HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

N60478.AR.000227
NWS EARLE
5090.3a

DATA VALIDATION

REPORT

COPY

Client Name:	**Roy F. Weston, Inc.**
Site Name:	**NWS - Earle, ColtsNeck, NJ**
RFW Lot No.:	**Various**
QA/QC Level:	**NEESA Level D - EPA Region II**
Fractions:	**Metals and TPH**
Volume Number:	**1 of 1**

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
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August 7, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Three (3) total metal soil samples and one (1) Matrix Spike and Duplicate pair, eleven (11) short list soil samples and one (1) Matrix Spike and Duplicate pair and one (1) water sample were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
23-002	920664001
23-101	920664002
23-003	920664003
23-004	920664004
23-005	920664005
23-006	920664006
23-007	920664007
23-008	920664008
23-201	920664009
23-001	920664011
23002B	920664012
23003B	920664013
23004B	920664014
23005B	920664015
23006B	920664016

Heartland ESI has reviewed the data for the samples listed above TAL Metals using Region II Data Validation Protocol, January 1992 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAL Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 920664**, the analysis of three (3) total metals soil samples and one (1) matrix spike and duplicate pair, eleven (11) short list soil samples and one (1) matrix spike and duplicate pair and one (1) water sample. Overall, the inorganic data quality was fair. The USEPA CLP analytical protocol was followed as required with the exception of the following problems. The ICV and Midrange Standards for Cyanide were not distilled as required by the Protocol. The QC for the water sample was found in another SDG, but the laboratory failed to flag based on this QC.

<u>Specific</u> QA/QC deficiency <u>Findings</u> are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standards for Arsenic and Thallium for waters were above the upper control limit. All positive results within the controlled area are qualified as estimated, "J".

2. The CRDL Standard for Lead for soil was below the lower control limit. All positive and non-detect results within the controlled area are qualified as estimated, "J" or "UJ".

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recoveries for waters for Beryllium and Lead and soils for Antimony, Arsenic, Lead, Manganese, Selenium, Silver and Zinc were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

4. The Serial dilutions for soils for Aluminum, Barium, Calcium, Chromium, Iron, Magnesium, Manganese and Vanadium were outside the control limit. All positive results greater than 10 times the IDL are qualified as estimated,"J".

MSA

5. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Lead	23-008.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	As and Tl	+	J	1
All soil samples	Pb	+/U	J/UJ	2
All water samples All soil samples	Be and Pb Sb, As, Pb, Mn, Se, Ag and Zn.	+/U	J/UJ	3
All total soil samples	Al, Ba, Ca, Cr, Fe, Mg, Mn and V.	+	J	4
23-008	Pb	+/U	J/UJ	5

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

U.S. EPA CLP 0037

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-002

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664001

Level (low/med): LOW Date Received: 6/12/92

% Solids: 76.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3140.00		E	P	J4
7440-36-0	Antimony	11.50	U	N	P	UJ3
7440-38-2	Arsenic	6.70		N	F	J3
7440-39-3	Barium	27.50	B	E	P	J4
7440-41-7	Beryllium	1.20	B		P	
7440-43-9	Cadmium	1.05	U		P	
7440-70-2	Calcium	1480.00		E	P	J4
7440-47-3	Chromium	56.90			P	
7440-48-4	Cobalt	1.80	B		P	
7440-50-8	Copper	1.31	U		P	
7439-89-6	Iron	12600.00		E	P	J4
7439-92-1	Lead	9.65		N*S	F	J3
7439-95-4	Magnesium	1110.00	B	E	P	J4
7439-96-5	Manganese	52.60		N*E	P	J3,4
7439-97-6	Mercury	.07	U		CV	
7440-02-0	Nickel	4.72	U		P	
7440-09-7	Potassium	2360.00			P	
7782-49-2	Selenium	.52	U	N	F	UJ3
7440-22-4	Silver	1.57	U	N	P	UJ3
7440-23-5	Sodium	73.00	B		P	
7440-28-0	Thallium	.52	U		F	
7440-62-2	Vanadium	94.90		E	P	J4
7440-66-6	Zinc	49.80		N*	P	J3
	Cyanide	1.31	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000038

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-101

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664002

Level (low/med): LOW Date Received: 6/12/92

% Solids: 73.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1930.00		E	P	J4
7440-36-0	Antimony	11.20	U	N	P	UJ3
7440-38-2	Arsenic	6.20		N	F	J3
7440-39-3	Barium	20.40	B	E	P	J4
7440-41-7	Beryllium	.77	B		P	
7440-43-9	Cadmium	1.02	U		P	
7440-70-2	Calcium	938.00	B	E	P	J4
7440-47-3	Chromium	37.10			P	
7440-48-4	Cobalt	1.53	U		P	
7440-50-8	Copper	1.28	U		P	
7439-89-6	Iron	10800.00		E	P	J4
7439-92-1	Lead	7.50		*NS	F	J3
7439-95-4	Magnesium	792.00	B	E	P	J4
7439-96-5	Manganese	46.60		*NE	P	J3,4
7439-97-6	Mercury	.07	U		CV	
7440-02-0	Nickel	4.59	U		P	
7440-09-7	Potassium	1570.00			P	
7782-49-2	Selenium	.50	U	N	F	UJ3
7440-22-4	Silver	1.53	U	N	P	UJ3
7440-23-5	Sodium	62.80	B		P	
7440-28-0	Thallium	.50	U		F	
7440-62-2	Vanadium	74.30		E	P	J4
7440-66-6	Zinc	39.50		*N	P	J3
	Cyanide	1.36	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000039

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-003

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664003

Level (low/med): LOW Date Received: 6/12/92

% Solids: 92.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	1.00	B		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	32.10			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	5.20			P	
7439-89-6	Iron				NR	
7439-92-1	Lead	5.10		*NS	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	81.60		*N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000040

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-004

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664004

Level (low/med): LOW Date Received: 6/12/92

% Solids: 68.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	6.70			P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	116.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	27.90			P	
7439-89-6	Iron				NR	
7439-92-1	Lead	143.10		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	499.00		*N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000041

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-005

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664005

Level (low/med): LOW Date Received: 6/12/92

% Solids: 63.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	1.70			P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	149.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	19.50			P	
7439-89-6	Iron				NR	
7439-92-1	Lead	128.50		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	131.00		*N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000042

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-006

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664006

Level (low/med): LOW Date Received: 6/12/92

% Solids: 59.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	1.25	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	280.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	15.80			P	
7439-89-6	Iron				NR	
7439-92-1	Lead	82.70		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	32.40		*N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000043

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-007

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664007

Level (low/med): LOW Date Received: 6/12/92

% Solids: 62.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	1.21	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	115.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	9.00			P	
7439-89-6	Iron				NR	
7439-92-1	Lead	39.20		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	11.80		*N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000044

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-008

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664008

Level (low/med): LOW Date Received: 6/12/92

% Solids: 72.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1750.00		E	P	J4
7440-36-0	Antimony	11.50	U	N	P	UJ3
7440-38-2	Arsenic	3.52		NS	F	J3
7440-39-3	Barium	3.80	B	E	P	
7440-41-7	Beryllium	.26	U		P	
7440-43-9	Cadmium	1.04	U		P	
7440-70-2	Calcium	102.00	B	E	P	
7440-47-3	Chromium	24.20			P	
7440-48-4	Cobalt	2.60	B		P	
7440-50-8	Copper	3.40	B		P	
7439-89-6	Iron	23600.00		E	P	J4
7439-92-1	Lead	15.90		*NW	F	J3,5
7439-95-4	Magnesium	213.00	B	E	P	J4
7439-96-5	Manganese	13.80		*NE	P	J3
7439-97-6	Mercury	.07	U		CV	
7440-02-0	Nickel	4.69	U		P	
7440-09-7	Potassium	678.00	B		P	
7782-49-2	Selenium	.51	U	N	F	UJ3
7440-22-4	Silver	1.80	B	N	P	J3
7440-23-5	Sodium	30.10	B		P	
7440-28-0	Thallium	.51	U		F	
7440-62-2	Vanadium	14.20		E	P	
7440-66-6	Zinc	17.90		*N	P	J3
	Cyanide	1.38	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

U.S. EPA - CLP 000045

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-201

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): WATER Lab Sample ID: 920664009

Level (low/med): LOW Date Received: 6/12/92

% 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	35.00	U		P	
7440-36-0	Antimony	44.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	3.00	U		P	
7440-41-7	Beryllium	1.00	U		P	UJ3
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	91.20	B		P	
7440-47-3	Chromium	8.00	U		P	
7440-48-4	Cobalt	6.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	44.60	B		P	
7439-92-1	Lead	2.00	U		F	UJ3
7439-95-4	Magnesium	139.00	B		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	970.00	U		P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	6.00	U		P	
7440-23-5	Sodium	252.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	9.80	B		P	
7440-66-6	Zinc	6.00	U		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 000045

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664011

Level (low/med): LOW Date Received: 6/12/92

% Solids: 85.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.87	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	17.70			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	5.00	B		P	
7439-89-6	Iron				NR	
7439-92-1	Lead	17.80		N*	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	24.70		N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

U.S. EPA - CLP 000047

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23002B

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664012

Level (low/med): LOW Date Received: 6/12/92

% Solids: 87.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.88	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	239.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	4.80	B		P	
7439-89-6	Iron				NR	
7439-92-1	Lead	560.00		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	558.00		N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000048

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23003B

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664013

Level (low/med): LOW Date Received: 6/12/92

% Solids: 83.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.92	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	40.30			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	5.60	B		P	
7439-89-6	Iron				NR	
7439-92-1	Lead	9.40		*NS	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	16.20		N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 0000049

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23004B

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664014

Level (low/med): LOW Date Received: 6/12/92

% Solids: 88.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.88	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	17.80			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	3.00	B		P	
7439-89-6	Iron				NR	
7439-92-1	Lead	15.30		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	89.90		N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000050

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23005B

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664015

Level (low/med): LOW Date Received: 6/12/92

% Solids: 87.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	2.10			P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	51.50			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	6.30			P	
7439-89-6	Iron				NR	
7439-92-1	Lead	13.70		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	191.00		N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23006B

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix (soil/water): SOIL Lab Sample ID: 920664016

Level (low/med): LOW Date Received: 6/12/92

% Solids: 88.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.86	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	7.70			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	2.60	B		P	
7439-89-6	Iron				NR	
7439-92-1	Lead	3.10		*N	F	J3
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	4.20	B	N	P	J3
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

23-002S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 76.2

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	94.0000		11.5456	U	131.20	71.6	N	P
Arsenic	75-125	10.2000		6.7000		10.50	32.5	N	F
Barium	75-125	478.3999		27.5000	B	524.80	85.9		P
Beryllium	75-125	12.4000		1.2000	B	13.10	85.4		P
Cadmium	75-125	11.8000		1.0496	U	13.10	90.0		P
Calcium									NR
Chromium	75-125	122.2000		56.9000		52.50	124.5		P
Cobalt	75-125	116.6000		1.8000	B	131.20	87.5		P
Copper	75-125	57.5000		1.3000	U	65.60	87.6		P
Iron									NR
Lead	75-125	12.8000		9.6000		5.20	61.5	N	F
Magnesium									NR
Manganese	75-125	150.4000		52.6000		131.20	74.5	N	P
Mercury									NR
Nickel	75-125	113.2000		2.4000	U	131.20	86.3		P
Potassium									NR
Selenium	75-125	1.9000		.5248	U	2.60	73.1	N	F
Silver	75-125	2.8000		1.5744	U	13.10	21.2	N	P
Sodium									NR
Thallium	75-125	11.9000		.5248	U	13.10	90.6		F
Vanadium	75-125	234.1000		94.9000		131.20	106.1		P
Zinc	75-125	154.6000		49.8000		131.20	79.8		P
Cyanide	75-125	5.7630		1.3120	U	6.56	87.8		C

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

23-004S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 68.8

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium	75-125	161.0000		116.3000		58.20	76.9		P
Cobalt									NR
Copper	75-125	89.2000		27.9000		72.70	84.3		P
Iron									NR
Lead	75-125	148.4000		142.5400		5.80	101.7		F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc	75-125	592.2000		499.3000		145.40	63.9	N	P
Cyanide									NR

Comments:

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

23-002A

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix: Level (low/med):

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony		118.30		44.00	U	120.0	98.6		P
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese		568.40		200.60		400.0	91.9		P
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

FORM V (Part 2) - IN

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

23-004A

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

Matrix: Level (low/med):

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc		5083.90		1716.50		3400.0	99.0		P
Cyanide									NR

Comments:

FORM V (Part 2) - IN

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

23-002D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

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

% Solids for Sample: 76.2 % Solids for Duplicate: 76.2

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		3138.7000		2973.1000		5.4		P
Antimony		11.5456	U	11.5456	U			P
Arsenic	2.6	6.7000		5.5000		20.6		F
Barium		27.5000	B	24.0000	B	13.8		P
Beryllium		1.2000	B	1.0000	B	14.3		P
Cadmium		1.0496	U	1.0496	U			P
Calcium	1312.0	1483.8000		932.8000	B	45.6		P
Chromium		56.9000		55.5000		2.4		P
Cobalt		1.8000	B	2.0000	B	12.4		P
Copper		1.3120	U	1.3120	U			P
Iron		12572.4000		12248.9000		2.6		P
Lead		9.6500		9.9000		0.0		F
Magnesium		1106.3000	B	961.7000	B	14.0		P
Manganese		52.6000		35.9000		37.9	*	P
Mercury								NR
Nickel		4.7232	U	4.7232	U			P
Potassium	1312.0	2362.8000		2224.9000		6.0		P
Selenium		.5248	U	.5248	U			F
Silver		1.5744	U	1.5744	U			P
Sodium		73.0000	B	57.3000	B	24.2		P
Thallium		.5248	U	.5248	U			F
Vanadium		94.9000		92.3000		2.7		P
Zinc		49.8000		38.5000		25.5	*	P
Cyanide		1.3120	U	1.3120	U			C

FORM VI - IN

03/90

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

23-004D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP640

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

% Solids for Sample: 68.8 % Solids for Duplicate: 68.8

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium		116.3000		137.2000		16.5		P
Cobalt								NR
Copper	7.3	27.9000		30.5000		8.9		P
Iron								NR
Lead		142.5400		93.1000		42.0	*	F
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc		499.3000		470.0000		6.1		P
Cyanide								NR

FORM VI - IN

03/90

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present?	[ ]		✓
Legible?	[ ]		✓
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

A.1.6	Form I to IX	Yes	No	N/A
A.1.6.1	Are all the Form I through Form IX labeled with:			
	Laboratory name?	[✓]	___	___
	Case/SAS number?	[✓]	___	___
	EPA sample No.?	[✓]	___	___
	SDG No.?	[✓]	___	___
	Contract No.?	[✓]	___	___
	Correct units?	[✓]	___	___
	Matrix?	[✓]	___	___

ACTION: If no for any of the above, note under Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.6.2	Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
	(NOTE: Check all forms against raw data.)			
	(a) all analytes analyzed by ICP?	[✓]	___	___
	(b) all analytes analyzed by GFAA?	[✓]	___	___
	(c) all analytes analyzed by AA Flame?	[ ]	___	✓
	(d) Mercury?	[✓]	___	___
	(e) Cyanide?	[✓]	___	___

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.1: Data Assessment - Contract Compliance (Total Review)

Date: Jan. 1992
Number: HW-2
Revision: 11

		YES	NO	N/A
A.1.7	Raw Data			
A.1.7.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]		
	Digestion Log for furnace AA Form XIII present?	[✓]		
	Distillation Log for mercury Form XIII present?	[✓]		
	Distillation Log for cyanides Form XIII present?	[✓]		
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]		
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[✓]		
	Are preparation dates present on sample preparation logs/bench sheets?	[✓]		
A.1.7.2	Measurement read out record present? ICP	[✓]		
	Flame AA	[ ]		✓
	Furnace AA	[✓]		
	Mercury	[✓]		
	Cyanides	[✓]		
A.1.7.3	Are all raw data to support all sample analyses and QC operations present?	[✓]		
	Legible?	[✓]		
	Properly Labeled?	[✓]		

ACTION: If no for any of the above questions in sections A.1.7.1 through A.1.7.3, write Telephone Record Log and contact laboratory for resubmittals.

		YES	NO	N/A
A.1.8	**Holding Times** - (aqueous and soil samples)			
	(Examine sample traffic reports and digestion/distillation logs.)			
	Mercury analysis (28 days). . . . . exceeded?	___	[✓]	___
	Cyanide distillation (14 days). . . . . exceeded?	___	[✓]	___
	Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___
	NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.			
	ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.			
A.1.8.2	Is pH of aqueous samples for: Metals Analysis >2?	___	[✓]	___
	Cyanides Analysis <12?	___	[✓]	___
	Action: If yes, flag the associated metals and cyanides data as estimated.			
A.1.9	**Form I (Final Data)**			
A.1.9.1	Are all Form I's present and complete?	[✓]	___	___
	ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
A.1.9.2	Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]	___	___
	Are soil sample results for each parameter corrected for percent solids?	[✓]	___	___
	Are all "less than IDL" values properly coded with "U"?	[✓]	___	___

		YES	NO	N/A
	Are the correct concentration qualifiers used with final data?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log, and contact laboratory for corrected data.			
A.1.9.3	Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	___	___
	Was a brief physical description of samples given on Form I's?	[✓]	___	___
	Was the dilution of any sample diluted beyond the requirements of the contract noted on Form I or Form XIV?	___	[✓]	___
	ACTION: If no for any of the above, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.10	**Calibration**			
A.1.10.1	Is record of at least 2 point calibration present for ICP analysis?	[✓]	___	___
	Is record of 5 point calibration present for Hg analysis?	[✓]	___	___
	Is record of 4 point calibration present for:			
	Flame AA?	[___]	___	✓
	Furnace AA?	[✓]	___	___
	Cyanides?	[✓]	___	___
	Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	[✓]	___	___

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

		YES	NO	N/A
A.1.10.2	Is correlation coefficient less than 0.995 for:			
	Mercury Analysis?	___	[✓]	___
	Cyanide Analysis?	___	[✓]	___
	Atomic Absorption Analysis?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

NOTE: The data validator shall calculate the correlation coefficient using concentrations of the standards and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.10.3	In the instance where less than 4 standards are measured in absorbance (or peak area, peak height,etc.) mode, are the remaining standards analyzed in concentration mode immediately after calibration within ±10% of the true values?	[✓]	___	___

ACTION: If no, flag the associated data as estimated if standards are not within ±10% of true values. Do not flag the data as estimated in linear range indicated by good recovery of standard(s).

A.1.11 Form II A (Initial and Continuing Calibration Verification)-

A.1.11.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.11.2	Circle on each Form IIA all percent recoveries that are outside the contract windows. Are all calibration standards (initial and continuing) within control limits:			
	Metals- 90-110%R?	[✓]	___	___
	Hg - 80-120%R?	[✓]	___	___
	Cyanides- 85-115%R?	[✓]	___	___

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ) if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
A.1.11.3 Was continuing calibration performed every 10 samples or every 2 hours?	[✓]	___	___
Was ICV for cyanides distilled?	[___]	✓	___
ACTION: If no for any of the above, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.12 <u>Form II B (CRDL Standards for AA and ICP)</u> -			
A.1.12.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (<u>except Hg</u>)?	[✓]	___	___
Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[___]	✓	___
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]	___	___
ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are: AA Analysis - **True Value ± CRDL; ICP Analysis - **True Value ± 2CRDL; CN Analysis - **True Value ± 0.5 x True Value.			

**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL. Compute the concentration of the missing mid-range standard from the calibration range.

		YES	NO	N/A
A.1.12.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?	[✓]	___	___

ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".

A.1.12.3 Circle on each Form IIB all the percent recoveries that are outside the acceptance windows.

Are CRA and CRI standards within control limits:

Metals	80 - 120%R?	[___]	✓	___

Is mid-range standard within control limits:

Cyanide	80 - 120%R?	[✓]	___	___

ACTION: Flag as estimated all sample results within the affected range if the recovery of the standard is between 50-79%; flag only positive data within the affected range if the recovery is between 121-150%; reject all data within the affected range if the recovery is less than 50%; reject only positive data within the affected range if the recovery is greater than 150%. Qualify 50% of the samples on either side of CRI standard outside the control limits.

Note: Flag or reject the final results only when sample raw data are within the affected ranges and the CRDL standards are outside the acceptance windows.

A.1.13 Form III (Initial and Continuing Calibration Blanks)

A.1.13.1	Present and complete?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[✓]	___	___
	Was an initial calibration blank analyzed?	[✓]	___	___
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the Contract-Problems/ Non-Compliance section of the "Data Assessment Narrative".			
A.1.13.2	Circle on each Form III all calibration blank values that are above CRDL (or 2 x IDL when IDL > CRDL).			
	Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	[✓]	___	___
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) positive sample results when raw sample value is less than or equal to calibration blank value analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank outside the control limits.			
A.1.14	FORM III (Preparation Blank) - (Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.14.1	Was one prep. blank analyzed for:			
	each Sample Delivery Group (SDG)?	[✓]	___	___
	each batch of digested samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) all the associated positive data <10 x IDLs for which prep. blank was not analyzed.			
	NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			

		YES	NO	N/A
A.1.14.2	Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?	___	[✓]	___
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep.blank?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value.			
A.1.14.3	Is concentration of prep. blank value (Form III) less than two times IDL, when IDL is greater than CRDL?	[✓]	___	___
	ACTION: If no, reject (red-line) all positive sample results when sample raw data are less than 10 times the prep. blank value.			
A.1.14.4	Is concentration of prep. blank below the negative CRDL?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated sample results less than 10xCRDL.			
A.1.15	Form IV (ICP Interference Check Sample)			
A.1.15.1	Present and complete?	[✓]	___	___
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all the samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.15.2	Circle all values on each Form IV that are more than ± 20% of true or established mean value.			
	Are all Interference Check Sample results inside the control limits (± 20%)?	[✓]	___	___
	If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			
A.1.16	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.16.1	Present and complete for: each SDG?	[ ]	✓	
	each matrix type?	[ ]	✓	
	each conc. range (i.e. low, med., high)?	[✓]		
	For both AA and ICP when both are used for the same analyte?	[✓]		
	ACTION: If no for any of the above, flag as estimated (J) all the positive data less than four times the spiking levels specified in SOW for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.16.2	Was field blank used for spiked sample?		[✓]	
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
A.1.16.3	Circle on each Form VA all spike recoveries that are outside control limits (75% to 125%).			
	Are all recoveries within control limits?	[ ]	✓	
	If no, is sample concentration greater than or equal to four times spike concentration?	[ ]	✓	

	YES	NO	N/A
ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[ ]	✓	
ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".			
A.1.16.4 Aqueous			
Are any spike recoveries:			
(a) less than 30%?		[✓]	
(b) between 30-74%?	✓	[ ]	
(c) between 126-150%?		[✓]	
(d) greater than 150%?		[✓]	
ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".			
A.1.16.5 Soil/Sediment			
Are any spike recoveries:			
(a) less than 10%?		[✓]	
(b) between 10-74%?	✓	[ ]	
(c) between 126-200%?		[✓]	
(d) greater than 200%?		[✓]	

		YES	NO	N/A
	ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".			
A.1.17	Form VI (Lab Duplicates)			
A.1.17.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any the above, flag as estimated (J) all the data ≥CRDL* for which duplicate sample was not analyzed. **Note**: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated. 2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in ug/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.17.2	Was field blank used for duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag all data ≥CRDL* as estimated (J) for which field blank was used as duplicate.			
A.1.17.3	Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	[___]	✓	___
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[✓]	___	___
	ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".			

Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.
2. If the result of lab duplicate analyzed by GFAA is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria to metals analyzed by GFAA.

A.1.17.4 Aqueous

Circle on each Form VI all values that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[✓]	___
Is any difference** between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

A.1.17.5 Soil/Sediment

Circle on each Form VI all values that are:

RPD > 100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[✓]	___
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[✓]	___

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
	ACTION: If yes, flag the associated data as estimated.			
A.1.18	**Field Duplicates**			
A.1.18.1	Were field duplicates analyzed?	[___]	✓	___

ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.

NOTE: 1. Do not calculate RPD when both values are less than IDL.
2. Flag all associated data only for field duplicate pair.

A.1.18.2 **Aqueous**

Circle all values on self prepared Form VI for field duplicates that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[✓]	___
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.18.3	**Soil/Sediment**			
	Circle all values on self prepared Form VI for field duplicates that are:			
	RPD >100%, or			
	Difference > 2 x CRDL*			
	Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) : >100%?	___	[✓]	___
	Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL): >2x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated.			
A.1.19	**Form VII (Laboratory Control Sample)** (Note: LCS - not required for aqueous Hg and cyanide analyses.)			
A.1.19.1	Was one LCS prepared and analyzed for:			
	each SDG?	[✓]	___	___
	each batch samples digested/distilled?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all the data for which LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

	YES	NO	N/A

A.1.19.2 **Aqueous LCS**

Circle on each Form VII the LCS percent recoveries outside control limits (80 - 120%) except for aqueous Ag and Sb.

Is any LCS recovery:	less than 50%?	___	[✓]	___
	between 50% and 79%?	___	[✓]	___
	between 121% and 150%?	___	[✓]	___
	greater than 150%?	___	[✓]	___

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.19.3 **Solid LCS**

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).
2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

Is LCS "Found" value higher than the control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated positive data as estimated.

Is LCS "Found" value lower than the Control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated data as estimated.

