WESTON Analytics Use Only
9108L426

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 2

Client: Westinghouse Hanford Company
Est. Final Proj. Sampling Date:
Work Order #: 6168-02-01
Project Contact/Phone #: P.H.Butcher/(509)376-5045
AD Project Manager: Josie King
QC: CLP Del: CLP TAT: 35 day
Date Rec'd: 8/12/91 Date Due: 9/16/91
Account #: WS-Hanford

Refrigerator #															
#/Type Container	Liquid	3,G				1,G	1,P	3,P	1,P	1,P	1,P	1,P	1,G		
	Solid														
Volume	Liquid	40ml				250ml	1L	4L	1L	1,L	1,L	1,L	250ml		
	Solid			40ml											
Preservatives							NaOH	HNO3	HCL	HNO3	NaOH	HNO3	NaOH		

ANALYSES REQUESTED →

Lab ID	Client ID/Description	Matrix QC Chosen (✓)	Matrix	Date Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	* See below 1	2	3	4	INORG Metal (ug/L)	CN	F	* See below 5			
					CLP/4H				DAT Inorg	See Below	ISUB	ISUB	CLP Inorg	CLP Inorg	CLP	ISUB			
001	~~[illegible]~~ B01185 RAD	W		8/8/91					✓	✓	✓	✓	✓	✓		✓			
002	~~[illegible]~~ B01186	W		8/8/91											✓				
003	~~[illegible]~~ B01190	W		8/8/91	✓														
	*1)TOC,NO_2/NO_3																		
	2)Anions,TDS,Alk,pH Anions = IC-SO4, ICPO4, ICCL, ICFL, IC NO2, IC NO3																		
	3)Gross Alpha,Beta,Tc-99,Sr-90,Cs-137,Co-60,Pu-238,Pu-239/240																		
	4)Total Uranium																		
	5)Tritium																		
	CLP - Metal, Bi/Se/Si																		

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

Special Instructions:
NOTE: (F) = Filtered
(Un) = Unfiltered

BOL # 2474251285
OPC # W91-0481 # 6

DATE/REVISIONS:
8/13/91 1. Subbed Teledyne Radiochem - 004 only. YES
2.
3.
4.
5.
6.

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

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N

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

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[illegible]	[illegible]	8/12/91	11:00		[illegible]	8/12/91	

RFW 21 21-001/A-8/90 L372 L373 L375 L377 L378 Ref# Cooler# 381 596a

START 9613402.0697
0000002
0043029
9108L426-WBS-143

WESTON Analytics Use Only

9108L426

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford Company
Est. Final Proj. Sampling Date:
Work Order #: 6168-02-01
Project Contact/Phone #: P.H.Butcher/(509)376-5045
AD Project Manager: Josie King
QC: CLP Del: CLP TAT: 35 day
Date Rec'd: 9/12/91 Date Due: 9/16/91
Account #: WS-HAMRID

Refrigerator #																
#/Type Container	Liquid	3,Gs				1,G				1,P	1,P	1,P	1,G			
	Solid															
Volume	Liquid	40ml				250ml				1,L	1,L	1,L	250ml			
	Solid			40ml												
Preservatives																
ANALYSES REQUESTED →		ORGANIC				* See below			*	INORG		* See below				*
		VOA	BNA	Pest/PCB	Herb	1	2	3	4	Metal (un)	CN	Metal F	5			

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓)	Matrix	Date Collected	VOA	BNA	Pest/PCB	Herb	1	2	3	4	Metal (un)	CN	Metal F	5			
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										ICP/Hg	Hg	ISUS	ISUS	CLP	CLP	CLP	ISUS			
	004	[redacted] B01167	W		8/8/91					✓	✓	✓	✓	✓	✓		✓			
	005	[redacted] B01168	W		8/8/91											✓				
		[redacted]	W																	
		*1)TOC,NO_2/NO_3																		
		2)Anions,TDS,AlK,pH																		
		3)Gross Alpha,Beta,Tc-99,Sr-90,Cs-137,Co-60,Pu-238,Pu-239/240																		
		4)Total Uranium																		
		5)Tritium																		
		CLP - Metal, Bi/Se/Si																		

Special Instructions:

NOTE: (F) = Filtered
(Un) = Unfiltered

BOL # 2474251285
OPC # W91-0481 #6

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill #: _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) 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

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[illegible]	[illegible]	9/12/91	11:20 am		[illegible]	9/12/91	
	[illegible]	9/12/91					

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

RFW 21-21-001/A-8/90 L372 L373 L375 L377 L378 Ref# Cooler# 381-596a

0000003

96134021.0698

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

RFW Batch Number: 9108L426 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000 Report Date: 08/16/91 16:20 Page: 1a

	Cust ID:	BO11QO		VBLK	
Sample Information	RFW#:	003		91LVK141-MB1	
	Matrix:	WATER		WATER	
	D.F.:	1.00		1.00	
	Units:	ug/L		ug/L	
Surrogate Recovery	Toluene-d8	91	%	96	%
	Bromofluorobenzene	91	%	94	%
	1,2-Dichloroethane-d4	103	%	104	%
Chloromethane		10	U	10	U
Bromomethane		10	U	10	U
Vinyl Chloride		10	U	10	U
Chloroethane		10	U	10	U
Methylene Chloride		8	B	5	
Acetone		10	U	4	J
Carbon Disulfide		5	U	5	U
1,1-Dichloroethene		5	U	5	U
1,1-Dichloroethane		5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U
Chloroform		5	U	5	U
1,2-Dichloroethane		5	U	5	U
2-Butanone		10	U	10	U
1,1,1-Trichloroethane		5	U	5	U
Carbon Tetrachloride		5	U	5	U
Vinyl Acetate		10	U	10	U
Bromodichloromethane		5	U	5	U
1,2-Dichloropropane		5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U
Trichloroethene		5	U	5	U
Dibromochloromethane		5	U	5	U
1,1,2-Trichloroethane		5	U	5	U
Benzene		5	U	5	U
Trans-1,3-Dichloropropene		5	U	5	U
Bromoform		5	U	5	U
4-Methyl-2-pentanone		10	U	10	U
2-Hexanone		10	U	10	U
Tetrachloroethene		5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U

*= Outside of EPA CLP QC limits.

