START 9713506.2183 0000015 9302L483-WES-1021

0045864 8 of 2

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

Client: WESTINGHOUSE HANFORD
RFW #: 93021L483

W.O. #: 06168-002-001-9999-00
Date Received: 02-02-93

GC/MS VOLATILE

The set of samples consisted of two (2) water samples collected on 01-29-93.

The samples were analyzed according to criteria set forth in CLP SOW 03/90 for TCL Volatile target compounds on 02-09,10-93.

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

1. Non-target compounds were not detected in these samples.

2. All system monitoring compound (surrogate) recoveries were within EPA QC limits.

3. All matrix spike recoveries were within EPA QC limits.

4. All blank spike recoveries were within EPA QC limits.

5. The laboratory blanks contained the common contaminant Methylene Chloride at levels less than the CRQL.

6. All internal standard area and retention time criteria were met.

NOV 1996 RECEIVED LDMC

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

03.04.93
Date

sma/voa/02-483v.cn

PM - Josie Edwards
QA Data Yellow
Wells S. Kennard

WESTON Analytics Use Only
9302L483

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client: Westinghouse-Hanford
Est. Final Proj. Sampling Date:
Work Order #: OU08-002-001-9999-00
Project Contact/Phone #:
AD Project Manager: Josie Edwards
QC: CLP Del: CLP TAT: 35 DAY
Date Rec'd: 2/2/93 Date Due: 3/9/93
Account #: WS-HANFORD

Refrigerator #		1				3					1					
#/Type Container	Liquid	3G				1G	1P	1P	1P	1P	1P					
	Solid															
Volume	Liquid	40ml				500	850	1L	1L	1L	1L					
	Solid															
Preservatives		HCL				—	H2SO4	—	HNO3/NaOH		HNO3					
ANALYSES REQUESTED →		ORGANIC VOA	ORGANIC BNA	ORGANIC Pest/PCB	ORGANIC Herb	Anions	Cyanide	Alk/TDS	INORG Metal	INORG CN	pH/metals					
WESTON Analytics Use Only		CLP 524/4L				TCAN TCSO4 TCCL TCCA	CLP 335.2	TDS 160.1/L	MS/SD 6010	MS/SD 7470	MS/SD 6010					

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	CLP 524/4L	VOA	BNA	Pest/PCB	Herb	TCAN TCSO4 TCCL TCCA	CLP 335.2	TDS 160.1/L	MS/SD 6010	MS/SD 7470	MS/SD 6010
001	B082P4			W	1/29/93							✓	✓	✓	✓	✓	✓
002	B082P6																
003	B082P7						✓										
004	B082M8											✓	✓	✓	✓	✓	
005	B082N0																✓
006	B082N1						✓										

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
93-011

ORIGINAL RE-WRITTEN

DATE/REVISIONS: BAD INFO TO FOLLOW
2/4/93 1. TCAN was rec'd past hold
2.
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:
TCAN rec'd past hold 2/4/93

Relinquished by	Received by	Date	Time
EMERY	SPerko	2/2/93	1200
	2/2/93 SP		

Relinquished by	Received by	Date	Time
	SP 2/2/93		

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

00009092

9713506.2134

38°9713506.2135 [illegible]

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 1/24/93

Ice Chest No. SML-146

Field Logbook No. EFL-1020

Bill of Lading/Airbill No. 251900791-T

Offsite Property No. W93-0-0266-10

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

(1) B0 82P4
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

(2) B0 82P6
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

(3) B0 82P7
- 3, 40ml, Gs, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 1/24/93 [illegible] 1200	Received by: K. Trapp / K. Trapp	Date/Time: 2/1/93 0915
Relinquished by: 2/1/93 K. Trapp / K. Trapp 0930	Received by:	Date/Time:
Relinquished by: EMERY	Received by: Susan Rosa	Date/Time: 2/2/93 1200
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: File # 1

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713506.2136 0000002

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 1/24/93 Time 1031 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B082P4	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
B082P6	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
B082P7	3, 40ml, Gs	WATER	CLP-VOA
			TASK #: 93-011
			OPC#: W93-0-0266-10
			BOL#: 251900791-T

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406(05/90)

3.8°9713506 9392L483

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 200-BP-1

Collection Date 1/29/93

Ice Chest No. SML-146

Field Logbook No. EFL-1020

Bill of Lading/Airbill No. 51900791-7

Offsite Property No. W93-0-0266-10

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

(4) B082M8
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (UNFILTERED)
- 1, 500ml, G, WATER, ANIONS(PO4,SO4,Cl,F)
- 1, 250ml, P, WATER, NO2/NO3 (H2SO4)
- 1, 1L, P, WATER, ALKALINITY/TDS
- 1, 1L, P, WATER, CLP-CYANIDE(NaOH)

(5) B082N0
- 1, 1L, P, WATER, TAL METALS+Bi(HNO3) (FILTERED)

(4) B082N1
- 3, 40ml, Gs, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: 1/29/93 K. Trapp / K. Trapp 1202	Received by: K. Trapp / K. Trapp	Date/Time: 2/1/93 0915
Relinquished by: 0830 K. Trapp / K. Trapp 2/1/93	Received by:	Date/Time: 2/2/93 1200
Relinquished by: Emery	Received by: Susan Perez	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: FRIG. # 1

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713506.2138

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD LEE/GG HAMILTON Date Sampled 1/29/93 Time 0927 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B092M8	1, 1L, P	WATER	TAL METALS + Bi (HNO3) UNFILTERED
	1, 500ml, G	"	ANIONS (PO4,SO4,Cl,F)
	1, 250ml, P	"	NO2/NO3 (H2SO4)
	1, 1L, P	"	ALKALINITY, TDS
	1, 1L, P	"	CLP-CYANIDE (NaOH)
B092N0	1, 1L P	WATER	TAL METALS + Bi (HNO3) FILTERED
B092N1	3, 40ml, Gs	WATER	CLP-VOA
			TASK #: 93-011
			OPC#: W93-0-0266-10
			BOL#: 251900791-T