		YES	NO	N/A
A.1.20	**Form IX (ICP Serial Dilution)** -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.20.1	Was Serial Dilution analysis performed for:			
	each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med.)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated all the positive data ≥ 10xIDLs or ≥ CRDL when 10xIDL ≤ CRDL for which Serial Dilution Analysis was not performed.			
A.1.20.2	Was field blank(s) used for Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J). If 10xIDL ≤ CRDL, flag all data ≥ CRDL.			
A.1.20.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.20.4	Circle on each Form IX all percent difference that are outside the control limits for initial concentrations equal to or greater than 10 x IDLs only.			
	Are any % difference values:			
	> 10%?	✓	[___]	___
	≥ 100%?	___	[✓]	___

		YES	NO	N/A
	ACTION: Flag as estimated (J) all the associated sample data ≥ 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which percent difference is greater than 10% but less than 100%. Reject (red-line) all the associated sample results equal to or greater than 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which PD is greater than or equal to 100%.			
	Note: Flag or reject on Form I's only the sample results whose associated raw data are ≥ 10xIDL (or ≥ CRDL when 10xIDL≤ CRDL)			
A.1.21	Furnace Atomic Absorbtion (AA) QC Analysis			
A.1.21.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	___	___
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
A.1.21.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]	___	___
	Was a dilution analyzed for sample with analytical spike recovery less than 40%?	[✓]	___	___
	ACTION: If no for any of the above, flag all the associated data as estimated.			
A.1.21.3	Is *analytical spike recovery outside the control limits (85-115%) for any sample?	✓	[___]	___
	ACTION: If yes, flag as estimated the affected sample results if the recovery is between 10-84%; if the recovery is between 115-200%, flag the associated positive sample results as estimated; reject the associated sample results if the recovery is less than 10%; reject positive sample results if the recovery is greater than 200%.			

*Analytical spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
	NOTE: Reject or flag the data only when the affected sample(s) was not subsequently analyzed by Method of Standard Addition.			
A.1.22	**Form VIII (Method of Standard Addition Results)**			
A.1.22.1	Present?	[✓]		
	If no, is any Form I result coded with "S" or a "+"?		[✓]	
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.22.2	Is coefficient of correlation for MSA less than 0.990 for any sample?		[✓]	
	ACTION: If yes, reject (red-line) the affected data.			
A.1.22.3	Was *MSA required for any sample but not performed?		[✓]	
	Is coefficient of correlation for MSA less than 0.995?		[✓]	
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?		[✓]	
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.22.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-23?	[✓]		
	ACTION: If no, note exception under Contract Problem/ Non-Compliance section of the "Data Assessment Narrative", and prepare a separate list.			

MSA is not required on LCS and prep. blank.

		YES	NO	N/A
A.1.23	**Dissolved/Total or Inorganic/Total Analytes** -			
A.1.23.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	___	[✓]	___
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	___	[✓]	___
	NOTE: 1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration. 2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents. 3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.			
A.1.23.2	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	___	[✓]	___
A.1.23.3	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?	___	[✓]	___
	ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.			
A.1.24	**Form I (Field Blank)** -			
	(Note: Designate "Field Blank" as such on Form I.)			
A.1.24.1	Circle all field blank values on Form I that are greater than CRDL, (or 2 x IDL when IDL > CRDL).			
	Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[✓]	___	___

	YES	NO	N/A
If no, was field blank value already rejected due to other QC criteria?	[✓]	___	___

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value. Reject on Form I's the soil sample results that when converted to ug/L on wet basis are less than or equal to five times the field blank value in ug/L.

A.1.25 Form X, XI, XII (Verification of Instrumental Parameters).

A.1.25.1 Is verification report present for:

	YES	NO	N/A
Instrument Detection Limits (quarterly)?	[✓]	___	___
ICP Interelement Correction Factors (annually)?	[✓]	___	___
ICP Linear Ranges (quarterly)?	[✓]	___	___

ACTION: If no, contact TPO of the lab.

A.1.25.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)

	YES	NO	N/A
A.1.25.2.1 Are IDLs present for: all the analytes?	[✓]	___	___
all the instruments used?	[✓]	___	___
For both AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

	YES	NO	N/A
A.1.25.2.2 Is IDL greater than CRDL for any analyte?	___	[✓]	___
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	[✓]	___	___

	YES	NO	N/A
Action : If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			
A.1.25.3 **Form XI (Linear Ranges)**			
A.1.25.3.1 Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___

ACTION: If no, flag the result reported on Form I as estimated(J).

A.1.26 **Percent Solids of Sediments**

A.1.26.1 Are percent solids in sediment(s): < 50%?	___	[✓]	___
< 10%?	___	[✓]	___

ACTION: If yes, qualify as estimated all the results of a sample that has per cent solids between 10%-50% (i.e. moisture content between 50%-90%). Reject all the results of a sample that has per cent solids less than 10% (i.e. moisture content greater than 90%).

NOTE: Reject or flag(J) only the sample results that were not previously rejected or flaged due to other QC criteria.

Case#	NWS	Site	Naval Weapons Station	Matrix: Soil	✓
SDG#	CLP 640	Lab	Roy F. Weston	Water	✓
Contractor	Roy F. Weston	Reviewer	Heartland ESI	Other	

A.2.1 Validation Flags- The following flags have been applied in red by the data validator and must be considered by the data user.

J- This flag indicates the result qualified as estimated

Red- Line- A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

Fully Usable Data- The results that do not carry "J" or "red-line" are fully usable.

Contractual Qualifiers- The legend of contractual qualifiers applied by the lab on Form I's is found on page B-20 of SOW ILM01.0.

A.2.2 The data assessment is given below and on the attached sheets.

1. The CRDL Standards for Arsenic for waters and Thallium for waters were above the upper control limit. All positive results are qualified as estimated.
2. The CRDL Standard for Lead for soils were below lower control limit. All positive and non-detect results are qualified as estimated.
3. The Matrix Spike recoveries for waters for Beryllium and Lead and for Total

.2.2 (continuation)

soils for Antimony, Arsenic, Lead, Manganese, Selenium and Silver and for short list soils for Zinc were below the lower control limit. All positive and non-detect results are qualified as estimated.

4. The serial dilutions for total soils for Aluminum, Barium, Calcium, Chromium, Iron, Magnesium, Manganese and Vanadium were outside the control limits. All positive results are qualified as estimated.

5. The Post digestion spike recovery for Lead for sample 23-008 was below the lower control limit. All positive and non-detect results are qualified as estimated.

PBH 8/6/92

A.2.3 Contract-Problem/Non-Compliance

The ICV and midrange standards were distilled for Cyanide as required by Protocol. The water sample was not qualified for the QC as reported in CLP 627.

PBH 8/6/92

MMB/ESAT Rviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul D. Hanly Date: 8/6/92
Signature

Verified by: _____ Date: _____

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

of Review: 8/6/92 Date: 8/6/92 Case #: CLP 640

: Naval Weapons Station Lab Name: Roy F. Weston

ewer's Initials: PBH Number of Samples: 15 sample

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
													0	
e AA														
ace AA														
cury														
l														
r														

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

						4					8		12	
e AA														
ace AA		3				3						1	7	
cury														
l		3				7					8	1	19	
r														

:
sterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Checklist

Date: Jan. 1992
Number: HW-2
Revision: 11

Inorganic Analysis

INORGANIC REGIONAL DATA ASSESSMENT

Region II

ASE NO. NWS

SITE Naval Weapon Station

ABORATORY Roy F. Weston

NO. OF SAMPLES/ MATRIX 14 soils 6 water

OG# CLP 640

REVIEWER (IF NOT ESD) Heartland EST

OW# 390

REVIEWER'S NAME Paul B. Hunsberg

PO: ACTION _____ FYI _____

COMPLETION DATE 8/6/92

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CYANIDE
HOLDING TIMES	O	O	O	O
CALIBRATIONS				
BLANKS				
ICS				
LCS				
DUPLICATE ANALYSIS				
MATRIX SPIKE				
MSA				
SERIAL DILUTION				
SAMPLE VERIFICATION				
OTHER QC				
OVERALL ASSESSMENT				

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

TION ITEMS: _____

EAS OF CONCERN: _____

TABLE PERFORMANCE: _____

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

August 7, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Seventeen (17) total metal soil samples and one (1) Matrix Spike and Duplicate pair, seven (7) short list soil samples and one (1) Matrix Spike and Duplicate pair and three (3) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
13-001	920662702
13-002	920662703
13-003	920662704
13-021	920662705
13-101	920662706
13-031	920662707
13-041	920662708
13-051	920662709
13-061	920662710
27-002	920662711
27-003	920662712
27-004	920662713
27-005	920662714
27-006	920662715
27-007	920662716
27-008	920662717
27-081	920662718
27-082	920662719
27-021	920662720
27-022	920662721
27-031	920662722
27-032	920662723
27-041	920662724

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

Navy No.	RFW No.
27-051	920662726
27-052	920662727
01-007	920662729
01-010	920662730
27-042	920662725

Heartland ESI has reviewed the data for the samples listed above TAL Metals using Region II Data Validation Protocol, January 1992 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAL Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 920627**, the analysis of seventeen (17) total metals soil samples and one (1) matrix spike and duplicate pair, seven (7) short list soil samples and one (1) matrix spike and duplicate pair and three (3) water samples and one (1) matrix spike and duplicate pair. Overall, the inorganic data quality was fair. The USEPA CLP analytical protocol was followed as required with the exception of the following problems. The ICV and Midrange Standards for Cyanide were not distilled as required by the Protocol.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standards for soils for Antimony, Selenium and Lead were below the lower control limit. All positive and non-detect results within the associated area are qualified as estimated, "J" or "UJ".

2. The CRDL Standards for soil for Zinc and for water for Arsenic were above the upper control limit. All positive results within the assoicated area are qualified as estimated, "J".

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recoveries for water for Lead and and Silver and for soil for Selenium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

4. The Matrix Spike recoveries for soil for Lead and Silver were above the upper control limit. All positive results are qualified as estimated, "J".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

5. The Serial dilutions for soils for Aluminum, Barium and Iron and for water for Magnesium were outside the control limit. All positive results greater than 10 times the IDL are qualified as estimated,"J".

6. The Serial Dilution for waters for Zinc was greater than 100%. All positive results greater than 10 times the IDL will be rejected.

MSA

7. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Lead	13-001 and 13-003.
Selenium	13-001, 13-003, 13-021, 13-101, 13-031, 13-041, 13-051, 01-007, 01-010, 13-061, 27-021, 27-022, 27-031, 27-032, 27-051 and 27-052.
Thallium	27-021.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All soil samples	Sb, Se, Pb.	+/U	J/UJ	1
All soil samples All water samples	Zn As	+	J	2
All water samples All soil samples	Be and Pb Se	+/U	J/UJ	3
All soil samples	Pb and Ag	+	J	4
All water samples All soil samples	Mg Al, Ba, Fe.	+	J	5
All water samples	Zn	+	R	6
13-001 and 13-003. 13-001, 13-003, 13-021, 13-101, 13-031, 13-041, 13-051, 01-007, 01-010, 13-061, 27-021, 27-022, 27-032, 27-051 and 27-052. 27-021.	Pb Se Tl	+/U	J/UJ	7

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): WATER Lab Sample ID: 920662702

Level (low/med): LOW Date Received: 6/11/92

% 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	407.00			P	
7440-36-0	Antimony	36.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	41.90	B		P	
7440-41-7	Beryllium	1.20	B	N	P	J3
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	7960.00			P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	7.00	U		P	
7440-50-8	Copper	7.00	U		P	
7439-89-6	Iron	86.90	B		P	
7439-92-1	Lead	2.00	U	NW	F	UJ3,7
7439-95-4	Magnesium	1330.00	B		P	
7439-96-5	Manganese	62.00			P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	896.00	U		P	
7782-49-2	Selenium	2.00	U	W	F	UJ7
7440-22-4	Silver	8.00	U		P	
7440-23-5	Sodium	4410.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	11.80	B		P	
7440-66-6	Zinc	30.10			P	
	Cyanide	20.00	U		C	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-002

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): WATER Lab Sample ID: 920662703

Level (low/med): LOW Date Received: 6/11/92

% 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	1350.00			P	
7440-36-0	Antimony	36.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	43.40	B		P	
7440-41-7	Beryllium	1.00	U	N	P	UJ3
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	2360.00	B		P	
7440-47-3	Chromium	9.40	B		P	
7440-48-4	Cobalt	7.00	U		P	
7440-50-8	Copper	7.00	U		P	
7439-89-6	Iron	499.00			P	
7439-92-1	Lead	16.90		NS	F	J3
7439-95-4	Magnesium	2090.00	B		P	
7439-96-5	Manganese	60.50			P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	1050.00	B		P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	8.00	U		P	
7440-23-5	Sodium	3770.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	10.70	B		P	
7440-66-6	Zinc	53.10			P	
	Cyanide	10.00	U		C	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-003

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): WATER Lab Sample ID: 920662704

Level (low/med): LOW Date Received: 6/11/92

% 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	2630.00			P	
7440-36-0	Antimony	36.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	41.50	B		P	
7440-41-7	Beryllium	1.00	U	N	P	UJ3
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	1890.00	B		P	
7440-47-3	Chromium	35.90			P	
7440-48-4	Cobalt	7.00	U		P	
7440-50-8	Copper	7.00	U		P	
7439-89-6	Iron	5750.00			P	
7439-92-1	Lead	13.40	U	NWS	F	UJ3, 7
7439-95-4	Magnesium	2300.00	B		P	
7439-96-5	Manganese	61.60			P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	21.90	B		P	
7440-09-7	Potassium	2380.00	B		P	
7782-49-2	Selenium	2.00	U	W	F	UJ 7
7440-22-4	Silver	8.00	U		P	
7440-23-5	Sodium	4270.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	13.90	B		P	
7440-66-6	Zinc	~~72.70~~			~~P~~	6
	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.

13-021

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662705

Level (low/med): LOW Date Received: 6/11/92

% Solids: 94.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1080.00		E	P	J5
7440-36-0	Antimony	7.33	U		P	UJ1
7440-38-2	Arsenic	.90	B		F	
7440-39-3	Barium	4.90	B		P	
7440-41-7	Beryllium	.29	B		P	
7440-43-9	Cadmium	.81	U		P	
7440-70-2	Calcium	39.70	B		P	
7440-47-3	Chromium	21.70		*	P	
7440-48-4	Cobalt	1.43	U		P	
7440-50-8	Copper	4.20	B	*	P	
7439-89-6	Iron	3850.00		E	P	J5
7439-92-1	Lead	58.00		N	F	J4
7439-95-4	Magnesium	99.80	B		P	
7439-96-5	Manganese	12.40			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.66	U		P	
7440-09-7	Potassium	246.00	B		P	
7782-49-2	Selenium	.41	U	WN	F	UJ1,3,7
7440-22-4	Silver	1.63	U	N	P	
7440-23-5	Sodium	23.80	U		P	
7440-28-0	Thallium	.41	U		F	
7440-62-2	Vanadium	25.30			P	
7440-66-6	Zinc	13.70		*	P	~~J7~~
	Cyanide	1.05	U		C	PBH 8/6/92

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-101

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662706

Level (low/med): LOW Date Received: 6/11/92

% Solids: 97.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1260.00		E	P	J5
7440-36-0	Antimony	7.41	U		P	UJ1
7440-38-2	Arsenic	1.10	B		F	
7440-39-3	Barium	5.30	B		P	
7440-41-7	Beryllium	.33	B		P	
7440-43-9	Cadmium	.82	U		P	
7440-70-2	Calcium	36.40	B		P	
7440-47-3	Chromium	22.00		*	P	
7440-48-4	Cobalt	1.44	U		P	
7440-50-8	Copper	4.40	B	*	P	
7439-89-6	Iron	4110.00		E	P	J5
7439-92-1	Lead	25.70		N	F	J4
7439-95-4	Magnesium	107.00	B		P	
7439-96-5	Manganese	11.80			P	
7439-97-6	Mercury	.83			CV	
7440-02-0	Nickel	3.70	U		P	
7440-09-7	Potassium	211.00	B		P	
7782-49-2	Selenium	.41	U	NW	F	UJ1,3,7
7440-22-4	Silver	1.65	U	N	P	
7440-23-5	Sodium	24.10	U		P	
7440-28-0	Thallium	.41	U		F	
7440-62-2	Vanadium	26.70			P	
7440-66-6	Zinc	14.50		*	P	
	Cyanide	1.03	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-031

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662707

Level (low/med): LOW Date Received: 6/11/92

% Solids: 94.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	512.00		E	P	J5
7440-36-0	Antimony	7.39	U		P	UJ1
7440-38-2	Arsenic	.41	U		F	
7440-39-3	Barium	1.80	B		P	
7440-41-7	Beryllium	.20	U		P	
7440-43-9	Cadmium	.82	U		P	
7440-70-2	Calcium	35.30	B		P	
7440-47-3	Chromium	2.80		*	P	
7440-48-4	Cobalt	1.44	U		P	
7440-50-8	Copper	1.44	U	*	P	
7439-89-6	Iron	2520.00		E	P	J5
7439-92-1	Lead	1.50		N	F	J4
7439-95-4	Magnesium	43.40	B		P	
7439-96-5	Manganese	4.50			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.70	U		P	
7440-09-7	Potassium	184.00	U		P	
7782-49-2	Selenium	.41	U	NW	F	UJ1,3,7
7440-22-4	Silver	1.64	U	N	P	
7440-23-5	Sodium	24.10	B		P	
7440-28-0	Thallium	.41	U		F	
7440-62-2	Vanadium	3.30	B		P	
7440-66-6	Zinc	7.60		*	P	
	Cyanide	1.06	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-041

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662708

Level (low/med): LOW Date Received: 6/11/92

% Solids: 93.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	816.00		E	P	J5
7440-36-0	Antimony	7.68	U		P	UJ1
7440-38-2	Arsenic	.83	B		F	
7440-39-3	Barium	4.60	B		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.85	U		P	
7440-70-2	Calcium	29.10	B		P	
7440-47-3	Chromium	8.80		*	P	
7440-48-4	Cobalt	1.49	U		P	
7440-50-8	Copper	3.50	B	*	P	
7439-89-6	Iron	2920.00		E	P	J5
7439-92-1	Lead	5.60		NS	F	J4
7439-95-4	Magnesium	54.40	B		P	
7439-96-5	Manganese	6.70			P	
7439-97-6	Mercury	.46			CV	
7440-02-0	Nickel	3.84	U		P	
7440-09-7	Potassium	195.00	B		P	
7782-49-2	Selenium	.43	U	NW	F	UJ1,3,7
7440-22-4	Silver	2.60		N	P	J4
7440-23-5	Sodium	25.00	U		P	
7440-28-0	Thallium	.43	U		F	
7440-62-2	Vanadium	9.30	B		P	
7440-66-6	Zinc	10.50		*	P	
	Cyanide	1.07	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-051

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662709

Level (low/med): LOW Date Received: 6/11/92

% Solids: 91.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	519.00		E	P	JJ
7440-36-0	Antimony	7.70	U		P	UJ1
7440-38-2	Arsenic	.68	B		F	
7440-39-3	Barium	1.50	U		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.86	U		P	
7440-70-2	Calcium	17.40	B		P	
7440-47-3	Chromium	10.30		*	P	
7440-48-4	Cobalt	1.50	U		P	
7440-50-8	Copper	1.50	U	*	P	
7439-89-6	Iron	2400.00		E	P	JJ
7439-92-1	Lead	3.80		N	F	J4
7439-95-4	Magnesium	26.70	B		P	
7439-96-5	Manganese	3.60			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.85	U		P	
7440-09-7	Potassium	192.00	U		P	
7782-49-2	Selenium	.43	U	NW	F	UJ1,3,7
7440-22-4	Silver	1.71	U	N	P	
7440-23-5	Sodium	25.00	U		P	
7440-28-0	Thallium	.43	U		F	
7440-62-2	Vanadium	11.50			P	
7440-66-6	Zinc	12.40		*	P	
	Cyanide	1.09	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-061

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662710

Level (low/med): LOW Date Received: 6/11/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1790.00		E	P	J5
7440-36-0	Antimony	7.74	U		P	UJ1
7440-38-2	Arsenic	1.60	B		F	
7440-39-3	Barium	5.30	B		P	
7440-41-7	Beryllium	.47	B		P	
7440-43-9	Cadmium	1.10			P	
7440-70-2	Calcium	121.00	B		P	
7440-47-3	Chromium	44.10		*	P	
7440-48-4	Cobalt	1.51	U		P	
7440-50-8	Copper	6.00		*	P	
7439-89-6	Iron	6980.00		E	P	J5
7439-92-1	Lead	22.60		N	F	J4
7439-95-4	Magnesium	170.00	B		P	
7439-96-5	Manganese	14.80			P	
7439-97-6	Mercury	.36			CV	
7440-02-0	Nickel	3.87	U		P	
7440-09-7	Potassium	545.00	B		P	
7782-49-2	Selenium	.43	U	NW	F	UJ1, 3, 7
7440-22-4	Silver	42.10		N	P	J4
7440-23-5	Sodium	25.20	U		P	
7440-28-0	Thallium	.43	U		F	
7440-62-2	Vanadium	53.90			P	
7440-66-6	Zinc	39.90		*	P	
	Cyanide	1.08	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-002

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662711

Level (low/med): LOW Date Received: 6/11/92

% Solids: 95.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium	311.00		*	P
7440-48-4	Cobalt				NR
7440-50-8	Copper	434.00		*	P
7439-89-6	Iron				NR
7439-92-1	Lead	743.00		NS	F J Y
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	528.00		*	P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-003

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662712

Level (low/med): LOW Date Received: 6/11/92

% Solids: 93.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	785.00		E	P	J5
7440-36-0	Antimony	7.38	U		P	UJ1
7440-38-2	Arsenic	2.50			F	
7440-39-3	Barium	86.10			P	J5
7440-41-7	Beryllium	.23	B		P	
7440-43-9	Cadmium	9.90			P	
7440-70-2	Calcium	270.00	B		P	
7440-47-3	Chromium	71.40		*	P	
7440-48-4	Cobalt	2.50	B		P	
7440-50-8	Copper	167.00		*	P	
7439-89-6	Iron	8280.00		E	P	J5
7439-92-1	Lead	229.00		N	F	J4
7439-95-4	Magnesium	89.20	B		P	
7439-96-5	Manganese	73.50			P	
7439-97-6	Mercury	.15			CV	
7440-02-0	Nickel	8.40			P	
7440-09-7	Potassium	184.00	U		P	
7782-49-2	Selenium	.41	U	N	F	UJ1, 3
7440-22-4	Silver	1.64	U	N	P	
7440-23-5	Sodium	24.00	U		P	
7440-28-0	Thallium	.41	U		F	
7440-62-2	Vanadium	3.10	B		P	
7440-66-6	Zinc	120.00		*	P	
	Cyanide	1.07	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-004

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662713

Level (low/med): LOW Date Received: 6/11/92

% Solids: 90.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium	4.60		*	P
7440-48-4	Cobalt				NR
7440-50-8	Copper	2.40	B	*	P
7439-89-6	Iron				NR
7439-92-1	Lead	2.10		N	F J4
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	7.40		*	P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-005

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662714

Level (low/med): LOW Date Received: 6/11/92

% Solids: 93.6

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium	4.80		*	P
7440-48-4	Cobalt				NR
7440-50-8	Copper	19.90		*	P
7439-89-6	Iron				NR
7439-92-1	Lead	23.10		N	F J4
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	46.40		*	P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-006

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662715

Level (low/med): LOW Date Received: 6/11/92

% Solids: 87.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium	471.00		*	P
7440-48-4	Cobalt				NR
7440-50-8	Copper	325.00		*	P
7439-89-6	Iron				NR
7439-92-1	Lead	786.00		N	F J4
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	840.00		*	P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-007

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662716

Level (low/med): LOW Date Received: 6/11/92

% Solids: 89.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium				NR	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	169.00		*	P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	82.60		*	P	
7439-89-6	Iron				NR	
7439-92-1	Lead	110.00		N	F	J4
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	320.00		*	P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-008

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662717

Level (low/med): LOW Date Received: 6/11/92

% Solids: 91.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium				NR	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	5.10		*	P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	32.30		*	P	
7439-89-6	Iron				NR	
7439-92-1	Lead	15.90		N	F	J4
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	13.60		*	P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-081

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662718

Level (low/med): LOW Date Received: 6/11/92

% Solids: 91.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium				NR	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	4.80		*	P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	29.50		*	P	
7439-89-6	Iron				NR	
7439-92-1	Lead	18.40		N	F	J4
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	41.70		*	P	
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-082

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): WATER Lab Sample ID: 920662719

Level (low/med): LOW Date Received: 6/11/92

% 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				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium	7.00	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper	7.00	U		P
7439-89-6	Iron				NR
7439-92-1	Lead	2.00	U	N	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	6.50	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-021

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662720

Level (low/med): LOW Date Received: 6/11/92

% Solids: 94.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	379.00	B	E	P	J5
7440-36-0	Antimony	74.80	U		P	UJ1
7440-38-2	Arsenic	17.10			F	
7440-39-3	Barium	129.00			P	J5
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	64.40			P	
7440-70-2	Calcium	171.00	B		P	
7440-47-3	Chromium	1620.00		*	P	
7440-48-4	Cobalt	52.40			P	
7440-50-8	Copper	1450.00		*	P	
7439-89-6	Iron	349000.00		E	P	J5
7439-92-1	Lead	787.00		N	F	J4
7439-95-4	Magnesium	466.00	B		P	
7439-96-5	Manganese	2560.00			P	
7439-97-6	Mercury	.41			CV	
7440-02-0	Nickel	377.00			P	
7440-09-7	Potassium	186.00	U		P	
7782-49-2	Selenium	.42	U	WN	F	UJ1, 3, 7
7440-22-4	Silver	32.20		N	P	J4
7440-23-5	Sodium	26.70	B		P	
7440-28-0	Thallium	.42	U	W	F	UJ7.
7440-62-2	Vanadium	10.40	U		P	
7440-66-6	Zinc	774.00		*	P	
	Cyanide	1.58			C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-022

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662721

Level (low/med): LOW Date Received: 6/11/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3050.00		E	P	J5
7440-36-0	Antimony	7.43	U		P	UJ1
7440-38-2	Arsenic	2.40			F	
7440-39-3	Barium	17.30	B		P	J5
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	7.40			P	
7440-70-2	Calcium	256.00	B		P	
7440-47-3	Chromium	15.00		*	P	
7440-48-4	Cobalt	1.44	U		P	
7440-50-8	Copper	11.30		*	P	
7439-89-6	Iron	5740.00		E	P	J5
7439-92-1	Lead	25.60		N	F	J4
7439-95-4	Magnesium	223.00	B		P	
7439-96-5	Manganese	35.10			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.71	U		P	
7440-09-7	Potassium	212.00	B		P	
7782-49-2	Selenium	.43	U	NW	F	UJ1,3,7
7440-22-4	Silver	1.65	U	N	P	
7440-23-5	Sodium	24.10	U		P	
7440-28-0	Thallium	.43	U		F	
7440-62-2	Vanadium	8.90	B		P	
7440-66-6	Zinc	48.30		*	P	
	Cyanide	1.08	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-031