000005
9143027.1699

Cust ID:	B011Q0		VBLK	
RFW#:	003		91LVK141-MB1	
Toluene	5	U	5	U
Chlorobenzene	5	U	5	U
Ethylbenzene	5	U	5	U
Styrene	5	U	5	U
Xylene (total)	5	U	5	U

*= Outside of EPA CLP QC limits.

9613402.0700 0000006

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ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 08-12-91
RFW #: 9108L426, GC/MS VOLATILE
W.O. #: 6168-02-01

NARRATIVE

One (1) water sample was collected on 08-08-91.

The sample and its associated QC samples were analyzed according to criteria set forth in CLP SOW 02/88 (Rev. 05/89) for TCL Volatile target compounds on 08-14-91.

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

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

2. All surrogate recoveries were within EPA QC limits.

3. Matrix spike and spike duplicate samples are associated with RFW lot 9107L299.

4. The laboratory blanks contained the common contaminants methylene chloride and acetone at levels less than 2x the CRQL.

5. Internal standard area and retention time criteria were met for samples and blanks.

8.23.91

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

1B
VOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

B011QO

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

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9108L426-003

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

Lab File ID: AK8E06

Level: (low/med) LOW

Date Received: 08/12/91

% Moisture: not dec. _____

Date Analyzed: 08/14/91

Column: (pack/cap) CAP

Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
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	8	B
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

CLIENT SAMPLE NO.

B011Q0

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

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

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9108L426-003

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

Lab File ID: AK8E06

Level: (low/med) LOW

Date Received: 08/12/91

% Moisture: not dec. _____

Date Analyzed: 08/14/91

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

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

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

9613402.0704

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 08-12-91
RFW #: 9108L426
W.O. #: 6168-02-01-0000

INORGANIC NARRATIVE

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. Sample holding times as required by 40CFR136 were met for water samples with the exception of pH, nitrate by ic and nitrite by ic which were 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 limit. 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. Methods for the analysis of solid samples are derived from Test Methods for Evaluating Solid Waste (USEPA SW846).

10.23.91

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

NOV 1991 RECEIVED DMO

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9613402.0705

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/23/91

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

WESTON BATCH #: 9108L426

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	BO1185	Alkalinity	62.0	MG/L	2.0
		Chloride by IC	22.2	MG/L	2.5
		Fluoride by IC	0.25 u	MG/L	0.25
		Nitrite by IC	0.25 u	MG/L	0.25
		Nitrate by IC	48.8	MG/L	2.5
		Cyanide, Total	119	UG/L	20.0
		Phosphate by IC	0.25 u	MG/L	0.25
		Sulfate by IC	27.5	MG/L	2.5
		Nitrate Nitrite	153	MG/L	10.0
		Total Organic Carbon	2.6	MG/L	1.0
		pH	7.4	PH UNITS	0.010
		Total Dissolved Solids	2020	MG/L	5.0
-004	BO1167	Alkalinity	122	MG/L	2.0
		Chloride by IC	8.5	mg/L	0.25
		Fluoride by IC	0.67	mg/L	0.50
		Nitrite by IC	0.25 u	mg/L	0.25
		Nitrate by IC	1.1	mg/L	0.25
		Cyanide, Total	10.0 u	UG/L	10.0
		Phosphate by IC	0.25 u	mg/L	0.25
		Sulfate by IC	13.3	mg/L	0.25
		Nitrate Nitrite	0.25	MG/L	0.10
		Total Organic Carbon	0.94	MG/L	0.50
		pH	7.8	PH UNITS	0.010
		Total Dissolved Solids	191	MG/L	5.0

Roy F. Weston, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 8/12/91
RFW #: 9108L426
W.O. #: 6168-02-01

METALS NARRATIVE

The set of samples consisted of four (4) water samples collected on 8/8/91.

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

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

1. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory.

2. All ICV and CCV values were within control limits.

3. All ICB and CCB values were within control limits.

4. All preparation blank values were within control limits.

5. All LCS results were within the 80-120% control limits.

6. All matrix spike recoveries were within the 75-125% control limits with the exception of Fe, Pb, Se and Tl. All corresponding samples were flagged with an "N" according to CLP protocol.

7. All duplicate analyses were within the 20% RPD control limit.

8. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart and also requires manual digestion.

WESTON

9. 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).

10. Quarterly Detection Limits for IC2 are included in this package.

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

10.30.91.
Date

pas\ clp-met.nar

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/28/91

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

WESTON BATCH #: 9108L426

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B01185	Silver, Total	10.0	u	UG/L	10.0
		Aluminum, Total	200	u	UG/L	200
		Arsenic, Total	10.0	u	UG/L	10.0
		Barium, Total	200	u	UG/L	200
		Beryllium, Total	5.0	u	UG/L	5.0
		Bismuth, Total	200	u	UG/L	200
		Calcium, Total	285000		UG/L	5000
		Cadmium, Total	5.0	u	UG/L	5.0
		Cobalt, Total	50.0	u	UG/L	50.0
		Chromium, Total	15.8		UG/L	10.0
		Copper, Total	25.0	u	UG/L	25.0
		Iron, Total	789		UG/L	100
		Mercury, Total	0.20	u	UG/L	0.20
		Potassium, Total	15800		UG/L	5000
		Magnesium, Total	77700		UG/L	5000
		Manganese, Total	21.5		UG/L	15.0
		Sodium, Total	64400		UG/L	5000
		Nickel, Total	40.0	u	UG/L	40.0
		Lead, Total	30.0	u	UG/L	30.0
		Antimony, Total	60.0	u	UG/L	60.0
		Selenium, Total	50.0	u	UG/L	50.0
		Silicon, Total	14700		UG/L	100
		Thallium, Total	100	u	UG/L	100
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	21.1		UG/L	20.0