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406(05/90)

Roy F. Weston, Inc. - Lionville Laboratory
Volatiles by GC/MS, HSL List

RFW Batch Number: 9302L483 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Report Date: 02/25/93 08:15 Page: 1a

	Cust ID:	B082P7		B082P7		B082P7		B082N1		VBLK		VBLK	
Sample Information	RFW#:	003		003 MS		003 MSD		006		93LVK023-MB1		93LVK024-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	103	%	109	%	110	%	107	%	102	%	107	%
	Bromofluorobenzene	98	%	103	%	106	%	102	%	99	%	103	%
	1,2-Dichloroethane-d4	93	%	104	%	110	%	103	%	96	%	104	%
			fl		fl		fl		fl		fl		fl
Chloromethane		10	U	10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U	10	U
Methylene Chloride		3	JB	5	JB	2	JB	5	JB	4	J	4	J
Acetone		10	U	10	U	10	U	10	U	10	U	10	U
Carbon Disulfide		10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene		10	U	101	%	98	%	10	U	10	U	10	U
1,1-Dichloroethane		10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)		10	U	10	U	10	U	10	U	10	U	10	U
Chloroform		10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane		10	U	10	U	10	U	10	U	10	U	10	U
2-Butanone		10	U	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		10	U	10	U	10	U	10	U	10	U	10	U
Carbon Tetrachloride		10	U	10	U	10	U	10	U	10	U	10	U
Bromodichloromethane		10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane		10	U	10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U	10	U
Trichloroethene		10	U	102	%	97	%	10	U	10	U	10	U
Dibromochloromethane		10	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane		10	U	10	U	10	U	10	U	10	U	10	U
Benzene		10	U	99	%	93	%	10	U	10	U	10	U
trans-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U	10	U
Bromoform		10	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		10	U	10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane		10	U	10	U	10	U	10	U	10	U	10	U
Toluene		10	U	104	%	97	%	10	U	10	U	10	U

*= Outside of EPA CLP QC limits.

9213506.2189 0 0 0 0 9 1 0

RFW Batch Number: 9302L483 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Page: 1b

Cust ID:	BO82P7	BO82P7	BO82P7	BO82N1	VBLK	VBLK
RFW#:	003	003 MS	003 MSD	006	93LVK023-MB1	93LVK024-MB1
Chlorobenzene	10 U	105 %	97 %	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U
Xylene (total)	10 U	10 U	10 U	10 U	10 U	10 U

*= Outside of EPA CLP QC limits.

9713506.2130 0006011

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BO82P7

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-003

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

Lab File ID: AK2909

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

9413506.2192 000030

CLIENT SAMPLE NO.

BO82P7

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-003

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

Lab File ID: AK2909

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

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

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BO82N1

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-006

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

Lab File ID: AK2910

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

CLIENT SAMPLE NO.

BO82N1

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-006

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

Lab File ID: AK2910

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

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

9713506.2195 0000007

WESTON

MAR 1993
RECEIVED
OSM DMO

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

Client : WESTINGHOUSE HANFORD
RFW# : 9302L483

W.O. #: 06168-002-001-9999-00
Date Received: 02-02-93

INORGANIC

The following is a summary of the quality control results and a description of any problems encountered during the analysis of this batch of samples:

1. All sample holding times as required by 40CFR136 were met with the exception of Phosphate by IC (received past hold).

2. All preparation blank results were below the required detection limit.

3. All laboratory control standards (blank spikes) were within the control limits of 80-120%. All %RPD were within the 20% guidance limit.

4. All calibration verification checks were within the required control limits of 90-110%. Calibration verification is performed using independent standards.

5. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits with the exception of Nitrate Nitrite. All %RPD were within the 20% guidance limit.

6. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit.

7. The analytical methods applied by the laboratory, unless otherwise requested, for all inorganic analyses are derived from the USEPA Method for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020) and Standard Methods for the Examination of Water and Wastewater 16 ed.

2.23.93
Date

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

pas/i01-483

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 02/11/93

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

WESTON BATCH #: 9302L483

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B082P4	Alkalinity	100		MG/L	2.0
		Chloride by IC	5.3		MG/L	0.25
		Fluoride by IC	0.84		MG/L	0.50
		Cyanide, Total	50.3		UG/L	20.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	34.7		MG/L	5.0
		Nitrate Nitrite	17.6		MG-N/L	2.5
		Total Dissolved Solids	316		MG/L	5.0
-004	B082M8	Alkalinity	130		MG/L	2.0
		Chloride by IC	10.1		MG/L	5.0
		Fluoride by IC	0.58		MG/L	0.50
		Cyanide, Total	10.0	u	UG/L	10.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	39.2		MG/L	5.0
		Nitrate Nitrite	5.5		MG-N/L	1.0
		Total Dissolved Solids	209		MG/L	5.0

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

Client: WESTINGHOUSE HANFORD
RFW #: 9302L483

W.O. #: 06168-002-001-9999-00
Date Received: 02-02-93

CLP METALS

1. This narrative covers the analysis of four (4) water samples.

2. The samples were prepared and analyzed in accordance with the following protocols: CLP SOW 3/90.

3. ICVs, CCVs, and LCSs stock standards were purchased form Inorganic Ventures Laboratory.

4. All Initial and Continuing Calibration Verifications (ICV/CCV's) were within control limits.

5. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.

6. All Preparation/Method Blanks were below Reporting Limits.

7. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.

8. All Laboratory Control Samples (LCS) were within the 80-120% control limits.

9. All Serial Dilution percent differences were within USEPA SOW control limits.

10. All Matrix Spike recoveries were within the 75-125% control limits (exception allowed when sample concentration exceeds the spike added concentration by a factor of 4 or more).

