

9107L177-WES-118
 9107L177-000002
 0043055
 9613402.1206
 START

WESTON Analytics Use Only
 9107L177

TASK #91-0001
 Custody Transfer Record/Lab Work Request

Client Westinghouse Hanford
 Est. Final Proj. Sampling Date _____
 Work Order # 6168-02-01-0000
 Project Contact/Phone # _____
 AD Project Manager Jessie King
 QC CLP Del CLP TAT 35
 Date Rec'd 7/16/91 Date Due 8/20/91
 Account # WHS-HANFORD

Refrigerator #	1		
#/Type Container	Liquid	36	
	Solid		
Volume	Liquid	40L	
	Solid		
Preservatives			
ANALYSES REQUESTED	ORGANIC		
	VOA	BNA	Pes/PCB
			Herb
			INORG
			Metal
			CN

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓)	Matrix	Date Collected	VOA	BNA	Pes/PCB	Herb	INORG	
S - Soil	001	B00X59		W	7-12-91						
SE - Sediment	002	B00X70									
SO - Solid	003	B00Y16									
SL - Sludge	004	B00XV1									
W - Water	005	B00XY7									
O - Oil	006	B00XY8									
A - Air											
DS - Drum Solids											
DL - Drum Liquids											
L - EP/TCLP Leachate											
WI - Wipe											
X - Other											
F - Fish											
* ANIONS: F, I, S, Cl, Alk, PH						ICP04	ICSO4	ICFL	ICCL	ICNO3	ICNO2



Special Instructions:
 ** I SUB = TOTAL URANIUM, TRITIUM, GRASS ALPHA, BETA, TC-99, Sr-90, Cs-137, Co-60, Pu-238, Pu-239/240
 *** metals = CLP + Bi, Se, Si
 DATE/REVISIONS:
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____

WESTON Analytics Use Only

Samples were:
 Shipped Hand Delivered
 Airbill # 242 1352 40

COC Tape was:
 1) Present on Outer Package or N
 2) Unbroken on Outer Package or N
 3) Present on Sample or N
 4) Unbroken on Sample or N
 5) Received Within Holding Times or N
 COC Record Present Upon Sample Rec't or N

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:
 PH, ICNO3, ICNO2, ICNO4, ICNO5, ICNO6, ICNO7, ICNO8, ICNO9, ICNO10, ICNO11, ICNO12, ICNO13, ICNO14, ICNO15, ICNO16, ICNO17, ICNO18, ICNO19, ICNO20, ICNO21, ICNO22, ICNO23, ICNO24, ICNO25, ICNO26, ICNO27, ICNO28, ICNO29, ICNO30, ICNO31, ICNO32, ICNO33, ICNO34, ICNO35, ICNO36, ICNO37, ICNO38, ICNO39, ICNO40, ICNO41, ICNO42, ICNO43, ICNO44, ICNO45, ICNO46, ICNO47, ICNO48, ICNO49, ICNO50, ICNO51, ICNO52, ICNO53, ICNO54, ICNO55, ICNO56, ICNO57, ICNO58, ICNO59, ICNO60, ICNO61, ICNO62, ICNO63, ICNO64, ICNO65, ICNO66, ICNO67, ICNO68, ICNO69, ICNO70, ICNO71, ICNO72, ICNO73, ICNO74, ICNO75, ICNO76, ICNO77, ICNO78, ICNO79, ICNO80, ICNO81, ICNO82, ICNO83, ICNO84, ICNO85, ICNO86, ICNO87, ICNO88, ICNO89, ICNO90, ICNO91, ICNO92, ICNO93, ICNO94, ICNO95, ICNO96, ICNO97, ICNO98, ICNO99, ICNO100

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<u>Emery</u>	<u>Jessie King</u>	<u>7-16-91</u>	<u>3:30 PM</u>		<u>Jessie King</u>	<u>7-18-91</u>	

9613402.1207

0000003

CHAIN OF CUSTODY

RFW 9107L177

Company Contact	B.H. FORD	Telephone	509-376-6465	
Sample Collected by	L. WALKER	Date	7-12-91	Time 0845
Sample Locations	200-BP-1			
Ice Chest No.	SML-10	Field Logbook and Page No.	WHC-N-4461/Pg. 53	
Remarks	N/A			
Bill of Lading No.	2474251659	Offsite Property No.	W91-0334 # 55	
Method of Shipment	EMERY			
Shipped to	WESTON Analytica			

SAMPLE IDENTIFICATION

B00 X59

- 1, 1L, P, WATER, CLP-CN, NaOH
- 1, 1L, P, WATER, CLP-METAL, Bi/Se/Si, HNO3, UNFILTERED
- 1, 500ml, G, WATER, TOC, NO2/NO3, H2SO4
- 1, 1L, P, WATER, ANIONS, TDS, ALK, pH
- 3, 4L, P, WATER, ALPHA, BETA, Tc-99, Sr-90, Cs-137, Co-60, Pu-238, Pu-239/240, HNO3
- 1, 1L, P, WATER, TOTAL URANIUM, HCl
- 1, 250ml, G, WATER, TRITIUM