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/28/91

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

WESTON BATCH #: 9108L426

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-002	BO1186	Silver, Soluble	10.0	u	UG/L	10.0
		Aluminum, Soluble	200	u	UG/L	200
		Arsenic, Soluble	10.0	u	UG/L	10.0
		Barium, Soluble	200	u	UG/L	200
		Beryllium, Soluble	5.0	u	UG/L	5.0
		Bismuth, Soluble	200	u	UG/L	200
		Calcium, Soluble	269000		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	107		UG/L	25.0
		Iron, Soluble	400		UG/L	100
		Mercury, Soluble	0.20	u	UG/L	0.20
		Potassium, Soluble	15000		UG/L	5000
		Magnesium, Soluble	73500		UG/L	5000
		Manganese, Soluble	18.6		UG/L	15.0
		Sodium, Soluble	61600		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	50.0	u	UG/L	50.0
		Silicon, Soluble	14100		UG/L	100
		Thallium, Soluble	10.0	u	UG/L	10.0
		Vanadium, Soluble	50.0	u	UG/L	50.0
		Zinc, Soluble	20.0	u	UG/L	20.0

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/28/91

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

WESTON BATCH #: 9108L426

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-004	BO1167	Silver, Total	10.0	u	UG/L	10.0
		Aluminum, Total	200	u	UG/L	200
		Arsenic, Total	10.0	u	UG/L	10.0
		Barium, Total	200	u	UG/L	200
		Beryllium, Total	5.0	u	UG/L	5.0
		Bismuth, Total	200	u	UG/L	200
		Calcium, Total	30300		UG/L	5000
		Cadmium, Total	5.0	u	UG/L	5.0
		Cobalt, Total	50.0	u	UG/L	50.0
		Chromium, Total	35.8		UG/L	10.0
		Copper, Total	25.0	u	UG/L	25.0
		Iron, Total	264		UG/L	100
		Mercury, Total	0.20	u	UG/L	0.20
		Potassium, Total	5000	u	UG/L	5000
		Magnesium, Total	6990		UG/L	5000
		Manganese, Total	98.6		UG/L	15.0
		Sodium, Total	21400		UG/L	5000
		Nickel, Total	40.0	u	UG/L	40.0
		Lead, Total	3.0	u	UG/L	3.0
		Antimony, Total	60.0	u	UG/L	60.0
		Selenium, Total	5.0	u	UG/L	5.0
		Silicon, Total	11200		UG/L	100
		Thallium, Total	10.0	u	UG/L	10.0
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	93.0		UG/L	20.0

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/28/91

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

WESTON BATCH #: 9108L426

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-005	BO1168	Silver, Soluble	10.0	u	UG/L	10.0
		Aluminum, Soluble	200	u	UG/L	200
		Arsenic, Soluble	10.0	u	UG/L	10.0
		Barium, Soluble	200	u	UG/L	200
		Beryllium, Soluble	5.0	u	UG/L	5.0
		Bismuth, Soluble	200	u	UG/L	200
		Calcium, Soluble	31000		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	7150		UG/L	5000
		Manganese, Soluble	92.3		UG/L	15.0
		Sodium, Soluble	21100		UG/L	5000
		Nickel, Soluble	40.0	u	UG/L	40.0
		Lead, Soluble	3.0	u	UG/L	3.0
		Antimony, Soluble	60.0	u	UG/L	60.0
		Selenium, Soluble	5.0	u	UG/L	5.0
		Silicon, Soluble	11400		UG/L	100
		Thallium, Soluble	10.0	u	UG/L	10.0
		Vanadium, Soluble	50.0	u	UG/L	50.0
		Zinc, Soluble	100		UG/L	20.0

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01185

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842601

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	91.00	U		P
7440-36-0	Antimony	20.00	U		P
7440-38-2	Arsenic	2.20	B		F
7440-39-3	Barium	80.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	285000.00			P
7440-47-3	Chromium	15.80			P
7440-48-4	Cobalt	10.00	U		P
7440-50-8	Copper	14.00	B		P
7439-89-6	Iron	789.00		N	P
7439-92-1	Lead	20.00	U	NW	F
7439-95-4	Magnesium	77700.00			P
7439-96-5	Manganese	21.50			P
7439-97-6	Mercury	.20	U		CV
7440-02-0	Nickel	11.00	U		P
7440-09-7	Potassium	15800.00			P
7782-49-2	Selenium	35.00	B	NW	F
7440-22-4	Silver	10.00	U		P
7440-23-5	Sodium	64400.00			P
7440-28-0	Thallium	20.00	U	NE	F
7440-62-2	Vanadium	47.20	B		P
7440-66-6	Zinc	21.10			P
	Cyanide	119.00			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.

B01186

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842602

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	91.00	U		P
7440-36-0	Antimony	20.00	U		P
7440-38-2	Arsenic	2.10	B		F
7440-39-3	Barium	74.30	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	269000.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	10.00	U		P
7440-50-8	Copper	107.00			P
7439-89-6	Iron	400.00		N	P
7439-92-1	Lead	2.00	U	NW	F
7439-95-4	Magnesium	73500.00			P
7439-96-5	Manganese	18.60			P
7439-97-6	Mercury	.20	U		CV
7440-02-0	Nickel	11.00	U		P
7440-09-7	Potassium	15000.00			P
7782-49-2	Selenium	25.00	B	NW	F
7440-22-4	Silver	10.00	U		P
7440-23-5	Sodium	61600.00			P
7440-28-0	Thallium	2.00	U	NW	F
7440-62-2	Vanadium	45.60	B		P
7440-66-6	Zinc	19.10	B		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.

B01167

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842604

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	91.00	U		P
7440-36-0	Antimony	20.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	73.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	30300.00			P
7440-47-3	Chromium	35.80			P
7440-48-4	Cobalt	10.00	U		P
7440-50-8	Copper	10.00	U		P
7439-89-6	Iron	264.00		N	P
7439-92-1	Lead	2.00	U	N	F
7439-95-4	Magnesium	6990.00			P
7439-96-5	Manganese	98.60			P
7439-97-6	Mercury	.20	U		CV
7440-02-0	Nickel	23.50	B		P
7440-09-7	Potassium	4830.00	B		P
7782-49-2	Selenium	2.00	U	N	F
7440-22-4	Silver	10.00	U		P
7440-23-5	Sodium	21400.00			P
7440-28-0	Thallium	2.00	U	NW	F
7440-62-2	Vanadium	13.50	B		P
7440-66-6	Zinc	93.00			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.