    Matrix spike analyses are not required for Ca, Mg, Na, and K in waters.

11. All Duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits for samples values greater than 5X Reporting Limit, or +/- the Reporting Limits for sample values less than 5X Reporting Limit.

12. Method of Standard Additions (MSA) analyses were not required.

WESTON

13. 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.

14. 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).

15. ICP Interelement Correction Factors for IC3 are included in this package, but do not appear on EDD.

16. 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.

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

3.3.93
Date

mlj/clp-met.nar

9713506.2199

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

Client: WESTINGHOUSE HANFORD
RFW #: 9302L483

W.O. #: 06168-002-001-9999-00
Date Received: 02-02-93

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.

Raymond A. Siery
Inorganic Section Manager

3.2.93
Date

mlj\clp-met.nar

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/02/93

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

WESTON BATCH #: 9302L483

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B082P4	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	150	u	UG/L	150
		Calcium, Total	34700		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	5980		UG/L	5000
		Magnesium, Total	10700		UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	31500		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
		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

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/02/93

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

WESTON BATCH #: 9302L483

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-002	B082P6	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	150	u	UG/L	150
		Calcium, Soluble	36700		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	6780		UG/L	5000
		Magnesium, Soluble	11200		UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	32800		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
		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

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/02/93

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

WESTON BATCH #: 9302L483

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-004	BO82M8	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	150	u	UG/L	150
		Calcium, Total	33000		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	6540		UG/L	5000
		Magnesium, Total	10600		UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	22700		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
		Thallium, Total	10.0	u	UG/L	10.0
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	24.5		UG/L	20.0

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 03/02/93

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

WESTON BATCH #: 9302L483

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-005	BO82N0	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	150	u	UG/L	150
		Calcium, Soluble	33400		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	5000	u	UG/L	5000
		Magnesium, Soluble	10600		UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	22800		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
		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

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082P4

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248301

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.20	B		F
7440-39-3	Barium	29.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	34700.00			P
7440-47-3	Chromium	8.50	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	51.20	B		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	10700.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.11	B		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	5980.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	31500.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	28.80	B		P
7440-66-6	Zinc	9.10	B		P
	Cyanide	50.30			C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082P6

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248302

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	4.70	B		F
7440-39-3	Barium	30.50	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	36700.00			P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	12.60	B		P
7439-92-1	Lead	2.00	U	W	F
7439-95-4	Magnesium	11200.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.11	B		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	6780.00			P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	32800.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	24.80	B		P
7440-66-6	Zinc	8.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082M8

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248304

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	2.80	B	W	F
7440-39-3	Barium	33.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	33000.00			P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	32.30	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	10600.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	6540.00			P
7782-49-2	Selenium	2.50	B	W	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	22700.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	22.80	B		P
7440-66-6	Zinc	24.50			P
	Cyanide	10.00	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082N0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248305

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P
7440-36-0	Antimony	57.00	U		P
7440-38-2	Arsenic	5.40	B	W	F
7440-39-3	Barium	32.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	33400.00			P
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	9.00	U		P
7439-89-6	Iron	10.00	U		P
7439-92-1	Lead	2.20	B		F
7439-95-4	Magnesium	10600.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	19.00	U		P
7440-09-7	Potassium	4910.00	B		P
7782-49-2	Selenium	2.20	B	W	F
7440-22-4	Silver	7.00	U		P
7440-23-5	Sodium	22800.00			P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	24.80	B		P
7440-66-6	Zinc	13.50	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713506.2208

MEMORANDUM

TO: 200-BP-1 Project QA Record April 15, 1993

FR: Susan Winter, Golder Associates Inc.

RE: VOLATILE ORGANIC ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L483-WES-1021

INTRODUCTION

This memo presents the results of data validation on data package 9302L483-WES-1021 consisting of two (2) low level water samples submitted for volatile organic analysis. The samples were analyzed by Weston Analytics according to the CLP protocol for TCL volatile compounds. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B082P7	01/29/93	WATER
B082N1	01/29/93	WATER

Data validation was conducted in accordance with the WHC statement of work (WHC 1991) 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.

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

Detection Limits. Detection limit goals were met for all associated compounds.

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 66 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan objectives of 90%.

MAJOR DEFICIENCIES

No deficiencies were identified for the volatile fraction which required rejection of data.

MINOR DEFICIENCIES

Calibration

Initial calibration verification (ICV) and continuing calibration verification (CCV) relative response factors (RRF) for 1,1,2,2-tetrachloroethane were less than the control limit of 0.5. Therefore, the associated sample results have been qualified as estimated (UJ).

Blanks

Methylene chloride was detected in the laboratory method blank. Therefore, the associated sample results have been qualified as undetected (U).

REFERENCES

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

9713506.2210

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

GLOSSARY OF ORGANIC DATA REPORTING QUALIFIERS

B - Indicates the compound was analyzed for and detected in the associated blank. The "B" qualifier for organic data is applied by the laboratory only and is not applied by the data validators.

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

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

R - Indicates the compound was analyzed for and detected; however, 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.