B00 XTO

- 1, 1L, P, WATER, CLP-METAL, Bi/Se/Si, HNO3, FILTERED

B00 Y16

- 3, 40 ml, G, Water, CLP-VONA

CHAIN OF POSSESSION

Relinquished by: <i>L.D. Walker</i> L. D. Walker	Received by: <i>P.H. Dutcher</i> P.H. Dutcher	Date/Time: 7/15/91 0750
Relinquished by: <i>P.H. Dutcher</i> P.H. Dutcher	Received by: <i>S.L. Raymond</i> S.L. Raymond	Date/Time: 7-15-91 11:00AM.
Relinquished by: <i>S.L. Raymond</i> S.L. Raymond	Received by:	Date/Time:
Relinquished by: <i>Emery</i> Emery	Received by: <i>Chris Higgins</i> Chris Higgins	Date/Time: 7-16-91/3:30pm

9613402.1208

0000004

CHAIN OF CUSTODY

RFW 9107L177

Company Contact	B.H. FORD	Telephone	509-376-6465	
Sample Collected by	L. WALKER	Date	7-12-91	Time 0845
Sample Locations	200-BP-1			
Ice Chest No.	SML-10	Field Logbook and Page No.	WHC-N-4461/pg. 53	
Remarks	N/A			
Bill of Lading No.	2474251659	Offsite Property No.	491-0334 #55	
Method of Shipment	EMERY			
Shipped to	WESTON Analytics			

SAMPLE IDENTIFICATION

BOO XV1
 PNB
 7/15/91

- 1, 1L, P, WATER, CLP CN, NaOH
- 1, 1L, P, WATER, CLP METAL, Bi/Se/Si, HNO3, UNFILTERED
- 1, 500ml, G, WATER, TOC, NO2/NO3, H2SO4
- 1, 1L, P, WATER, ANIONS, TO3, ALK, PH
- 3, 4L, P, WATER, ALPHA, BETA, Tc-99, Sr-90, Cs-137, Co-60, Pu-238, Pu-239/240, HNO3
- 1, 1L, P, WATER, TOTAL URANIUM, HCl
- 1, 250ml, G, WATER, TRITIUM

~~BOO XV2~~
 PNB
 7/15/91

- 1, 1L, P, WATER, CLP METAL, Bi/Se/Si, HNO3, FILTERED

CHAIN OF POSSESSION

Relinquished by: <i>L.D. Walker</i> L. D. Walker	Received by: <i>A. Butcher</i> A. Butcher	Date/Time: 7/15/91 0750
Relinquished by: <i>A. Butcher</i> A. Butcher	Received by: <i>S. L. Raymond</i> S. L. Raymond	Date/Time: 7-15-91 11:07 AM.
Relinquished by: <i>S. L. Raymond</i> S. L. Raymond	Received by:	Date/Time:
Relinquished by: <i>Emery</i> Emery	Received by: <i>Chris [unclear]</i> Chris [unclear]	Date/Time: 7-16-91 / 3:30pm

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0000005

CHAIN OF CUSTODY

RFW# 9107L177

Company Contact	B.H. FORD	Telephone	509-376-6465	
Sample Collected by	L. WALKER	Date	7-12-91	Time 1015
Sample Locations	200-BP-1			
Ice Chest No.	BI7	Field Logbook and Page No.	WHC-N-4461 / pg. 53	
Remarks	N/A			
Bill of Lading No.	2474251659	Offsite Property No.	W91-0334 #55	
Method of Shipment	EMERY			
Shipped to	WESTON Analytics			

SAMPLE IDENTIFICATION

800XY7

- 1, 1L, P, WATER, CLP-CN, NaOH
- 1, 1L, P, WATER, CLP-METAL, Bi/Se/Si, HNO3, UNFILTERED
- 1, 500ml, G, WATER, TOC, NO2/NO3, H2SO4
- 1, 1L, P, WATER, ANIONS, TDS, ALK, pH
- 3, 4L, P, WATER, ALPHA, BETA, Tc-99, Sr-90, Cs-137, Co-60, Pu-238, Pu-239/240, HNO3
- 1, 1L, P, WATER, TOTAL URANIUM, HCl
- 1, 250ml, G, WATER, TRITIUM

800XY8

- 1, 1L, P, WATER, CLP-METAL, Bi/Se/Si, HNO3, FILTERED

CHAIN OF POSSESSION

Relinquished by: <i>L.D. Walker</i> L.D. Walker	Received by: <i>P.H. Butcher</i> P.H. Butcher	Date/Time: 7/15/91 0750
Relinquished by: <i>P.H. Butcher</i> P.H. Butcher	Received by: <i>L.D. Raymond</i> L.D. Raymond	Date/Time: 7/15/91 11:07 AM.
Relinquished by: <i>L.D. Raymond</i> L.D. Raymond	Received by:	Date/Time:
Relinquished by: <i>Emery</i> Emery	Received by: <i>Chris King</i> Chris King	Date/Time: 7-16-91 / 3:30 PM

Cust ID:

BOOY16

BOOY16

VBLK

RfW#:

003

003

91LVW114-MB1

REPREP

Toluene	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U

* = Outside of EPA CLP QC limits.

0000008

261342.21

WESTON**ROY F. WESTON, INC.
Lionville Laboratory**

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 07-16-91
RFW #: 9107L177, GC/MS VOLATILE
W.O. #: 6168-02-01

NARRATIVE

One (1) water sample was collected on 07-12-91.