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662722

Level (low/med): LOW Date Received: 6/11/92

% Solids: 94.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2670.00		E	P	J5
7440-36-0	Antimony	7.28	U		P	UJ1
7440-38-2	Arsenic	.98	B		F	
7440-39-3	Barium	16.80	B		P	J5
7440-41-7	Beryllium	.20	U		P	
7440-43-9	Cadmium	1.40			P	
7440-70-2	Calcium	364.00	B		P	
7440-47-3	Chromium	16.70		*	P	
7440-48-4	Cobalt	1.42	U		P	
7440-50-8	Copper	7.40		*	P	
7439-89-6	Iron	4630.00		E	P	J5
7439-92-1	Lead	20.10		N	F	J4
7439-95-4	Magnesium	180.00	B		P	
7439-96-5	Manganese	16.30			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.64	U		P	
7440-09-7	Potassium	181.00	U		P	
7782-49-2	Selenium	.41	U	NW	F	UJ1,3,7
7440-22-4	Silver	1.62	U	N	P	
7440-23-5	Sodium	26.00	B		P	
7440-28-0	Thallium	.41	U		F	
7440-62-2	Vanadium	7.30	B		P	
7440-66-6	Zinc	34.40		*	P	
	Cyanide	1.06	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-032

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662723

Level (low/med): LOW Date Received: 6/11/92

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2880.00		E	P	J5
7440-36-0	Antimony	7.48	U		P	UJ1
7440-38-2	Arsenic	3.10			F	
7440-39-3	Barium	15.90	B		P	J5
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	7.50			P	
7440-70-2	Calcium	266.00	B		P	
7440-47-3	Chromium	71.30		*	P	
7440-48-4	Cobalt	12.20			P	
7440-50-8	Copper	144.00		*	P	
7439-89-6	Iron	72100.00		E	P	J5
7439-92-1	Lead	25.90		NS	F	J4
7439-95-4	Magnesium	239.00	B		P	
7439-96-5	Manganese	557.00			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	48.10			P	
7440-09-7	Potassium	186.00	U		P	
7782-49-2	Selenium	.42	U	NW	F	UJ1,3,7
7440-22-4	Silver	5.20		N	P	J4
7440-23-5	Sodium	26.10	B		P	
7440-28-0	Thallium	.42	U		F	
7440-62-2	Vanadium	1.04	U		P	
7440-66-6	Zinc	71.20		*	P	
	Cyanide	1.08	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-041

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662724

Level (low/med): LOW Date Received: 6/11/92

% Solids: 88.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1010.00		E	P	J5
7440-36-0	Antimony	7.68	U		P	UJ1
7440-38-2	Arsenic	4.50			F	
7440-39-3	Barium	37.40	B		P	J5
7440-41-7	Beryllium	.23	B		P	
7440-43-9	Cadmium	7.50			P	
7440-70-2	Calcium	136.00	B		P	
7440-47-3	Chromium	256.00		*	P	
7440-48-4	Cobalt	3.30	B		P	
7440-50-8	Copper	38.60		*	P	
7439-89-6	Iron	4420.00		E	P	J5
7439-92-1	Lead	559.00		N	F	J4
7439-95-4	Magnesium	99.30	B		P	
7439-96-5	Manganese	27.90			P	
7439-97-6	Mercury	.06	U		CV	
7440-02-0	Nickel	5.90	B		P	
7440-09-7	Potassium	191.00	U		P	
7782-49-2	Selenium	.75	B	N	F	J1,3
7440-22-4	Silver	1.71	U	N	P	
7440-23-5	Sodium	32.60	B		P	
7440-28-0	Thallium	.44	U		F	
7440-62-2	Vanadium	4.90	B		P	
7440-66-6	Zinc	438.00		*	P	
	Cyanide	2.76			C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-042

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662725

Level (low/med): LOW Date Received: 6/11/92

% Solids: 89.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2710.00		E	P	J5
7440-36-0	Antimony	7.89	U		P	UJ1
7440-38-2	Arsenic	1.40	B		F	
7440-39-3	Barium	9.50	B		P	
7440-41-7	Beryllium	.24	B		P	
7440-43-9	Cadmium	4.90			P	
7440-70-2	Calcium	91.30	B		P	
7440-47-3	Chromium	28.50		*	P	
7440-48-4	Cobalt	3.80	B		P	
7440-50-8	Copper	7.20		*	P	
7439-89-6	Iron	5430.00		E	P	J5
7439-92-1	Lead	63.20		N	F	J4
7439-95-4	Magnesium	132.00	B		P	
7439-96-5	Manganese	27.30			P	
7439-97-6	Mercury	.06	U		CV	
7440-02-0	Nickel	3.95	U		P	
7440-09-7	Potassium	196.00	U		P	
7782-49-2	Selenium	.44	U	N	F	UJ1,3
7440-22-4	Silver	1.75	U	N	P	
7440-23-5	Sodium	28.60	B		P	
7440-28-0	Thallium	.44	U		F	
7440-62-2	Vanadium	8.70	B		P	
7440-66-6	Zinc	215.00		*	P	
	Cyanide	1.12	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-051

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662726

Level (low/med): LOW Date Received: 6/11/92

% Solids: 91.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6730.00		E	P	J5
7440-36-0	Antimony	7.51	U		P	UJ1
7440-38-2	Arsenic	.62	B		F	
7440-39-3	Barium	13.50	B		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	2.10			P	
7440-70-2	Calcium	97.80	B		P	
7440-47-3	Chromium	25.80		*	P	
7440-48-4	Cobalt	2.80	B		P	
7440-50-8	Copper	6.10		*	P	
7439-89-6	Iron	9420.00		E	P	J5
7439-92-1	Lead	36.20		N	F	J4
7439-95-4	Magnesium	168.00	B		P	
7439-96-5	Manganese	19.30			P	
7439-97-6	Mercury	.07	B		CV	
7440-02-0	Nickel	3.76	U		P	
7440-09-7	Potassium	228.00	B		P	
7782-49-2	Selenium	.41	U	NW	F	UJ1,3,7
7440-22-4	Silver	1.67	U	N	P	
7440-23-5	Sodium	33.00	B		P	
7440-28-0	Thallium	.41	U		F	
7440-62-2	Vanadium	13.40			P	
7440-66-6	Zinc	223.00		*	P	
	Cyanide	1.09	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-052

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662727

Level (low/med): LOW Date Received: 6/11/92

% Solids: 92.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6990.00		E	P	J5
7440-36-0	Antimony	7.66	U		P	U51
7440-38-2	Arsenic	.73	B		F	
7440-39-3	Barium	12.30	B		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	1.20			P	
7440-70-2	Calcium	91.40	B		P	
7440-47-3	Chromium	20.90		*	P	
7440-48-4	Cobalt	2.30	B		P	
7440-50-8	Copper	4.20	B	*	P	
7439-89-6	Iron	8920.00		E	P	J5
7439-92-1	Lead	21.10		N	F	J4
7439-95-4	Magnesium	182.00	B		P	
7439-96-5	Manganese	17.90			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.83	U		P	
7440-09-7	Potassium	191.00	U		P	
7782-49-2	Selenium	.43	U	NW	F	U51,3,7
7440-22-4	Silver	1.70	U	N	P	
7440-23-5	Sodium	29.90	B		P	
7440-28-0	Thallium	.43	U		F	
7440-62-2	Vanadium	13.60			P	
7440-66-6	Zinc	130.00		*	P	
	Cyanide	1.08	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-007

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662729

Level (low/med): LOW Date Received: 6/11/92

% Solids: 94.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1510.00		E	P	J5
7440-36-0	Antimony	7.50	U		P	UJ1
7440-38-2	Arsenic	2.10	B		F	
7440-39-3	Barium	97.40			P	J5
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.83	U		P	
7440-70-2	Calcium	124.00	B		P	
7440-47-3	Chromium	44.20		*	P	
7440-48-4	Cobalt	1.46	U		P	
7440-50-8	Copper	72.80		*	P	
7439-89-6	Iron	7820.00		E	P	J5
7439-92-1	Lead	74.90		N	F	J4
7439-95-4	Magnesium	183.00	B		P	
7439-96-5	Manganese	23.10			P	
7439-97-6	Mercury	1.93			CV	
7440-02-0	Nickel	3.75	U		P	
7440-09-7	Potassium	385.00	B		P	
7782-49-2	Selenium	.42	U	NW	F	UJ1,3,7
7440-22-4	Silver	5.30		N	P	J4
7440-23-5	Sodium	29.20	B		P	
7440-28-0	Thallium	.42	U		F	
7440-62-2	Vanadium	17.70			P	
7440-66-6	Zinc	110.00		*	P	
	Cyanide	1.06	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-010

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix (soil/water): SOIL Lab Sample ID: 920662730

Level (low/med): LOW Date Received: 6/11/92

% Solids: 92.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1830.00		E	P	J5
7440-36-0	Antimony	7.64	U		P	UJ1
7440-38-2	Arsenic	.81	B		F	
7440-39-3	Barium	19.30	B		P	J5
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.85	U		P	
7440-70-2	Calcium	65.60	B		P	
7440-47-3	Chromium	50.20		*	P	
7440-48-4	Cobalt	1.48	U		P	
7440-50-8	Copper	6.90		*	P	
7439-89-6	Iron	8680.00		E	P	J5
7439-92-1	Lead	15.20		N	F	J4
7439-95-4	Magnesium	288.00	B		P	
7439-96-5	Manganese	7.00			P	
7439-97-6	Mercury	.09	B		CV	
7440-02-0	Nickel	3.82	U		P	
7440-09-7	Potassium	489.00	B		P	
7782-49-2	Selenium	.43	U	NW	F	UJ1,3,7
7440-22-4	Silver	6.80		N	P	J4
7440-23-5	Sodium	27.20	B		P	
7440-28-0	Thallium	.43	U		F	
7440-62-2	Vanadium	20.00			P	
7440-66-6	Zinc	23.50		*	P	
	Cyanide	1.09	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

13-001S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide	75-125	87.4430		20.0000	U	100.00	87.4		C

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

13-003S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	4527.6990		2628.5000		2000.00	95.0		P
Antimony	75-125	496.0000		36.0000	U	500.00	99.2		P
Arsenic	75-125	35.5000		2.0000	U	40.00	88.8		F
Barium	75-125	1865.4000		41.5000	B	2000.00	91.2		P
Beryllium	75-125	36.5000		1.0000	U	50.00	73.0	N	P
Cadmium	75-125	44.0000		4.0000	U	50.00	88.0		P
Calcium									NR
Chromium	75-125	225.0000		35.9000		200.00	94.6		P
Cobalt	75-125	469.3000		6.4000	U	500.00	93.7		P
Copper	75-125	233.4000		5.8000	U	250.00	93.4		P
Iron	75-125	6656.5000		5750.6020		1000.00	90.6		P
Lead	75-125	24.5000		13.0000		20.00	57.5	N	F
Magnesium									NR
Manganese	75-125	521.0000		61.6000		500.00	91.9		P
Mercury	75-125	1.0330		.1000	U	1.00	103.3		CV
Nickel	75-125	479.8000		21.9000	B	500.00	91.6		P
Potassium									NR
Selenium	75-125	9.6000		2.0000	U	10.00	96.0		F
Silver	75-125	47.5000		8.0000	U	50.00	95.0		P
Sodium									NR
Thallium	75-125	50.0000		2.0000	U	50.00	100.0		F
Vanadium	75-125	487.1001		13.9000	B	500.00	94.6		P
Zinc	75-125	523.8999		72.7000		500.00	90.2		P
Cyanide									NR

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

13-041S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 93.7

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	97.0000		7.6824	U	106.70	90.9		P
Arsenic	75-125	7.6000		.8300	B	8.50	79.6		F
Barium	75-125	386.8000		4.6000	B	426.80	89.5		P
Beryllium	75-125	8.5000		.2134	U	10.70	79.6		P
Cadmium	75-125	9.5000		.8536	U	10.70	88.8		P
Calcium									NR
Chromium	75-125	50.4000		8.8000		42.70	97.4		P
Cobalt	75-125	95.4000		1.4938	U	106.70	89.4		P
Copper	75-125	53.3000		3.5000	B	53.40	93.3		P
Iron									NR
Lead	75-125	12.6000		5.6000		4.30	162.8	N	F
Magnesium									NR
Manganese	75-125	102.2000		6.7000		106.70	89.5		P
Mercury	75-125	1.0230		.4560		.53	106.3		CV
Nickel	75-125	92.7000		3.8412	U	106.70	86.9		P
Potassium									NR
Selenium	75-125	.9600	B	.4268	U	2.10	45.0	N	F
Silver	75-125	17.8000		2.6000		10.70	142.1	N	P
Sodium									NR
Thallium	75-125	9.8000		.4268	U	10.70	91.4		F
Vanadium	75-125	109.4000		9.3000	B	106.70	93.8		P
Zinc	75-125	105.3000		10.5000		106.70	88.9		P
Cyanide	75-125	5.1230		1.0680	U	5.34	95.0		C

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

27-002S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 95.3

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium	75-125	376.7000		310.6001		42.00	157.6		P
Cobalt									NR
Copper	75-125	484.6001		433.8999		52.50	96.7		P
Iron									NR
Lead	75-125	944.6001		742.7000		4.19	4817.4		F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc	75-125	642.0000		528.3999		105.00	108.3		P
Cyanide									NR

Comments:

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

13-003A

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

Matrix: Level (low/med):

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium	75-125	12.50		1.00	U	10.0	125.0		P
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

FORM V (Part 2) - IN

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

13-001D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

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

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

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead								NR
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc								NR
Cyanide		20.0000	U	20.0000	U			C

FORM VI - IN

03/90

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

13-003D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

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

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

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		2628.5000		2797.9000		6.2		P
Antimony		36.0000	U	36.0000	U			P
Arsenic		2.0000	U	2.0000	U			F
Barium		41.5000	B	42.1000	B	1.4		P
Beryllium		1.0000	U	1.2000	B	200.0		P
Cadmium		4.0000	U	4.0000	U			P
Calcium		1885.6000	B	2164.8000	B	13.8		P
Chromium	10.0	35.9000		40.3000		11.5		P
Cobalt		7.0000	U	7.0000	U			P
Copper		7.0000	U	7.0000	U			P
Iron		5750.6020		5994.3010		4.1		P
Lead	3.0	2.0000	U	11.0000		0.0		F
Magnesium		2302.4000	B	2768.9000	B	18.4		P
Manganese	15.0	61.6000		62.2000		1.0		P
Mercury		.1000	U	.1250	B	200.0		CV
Nickel		21.9000	B	18.0000	U	200.0		P
Potassium		2379.9000	B	2151.0000	B	10.1		P
Selenium		2.0000	U	2.0000	U			F
Silver		8.0000	U	8.0000	U			P
Sodium		4271.8980	B	4192.8010	B	1.9		P
Thallium		2.0000	U	2.0000	U			F
Vanadium		13.9000	B	15.5000	B	10.9		P
Zinc	20.0	72.7000		52.8000		31.7		P
Cyanide								NR

FORM VI - IN

03/90

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

13-041D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

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

% Solids for Sample: 93.7 % Solids for Duplicate: 93.7

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		815.8999		837.8000		2.6		P
Antimony		7.6824	U	7.6824	U			P
Arsenic		.8300	B	.8700	B	5.0		F
Barium		4.6000	B	6.2000	B	29.7		P
Beryllium		.2134	U	.2134	U			P
Cadmium		.8536	U	.8536	U			P
Calcium		29.1000	B	59.2000	B	68.2		P
Chromium	2.1	8.8000		8.3000		6.7		P
Cobalt		1.4938	U	1.4938	U			P
Copper		3.5000	B	3.0000	B	15.6		P
Iron		2918.6000		3135.3000		7.2		P
Lead		5.6000		8.1000		0.0		F
Magnesium		54.4000	B	51.8000	B	4.9		P
Manganese	3.2	6.7000		6.9000		3.5		P
Mercury	.1	.4560		.2220		69.2		CV
Nickel		3.8412	U	3.8412	U			P
Potassium		194.7000	B	191.2064	U	200.0		P
Selenium		.4268	U	.4268	U			F
Silver	2.1	2.6000		2.4000		6.8		P
Sodium		24.9678	U	24.9678	U			P
Thallium		.4268	U	.4268	U			F
Vanadium		9.3000	B	9.1000	B	2.3		P
Zinc	4.3	10.5000		10.0000		4.6		P
Cyanide		5.2210	U	1.0680	U			C

FORM VI - IN

03/90

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

27-002D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP627

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

% Solids for Sample: 95.3 % Solids for Duplicate: 95.3

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium		310.6001		501.0000		46.9	*	P
Cobalt								NR
Copper		433.8999		790.5000		58.3	*	P
Iron								NR
Lead		742.7000		710.0000		4.5		F
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc		528.3999		713.2000		29.8	*	P
Cyanide								NR

FORM VI - IN

03/90

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present?	[ ]		✓
Legible?	[ ]		✓
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

A.1.6	Form I to IX	Yes	No	N/A
A.1.6.1	Are all the Form I through Form IX labeled with:			
	Laboratory name?	[✓]	___	___
	Case/SAS number?	[✓]	___	___
	EPA sample No.?	[✓]	___	___
	SDG No.?	[✓]	___	___
	Contract No.?	[✓]	___	___
	Correct units?	[✓]	___	___
	Matrix?	[✓]	___	___

ACTION: If no for any of the above, note under Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.6.2	Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
	(NOTE: Check all forms against raw data.)			
	(a) all analytes analyzed by ICP?	[✓]	___	___
	(b) all analytes analyzed by GFAA?	[✓]	___	___
	(c) all analytes analyzed by AA Flame?	[ ]	___	✓
	(d) Mercury?	[✓]	___	___
	(e) Cyanide?	[✓]	___	___

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.1: Data Assessment - Contract Compliance (Total Review)

Date: Jan. 1992
Number: HW-2
Revision: 11

		YES	NO	N/A
A.1.7	Raw Data			
A.1.7.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]	___	___
	Digestion Log for furnace AA Form XIII present?	[✓]	___	___
	Distillation Log for mercury Form XIII present?	[✓]	___	___
	Distillation Log for cyanides Form XIII present?	[✓]	___	___
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]	___	___
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[✓]	___	___
	Are preparation dates present on sample preparation logs/bench sheets?	[✓]	___	___
A.1.7.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	___	___
A.1.7.3	Are all raw data to support all sample analyses and QC operations present?	[✓]	___	___
	Legible?	[✓]	___	___
	Properly Labeled?	[✓]	___	___

ACTION: If no for any of the above questions in sections A.1.7.1 through A.1.7.3, write Telephone Record Log and contact laboratory for resubmittals.

		YES	NO	N/A
A.1.8	**Holding Times** - (aqueous and soil samples)			
	(Examine sample traffic reports and digestion/distillation logs.)			
	Mercury analysis (28 days). . . . . exceeded?	___	[✓]	___
	Cyanide distillation (14 days). . . . . exceeded?	___	[✓]	___
	Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___
	NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.			
	ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.			
A.1.8.2	Is pH of aqueous samples for:			
	Metals Analysis >2?	___	[✓]	___
	Cyanides Analysis <12?	___	[✓]	___
	Action: If yes, flag the associated metals and cyanides data as estimated.			
A.1.9	Form I (Final Data)			
A.1.9.1	Are all Form I's present and complete?	[✓]	___	___
	ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
A.1.9.2	Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]	___	___
	Are soil sample results for each parameter corrected for percent solids?	[✓]	___	___
	Are all "less than IDL" values properly coded with "U"?	[✓]	___	___

		YES	NO	N/A
	Are the correct concentration qualifiers used with final data?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log, and contact laboratory for corrected data.			
A.1.9.3	Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	___	___
	Was a brief physical description of samples given on Form I's?	[✓]	___	___
	Was the dilution of any sample diluted beyond the requirements of the contract noted on Form I or Form XIV?	___	[✓]	___
	ACTION: If no for any of the above, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.10	**Calibration**			
A.1.10.1	Is record of at least 2 point calibration present for ICP analysis?	[✓]	___	___
	Is record of 5 point calibration present for Hg analysis?	[✓]	___	___
	Is record of 4 point calibration present for:			
	Flame AA?	[___]	___	✓
	Furnace AA?	[✓]	___	___
	Cyanides?	[✓]	___	___
	Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	[✓]	___	___

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

		YES	NO	N/A
A.1.10.2	Is correlation coefficient less than 0.995 for:			
	Mercury Analysis?	___	[✓]	___
	Cyanide Analysis?	___	[✓]	___
	Atomic Absorption Analysis?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

NOTE: The data validator shall calculate the correlation coefficient using concentrations of the standards and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.10.3	In the instance where less than 4 standards are measured in absorbance (or peak area, peak height,etc.) mode, are the remaining standards analyzed in concentration mode immediately after calibration within ±10% of the true values?	[✓]	___	___

ACTION: If no, flag the associated data as estimated if standards are not within ±10% of true values. Do not flag the data as estimated in linear range indicated by good recovery of standard(s).

A.1.11 Form II A (Initial and Continuing Calibration Verification)-

A.1.11.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.11.2	Circle on each Form IIA all percent recoveries that are outside the contract windows. Are all calibration standards (initial and continuing) within control limits:			
	Metals- 90-110%R?	[✓]	___	___
	Hg - 80-120%R?	[✓]	___	___
	Cyanides- 85-115%R?	[✓]	___	___

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ) if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
A.1.11.3 Was continuing calibration performed every 10 samples or every 2 hours?	[✓]	___	___
Was ICV for cyanides distilled?	[___]	✓	___

ACTION: If no for any of the above, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.12 Form II B (CRDL Standards for AA and ICP) -

	YES	NO	N/A
A.1.12.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?	[✓]	___	___
Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[___]	✓	✗ PBH
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]	___	___ 8/6/92

ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are:
AA Analysis - **True Value ± CRDL
ICP Analysis - **True Value ± 2CRDL
CN Analysis - **True Value ± 0.5 x True Value.

**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL. Compute the concentration of the missing mid-range standard from the calibration range.

		YES	NO	N/A
A.1.12.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?	[✓]	___	___
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.12.3	Circle on each Form IIB all the percent recoveries that are outside the acceptance windows.			
	Are CRA and CRI standards within control limits:			
	Metals 80 - 120%R?	[___]	✓	___
	Is mid-range standard within control limits:			
	Cyanide 80 - 120%R?	[✓]	___	___
	ACTION: Flag as estimated all sample results within the affected range if the recovery of the standard is between 50-79%; flag only positive data within the affected range if the recovery is between 121-150%; reject all data within the affected range if the recovery is less than 50%; reject only positive data within the affected range if the recovery is greater than 150%. Qualify 50% of the samples on either side of CRI standard outside the control limits.			
	Note: Flag or reject the final results only when sample raw data are within the affected ranges and the CRDL standards are outside the acceptance windows.			
A.1.13	Form III (Initial and Continuing Calibration Blanks)			
A.1.13.1	Present and complete?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[✓]	___	___
	Was an initial calibration blank analyzed?	[✓]	___	___
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the Contract-Problems/ Non-Compliance section of the "Data Assessment Narrative".			
A.1.13.2	Circle on each Form III all calibration blank values that are above CRDL (or 2 x IDL when IDL > CRDL).			
	Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	[✓]	___	___
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) positive sample results when raw sample value is less than or equal to calibration blank value analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank outside the control limits.			
A.1.14	FORM III (Preparation Blank) - (Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.14.1	Was one prep. blank analyzed for:			
	each Sample Delivery Group (SDG)?	[✓]	___	___
	each batch of digested samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) all the associated positive data <10 x IDLs for which prep. blank was not analyzed.			
	NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			

		YES	NO	N/A
A.1.14.2	Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?	___	[✓]	___
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep.blank?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value.			
A.1.14.3	Is concentration of prep. blank value (Form III) less than two times IDL, when IDL is greater than CRDL?	[✓]	___	___
	ACTION: If no, reject (red-line) all positive sample results when sample raw data are less than 10 times the prep. blank value.			
A.1.14.4	Is concentration of prep. blank below the negative CRDL?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated sample results less than 10xCRDL.			
A.1.15	Form IV (ICP Interference Check Sample)			
A.1.15.1	Present and complete?	[✓]	___	___
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all the samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.15.2	Circle all values on each Form IV that are more than ± 20% of true or established mean value.			
	Are all Interference Check Sample results inside the control limits (± 20%)?	[✓]	___	___
	If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			
A.1.16	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.16.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each conc. range (i.e. low, med., high)?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) all the positive data less than four times the spiking levels specified in SOW for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.16.2	Was field blank used for spiked sample?	___	[✓]	___
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
A.1.16.3	Circle on each Form VA all spike recoveries that are outside control limits (75% to 125%).			
	Are all recoveries within control limits?	[___]	✓	___
	If no, is sample concentration greater than or equal to four times spike concentration?	[✗]	✓	___

PBH 8/6/92

	YES	NO	N/A
ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[✓]	___	___
ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".			
A.1.16.4 Aqueous Are any spike recoveries:			
(a) less than 30%?	___	[✓]	___
(b) between 30-74%?	✓	[___]	___
(c) between 126-150%?	___	[✓]	___
(d) greater than 150%?	___	[✓]	___
ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".			
A.1.16.5 Soil/Sediment Are any spike recoveries:			
(a) less than 10%?	___	[✓]	___
(b) between 10-74%?	✓	[___]	___
(c) between 126-200%?	✓	[___]	___
(d) greater than 200%?	___	[✓]	___

		YES	NO	N/A
	ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".			
A.1.17	Form VI (Lab Duplicates)			
A.1.17.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any the above, flag as estimated (J) all the data ≥CRDL* for which duplicate sample was not analyzed.			
	Note: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated.			
	2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in ug/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.17.2	Was field blank used for duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag all data ≥CRDL* as estimated (J) for which field blank was used as duplicate.			
A.1.17.3	Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	[___]	✓	___
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[✓]	___	___
	ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".			

* Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.
2. If the result of lab duplicate analyzed by GFAA is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria to metals analyzed by GFAA.

