIUM	5000	ND	711	200
SODIUM	5000	2210	2110	5

Agm 8/25/94

Filename: B0C2V7FS.WK1

25-Aug-94

031

96135C3.0362

MEMORANDUM

TO: 300-FF-5 Project QA Record September 6, 1994

FR: Susan Manchester, Golder Associates Inc. SGM

RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE: B0C2V7-TMA-786 (943-1610.001, Filename B0C2V7-R.FF5)

INTRODUCTION

This memo presents the results of data validation on data package B0C2V7-TMA-786 prepared by the Thermo Analytical (TMA) laboratory. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA	ANALYSIS
B0C2V7 B0C2W0	06/23/94 06/23/94	Water Water	SEE NOTE 1

Note 1. All samples were analyzed for total uranium using a WHC approved method.

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. 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.

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

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data package with a total of 2 determinations reported, both of which were deemed valid. This results in a completeness of 100 percent, which meets normal work plan objectives of 90%.

Revised SGM 9/06/94

001

MAJOR DEFICIENCIES

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

MINOR DEFICIENCIES

No minor deficiencies were identified during data validation which required qualification of data.

REFERENCES

WHC 1993, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Validation of 300-FF-5 Data, Statement of Work, Environmental and Waste Characterization Analytical Data Validation, Task Order MSH-SWV-315905, August 10, 1994, Westinghouse Hanford Company, Richland, Washington.

9613503.0365

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

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.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY

SDG: B0C2V7-TMA-786	VALIDATOR:	DATE: August 17, 1994	PAGE 1 OF 1
COMMENTS: RADIOCHEMISTRY ANALYSIS			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
NO QUALIFICATION REQUIRED			

006

9613503.0369

ATTACHMENT 3

QUALIFIED DATA SUMMARY AND ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: BOC2V7-TMA-786

	Samp#	BOC2V7		BOC2W0	
	Date	6-23-94		6-23-94	
	Location	SPRING 6,3 ft		SPRING 11,10 ft	
	Depth	3.17		5.00	
	Type	SPLIT		SPLIT	
	Comments	---		---	
Parameter	Units	Result	Q	Result	Q
URANIUM	UG/L	0.480		0.440	

Verified

Agm 8/23/94

96135503.0370

9613503.0371

TMA NORCAL

300-FF-5

SAMPLE DELIVERY GROUP 7391

N406089-01

BOC2V7

DATA SHEET

Spring #6, Site 3Ft. Bottom Depth, Split

SDG	7391	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N406089-01	Client sample id	BOC2V7
Dept sample id	7391-001	Location/Matrix	300-FF-5 S6S3 LIQUID
Received	06/27/94	Collected	06/23/94
		Chain of custody id	BNW55520

sgm 8/17/94

ANALYTE	CAS NO	RESULT ~~pCi/L~~	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	Q
Total Uranium (ug/L)	7440-61-1	0.48	0.10	0.05	0.1		U_T	

Verified

sgm 8/17/94

009

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	3.00
Report date	07/28/94

9613503.0372

300-FF-5

N406089-02

TMA NORCAL

SAMPLE DELIVERY GROUP 7391

DATA SHEET

B0C2W0

Spring #11, Site 10 ft. Bottom Depth, Split

SDG	7391	Client	Westinghouse Hanford
Contact	N. Joseph Verville	Contract	MBH-SVV-069262
Lab sample id	N406089-02	Client sample id	B0C2W0
Dept sample id	7391-002	Location/Matrix	300-FF-5 S11S10 LIQUID
Received	06/27/94	Collected	06/23/94
		Chain of custody id	BNW55520

sgm 8/17/94

ANALYTE	CAS NO	RESULT ~~pCi/L~~	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Total Uranium (ug/L)	7440-61-1	0.44	0.093	0.05	0.1		U_T

Q

Verified sgm 8/17/94

010

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	3.00
Report date	07/28/94

ATTACHMENT 4

LABORATORY NARRATIVE AND CHAIN-OF-CUSTODY DOCUMENTATION

TMA/Norcal
Report N4-06-089-7391
Sample Delivery Group 7391

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative **July 29, 1994**

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7391 is comprised of two water samples designated as SAF# 94-083.

There were no unique ID's to identify the Chain-of-Custody documents, however, the project designation on each document was SAF# 94-083.

One 1000 mL poly bottle containing each sample was received for analyses.

2.0 ANALYSIS NOTES

2.1 Total Uranium Analyses

The MDA of the laboratory control sample was greater than the RDL due to dilutions performed on the sample to achieve a response in the calibration range of the laser phosphorimeter (KPA). Both samples contained uranium concentrations greater than the RDL.

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Transmitted

☐ Priority
☒ Normal

Collector: Rick Mackliet	Company Contact: LC Hulstrom	Telephone No.: (509) 376-4034
Project Designation: 300-FF-5	Sampling Location: 300-FF-5 5653	SAF No.: 94-083
Ice Chest No.: N/A	Field Logbook No.: BNW 55520	Method of Shipment: Fed Ex
Shipped To: TMA	Offsite Property No.: PNL-94-1311	Bill of Lading/Air Bill No.: 3123691502

Possible Sample Hazards/Remarks

Special Handling and/or Storage
COOL TO 4 DEGREES CENTIGRADE

013

SAMPLE ANALYSIS

Preservative	HNO_3	HNO_3	HNO_3															
Type of Container	P	P	P															
No. of Container(s)	1	1	1															
Volume	1000 ml	1000 ml	1000 ml															
	URAN	ICP	ICP(F)															
Sample No.	Matrix*	Date Sampled	Time Sampled															
B0C2V7	V	6/23/94	1218	1	1													
B0C2V8	V	6/23/94	1218	~~1~~		1												
	V																	
	V																	
	V																	
	V																	

