START 9613402.1950

9212L888-WES-914

013 0043045 342

WESTON

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client : WESTINGHOUSE HANFORD
RFW# : 9212L888

W.O. #: 06168-002-001-9999-00
Date Received: 12-02-92

CLP METALS

The set of samples consisted of two (2) sediment samples collected on 11-22 and 11-24-92.

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 exceptions of arsenic, selenium and silver. All exceptions are flagged with a "N" on the CLP forms.

7. All duplicate analyses were within the 20% RPD control limit with the exception of silver. All exceptions are flagged with a "*" on the CLP forms.

8. Arsenic sample results were calculated by the method of standard addition (MSA). All corresponding samples were flagged with a "S" according to CLP protocol.

9. For MSA, results reported on Form 8 are calculated from absorbance values. Results reported on other forms are based on concentration. As indicated in the SOWILM01.0, page B-32, differences due to rounding may be found between the MSA values on Form 8 and the results reported on the other forms.

FEB 1996
RECEIVED
EDMC

WESTON
MANAGERS DESIGNERS/CONSULTANTS

10. 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.

11. 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).

12. Quarterly Detection Limits, ICP Interelement Correction Factors and ICP Linear Ranges for IC3 are included in this package, but do not appear on EDD.

13. The graphite furnace time that appears on form XIV is the time of the first injection. The time that appears on the data is the print time.

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

1.8.93
Date

mlj/clp-met.nar

9613402.1952

015

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9212L888

W.O. #: 06168-002-001-9999-00
Date Received: 12-02-92

CLP METALS ADDENDUM

1. Following Exhibit E, Section V, Item 10, page E-23 of the USEPA Statement of Work for Inorganics Analysis, Document Number ILM02.0 ICP Instrument Detection Limits (IDLs) are reported for two (2) ICP instruments. The instrument identification numbers are "IC1" and "IC3". The highest IDL for the two instruments is used for reporting concentration values in this sample data package.

2. A discrepancy exists between raw data and Form XIVs analytical spikes recovery calculations performed for graphite furnace AA analytes. Instrument software calculates spike recoveries based on absolute values below the IDL for sample results. This is hard-coded by the vendor and is currently not correctable. CLP convention (SOW ILM02.0, Exhibit E, Section V, Item 6, page E-20) requires that when values fall below the IDL, the sample result is equal to zero (0) for the purposes of calculating the percent recovery. The Form XIVs contain the correct calculation.

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

1.8.93
Date

mlj\clp-met.nar

FORM OF PAYMENT

Cash ☐ FCCOD ☐

Bill to Consignee ☒ Third Party Billing ☐

Shipper's Account Number
850281585

EMERY WORLDWIDE — A CF Company

SERVICES **

UNITED STATES / CANADA: Same Day (Extra Charges) ☐ AM ☒ PM ☐ Second Day ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date: 12-01-92 | Origin: PBC | Shipment Number: 251900726 0

From:
ESTINGHOUSE SHIPPING DEPT. (509) 376-6665
2-06 U.S. DEPARTMENT OF ENERGY C/O
STINGHOUSE HANFORD
BLDG 1163
52 STEVENS DRIVE
CHLAND WA

Canada ☐

To:
PEG BEATY
RF WESTON INC
208 WELSH POOL ROAD
LIONVILLE PA 19341

Hold for Pick Up ☐ Canada ☐

Tariff Dest. | Gateway

Check to Shipper $

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Customer's Reference Numbers: 6A3 A1225 W93-0-0122#14 97352

Consignee's Account Number: E

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
CE CHEST IT-51 L SAMPLES NG7, B07NH7	1	14	14	17	1	36

FOR INFORMATION OR RATES CALL 1-800 44 EMERY (1-800-443-6379)

Declared Value $

251900726 0

Remarks: RNIGHT DELIVERY NATURE SECURITY SERVICE

Permanent

Zip Ship ☐ For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used: Urgent Letter 9X12 ☒ Urgent Pack 12X15 ☒

International Shipments: Free Domicile ☐ Commodity Code

Third Party Account Number mandatory for Third Party Billing. Third Party Account Number: E

International Customs Value | International Insurance

Charge

Total Transportation Charges | Other Charges/Advance at Origin ☐ OC/AO- $

3-PhL-A

Terms and Conditions on back

9613402.1953

02

PRECISION PRINTING SYSTEMS • (509) 239-0016

EMERY WORLDWIDE

A CF Company

SIGNATURE AND TALLY RECORD

60029-46 (8/89) Litho USA

A.O.