A.1.17.4 Aqueous

Circle on each Form VI all values that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[✓]	___
Is any difference** between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

A.1.17.5 Soil/Sediment

Circle on each Form VI all values that are:

RPD > 100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[✓]	___
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[✓]	___

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
	ACTION: If yes, flag the associated data as estimated.			
A.1.18	**Field Duplicates**			
A.1.18.1	Were field duplicates analyzed?	[ ]	✓	

ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.

NOTE: 1. Do not calculate RPD when both values are less than IDL.
2. Flag all associated data only for field duplicate pair.

A.1.18.2 **Aqueous**

Circle all values on self prepared Form VI for field duplicates that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?		[✓]	
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?		[✓]	

ACTION: If yes, flag the associated data as estimated.

* Substitute IDL for CRDL when IDL > CRDL.
Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
.1.18.3	**Soil/Sediment**			
	Circle all values on self prepared Form VI for field duplicates that are:			
	RPD >100%, or			
	Difference > 2 x CRDL*			
	Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) : >100%?	___	[✓]	___
	Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL): >2x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated.			
.1.19	**Form VII (Laboratory Control Sample)** (Note: LCS - not required for aqueous Hg and cyanide analyses.)			
.1.19.1	Was one LCS prepared and analyzed for:			
	each SDG?	[✓]	___	___
	each batch samples digested/distilled?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all the data for which LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

	YES	NO	N/A

A.1.19.2 **Aqueous LCS**

Circle on each Form VII the LCS percent recoveries outside control limits (80 - 120%) except for aqueous Ag and Sb.

Is any LCS recovery:				
less than 50%?	___	[✓]	___
between 50% and 79%?	___	[✓]	___
between 121% and 150%?	___	[✓]	___
greater than 150%?	___	[✓]	___

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.19.3 **Solid LCS**

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).
2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

Is LCS "Found" value higher than the control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated positive data as estimated.

Is LCS "Found" value lower than the Control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated data as estimated.

		YES	NO	N/A
.1.20	**Form IX (ICP Serial Dilution)** -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
.1.20.1	Was Serial Dilution analysis performed for:			
	each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med.)?	[___]	___	___
	ACTION: If no for any of the above, flag as estimated all the positive data ≥ 10xIDLs or ≥ CRDL when 10xIDL ≤ CRDL for which Serial Dilution Analysis was not performed.			
1.2[illegible]2	Was field blank(s) used for Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J). If 10xIDL ≤ CRDL, flag all data ≥ CRDL.			
1.20.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
1.20.4	Circle on each Form IX all percent difference that are outside the control limits for initial concentrations equal to or greater than 10 x IDLs only.			
	Are any % difference values:			
	> 10%?	✓	[___]	___
	≥ 100%?	✓	[___]	___

		YES	NO	N/A
	ACTION: Flag as estimated (J) all the associated sample data ≥ 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which percent difference is greater than 10% but less than 100%. Reject (red-line) all the associated sample results equal to or greater than 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which PD is greater than or equal to 100%.			
	Note: Flag or reject on Form I's only the sample results whose associated raw data are ≥ 10xIDL (or ≥ CRDL when 10xIDL≤ CRDL)			
..1.21	Furnace Atomic Absorbtion (AA) QC Analysis			
.1.21.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	___	___
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
.1.21.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]	___	___
	Was a dilution analyzed for sample with analytical spike recovery less than 40%?	[✓]	___	___
	ACTION: If no for any of the above, flag all the associated data as estimated.			
.1.21.3	Is *analytical spike recovery outside the control limits (85-115%) for any sample?	✓	[___]	___
	ACTION: If yes, flag as estimated the affected sample results if the recovery is between 10-84%; if the recovery is between 115-200%, flag the associated positive sample results as estimated; reject the associated sample results if the recovery is less than 10%; reject positive sample results if the recovery is greater than 200%.			

*Analytical spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
	NOTE: Reject or flag the data only when the affected sample(s) was not subsequently analyzed by Method of Standard Addition.			
A.1.22	**Form VIII (Method of Standard Addition Results)**			
A.1.22.1	Present?	[✓]		
	If no, is any Form I result coded with "S" or a "+"?		[✓]	
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.22.2	Is coefficient of correlation for MSA less than 0.990 for any sample?		[✓]	
	ACTION: If yes, reject (red-line) the affected data.			
A.1.22.3	Was *MSA required for any sample but not performed?		[✓]	
	Is coefficient of correlation for MSA less than 0.995?		[✓]	
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?		[✓]	
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.22.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-23?	[✓]		
	ACTION: If no, note exception under Contract Problem/ Non-Compliance section of the "Data Assessment Narrative", and prepare a separate list.			

* MSA is not required on LCS and prep. blank.

		YES	NO	N/A
..1.23	**Dissolved/Total or Inorganic/Total Analytes** -			
..1.23.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	___	[✓]	___
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	___	[✓]	___
	NOTE: 1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration. 2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents. 3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.			
..1.23.2	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	___	[✓]	___
..1.23.3	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?	___	[✓]	___
	ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.			
..1.24	**Form I (Field Blank)** -			
	(Note: Designate "Field Blank" as such on Form I.)			
.1.24.1	Circle all field blank values on Form I that are greater than CRDL, (or 2 x IDL when IDL > CRDL).			
	Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[✓]	___	___

	YES	NO	N/A
If no, was field blank value already rejected due to other QC criteria?	[✓]	___	___

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value. Reject on Form I's the soil sample results that when converted to ug/L on wet basis are less than or equal to five times the field blank value in ug/L.

A.1.25 Form X, XI, XII (Verification of Instrumental Parameters).

A.1.25.1 Is verification report present for:

	YES	NO	N/A
Instrument Detection Limits (quarterly)?	[✓]	___	___
ICP Interelement Correction Factors (annually)?	[✓]	___	___
ICP Linear Ranges (quarterly)?	[✓]	___	___

ACTION: If no, contact TPO of the lab.

A.1.25.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)

	YES	NO	N/A
A.1.25.2.1 Are IDLs present for: all the analytes?	[✓]	___	___
all the instruments used?	[✓]	___	___
For both AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

	YES	NO	N/A
A.1.25.2.2 Is IDL greater than CRDL for any analyte?	___	[✓]	___
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	[✓]	___	___

	YES	NO	N/A
Action : If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			
A.1.25.3 **Form XI (Linear Ranges)**			
A.1.25.3.1 Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___

ACTION: If no, flag the result reported on Form I as estimated(J).

A.1.26 **Percent Solids of Sediments**

A.1.26.1 Are percent solids in sediment(s): < 50%?	___	[✓]	___
< 10%?	___	[✓]	___

ACTION: If yes, qualify as estimated all the results of a sample that has per cent solids between 10%-50% (i.e. moisture content between 50%-90%). Reject all the results of a sample that has per cent solids less than 10% (i.e. moisture content greater than 90%).

NOTE: Reject or flag(J) only the sample results that were not previously rejected or flaged due to other QC criteria.

'ase#	NWS	Site	Naval Weapons Stati	Matrix: Soil	✓
DG#	CLP 627	Lab	Roy F. Weston	Water	✓
ontractor	Roy F. Weston	Reviewer	Heartland EST	Other	

.2.1 Validation Flags- The following flags have been applied in red by the data validator and must be considered by the data user.

J- This flag indicates the result qualified as estimated

Red- Line- A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

Fully Usable Data- The results that do not carry "J" or "red-line" are fully usable.

Contractual Qualifiers- The legend of contractual qualifiers applied by the lab on Form I's is found on page B-20 of SOW ILM01.0.

.2.2 The data assessment is given below and on the attached sheets.

1. The CRDL Standards for Antimony and Selenium and Lead were below the lower control limit. All associated data will be qualified as estimated.
2. The CRDL Standards for Zinc for soils and Arsenic for waters were above the upper control limit. All associated data will be qualified as estimated.
3. The Matrix Spike recoveries for water for Beryllium and Lead and for soils for Selenium were below the lower control limit. All

..2.2 (continuation)

positive and non-detect results are qualified as estimated.

4. The Matrix Spike Recoveries for Soils for Lead and Silver were above the upper control limit. All positive results are qualified as estimated.

5. The Serial Dilutions for water for Magnesium and for soil for Aluminum, Barium and Iron were outside of the control limit. All positive results are qualified as estimated.

6. The Serial Dilution for Zinc was greater than 100%. All positive results are rejected.

7. The Post Digestion spiking for the following samples were below the control limit. All positive and non-detect results are qualified as estimated. Lead - 13-001 and 13-003. Selenium - 13-001, 13-003, 13-021, 13-101, 13-031, 13-041, 13-051, 01-007, 01-010, 13-061, 27-021, 27-022, 27-031, 27-032, 27-051, 27-052. Thallium - 27-021.

PDH 8/7/92

A.2.3 Contract-Problem/Non-Compliance

The ICV and Midrange standards for Cyanide were not distilled as required by Protocol.

PBH 8/6/92

MMB/ESAT Rviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hanby Date: 8/6/92
Signature

Verified by: _____ Date: _____

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

of Review: 8/6/92 Date: 8/6/92 Case #: NWS

: Naval Weapons Station Lab Name: Roy F Weston

ewer's Initials: PBH Number of Samples: 15

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
											1		1	
ne AA														
nace AA														
cury														
al											1		1	
er														

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

		2				2					4		8	
ne AA														
nace AA		2				2						2	6	
cury														
al		4				4					4	2	14	
er														

e:
sterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Checklist

Date: Jan. 1992
Number: HW-2
Revision: 11

Inorganic Analysis

INORGANIC REGIONAL DATA ASSESSMENT

Region II

ASE NO. NW5

SITE Naval Weapons Station

ABORATORY Roy F. Weston

NO. OF SAMPLES/ MATRIX 3 waters 12 soils

DG# CLP 627

REVIEWER (IF NOT ESD) Heartland EST

OW# 390

REVIEWER'S NAME Paul B. Humburg

PO: ACTION _____ FYI _____

COMPLETION DATE 8/6/92

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CYANIDE
HOLDING TIMES	O	O	O	O
CALIBRATIONS	↓	↓	↓	↓
BLANKS	↓	↓	↓	↓
ICS	↓	↓	↓	↓
LCS	↓	↓	↓	↓
DUPLICATE ANALYSIS	↓	↓	↓	↓
MATRIX SPIKE	↓	↓	↓	↓
MSA		↓	↓	↓
SERIAL DILUTION	Z	↓	↓	↓
SAMPLE VERIFICATION	O	↓	↓	↓
OTHER QC	↓	↓	↓	↓
OVERALL ASSESSMENT	↓	↓	↓	↓

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

CTION ITEMS: _____

REAS OF CONCERN: _____

OTABLE PERFORMANCE: _____

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

August 7, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Nine (9) total metal soil samples and one (1) water sample were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-001	920661001
01-004	920661004
01-006	920661006
01-009	920661008
01-901	920661010
01-012	920661011
01-014	920661013
01-151	920661014
01-152	920661016
01-007	920661017

Heartland ESI has reviewed the data for the samples listed above TAL Metals using Region II Data Validation Protocol, January 1992 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAL Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 920610**, the analysis of nine (9) total metals soil samples and one (1) water sample. Overall, the inorganic data quality was fair. The USEPA CLP analytical protocol was followed as required with the exception of the following problems. The ICV and Midrange Standards for Cyanide were not distilled as required by the Protocol. The QC for the water sample and soil samples were found in another SDG, but the laboratory failed to flag based on this QC.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standards for Arsenic for waters and Lead for soils were above the upper control limit. All positive results within the controlled area are qualified as estimated, "J".

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

2. The Matrix Spike recoveries for Chromiumand Zinc for soils were below 10%. All data is rejected.

3. The Matrix Spike recoveries for waters for Beryllium and Lead and soils for Cadmium, Copper, Selenium and Silver were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

4. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Selenium	01-004.

5. The following analytes exhibited high recovery during the GFAA spiking procedures. All positive data is qualified as estimated, "J".

Analyte	Samples
Thallium	01-001, 01-004, 01-006, 01-009, 01-901, 01-012, 01-014, 01-151 and 01-007.

6. The MSAs for Sample 01-151 for Lead were below .990. All data is rejected.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples All soil samples	As Pb	+	J	1
All soil samples	Cr and Zn.	+/U	R	2
All soil samples All water samples	Cd, Cu, Se and Ag. Be and Pb	+/U	J/UJ	3
01-004	Se	+/U	J/UJ	4
01-001, 01-004, 01-006, 01-009, 01-901, 01-012, 01-014, 01-151 and 01-007.	Tl	+	J	5
01-151	Pb	+/U	R	6

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661001

Level (low/med): LOW Date Received: 6/09/92

% Solids: 96.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2590.00			P	
7440-36-0	Antimony	7.39	U		P	
7440-38-2	Arsenic	2.80			F	
7440-39-3	Barium	132.00			P	
7440-41-7	Beryllium	.45	B		P	
7440-43-9	Cadmium	2.20			P	J3
7440-70-2	Calcium	54.90	B		P	
7440-47-3	Chromium	~~56.00~~			~~P~~	2
7440-48-4	Cobalt	3.10	B		P	
7440-50-8	Copper	73.50			P	J3
7439-89-6	Iron	11100.00			P	
7439-92-1	Lead	95.60			F	
7439-95-4	Magnesium	299.00	B		P	
7439-96-5	Manganese	34.80			P	
7439-97-6	Mercury	.11			CV	
7440-02-0	Nickel	3.70	U		P	
7440-09-7	Potassium	750.00	B		P	
7782-49-2	Selenium	.42	U		F	UJ3
7440-22-4	Silver	4.50			P	J3
7440-23-5	Sodium	26.30	B		P	
7440-28-0	Thallium	.42	U	W	F	
7440-62-2	Vanadium	27.20			P	
7440-66-6	Zinc	~~71.50~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-004

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661004

Level (low/med): LOW Date Received: 6/09/92

% Solids: 96.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1210.00			P	
7440-36-0	Antimony	7.43	U		P	
7440-38-2	Arsenic	1.90	B		F	
7440-39-3	Barium	11.50	B		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.82	U		P	UJ3
7440-70-2	Calcium	278.00	B		P	
7440-47-3	Chromium	~~25.40~~			~~P~~	2
7440-48-4	Cobalt	2.00	B		P	
7440-50-8	Copper	13.80			P	J3
7439-89-6	Iron	5210.00			P	
7439-92-1	Lead	64.20			F	
7439-95-4	Magnesium	154.00	B		P	
7439-96-5	Manganese	12.90			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.71	U		P	
7440-09-7	Potassium	401.00	B		P	
7782-49-2	Selenium	.41	U	W	F	UJ3, 4
7440-22-4	Silver	2.60			P	J3
7440-23-5	Sodium	24.10	U		P	
7440-28-0	Thallium	.41	U	W	F	
7440-62-2	Vanadium	12.30			P	
7440-66-6	Zinc	~~18.00~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 0 1 7 7 3 3 2

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-006

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661006

Level (low/med): LOW Date Received: 6/09/92

% Solids: 92.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2980.00			P	
7440-36-0	Antimony	7.39	U		P	
7440-38-2	Arsenic	4.00			F	
7440-39-3	Barium	277.00			P	
7440-41-7	Beryllium	.45	B		P	
7440-43-9	Cadmium	1.30			P	J3
7440-70-2	Calcium	200.00	B		P	
7440-47-3	Chromium	~~65.70~~			~~P~~	2
7440-48-4	Cobalt	3.20	B		P	
7440-50-8	Copper	119.00			P	J3
7439-89-6	Iron	11200.00			P	
7439-92-1	Lead	143.00			F	
7439-95-4	Magnesium	446.00	B		P	
7439-96-5	Manganese	36.60			P	
7439-97-6	Mercury	.75			CV	
7440-02-0	Nickel	3.70	U		P	
7440-09-7	Potassium	1130.00			P	
7782-49-2	Selenium	.42	U		F	UJ3
7440-22-4	Silver	5.40			P	J3
7440-23-5	Sodium	25.70	B		P	
7440-28-0	Thallium	.42	U	W	F	
7440-62-2	Vanadium	43.80			P	
7440-66-6	Zinc	~~204.00~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-009

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661008

Level (low/med): LOW Date Received: 6/09/92

% Solids: 96.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1390.00			P	
7440-36-0	Antimony	6.96	U		P	
7440-38-2	Arsenic	.89	B		F	
7440-39-3	Barium	1.60	B		P	
7440-41-7	Beryllium	.21	B		P	
7440-43-9	Cadmium	.77	U		P	UJ3
7440-70-2	Calcium	17.00	B		P	
7440-47-3	Chromium	~~32.10~~			~~P~~	2
7440-48-4	Cobalt	1.50	B		P	
7440-50-8	Copper	4.00	B		P	J3
7439-89-6	Iron	6880.00			P	
7439-92-1	Lead	8.46		S	F	
7439-95-4	Magnesium	231.00	B		P	
7439-96-5	Manganese	4.70			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.48	U		P	
7440-09-7	Potassium	657.00	B		P	
7782-49-2	Selenium	.41	U		F	UJ3
7440-22-4	Silver	1.55	U		P	UJ3
7440-23-5	Sodium	22.60	U		P	
7440-28-0	Thallium	.41	U	W	F	
7440-62-2	Vanadium	14.30			P	
7440-66-6	Zinc	~~6.60~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-901

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661010

Level (low/med): LOW Date Received: 6/09/92

% Solids: 95.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1150.00			P	
7440-36-0	Antimony	7.51	U		P	
7440-38-2	Arsenic	1.00	B		F	
7440-39-3	Barium	1.60	B		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.83	U		P	UJ3
7440-70-2	Calcium	17.80	B		P	
7440-47-3	Chromium	~~25.80~~			~~P~~	2
7440-48-4	Cobalt	1.50	B		P	
7440-50-8	Copper	4.70	B		P	J3
7439-89-6	Iron	5190.00			P	
7439-92-1	Lead	14.90			F	
7439-95-4	Magnesium	143.00	B		P	
7439-96-5	Manganese	4.00			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.76	U		P	
7440-09-7	Potassium	444.00	B		P	
7782-49-2	Selenium	.39	U		F	UJ3
7440-22-4	Silver	1.67	U		P	UJ3
7440-23-5	Sodium	24.40	U		P	
7440-28-0	Thallium	.39	U	W	F	
7440-62-2	Vanadium	12.00			P	
7440-66-6	Zinc	~~6.20~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 0000035

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-012

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661011

Level (low/med): LOW Date Received: 6/09/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1610.00			P	
7440-36-0	Antimony	7.58	U		P	
7440-38-2	Arsenic	.75	B		F	
7440-39-3	Barium	22.50	B		P	
7440-41-7	Beryllium	.34	B		P	
7440-43-9	Cadmium	.84	U		P	UJ3
7440-70-2	Calcium	52.10	B		P	
7440-47-3	Chromium	~~53.40~~			~~P~~	2
7440-48-4	Cobalt	2.10	B		P	
7440-50-8	Copper	29.00			P	J3
7439-89-6	Iron	8880.00			P	
7439-92-1	Lead	41.90			F	
7439-95-4	Magnesium	255.00	B		P	
7439-96-5	Manganese	11.10			P	
7439-97-6	Mercury	.10	B		CV	
7440-02-0	Nickel	3.79	U		P	
7440-09-7	Potassium	711.00	B		P	
7782-49-2	Selenium	.43	U		F	UJ3
7440-22-4	Silver	26.90			P	J3
7440-23-5	Sodium	24.60	U		P	
7440-28-0	Thallium	.49	B	W	F	J5
7440-62-2	Vanadium	24.00			P	
7440-66-6	Zinc	~~36.40~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

U.S. EPA CLP 000036

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-014

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661013

Level (low/med): LOW Date Received: 6/09/92

% Solids: 90.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	538.00			P	
7440-36-0	Antimony	7.62	U		P	
7440-38-2	Arsenic	.80	B		F	
7440-39-3	Barium	1.60	B		P	
7440-41-7	Beryllium	.21	U		P	
7440-43-9	Cadmium	.85	U		P	UJ3
7440-70-2	Calcium	14.20	B		P	
7440-47-3	Chromium	~~12.40~~			~~P~~	2
7440-48-4	Cobalt	1.48	U		P	
7440-50-8	Copper	4.30	B		P	J3
7439-89-6	Iron	2590.00			P	
7439-92-1	Lead	3.50		S	F	
7439-95-4	Magnesium	54.30	B		P	
7439-96-5	Manganese	2.20	B		P	
7439-97-6	Mercury	.06	U		CV	
7440-02-0	Nickel	3.81	U		P	
7440-09-7	Potassium	190.00	U		P	
7782-49-2	Selenium	.43	U		F	UJ3
7440-22-4	Silver	1.69	U		P	UJ3
7440-23-5	Sodium	24.80	U		P	
7440-28-0	Thallium	.43	U	W	F	
7440-62-2	Vanadium	8.30	B		P	
7440-66-6	Zinc	~~3.70~~	~~B~~		~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP 000037

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-151

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661014

Level (low/med): LOW Date Received: 6/09/92

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2060.00			P	
7440-36-0	Antimony	7.70	U		P	
7440-38-2	Arsenic	.98	B		F	
7440-39-3	Barium	45.40			P	
7440-41-7	Beryllium	.34	B		P	
7440-43-9	Cadmium	.86	U		P	UJ3
7440-70-2	Calcium	19.40	B		P	
7440-47-3	Chromium	~~46.50~~			~~P~~	2
7440-48-4	Cobalt	1.80	B		P	
7440-50-8	Copper	9.60			P	J3
7439-89-6	Iron	9170.00			P	
7439-92-1	Lead	~~5.30~~		~~S~~	~~F~~	6
7439-95-4	Magnesium	256.00	B		P	
7439-96-5	Manganese	10.50			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.85	U		P	
7440-09-7	Potassium	752.00	B		P	
7782-49-2	Selenium	.42	U		F	UJ3
7440-22-4	Silver	1.71	U		P	UJ3
7440-23-5	Sodium	25.00	U		P	
7440-28-0	Thallium	.42	U	W	F	
7440-62-2	Vanadium	18.70			P	
7440-66-6	Zinc	~~21.10~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP 000038

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-152

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): WATER Lab Sample ID: 920661016

Level (low/med): LOW Date Received: 6/09/92

% 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	109.00	B		P	
7440-36-0	Antimony	36.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	7.00	U		P	
7440-41-7	Beryllium	1.00	U		P	UJ3
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	732.00	B		P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	7.00	U		P	
7440-50-8	Copper	7.00	U		P	
7439-89-6	Iron	57.40	B		P	
7439-92-1	Lead	2.00	U		F	UJ3
7439-95-4	Magnesium	192.00	B		P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	896.00	U		P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	8.00	U		P	
7440-23-5	Sodium	1310.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	9.30	B		P	
7440-66-6	Zinc	7.90	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.

01-007

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: N.W.S SAS No.: SDG No.: CLP610

Matrix (soil/water): SOIL Lab Sample ID: 920661017

Level (low/med): LOW Date Received: 6/09/92

% Solids: 92.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1330.00			P	
7440-36-0	Antimony	7.75	U		P	
7440-38-2	Arsenic	3.30			F	
7440-39-3	Barium	290.00			P	
7440-41-7	Beryllium	.24	B		P	
7440-43-9	Cadmium	1.90			P	J3
7440-70-2	Calcium	106.00	B		P	
7440-47-3	~~Chromium~~	~~34.80~~			~~P~~	2
7440-48-4	Cobalt	2.50	B		P	
7440-50-8	Copper	136.00			P	J3
7439-89-6	Iron	6600.00			P	
7439-92-1	Lead	179.00			F	
7439-95-4	Magnesium	196.00	B		P	
7439-96-5	Manganese	45.80			P	
7439-97-6	Mercury	.96			CV	
7440-02-0	Nickel	3.88	U		P	
7440-09-7	Potassium	493.00	B		P	
7782-49-2	Selenium	.41	U		F	UJ3
7440-22-4	Silver	5.90			P	J3
7440-23-5	Sodium	25.20	U		P	
7440-28-0	Thallium	.41	U	W	F	
7440-62-2	Vanadium	17.60			P	
7440-66-6	Zinc	~~183.00~~			~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present?	[ ]		✓
Legible?	[ ]		✓
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

A.1.6	Form I to IX	Yes	No	N/A
A.1.6.1	Are all the Form I through Form IX labeled with:			
	Laboratory name?	[✓]	___	___
	Case/SAS number?	[✓]	___	___
	EPA sample No.?	[✓]	___	___
	SDG No.?	[✓]	___	___
	Contract No.?	[✓]	___	___
	Correct units?	[✓]	___	___
	Matrix?	[✓]	___	___

ACTION: If no for any of the above, note under Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.6.2	Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
	(NOTE: Check all forms against raw data.)			
	(a) all analytes analyzed by ICP?	[✓]	___	___
	(b) all analytes analyzed by GFAA?	[✓]	___	___
	(c) all analytes analyzed by AA Flame?	[ ]	___	✓
	(d) Mercury?	[✓]	___	___
	(e) Cyanide?	[✓]	___	✓

PBH 8/7/92

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.1: Data Assessment - Contract Compliance (Total Review)

Date: Jan. 1992
Number: HW-2
Revision: 11

		YES	NO	N/A
A.1.7	Raw Data			
A.1.7.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]		
	Digestion Log for furnace AA Form XIII present?	[✓]		
	Distillation Log for mercury Form XIII present?	[✓]		
	Distillation Log for cyanides Form XIII present?	[✓] PBH 8/7/92		✓
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]		
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[✓]		
	Are preparation dates present on sample preparation logs/bench sheets?	[✓]		
A.1.7.2	Measurement read out record present? ICP	[✓]		
	Flame AA	[ ]		✓
	Furnace AA	[✓]		
	Mercury	[✓]		
	Cyanides	[ ]		✓
A.1.7.3	Are all raw data to support all sample analyses and QC operations present?	[✓]		
	Legible?	[✓]		
	Properly Labeled?	[✓]		

ACTION: If no for any of the above questions in sections A.1.7.1 through A.1.7.3, write Telephone Record Log and contact laboratory for resubmittals.