9713506.2212

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9713506.2213

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 9302L483	REVIEWER: [illegible]	DATE: 4/6/93	PAGE 1 OF 1
COMMENTS: Volatiles			
COMPOUND	**QUALIFIER**	**SAMPLES AFFECTED**	**REASON**
1,1,2,2-Tetrachloroethane	UJ	B082P7	ICV & CCV RRF out & CL (K<0.5)
↓	↓	B082N1	↓
↓	↓	B082P7ms/msd	↓
4/6/93	4/6/93		4/6/93
CH_2Cl_2	U	all	present in blank

9713506.2214

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

9716506.2215 0000029

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082P7

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-003

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

Lab File ID: AK2909

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

4/6/93

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082N1

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-006

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

Lab File ID: AK2910

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

4/6/93

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ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 200-BP-1	REVIEWER: [illegible]	DATE: 4/6/93
LABORATORY: Weston	CASE:	SDG: 9302L483
SAMPLES/MATRIX: Water		
B08297		
B082N1		

1. DATA PACKAGE COMPLETENESS

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

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Data Summary	✓		
Chain-of-Custody	✓		
QC Summary			
Surrogate report	✓		
MS/MSD report	✓		
Blank summary report	✓		
GC/MS tuning report	✓		
Internal standard summary report	✓		
Sample Data			
Sample reports	✓		
TIC reports for each sample	✓		
RIC reports for all samples	✓		
Raw and corrected spectra for all detected results	✓		
Raw and corrected library search data for all reported TIC			✓
Quantitation and calculation data for all TIC			✓
Standards Data			
Initial calibration report	✓		
RIC and quantitation reports for initial calibration	✓		
Continuing calibration reports	✓		
RIC and quantitation reports for cont. calibrations	✓		
Internal standard summary report	✓		
Raw QC Data			
Tuning report, spectra and mass lists	✓		
Blank analysis reports	✓		
TIC reports for all blanks	✓		
RIC and quantitation reports for blanks	✓		
Raw and corrected spectra for all detected results in blanks	✓		
Raw and corrected library search data for all reported TIC			✓

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	—	—	✓
MS/MSD report forms	✓	—	—
RIC and quantitation reports for MS/MSD	—	—	—
Additional Data			
Moisture/% solids data sheets	—	—	✓
Reduction formulae	—	—	✓
Instrument time logs	✓	—	—
Chemist notebook pages	—	—	✓
Sample preparation sheets	✓	—	—

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? (Yes) No N/A

Do all tunes on all instruments meet the tuning criteria? (Yes) No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No (N/A)

Has the laboratory made any calculation or transciption errors? Yes (No) N/A

Have the proper significant figures been reported? (Yes) No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? (Yes) No N/A

Are all RSD values ≤30% (2/88 SOW)? Yes No (N/A)

Are all RRF values ≥0.05 (2/88 SOW)? 4/6/93 ~~(Yes)~~ No (N/A)

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries <10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but >10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is >5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

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

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

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

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

6.3 FIELD SPLIT SAMPLES

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

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

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference specrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. 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 recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

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REGULATORY

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Roy F. Weston, Inc. - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
WESTINGHOUSE HANFORD

DATE RECEIVED: 02/02/93 RFW LOT # :9302L483

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B082P7	003	W	93LVK023	01/29/93	N/A	02/09/93 11
B082P7	003 MS	W	93LVK024	01/29/93	N/A	02/10/93 12
B082P7	003 MSD	W	93LVK024	01/29/93	N/A	02/10/93 12
B082N1	006	W	93LVK023	01/29/93	N/A	02/09/93 11
LAB QC:						
VBLK	MB1	W	93LVK023	N/A	N/A	02/09/93
VBLK	MB1	W	93LVK024	N/A	N/A	02/10/93
VBLK	MB1 BS	W	93LVK024	N/A	N/A	02/10/93

4/6/93

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6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Roy F. Weston, Inc. Contract: 6168-02-01

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9302L483

Instrument ID: HP-MSD K Calibration Date(s): 02/09/93 02/09/93

Heated Purge: (Y/N) N Calibration Time(s): 1053 1346

GC Column: DB624 ID: .53(mm)

LAB FILE ID: RRF10 = AK2902 RRF20 = AK2907
RRF50 = AK2903 RRF100= AK2906 RRF200= AK2904

COMPOUND	RRF10	RRF20	RRF50	RRF100	RRF200	RRF	% RSD	MIN RRF
Chloromethane	0.668	0.605	0.676	0.626	0.604	0.636	5.4	
Bromomethane *	1.544	1.385	1.478	1.350	1.322	1.416	6.6*	0.100
Vinyl Chloride *	0.860	0.785	0.829	0.775	0.754	0.801	5.4*	0.100
Chloroethane	0.458	0.391	0.409	0.367	0.346	0.394	10.9	
Methylene Chloride	1.135	1.003	0.930	0.953	0.909	0.986	9.2	
Acetone	0.135	0.090	0.084	0.078	0.072	0.092	27.5	
Carbon Disulfide	2.670	2.495	2.727	2.657	2.678	2.645	3.3	
1,1-Dichloroethene *	1.169	1.093	1.128	1.092	1.051	1.107	4.0*	0.100
1,1-Dichloroethane *	1.978	1.988	1.910	1.930	1.892	1.939	2.2*	0.200
1,2-Dichloroethene (total)	1.230	1.166	1.171	1.181	1.142	1.178	2.8	
Chloroform *	3.218	3.314	3.111	3.222	3.049	3.183	3.3*	0.200
1,2-Dichloroethane *	0.413	0.450	0.406	0.418	0.397	0.417	4.9*	0.100
2-Butanone	0.018	0.020	0.025	0.026	0.025	0.023	14.4	
1,1,1-Trichloroethane *	3.526	3.654	3.462	3.595	3.459	3.539	2.4*	0.100
Carbon Tetrachloride *	3.966	4.069	3.979	4.148	4.022	4.037	1.8*	0.100
Bromodichloromethane *	0.761	0.799	0.752	0.764	0.759	0.767	2.4*	0.200
1,2-Dichloropropane	0.269	0.267	0.245	0.243	0.238	0.252	5.7	
cis-1,3-Dichloropropene *	0.518	0.516	0.502	0.504	0.500	0.508	1.6*	0.200
Trichloroethene *	0.510	0.513	0.491	0.486	0.480	0.496	3.0*	0.300
Dibromochloromethane *	1.082	1.149	1.053	1.067	1.025	1.075	4.3*	0.100
1,1,2-Trichloroethane *	0.350	0.360	0.331	0.317	0.292	0.330	8.1*	0.100
Benzene *	0.592	0.550	0.533	0.527	0.517	0.544	5.4*	0.500
trans-1,3-Dichloropropene *	0.433	0.447	0.435	0.425	0.441	0.436	1.9*	0.100
Bromoform *	0.812	0.912	0.846	0.844	0.808	0.845	4.9*	0.100
4-Methyl-2-pentanone	0.133	0.169	0.149	0.142	0.125	0.144	11.7	
2-Hexanone	0.082	0.094	0.088	0.086	0.080	0.086	6.6	
Tetrachloroethene *	0.744	0.714	0.710	0.684	0.685	0.707	3.5*	0.200
1,1,2,2-Tetrachloroethane *	0.450	0.485	0.433	0.386	0.390	0.429	9.8*	0.500
Toluene *	0.571	0.581	0.558	0.550	0.545	0.561	2.7*	0.400
Chlorobenzene *	1.000	0.983	0.941	0.927	0.914	0.953	3.9*	0.500
Ethylbenzene *	0.391	0.394	0.380	0.376	0.371	0.382	2.5*	0.100
Styrene *	0.741	0.781	0.754	0.743	0.747	0.753	2.2*	0.300
Xylene (total) *	0.456	0.467	0.440	0.438	0.431	0.446	3.3*	0.300
Toluene-d8	0.901	0.988	0.991	0.993	0.963	0.967	4.0	
Bromofluorobenzene *	0.842	0.925	0.909	0.919	0.873	0.894	4.0*	0.200
1,2-Dichloroethane-d4	0.340	0.401	0.366	0.373	0.344	0.365	6.8	