3

9413503.0925

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Rick Mac	6/23/94 1500	TL VanArsdale JXU.cm	6/23/94 1500
TL VanArsdale JXU.cm	6/24/94 1210	[illegible]	6/27/94 11:20

Sign/Print Names

SPECIAL INSTRUCTIONS

Matrix*
- S = Soil
- SE = Sediment
- SO = Solid
- SL = Sludge
- W = Water
- O = Oil
- A = Air
- DS = Drum Solid
- DL = Drum Liquid
- T = Tissue
- WI = Wire
- 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-8000-820 (12/92)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Date Turnaround: [ ] Priority [X] Normal

Collector: Reck, Mackland	Company Contact: LC Hulstrom	Telephone No.: (509) 376-4034
Project Designation: 300-FF-5	Sampling Location: 300-FF-5 S11S10	SAF No.: 94-083
Ice Chest No.: N/A	Field Logbook No.: BNW 55520	Method of Shipment: FED EX
Shipped To: TMA	Offsite Property No.: PNL-94-1311	Bill of Lading/Air Bill No.: 3123691502

Possible Sample Hazards/Remarks

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

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SAMPLE ANALYSIS

Preservative	HNO_3	HNO_3	HNO_3			
Type of Container	P	P	P			
No. of Container(s)	1	1	1			
Volume	1000 ml	1000 ml	1000 ml			
SAMPLE ANALYSIS	URAN ✓	ICP ✓	ICP(F) ✓			

Sample No.	Matrix*	Date Sampled	Time Sampled															
B0C2W0	V	6/23/94	1108	1	1													
B0C2W1	V	6/23/94	1108			1												
	V																	
	V																	
	V																	
	V																	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature] PNL	6/23/94 1500	TL VanArsdale [signature]	6/23/94 1500
TL VanArsdale [signature]	6/24/94 1210	[signature]	6/27/94 11:50

SPECIAL INSTRUCTIONS

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

OC 8000 820 (12/92)

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

9613505.0378

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 300-FF-5		DATA PACKAGE: BOC2V7-TMA-786
VALIDATOR: JGM	LAB: TMA	DATE: 8/17/94
CASE:		SDG: BOC2V7-TMA-786

ANALYSES PERFORMED

☐ Gross Alpha/Beta	☐ Strontium-90	☐ Technetium-99	☐ Alpha Spectroscopy	☐ Gamma Spectroscopy	
☒ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX waters

BOC2V7

BOC2W0

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? . . . . . 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: See item 6 of checklist for LCS 38. An LCS was performed in place of a matrix spike.

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:_____

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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: Both samples B0C2W7 and B0C2W0 are identified as field splits. Refer to attached Field Split Precision Calc. Summary.

10. Holding Times

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

Comments:

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . (Yes) No N/A
Results supported in raw data? . . . . . (Yes) No N/A
Results Acceptable? . . . . . (Yes) No N/A
Transcription/Calculation errors? . . . . . Yes (No) N/A
MDA's meet required detection limits? . . . . . (Yes) No N/A
Transcription/calculation errors? . . . . . Yes (No) N/A

Comments:

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HOLDING TIME SUMMARY

BOC2V7-TMA-786

SDG:	VALIDATOR: Steve Manchester	DATE: 8/17/94	PAGE 1 OF 1
COMMENTS: Radiochemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOC2V7	Total U	6/23/94		7/20/94		27	None
BOC2W0	Total U	6/23/94		7/20/94		27	None

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

FIELD SPLIT PRECISION CALCULATION WORKSHEET FOR SDG B0C2V7-TMA-786

SDG NO.: B0C2V7-TMA-786

SAMPLE ID FROM DATA PACKAGE W0109-ITC-097: B0C2R4
FIELD SPLIT SAMPLE ID: B0C2V7

SAMPLE LOCATION: SPRING #6, SITE 3 FT, BOTTOM DEPTH

PARAMETER	B0C2R4 RESULT	B0C2V7 RESULT	RPD
TOTAL URANIUM	0.47	0.48	2

SAMPLE ID FROM DATA PACKAGE W0109-ITC-097: B0C2V1
FIELD SPLIT SAMPLE ID: B0C2W0

SAMPLE LOCATION: SPRING #11, SITE 10 FT, BOTTOM DEPT

PARAMETER	B0C2V1 RESULT	B0C2W0 RESULT	RPD
TOTAL URANIUM	0.38	0.44	14

Appr 8/17/94

Filename: B0C2V7FS.WK1

17-Aug-94

B0C2V7-TMA-786
Total Uranium

Standard	Intensity	Sample ID	Lab ID	Intens.	ug/L Calc.	ug/L Rptd	Amount of Smpl	Prep. Volume	Dilution	Calc Result	Rptd Rslt
0.049	258										
0.156	814	B0C2V7	7391-001	2339	0.464	0.485	0.02	0.02	1	0.48	0.49
0.521	2736	B0C2W0	7391-002	2065	0.410	0.444	0.02	0.02	1	0.44	0.44
0.976	4861	LCS	7391-003	13440	2.668	2.651	0.02	0.02	10	26.51	26.50
2.603	12717	LAB BLANK	7391-004	-343	-0.068	0.051	0.02	0.02	1	0.05	0.05
4.881	24163	B0C2V7 DUP	7391-005	2397	0.476	0.501	0.02	0.02	1	0.50	0.50
16.27	77405										
Slope:	2.0E-04										

sgmc 8/17/94

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