DATE: 12-01-92 SHIPMENT NO.: 251900726 0

SHIPPER: WESTINGHOUSE SHIPPING DEPT. (509) 376-6665

REFERENCE NO.: W93-0-0122#14

SHIPPER NAME AND ADDRESS	CONSIGNEE NAME AND ADDRESS
WESTINGHOUSE SHIPPING DEPT. (509) 376-6665 G2-06 U.S. DEPARTMENT OF ENERGY C/O WESTINGHOUSE HANFORD COMPANY 2355 STEVENS DRIVE 1163 BUILDING PO BOX 1970 RICHLAND WA 99352	[illegible] PEG BEATY RF WESTON INC 208 WELSH POOL ROAD LIONVILLE PA 19341

PSC

3PHC

Pieces	Weight	Description/Marks	Emery Authorization No.
1	36 LBS	B07NG7, B07NH7 ICE CHEST IT-51 SOIL SAMPLES	

EACH PERSON HANDLING OR TAKING CUSTODY OF THIS SHIPMENT MUST SIGN AND COMPLETE THE INFORMATION BELOW

	Name of Person/Company	Transship Point/Destination	Signature of Person Accepting Custody	Time/Date
1.	[illegible]	Richland Lic	[illegible]	[illegible]
2.	[illegible]	[illegible]	[illegible]	[illegible]
3.	[illegible]	[illegible]	[illegible]	[illegible]
4.	Dimosbrucker Ox	By	[illegible]	1600 12/1
5.	C. OAKES	Eun/HDY	Charlie Oakes	0332 12-2-92
6.	Brian E Shaffer	Lionville	Brian E Shaffer	12/2/92 1:15 pm
7.				
8.				

9613402.1954

SPECIAL HANDLING INSTRUCTIONS

DESTINATION TERMINAL COPY

9613402.1955

3A

FEDEX® PRIORITY OVERNIGHT THU

exp# 9481 14APR93

Trk# 588 8690 823

PSCA

99352-WA-US

82PSC

9613402.1956

0 5 9212086

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator: BRIAN MATINGLY

OSM Project No. 92-374

Company Contact: Steve Weiss, Ron Mitchell

Telephone: 376-1683, 376-5122

Project Designation/Sampling Locations: 100 AREA, COLUMBIA RIVER, HANFORD REACH

Collection Date: 11/24/92

Ice Chest No.: IT #51

Field Logbook No.: 199806.226

Bill of Lading/Airbill No.: 251 900 7260

Offsite Property No.: W93-0-0122 #14

Method of Shipment: EMERY

Shipped to: WESTON 208 WELCH POINT RD. CONNELLE PA 19341

Possible Sample Hazards/Remarks: NONE

Sample Identification

B47N67 1x1000 ML, 2x250 ML, 1x125 ML, COLUMBIA RIVER SEDIMENT

B47N H7 1x1000 ML, 2x250 ML, 1x125 ML, COLUMBIA RIVER SEDIMENT

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Fed Ex	Susan Perko	12/2/92 930
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

9613402.1957 0 6

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

Collector MAHFOD, MATTINGLY, GIAMAN Date 11-24-92

Company Contact Steve Weiss or Ron Mitchell Telephone 1509 1376-1683 376-6122

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested
B07N67	SE	11/22/92	1400	1x1000ml-Plastic: Alpha Spec (Am, Pu, U), Gross Beta, Gamma Spec, ^{90}Sr
	SE			
	SE			1 x 250ml-Glass: Mercury
	SE			1 x 250 ml-Glass: Lead
	SE			1 x 125 ml-Glass: ICP and AA Metals
B07N47	SE	11/24/92	1100	1 x 1000ml-Plastic: Alpha Spec (Am, Pu, U), Gross Beta, Gamma Spec, ^{90}Sr
	SE			
	SE			1 x 250 ml-Glass: Lead
	SE			1 x 250ml-Glass: Mercury
	SE			1 x 125 ml-Glass: ICP and AA Metals
	SE			1x1000ml-Plastic: Alpha Spec (Am, Pu, U), Gross Beta, Gamma Spec Sr-90
	SE			1x250ml-Glass: Lead
	SE			1x250 ml Glass: Mercury
	SE			1x125ml Glass: ICP and AA Metals
	SE			1x1000ml-Plastic: Alpha Spec (Am, Pu, U), Gross Beta, Gamma Spec, ^{90}Sr
	SE			1x 250ml-Glass: Lead
	SE			1x 250 ml-Glass: Mercury
	SE			1x 125 ml-Glass: ICP & AA metals
	SE			