The sample and its associated QC samples were analyzed according to criteria set forth in CLP SOW 2/88 (rev 5/89) for TCL Volatile target compounds on 07-19-91.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analysis:

1. Non-target compounds were not detected in these samples.
2. Two (2) of nine (9) surrogate recoveries were outside EPA QC limits. EPA QC surrogate recovery criteria were not met for sample B00Y16. This sample was re-analyzed on 07-19-91 and reported.
3. Matrix spike and spike duplicate samples are associated with RFW lot 9107L112.
4. The laboratory blank contained the common contaminants methylene chloride and acetone at levels less than the CRQL.
5. All internal standard area and retention time criteria were met.



Jack R. Tuschall, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

8.5.91.
Date

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

BOOY16

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9107L177-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: W071920

Level: (low/med) LOW

Date Received: 07/16/91

% Moisture: not dec. _____

Date Analyzed: 07/19/91

Column: (pack/cap) PACK

Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/L

74-87-3	-----Chloromethane	10	U
74-83-9	-----Bromomethane	10	U
75-01-4	-----Vinyl Chloride	10	U
75-00-3	-----Chloroethane	10	U
75-09-2	-----Methylene Chloride	16	B
67-64-1	-----Acetone	3	JB
75-15-0	-----Carbon Disulfide	5	U
75-35-4	-----1,1-Dichloroethene	5	U
75-34-3	-----1,1-Dichloroethane	5	U
540-59-0	-----1,2-Dichloroethene (total)	5	U
67-66-3	-----Chloroform	5	U
107-06-2	-----1,2-Dichloroethane	5	U
78-93-3	-----2-Butanone	10	U
71-55-6	-----1,1,1-Trichloroethane	5	U
56-23-5	-----Carbon Tetrachloride	5	U
108-05-4	-----Vinyl Acetate	10	U
75-27-4	-----Bromodichloromethane	5	U
78-87-5	-----1,2-Dichloropropane	5	U
10061-01-5	-----cis-1,3-Dichloropropene	5	U
79-01-6	-----Trichloroethene	5	U
124-48-1	-----Dibromochloromethane	5	U
79-00-5	-----1,1,2-Trichloroethane	5	U
71-43-2	-----Benzene	5	U
10061-02-6	-----Trans-1,3-Dichloropropene	5	U
75-25-2	-----Bromoform	5	U
108-10-1	-----4-Methyl-2-pentanone	10	U
591-78-6	-----2-Hexanone	10	U
127-18-4	-----Tetrachloroethene	5	U
79-34-5	-----1,1,2,2-Tetrachloroethane	5	U
108-88-3	-----Toluene	5	U
108-90-7	-----Chlorobenzene	5	U
100-41-4	-----Ethylbenzene	5	U
100-42-5	-----Styrene	5	U
1330-20-7	-----Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

0000020 CLIENT SAMPLE NO.

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

BOOY16

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9107L177-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: W071920

Level: (low/med) LOW

Date Received: 07/16/91

% Moisture: not dec.

Date Analyzed: 07/19/91

Column: (pack/cap) PACK

Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

BOOY16RE

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9107L177-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: W071909

Level: (low/med) LOW

Date Received: 07/16/91

% Moisture: not dec.

Date Analyzed: 07/19/91

Column: (pack/cap) PACK

Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) ug/L

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	B
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

0000029 CLIENT SAMPLE NO.

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

BOOY16RE

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9107L177-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: W071909

Level: (low/med) LOW

Date Received: 07/16/91

% Moisture: not dec. _____

Date Analyzed: 07/19/91

Column: (pack/cap) PACK

Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/16/91

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9107L177

WORK ORDER: 6168-02-01-0000

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
=====	=====	=====	=====	=====	=====
-001	BOOKS9	Alkalinity	108	MG/L	2.0
		Chloride by IC	7.5	mg/L	0.25
		Fluoride by IC	0.50 u	mg/L	0.50
		Nitrite by IC	0.25 u	mg/L	0.25
		Nitrate by IC	37.2	mg/L	2.5
		Cyanide, Total	10.0 u	UG/L	10.0
		Phosphate by IC	0.25 u	mg/L	0.25
		Sulfate by IC	40.6	mg/L	2.5
		Nitrate Nitrite	7.9	MG/L	1.0
		Total Organic Carbon	0.78	MG/L	0.50
		pH	7.9	PH UNITS	0.010
		Total Dissolved Solids	264	MG/L	5.0
-005	BOOXY7	Alkalinity	94.0	MG/L	2.0
		Chloride by IC	5.0	mg/L	0.25
		Fluoride by IC	0.50 u	mg/L	0.50
		Nitrite by IC	0.25 u	mg/L	0.25
		Nitrate by IC	15.9	mg/L	0.25
		Cyanide, Total	10.0 u	UG/L	10.0
		Phosphate by IC	0.25 u	mg/L	0.25
		Sulfate by IC	26.9	mg/L	2.5
		Nitrate Nitrite	3.2	MG/L	0.20
		Total Organic Carbon	2.5	MG/L	0.50
		pH	8.0	PH UNITS	0.010
		Total Dissolved Solids	194	MG/L	5.0



Roy F. Weston, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD

SAMPLES RECEIVED: 7/16/91

RFW #: 9107L177

W.O. #: 6168-02-01

METALS NARRATIVE

The set of samples consisted of four (4) water samples collected on 7/12/91.