		YES	NO	N/A
A.1.8	**Holding Times** - (aqueous and soil samples)			
	(Examine sample traffic reports and digestion/distillation logs.)			
	Mercury analysis (28 days). . . . . exceeded?	___	[✓]	___
	Cyanide distillation (14 days). . . . . exceeded?	___	[___]	✓
	Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___
	NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.			
	ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.			
A.1.8.2	Is pH of aqueous samples for: Metals Analysis >2?	___	[✓]	___
	Cyanides Analysis <12?	___	[___]	✓
	Action: If yes, flag the associated metals and cyanides data as estimated.			
A.1.9	**Form I (Final Data)**			
A.1.9.1	Are all Form I's present and complete?	[✓]	___	___
	ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
A.1.9.2	Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]	___	___
	Are soil sample results for each parameter corrected for percent solids?	[✓]	___	___
	Are all "less than IDL" values properly coded with "U"?	[✓]	___	___

		YES	NO	N/A
	Are the correct concentration qualifiers used with final data?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log, and contact laboratory for corrected data.			
A.1.9.3	Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	___	___
	Was a brief physical description of samples given on Form I's?	[✓]	___	___
	Was the dilution of any sample diluted beyond the requirements of the contract noted on Form I or Form XIV?	___	[✓]	___
	ACTION: If no for any of the above, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.10	Calibration			
A.1.10.1	Is record of at least 2 point calibration present for ICP analysis?	[✓]	___	___
	Is record of 5 point calibration present for Hg analysis?	[✓]	___	___
	Is record of 4 point calibration present for:			
	Flame AA?	[___]	___	✓
	Furnace AA?	[✓]	___	___
	Cyanides?	[___]	___	✓
	Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	[✓]	___	___

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

		YES	NO	N/A
A.1.10.2	Is correlation coefficient less than 0.995 for:			
	Mercury Analysis?		[✓]	
	Cyanide Analysis?		[ ]	✓
	Atomic Absorption Analysis?		[✓]	

ACTION: If yes, flag the associated data as estimated.

NOTE: The data validator shall calculate the correlation coefficient using concentrations of the standards and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.10.3	In the instance where less than 4 standards are measured in absorbance (or peak area, peak height,etc.) mode, are the remaining standards analyzed in concentration mode immediately after calibration within ±10% of the true values?	[✓]		

ACTION: If no, flag the associated data as estimated if standards are not within ±10% of true values. Do not flag the data as estimated in linear range indicated by good recovery of standard(s).

A.1.11 Form II A (Initial and Continuing Calibration Verification)-

A.1.11.1	Present and complete for every metal and cyanide?	[✓]		
	Present and complete for AA and ICP when both are used for the same analyte?	[✓]		

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.11.2	Circle on each Form IIA all percent recoveries that are outside the contract windows. Are all calibration standards (initial and continuing) within control limits:			
	Metals- 90-110%R?	[✓]		
	Hg - 80-120%R?	[✓]		
	Cyanides- 85-115%R?	[ ]		✓

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ) if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
A.1.11.3 Was continuing calibration performed every 10 samples or every 2 hours?	[✓]	___	___
Was ICV for cyanides distilled?	[___]	___	✓
ACTION: If no for any of the above, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.12 Form II B (CRDL Standards for AA and ICP) -			
A.1.12.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?	[✓]	___	___
Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[___]	___	✓
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]	___	___
ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are: AA Analysis - **True Value ± CRDL; ICP Analysis - **True Value ± 2CRDL; CN Analysis - **True Value ± 0.5 x True Value.			

**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL. Compute the concentration of the missing mid-range standard from the calibration range.

		YES	NO	N/A
A.1.12.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.12.3	Circle on each Form IIB all the percent recoveries that are outside the acceptance windows.			
	Are CRA and CRI standards within control limits:			
	Metals 80 - 120%R?	[ ]	✓	
	Is mid-range standard within control limits:			
	Cyanide 80 - 120%R?	[ ]		✓
	ACTION: Flag as estimated all sample results within the affected range if the recovery of the standard is between 50-79%; flag only positive data within the affected range if the recovery is between 121-150%; reject all data within the affected range if the recovery is less than 50%; reject only positive data within the affected range if the recovery is greater than 150%. Qualify 50% of the samples on either side of CRI standard outside the control limits.			
	Note: Flag or reject the final results only when sample raw data are within the affected ranges and the CRDL standards are outside the acceptance windows.			
A.1.13	Form III (Initial and Continuing Calibration Blanks)			
A.1.13.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for the same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	[✓]		

		YES	NO	N/A
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the Contract-Problems/ Non-Compliance section of the "Data Assessment Narrative".			
A.1.13.2	Circle on each Form III all calibration blank values that are above CRDL (or 2 x IDL when IDL > CRDL).			
	Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	[✓]	___	___
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) positive sample results when raw sample value is less than or equal to calibration blank value analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank outside the control limits.			
A.1.14	FORM III (Preparation Blank) - (Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.14.1	Was one prep. blank analyzed for:			
	each Sample Delivery Group (SDG)?	[✓]	___	___
	each batch of digested samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the associated positive data <10 x IDLs for which prep. blank was not analyzed.			
	NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			

		YES	NO	N/A
A.1.14.2	Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?	___	[✓]	___
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep.blank?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value.			
A.1.14.3	Is concentration of prep. blank value (Form III) less than two times IDL, when IDL is greater than CRDL?	[✓]	___	___
	ACTION: If no, reject (red-line) all positive sample results when sample raw data are less than 10 times the prep. blank value.			
A.1.14.4	Is concentration of prep. blank below the negative CRDL?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated sample results less than 10xCRDL.			
A.1.15	Form IV (ICP Interference Check Sample)			
A.1.15.1	Present and complete?	[✓]	___	___
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all the samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.15.2	Circle all values on each Form IV that are more than ± 20% of true or established mean value.			
	Are all Interference Check Sample results inside the control limits (± 20%)?	[✓]	___	___
	If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			
A.1.16	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.16.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each conc. range (i.e. low, med., high)?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the positive data less than four times the spiking levels specified in SOW for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.16.2	Was field blank used for spiked sample?	___	[✓]	___
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
A.1.16.3	Circle on each Form VA all spike recoveries that are outside control limits (75% to 125%).			
	Are all recoveries within control limits?	[___]	✓	___
	If no, is sample concentration greater than or equal to four times spike concentration?	[___]	✓	___

	YES	NO	N/A
ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[ ]	✓	
ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".			
A.1.16.4 Aqueous Are any spike recoveries:			
(a) less than 30%?		[✓]	
(b) between 30-74%?	✓	[ ]	
(c) between 126-150%?		[✓]	
(d) greater than 150%?		[✓]	
ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".			
A.1.16.5 Soil/Sediment Are any spike recoveries:			
(a) less than 10%?	✓	[ ]	
(b) between 10-74%?	✓	[ ]	
(c) between 126-200%?		[✓]	
(d) greater than 200%?		[✓]	

		YES	NO	N/A
	ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".			
A.1.17	Form VI (Lab Duplicates)			
A.1.17.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any the above, flag as estimated (J) all the data ≥CRDL* for which duplicate sample was not analyzed.			
	Note: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated.			
	2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in ug/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.17.2	Was field blank used for duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag all data ≥CRDL* as estimated (J) for which field blank was used as duplicate.			
A.1.17.3	Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	[___]	✓	___
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[___]	✓	___
	ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".			

* Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.
2. If the result of lab duplicate analyzed by GFAA is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria to metals analyzed by GFAA.

A.1.17.4 Aqueous

Circle on each Form VI all values that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[✓]	___
Is any difference** between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

A.1.17.5 Soil/Sediment

Circle on each Form VI all values that are:

RPD > 100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[✓]	___
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[✓]	___

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
	ACTION: If yes, flag the associated data as estimated.			
A.1.18	**Field Duplicates**			
A.1.18.1	Were field duplicates analyzed?	[___]	✓	___

ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.

NOTE: 1. Do not calculate RPD when both values are less than IDL.
2. Flag all associated data only for field duplicate pair.

A.1.18.2 **Aqueous**

Circle all values on self prepared Form VI for field duplicates that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[___]	✓
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[___]	✓

ACTION: If yes, flag the associated data as estimated.

* Substitute IDL for CRDL when IDL > CRDL.
Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.18.3	**Soil/Sediment**			
	Circle all values on self prepared Form VI for field duplicates that are:			
	RPD >100%, or			
	Difference > 2 x CRDL*			
	Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) : >100%?	___	[___]	✓
	Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL): >2x *CRDL?	___	[___]	✓
	ACTION: If yes, flag the associated data as estimated.			
A.1.19	**Form VII (Laboratory Control Sample)** (Note: LCS - not required for aqueous Hg and cyanide analyses.)			
A.1.19.1	Was one LCS prepared and analyzed for:			
	each SDG?	[✓]	___	___
	each batch samples digested/distilled?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all the data for which LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.19.2	**Aqueous LCS**			
	Circle on each Form VII the LCS percent recoveries outside control limits (80 - 120%) except for aqueous Ag and Sb.			
	Is any LCS recovery: less than 50%?	___	[✓]	___
	between 50% and 79%?	___	[✓]	___
	between 121% and 150%?	___	[✓]	___
	greater than 150%?	___	[✓]	___

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.19.3 **Solid LCS**

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).
2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

Is LCS "Found" value higher than the control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated positive data as estimated.

Is LCS "Found" value lower than the Control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated data as estimated.

		YES	NO	N/A
A.1.20	**Form IX (ICP Serial Dilution)** -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.20.1	Was Serial Dilution analysis performed for:			
	each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med.)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated all the positive data ≥ 10xIDLs or ≥ CRDL when 10xIDL ≤ CRDL for which Serial Dilution Analysis was not performed.			
A.1.20.2	Was field blank(s) used for Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J). If 10xIDL ≤ CRDL, flag all data ≥ CRDL.			
A.1.20.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.20.4	Circle on each Form IX all percent difference that are outside the control limits for initial concentrations equal to or greater than 10 x IDLs only.			
	Are any % difference values:			
	> 10%?	___	[✓]	___
	≥ 100%?	___	[✓]	___

		YES	NO	N/A
	ACTION: Flag as estimated (J) all the associated sample data ≥ 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which percent difference is greater than 10% but less than 100%. Reject (red-line) all the associated sample results equal to or greater than 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which PD is greater than or equal to 100%.			
	Note: Flag or reject on Form I's only the sample results whose associated raw data are ≥ 10xIDL (or ≥ CRDL when 10xIDL≤ CRDL)			
A.1.21	Furnace Atomic Absorbtion (AA) QC Analysis			
A.1.21.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	___	___
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
A.1.21.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]	___	___
	Was a dilution analyzed for sample with analytical spike recovery less than 40%?	[✓]	___	___
	ACTION: If no for any of the above, flag all the associated data as estimated.			
A.1.21.3	Is *analytical spike recovery outside the control limits (85-115%) for any sample?	✓	[___]	___
	ACTION: If yes, flag as estimated the affected sample results if the recovery is between 10-84%; if the recovery is between 115-200%, flag the associated positive sample results as estimated; reject the associated sample results if the recovery is less than 10%; reject positive sample results if the recovery is greater than 200%.			

Analytical spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
	NOTE: Reject or flag the data only when the affected sample(s) was not subsequently analyzed by Method of Standard Addition.			
A.1.22	**Form VIII (Method of Standard Addition Results)**			
A.1.22.1	Present?	[✓]	___	___
	If no, is any Form I result coded with "S" or a "+"?	___	[✓]	___
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.22.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	✓	[___]	___
	ACTION: If yes, reject (red-line) the affected data.			
A.1.22.3	Was *MSA required for any sample but not performed?	___	[✓]	___
	Is coefficient of correlation for MSA less than 0.995?	✓	[___]	___
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	___	[✓]	___
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.22.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-23?	[✓]	___	___
	ACTION: If no, note exception under Contract Problem/ Non-Compliance section of the "Data Assessment Narrative", and prepare a separate list.			

* MSA is not required on LCS and prep. blank.

		YES	NO	N/A
A.1.23	**Dissolved/Total or Inorganic/Total Analytes** -			
A.1.23.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	___	[✓]	___
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	___	[✓]	___
	NOTE: 1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration. 2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents. 3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.			
A.1.23.2	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	___	[✓]	___
A.1.23.3	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?	___	[✓]	___
	ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.			
A.1.24	**Form I (Field Blank)** -			
	(Note: Designate "Field Blank" as such on Form I.)			
A.1.24.1	Circle all field blank values on Form I that are greater than CRDL, (or 2 x IDL when IDL > CRDL).			
	Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓

	YES	NO	N/A
If no, was field blank value already rejected due to other QC criteria?	[ ]		✓

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value. Reject on Form I's the soil sample results that when converted to ug/L on wet basis are less than or equal to five times the field blank value in ug/L.

A.1.25 Form X, XI, XII (Verification of Instrumental Parameters).

A.1.25.1 Is verification report present for:

	YES	NO	N/A
Instrument Detection Limits (quarterly)?	[✓]		
ICP Interelement Correction Factors (annually)?	[✓]		
ICP Linear Ranges (quarterly)?	[✓]		

ACTION: If no, contact TPO of the lab.

A.1.25.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)

	YES	NO	N/A
A.1.25.2.1 Are IDLs present for: all the analytes?	[✓]		
all the instruments used?	[✓]		
For both AA and ICP when both are used for the same analyte?	[ ]		✓

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

	YES	NO	N/A
A.1.25.2.2 Is IDL greater than CRDL for any analyte?		[✓]	
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	[✓]		

	YES	NO	N/A
Action : If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			
A.1.25.3 **Form XI (Linear Ranges)**			
A.1.25.3.1 Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___
ACTION: If no, flag the result reported on Form I as estimated(J).			
A.1.26 **Percent Solids of Sediments**			
A.1.26.1 Are percent solids in sediment(s): < 50%?	___	[✓]	___
< 10%?	___	[✓]	___

ACTION: If yes, qualify as estimated all the results of a sample that has per cent solids between 10%-50% (i.e. moisture content between 50%-90%). Reject all the results of a sample that has per cent solids less than 10% (i.e. moisture content greater than 90%).

NOTE: Reject or flag(J) only the sample results that were not previously rejected or flaged due to other QC criteria.

Case#	NWS	Site	Naval Weapons Station	Matrix: Soil	✓
SDG#	CLP 610	Lab	Roy F. Weston	Water	✓
Contractor	Roy F Weston	Reviewer	Heartland ESI	Other	

A.2.1 Validation Flags- The following flags have been applied in red by the data validator and must be considered by the data user.

J- This flag indicates the result qualified as estimated

Red- Line- A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

Fully Usable Data- The results that do not carry "J" or "red-line" are fully usable.

Contractual Qualifiers- The legend of contractual qualifiers applied by the lab on Form I's is found on page B-20 of SOW IILM01.0.

A.2.2 The data assessment is given below and on the attached sheets.

1. The CRDL Standards for Arsenic for waters and for Lead for soils were above the upper control limit. All associated positive results are qualified as estimated.
2. The Matrix spike Recoveries for soil for Chromium and Zinc were below 10%. All data is rejected.
3. The Matrix spike Recoveries for soils for Cadmium, Copper, Selenium and Silver and for waters for Beryllium and Lead were below

A.2.2 (continuation)

the lower control limit. All data is estimated

4. The Post digestion spike recovery for selenium for sample 01-004 was below the lower control limit. All data estimated

5. The Post digestion spike recoveries for Thallium for the following sample were above the upper control limit. All positive results are qualified as estimated. Thallium - 01-001, 01-004, 01-006, 01-009, 01-901, 01-012, 01-014, 01-151 and 01-007.

PBH 8/7/92

A.2.3 Contract-Problem/Non-Compliance

The Laboratory used associated QC from different SDGs but failed to flagged accordingly. Lead for Sample 01-651 had two MSRs below .990, therefore all data is rejected.

PBH 8/7/92

MMB/ESAT Rviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hively Date: 8/7/92
Signature

Verified by: _____ Date: _____

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

of Review: 8/7/92 Date: 8/7/92 Case #: NWS

: Naval Weapons Station Lab Name: Roy F. Weston

ewer's Initials: PBH Number of Samples: 10

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
						2							2	
ame AA														
rnace AA												1	1	
rcury														
tal						2						1	3	
her														

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

						4							4	
ame AA														
rnace AA		2				2						2	6	
rcury														
tal		2				6						2	10	
her														

te:
Asterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Checklist

Date: Jan. 1992
Number: HW-2
Revision: 11

Inorganic Analysis

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. NWS

SITE Naval Weapons Station

LABORATORY Roy F. Weston

NO. OF SAMPLES/ MATRIX 9 soils 1 water

SDG# CLP 610

REVIEWER (IF NOT ESD) Heartland ESI

SAS# 390

REVIEWER'S NAME Paul B. Humby

TO: ACTION _____ FYI _____

COMPLETION DATE 8/7/92

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CYANIDE
HOLDING TIMES	O	O	O	O
CALIBRATIONS				
BLANKS				
ICS				
LCS				
DUPLICATE ANALYSIS				
MATRIX SPIKE	Z			
MSA		Z		
SERIAL DILUTION	O			
SAMPLE VERIFICATION		O		
OTHER QC				
OVERALL ASSESSMENT				

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

ACTION ITEMS:

AREAS OF CONCERN:

STABLE PERFORMANCE:

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

August 7, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Four (4) total metal soil samples and one (1) Matrix Spike Duplicate pair and three (3) shot list soil samples and one (1) water sample were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
13-001	920661801
23-001	920661803
24-003	920661804
25-003	920661805
27-001	920661806
27-002	920661807
27001D	920661808
2700S2	920661810

Heartland ESI has reviewed the data for the samples listed above TAL Metals using Region II Data Validation Protocol, January 1992 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAL Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 920618**, the analysis of four (4) total metals soil samples and one (1) Matrix Spike and Duplicate pair and three (3) short list soil samples and one (1) water sample. Overall, the inorganic data quality was fair. The USEPA CLP analytical protocol was followed as required with the exception of the following problems. The ICV and Midrange Standards for Cyanide were not distilled as required by the Protocol. The QC for the water sample was found in another SDG, but the laboratory failed to flag based on this QC.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standards for Arsenic for waters and Lead for soils were above the upper control limit. All positive results within the controlled area are qualified as estimated, "J".

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

2. The Matrix Spike recoveries for Chromiumand Zinc for soils were below 10%. All data is rejected.

3. The Matrix Spike recoveries for waters for Beryllium and Lead and soils for Cadmium, Copper, Selenium and Silver were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

4. The following analytes exhibited high recovery during the GFAA spiking procedures. All positive data is qualified as estimated, "J".

Analyte	Samples
Thallium	13-001, 27-001, 27-002 and 2700D1.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples All soil samples	As Pb	+	J	1
All soil samples	Cr and Zn.	+/U	R	2
All soil samples All water samples	Cd, Cu, Se and Ag. Be and Pb	+/U	J/UJ	3
13-001, 27-001, 27-002 and 2700D1.	Tl	+	J	4

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

13-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661801

Level (low/med): LOW Date Received: 6/10/92

% Solids: 87.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2050.00			P	
7440-36-0	Antimony	7.80	U		P	
7440-38-2	Arsenic	3.00			F	
7440-39-3	Barium	14.50	B		P	
7440-41-7	Beryllium	.24	B		P	
7440-43-9	Cadmium	.87	U	N	P	UJ3
7440-70-2	Calcium	329.00	B		P	
7440-47-3	Chromium	~~14.80~~		~~N*~~	~~P~~	2
7440-48-4	Cobalt	2.40	B		P	
7440-50-8	Copper	25.20		N	P	J3
7439-89-6	Iron	8040.00			P	
7439-92-1	Lead	96.90			F	
7439-95-4	Magnesium	236.00	B		P	
7439-96-5	Manganese	27.00			P	
7439-97-6	Mercury	.14			CV	
7440-02-0	Nickel	3.90	U		P	
7440-09-7	Potassium	231.00	B		P	
7782-49-2	Selenium	.45	U	N	F	UJ3
7440-22-4	Silver	6.40		N	P	J3
7440-23-5	Sodium	25.40	U		P	
7440-28-0	Thallium	.45	U	W	F	
7440-62-2	Vanadium	14.80			P	
7440-66-6	Zinc	~~50.60~~		~~N*~~	~~P~~	2
	Cyanide	1.14	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

23-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661803

Level (low/med): LOW Date Received: 6/10/92

% Solids: 55.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	1.37	U	N	P	UJ3
7440-70-2	Calcium				NR	
7440-47-3	Chromium	~~35.50~~		N*	~~P~~	2
7440-48-4	Cobalt				NR	
7440-50-8	Copper	4.30	B	N	P	J3
7439-89-6	Iron				NR	
7439-92-1	Lead	13.80			F	
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	~~65.80~~		N*	~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 000031

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

24-003

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661804

Level (low/med): LOW Date Received: 6/10/92

% Solids: 96.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.83	U	N	P	U53
7440-70-2	Calcium				NR	
7440-47-3	Chromium	~~1.90~~	~~B~~	~~N*~~	~~P~~	2
7440-48-4	Cobalt				NR	
7440-50-8	Copper	1.44	U	N	P	U53
7439-89-6	Iron				NR	
7439-92-1	Lead	1.70			F	
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	~~2.00~~	~~B~~	~~N*~~	~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

25-003

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661805

Level (low/med): LOW Date Received: 6/10/92

% Solids: 96.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic				NR	
7440-39-3	Barium				NR	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	.82	U	N	P	UJ3
7440-70-2	Calcium				NR	
7440-47-3	Chromium	~~1.43~~	~~U~~	~~N*~~	~~P~~	2
7440-48-4	Cobalt				NR	
7440-50-8	Copper	5.30		N	P	J3
7439-89-6	Iron				NR	
7439-92-1	Lead	113.00			F	
7439-95-4	Magnesium				NR	
7439-96-5	Manganese				NR	
7439-97-6	Mercury				NR	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium				NR	
7440-22-4	Silver				NR	
7440-23-5	Sodium				NR	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	~~1.80~~	~~B~~	~~N*~~	~~P~~	2
	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP 000033

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661806

Level (low/med): LOW Date Received: 6/10/92

% Solids: 88.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1070.00			P	
7440-36-0	Antimony	8.10	U		P	
7440-38-2	Arsenic	5.60			F	
7440-39-3	Barium	35.40	B		P	
7440-41-7	Beryllium	.54	B		P	
7440-43-9	Cadmium	4.70		N	P	J 3
7440-70-2	Calcium	207.00	B		P	
7440-47-3	Chromium	~~140.00~~		~~N*~~	~~P~~	2
7440-48-4	Cobalt	7.70	B		P	
7440-50-8	Copper	61.20		N	P	J 3
7439-89-6	Iron	7100.00			P	
7439-92-1	Lead	184.00			F	
7439-95-4	Magnesium	90.00	B		P	
7439-96-5	Manganese	26.40			P	
7439-97-6	Mercury	.06	U		CV	
7440-02-0	Nickel	6.80	B		P	
7440-09-7	Potassium	260.00	B		P	
7782-49-2	Selenium	2.50		N	F	J 3
7440-22-4	Silver	1.80	U	N	P	UJ 3
7440-23-5	Sodium	29.60	B		P	
7440-28-0	Thallium	.45	U	W	F	
7440-62-2	Vanadium	3.90	B		P	
7440-66-6	Zinc	~~314.00~~		~~N*~~	~~P~~	2
	Cyanide	1.95			C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

27-002

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661807

Level (low/med): LOW Date Received: 6/10/92

% Solids: 94.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1670.00			P	
7440-36-0	Antimony	7.63	U		P	
7440-38-2	Arsenic	2.40			F	
7440-39-3	Barium	9.20	B		P	
7440-41-7	Beryllium	.30	B		P	
7440-43-9	Cadmium	.85	U	N	P	UJ3
7440-70-2	Calcium	55.40	B		P	
7440-47-3	Chromium	~~21.20~~		~~*N~~	~~P~~	2
7440-48-4	Cobalt	2.80	B		P	
7440-50-8	Copper	11.60		N	P	J3
7439-89-6	Iron	4750.00			P	
7439-92-1	Lead	22.90			F	
7439-95-4	Magnesium	151.00	B		P	
7439-96-5	Manganese	26.20			P	
7439-97-6	Mercury	.05	U		CV	
7440-02-0	Nickel	3.82	U		P	
7440-09-7	Potassium	265.00	B		P	
7782-49-2	Selenium	.61	B	N	F	J3
7440-22-4	Silver	1.70	U	N	P	UJ3
7440-23-5	Sodium	24.80	U		P	
7440-28-0	Thallium	.42	U	W	F	
7440-62-2	Vanadium	5.10	B		P	
7440-66-6	Zinc	~~39.60~~		~~*N~~	~~P~~	2
	Cyanide	1.06	U		C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

U.S. EPA CLP 000035

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

2700D1

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): SOIL Lab Sample ID: 920661808

Level (low/med): LOW Date Received: 6/10/92

% Solids: 90.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1190.00			P	
7440-36-0	Antimony	15.90			P	
7440-38-2	Arsenic	4.30			F	
7440-39-3	Barium	199.00			P	
7440-41-7	Beryllium	.31	B		P	
7440-43-9	Cadmium	36.30		N	P	J3
7440-70-2	Calcium	260.00	B		P	
7440-47-3	Chromium	~~500.00~~		~~*N~~	~~P~~	2
7440-48-4	Cobalt	9.30	B		P	
7440-50-8	Copper	426.00		N	P	J3
7439-89-6	Iron	22500.00			P	
7439-92-1	Lead	25.20			F	
7439-95-4	Magnesium	226.00	B		P	
7439-96-5	Manganese	165.00			P	
7439-97-6	Mercury	.20			CV	
7440-02-0	Nickel	15.80			P	
7440-09-7	Potassium	197.00	U		P	
7782-49-2	Selenium	1.60		NS	F	J3
7440-22-4	Silver	2.50		N	P	J3
7440-23-5	Sodium	25.90	B		P	
7440-28-0	Thallium	.43	U	W	F	
7440-62-2	Vanadium	1.10	U		P	
7440-66-6	Zinc	~~624.00~~		~~*N~~	~~P~~	2
	Cyanide	1.84			C	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

2700S2

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix (soil/water): WATER Lab Sample ID: 920661810

Level (low/med): LOW Date Received: 6/10/92

% 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	64.30	B		P	
7440-36-0	Antimony	36.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	11.50	B		P	
7440-41-7	Beryllium	1.00	U		P	UJ 3
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	1210.00	B		P	
7440-47-3	Chromium	7.00	U		P	
7440-48-4	Cobalt	7.00	U		P	
7440-50-8	Copper	7.00	U		P	
7439-89-6	Iron	51.90	B		P	
7439-92-1	Lead	2.00	U		F	UJ3
7439-95-4	Magnesium	122.00	B		P	
7439-96-5	Manganese	3.00	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	896.00	U		P	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	8.00	U		P	
7440-23-5	Sodium	2380.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	8.10	B		P	
7440-66-6	Zinc	13.60	B		P	
	Cyanide	20.00	U		C	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

27-001S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 88.9

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	107.0000		8.0964	U	112.40	95.1		P
Arsenic	75-125	12.9000		5.6000		9.00	80.7		F
Barium	75-125	400.0000		35.4000	B	449.80	81.1		P
Beryllium	75-125	9.2000		.5400	B	11.20	77.3		P
Cadmium	75-125	11.9000		4.7000		11.20	63.6	N	P
Calcium									NR
Chromium	75-125	139.1000		140.2000		45.00	-2.4	N	P
Cobalt	75-125	98.2000		7.7000	B	112.40	80.4		P
Copper	75-125	95.2000		61.2000		56.20	60.6	N	P
Iron									NR
Lead	75-125	143.9000		184.4000		4.50	-900.0		F
Magnesium									NR
Manganese	75-125	111.6000		26.4000		112.40	75.8		P
Mercury	75-125	.6520		.0562	U	.56	116.7		CV
Nickel	75-125	93.9000		6.8000	B	112.40	77.5		P
Potassium									NR
Selenium	75-125	4.1000		2.5000		2.20	72.0	N	F
Silver	75-125	3.6000		1.7992	U	11.20	31.6	N	P
Sodium									NR
Thallium	75-125	10.3000		.4498	U	11.20	92.0		F
Vanadium	75-125	97.2000		3.9000	B	112.40	83.0		P
Zinc	75-125	324.6001		314.5000		112.40	9.0	N	P
Cyanide	75-125	7.9490		1.9530		5.62	106.7		C

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

2700S2S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide	75-125	93.0540		20.0000	U	100.00	93.1		C

Comments:

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

27-001A

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

Matrix: Level (low/med):

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium	75-125	447.50		21.10		50.0	852.8		P
Calcium									NR
Chromium	75-125	1664.10		623.20		1200.0	86.7		P
Cobalt									NR
Copper	75-125	763.50		271.90		600.0	81.9		P
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc	75-125	3713.40		1398.50		1200.0	192.9		P
Cyanide									NR

Comments:

FORM V (Part 2) - IN

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6
DUPLICATES

EPA SAMPLE NO.