*Type of Sample: A = Air; DL = Drum Liquids; DS = Drum Solids; L = Liquid; O = Oil; S = Soil; SE = Sediment; SL = Sludge; SO = Solid; T = Tissue; W = Water; WI = Wipe; X = Other

Field Information OSM Project No. 92-374

Special Handling and/or Storage 4°C

Possible Sample Hazards NONE

A-6000-406 (08/91)

9613402.1958

SAMPLE ANALYSIS REQUEST

DOE AREAS FACILITIES HEALTH & SAFETY

373-1436

FAX: 373-4030

0 7

REQUESTER: Rich Mabood

PHONE: 376-1683

DATE: 11-23-92

HEALTH PHYSICS USE ONLY

SAMPLE NUMBER	SAMPLE DATE/TIME	SAMPLE DESCRIPTION	ANALYSIS DATE/TIME	LAB NUMBER	BETA/GAMMA/ALPHA RESULTS (pCi/gm)	ALPHA RESULTS (pCi/gm)
B07NG0	11-21-92 1050	Sediment	11-23-92 2049	G92-1275	16.1	1.3
B07NG1	11-21-92 1245	Sediment	11-23-92 2059	G92-1276	14.9	1.7
B07NG2	11-22-92 1345	Sediment	11-23-92 2109	G92-1277	14.2	1.5
B07NG3	11-22-92 1315	Sediment	11-23-92 2120	G92-1278	13.6	<MDA
B07NG4	11-22-92 1105	Sediment	11-23-92 2130	G92-1279	14.0	1.3
B07NG5	11-22-92 1330	Sediment	11-23-92 2140	G92-1280	16.4	2.0
B07NG6	11-22-92 1340	Sediment	11-23-92 2150	G92-1281	15.9	1.8
B07NG7	11-22-92 1350	Sediment	11-23-92 2228	G92-1282	16.3	1.7
B07NG8	11-23-92 0820	Sand	11-23-92 2305	G92-1283	19.6	<MDA
B07NG9	11-23-92 1015	Sediment	11-24-92 0926	G92-1284	29.5	1.5
B07NH0	11-23-92 1030	Sediment	11-24-92 0920	G92-1285	24.6	<MDA
B07NH1	11-23-92 1150	Sediment	11-24-92 1404	G92-1286	15.2	1.1
B07NH2	11-23-92 1215	Sediment	11-24-92 1215	G92-1287	23.4	2.0
B07NH3	11-23-92 1345	Sediment	11-24-92 1535	G92-1288	19.0	1.8

ANALYSIS BY: J. Mills

DATE: 11-24-92

9613402.1959

SAMPLE ANALYSIS REQUEST

100 AREAS FACILITIES HEALTH & SAFETY

373-1436

FAX: 373-4030

0 8

REQUESTER: Rich Mahood

PHONE: 376-1683

DATE: 11-23-92

HEALTH PHYSICS USE ONLY

SAMPLE NUMBER	SAMPLE DATE/TIME	SAMPLE DESCRIPTION	ANALYSIS DATE/TIME	LAB NUMBER	BETA/GAMMA/ALPHA RESULTS (bCi/gm)	ALPHA RESULTS (bCi/gm)
B07NH4	11-23-92 1410	Sediment	11-24-92 1619	G92-1289	17.8	1.5
B07NF9	11-21-92 1030	Sediment	11-24-92 1655	G92-1290	17.0	2.2
B07NH5	11-24-92 1100	Sediment	11-24-92 1730	G92-1292	17.4	1.7
B07NH6	11-24-92 1100	Sediment	11-24-92 1812	G92-1293	15.3	1.3
B07NH7	11-24-92 1100	Sediment	11-24-92 1850	G92-1294	14.8	1.7

N

ANALYSIS BY: J. Mith

DATE: 11-24-92

9615402.1960 "Next Day Service" 0 3 Signature Security

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
Westinghouse Hanford Co.		[illegible] 14