The samples were analyzed according to criteria set forth in CLP SOW 3/90.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analysis:

1. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory.
2. All ICV and CCV values were within control limits.
3. All ICB and CCB values were within control limits.
4. All preparation blank values were within control limits.
5. All LCS results were within the 80-120% control limits.
6. All matrix spike recoveries were within the 75-125% control limits with the exception of As and Pb. All corresponding samples were flagged with an "N" according to CLP protocol.
7. All duplicate analyses were within the 20% RPD control limit with the exception of Cu. All corresponding samples were flagged with a "*" according to CLP protocol.
9. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart, and also requires manual digestion.

WESTON

10. HG1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).



Jack R. Tuschall, Ph.D.
Laboratory Manager
WESTON Analytical Laboratories

9. 13. 91.

Date

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ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/20/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9107L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	BOOX9	Silver, Total	10.0	u UG/L	10.0
		Aluminum, Total	200	u UG/L	200
		Arsenic, Total	10.0	u UG/L	10.0
		Barium, Total	200	u UG/L	200
		Beryllium, Total	5.0	u UG/L	5.0
		Bismuth, Total	200	u UG/L	200
		Calcium, Total	38600	UG/L	5000
		Cadmium, Total	5.0	u UG/L	5.0
		Cobalt, Total	50.0	u UG/L	50.0
		Chromium, Total	16.5	UG/L	10.0
		Copper, Total	25.0	u UG/L	25.0
		Iron, Total	102	UG/L	100
		Mercury, Total	0.20	u UG/L	0.20
		Potassium, Total	5340	UG/L	5000
		Magnesium, Total	11900	UG/L	5000
		Manganese, Total	15.0	u UG/L	15.0
		Sodium, Total	20600	UG/L	5000
		Nickel, Total	40.0	u UG/L	40.0
		Lead, Total	3.0	u UG/L	3.0
		Antimony, Total	60.0	u UG/L	60.0
		Selenium, Total	5.0	u UG/L	5.0
		Silicon, Total	13400	UG/L	100
		Thallium, Total	10.0	u UG/L	10.0
		Vanadium, Total	50.0	u UG/L	50.0
		Zinc, Total	20.0	u UG/L	20.0

9613402.1222

0000009

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/20/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9107L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-002	BOOKTO	Silver, Soluble	10.0	u UG/L	10.0
		Aluminum, Soluble	200	u UG/L	200
		Arsenic, Soluble	10.0	u UG/L	10.0
		Barium, Soluble	200	u UG/L	200
		Beryllium, Soluble	5.0	u UG/L	5.0
		Bismuth, Soluble	200	u UG/L	200
		Calcium, Soluble	39100	UG/L	5000
		Cadmium, Soluble	5.0	u UG/L	5.0
		Cobalt, Soluble	50.0	u UG/L	50.0
		Chromium, Soluble	10.0	u UG/L	10.0
		Copper, Soluble	25.0	u UG/L	25.0
		Iron, Soluble	100	u UG/L	100
		Mercury, Soluble	0.20	u UG/L	0.20
		Potassium, Soluble	5450	UG/L	5000
		Magnesium, Soluble	12100	UG/L	5000
		Manganese, Soluble	15.0	u UG/L	15.0
		Sodium, Soluble	21200	UG/L	5000
		Nickel, Soluble	40.0	u UG/L	40.0
		Lead, Soluble	3.0	u UG/L	3.0
		Antimony, Soluble	60.0	u UG/L	60.0
		Selenium, Soluble	5.0	u UG/L	5.0
		Silicon, Soluble	13700	UG/L	100
		Thallium, Soluble	10.0	u UG/L	10.0
		Vanadium, Soluble	50.0	u UG/L	50.0
		Zinc, Soluble	20.0	u UG/L	20.0

9613402.1223

0000010

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/20/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9107L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-005	BOOXY7	Silver, Total	10.0	u UG/L	10.0
		Aluminum, Total	200	u UG/L	200
		Arsenic, Total	10.0	u UG/L	10.0
		Barium, Total	200	u UG/L	200
		Beryllium, Total	5.0	u UG/L	5.0
		Bismuth, Total	200	u UG/L	200
		Calcium, Total	32900	UG/L	5000
		Cadmium, Total	5.0	u UG/L	5.0
		Cobalt, Total	50.0	u UG/L	50.0
		Chromium, Total	10.0	u UG/L	10.0
		Copper, Total	25.0	u UG/L	25.0
		Iron, Total	100	u UG/L	100
		Mercury, Total	0.20	u UG/L	0.20
		Potassium, Total	5280	UG/L	5000
		Magnesium, Total	9880	UG/L	5000
		Manganese, Total	15.0	u UG/L	15.0
		Sodium, Total	16100	UG/L	5000
		Nickel, Total	40.0	u UG/L	40.0
		Lead, Total	3.0	u UG/L	3.0
		Antimony, Total	60.0	u UG/L	60.0
		Selenium, Total	5.0	u UG/L	5.0
		Silicon, Total	14100	UG/L	100
		Thallium, Total	10.0	u UG/L	10.0
		Vanadium, Total	50.0	u UG/L	50.0
		Zinc, Total	20.0	u UG/L	20.0