27-001D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

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

% Solids for Sample: 88.9 % Solids for Duplicate: 88.9

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		1070.7000		988.8000		8.0		P
Antimony		8.0964	U	8.0964	U			P
Arsenic	2.2	5.6000		5.3000		5.5		F
Barium		35.4000	B	28.7000	B	20.8		P
Beryllium		.5400	B	.4300	B	23.3		P
Cadmium	1.1	4.7000		3.9000		20.4		P
Calcium		207.4000	B	218.6000	B	5.2		P
Chromium		140.2000		102.1000		31.5	*	P
Cobalt		7.7000	B	7.1000	B	9.1		P
Copper		61.2000		50.2000		19.8		P
Iron		7102.6990		6300.3010		12.0		P
Lead		184.4000		157.4000		15.8		F
Magnesium		90.0000	B	78.0000	B	14.3		P
Manganese		26.4000		24.6000		7.1		P
Mercury		.0562	U	.0562	U			CV
Nickel		6.8000	B	6.1000	B	11.8		P
Potassium		260.1001	B	270.5000	B	3.9		P
Selenium	1.1	2.5000		2.5000		2.7		F
Silver		1.7992	U	1.7992	U			P
Sodium		29.6000	B	27.6000	B	7.1		P
Thallium		.4498	U	.4498	U			F
Vanadium		3.9000	B	4.3000	B	10.5		P
Zinc		314.5000		215.1000		37.6	*	P
Cyanide	1.1	1.9530		2.7110		75.8		C

FORM VI - IN

03/90

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

2700S2D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP618

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

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

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead								NR
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc								NR
Cyanide		20.0000	U	20.0000	U			C

FORM VI - IN

03/90

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present?	[ ]		✓
Legible?	[ ]		✓
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

A.1.6	Form I to IX	Yes	No	N/A
A.1.6.1	Are all the Form I through Form IX labeled with:			
	Laboratory name?	[✓]	___	___
	Case/SAS number?	[✓]	___	___
	EPA sample No.?	[✓]	___	___
	SDG No.?	[✓]	___	___
	Contract No.?	[✓]	___	___
	Correct units?	[✓]	___	___
	Matrix?	[✓]	___	___

ACTION: If no for any of the above, note under Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.6.2	Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
	(NOTE: Check all forms against raw data.)			
	(a) all analytes analyzed by ICP?	[✓]	___	___
	(b) all analytes analyzed by GFAA?	[✓]	___	___
	(c) all analytes analyzed by AA Flame?	[___]	___	✓
	(d) Mercury?	[✓]	___	___
	(e) Cyanide?	[✓]	___	___

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.1: Data Assessment - Contract Compliance (Total Review)

Date: Jan. 1992
Number: HW-2
Revision: 11

		YES	NO	N/A
A.1.7	Raw Data			
A.1.7.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]	___	___
	Digestion Log for furnace AA Form XIII present?	[✓]	___	___
	Distillation Log for mercury Form XIII present?	[✓]	___	___
	Distillation Log for cyanides Form XIII present?	[✓]	___	___
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]	___	___
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[✓]	___	___
	Are preparation dates present on sample preparation logs/bench sheets?	[✓]	___	___
A.1.7.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	___	___
A.1.7.3	Are all raw data to support all sample analyses and QC operations present?	[✓]	___	___
	Legible?	[✓]	___	___
	Properly Labeled?	[✓]	___	___

ACTION: If no for any of the above questions in sections A.1.7.1 through A.1.7.3, write Telephone Record Log and contact laboratory for resubmittals.

		YES	NO	N/A
A.1.8	**Holding Times** - (aqueous and soil samples)			
	(Examine sample traffic reports and digestion/distillation logs.)			
	Mercury analysis (28 days). . . . . exceeded?	___	[✓]	___
	Cyanide distillation (14 days). . . . . exceeded?	___	[✓]	___
	Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___
	NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.			
	ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.			
A.1.8.2	Is pH of aqueous samples for: Metals Analysis >2?	___	[✓]	___
	Cyanides Analysis <12?	___	[✓]	___
	Action: If yes, flag the associated metals and cyanides data as estimated.			
A.1.9	**Form I (Final Data)**			
A.1.9.1	Are all Form I's present and complete?	[✓]	___	___
	ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
A.1.9.2	Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]	___	___
	Are soil sample results for each parameter corrected for percent solids?	[✓]	___	___
	Are all "less than IDL" values properly coded with "U"?	[✓]	___	___

		YES	NO	N/A
	Are the correct concentration qualifiers used with final data?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log, and contact laboratory for corrected data.			
A.1.9.3	Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	___	___
	Was a brief physical description of samples given on Form I's?	[✓]	___	___
	Was the dilution of any sample diluted beyond the requirements of the contract noted on Form I or Form XIV?	___	[✓]	___
	ACTION: If no for any of the above, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.10	**Calibration**			
A.1.10.1	Is record of at least 2 point calibration present for ICP analysis?	[✓]	___	___
	Is record of 5 point calibration present for Hg analysis?	[✓]	___	___
	Is record of 4 point calibration present for:			
	Flame AA?	[___]	___	[✓]
	Furnace AA?	[✓]	___	___
	Cyanides?	[✓]	___	___
	Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	[✓]	___	___

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

		YES	NO	N/A
A.1.10.2	Is correlation coefficient less than 0.995 for:			
	Mercury Analysis?	___	[✓]	___
	Cyanide Analysis?	___	[✓]	___
	Atomic Absorption Analysis?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

NOTE: The data validator shall calculate the correlation coefficient using concentrations of the standards and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.10.3	In the instance where less than 4 standards are measured in absorbance (or peak area, peak height,etc.) mode, are the remaining standards analyzed in concentration mode immediately after calibration within ±10% of the true values?	[✓]	___	___

ACTION: If no, flag the associated data as estimated if standards are not within ±10% of true values. Do not flag the data as estimated in linear range indicated by good recovery of standard(s).

A.1.11 Form II A (Initial and Continuing Calibration Verification)-

A.1.11.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.11.2	Circle on each Form IIA all percent recoveries that are outside the contract windows. Are all calibration standards (initial and continuing) within control limits:			
	Metals- 90-110%R?	[✓]	___	___
	Hg - 80-120%R?	[✓]	___	___
	Cyanides- 85-115%R?	[✓]	___	___

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ) if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
A.1.11.3 Was continuing calibration performed every 10 samples or every 2 hours?	[✓]	___	___
Was ICV for cyanides distilled?	[___]	✓	___

ACTION: If no for any of the above, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.12 Form II B (CRDL Standards for AA and ICP) -

A.1.12.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?	[✓]	___	___
Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[✓]	___	___
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]	___	___

ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are:
AA Analysis - **True Value ± CRDL
ICP Analysis - **True Value ± 2CRDL
CN Analysis - **True Value ± 0.5 x True Value.

**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL. Compute the concentration of the missing mid-range standard from the calibration range.

		YES	NO	N/A
A.1.12.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.12.3	Circle on each Form IIB all the percent recoveries that are outside the acceptance windows.			
	Are CRA and CRI standards within control limits:			
	Metals 80 - 120%R?	[ ]	✓	
	Is mid-range standard within control limits:			
	Cyanide 80 - 120%R?	[✓]		
	ACTION: Flag as estimated all sample results within the affected range if the recovery of the standard is between 50-79%; flag only positive data within the affected range if the recovery is between 121-150%; reject all data within the affected range if the recovery is less than 50%; reject only positive data within the affected range if the recovery is greater than 150%. Qualify 50% of the samples on either side of CRI standard outside the control limits.			
	Note: Flag or reject the final results only when sample raw data are within the affected ranges and the CRDL standards are outside the acceptance windows.			
A.1.13	Form III (Initial and Continuing Calibration Blanks)			
A.1.13.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for the same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	[✓]		

		YES	NO	N/A
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the Contract-Problems/ Non-Compliance section of the "Data Assessment Narrative".			
A.1.13.2	Circle on each Form III all calibration blank values that are above CRDL (or 2 x IDL when IDL > CRDL).			
	Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	[✓]	___	___
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) positive sample results when raw sample value is less than or equal to calibration blank value analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank outside the control limits.			
A.1.14	FORM III (Preparation Blank) - (Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.14.1	Was one prep. blank analyzed for:			
	each Sample Delivery Group (SDG)?	[✓]	___	___
	each batch of digested samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the associated positive data <10 x IDLs for which prep. blank was not analyzed.			
	NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			

		YES	NO	N/A
A.1.14.2	Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?	___	[✓]	___
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep.blank?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value.			
A.1.14.3	Is concentration of prep. blank value (Form III) less than two times IDL, when IDL is greater than CRDL?	[✓]	___	___
	ACTION: If no, reject (red-line) all positive sample results when sample raw data are less than 10 times the prep. blank value.			
A.1.14.4	Is concentration of prep. blank below the negative CRDL?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated sample results less than 10xCRDL.			
A.1.15	Form IV (ICP Interference Check Sample)			
A.1.15.1	Present and complete?	[✓]	___	___
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all the samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.15.2	Circle all values on each Form IV that are more than ± 20% of true or established mean value.			
	Are all Interference Check Sample results inside the control limits (± 20%)?	[✓]	___	___
	If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			
A.1.16	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.16.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each conc. range (i.e. low, med., high)?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the positive data less than four times the spiking levels specified in SOW for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.16.2	Was field blank used for spiked sample?	___	[✓]	___
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
A.1.16.3	Circle on each Form VA all spike recoveries that are outside control limits (75% to 125%).			
	Are all recoveries within control limits?	[___]	✓	___
	If no, is sample concentration greater than or equal to four times spike concentration?	[___]	✓	___

	YES	NO	N/A
ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[ ]	✓	
ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".			

A.1.16.4 Aqueous

Are any spike recoveries:

(a) less than 30%?		[✓]	
(b) between 30-74%?	✓	[ ]	
(c) between 126-150%?		[✓]	
(d) greater than 150%?		[✓]	

ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".

A.1.16.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	✓	[ ]	
(b) between 10-74%?	✓	[ ]	
(c) between 126-200%?		[✓]	
(d) greater than 200%?		[✓]	

		YES	NO	N/A
	ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".			
A.1.17	Form VI (Lab Duplicates)			
A.1.17.1	Present and complete for: each SDG?	[✓]		
	each matrix type?	[✓]		
	each concentration range (i.e. low, med., high)?	[✓]		
	both AA and ICP when both are used for the same analyte?	[ ]		✓
	ACTION: If no for any the above, flag as estimated (J) all the data ≥CRDL* for which duplicate sample was not analyzed.			
	Note: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated.			
	2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in ug/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.17.2	Was field blank used for duplicate analysis?		[✓]	
	ACTION: If yes, flag all data ≥CRDL* as estimated (J) for which field blank was used as duplicate.			
A.1.17.3	Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	[ ]	✓	
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[✓]		
	ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".			

* Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.
2. If the result of lab duplicate analyzed by GFAA is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria to metals analyzed by GFAA.

A.1.17.4 Aqueous

Circle on each Form VI all values that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[✓]	___
Is any difference** between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

A.1.17.5 Soil/Sediment

Circle on each Form VI all values that are:

RPD > 100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[✓]	___
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[✓]	___

*Substitute IDL for CRDL when IDL > CRDL.
**Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
	ACTION: If yes, flag the associated data as estimated.			
A.1.18	**Field Duplicates**			
A.1.18.1	Were field duplicates analyzed?	[ ]		✓

ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.

NOTE:
1. Do not calculate RPD when both values are less than IDL.
2. Flag all associated data only for field duplicate pair.

A.1.18.2 **Aqueous**

Circle all values on self prepared Form VI for field duplicates that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?		[✓]	
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?		[✓]	

ACTION: If yes, flag the associated data as estimated.

* Substitute IDL for CRDL when IDL > CRDL.
Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.18.3	**Soil/Sediment**			
	Circle all values on self prepared Form VI for field duplicates that are:			
	RPD >100%, or			
	Difference > 2 x CRDL*			
	Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) : >100%?	___	[✓]	___
	Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL): >2x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated.			
A.1.19	**Form VII (Laboratory Control Sample)** (Note: LCS - not required for aqueous Hg and cyanide analyses.)			
A.1.19.1	Was one LCS prepared and analyzed for:			
	each SDG?	[✓]	___	___
	each batch samples digested/distilled?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all the data for which LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.19.2	**Aqueous LCS**			
	Circle on each Form VII the LCS percent recoveries outside control limits (80 - 120%) except for aqueous Ag and Sb.			
	Is any LCS recovery: less than 50%?	___	[✓]	___
	between 50% and 79%?	___	[✓]	___
	between 121% and 150%?	___	[✓]	___
	greater than 150%?	___	[✓]	___

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.19.3	**Solid LCS**			

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).
2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

Is LCS "Found" value higher than the control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated positive data as estimated.

Is LCS "Found" value lower than the Control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated data as estimated.

		YES	NO	N/A
A.1.20	**Form IX (ICP Serial Dilution)** -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.20.1	Was Serial Dilution analysis performed for:			
	each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med.)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated all the positive data ≥ 10xIDLs or ≥ CRDL when 10xIDL ≤ CRDL for which Serial Dilution Analysis was not performed.			
A.1.20.2	Was field blank(s) used for Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J). If 10xIDL ≤ CRDL, flag all data ≥ CRDL.			
A.1.20.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.20.4	Circle on each Form IX all percent difference that are outside the control limits for initial concentrations equal to or greater than 10 x IDLs only.			
	Are any % difference values:			
	> 10%?	___	[✓]	___
	≥ 100%?	___	[✓]	___

		YES	NO	N/A
	ACTION: Flag as estimated (J) all the associated sample data ≥ 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which percent difference is greater than 10% but less than 100%. Reject (red-line) all the associated sample results equal to or greater than 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which PD is greater than or equal to 100%.			
	Note: Flag or reject on Form I's only the sample results whose associated raw data are ≥ 10xIDL (or ≥ CRDL when 10xIDL≤ CRDL)			
A.1.21	Furnace Atomic Absorbtion (AA) QC Analysis			
A.1.21.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	___	___
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
A.1.21.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]	___	___
	Was a dilution analyzed for sample with analytical spike recovery less than 40%?	[✓]	___	___
	ACTION: If no for any of the above, flag all the associated data as estimated.			
A.1.21.3	Is *analytical spike recovery outside the control limits (85-115%) for any sample?	✓	[✓] PBH 8/5/92	___
	ACTION: If yes, flag as estimated the affected sample results if the recovery is between 10-84%; if the recovery is between 115-200%, flag the associated positive sample results as estimated; reject the associated sample results if the recovery is less than 10%; reject positive sample results if the recovery is greater than 200%.			

* Analytical spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
	NOTE: Reject or flag the data only when the affected sample(s) was not subsequently analyzed by Method of Standard Addition.			
A.1.22	**Form VIII (Method of Standard Addition Results)**			
A.1.22.1	Present?	[✓]		
	If no, is any Form I result coded with "S" or a "+"?		[✓]	
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.22.2	Is coefficient of correlation for MSA less than 0.990 for any sample?		[✓]	
	ACTION: If yes, reject (red-line) the affected data.			
A.1.22.3	Was *MSA required for any sample but not performed?		[✓]	
	Is coefficient of correlation for MSA less than 0.995?		[✓]	
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?		[✓]	
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.22.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-23?	[✓]		
	ACTION: If no, note exception under Contract Problem/ Non-Compliance section of the "Data Assessment Narrative", and prepare a separate list.			

MSA is not required on LCS and prep. blank.

		YES	NO	N/A
A.1.23	**Dissolved/Total or Inorganic/Total Analytes** -			
A.1.23.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	___	[___]	✓
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	___	[___]	✓
	NOTE: 1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration. 2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents. 3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.			
A.1.23.2	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	___	[___]	✓
A.1.23.3	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?	___	[___]	✓
	ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.			
A.1.24	**Form I (Field Blank)** -			
	(Note: Designate "Field Blank" as such on Form I.)			
A.1.24.1	Circle all field blank values on Form I that are greater than CRDL, (or 2 x IDL when IDL > CRDL).			
	Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓

	YES	NO	N/A
If no, was field blank value already rejected due to other QC criteria?	[ ]		✓

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value. Reject on Form I's the soil sample results that when converted to ug/L on wet basis are less than or equal to five times the field blank value in ug/L.

A.1.25 Form X, XI, XII (Verification of Instrumental Parameters).

A.1.25.1 Is verification report present for:

Instrument Detection Limits (quarterly)?	[✓]		
ICP Interelement Correction Factors (annually)?	[✓]		
ICP Linear Ranges (quarterly)?	[✓]		

ACTION: If no, contact TPO of the lab.

A.1.25.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)

A.1.25.2.1 Are IDLs present for: all the analytes?	[✓]		
all the instruments used?	[✓]		
For both AA and ICP when both are used for the same analyte?	[ ]		✓

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.25.2.2 Is IDL greater than CRDL for any analyte?		[✓]	
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	[✓]		

	YES	NO	N/A
Action : If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			
A.1.25.3 **Form XI (Linear Ranges)**			
A.1.25.3.1 Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___

ACTION: If no, flag the result reported on Form I as estimated(J).

A.1.26 **Percent Solids of Sediments**

A.1.26.1 Are percent solids in sediment(s): < 50%?	___	[✓]	___
< 10%?	___	[✓]	___

ACTION: If yes, qualify as estimated all the results of a sample that has per cent solids between 10%-50% (i.e. moisture content between 50%-90%). Reject all the results of a sample that has per cent solids less than 10% (i.e. moisture content greater than 90%).

NOTE: Reject or flag(J) only the sample results that were not previously rejected or flaged due to other QC criteria.

Case# NWS Site Naval Weapons Station Matrix: Soil ✓

SDG# CLP 618 Lab Roy F. Weston Water ✓

Contractor Roy F. Weston Reviewer Paul B. Hunsby (Heartland ESI) Other

A.2.1 Validation Flags- The following flags have been applied in red by the data validator and must be considered by the data user.

J- This flag indicates the result qualified as estimated

Red- Line- A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

Fully Usable Data- The results that do not carry "J" or "red-line" are fully usable.

Contractual Qualifiers- The legend of contractual qualifiers applied by the lab on Form I's is found on page B-20 of SOW IIM01.0.

A.2.2 The data assessment is given below and on the attached sheets.

1. The CRDL Standard for Arsenic for waters was above the upper control limit. All positive results between IDL and 20 µg/L are qualified as estimated.

The CRDL Standard for Lead for soils was above the upper control limit. All positive results between IDL and 6 µg/L are qualified as estimated.

2. The Matrix Spike Recoveries for Chromium and Zinc for soils were below 10%. All data

A.2.2 (continuation)

is rejected.

3. The Matrix Spike recoveries for soils for Cadmium, Copper, Selenium and Silver and for waters for Beryllium and Lead were below the lower control limit. All data is qualified as estimated.

4. The post digestion spikes for Thallium were above the upper control limit for samples 13-001, 27-001, 27-002 and 270001. All positive results are estimated.

BBH 8/5/91

A.2.3 Contract-Problem/Non-Compliance

The ICV and Midrange standards for Cyanide were not distilled as required by Protocol. The water sample was not flagged correctly nor did the Case Narrative explain the the QC for waters would be found in CLP 627.

PBH 8/5/92

MMB/ESAT Rviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hively Date: 8/5/92
Signature

Verified by: _____ Date: _____

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

e of Review: 8/5/92 Date: 8/5/92 Case #: CLP NWS

e: Naval Weapons Station Lab Name: Roy F. Weston

iewer's Initials: PBH Number of Samples: 8 Samples

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
P						2							2	
ame AA														
rnace AA														
rcury														
tal						2							2	
her														

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

P						4							4	
ame AA														
rnace AA		2				2						1	5	
rcury														
tal		2				6						1	9	
her														

te:
Asterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Checklist

Date: Jan. 1992
Number: HW-2
Revision: 11

Inorganic Analysis

INORGANIC REGIONAL DATA ASSESSMENT

Region II

ASE NO. NWS

SITE Naval Weapons Station

ABORATORY Roy F. Weston

NO. OF SAMPLES/ MATRIX 7 soils 1 water

OG# CLP 640

REVIEWER (IF NOT ESD) Heartland ESI

OW# 390

REVIEWER'S NAME Paul B. Hunbury

PO: ACTION _____ FYI _____

COMPLETION DATE 8/5/92

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
.	HOLDING TIMES	O	O	O	O
.	CALIBRATIONS				
.	BLANKS				
.	ICS				
.	LCS				
.	DUPLICATE ANALYSIS				
.	MATRIX SPIKE	2			
.	MSA				
.	SERIAL DILUTION	O			
0.	SAMPLE VERIFICATION				
1.	OTHER QC				
2.	OVERALL ASSESSMENT				

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

ITION ITEMS: _____

REAS OF CONCERN: _____

ATABLE PERFORMANCE: _____

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

August 7, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Seven (7) short list metal soil samples and one (1) water sample were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
24-001	920661101
24-002	920661102
24-101	920661103
24-004	920661104
25-001	920661105
25-002	920661106
25-004	920661107

Heartland ESI has reviewed the data for the samples listed above TAL Metals using Region II Data Validation Protocol, January 1992 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAL Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 920611**, the analysis of seven (7) short list soil samples and one (1) water sample. Overall, the inorganic data quality was fair. The USEPA CLP analytical protocol was followed as required.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standard for Lead for soils was below the lower control limit. All positive and non-detect results within the controlled area are qualified as estimated, "J" or "UJ".