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Environmental Engineering	Remedial Action	

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

Routing ☐ Contractor ☐ Vendor

Shipped to	Off-site Custodian
Weston 208 ~~Rd~~ Welch Pool Rd Lionville, PA 19341	Pay Beaty
	Full Title Sample Receipt

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1	Poly Chest: [illegible] vermiculite [illegible]	
36 lbs	Ice Chest IT-51: sample #s B07NG7, B07NH7	

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

Necessity for the Off-Site Use of this Property

Program not available on site

A/B# 251 900 7260

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

RM Clearance for Public Release	RM Survey No.	Date
Linda RB Glaman Linda RB Glaman	[illegible]	12/1/92

Location of Property (Area & Bldg.)	Contact	Phone
Columbia River Sediments	Steve Weiss	(504) 37[illegible]-1236

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12/1/92	P96A3/A1225	[illegible]

Originated By	Date	Authorized By	Date
Linda RB Glaman IT Corp [illegible]	12/1/92	[illegible]	11/30/92

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	[illegible]

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
[illegible]				
Date 12-1-92				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

Pm - Josie Data Deliver CA metals

WESTON Analytics Use Only

92121L888

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client: Westinghouse-HANFORD
Est. Final Proj. Sampling Date:
Work Order #: 06168-002-001-9999-00
Project Contact/Phone #:
AD Project Manager: Josie Edwards
QC: CLP Del: CLP TAT: 35 DAY
Date Rec'd: ~~12/1/92~~ 12/2/92 Date Due: ~~11/6/93~~ 11/7/93
Account #: WSHANFORD

Refrigerator #									2	2	2							
#/Type Container	Liquid																	
	Solid							1G	1G	1G	1G							
Volume	Liquid																	
	Solid							250	250	250	125							
Preservatives								—	—	—	—							
ANALYSES REQUESTED →		ORGANIC									INORG							
		VOA	BNA	Pest/PCB	Herb			Radiochem	Hg	Pb	Metal	CN						
								WESTON Analytics Use Only										
								ICLP	MHGTD	MPBTD	See Below							

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
001	B07NG7			SE	11/20/92	1400					✓	✓	✓	✓						
002	B07NH7			⊥	11/24/92	1100					✓	✓	✓	✓						
	RADIOCHEM = Alpha Spec (Am, Pu, U), Gross Beta, Gamma Spec, 90 Sr																			
	Metals = Westinghouse ICLP + Hg, Pb																			

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1. 12/3/92 Added Metals: As Se & Ti to list per SDR
2. 12/3/92 Changed date Rec'd & Due per SDR
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped (X) or Hand Delivered
Airbill # Emery
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Relinquished by	Received by	Date	Time
Emery	E Perkins	12/2/92	115
	SP 12/2/92		

Relinquished by	Received by	Date	Time
	SP 12/2/92		

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ____ Cooler# ____ 381-596a

010

9613402.1961

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 01/05/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9212L888

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B07NG7	Silver, Total	3.0	u	MG/KG	3.0
		Aluminum, Total	4830		MG/KG	59.3
		Arsenic, Total	4.9		MG/KG	3.0
		Barium, Total	76.5		MG/KG	59.3
		Beryllium, Total	1.5	u	MG/KG	1.5
		Calcium, Total	3280		MG/KG	1480
		Cadmium, Total	1.8		MG/KG	1.5
		Cobalt, Total	14.8	u	MG/KG	14.8
		Chromium, Total	13.3		MG/KG	3.0
		Copper, Total	17.2		MG/KG	7.4
		Iron, Total	10500		MG/KG	29.7
		Mercury, Total	0.15	u	MG/KG	0.15
		Potassium, Total	1480	u	MG/KG	1480
		Magnesium, Total	3040		MG/KG	1480
		Manganese, Total	130		MG/KG	4.5
		Sodium, Total	1480	u	MG/KG	1480
		Nickel, Total	11.9	u	MG/KG	11.9
		Lead, Total	27.9		MG/KG	8.9
		Antimony, Total	17.8	u	MG/KG	17.8
		Selenium, Total	1.5	u	MG/KG	1.5
		Thallium, Total	3.0	u	MG/KG	3.0
		Vanadium, Total	14.8	u	MG/KG	14.8
		Zinc, Total	230		MG/KG	5.9