B01168

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842605

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	91.00	U		P
7440-36-0	Antimony	20.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	74.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	31000.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	10.00	U		P
7440-50-8	Copper	10.00	U		P
7439-89-6	Iron	52.30	B	N	P
7439-92-1	Lead	2.00	U	N	F
7439-95-4	Magnesium	7150.00			P
7439-96-5	Manganese	92.30			P
7439-97-6	Mercury	.20	U		CV
7440-02-0	Nickel	11.00	U		P
7440-09-7	Potassium	4670.00	B		P
7782-49-2	Selenium	2.00	U	N	F
7440-22-4	Silver	10.00	U		P
7440-23-5	Sodium	21100.00			P
7440-28-0	Thallium	2.00	U	NW	F
7440-62-2	Vanadium	11.80	B		P
7440-66-6	Zinc	100.00			P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613402.0716

VALIDATION SUMMARY

9613402.0717

9108L426-WES-143

SAIC

Science Applications International Corporation
An Employee-Owned Company

0118-PKB.92
March 3, 1992

Mr. Mark A. Buckmaster
Westinghouse Hanford Company
P.O. Box 1970, MSIN H4-55
Richland, WA 99352

Subject: Deliverable for 200-BP-1 Validation, Task Order S-92-19, WHC Contract No. MLW-SVV-073750

Dear Mr. Buckmaster:

Enclosed please find a copy of the Data Validation Summary reports for Data Packages CLP426 and CLP782 required by the referenced SAIC task and WHC contract. This deliverable was prepared by a team of Golder Associates under the direction of Mr. Kent Angelos with support from SAIC.

Should you have any questions, please do not hesitate to contact the following: Mr. Kent Angelos, Golder Associates at (206) 883-0777, Mr. Mike Hoxie or myself at (509) 943-3133.

Sincerely yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

PKBrockman

P. K. Brockman
Program Manager

Enclosure
PKB/kdc

w. enc.
R. Bechtold, WHC
LB/Task S-92-19 Deliv File

w/o enc.
M. Adams, WHC
D. Caldwell, Golder
J. Wilborn, Albq
D. Wilson, WHC

w/enc. including original data package
T. Tonning, WHC

9613402.0718

Report To

Westinghouse Hanford Company
Richland, Washington

Data Validation Report
200-BP-1 RI/FS
Data Package: 9108L426-WES-143
SDG No.: CLP426
Analysis Type: Metals/Cyanide/Bi/Si/Volatile Organics/Wet Chemistry

Prepared By

Golder Associates Inc.
Redmond, Washington

Validated by: Sandy Sutton-Schildt
Sandy Sutton-Schildt
Staff Environmental Scientist

Reviewed by: Kent Angelos
Kent Angelos
Associate

February 26, 1992

913-1719

9613402.0719

TABLE OF CONTENTS

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1. INTRODUCTION 1

2. DATA QUALITY OBJECTIVES 1

3. QUALIFIED DATA 2

3.1 Major Deficiencies 2
3.2 Minor Deficiencies 2

4. CONCLUSIONS 3

5. REFERENCES 3

LIST OF ATTACHMENTS

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

1. INTRODUCTION

This report presents the results of data validation on case: WEST and SDG: CLP426 consisting of four (4) water samples for contract laboratory program/target analyte list (CLP/TAL) total and dissolved metals, CLP/TAL total cyanide, bismuth, and silicon; two (2) water samples for anions and wet chemistry; and one water sample for volatile organics (a day trip blank). Sample identifications, locations, and sample dates are provided in the tabular data summary provided in Attachment 3.

The samples were analyzed by the Weston - Lionville laboratory using the 3/90 statement of work (SOW) for metals and cyanide. Bismuth and silicon were analyzed by ICP methods. Anions (chloride, fluoride, nitrite, nitrate, phosphate, and sulfate), were analyzed by ion chromatography (IC), (EPA, 1984). Total organic carbon (TOC) was analyzed by method 505.B (APHA, 1985). Total dissolved solids (TDS), pH, alkalinity, and nitrate+nitrite were analyzed using EPA methods (EPA, 1979). Volatile organic compounds were analyzed by gas chromatography/mass spectrometry (GC/MS) according to the 2/88 (Rev. 5/89) CLP SOW for TCL organic compounds.

Validation was conducted in accordance with "Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision 0, November 1991" including Revision A, dated December 1991.

2. DATA QUALITY OBJECTIVES

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

Sample quantitation limits were in most samples less than the contract required quantitation limit (CRQL) specified in the QAPjP (DOE, 1989) with the exception of one sample result for lead (B01185) and bismuth. Bismuth was reported to a quantitation limit of 200 µg/L and the estimated detection limit specified in method 3111A (APHA, 1989) is 60 µg/L. However, all analyses were reported to within five times the CRQL.

The following assumptions regarding standard concentrations were made in order to check the continuing calibration verifications CCVs for the IC:

- fluoride 10 mg/L
- chloride 5 mg/L
- nitrite 5 mg/L
- nitrate 5 mg/L
- phosphate 5 mg/L
- sulfate 5 mg/L

3. QUALIFIED DATA

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

3.1 Major Deficiencies

Nitrate+nitrite results determined by the hydrazine reduction method 353.1 (EPA 1979) are rejected in sample B01167 and estimated in sample B01185 since they do not compare favorably with the IC data. Results for nitrate+nitrite are five times higher than the same results determined by IC in sample B01185 and four times lower than IC results in sample B01167. This may be due to acid preservation of the nitrate+nitrite samples which causes oxidation of any nitrite present to nitrate. If the samples are not pH adjusted to between 5 and 9 prior to analysis, reduction of nitrate to nitrite during application of the hydrazine reagent may be inhibited, though sodium hydroxide is used during analysis.

Two sample results for selenium and all results for lead are rejected due to the spike sample recovery being less than 30% with the corresponding results below the IDL.

3.2 Minor Deficiencies

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

- Copper and zinc were detected in one or more laboratory blanks. Associated results less than five times the highest blank concentration have been qualified as non-detects (U).

- Spike sample recoveries for silicon, iron, lead, selenium, and thallium were outside the control limits of 75 to 125%. Associated sample results have been qualified as estimated (J for detects, UJ or R for non-detects).

- GFAA analytical spike recoveries were outside the control limits of 85 to 115% for lead and selenium in samples B01185 and B01186, and in all samples for thallium. No qualification is necessary for selenium and thallium since spike sample recoveries required sample results qualified as estimated, and none is needed for lead since spike sample recoveries resulted in rejection (R) of all lead results.