9613402.1224

0000011

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/20/91

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9107L177

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-006	BOOXY8	Silver, Soluble	10.0	u UG/L	10.0
		Aluminum, Soluble	200	u UG/L	200
		Arsenic, Soluble	10.0	u UG/L	10.0
		Barium, Soluble	200	u UG/L	200
		Beryllium, Soluble	5.0	u UG/L	5.0
		Bismuth, Soluble	200	u UG/L	200
		Calcium, Soluble	33100	UG/L	5000
		Cadmium, Soluble	5.0	u UG/L	5.0
		Cobalt, Soluble	50.0	u UG/L	50.0
		Chromium, Soluble	10.0	u UG/L	10.0
		Copper, Soluble	25.0	u UG/L	25.0
		Iron, Soluble	100	u UG/L	100
		Mercury, Soluble	0.20	u UG/L	0.20
		Potassium, Soluble	5200	UG/L	5000
		Magnesium, Soluble	9980	UG/L	5000
		Manganese, Soluble	15.0	u UG/L	15.0
		Sodium, Soluble	16300	UG/L	5000
		Nickel, Soluble	40.0	u UG/L	40.0
		Lead, Soluble	3.0	u UG/L	3.0
		Antimony, Soluble	60.0	u UG/L	60.0
		Selenium, Soluble	5.0	u UG/L	5.0
		Silicon, Soluble	14000	UG/L	100
		Thallium, Soluble	10.0	u UG/L	10.0
		Vanadium, Soluble	50.0	u UG/L	50.0
		Zinc, Soluble	20.0	u UG/L	20.0

9613402.1225

0000018

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BOOX59

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717701

Level (low/med): LOW Date Received: 7/16/91

* 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	6.30	B	N	F
7440-39-3	Barium	38.30	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.10	B		P
7440-70-2	Calcium	38600.00			P
7440-47-3	Chromium	16.50			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	24.80	B	*	P
7439-89-6	Iron	102.00			P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	11900.00			P
7439-96-5	Manganese	5.50	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5340.00			P
7782-49-2	Selenium	3.20	B	W	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	20600.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	31.80	B		P
7440-66-6	Zinc	17.20	B		P
	Cyanide	7.56	U		C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

9613402.1226

0000019

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BOOXTO

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER

Lab Sample ID: 910717702

Level (low/med): LOW

Date Received: 7/16/91

* 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.40	B	N	F
7440-39-3	Barium	35.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	39100.00			P
7440-47-3	Chromium	5.70	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.40	B	*	P
7439-89-6	Iron	36.00	U		P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	12100.00			P
7439-96-5	Manganese	3.30	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5450.00			P
7782-49-2	Selenium	2.00	B		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	21200.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	30.10	B		P
7440-66-6	Zinc	12.20	B		P
	Cyanide				NR

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

9613402.1222

0000020

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BOOXY7

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717705

Level (low/med): LOW Date Received: 7/16/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.30	B	N	F
7440-39-3	Barium	30.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	32900.00			P
7440-47-3	Chromium	4.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.00	U	*	P
7439-89-6	Iron	89.40	B		P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	9880.00			P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5280.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	16100.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	31.50	B		P
7440-66-6	Zinc	13.70	B		P
	Cyanide	10.00	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613402.1228

U.S. EPA - CLP

0000021

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BOOXY8

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717706

Level (low/med): LOW Date Received: 7/16/91

* 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.80	B	N	F
7440-39-3	Barium	30.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	33100.00			P
7440-47-3	Chromium	4.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.00	U	*	P
7439-89-6	Iron	36.00	U		P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	9980.00			P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5200.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	16300.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	28.00	B		P
7440-66-6	Zinc	9.20	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613402.1229

VALIDATION SUMMARY

9613402_1230

9107L177-wes-118

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

DATE: January 26, 1993

TO: File 9107L177

FROM: S.D.L.A.

Telephone: 2-3206

CC:

SUBJECT:

VALIDATION DOCUMENTATION

Validation documentation for the above mentioned data package is filed with Data Package 9106L758.

Report To

**Westinghouse Hanford Company
Richland, Washington**

Data Validation Report

200-BP-1 RI/FS

Laboratory: Weston

**Data Packages: 9106L758, 9107L112
9107L156, 9107L177**

Matrix: Water

Analysis Type: Volatile Organics and Wet Chemistry

Prepared By

**Golder Associates Inc.
Redmond, Washington**

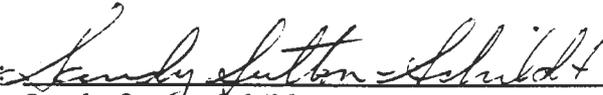
Report To

Westinghouse Hanford Company
Richland, Washington

Data Validation Report
200-BP-1 RI/FS
Data Package: 9107L177-WES-118
SDG No.: CLP177
Analysis Type: Metals/Cyanide/Bi/Si

Prepared By

Golder Associates Inc.
Redmond, Washington

Validated by: 
Sandy Sutton-Schildt
Staff Environmental Scientist

Reviewed by: 
Kent Angelos
Associate

TABLE OF CONTENTS

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1. INTRODUCTION	1
2. DATA QUALITY OBJECTIVES	1
3. QUALIFIED DATA	1
3.1 Major Deficiencies	1
3.2 Minor Deficiencies	1
4. CONCLUSIONS	2
5. REFERENCES	2

1. INTRODUCTION

This report presents the results of data validation on case WEST and SDG: CLP177 consisting of four (4) water samples for contract laboratory program/target analyte list (CLP/TAL) total and dissolved metals, CLP/TAL total cyanide, bismuth and silicon analysis. Sample identifications, locations and sample dates are provided in the tabular data summary provided in Attachment 3. The samples were analyzed by the Weston - Lionville laboratory using the 3/90 statement of work (SOW) for metals and cyanide. Validation was conducted in accordance with "Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision 0, November 1991" including Revision A, dated December 1991.