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 01/05/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9212L888

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-002	B07NH7	Silver, Total	5.3		MG/KG	2.5
		Aluminum, Total	2460		MG/KG	49.1
		Arsenic, Total	2.5	u	MG/KG	2.5
		Barium, Total	49.1	u	MG/KG	49.1
		Beryllium, Total	1.2	u	MG/KG	1.2
		Calcium, Total	2740		MG/KG	1230
		Cadmium, Total	1.2	u	MG/KG	1.2
		Cobalt, Total	12.3	u	MG/KG	12.3
		Chromium, Total	5.3		MG/KG	2.5
		Copper, Total	23.0		MG/KG	6.1
		Iron, Total	6480		MG/KG	24.6
		Mercury, Total	0.13	u	MG/KG	0.13
		Potassium, Total	1230	u	MG/KG	1230
		Magnesium, Total	1480		MG/KG	1230
		Manganese, Total	144		MG/KG	3.7
		Sodium, Total	1230	u	MG/KG	1230
		Nickel, Total	9.8	u	MG/KG	9.8
		Lead, Total	18.1		MG/KG	7.4
		Antimony, Total	14.7	u	MG/KG	14.7
		Selenium, Total	1.2	u	MG/KG	1.2
		Thallium, Total	2.5	u	MG/KG	2.5
		Vanadium, Total	12.3	u	MG/KG	12.3
		Zinc, Total	167		MG/KG	4.9

9613402.1964

U.S. EPA - CLP

026 EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

B07NG7

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP888

Matrix (soil/water): SOIL Lab Sample ID: 921288801

Level (low/med): LOW Date Received: 12/02/92

% Solids: 67.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4830.00			P
7440-36-0	Antimony	17.80	U		P
7440-38-2	Arsenic	4.90		NS	F
7440-39-3	Barium	76.50			P
7440-41-7	Beryllium	.42	B		P
7440-43-9	Cadmium	2.08	U		P
7440-70-2	Calcium	3280.00			P
7440-47-3	Chromium	13.30			P
7440-48-4	Cobalt	7.00	B		P
7440-50-8	Copper	17.20			P
7439-89-6	Iron	10500.00			P
7439-92-1	Lead	27.90			F
7439-95-4	Magnesium	3040.00			P
7439-96-5	Manganese	130.00			P
7439-97-6	Mercury	.07	U		CV
7440-02-0	Nickel	11.80	B		P
7440-09-7	Potassium	1080.00	B		P
7782-49-2	Selenium	.59	U	N	F
7440-22-4	Silver	2.97	U	N*	P
7440-23-5	Sodium	131.00	B		P
7440-28-0	Thallium	.59	U		F
7440-62-2	Vanadium	14.50	B		P
7440-66-6	Zinc	230.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613402.1965

U.S. EPA - CLP

027 EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

B07NH7

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP888

Matrix (soil/water): SOIL Lab Sample ID: 921288802

Level (low/med): LOW Date Received: 12/02/92

% Solids: 78.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2460.00			P
7440-36-0	Antimony	14.70	U		P
7440-38-2	Arsenic	2.20	B	N	F
7440-39-3	Barium	36.20	B		P
7440-41-7	Beryllium	.25	U		P
7440-43-9	Cadmium	1.72	U		P
7440-70-2	Calcium	2740.00			P
7440-47-3	Chromium	5.30			P
7440-48-4	Cobalt	3.30	B		P
7440-50-8	Copper	23.00			P
7439-89-6	Iron	6480.00			P
7439-92-1	Lead	18.10			F
7439-95-4	Magnesium	1480.00			P
7439-96-5	Manganese	144.00			P
7439-97-6	Mercury	.06	U		CV
7440-02-0	Nickel	7.40	B		P
7440-09-7	Potassium	424.00	B		P
7782-49-2	Selenium	.50	U	N	F
7440-22-4	Silver	5.30		N*	P
7440-23-5	Sodium	219.00	B		P
7440-28-0	Thallium	.52	B		F
7440-62-2	Vanadium	6.50	B		P
7440-66-6	Zinc	167.00			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613402.1966

9212L888-WES-914

MEMORANDUM

TO: Columbia River Sediment Project QA Record April 8, 1993

FR: Christina Jensen, Golder Associates Inc.