- Methylene chloride was detected in the laboratory blank and sample B011Q0. The sample result has been qualified as a non-detect (U) in accordance with validation requirements.

- The holding times for nitrite, nitrate, and phosphate were exceeded and all associated sample results have been qualified as estimated (J for detects, UJ for non-detects).

- A sample matrix spike was performed only for cyanide and TOC, and a laboratory control sample was done only for cyanide during the wet chemistry analysis. Therefore, sample results for other parameters may not represent sample conditions.

4. CONCLUSIONS

Sections 1 through 3 present a summary of the data quality for the subject data package. The attachments provide supporting documentation and a tabular summary of the qualified data. The original, as-received, data package is enclosed for submittal to the project QA record.

5. REFERENCES

APHA 1985, Standard Methods for the Examination of Water and Wastewater, 16th Edition. American Public Health Association, Washington, D.C.

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

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

EPA 1979, Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

EPA 1984, Test Method: The Determination of Inorganic Anions in Water by Ion Chromatography - Method 300.0. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

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

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

U - Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to identified quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are usable for decision making processes.

B - Indicates the compound or analyte was analyzed for and detected. The associated value is less than the CRQL but greater than the IDL.

R - Indicates the compound or analyte was analyzed for and due to an identified quality control deficiency the data are unusable.

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

9613402.0724

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP426	REVIEWER SSchlodt	DATE: 2/12/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Cu	U	B001185	Analyte found in lab blank
Zn	U	B001185, 1186	↓
Si	J	all	Matrix spike
Fe	J	all	recovery <75%
Pb	~~UJ~~ R SSS 2/24/92	all	recovery <30%
Se	J	B001185, 1186	%R 30-74%
↓	R	B001167, 1168	%R <30%
Tl	UJ	all	%R 30-75%
~~As~~ SSS 2/12/92			
As	UJ	B01167	Analytical spike recovery <55%

2/24/92

2/24/92

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP426	REVIEWER: S Schulat	DATE: 2/13/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	BC11Q0	Compound found in lab blank

2/26/92

4/24/92

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: CLP426	REVIEWER SSchubert	DATE: 2/19/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Phosphate	UJ	B01185, 67	Holding time
Nitrite	UJ	↓	exceeded
Nitrate	J		
NO_3/NO_2	R	B01167 ~~B01185, 67~~	Result disparity
NO_3/NO_2	J	B01185	Result disparity w/ IC data

2/20/92

2/24/92

9613402.0728

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project	200-BP-1																	
Laboratory	WESTON																	
Case WEST	SDG	CLP426																
Sample Number		B01185		B01186		B01167		B01168										
Location		6-50-53A		6-50-53A		6-49-57B		6-49-57B										
Remarks		total		dissolved		total		dissolved										
Sample Date		8-8-91		8-8-91		8-8-91		8-8-91										
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	91	U	91	U	91	U	91	U										
Antimony	60	20	U	20	U	20	U	20	U										
Arsenic	10	2.2	B	2.1	B	2	UJ	2	U										
Barium	200	80.1	B	74.3	B	73.7	B	74.1	B										
Beryllium	5	1	U	1	U	1	U	1	U										
Cadmium	5	3	U	3	U	3	U	3	U										
Calcium	5000	285000		269000		30300		31000											
Chromium	10	15.8		6	U	35.8		6	U										
Cobalt	50	10	U	10	U	10	U	10	U										
Copper	25	14	U	107		10	U	10	U										
Iron	100	789	J	400	J	264	J	52.3	J										
Lead	5	20	R	2	R	2	R	2	R										
Magnesium	5000	77700		73500		6990		7150											
Manganese	15	21.5		18.6		98.6		92.3											
Mercury	0.2	0.2	U	0.2	U	0.2	U	0.2	U										
Nickel	40	11	U	11	U	23.5	B	11	U										
Potassium	5000	15800		15000		4830	B	4670	B										
Selenium	5	35	J	25	J	2	R	2	R										
Silver	10	10	U	10	U	10	U	10	U										
Sodium	5000	64400		61600		21400		21100											
Thallium	10	20	UJ	2	UJ	2	UJ	2	UJ										
Vanadium	50	47.2	B	45.6	B	13.5	B	11.8	B										
Zinc	20	21.1	U	19.1	U	93		100											
Cyanide	10	119				10	U												
Bismuth		200	U	200	U	200	U	200	U										
Silicon		14700	J	14100	J	11200	J	11400	J										

9613402.0729

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01185
6-50-53A

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842601

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	91.00	U		P	
7440-36-0	Antimony	20.00	U		P	
7440-38-2	Arsenic	2.20	B		F	
7440-39-3	Barium	80.10	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	285000.00			P	
7440-47-3	Chromium	15.80			P	
7440-48-4	Cobalt	10.00	U		P	
7440-50-8	Copper	14.00	~~B~~		P	U
7439-89-6	Iron	789.00		N	P	J
~~7439-92-1~~	~~Lead~~	~~20.00~~	~~U~~	~~NW~~	~~F~~	~~UJ~~ R
7439-95-4	Magnesium	77700.00			P	
7439-96-5	Manganese	21.50			P	
7439-97-6	Mercury	.20	U		CV	
7440-02-0	Nickel	11.00	U		P	
7440-09-7	Potassium	15800.00			P	
7782-49-2	Selenium	35.00	~~B~~	NW	F	J
7440-22-4	Silver	10.00	U		P	
7440-23-5	Sodium	64400.00			P	
7440-28-0	Thallium	20.00	~~U~~	NE	F	UJ
7440-62-2	Vanadium	47.20	B		P	
7440-66-6	Zinc	21.10			P	U
	Cyanide	119.00			C	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