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

2. The Matrix Spike recovery for Lead for soils were below 10%. All data is rejected.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All soil samples	Pb	+/U	J/UJ	1
All soil samples	Pb	+/U	R	2

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

U.S. EPA CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

24-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661101

Level (low/med): LOW Date Received: 6/09/92

% Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.81	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	2.20			P
7440-48-4	Cobalt				NR
7440-50-8	Copper	1.42	U		P
7439-89-6	Iron				NR
7439-92-1	Lead	~~9.95~~		~~N~~	~~F~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1.30	B		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP 000023

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

24-002

ab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661102

Level (low/med): LOW Date Received: 6/09/92

% Solids: 97.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.80	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1.40	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper	1.40	U		P
7439-89-6	Iron				NR
7439-92-1	Lead	~~9.00~~		~~NS~~	~~F~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1.30	B		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

FORM I - IN 03/90

U.S. EPA 000024 CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

24-101

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661103

Level (low/med): LOW Date Received: 6/09/92

% Solids: 97.1

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.80	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1.41	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper	1.41	U		P
7439-89-6	Iron				NR
7439-92-1	Lead	~~6.40~~		~~NS~~	~~F~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1.20	B		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP 0100025

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

24-004

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661104

Level (low/med): LOW Date Received: 6/09/92

% Solids: 94.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.80	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	2.40			P
7440-48-4	Cobalt				NR
7440-50-8	Copper	1.40	U		P
7439-89-6	Iron				NR
7439-92-1	Lead	~~6.30~~		~~NS~~	~~P~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1.50	B		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA -CLP- 0026

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

25-001

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661105

Level (low/med): LOW Date Received: 6/09/92

% Solids: 96.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.83	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1.60	B		P
7440-48-4	Cobalt				NR
7440-50-8	Copper	3.50	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	~~11.90~~		~~N~~	~~F~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1.40	B		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

25-002

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661106

Level (low/med): LOW Date Received: 6/09/92

% Solids: 93.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.80	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1.40	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper	5.30			P
7439-89-6	Iron				NR
7439-92-1	Lead	~~61.80~~		N	~~F~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	1.20			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

25-004

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix (soil/water): SOIL Lab Sample ID: 920661107

Level (low/med): LOW Date Received: 6/09/92

% Solids: 99.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	.79	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1.38	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper	82.60			P
7439-89-6	Iron				NR
7439-92-1	Lead	~~406.00~~		~~NS~~	~~F~~ 2
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	2.90	B		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

25-001S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 96.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium	75-125	8.7000		.8336	U	10.40	83.2		P
Calcium									NR
Chromium	75-125	36.3000		1.6000	B	41.70	83.2		P
Cobalt									NR
Copper	75-125	50.0000		3.5000	B	52.10	89.3		P
Iron									NR
Lead	75-125	9.5400		11.9000		4.16	-57.1	N	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc	75-125	88.6000		1.4000	B	104.20	85.0		P
Cyanide									NR

Comments:

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

25-001D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP611

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

% Solids for Sample: 96.0 % Solids for Duplicate: 96.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium		.8336	U	.8336	U			P
Calcium								NR
Chromium		1.6000	B	1.4588	U	200.0		P
Cobalt								NR
Copper		3.5000	B	3.5000	B	1.8		P
Iron								NR
Lead		11.9000		10.3000		15.0		F
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc		1.4000	B	1.6000	B	13.3		P
Cyanide								NR

FORM VI - IN

03/90

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present?	[ ]		✓
Legible?	[ ]		✓
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

A.1.6	Form I to IX	Yes	No	N/A
A.1.6.1	Are all the Form I through Form IX labeled with:			
	Laboratory name?	[✓]	___	___
	Case/SAS number?	[✓]	___	___
	EPA sample No.?	[✓]	___	___
	SDG No.?	[✓]	___	___
	Contract No.?	[✓]	___	___
	Correct units?	[✓]	___	___
	Matrix?	[✓]	___	___

ACTION: If no for any of the above, note under Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.6.2	Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
	(NOTE: Check all forms against raw data.)			
	(a) all analytes analyzed by ICP?	[✓]	___	___
	(b) all analytes analyzed by GFAA?	[✓]	___	___
	(c) all analytes analyzed by AA Flame?	[___]	___	✓
	(d) Mercury?	[___]	___	✓
	(e) Cyanide?	[___]	___	✓

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.1: Data Assessment - Contract Compliance (Total Review)

Date: Jan. 1992
Number: HW-2
Revision: 11

		YES	NO	N/A
A.1.7	**Raw Data**			
A.1.7.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]	___	___
	Digestion Log for furnace AA Form XIII present?	[✓]	___	___
	Distillation Log for mercury Form XIII present?	[___]	___	✓
	Distillation Log for cyanides Form XIII present?	[___]	___	✓
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]	___	___
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[✓]	___	___
	Are preparation dates present on sample preparation logs/bench sheets?	[✓]	___	___
A.1.7.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[___]	___	✓
	Cyanides	[___]	___	✓
A.1.7.3	Are all raw data to support all sample analyses and QC operations present?	[✓]	___	___
	Legible?	[✓]	___	___
	Properly Labeled?	[✓]	___	___

ACTION: If no for any of the above questions in sections A.1.7.1 through A.1.7.3, write Telephone Record Log and contact laboratory for resubmittals.

		YES	NO	N/A
A.1.8	**Holding Times** - (aqueous and soil samples)			
	(Examine sample traffic reports and digestion/distillation logs.)			
	Mercury analysis (28 days). . . . . exceeded?	___	[___]	✓
	Cyanide distillation (14 days). . . . . exceeded?	___	[___]	✓
	Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___
	NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.			
	ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.			
A.1.8.2	Is pH of aqueous samples for: Metals Analysis >2?	___	[✓]	___
	Cyanides Analysis <12?	___	[___]	✓
	Action: If yes, flag the associated metals and cyanides data as estimated.			
A.1.9	Form I (Final Data)			
A.1.9.1	Are all Form I's present and complete?	[✓]	___	___
	ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
A.1.9.2	Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]	___	___
	Are soil sample results for each parameter corrected for percent solids?	[✓]	___	___
	Are all "less than IDL" values properly coded with "U"?	[✓]	___	___

		YES	NO	N/A
	Are the correct concentration qualifiers used with final data?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log, and contact laboratory for corrected data.			
A.1.9.3	Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	___	___
	Was a brief physical description of samples given on Form I's?	[✓]	___	___
	Was the dilution of any sample diluted beyond the requirements of the contract noted on Form I or Form XIV?	___	[✓]	___
	ACTION: If no for any of the above, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.10	Calibration			
A.1.10.1	Is record of at least 2 point calibration present for ICP analysis?	[✓]	___	___
	Is record of 5 point calibration present for Hg analysis?	[___]	___	✓
	Is record of 4 point calibration present for:			
	Flame AA?	[___]	___	✓
	Furnace AA?	[✓]	___	___
	Cyanides?	[___]	___	✓
	Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	[✓]	___	___

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

		YES	NO	N/A
A.1.10.2	Is correlation coefficient less than 0.995 for:			
	Mercury Analysis?	___	[___]	✓
	Cyanide Analysis?	___	[___]	✓
	Atomic Absorption Analysis?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

NOTE: The data validator shall calculate the correlation coefficient using concentrations of the standards and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.10.3	In the instance where less than 4 standards are measured in absorbance (or peak area, peak height,etc.) mode, are the remaining standards analyzed in concentration mode immediately after calibration within ±10% of the true values?	[___]	___	✓

ACTION: If no, flag the associated data as estimated if standards are not within ±10% of true values. Do not flag the data as estimated in linear range indicated by good recovery of standard(s).

A.1.11 Form II A (Initial and Continuing Calibration Verification)-

A.1.11.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.11.2	Circle on each Form IIA all percent recoveries that are outside the contract windows. Are all calibration standards (initial and continuing) within control limits:			
	Metals- 90-110%R?	[✓]	___	___
	Hg - 80-120%R?	[___]	___	✓
	Cyanides- 85-115%R?	[___]	___	✓

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ) if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
A.1.11.3 Was continuing calibration performed every 10 samples or every 2 hours?	[✓]	___	___
Was ICV for cyanides distilled?	[___]	___	✓
ACTION: If no for any of the above, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.12 Form II B (CRDL Standards for AA and ICP) -			
A.1.12.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?	[✓]	___	___
Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[___]	___	✓
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]	___	___
ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are: AA Analysis - **True Value ± CRDL; ICP Analysis - **True Value ± 2CRDL; CN Analysis - **True Value ± 0.5 x True Value.			

**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL. Compute the concentration of the missing mid-range standard from the calibration range.

		YES	NO	N/A
A.1.12.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.12.3	Circle on each Form IIB all the percent recoveries that are outside the acceptance windows.			
	Are CRA and CRI standards within control limits:			
	Metals 80 - 120%R?	[ ]	✓	
	Is mid-range standard within control limits:			
	Cyanide 80 - 120%R?	[ ]		✓
	ACTION: Flag as estimated all sample results within the affected range if the recovery of the standard is between 50-79%; flag only positive data within the affected range if the recovery is between 121-150%; reject all data within the affected range if the recovery is less than 50%; reject only positive data within the affected range if the recovery is greater than 150%. Qualify 50% of the samples on either side of CRI standard outside the control limits.			
	Note: Flag or reject the final results only when sample raw data are within the affected ranges and the CRDL standards are outside the acceptance windows.			
A.1.13	Form III (Initial and Continuing Calibration Blanks)			
A.1.13.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for the same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	[✓]		

		YES	NO	N/A
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the Contract-Problems/ Non-Compliance section of the "Data Assessment Narrative".			
A.1.13.2	Circle on each Form III all calibration blank values that are above CRDL (or 2 x IDL when IDL > CRDL).			
	Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	[✓]	___	___
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) positive sample results when raw sample value is less than or equal to calibration blank value analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank outside the control limits.			
A.1.14	FORM III (Preparation Blank) - (Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.14.1	Was one prep. blank analyzed for:			
	each Sample Delivery Group (SDG)?	[✓]	___	___
	each batch of digested samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the associated positive data <10 x IDLs for which prep. blank was not analyzed.			
	NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			

		YES	NO	N/A
A.1.14.2	Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?	___	[✓]	___
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep.blank?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value.			
A.1.14.3	Is concentration of prep. blank value (Form III) less than two times IDL, when IDL is greater than CRDL?	[✓]	___	___
	ACTION: If no, reject (red-line) all positive sample results when sample raw data are less than 10 times the prep. blank value.			
A.1.14.4	Is concentration of prep. blank below the negative CRDL?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated sample results less than 10xCRDL.			
A.1.15	Form IV (ICF Interference Check Sample)			
A.1.15.1	Present and complete?	[✓]	___	___
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all the samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.15.2	Circle all values on each Form IV that are more than ± 20% of true or established mean value.			
	Are all Interference Check Sample results inside the control limits (± 20%)?	[✓]	___	___
	If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			
A.1.16	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.16.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each conc. range (i.e. low, med., high)?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the positive data less than four times the spiking levels specified in SOW for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.16.2	Was field blank used for spiked sample?	___	[✓]	___
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
A.1.16.3	Circle on each Form VA all spike recoveries that are outside control limits (75% to 125%).			
	Are all recoveries within control limits?	[___]	✓	___
	If no, is sample concentration greater than or equal to four times spike concentration?	[___]	✓	___

	YES	NO	N/A
ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[✓]	___	___

ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".

A.1.16.4 Aqueous

Are any spike recoveries:

(a) less than 30%?	✗	[___]	✓
(b) between 30-74%?	___	[✗]	✓
(c) between 126-150%?	___	[✗]	✓
(d) greater than 150%?	___	[✗]	✓

PBH 8/5/92

ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".

A.1.16.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	✓	[___]	✓
(b) between 10-74%?	___	[✓]	___
(c) between 126-200%?	___	[✓]	___
(d) greater than 200%?	___	[✓]	___

		YES	NO	N/A
	ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".			
A.1.17	Form VI (Lab Duplicates)			
A.1.17.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any the above, flag as estimated (J) all the data ≥CRDL* for which duplicate sample was not analyzed.			
	Note: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated.			
	2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in ug/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.17.2	Was field blank used for duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag all data ≥CRDL* as estimated (J) for which field blank was used as duplicate.			
A.1.17.3	Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[✓]	___	___
	ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".			

Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.
2. If the result of lab duplicate analyzed by GFAA is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria to metals analyzed by GFAA.

A.1.17.4 Aqueous

Circle on each Form VI all values that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[___]	✓
Is any difference** between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[___]	✓

ACTION: If yes, flag the associated data as estimated.

A.1.17.5 Soil/Sediment

Circle on each Form VI all values that are:

RPD > 100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[✓]	___
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[✓]	___

*Substitute IDL for CRDL when IDL > CRDL.
**Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
	ACTION: If yes, flag the associated data as estimated.			
A.1.18	Field Duplicates			
A.1.18.1	Were field duplicates analyzed?	[___]	✓	X PBH 8/5/92

ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.

NOTE: 1. Do not calculate RPD when both values are less than IDL.
2. Flag all associated data only for field duplicate pair.

A.1.18.2 Aqueous

Circle all values on self prepared Form VI for field duplicates that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[___]	✓
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[___]	✓

ACTION: If yes, flag the associated data as estimated.

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.18.3	**Soil/Sediment**			
	Circle all values on self prepared Form VI for field duplicates that are:			
	RPD >100%, or			
	Difference > 2 x CRDL*			
	Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) : >100%?	___	[___]	✓
	Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL): >2x *CRDL?	___	[___]	✓
	ACTION: If yes, flag the associated data as estimated.			
A.1.19	**Form VII (Laboratory Control Sample)** (Note: LCS - not required for aqueous Hg and cyanide analyses.)			
A.1.19.1	Was one LCS prepared and analyzed for:			
	each SDG?	[✓]	___	___
	each batch samples digested/distilled?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all the data for which LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.19.2	**Aqueous LCS**			
	Circle on each Form VII the LCS percent recoveries outside control limits (80 - 120%) except for aqueous Ag and Sb.			
	Is any LCS recovery: less than 50%?	___	[___]	✓
	between 50% and 79%?	___	[___]	✓
	between 121% and 150%?	___	[___]	✓
	greater than 150%?	___	[___]	✓

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.19.3	**Solid LCS**			
	NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J). 2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.			
	Is LCS "Found" value higher than the control limits on Form VII?	___	[✓]	___
	ACTION: If yes, qualify all associated positive data as estimated.			
	Is LCS "Found" value lower than the Control limits on Form VII?	___	[✓]	___
	ACTION: If yes, qualify all associated data as estimated.			

		YES	NO	N/A
A.1.20	**Form IX (ICP Serial Dilution)** -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.20.1	Was Serial Dilution analysis performed for:			
	each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med.)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated all the positive data ≥ 10xIDLs or ≥ CRDL when 10xIDL ≤ CRDL for which Serial Dilution Analysis was not performed.			
A.1.[illegible]2	Was field blank(s) used for Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J). If 10xIDL ≤ CRDL, flag all data ≥ CRDL.			
A.1.20.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.20.4	Circle on each Form IX all percent difference that are outside the control limits for initial concentrations equal to or greater than 10 x IDLs only.			
	Are any % difference values:			
	> 10%?	___	[✓]	___
	≥ 100%?	___	[✓]	___

		YES	NO	N/A
	ACTION: Flag as estimated (J) all the associated sample data ≥ 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which percent difference is greater than 10% but less than 100%. Reject (red-line) all the associated sample results equal to or greater than 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which PD is greater than or equal to 100%.			
	Note: Flag or reject on Form I's only the sample results whose associated raw data are ≥ 10xIDL (or ≥ CRDL when 10xIDL≤ CRDL)			
A.1.21	Furnace Atomic Absorbtion (AA) QC Analysis			
A.1.21.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	___	___
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
A.1.21.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]	___	___
	Was a dilution analyzed for sample with analytical spike recovery less than 40%?	[✓]	___	___
	ACTION: If no for any of the above, flag all the associated data as estimated.			
A.1.21.3	Is *analytical spike recovery outside the control limits (85-115%) for any sample?	___	[✓]	___
	ACTION: If yes, flag as estimated the affected sample results if the recovery is between 10-84%; if the recovery is between 115-200%, flag the associated positive sample results as estimated; reject the associated sample results if the recovery is less than 10%; reject positive sample results if the recovery is greater than 200%.			

*Analytical spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
	NOTE: Reject or flag the data only when the affected sample(s) was not subsequently analyzed by Method of Standard Addition.			
A.1.22	**Form VIII (Method of Standard Addition Results)**			
A.1.22.1	Present?	[✓]	___	___
	If no, is any Form I result coded with "S" or a "+"?	___	[✓]	___
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.22.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	___	[✓]	___
	ACTION: If yes, reject (red-line) the affected data.			
A.1.22.3	Was *MSA required for any sample but not performed?	___	[✓]	___
	Is coefficient of correlation for MSA less than 0.995?	___	[✓]	___
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	___	[✓]	___
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.22.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-23?	[✓]	___	___
	ACTION: If no, note exception under Contract Problem/ Non-Compliance section of the "Data Assessment Narrative", and prepare a separate list.			

* MSA is not required on LCS and prep. blank.

		YES	NO	N/A
A.1.23	**Dissolved/Total or Inorganic/Total Analytes** -			
A.1.23.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	___	[✓]	___
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	___	[___]	✓
	NOTE: 1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration. 2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents. 3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.			
A.1.23.2	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	___	[✓]	___
A.1.23.3	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?	___	[✓]	___
	ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.			
A.1.24	**Form I (Field Blank)** -			
	(Note: Designate "Field Blank" as such on Form I.)			
A.1.24.1	Circle all field blank values on Form I that are greater than CRDL, (or 2 x IDL when IDL > CRDL).			
	Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓

	YES	NO	N/A
If no, was field blank value already rejected due to other QC criteria?	[ ]		✓

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value. Reject on Form I's the soil sample results that when converted to ug/L on wet basis are less than or equal to five times the field blank value in ug/L.

A.1.25 Form X, XI, XII (Verification of Instrumental Parameters).

A.1.25.1 Is verification report present for:

	YES	NO	N/A
Instrument Detection Limits (quarterly)?	[✓]		
ICP Interelement Correction Factors (annually)?	[✓]		
ICP Linear Ranges (quarterly)?	[✓]		

ACTION: If no, contact TPO of the lab.

A.1.25.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)

	YES	NO	N/A
A.1.25.2.1 Are IDLs present for: all the analytes?	[✓]		
all the instruments used?	[✓]		
For both AA and ICP when both are used for the same analyte?	[ ]		✓

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

	YES	NO	N/A
A.1.25.2.2 Is IDL greater than CRDL for any analyte?		[✓]	
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	[✓]		

	YES	NO	N/A
Action : If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			
A.1.25.3 **Form XI (Linear Ranges)**			
A.1.25.3.1 Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___
ACTION: If no, flag the result reported on Form I as estimated(J).			
A.1.26 **Percent Solids of Sediments**			
A.1.26.1 Are percent solids in sediment(s): < 50%?	___	[✓]	___
< 10%?	___	[✓]	___

ACTION: If yes, qualify as estimated all the results of a sample that has per cent solids between 10%-50% (i.e. moisture content between 50%-90%). Reject all the results of a sample that has per cent solids less than 10% (i.e. moisture content greater than 90%).

NOTE: Reject or flag(J) only the sample results that were not previously rejected or flaged due to other QC criteria.

Case#	NWS	Site	Naval Weapon Station	Matrix: Soil	✓
SDG#	CLP 611	Lab	Roy F. Weston	Water	
Contractor	Roy F. Weston	Reviewer	Heartland EST	Other	

A.2.1 Validation Flags- The following flags have been applied in red by the data validator and must be considered by the data user.

J- This flag indicates the result qualified as estimated

Red- Line- A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

Fully Usable Data- The results that do not carry "J" or "red-line" are fully usable.

Contractual Qualifiers- The legend of contractual qualifiers applied by the lab on Form I's is found on page B-20 of SOW ILM01.0.

A.2.2 The data assessment is given below and on the attached sheets.

1. The CRDL Standard for Lead was below the lower control limit. All data between the non-detect results and 6 ug/L will be qualified as estimated.
2. The Matrix Spike Recovery was below 10%. All positive and non-detect results are rejected.

PBH 8/5/92

A.2.3 Contract-Problem/Non-Compliance

PBH 8/5/92

MMB/ESAT Rviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hornby Date: 8/5/92
Signature

Verified by: _____ Date: _____

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

f Review: 8/5/92 Date: 8/5/92 Case #: CLP 611

: Naval Weapons Station Lab Name: Roy F. Weston

ewer's Initials: PBH Number of Samples: 2 soil samples

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
ine AA														
nace AA						1							1	
cury														
al														
er						1							1	

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

ine AA														
nace AA		1											1	
cury														
al		1											1	
er														

te:
Asterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Checklist

Date: Jan. 1992
Number: HW-2
Revision: 11

Inorganic Analysis

INORGANIC REGIONAL DATA ASSESSMENT

Region II

ASE NO. NWS

SITE Naval Weapons Station

ABORATORY Roy F. Weston

NO. OF SAMPLES/ MATRIX 7 soil samples

OG# CLP 611

REVIEWER (IF NOT ESD) Heartland EST

ON# 390

REVIEWER'S NAME Paul B. Humby

PO: ACTION _____ FYI _____

COMPLETION DATE 8/5/92

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CYANIDE
HOLDING TIMES	O	O	NA	NA
CALIBRATIONS	↓	↓	↓	↓
BLANKS	↓	↓	↓	↓
ICS	↓	↓	↓	↓
LCS	↓	↓	↓	↓
DUPLICATE ANALYSIS	↓	↓	↓	↓
MATRIX SPIKE	↓	Z	↓	↓
MSA	↓	O	↓	↓
SERIAL DILUTION	↓	↓	↓	↓
SAMPLE VERIFICATION	↓	↓	↓	↓
OTHER QC	↓	↓	↓	↓
OVERALL ASSESSMENT	↓	↓	↓	↓

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

CTION ITEMS: _____

REAS OF CONCERN: _____

TABLE PERFORMANCE: _____

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

August 7, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Three (3) field water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-001	920677001
01-003	920677002
01-301	920677003

Heartland ESI has reviewed the data for the samples listed above TAL Metals using Region II Data Validation Protocol, January 1992 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAL Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 920770**, the analysis of three (3) field water samples and one (1) matrix spike and duplicate pair. Overall, the inorganic data quality was fair. The USEPA CLP analytical protocol was followed as required.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

1. The Matrix Spike recovery for Arsenic was below 30%. All data is rejected.

2. The Matrix Spike recoveeries for Antimony and Selenium were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

3. The Matrix Spike recovery for Chromium was above the upper control limit. All positive results are qualified as estimated, "J".

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

4. The Serial dilutions for waters for Barium, Chromium, Copper, Manganese and Zinc were outside the control limit. All positive results greater than 10 times the IDL are qualified as estimated,"J".

MSA

5. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Selenium	01-001, 01-003 and 01-301.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	As	+/U	R	1
All water samples	Sb and Se	+/U	J/UJ	2
All water samples	Cr	+	J	3
All water samples	Ba, Cr, Cu, Mn and Zn.	+	J	4
01-001, 01-003 and 01-301.	Se	+/U	J/UJ	5

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-001

ab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP770

Matrix (soil/water): WATER Lab Sample ID: 920677001

Level (low/med): LOW Date Received: 6/24/92

% 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	31000.00			P	
7440-36-0	Antimony	44.00	U	N	P	UJ2
7440-38-2	Arsenic	~~2.00~~	~~U~~	~~N~~	~~F~~	R1
7440-39-3	Barium	220.00		E	P	J4
7440-41-7	Beryllium	6.00			P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	4440.00	B		P	
7440-47-3	Chromium	538.00		NE	P	J3,4
7440-48-4	Cobalt	19.90	B		P	
7440-50-8	Copper	26.70			P	J4
7439-89-6	Iron	75700.00			P	
7439-92-1	Lead	12.50			F	
7439-95-4	Magnesium	6200.00			P	
7439-96-5	Manganese	110.00		E	P	J4
7439-97-6	Mercury	.11	B		CV	
7440-02-0	Nickel	18.50	B		P	
7440-09-7	Potassium	13700.00			P	
7782-49-2	Selenium	2.00	U	WN	F	UJ2,5
7440-22-4	Silver	6.20	B		P	
7440-23-5	Sodium	2430.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	172.00			P	
7440-66-6	Zinc	652.00		E	P	J4
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP 000020

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

01-003

ab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP770

Matrix (soil/water): WATER Lab Sample ID: 920677002

Level (low/med): LOW Date Received: 6/24/92

% 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	16800.00			P	
7440-36-0	Antimony	44.00	U	N	P	UJ2
7440-38-2	Arsenic	~~2.40~~	~~B~~	~~N~~	~~F~~	R1
7440-39-3	Barium	50.60	B	E	P	
7440-41-7	Beryllium	2.30	B		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	2290.00	B		P	
7440-47-3	Chromium	245.00		NE	P	J3,4
7440-48-4	Cobalt	6.40	B		P	
7440-50-8	Copper	7.00	B		P	
7439-89-6	Iron	40400.00			P	
7439-92-1	Lead	7.20			F	
7439-95-4	Magnesium	3860.00	B		P	
7439-96-5	Manganese	45.40		E	P	J4
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	7130.00			P	
7782-49-2	Selenium	2.00	U	NW	F	UJ2,5
7440-22-4	Silver	6.00	U		P	
7440-23-5	Sodium	3000.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	88.90			P	
7440-66-6	Zinc	66.70		E	P	J4
	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.