RE: Inorganics Analysis Data Validation Summary for 9212L888-WES-914

INTRODUCTION

This memo presents the results of data validation on data package 9212L888-WES-914 consisting of two sediment samples submitted for inorganics analysis. The samples were analyzed by Weston using CLP protocols. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B07NG7	11/22/92	SEDIMENT
B07NH7	11/24/92	SEDIMENT

Data validation was conducted in accordance with the WHC statement of work (WHC 1993) and validation procedures (Bechtold 1992). Attachments 1 through 4 to this memo provide the data validation supporting documentation and a summary of the validated results.

DATA QUALITY OBJECTIVES

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met with the exception of arsenic, selenium and silver spike recoveries and arsenic and thallium GFAA analytical spike recoveries.

Sample Result Verification. All sample results were supported in the raw data with no data correction necessary.

Detection Limits. Detection limit goals were met for all analyses.

Completeness. The data package was complete for all requested analyses. A total of two samples were validated in this data set with a total of 46 determinations reported. Out of the 46 determinations reported, all determinations were deemed valid which results in a completeness of 100 percent. This completeness percentage meets the work plan objectives of 90%.

MAJOR DEFICIENCIES

There were no major deficiencies identified requiring rejection of the data.

MINOR DEFICIENCIES

Holding Times The holding time was exceeded for mercury analysis by one day. All mercury results were qualified as estimated (J for detects, UJ for nondetects).

Matrix Spike

Arsenic, selenium and silver spike results exceeded the QC limits of 75% to 125% with results qualified as estimated (J for detects, UJ for nondetects).

GFAA Analytical Spikes

The analytical spike percent recoveries exceeded the QC limits of 85% to 115% for the following samples and analytes and the associated sample results have been qualified as estimated (J for detects, UJ for nondetects):

Sample	Analyte
B07NG7	Arsenic
B07NG7	Thallium

Method of Standard Additions

A method of standard addition MSA was performed on sample B07NG7 for arsenic which was not required. The sample result was corrected on the results form to reflect the original concentration.

REFERENCES

WHC, 1993, Westinghouse Hanford Company, Validation of Columbia River Sediment Data, Statement of Work, Revision 0, January 1993. Westinghouse Hanford Company, Richland, Washington.

Bechtold, 1992, Westinghouse Hanford Company, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 1, 1992. Westinghouse Hanford Company, Richland, Washington.

9613402.1968

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9613402.1969

GLOSSARY OF INORGANIC DATA REPORTING QUALIFIERS

B - Indicates the analyte was analyzed for and detected. The value reported is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL). The data are usable for decision making purposes.

U - Indicates the 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. The data are usable for decision making purposes.

UJ - Indicates the analyte was analyzed for and not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit. The data are usable for decision making purposes.

J - Indicates the analyte was analyzed for and detected. The associated value is estimated due to a deficiency identified during data validation. The data are usable for decision making purposes.

UR - Indicates the analyte was analyzed for and not detected; however, due to an identified quality control deficiency the data are unusable.

R - Indicates the analyte was analyzed and detected; however, due to an identified quality control deficiency the data are unusable.

9613402.1970

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP 888	REVIEWER: CJ	DATE: 4/5/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Hg	UJ	all	hold time exceeded
As	J or UJ	all	SSR exceeded
Se	J or UJ	all	↓
Ag	J or UJ	all	↓
As	J or UJ	B07N67	Furnace QC exceeded
Tl	J or UJ	B07N67	↓
As	4.31	B07N67	MSA not needed