2/20/92
4/24

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01186
6-50-53A

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842602

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	91.00	U		P	
7440-36-0	Antimony	20.00	U		P	
7440-38-2	Arsenic	2.10	B		F	
7440-39-3	Barium	74.30	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	269000.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	10.00	U		P	
7440-50-8	Copper	107.00			P	
7439-89-6	Iron	400.00		N	P	J
~~7439-92-1~~	~~Lead~~	~~2.00~~	~~U~~	~~NW~~	~~F~~	~~UJ~~ R
7439-95-4	Magnesium	73500.00			P	
7439-96-5	Manganese	18.60			P	
7439-97-6	Mercury	.20	U		CV	
7440-02-0	Nickel	11.00	U		P	
7440-09-7	Potassium	15000.00			P	
7782-49-2	Selenium	25.00	B	NW	F	J
7440-22-4	Silver	10.00	U		P	
7440-23-5	Sodium	61600.00			P	
7440-28-0	Thallium	2.00	U	NW	F	UJ
7440-62-2	Vanadium	45.60	B		P	
7440-66-6	Zinc	19.10	B		P	U
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

2/26/92

2/24/

9613402.0752 0000025

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01167
6-49-5713

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842604

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	91.00	U		P	
7440-36-0	Antimony	20.00	U		P	
7440-38-2	Arsenic	2.00	U		F	UJ
7440-39-3	Barium	73.70	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	30300.00			P	
7440-47-3	Chromium	35.80			P	
7440-48-4	Cobalt	10.00	U		P	
7440-50-8	Copper	10.00	U		P	
7439-89-6	Iron	264.00		N	P	J
7439-92-1	Lead	2.00	U	N	F	R
7439-95-4	Magnesium	6990.00			P	
7439-96-5	Manganese	98.60			P	
7439-97-6	Mercury	.20	U		CV	
7440-02-0	Nickel	23.50	B		P	
7440-09-7	Potassium	4830.00	B		P	
7782-49-2	Selenium	2.00	U	N	F	R
7440-22-4	Silver	10.00	U		P	
7440-23-5	Sodium	21400.00			P	
7440-28-0	Thallium	2.00	U	NW	F	UJ
7440-62-2	Vanadium	13.50	B		P	
7440-66-6	Zinc	93.00			P	
	Cyanide	10.00	U		C	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

2/28/92

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01168
6-49-57B

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

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP426

Matrix (soil/water): WATER Lab Sample ID: 910842605

Level (low/med): LOW Date Received: 8/12/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	91.00	U		P	
7440-36-0	Antimony	20.00	U		P	
7440-38-2	Arsenic	2.00	~~U~~		F	~~UJ~~ SSS 4/12/92
7440-39-3	Barium	74.10	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	31000.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	10.00	U		P	
7440-50-8	Copper	10.00	U		P	
7439-89-6	Iron	52.30	~~B~~	N	P	J
~~7439-92-1~~	~~Lead~~	~~2.00~~	~~U~~	~~N~~	~~P~~	~~UJ~~ R
7439-95-4	Magnesium	7150.00			P	
7439-96-5	Manganese	92.30			P	
7439-97-6	Mercury	.20	U		CV	
7440-02-0	Nickel	11.00	U		P	
7440-09-7	Potassium	4670.00	B		P	
~~7782-49-2~~	~~Selenium~~	~~2.00~~	~~U~~	~~N~~	~~P~~	R
7440-22-4	Silver	10.00	U		P	
7440-23-5	Sodium	21100.00			P	
7440-28-0	Thallium	2.00	~~U~~	NW	F	UJ
7440-62-2	Vanadium	11.80	B		P	
7440-66-6	Zinc	100.00			P	
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

AMW 2/26/92

AJL 2/26/92

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project	200-BP-1		
Laboratory	WESTON		
Case WEST	SDG	CLP426	
Sample Number		B011Q0	
Location		day trip	
Remarks		blank	
Sample Date		8-8-91	
Organic Compounds	CRQL	Result	
Chloromethane	10	10	U
Bromomethane	10	10	U
Vinyl Chloride	10	10	U
Chloroethane	10	10	U
Methylene Chloride	5	8	U
Acetone	10	10	U
Carbon Disulfide	5	5	U
1,1-Dichloroethene	5	5	U
1,1-Dichloroethane	5	5	U
1,2-Dichloroethene (total)	5	5	U
Chloroform	5	5	U
1,2-Dichloroethane	5	5	U
2-Butanone	10	10	U
1,1,1-Trichloroethane	5	5	U
Carbon Tetrachloride	5	5	U
Vinyl Acetate	10	10	U
Bromodichloromethane	5	5	U
1,2-Dichloropropane	5	5	U
cis-1,3-Dichloropropene	5	5	U
Trichloroethene	5	5	U
Dibromochloromethane	5	5	U
1,1,2-Trichloroethane	5	5	U
Benzene	5	5	U
Trans-1,3-Dichloropropene	5	5	U
Bromoform	5	5	U
4-Methyl-2-pentanone	10	10	U
2-Hexanone	10	10	U
Tetrachloroethene	5	5	U
1,1,2,2-Tetrachloroethane	5	5	U
Toluene	5	5	U
Chlorobenzene	5	5	U
Ethylbenzene	5	5	U
Styrene	5	5	U
Xylene (total)	5	5	U

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1A 0000010

VOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

B01100 ~~Duplicate 4~~ DA/Trip blank SSS 2/26/92

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

Client: WESTINGHOUSE HANFORD

Matrix: WATER Lab Sample ID: 9108L426-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: AK8E06

Level: (low/med) LOW Date Received: 08/12/91

% Moisture: not dec. _____ Date Analyzed: 08/14/91

Column: (pack/cap) CAP Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
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	~~8~~	~~B~~ U +0 SSS 2/26/92
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	~~U~~ ~~UJ~~ R SSS 2/13/92
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

FORM 1 V-1 12/88 Rev. KMS 2/26/92

SSS 2/26/92

1E 000017

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B011Q0
~~Duplicate 4~~
Day Trip Blank SSS 2/26/92

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

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9108L426-003

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

Lab File ID: AK8E06

Level: (low/med) LOW

Date Received: 08/12/91

% Moisture: not dec. _____

Date Analyzed: 08/14/91

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

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

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

FORM 1 VOA-TIC 12/88 Rev.