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

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7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Roy F. Weston, Inc. Contract: 6168-02-01

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9302L483

Instrument ID: HP-MSD Calibration Date: 02/09/93 Time: 1128

Lab File ID: AK2903 Init. Calib. Date(s): 02/09/93 02/09/93

Heated Purge: (Y/N) N Init. Calib. Times: 1053 1346

GC Column: DB624 ID: .53(mm)

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.636	0.676		-6.2	
Bromomethane	1.416	1.478	0.100	-4.4	25.0
Vinyl Chloride	0.801	0.829	0.100	-3.5	25.0
Chloroethane	0.394	0.409		-3.9	
Methylene Chloride	0.986	0.930		5.7	
Acetone	0.092	0.084		9.0	
Carbon Disulfide	2.645	2.727		-3.1	
1,1-Dichloroethene	1.107	1.128	0.100	-1.9	25.0
1,1-Dichloroethane	1.939	1.910	0.200	1.5	25.0
1,2-Dichloroethene (total)	1.178	1.171		0.6	
Chloroform	3.183	3.111	0.200	2.3	25.0
1,2-Dichloroethane	0.417	0.406	0.100	2.7	25.0
2-Butanone	0.023	0.025		-9.6	
1,1,1-Trichloroethane	3.539	3.462	0.100	2.2	25.0
Carbon Tetrachloride	4.037	3.979	0.100	1.4	25.0
Bromodichloromethane	0.767	0.752	0.200	1.9	25.0
1,2-Dichloropropane	0.252	0.245		2.8	
cis-1,3-Dichloropropene	0.508	0.502	0.200	1.2	25.0
Trichloroethene	0.496	0.491	0.300	1.0	25.0
Dibromochloromethane	1.075	1.053	0.100	2.0	25.0
1,1,2-Trichloroethane	0.330	0.331	0.100	-0.4	25.0
Benzene	0.544	0.533	0.500	2.0	25.0
trans-1,3-Dichloropropene	0.436	0.435	0.100	0.2	25.0
Bromoform	0.845	0.846	0.100	-0.2	25.0
4-Methyl-2-pentanone	0.144	0.149		-3.3	
2-Hexanone	0.086	0.088		-1.9	
Tetrachloroethene	0.707	0.710	0.200	-0.4	25.0
1,1,2,2-Tetrachloroethane	0.429	0.433	0.500	-0.9	25.0
Toluene	0.561	0.558	0.400	0.4	25.0
Chlorobenzene	0.953	0.941	0.500	1.2	25.0
Ethylbenzene	0.382	0.380	0.100	0.6	25.0
Styrene	0.753	0.754	0.300	-0.1	25.0
Xylene (total)	0.446	0.440	0.300	1.3	25.0
Toluene-d8	0.967	0.991		-2.4	
Bromofluorobenzene	0.894	0.909	0.200	-1.7	25.0
1,2-Dichloroethane-d4	0.365	0.366		-0.2	

All other compounds must meet a minimum RRF of 0.010.

FORM VII VOA 3/90 Rev.

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7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Roy F. Weston, Inc. Contract: 6168-02-01

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9302L483

Instrument ID: HP-MSD K Calibration Date: 02/10/93 Time: 1008

Lab File ID: AK2A02 Init. Calib. Date(s): 02/09/93 02/09/93

Heated Purge: (Y/N) N Init. Calib. Times: 1053 1346

GC Column: DB624 ID: .53(mm)