2. DATA QUALITY OBJECTIVES

The data packages were complete for all requested analyses and met the data quality objectives of the "RI/FS Work Plan for the 200-BP-1 Operable Unit, Hanford Site, Richland, Washington, DOE/RL 88-32". Data quality objectives for the project specified the use of CLP methods for the TAL metals and cyanide, and the use of standard methods for the analysis of silicon and bismuth (APHA, 1989).

Sample quantitation limits were in most samples less than the contract required quantitation limit (CRQL) specified in the QAPjP (DOE, 1989) with the exception of bismuth. Bismuth was reported to a quantitation limit of 200 $\mu\text{g/L}$ and the estimated detection limit specified in method 3111A (APHA, 1989) is 60 $\mu\text{g/L}$. However, all analyses were reported to within five times the CRQL.

3. QUALIFIED DATA

This section presents a summary of the qualifications required based on validation of the subject data package.

3.1 Major Deficiencies

No data were rejected as a result of the validation.

3.2 Minor Deficiencies

The following qualifications were required as a result of the validation. Attachment 2 provides a summary of the samples affected.

- Arsenic, copper, iron, and zinc were detected in one or more laboratory blanks. Associated sample results less than five times the highest blank concentration have been qualified as non-detects (see Attachments 2 and 4).

- Matrix spike recoveries for arsenic and lead were not within the control limits of 75 to 125%. All associated sample results have been qualified as estimated (UJ for non-detects).
- Analytical spike recoveries for selenium and thallium exceeded the control limit of 85 to 115%. Five associated sample results have been qualified as estimated (J for detects, UJ for non-detects).

4. CONCLUSIONS

Sections 1 through 3 present a summary of the data quality for the subject data package. No major deficiencies were identified during the validation requiring rejection of data. The attachments provide supporting documentation and a tabular summary of the qualified data. The original, as-received data package is enclosed for submittal to the project QA record.

5. REFERENCES

APHA, 1989, Standard Methods for the Examination of Water and Wastewater, 17th Edition, American Public Health Association, Washington, D.C.

DOE, 1989, Remedial Investigation/Feasibility Study Work Plan for the 200-BP-1 Operable Unit Hanford Site, Richland, Washington, DOE/RL 88-32. United States Department of Energy, Richland, Washington.

WHC, 1991, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision A, November 1991. Westinghouse Hanford Company, Richland, Washington.

LIST OF ATTACHMENTS

- 1 Glossary of Data Qualifiers
- 2 Summary of Data Qualifications - Form B-7
- 3 As-Qualified Data Summary
- 4 Data Review Supporting Documentation

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

- U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected. Due to identified quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit.
- J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are usable for decision making processes.
- B - Indicates the compound or analyte was analyzed for and detected. The associated value is less than the CRQL but greater than the IDL.
- R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.
- NJ - Indicates presumptive evidence of a compound at an estimated value.
- N - Indicates presumptive evidence of a compound.

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ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP 177	REVIEWER: S. Schmitt	DATE: 2/8/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
As	U	all	Analyte found in lab blank
Cu	U	B00X59, B00X70	↓
Fe	U	B00X59, B00X77	
Zn	U	all	
As	UJ	all	Matrix spike recovery < 75%
Pb	UJ	all	
Se	J	B00X59	Analytical spike recovery < 75% > 115%
Tl	UJ	all	

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2/17/92

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ATTACHMENT 3
AS QUALIFIED DATA SUMMARY

Project		200-BP-1																					
Laboratory		WESTON																					
Case WEST		SDG		CLP177																			
Sample Number		B00XS9		B00XT0		B00XY7		B00XY8															
Location		2-33-38		2-33-38		2-33-24		2-33-24															
Remarks		total		dissolve		total		dissolved		total		dissolved		total		dissolved		total		dissolved			
Sample Date		7-12-91		7-12-91		7-12-91		7-12-91															
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Aluminum	200	96	U	96	U	96	U	96	U														
Antimony	60	55	U	55	U	55	U	55	U														
Arsenic	10	6.3	UJ	5.4	UJ	5.3	UJ	5.8	UJ														
Barium	200	38.3	B	35.1	B	30.7	B	30	B														
Beryllium	5	1	U	1	U	1	U	1	U														
Cadmium	5	4.1	B	4	U	4	U	4	U														
Calcium	5000	38600		39100		32900		33100															
Chromium	10	16.5		5.7	B	4	U	4	U														
Cobalt	50	8	U	8	U	8	U	8	U														
Copper	25	24.8	U	6.4	U	6	U	6	U														
Iron	100	102	U	36	U	89.4	U	36	U														
Lead	5	2	UJ	2	UJ	2	UJ	2	UJ														
Magnesium	5000	11900		12100		9880		9980															
Manganese	15	5.5	B	3.3	B	3	U	3	U														
Mercury	0.2	0.1	U	0.1	U	0.1	U	0.1	U														
Nickel	40	10	U	10	U	10	U	10	U														
Potassium	5000	5340		5450		5280		5200															
Selenium	5	3.2	J	2	B	2	U	2	U														
Silver	10	7	U	7	U	7	U	7	U														
Sodium	5000	20600		21200		16100		16300															
Thallium	10	2	UJ	2	UJ	2	UJ	2	UJ														
Vanadium	50	31.8	B	30.1	B	31.5	B	28	B														
Zinc	20	17.2	U	12.2	U	13.7	U	9.2	U														
Cyanide	10	7.56	U			10	U																
Bismuth		200	U	200	U	200	U	200	U														
Silicon		13400		13700		14100		14000															