2/26/92
2/24/92

WET CHEMISTRY, WATER MATRIX, (mg/L)

Project	200-BP-1				
Laboratory	WESTON				
Case WEST	SDG	CLP426			
Sample Number		B01185		B01167	
Location		6-50-53A		6-49-57B	
Remarks					
Sample Date		8-8-91		8-8-91	
Wet Chemistry Analytes	CRQL	Result	Q	Result	Q
Alkalinity	2.0	62		122	
Chloride	0.5	22.2		8.5	
Fluoride	0.5	0.25		0.67	
Nitrite	0.5	0.25	UJ	0.25	UJ
Nitrate	0.5	40.8	J	1.1	J
Cyanide (total)	10 µg/L	119		10	
Phosphate	0.5	0.25	UJ	0.25	UJ
Sulfate	0.5	27.5		13.3	
Nitrate Nitrite	1.0	153	J	0.25	R
Total Organic Carbon	0.5	2.6		0.94	
pH	0.01 unit	7.4		7.8	
Total Dissolved Solids	5.0	2020		191	

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ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/23/91

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

WESTON BATCH #: 9108L426

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	B01185	Alkalinity	62.0	MG/L	2.0
	6-50-53A	Chloride by IC	22.2	MG/L	2.5
		Fluoride by IC	0.25 u	MG/L	0.25
		Nitrite by IC	0.25 ~~u~~	MG/L	0.25 UJ
		Nitrate by IC	40.8 ~~48.8~~	MG/L	2.5 J
		Cyanide, Total	119	UG/L	20.0
		Phosphate by IC	0.25 ~~u~~	MG/L	0.25 UJ
		Sulfate by IC	27.5	MG/L	2.5
		Nitrate Nitrite	153 ~~153~~	MG/L	10.0 ~~R~~ J
		Total Organic Carbon	2.6	MG/L	1.0
		pH	7.4	PH UNITS	0.010
		Total Dissolved Solids	2020	MG/L	5.0
-004	B01167	Alkalinity	122	MG/L	2.0
	6-49-57B	Chloride by IC	8.5	mg/L	0.25
		Fluoride by IC	0.67	mg/L	0.50
		Nitrite by IC	0.25 ~~u~~	mg/L	0.25 UJ
		Nitrate by IC	1.1	mg/L	0.25 J
		Cyanide, Total	10.0 u	UG/L	10.0
		Phosphate by IC	0.25 ~~u~~	mg/L	0.25 UJ
		Sulfate by IC	13.3	mg/L	0.25
		~~Nitrate Nitrite~~	~~0.25~~	~~MG/L~~	~~0.10~~ R
		Total Organic Carbon	0.94	MG/L	0.50
		pH	7.8	PH UNITS	0.010
		Total Dissolved Solids	191	MG/L	5.0

2/26/92
2/26

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ATTACHMENT 4

DATA REVIEW SUPPORTING DOCUMENTATION

9613402.0740

DRAFT 7/91

INORGANIC ANALYSIS DATA REVIEW CHECKLIST - FORM A-6

PROJECT: 913-1719	REVIEWER: SSchilde	DATE: 2/12/92
LABORATORY: Wexton	CASE: West	SDG: CLP 426
SAMPLES/MATRIX: B001185, 1186, 1167, 1168 / Water		

1. COMPLETENESS AND CONTRACT COMPLIANCE

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

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	✓		

SS 2/26/92

Data Package Item	Present?: Yes	No	N/A
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	✓		
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 non-detects).

3. INITIAL CALIBRATIONS

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

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

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

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

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

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

Are there calculation errors? Yes (No) N/A

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

MW 2/26/92

5. ICP INTERFERENCE CHECK SAMPLE

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

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

Are there calculation errors? Yes No N/A

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

6. LABORATORY BLANKS

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

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

7. FIELD BLANKS

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

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

8. MATRIX SPIKE SAMPLE ANALYSIS

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

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

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

9. LABORATORY CONTROL SAMPLE

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

Are there calculation errors? Yes No N/A

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

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

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

10. PERFORMANCE AUDIT ANALYSES

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

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

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

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

12. ICP SERIAL DILUTION

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

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

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

2/26/92

13. FIELD DUPLICATE SAMPLES

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

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

14. FIELD SPLIT SAMPLES

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

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

15. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections?	Yes	No	N/A
Are applicable duplicate injection RSD values within control?	Yes	No	N/A
If no, were samples rerun once as required?	Yes	No	N/A
Does the RSD for the rerun fall within the control limits?	Yes	No	N/A
Were analytical spike recoveries within the control limits?	Yes	No	N/A
If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients $\geq$0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

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

Klmt 2/26/92

16. ANALYTE QUANTITATION AND DETECTION LIMITS

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

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

17. OVERALL ASSESSMENT AND SUMMARY

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

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

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COMMENTS (attach additional sheets as necessary):

~~Lab sample B0485 result for Tl reported incorrectly as 200, should be 32~~
Tl reported correctly. [illegible] 2/26/92

[illegible] 2/26/92
[illegible] 2/24/92

HOLDING TIME SUMMARY - FORM B-1

SDG: CLP426 | REVIEWER: S. Schmidt | DATE: 2/12/92 | PAGE 1 OF 1

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B001185,6	CN	8/8/91	8/22/91	8/22/91	14	14	none
B001167,8	↓	8/8/91	↓	↓	↓	↓	↓
B001185,6	CV	8/8/91	8/30/91	9/4/91	22	27	none
B001167,8	↓	↓	8/15/91	8/19/91	7	11	↓
B001185,6	GFAA-As	8/8/91	8/22/91	8/29/91	14	21	none
B001167,8	↓		8/15/91	8/16/91	7	8	
B001185,6	GFAA-Pb		8/22/91	8/29/91	14	21	
B001167,8	↓		8/15/91	8/16/91	7	8	
B001185,6	GFAA-Se		8/22/91	8/29/91	14	21	
B001167,8	↓		8/15/91	8/16/91	7	8	
B001185,6	GFAA-Tl		8/22/91	8/30/91	14	22	
B001167,8	↓		8/15/91	8/17/91	SSS 2/12/92 ~~8~~ 7	9	
B001185,6	ICP		8/22/91	10/18/91	SSS 2/12/92 ~~7~~ 14	71	
B001167,8	↓	↓	8/15/91	9/25/91	7	48	↓

Mark Lab 2/24/92

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BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: CLP426 | REVIEWER: S Schilbt | DATE: 2/12/92 | PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Cu	7.4	B		ug/L	37.0		B001185	14.0 U
PBlk	Zn	5.6	B			28.0		B001185	21.1 U
CCB	↓	5.6	B			28.0		B001186	19.1 U
CCB	↓	6.3				31.5			
CCB	Tl	-7.0				-35.0		none	
PBlk	↓	-4.7	B			-23.5			