9613402.1972

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

9613402.1973

U.S. EPA - CLP

026 EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

B07NG7

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP888

Matrix (soil/water): SOIL Lab Sample ID: 921288801

Level (low/med): LOW Date Received: 12/02/92

% Solids: 67.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4830.00			P	Q
7440-36-0	Antimony	17.80	U		P	
7440-38-2	Arsenic	4.30 ~~4.90~~		NS	F	J
7440-39-3	Barium	76.50			P	
7440-41-7	Beryllium	.42	B		P	
7440-43-9	Cadmium	2.08	U		P	
7440-70-2	Calcium	3280.00			P	
7440-47-3	Chromium	13.30			P	
7440-48-4	Cobalt	7.00	B		P	
7440-50-8	Copper	17.20			P	
7439-89-6	Iron	10500.00			P	J
7439-92-1	Lead	27.90			F	
7439-95-4	Magnesium	3040.00			P	
7439-96-5	Manganese	130.00			P	
7439-97-6	Mercury	.07	~~U~~		CV	UJ
7440-02-0	Nickel	11.80	B		P	
7440-09-7	Potassium	1080.00	B		P	
7782-49-2	Selenium	.59	~~U~~	N	F	UJ
7440-22-4	Silver	2.97	~~U~~	N*	P	UJ
7440-23-5	Sodium	131.00	B		P	
7440-28-0	Thallium	.59	~~U~~		F	UJ
7440-62-2	Vanadium	14.50	B		P	
7440-66-6	Zinc	230.00			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

4/15/93

9613402.1974

U.S. EPA - CLP

027 EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

B07NH7

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP888

Matrix (soil/water): SOIL Lab Sample ID: 921288802

Level (low/med): LOW Date Received: 12/02/92

% Solids: 78.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2460.00			P	Q
7440-36-0	Antimony	14.70	U		P	
7440-38-2	Arsenic	2.20	~~B~~	N	F	BJ
7440-39-3	Barium	36.20	B		P	
7440-41-7	Beryllium	.25	U		P	
7440-43-9	Cadmium	1.72	U		P	
7440-70-2	Calcium	2740.00			P	
7440-47-3	Chromium	5.30			P	
7440-48-4	Cobalt	3.30	B		P	
7440-50-8	Copper	23.00			P	
7439-89-6	Iron	6480.00			P	J
7439-92-1	Lead	18.10			F	
7439-95-4	Magnesium	1480.00			P	
7439-96-5	Manganese	144.00			P	
7439-97-6	Mercury	.06	~~U~~		CV	UJ
7440-02-0	Nickel	7.40	B		P	
7440-09-7	Potassium	424.00	B		P	
7782-49-2	Selenium	.50	~~U~~	N	F	UJ
7440-22-4	Silver	5.30		N*	P	J
7440-23-5	Sodium	219.00	B		P	
7440-28-0	Thallium	.52	~~B~~		F	BJ
7440-62-2	Vanadium	6.50	B		P	
7440-66-6	Zinc	167.00			P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

GJ 4/5/93

9613402.1975

ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Columbia River Sediments	REVIEWER: CJ	DATE: 4/2/93
LABORATORY: Weston	CASE: 9212L888 WDS -914	SDG: CLP 888
SAMPLES/MATRIX: Soils B07N67, B07NH7		

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.

Data Package Item	Present?: Yes	No	N/A
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	✓		
Raw Data			
ICP Raw Data	✓		
Furnace AA Raw Data	✓		
Mercury Raw Data	✓		
Cyanide Raw Data			✓
Additional Data			
Internal laboratory chain-of-custody	✓		
Laboratory Sample Preparation Records	✓		

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	✓		
Reduction Formulae		✓	
Instrument Run Logs	✓		
Chemist Notebook Pages		✓	

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 nondetects).

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 cyanide 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 cyanide 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.

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 laboratory blanks? Yes (No) N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations < 10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

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

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (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 nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

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. If field blanks were used for laboratory duplicates, note in the validation narrative.

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.

1516. 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

See note (1)

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients $\geq$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 nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is $\geq$10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. 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).

18. 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 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

① Lab did not need to do an MSA on B07N67 for arsenic. Original value is 14.5, Spike is 31 with 82.2 %R. Value calculated and reported on Form I.

9613402.1982

HOLDING TIME SUMMARY - FORM B-1

SDG: CLP888	REVIEWER: C. Jensen	DATE: 4/2/93	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
all	metals	11/22/92, 11/24/92	12/22/92, 12/24/92	12/28, 29/1993	30, 28	< 6 mos	none
all	Hg	11/22/11/24/92	12/18/92,	12/21/92	26	29 ~~30~~	~~none~~ UJ

ACCURACY DATA SUMMARY - FORM B-4

SDG: CLP888	REVIEWER: C Jensen	DATE: 4/2/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B07N67S	Arsenic	62.6	all	J or UJ
↓	Selenium	66.7	all	↓
↓	Silver	139.1	all	J for detects
B07N67	Arsenic	82.2	B07N67	J or UJ
B07N67	Thallium	26.76 (LSD)	B07N67	J or UJ

9613402.1983