Assoc with B0B2P7MS ~~B0B2P7~~ B0B2P7MSD

COMPOUND	RRF	RRF50	MIN RRF	%D	MAX %D
Chloromethane	0.636	0.589		7.4	
Bromomethane	1.416	1.436	0.100	-1.4	25.0
Vinyl Chloride	0.801	0.736	0.100	8.1	25.0
Chloroethane	0.394	0.398		-1.0	
Methylene Chloride	0.986	1.013		-2.7	
Acetone	0.092	0.132		-44.0	
Carbon Disulfide	2.645	2.455		7.2	
1,1-Dichloroethene	1.107	1.075	0.100	2.9	25.0
1,1-Dichloroethane	1.939	1.887	0.200	2.7	25.0
1,2-Dichloroethene (total)	1.178	1.140		3.2	
Chloroform	3.183	3.142	0.200	1.3	25.0
1,2-Dichloroethane	0.417	0.405	0.100	2.8	25.0
2-Butanone	0.023	0.028		-23.8	
1,1,1-Trichloroethane	3.539	3.550	0.100	-0.3	25.0
Carbon Tetrachloride	4.037	4.011	0.100	0.6	25.0
Bromodichloromethane	0.767	0.748	0.200	2.4	25.0
1,2-Dichloropropane	0.252	0.239		5.0	
cis-1,3-Dichloropropene	0.508	0.490	0.200	3.6	25.0
Trichloroethene	0.496	0.494	0.300	0.4	25.0
Dibromochloromethane	1.075	0.999	0.100	7.1	25.0
1,1,2-Trichloroethane	0.330	0.306	0.100	7.2	25.0
Benzene	0.544	0.536	0.500	1.5	25.0
trans-1,3-Dichloropropene	0.436	0.409	0.100	6.3	25.0
Bromoform	0.845	0.781	0.100	7.6	25.0
4-Methyl-2-pentanone	0.144	0.139		3.3	
2-Hexanone	0.086	0.112		-30.5	
Tetrachloroethene	0.707	0.727	0.200	-2.8	25.0
1,1,2,2-Tetrachloroethane	0.429	0.383	0.500	10.7	25.0
Toluene	0.561	0.545	0.400	2.9	25.0
Chlorobenzene	0.953	0.920	0.500	3.4	25.0
Ethylbenzene	0.382	0.366	0.100	4.3	25.0
Styrene	0.753	0.715	0.300	5.1	25.0
Xylene (total)	0.446	0.429	0.300	3.8	25.0
Toluene-d8	0.967	0.951		1.6	
Bromofluorobenzene	0.894	0.917	0.200	-2.6	25.0
1,2-Dichloroethane-d4	0.365	0.367		-0.5	

All other compounds must meet a minimum RRF of 0.010.

FORM VII VOA 3/90 Rev.

9713506.2229

1A

0000076 CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

VBLK

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: LAB

Matrix: (soil/water) WATER

Lab Sample ID: 93LVK023-MB1

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

Lab File ID: AK2908

Level: (low/med) LOW

Date Received: 02/09/93

% Moisture: not dec.

Date Analyzed: 02/09/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Assoc w/ B082P7 B082N1

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

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

NC=40

4/6/93

9213506.2230 000003

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 93LVK024-MB1

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

Lab File ID: AK2A05

Level: (low/med) LOW

Date Received: 02/10/93

% Moisture: not dec.

Date Analyzed: 02/10/93

Assoc w/ B082P7 MS B082P7 MSD

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

x10=40

4/6/93

9213506.2231 0000092

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B082P7MS

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9302L483-003 MS

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

Lab File ID: AK2A17

Level: (low/med) LOW

Date Received: 02/02/93

% Moisture: not dec.

Date Analyzed: 02/10/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

4/6/93

SP: SPIKE COMPOUND FORM 1 VOA 3/90

9713506.2232 1A 0000093

CLIENT SAMPLE NO.

BO82P7MSD

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER — Lab Sample ID: 9302L483-003 MSD

Sample wt/vol: 5.00 (g/mL) ML — Lab File ID: AK2A08

Level: (low/med) LOW — Date Received: 02/02/93

% Moisture: not dec. — Date Analyzed: 02/10/93

GC Column: DB624 ID: .53(mm) — Dilution Factor: 1.00

Soil Extract Volume: (uL) — Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5.2	~~UB~~ u
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene		SP
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene		SP
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene		SP
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	~~U~~ u
108-88-3	Toluene		SP
108-90-7	Chlorobenzene		SP
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

4/6/93

SP: SPIKE COMPOUND

9713506.2233

MEMORANDUM

APR 1993
RECEIVED
OSM DMO

TO: 200-BP-1 Project QA Record April 16, 1993

FR: Susan Winter, Golder Associates Inc.

RE: GENERAL CHEMISTRY ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L483-WES-1021

INTRODUCTION

This memo presents the results of data validation on data package 9302L483-WES-1021 consisting of two (2) water samples submitted for general chemistry analysis. The samples were analyzed by Weston Analytics using standard methods for all associated parameters. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B082P4	01/29/93	WATER
B082M8	01/29/93	WATER

Data validation was conducted in accordance with the WHC statement of work (WHC 1991) 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.

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

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

Completeness. The data package was complete for all requested analyses. Two (2) samples were validated in this data set with a total of 16 determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan objectives of 90%.

MAJOR DEFICIENCIES

No deficiencies were identified for the wet chemistry parameters which required rejection of data.

MINOR DEFICIENCIES

Holding Times

The phosphate analysis was performed out of the required holding time. Therefore, all associated sample results have been qualified as estimated (UJ).

REFERENCES

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

9713506.2235

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

9713506.2236

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.