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ACCURACY DATA SUMMARY - FORM B-4

SDG: CLP 426	REVIEWER: S Schulak	DATE: 2/12/92	PAGE 1 OF 1	
COMMENTS: Spike sample recovery				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B0011855	Si	0	all	J
	Fe	63.6	all	J
	Pb	25.5	all	~~UJ~~ R
	Se	0	B0011855,6	J
	↓		B0011867,8	R
	Tl	33.6	all	UJ

SSS 2/24/92

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ACCURACY DATA SUMMARY - FORM B-4

SDG: CLP426	REVIEWER: S Schuldt	DATE: 2/12/92	PAGE 1 OF 1	
COMMENTS: Analytical spike recovery				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B001167	As	83.7		~~none~~ J
B001185	Pb	52.8		none
B001186	↓	64.2		none
B001185	Se	76.6		none
B001186	↓	84.7		none
B001167	Tl	30.6		none

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VOLATILE ORGANIC DATA REVIEW CHECKLIST - FORM A-1

PROJECT: 913-1719	REVIEWER: SSchulde	DATE: 2/12/92
LABORATORY: Weston	CASE: West	SDG: CLP 426
SAMPLES/MATRIX: B0011Q0 / water		

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	✓		

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Data Package Item	Present?: Yes	No	N/A
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	✓		
Quantitation and calculation data for all TIC			✓
MS/MSD report forms		✓	
RIC and quantitation reports for MS/MSD		✓	
Additional Data			
Moisture/% solids data sheets		✓ SS 2/12/92	✓
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, qualify associated samples as estimated (J for detects or UJ for non-detects).

3. INSTRUMENT CALIBRATION AND TUNING

3.1 GC/MS TUNING

Is a BFB tune report present for each applicable 12h 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

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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 non-detects). 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%?	Yes	No	N/A
Are all RRF values ≥0.05?	Yes	No	N/A

ACTION: If any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all non-detects as unusable (R). If any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for non-detects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12h periods in which associated samples were analyzed ?	Yes	No	N/A
Are all RRF values ≥0.05?	Yes	No	N/A
Are all %D values ≤25%?	Yes	No	N/A

ACTION: If any RRF value is out of specification qualify all associated detected results as estimated and all non-detects as unusable (R). If any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for non-detects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12h 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 <10X the highest blank concentration for the common laboratory contaminants, as non-detects (U) or at the SQL if the result is < CRQL. Qualify all remaining sample results <5X the blank concentration in similar fashion.

Rhet 1/26/92

4.2. FIELD BLANKS

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

ACTION: Qualify all detected sample results less than or equal to five times the amount in any valid field blank as non-detects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

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

Are any surrogate recoveries less than 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 non-detects) for surrogates out of specification but greater than 10%. Qualify all associated positive sample results as estimated (J) and all non-detect 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 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 not the results in the validation narrative. 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

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ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for non-detects). If area counts are outside the acceptance limits and the retention time criteria are not met qualify all non-detects in the associated samples as unusable (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 explained?	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 five times the CRQL 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

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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 non-detects (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 non-detects (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 of the data validation requirements.

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9613402.0758

COMMENTS (attach additional sheets as necessary):

No comments

HOLDING TIME SUMMARY - FORM B-1

SDG: CLP426	REVIEWER: S Schuldt	DATE: 2/12/92	PAGE 1 OF 1
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B001Q0	VOA	8/8/91	8/14/91	8/14/91	6	6	none

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9150 2.0759

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: CLP426	REVIEWER: S Schulert	DATE: 2/13/93	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK	Methylene Chloride	5			ug/L		50	B0011Q0	~~10~~ 8 U
↓	Acetone	4	J		↓		40	none	

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B-3

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DRAFT 7/91

WET CHEMISTRY DATA REVIEW CHECKLIST - FORM A-7

PROJECT: 913-1719	REVIEWER: S Schlabl	DATE: 2/18/92
LABORATORY: Weston	CASE:	SDG: CLP426
SAMPLES/MATRIX: B01185, 67 / Water		

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	✓		

Rmt 2/26/92

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 non-detects).

3. INITIAL CALIBRATIONS

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

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

Was a 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

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

Lab KMA 2/26/92

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

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

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7. MATRIX SPIKE SAMPLE ANALYSIS

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

ACTION: If spike recovery is outside the control limits and the sample results are greater than the CRQL, qualify the data as estimated (J). If the spike recovery is less than 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.

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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 of the data validation requirements.

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COMMENTS (attach additional sheets as necessary):

1. Sample BC1185 NO_3 result reported incorrectly. Should be 40.8 mg/L

2. Suspect improper method for NO_3/NO_2 analysis by hydrazine reduction.

3. Assume standards used for ICV & CCV

F!	10	mg/L
Cl	5	
NO_2	5	
Br	7.5	
NO_3	5	
PO_4	5	
SO_4	5	

4. Sample spiked only for CN and TOC.

5. LCS only for CN.

2/24/92

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HOLDING TIME SUMMARY - FORM B-1

SDG: CLP426	REVIEWER: G Schildt	DATE: 2/18/92	PAGE 1 OF 2
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01185	TOC	8/8/91		8/28/91		20	none
	NO_2/NO_3			8/28/91		20	none
	TDS			8/14/91		6	none
	Alk			8/21/91		13	
	pH			8/12/91		4	
	SO_4			10/16/91		69	none
	PO_4						J
	Cl						none
	F						none
	NO_2						J
	NO_3						J

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HOLDING TIME SUMMARY - FORM B-1

SDG: CLP926 | REVIEWER: S. Schulz | DATE: 2/18/92 | PAGE 2 OF 2

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01167	TOC	8/8/91		8/28/91		20	none
	NO_2/NO_3			8/28/91		20	none
	TDS			8/13/91		5	none
	Alk			8/19/91		11	
	pH			8/12/91		4	
	SO_4			8/15/91		7	none
	PO_4						J
	Cl						none
	F						none
	NO_2						J
	NO_3						J

2/24/92

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: CLP426	REVIEWER: S Schildt	DATE: 2/18/92	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
Blank	Nitrite	.358			mg/L	1.79		none	

96/9402.0768