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9613402.1241 0000013

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

BOOKS9

2-33-38

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717701

Level (low/med): LOW Date Received: 7/16/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	6.30	B N		F UJ
7440-39-3	Barium	38.30	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.10	B		P
7440-70-2	Calcium	38600.00			P
7440-47-3	Chromium	16.50			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	24.80	B *		P U
7439-89-6	Iron	102.00			P U
7439-92-1	Lead	2.00	U NW		F UJ
7439-95-4	Magnesium	11900.00			P
7439-96-5	Manganese	5.50	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5340.00			P
7782-49-2	Selenium	3.20	B W		F J
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	20600.00			P
7440-28-0	Thallium	2.00	U W		F UJ
7440-62-2	Vanadium	31.80	B		P
7440-66-6	Zinc	17.20	B		P U
	Cyanide	7.56	U		C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FORM I - IN

03/90

Handwritten:
2/17/92

1
 INORGANIC ANALYSIS DATA SHEET

BOOXTO
 2-33-38

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717702

Level (low/med): LOW Date Received: 7/16/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.40	B	N	F <i>uJ</i>
7440-39-3	Barium	35.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	39100.00			P
7440-47-3	Chromium	5.70	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.40	B	*	P <i>u</i>
7439-89-6	Iron	36.00	U		P
7439-92-1	Lead	2.00	U	NW	F <i>uJ</i>
7439-95-4	Magnesium	12100.00			P
7439-96-5	Manganese	3.30	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5450.00			P
7782-49-2	Selenium	2.00	B		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	21200.00			P
7440-28-0	Thallium	2.00	U	W	F <i>uJ</i>
7440-62-2	Vanadium	30.10	B		P
7440-66-6	Zinc	12.20	B		P <i>u</i>
	Cyanide				NR

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

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1
INORGANIC ANALYSIS DATA SHEET

BOOXY7
2-33-24

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717705

Level (low/med): LOW Date Received: 7/16/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.30	B N		F UJ
7440-39-3	Barium	30.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	32900.00			P
7440-47-3	Chromium	4.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.00	U *		P
7439-89-6	Iron	89.40	B		P U
7439-92-1	Lead	2.00	U NW		F UJ
7439-95-4	Magnesium	9880.00			P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5280.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	16100.00			P
7440-28-0	Thallium	2.00	U		F UJ
7440-62-2	Vanadium	31.50	B		P
7440-66-6	Zinc	13.70	B		P U
	Cyanide	10.00	U		C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

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2/17/92

1
 INORGANIC ANALYSIS DATA SHEET

BOOXY8
 233-24

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP177

Matrix (soil/water): WATER Lab Sample ID: 910717706

Level (low/med): LOW Date Received: 7/16/91

% 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	96.00	U		P
7440-36-0	Antimony	55.00	U		P
7440-38-2	Arsenic	5.80	B	N	F UJ
7440-39-3	Barium	30.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	33100.00			P
7440-47-3	Chromium	4.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	6.00	U	*	P
7439-89-6	Iron	36.00	U		P
7439-92-1	Lead	2.00	B	NW	F UJ
7439-95-4	Magnesium	9980.00			P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	10.00	U		P
7440-09-7	Potassium	5200.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	16300.00			P
7440-28-0	Thallium	2.00	U	W	F UJ
7440-62-2	Vanadium	28.00	B		P
7440-66-6	Zinc	9.20	B		P U
	Cyanide				NR

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

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ATTACHMENT 4

DATA REVIEW SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA REVIEW CHECKLIST - FORM A-6

PROJECT: 913-1719	REVIEWER: S. Schubert	DATE: 2/8/92
LABORATORY: Weston	CASE: West	SDG: CLP177
SAMPLES/MATRIX: BODX59, XT0, XY7, XY8 / water		

1. COMPLETENESS AND CONTRACT COMPLIANCE

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

<u>Data Package Item</u>	<u>Present?:</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>
Case Narrative		/	—	—
Cover Page		/	—	—
Traffic Reports		/	—	—
Sample Data		/	—	—
Inorganic Analysis Data Sheets		/	—	—
Standards Data		/	—	—
Initial and Continuing Calibration Verification		/	—	—
CRDL Standard for AA and ICP		/	—	—
QC Summary		/	—	—
Blanks		/	—	—
ICP Interference Check Summary		/	—	—
Spike Sample Recovery		/	—	—
Post-Digestion Spike Sample Recovery		/	—	—
Duplicate		/	—	—
Laboratory Control Sample		/	—	—
Standard Addition Results		/	—	—
ICP Serial Dilutions		/	—	—
Instrument Detection Limits		/	—	—
ICP Interelement Correction Factors		/	—	—
ICP Linear Ranges		/	—	—
Preparation Log		/	—	—
Analysis Run Log		/	—	—

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<u>Data Package Item</u>	<u>Present?:</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>
Raw Data				
ICP Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Furnace AA Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mercury Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Raw Data		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional Data				
Internal laboratory chain-of-custody		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Laboratory Sample Preparation Records		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percent Solids Analysis Records		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reduction Formulae		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Instrument Run Logs		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemist Notebook Pages		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. HOLDING TIMES

Have all samples been analyzed within holding times? Yes No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for non-detects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? Yes No N/A

Are the correlation coefficients ≥ 0.995 ? Yes No N/A

Was a midrange CN standard distilled? Yes No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results $> IDL$ as estimated (J) and results $< IDL$ as estimated (UJ), if the correlation coefficient is < 0.995 or the laboratory did not distill the midrange CN standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

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5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? Yes No N/A

Are the AB solution %R values within control? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5X the amount in any laboratory blank as non-detected (U).