9713506.2237

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9713506.2238

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 93021483	REVIEWER: [illegible]	DATE: 4/06/93	PAGE 1 OF 1
COMMENTS: Wet Chemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phosphate	UJ	All	Exceeded holding time

9713506.2239

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

9713506.2240 0100004

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 02/11/93

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

WESTON BATCH #: 9302L483

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	B082P4	Alkalinity	100	MG/L	2.0
		Chloride by IC	5.3	MG/L	0.25
		Fluoride by IC	0.84	MG/L	0.50
		Cyanide, Total	50.3	UG/L	20.0
		Phosphate by IC	0.25 ~~u~~	MG/L	0.25
		Sulfate by IC	34.7	MG/L	5.0
		Nitrate Nitrite	17.6	MG-N/L	2.5
		Total Dissolved Solids	316	MG/L	5.0
-004	B082M8	Alkalinity	130	MG/L	2.0
		Chloride by IC	10.1	MG/L	5.0
		Fluoride by IC	0.58	MG/L	0.50
		Cyanide, Total	10.0 u	UG/L	10.0
		Phosphate by IC	0.25 ~~u~~	MG/L	0.25
		Sulfate by IC	39.2	MG/L	5.0
		Nitrate Nitrite	5.5	MG-N/L	1.0
		Total Dissolved Solids	209	MG/L	5.0

4/6/93

9713506.2241

ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

9713506.2242

WHC-SD-EN-SPP-002, Rev. 1

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: 200-BP-1	REVIEWER: [illegible]	DATE: 4/6/93
LABORATORY: Weston	CASE:	SDG: 9302L483
SAMPLES/MATRIX: Water		
B082P4		
B082M8		

1. DATA PACKAGE COMPLETENESS

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/Chain-of-Custody	✓		
Sample Analysis Data Report Forms	✓		
Standards Data	✓		
QC Summary			
Blanks Summary Report Forms	✓		
Spike Sample Recovery Report Forms	✓		
Duplicate Sample Analysis Report Forms	✓		
Laboratory Control Sample Report Forms	✓		
Raw Data			
Ion Chromatograph Chromatograms	✓		
TOC and TOX Instrument Printouts			✓
Laboratory Bench Sheets	✓		
Additional Data			
Laboratory Sample Preparation Logs	✓		
Instrument Run Logs	✓		
Internal Laboratory Chain-of-Custory			✓
Percent Solids Analysis Records			✓
Reduction Formulae			✓
Chemist Notebook Pages			✓

2. HOLDING TIMES

Were all samples analyzed within holding times? Yes **(No)** N/A

Action: If any holding times were 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 balance check conducted prior to the TDS analysis? Yes No N/A

Was the titrant normality checked? Yes No N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency? Yes No N/A

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 the validation requirements.

5. 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) and list the affected samples and analytes below.

6. 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).

7. MATRIX SPIKE SAMPLE ANALYSIS

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

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. 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 affected results 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 %R 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.

9. 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 samples in the validation narrative.

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

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

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

12. FIELD SPLIT SAMPLES

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

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

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	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).

14. 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.

HOLDING TIME SUMMARY - FORM B-1

9302L483

SDG:	REVIEWER: [illegible]	DATE: 4/06/93	PAGE 1 OF 1
COMMENTS: Wet Chemistry			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B082P4	Alkalinity	01/29/93		2/04/93		6	None
B082M8	Cl-IC			2/04/93		6	
	F-IC						
	PO4-IC						UJ
	SO4-IC						None
	CN			2/10/93		12	
	NO2/NO3			2/04/93		6	
	TDS			2/04/93			

9713506.2247

MEMORANDUM

APR 1993

TO: 200-BP-1 Project QA Record April 15, 1993

FR: Susan Winter, Golder Associates Inc.

RE: METALS ANALYSIS DATA VALIDATION SUMMARY FOR DATA PACKAGE 9302L483-WES-1021

INTRODUCTION

This memo presents the results of data validation on data package 9302L483-WES-1021 consisting of four (4) water samples submitted for metals analysis. The samples were analyzed by Weston Analytics using the CLP protocol for TAL metals/cyanide analytes. A list of the samples validated is provided in the following table.

SAMPLE ID	SAMPLE DATE	MEDIA
B082P4	01/29/93	WATER
B082P6	01/29/93	WATER
B082M8	01/29/93	WATER
B082N0	01/29/93	WATER

Data validation was conducted in accordance with the WHC statement of work (WHC 1991) 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 the GFAA analytical spikes for lead, selenium and thallium as discussed under "Minor Deficiencies".

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

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

Completeness. The data package was complete for all requested analyses. Four samples were validated in this data set with a total of ninety-eight (98) determinations reported, all of which were deemed valid. This results in a completeness of 100 percent which meets the work plan objectives of 90%.

MAJOR DEFICIENCIES

No deficiencies were identified for the metals fraction which required rejection of data.

MINOR DEFICIENCIES

Blanks

Vanadium and arsenic were detected in the laboratory blanks. Therefore, the associated sample results have been qualified as undetected (U).

GFAA Analytical Spikes

The GFAA analytical spikes for lead, samples B082P4, B082P6, and B082M8; selenium, samples B082M8 and B082N0; and thallium, sample B082P6 only, were out of the control limits of 85% and 115%. Therefore, the associated sample results have been qualified as estimated (UJ for non-detects, BJ for detects less than the CRDL but greater than the IDL).

REFERENCES

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

9713506.2249

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

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.

9713506.2251

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

9713506.2252

DATA QUALIFICATION SUMMARY - FORM B-7

93021483

SDG:	REVIEWER: [illegible]	DATE: 4/02/93	PAGE 1 OF 1
COMMENTS: Metals			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Vanadium	u	All	present in blank
Arsenic	u	B082P6	
		M8	
		NO	
Lead	UJ	B082P4	GFAA Analytical Spike <85%
		P6	
		M8	
Selenium	RJ	B082M8	
	RJ	NO	
Thallium	UJ	B082P6	GFAA Analytical Spike >125% 115% 4/8/93

9713506.2253

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

9713506.2254 000029

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082P4

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248301

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.20	B		F	
7440-39-3	Barium	29.70	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	34700.00			P	
7440-47-3	Chromium	8.50	B		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	51.20	B		P	
7439-92-1	Lead	2.00	U	W	F	
7439-95-4	Magnesium	10700.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.11	B		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	5980.00			P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	31500.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	28.80	B		P	
7440-66-6	Zinc	9.10	B		P	
	Cyanide	50.30			C	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN 03/90