01-301

ab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP770

Matrix (soil/water): WATER Lab Sample ID: 920677003

Level (low/med): LOW Date Received: 6/24/92

% 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	8610.00			P	
7440-36-0	Antimony	44.00	U	N	P	UJ2
7440-38-2	Arsenic	~~2.80~~	~~B~~	~~N~~	~~F~~	R1
7440-39-3	Barium	37.90	B	E	P	
7440-41-7	Beryllium	1.70	B		P	
7440-43-9	Cadmium	4.00	U		P	
7440-70-2	Calcium	2000.00	B		P	
7440-47-3	Chromium	122.00		NE	P	J3,4
7440-48-4	Cobalt	6.00	U		P	
7440-50-8	Copper	5.40	B		P	
7439-89-6	Iron	21300.00			P	
7439-92-1	Lead	5.30			F	
7439-95-4	Magnesium	2430.00	B		P	
7439-96-5	Manganese	29.60		E	P	J4
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	18.00	U		P	
7440-09-7	Potassium	3920.00	B		P	
7782-49-2	Selenium	2.00	U	NW	F	UJ2,5
7440-22-4	Silver	6.00	U		P	
7440-23-5	Sodium	3420.00	B		P	
7440-28-0	Thallium	2.00	U		F	
7440-62-2	Vanadium	47.20	B		P	
7440-66-6	Zinc	50.40		E	P	J4
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

01-001S

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP770

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	43681.4000		30998.8000		2000.00	634.1		P
Antimony	75-125	332.8000		44.0000	U	500.00	66.6	N	P
Arsenic	75-125	6.6000	B	2.0000	U	40.00	16.5	N	F
Barium	75-125	1913.0000		220.3000		2000.00	84.6		P
Beryllium	75-125	47.1000		6.0000		50.00	82.2		P
Cadmium	75-125	44.6000		3.7000	B	50.00	81.8		P
Calcium									NR
Chromium	75-125	826.6001		538.3000		200.00	144.2	N	P
Cobalt	75-125	443.8000		19.9000	B	500.00	84.8		P
Copper	75-125	235.9000		26.7000		250.00	83.7		P
Iron	75-125	86764.1300		75665.0000		1000.00	1109.9		P
Lead	75-125	30.5000		12.5000		20.00	90.0		F
Magnesium									NR
Manganese	75-125	538.3000		110.2000		500.00	85.6		P
Mercury	75-125	1.0480		.1100	B	1.00	93.8		CV
Nickel	75-125	435.8000		18.5000	B	500.00	83.5		P
Potassium									NR
Selenium	75-125	4.3000	B	2.0000	U	10.00	43.0	N	F
Silver	75-125	44.9000		6.2000	B	50.00	77.4		P
Sodium									NR
Thallium	75-125	39.8000		2.0000	U	50.00	79.6		F
Vanadium	75-125	631.2000		172.5000		500.00	91.7		P
Zinc	75-125	1072.6000		652.0000		500.00	84.1		P
Cyanide									NR

Comments:

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

01-001A

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP770

Matrix: Level (low/med):

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony		63.10		44.00	U	120.0	52.6		P
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium		1470.00		538.30		1100.0	84.7		P
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

FORM V (Part 2) - IN

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

01-001D

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-04

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP770

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

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

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	%RPD	Q	M
Aluminum		30998.8000		27178.5000		13.1		P
Antimony		44.0000	U	44.0000	U			P
Arsenic		2.0000	U	2.0000	U			F
Barium	200.0	220.3000		202.9000		8.2		P
Beryllium	5.0	6.0000		3.4000	B	55.3		P
Cadmium		4.0000	U	4.0000	U			P
Calcium		4441.0000	B	4492.8010	B	1.2		P
Chromium		538.3000		477.0000		12.1		P
Cobalt		19.9000	B	6.9000	B	97.0		P
Copper	25.0	26.7000		22.5000	B	17.1		P
Iron		75665.0000		62873.5000		18.5		P
Lead	3.0	12.5000		13.7000		9.2		F
Magnesium	5000.0	6202.0000		4906.6990	B	23.3		P
Manganese		110.2000		102.4000		7.3		P
Mercury		.1120	B	.1000	U	200.0		CV
Nickel		18.5000	B	18.0000	U	200.0		P
Potassium	5000.0	13686.4000		9995.3980		31.2		P
Selenium		2.0000	U	2.0000	U			F
Silver	10.0	6.2000	B	6.0000	U	43.1		P
Sodium	5000.0	2434.2000	B	2366.3000	B	2.8		P
Thallium		2.0000	U	2.0000	U			F
Vanadium	50.0	172.5000		132.9000		25.9		P
Zinc		652.0000		655.7000		.6		P
Cyanide								NR

FORM VI - IN

03/90

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present?	[ ]		✓
Legible?	[ ]		
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

A.1.6	Form I to IX	Yes	No	N/A
A.1.6.1	Are all the Form I through Form IX labeled with:			
	Laboratory name?	[✓]	___	___
	Case/SAS number?	[✓]	___	___
	EPA sample No.?	[✓]	___	___
	SDG No.?	[✓]	___	___
	Contract No.?	[✓]	___	___
	Correct units?	[✓]	___	___
	Matrix?	[✓]	___	___

ACTION: If no for any of the above, note under Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.6.2	Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
	(NOTE: Check all forms against raw data.)			
	(a) all analytes analyzed by ICP?	[✓]	___	___
	(b) all analytes analyzed by GFAA?	[✓]	___	___
	(c) all analytes analyzed by AA Flame?	[✓] PB H 8/5/92	___	✓
	(d) Mercury?	[✓]	___	___
	(e) Cyanide?	[___]	___	✓

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.1: Data Assessment - Contract Compliance (Total Review)

Date: Jan. 1992
Number: HW-2
Revision: 11

		YES	NO	N/A
A.1.7	Raw Data			
A.1.7.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]		
	Digestion Log for furnace AA Form XIII present?	[✓]		
	Distillation Log for mercury Form XIII present?	[✓]		
	Distillation Log for cyanides Form XIII present?	[ ]		✓
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[ ]		✓
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[ ]		✓
	Are preparation dates present on sample preparation logs/bench sheets?	[✓]		
A.1.7.2	Measurement read out record present? ICP	[✓]		
	Flame AA	[ ]		✓
	Furnace AA	[✓]		
	Mercury	[✓]		
	Cyanides	[ ]		✓
A.1.7.3	Are all raw data to support all sample analyses and QC operations present?	[✓]		
	Legible?	[✓]		
	Properly Labeled?	[✓]		

ACTION: If no for any of the above questions in sections A.1.7.1 through A.1.7.3, write Telephone Record Log and contact laboratory for resubmittals.

		YES	NO	N/A
A.1.8	**Holding Times** - (aqueous and soil samples)			
	(Examine sample traffic reports and digestion/distillation logs.)			
	Mercury analysis (28 days). . . . . exceeded?	___	[✓]	___
	Cyanide distillation (14 days). . . . . exceeded?	___	[___]	✓
	Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___
	NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.			
	ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.			
A.1.8.2	Is pH of aqueous samples for: Metals Analysis >2?	___	[✓]	___
	Cyanides Analysis <12?	___	[___]	✓
	Action: If yes, flag the associated metals and cyanides data as estimated.			
A.1.9	**Form I (Final Data)**			
A.1.9.1	Are all Form I's present and complete?	[✓]	___	___
	ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
A.1.9.2	Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]	___	___
	Are soil sample results for each parameter corrected for percent solids?	[___]	___	✓
	Are all "less than IDL" values properly coded with "U"?	[✓]	___	___

		YES	NO	N/A
	Are the correct concentration qualifiers used with final data?	[✓]	___	___
	ACTION: If no for any of the above, prepare Telephone Record Log, and contact laboratory for corrected data.			
.1.9.3	Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	___	___
	Was a brief physical description of samples given on Form I's?	[✓]	___	___
	Was the dilution of any sample diluted beyond the requirements of the contract noted on Form I or Form XIV?	___	[✓]	___
	ACTION: If no for any of the above, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
.1.10	**Calibration**			
.1.10.1	Is record of at least 2 point calibration present for ICP analysis?	[✓]	___	___
	Is record of 5 point calibration present for Hg analysis?	[✓]	___	___
	Is record of 4 point calibration present for:			
	Flame AA?	[___]	___	✓
	Furnace AA?	[✓]	___	___
	Cyanides?	[___]	___	✓
	Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	[✓]	___	___

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

		YES	NO	N/A
A.1.10.2	Is correlation coefficient less than 0.995 for:			
	Mercury Analysis?	___	[✓]	___
	Cyanide Analysis?	___	[___]	✓
	Atomic Absorption Analysis?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

NOTE: The data validator shall calculate the correlation coefficient using concentrations of the standards and the corresponding instrument response (e.g. absorbance, peak area, peak height, etc.).

A.1.10.3	In the instance where less than 4 standards are measured in absorbance (or peak area, peak height,etc.) mode, are the remaining standards analyzed in concentration mode immediately after calibration within ±10% of the true values?	[___]	___	✓

ACTION: If no, flag the associated data as estimated if standards are not within ±10% of true values. Do not flag the data as estimated in linear range indicated by good recovery of standard(s).

A.1.11 Form II A (Initial and Continuing Calibration Verification)-

A.1.11.1	Present and complete for every metal and cyanide?	[✓]	___	___
	Present and complete for AA and ICP when both are used for the same analyte?	[✓]	___	___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

A.1.11.2	Circle on each Form IIA all percent recoveries that are outside the contract windows. Are all calibration standards (initial and continuing) within control limits:			
	Metals- 90-110%R?	[✓]	___	___
	Hg - 80-120%R?	[✓]	___	___
	Cyanides- 85-115%R?	[___]	___	✓

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ) if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
A.1.11.3 Was continuing calibration performed every 10 samples or every 2 hours?	[✓]	___	___
Was ICV for cyanides distilled?	[___]	___	✓

ACTION: If no for any of the above, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

A.1.12 Form II B (CRDL Standards for AA and ICP) -

A.1.12.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?	[✓]	___	___
Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[___]	___	✓
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]	___	___

ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are:
AA Analysis - **True Value ± CRDL
ICP Analysis - **True Value ± 2CRDL
CN Analysis - **True Value ± 0.5 x True Value.

**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL. Compute the concentration of the missing mid-range standard from the calibration range.

		YES	NO	N/A
A.1.12.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?	[✓]	___	___
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.12.3	Circle on each Form IIB all the percent recoveries that are outside the acceptance windows.			
	Are CRA and CRI standards within control limits:			
	Metals 80 - 120%R?	[✓]	___	___
	Is mid-range standard within control limits:			
	Cyanide 80 - 120%R?	[___]	___	✓
	ACTION: Flag as estimated all sample results within the affected range if the recovery of the standard is between 50-79%; flag only positive data within the affected range if the recovery is between 121-150%; reject all data within the affected range if the recovery is less than 50%; reject only positive data within the affected range if the recovery is greater than 150%. Qualify 50% of the samples on either side of CRI standard outside the control limits.			
	Note: Flag or reject the final results only when sample raw data are within the affected ranges and the CRDL standards are outside the acceptance windows.			
A.1.13	Form III (Initial and Continuing Calibration Blanks)			
A.1.13.1	Present and complete?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[✓]	___	___
	Was an initial calibration blank analyzed?	[✓]	___	___
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the Contract-Problems/ Non-Compliance section of the "Data Assessment Narrative".			
A.1.13.2	Circle on each Form III all calibration blank values that are above CRDL (or 2 x IDL when IDL > CRDL).			
	Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	[✓]	___	___
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated (J) positive sample results when raw sample value is less than or equal to calibration blank value analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank outside the control limits.			
A.1.14	FORM III (Preparation Blank) - (Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.14.1	Was one prep. blank analyzed for:			
	each Sample Delivery Group (SDG)?	[✓]	___	___
	each batch of digested samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the associated positive data <10 x IDLs for which prep. blank was not analyzed.			
	NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			

		YES	NO	N/A
A.1.14.2	Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?	___	[✓]	___
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep.blank?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value.			
A.1.14.3	Is concentration of prep. blank value (Form III) less than two times IDL, when IDL is greater than CRDL?	[✓]	___	___
	ACTION: If no, reject (red-line) all positive sample results when sample raw data are less than 10 times the prep. blank value.			
A.1.14.4	Is concentration of prep. blank below the negative CRDL?	___	[✓]	___
	ACTION: If yes, reject (red-line) all associated sample results less than 10xCRDL.			
A.1.15	Form IV (ICP Interference Check Sample)			
A.1.15.1	Present and complete?	[✓]	___	___
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]	___	___
	ACTION: If no, flag as estimated (J) all the samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.15.2	Circle all values on each Form IV that are more than ± 20% of true or established mean value.			
	Are all Interference Check Sample results inside the control limits (± 20%)?	[✓]	___	___
	If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	[✓]	___	___

		YES	NO	N/A
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			
A.1.16	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.16.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each conc. range (i.e. low, med., high)?	[✓]	___	___
	For both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all the positive data less than four times the spiking levels specified in SOW for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.16.2	Was field blank used for spiked sample?	___	[✓]	___
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
A.1.16.3	Circle on each Form VA all spike recoveries that are outside control limits (75% to 125%).			
	Are all recoveries within control limits?	[___]	✓	___
	If no, is sample concentration greater than or equal to four times spike concentration?	[___]	✓	___

	YES	NO	N/A
ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[✓]	___	___
ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".			

A.1.16.4 Aqueous

Are any spike recoveries:

(a) less than 30%?	✓	[___]	___
(b) between 30-74%?	✓	[___]	___
(c) between 126-150%?	✓	[___]	___
(d) greater than 150%?	___	[✓]	___

ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".

A.1.16.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	___	[___]	✓
(b) between 10-74%?	___	[___]	✓
(c) between 126-200%?	___	[___]	✓
(d) greater than 200%?	___	[___]	✓

		YES	NO	N/A
	ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".			
A.1.17	Form VI (Lab Duplicates)			
A.1.17.1	Present and complete for: each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any the above, flag as estimated (J) all the data ≥CRDL* for which duplicate sample was not analyzed.			
	Note: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated.			
	2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in ug/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.17.2	Was field blank used for duplicate analysis?	___	[✓]	___
	ACTION: If yes, flag all data ≥CRDL* as estimated (J) for which field blank was used as duplicate.			
A.1.17.3	Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	[✓]	___	___
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[✓]	___	___
	ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".			

* Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.
2. If the result of lab duplicate analyzed by GFAA is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria to metals analyzed by GFAA.

A.1.17.4 Aqueous

Circle on each Form VI all values that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[✓]	___
Is any difference** between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___

ACTION: If yes, flag the associated data as estimated.

A.1.17.5 Soil/Sediment

Circle on each Form VI all values that are:

RPD > 100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[___]	✓
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[___]	✓

*Substitute IDL for CRDL when IDL > CRDL.
**Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
	ACTION: If yes, flag the associated data as estimated.			
A.1.18	**Field Duplicates**			
A.1.18.1	Were field duplicates analyzed?	[___]	✓	___

ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.

NOTE: 1. Do not calculate RPD when both values are less than IDL.
2. Flag all associated data only for field duplicate pair.

A.1.18.2 **Aqueous**

Circle all values on self prepared Form VI for field duplicates that are:

RPD > 50%, or
Difference > CRDL*

Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	___	[___]	✓
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[___]	✓

ACTION: If yes, flag the associated data as estimated.

* Substitute IDL for CRDL when IDL > CRDL.
Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.18.3	**Soil/Sediment**			
	Circle all values on self prepared Form VI for field duplicates that are:			
	RPD >100%, or			
	Difference > 2 x CRDL*			
	Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) : >100%?	___	[✓]	___
	Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL): >2x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated.			
A.1.19	**Form VII (Laboratory Control Sample)** (Note: LCS - not required for aqueous Hg and cyanide analyses.)			
A.1.19.1	Was one LCS prepared and analyzed for:			
	each SDG?	[✓]	___	___
	each batch samples digested/distilled?	[✓]	___	___
	both AA and ICP when both are used for the same analyte?	[___]	___	✓
	ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all the data for which LCS was not analyzed.			
	NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

		YES	NO	N/A
A.1.19.2	**Aqueous LCS**			
	Circle on each Form VII the LCS percent recoveries outside control limits (80 - 120%) except for aqueous Ag and Sb.			
	Is any LCS recovery: less than 50%?	___	[✓]	___
	between 50% and 79%?	___	[✓]	___
	between 121% and 150%?	___	[✓]	___
	greater than 150%?	___	[✓]	___

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.19.3 **Solid LCS**

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).
2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

Is LCS "Found" value higher than the control limits on Form VII?	___	[___]	✓

ACTION: If yes, qualify all associated positive data as estimated.

Is LCS "Found" value lower than the Control limits on Form VII?	___	[___]	✓

ACTION: If yes, qualify all associated data as estimated.

		YES	NO	N/A
A.1.20	**Form IX (ICP Serial Dilution)** -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.20.1	Was Serial Dilution analysis performed for:			
	each SDG?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med.)?	[✓]	___	___
	ACTION: If no for any of the above, flag as estimated all the positive data ≥ 10xIDLs or ≥ CRDL when 10xIDL ≤ CRDL for which Serial Dilution Analysis was not performed.			
A.1.20.2	Was field blank(s) used for Serial Dilution Analysis?	___	[✓]	___
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J). If 10xIDL ≤ CRDL, flag all data ≥ CRDL.			
A.1.20.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	___	___
	ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			
A.1.20.4	Circle on each Form IX all percent difference that are outside the control limits for initial concentrations equal to or greater than 10 x IDLs only.			
	Are any % difference values:			
	> 10%?	✓	[___]	___
	≥ 100%?	___	[✓]	___

		YES	NO	N/A
	ACTION: Flag as estimated (J) all the associated sample data ≥ 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which percent difference is greater than 10% but less than 100%. Reject (red-line) all the associated sample results equal to or greater than 10xIDLs (or ≥ CRDL when 10xIDL ≤ CRDL) for which PD is greater than or equal to 100%.			
	Note: Flag or reject on Form I's only the sample results whose associated raw data are ≥ 10xIDL (or ≥ CRDL when 10xIDL≤ CRDL)			
A.1.21	Furnace Atomic Absorbtion (AA) QC Analysis			
A.1.21.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	___	___
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
A.1.21.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]	___	___
	Was a dilution analyzed for sample with analytical spike recovery less than 40%?	[✓]	___	___
	ACTION: If no for any of the above, flag all the associated data as estimated.			
A.1.21.3	Is *analytical spike recovery outside the control limits (85-115%) for any sample?	✓	[___]	___
	ACTION: If yes, flag as estimated the affected sample results if the recovery is between 10-84%; if the recovery is between 115-200%, flag the associated positive sample results as estimated; reject the associated sample results if the recovery is less than 10%; reject positive sample results if the recovery is greater than 200%.			

*Analytical spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
	NOTE: Reject or flag the data only when the affected sample(s) was not subsequently analyzed by Method of Standard Addition.			
A.1.22	**Form VIII (Method of Standard Addition Results)**			
A.1.22.1	Present?	[✓]	___	___
	If no, is any Form I result coded with "S" or a "+"?	___	[✓]	___
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.22.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	___	[✓]	___
	ACTION: If yes, reject (red-line) the affected data.			
A.1.22.3	Was *MSA required for any sample but not performed?	___	[✓]	___
	Is coefficient of correlation for MSA less than 0.995?	___	[✓]	___
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	___	[✓]	___
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.22.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-23?	[✓]	___	___
	ACTION: If no, note exception under Contract Problem/ Non-Compliance section of the "Data Assessment Narrative", and prepare a separate list.			

* MSA is not required on LCS and prep. blank.

		YES	NO	N/A
A.1.23	**Dissolved/Total or Inorganic/Total Analytes** -			
A.1.23.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	___	[___]	✓
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	___	[___]	✓
	NOTE: 1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration. 2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents. 3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.			
A.1.23.2	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	___	[___]	✓
A.1.23.3	Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?	___	[___]	✓
	ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.			
A.1.24	**Form I (Field Blank)** -			
	(Note: Designate "Field Blank" as such on Form I.)			
A.1.24.1	Circle all field blank values on Form I that are greater than CRDL, (or 2 x IDL when IDL > CRDL).			
	Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓

	YES	NO	N/A
If no, was field blank value already rejected due to other QC criteria?	[ ]		✓

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value. Reject on Form I's the soil sample results that when converted to ug/L on wet basis are less than or equal to five times the field blank value in ug/L.

A.1.25 Form X, XI, XII (Verification of Instrumental Parameters).

A.1.25.1 Is verification report present for:

	YES	NO	N/A
Instrument Detection Limits (quarterly)?	[✓]		
ICP Interelement Correction Factors (annually)?	[✓]		
ICP Linear Ranges (quarterly)?	[✓]		

ACTION: If no, contact TPO of the lab.

A.1.25.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)

	YES	NO	N/A
A.1.25.2.1 Are IDLs present for: all the analytes?	[✓]		
all the instruments used?	[✓]		
For both AA and ICP when both are used for the same analyte?	[✓]		

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.

	YES	NO	N/A
A.1.25.2.2 Is IDL greater than CRDL for any analyte?		[✓]	
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	[✓]		

	YES	NO	N/A
Action : If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			
A.1.25.3 **Form XI (Linear Ranges)**			
A.1.25.3.1 Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___
ACTION: If no, flag the result reported on Form I as estimated(J).			
A.1.26 **Percent Solids of Sediments**			
A.1.26.1 Are percent solids in sediment(s):			
< 50%?	___	[___]	✓
< 10%?	___	[___]	✓

ACTION: If yes, qualify as estimated all the results of a sample that has per cent solids between 10%-50% (i.e. moisture content between 50%-90%). Reject all the results of a sample that has per cent solids less than 10% (i.e. moisture content greater than 90%).

NOTE: Reject or flag(J) only the sample results that were not previously rejected or flaged due to other QC criteria.

Case#	NWS	Site	Naval Weapons Station	Matrix: Soil	
SDG#	CLP 770	Lab	Roy F. Weston	Water	✓
Contractor	Roy F. Weston	Reviewer	Heartland ESI	Other	

A.2.1 Validation Flags- The following flags have been applied in red by the data validator and must be considered by the data user.

J- This flag indicates the result qualified as estimated

Red- Line- A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

Fully Usable Data- The results that do not carry "J" or "red-line" are fully usable.

Contractual Qualifiers- The legend of contractual qualifiers applied by the lab on Form I's is found on page B-20 of SOW ILM01.0.

A.2.2 The data assessment is given below and on the attached sheets.

1. The Matrix Spike for Arsenic was below 30%. All data is rejected.
2. The Matrix Spike recoveries for Antimony and Selenium were below the lower control limit. All data is estimated.
3. The Matrix Spike recovery for Chromium was above the upper control limit. All positive results are estimated.
4. The Serial dilutions for Barium, Chromium, Copper, Manganese and Zinc were outside

A.2.2 (continuation)

the control limits. All positive results are qualified as estimated.

5. The post digestion spikes for Selenium for samples 01-001, 01-003 and 01-301 were below the lower control limit. All data is estimated.

PBH 8/5/92

A.2.3 Contract-Problem/Non-Compliance

PBH 8/5/92

MMB/ESAT Rviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Humbry Date: 8/5/92
Signature

Verified by: _____ Date: _____

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

e of Review: 8/5/92 Date: 8/5/92 Case #: CLP 770

e: Naval Weapons Station Lab Name: Roy F. Weston

iewer's Initials: PBH Number of Samples: 3 waters

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
P														
ame AA														
rnace AA						1							1	
rcury														
tal						1							1	
her														

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

P						2					5		7	
ame AA														
rnace AA						1						1	2	
rcury														
tal						3					5	1	9	
her														

te:
Asterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Checklist

Date: Jan. 1992
Number: HW-2
Revision: 11

Inorganic Analysis

PBH 8/5/92 INORGANIC REGIONAL DATA ASSESSMENT Region II

CASE NO. NWS
SITE Naval Weapons Station
LABORATORY Roy F. Weston
NO. OF SAMPLES/ MATRIX 3 water samples
SDG# CLP 770
REVIEWER (IF NOT ESD) Heartland ESI
SOW# 390
REVIEWER'S NAME Paul B. Hinsby
TO: ACTION FYI
COMPLETION DATE 8/5/92

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CYANIDE
HOLDING TIMES	O	O	O	NA
CALIBRATIONS				
BLANKS				
ICS				
LCS				
DUPLICATE ANALYSIS		Z		
MATRIX SPIKE		O		
MSA				
SERIAL DILUTION				
SAMPLE VERIFICATION				
OTHER QC				
OVERALL ASSESSMENT				

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

ACTION ITEMS:

AREAS OF CONCERN:

NOTABLE PERFORMANCE:

HEARTLAND ENVIRONMENTAL SERVICES, INC.
P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

August 10, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Twenty three (23) soil samples and three (3) Matrix Spike and Duplicate pairs were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-001	920661001
01-002	920661002
01-003	920661003
01-004	920661004
01-005	920661005
01-006	920661006
01-008	920661007
01-009	920661008
01-011	920661009
01-009	920661010
01-012	920661011
01-013	920661012
01-014	920661013
01-015	920661014
01-016	920661015
01-015	920661016
29-001	920661801
01-007	920662729
01-010	920662730
29-002	920662731
29-003	920662732
29-004	920662733
29-005	920662734

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

Heartland ESI has reviewed the data for the samples listed above for Total Petroleum Hydrocarbons using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Total Petroleum Hydrocarbons reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9206610, 9206618 and 9206627,** the analysis of twenty three (23) field soil samples and three (3) matrix spike and duplicate pairs. Overall, the total petroleum hydrocarbon data quality was good. The USEPA analytical protocol was followed as required.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

No deficiencies in this section.

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

All data stands as reported with no qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

Roy F. Weston, Inc. - Lionville Laboratory
Petroleum Hydrocarbons by IR

RFW Batch Number: 9206L610 Client: NAVAL WEAPONS/COLTSNECK Work Order: 1771-15-04-0000 Report Date: 06/26/[illegible] 09:10 Page: 1

	Cust ID:	01-001-S001	01-002-S001	01-003-S001	01-004-S001	01-005-S001	01-005-S001
Sample Information	RFW#:	001	002	003	004	005	005 MS
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	5.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Petroleum Hydrocarbon		6.5	3.6 J	16	450	5.8	101 %

	Cust ID:	01-005-S001	01-006-S001	01-008-S001	01-009-S001	01-011-S001	01-009-S101
Sample Information	RFW#:	005 MSD	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Petroleum Hydrocarbon		102 %	40	4.3 U	5.2	2.2 J	3.3 J

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Roy F. Weston, Inc. Lionville Laboratory
Petroleum Hydrocarbons by IR

RFW Batch Number: 9206L610 Client: NAVAL WEAPONS/COLTSNECK Work Order: 1771-15-04-0000 Report Date: 06/26/[illegible] 09:10 Page: 2

	Cust ID:	01-012-S001	01-013-S001	01-014-S001	01-015-S001	01-016-S001	01-015-S201
Sample Information	RFW#:	011	012	013	014	015	016
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/L
Petroleum Hydrocarbon		4.4 U	4.0 J	2.4 J	2.3 J	9.6	1.1 U

	Cust ID:	PBLK	PBLK BS	PBLK	PBLK BS	PBLK	PBLK BS
Sample Information	RFW#:	92DHC133-MB1	92DHC133-MB1	92DHC138-MB1	92DHC138-MB1	92DHC132-MB1	92DHC132-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/L	mg/L
Petroleum Hydrocarbon		4.0 U	94 %	4.0 U	97 %	1.0 U	104 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Cust ID: PBLK BSD

Sample Information

RFW#: 92DHC132-MB1
Matrix: WATER
D.F.: 1.00
Units: mg/L

Petroleum Hydrocarbon	100	%

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Roy F. Weston, Inc. Lionville Laboratory
Petroleum Hydrocarbons by IR

RFW Batch Number: 9206L618 Client: NAVAL WEAPONS/COLTSNECK Work Order: 1771-15-04-0000 Report Date: 06/22/ 4:10 Page: 1

	Cust ID:	29-001-S001	PBLK	PBLK BS
Sample Information	RFW#:	009	92DHC134-MB1	92DHC134-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	125	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg
Petroleum Hydrocarbon		28000	4.0 U	92 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000008

Roy F. Weston, Inc. - Lionville Laboratory
Petroleum Hydrocarbons by IR

RFW Batch Number: 9206L627 Client: NAVAL WEAPONS/COLTSNECK Work Order: 1771-15-04-0000 Report Date: 06/30/92 08:59 Page: 1

	Cust ID:	01-007-S001	01-010-S001	29-002-S001	29-003-S001	29-003-S001	29-003-S001
Sample Information	RFW#:	029	030	031	032	032 MS	032 MSD
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Petroleum Hydrocarbon		9.4	3.4 J	7.8	7.0	96 %	97 %

	Cust ID:	29-004-S001	29-005-S001	PBLK	PBLK BS	PBLK	PBLK BS
Sample Information	RFW#:	033	034	92DHC140-MB1	92DHC140-MB1	92DHC142-MB1	92DHC142-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Petroleum Hydrocarbon		51	60	4.0 U	97 %	4.0 U	96 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000009