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5X the amount in any valid field blank as non-detected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all non-detects as estimated (UJ). If spike recovery is <30%, reject all non-detects (R).

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results > IDL, for which the LCS %R falls within the range 50-79% or > 120%. Qualify as estimated (UJ), all sample results < IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R < 50%.

SOLID LCS - Qualify as estimated (J), all sample results > IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results < IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample analyses in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No **N/A**

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No **N/A**

ACTION: Note the results of the field split samples in the validation narrative.

15. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? **Yes** No N/A

Are applicable duplicate injection RSD values within control? **Yes** No N/A

If no, were samples rerun once as required? Yes No **N/A**

Does the RSD for the rerun fall within the control limits? Yes No **N/A**

Were analytical spike recoveries within the control limits? Yes **No** N/A

If no, were MSA analyses performed when required? Yes No **N/A**

Are MSA correlation coefficients ≥ 0.995 ? Yes No **N/A**

If no, was a second MSA analysis performed? Yes No **N/A**

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for non-detects). If the analytical spike recovery is less than 40 percent qualify detects as estimated (J). If the analytical spike recovery is greater than or equal to 10% but less than 40 percent, qualify all non-detects as estimated (UJ) and if the analytical spike recovery is less than 10 percent, reject all non-detects (R). If the sample absorbance is less than 50% of the analytical spike absorbance and the analytical spike recovery is less than 85% or greater than 115%, qualify all results as estimated (J for detects and UJ for non-detects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was less than 0.995, qualify the associated detected results as estimated (J).

16. ANALYTE QUANTITATION AND DETECTION LIMITS

- Have results been reported and calculated correctly? Yes No N/A
- Are results within the calibrated range of the instruments and within the linear range of the ICP? Yes No N/A
- Are all detection limits below the CRQL? Yes No N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

17. OVERALL ASSESSMENT AND SUMMARY

- Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A
- Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10 of the data validation requirements.

HOLDING TIME SUMMARY - FORM B-1

SDG: CLP177		REVIEWER: SS Chilcott			DATE: 2/7/92		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	
BOOX59, XTO	CN	7/12/91	7/19/91	7/19/91	7	7	none	
BOOXY7, 8	↓	↓	↓	↓	↓	↓	↓	
BOOX59, XTO	CV	↓	7/25/91	7/26/91	13	14		
BOOXY7, 8	↓	↓	↓	↓	↓	↓		
BOOX59, XTO	GFAA-As	7/12/91	7/25/91	7/29/91	13	17	none	
BOOXY7, 8	↓	↓	↓	↓	↓	↓	↓	
BOOX59, XTO	GFAA-Pb	↓	↓	7/30/91	↓	18		
BOOXY7, 8	↓	↓	↓	↓	↓	↓		
BOOX59, XTO	GFAA-Se	↓	↓	7/28/91	↓	16		
BOOXY7, 8	↓	↓	↓	↓	↓	↓		
BOOX59, XTO	GFAA-Tl	↓	↓	7/29/91	↓	17		
BOOXY7, 8	↓	↓	↓	↓	↓	↓		
BOOX59, XTO	ICP	7/12/91	7/25/91	8/16/91	13	37	none	
BOOXY7, 8	↓	↓	↓	↓	↓	↓	↓	

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BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: CLP177		REVIEWER: S Schildt			DATE: 2/7/92			PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PB1K	As	-2.4	B		µg/L	12.0		B00X59	6.3 u
								B00X70	5.4 u
								B00X77	5.3 u
								B00X78	5.8 u
ICB	Cu	6.9	B		µg/L	34.5		B00X59	24.8 u
CCB1		8.7				43.5		B00X70	6.4 u
CCB2		6.9				34.5			
CCB3		6.9				34.5			
PB1K	Fe	87.4	B		µg/L	437.0 ⁵⁵⁵ 487.4		B00X59	102.0 u
								B00X77	89.4 u
CCB3	Zn	4.2	B		µg/L	21.0		B00X59	17.2 u
PB1K		8.0	B		µg/L	40		B00X70	12.2 u
								B00X77	13.7 u
								B00X78	9.2 u

B-3

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ACCURACY DATA SUMMARY - FORM B-4

SDG: CLP177		REVIEWER: S Schulz		DATE: 2/8/92		PAGE 1 OF 1	
COMMENTS: Analytical spike recovery							
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED			
B00X59	Pb	84.9		none			
B00XT0	↓	82.4					
B00X47	↓	84.9					
B00X48	↓	84.4					
B00X59	Se	75.7		J			
B00X59	Tl	123.8		UJ			
B00XT0	↓	118.6		UJ			
B00X47	↓	120.1		UJ			
B00X48	↓	121.9		UJ			

B-4

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