4/2/93

9713506.2255 0000030

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082P6

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248302

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	4.70	~~B~~		F	U
7440-39-3	Barium	30.50	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	36700.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	12.60	B		P	
7439-92-1	Lead	2.00	~~U~~	W	F	UJ
7439-95-4	Magnesium	11200.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.11	B		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	6780.00			P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	32800.00			P	
7440-28-0	Thallium	2.00	~~U~~	W	F	UJ
7440-62-2	Vanadium	24.80	~~B~~		P	U
7440-66-6	Zinc	8.00	U		P	
	Cyanide				NR	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN 03/90

4/12/93

9713506.2256 0000031

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082M8

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248304

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	2.80	~~B~~	W	F	u
7440-39-3	Barium	33.10	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	33000.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	32.30	B		P	
7439-92-1	Lead	2.00	~~U~~		F	u5
7439-95-4	Magnesium	10600.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	6540.00			P	
7782-49-2	Selenium	2.50	~~B~~	W	F	B5
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	22700.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	22.80	~~B~~		P	u
7440-66-6	Zinc	24.50			P	
	Cyanide	10.00	U		C	
7440-69-9	Bismuth	150.00	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

4/12/93

FORM I - IN 03/90

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B082N0

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Matrix (soil/water): WATER Lab Sample ID: 930248305

Level (low/med): LOW Date Received: 2/02/93

% 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	64.00	U		P	
7440-36-0	Antimony	57.00	U		P	
7440-38-2	Arsenic	5.40	~~B~~	W	F	u
7440-39-3	Barium	32.00	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	33400.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	9.00	U		P	
7439-89-6	Iron	10.00	U		P	
7439-92-1	Lead	2.20	B		F	
7439-95-4	Magnesium	10600.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	19.00	U		P	
7440-09-7	Potassium	4910.00	B		P	
7782-49-2	Selenium	2.20	~~B~~	W	F	BJ
7440-22-4	Silver	7.00	U		P	
7440-23-5	Sodium	22800.00			P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	24.80	~~B~~		P	u
7440-66-6	Zinc	13.50	B		P	
	Cyanide				NR	
7440-69-9	Bismuth	150.00	u		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

4/2/93

FORM I - IN 03/90

9713506.2258

ATTACHMENT 4

DATA VALIDATION SUPPORTING DOCUMENTATION

9713506.2259

WHC-SD-EN-SPP-002, Rev. 1

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: 200-BP-1	REVIEWER: [illegible]	DATE: 4/8/93
LABORATORY: Weston	CASE:	SDG: 9302L483
SAMPLES/MATRIX: Waters		
B082P4 B082M8		
B082P6 B082N0		

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

4/2/93

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 nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥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.

HOLDING TIME SUMMARY - FORM B-1

93021483

SDG:	REVIEWER: [illegible]	DATE: 4/02/93	PAGE 1 OF 1
COMMENTS: Metals			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B082P4	ICP	01/29/93		2/26/93		28	None
B082P6	Bi			2/26/93		28	
B082M8	As			2/26/93		28	
B082N0	Pb			2/27/93		29	
	Se			2/26/93		28	
	Tl			2/25/93		27	
	Hg			2/17/93		19	

U.S. EPA - CLP

3
BLANKS

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

Lab code: WESTON Case No.: WEST SAS No.: SDG No.: CLP483

Preparation Blank Matrix (soil/water): WATER

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

5X

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
					5X				5X		
Aluminum	64.0	U	64.0	U	64.0	U	64.0	U	64.000	U	P
Antimony	57.0	U	57.0	U	57.0	U	57.0	U	57.000	U	P
Arsenic	2.0	U	2.0	U	17.5 3.5	B	-2.2	B	2.000	U	F
Barium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Calcium	17.0	U	17.0	U	17.0	U	17.0	U	17.000	U	P
Chromium	7.0	U	7.0	U	7.0	U	7.0	U	7.000	U	P
Cobalt	8.0	U	8.0	U	8.0	U	-8.8	B	8.000	U	P
Copper	9.0	U	9.0	U	9.0	U	9.0	U	9.000	U	P
Iron	-17.0	B	-16.0	B	-17.0	B	-23.0	B	-15.000	B	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Magnesium	44.0	U	44.0	U	44.0	U	44.0	U	44.000	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Mercury	.1	U	.1	U	.1	U	.1	U	.100	U	CV
Nickel	19.0	U	19.0	U	19.0	U	19.0	U	44.365 19.000	U	P
Potassium	877.0	U	877.0	U	877.0	U	877.0	U	887.300	B	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Silver	7.0	U	35.5 7.1	B	7.0	U	7.0	U	7.000	U	P
Sodium	155.0	U	155.0	U	155.0	U	155.0	U	155.000	U	P
Thallium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Vanadium	7.0	U	7.0	U	44.5 8.9	B	7.5	B	44.5 8.900	B	P
Zinc	8.0	U	8.0	U	8.0	U	8.0	U	8.000	U	P
Cyanide	10.0	U	10.0	U	10.0	U			10.000	U	C

FORM III - IN 03/90

As, Ag B082P4

As, Ag B082P6
B082M8
B082N0

V: CABL - All samples

4/02/93

ACCURACY DATA SUMMARY - FORM B-4

SDG: 93026483	REVIEWER: [illegible]	DATE: 4/02/93	PAGE 1 OF 1
COMMENTS: GFAA Analytical Spikes			

SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B082P4	Lead	79.5	B082P4	UJ
↓ P6	↓	76.6	↓ P6	UJ
↓ M8	↓	83.2	↓ M8	UJ
B082M8	Selenium	70.1	B082M8	BJ
↓ NO	↓	80.1	↓ NO	BJ
B082P6	Thallium	124.2	B082P6	UJ

9213506.2226