HEARTLAND ENVIRONMENTAL SERVICES, INC.

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July 15, 1991

To: John Williams
Roy F. Weston Inc.
One Weston Way
Lionville, PA

From: Paul B. Humburg
Project Manager
Heartland ESI

Subject: Data Validation Services using EPA Region II guidelines for Inorganic analyses. The samples reviewed consisted of twenty two waters for full TAL metals plus Cyanide plus 2 MS/Ds. The analyses were performed by Roy F. Weston's Gulf Coast Laboratory.

EPA ID	Gulf Coast ID	EPA ID	Gulf Coast ID
	Water Samples (full TAL)		
1901M1	03L008-001	A304M1	03L008-018
1901M1MS	03L008-001MS	A305M1	03L008-019
1901M1D	03L008-001D	A306M1	03L088-020
1902M1	03L008-002	A307M1	03L008-021
190311	03L008-004	A307M1MS	03L008-021MS
1903M1	03L008-003	A307M1D	03L008-021D
1903M2	03L008-005	A307M2	03L008-022
1904M1	03L008-006	A401M1	03L008-009
1905M1	03L008-007	A402M0	03L008-010
1906M1	03L008-008	A402M1	03L008-011
A301M1	03L008-015	A402M2	03L008-023
A302M1	03L008-016	A405M1	03L008-012
A303M1	03L008-017	A406M1	03L008-013

Heartland ESI has reviewed the data for the samples listed above for the TAL list for Metals plus Cyanide using EPA Region II CLP Inorganic Data Assessment Protocol, Standard Operating Procedure HW-2, Revision 10, February 1990. Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to the requirements and deliverables of U.S. EPA CLP Region II. This screening assumes that the analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Individual fraction was reviewed as follows:

* Metals plus Cyanide by Paul B. Humburg with secondary review by Christopher D. Scarpellino

Please refer to the Form Is and detailed Data Validation Report for additional information. The Cyanide Data Summary List is included in this report because the laboratory did not submit the Cyanides on the Forms Is in the CLP package. The Form Is included in the Data Validation Report are annotated with the standard validation qualifiers as well as footnotes which refer to the specific findings listed numerically in the Data Assessment Narrative section. Specific comments are provided in the following case narrative.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

INORGANICS DATA ASSESSMENT NARRATIVE

General

The overall package quality was good. The Form Is contained in this data package did not include Cyanide as a target analyte. The laboratory prepared the Cyanide analytical results as a separate package. This reviewer has included the Cyanides in our TAL Metals package.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (ICV) standard for Cyanide as required by EPA Region II protocol.

No field blanks were apparently associated with this set of samples. The Chain-of-Custodies associated with these samples do not indicate that the water samples are equipment or field blanks. Therefore, the soil samples were not qualified based on results from the water samples. The water samples were simply reviewed as additional field samples.
All other contractual requirements were met.

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

Holding Times

The holding times were met as specified by QA protocol.

Calibration

1. The CRDL Standard for Antimony and Cadmium was below the control limit for samples 03L008-001 thru -0021. All positive and non-detect results are flagged "UJ" or "J" , as estimated.

2. The CRDL Standard for Lead for sample A304M1 was below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

3. The CRDL Standard for Lead for samples A302M1 and A303M1 was below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Inorganics Data Assessment Narrative (continued - Page 2)

Spike Recovery

4. The Matrix Spike Recovery for Thallium was below the lower control limit for samples 03L008-001 thru -021. All positive and non-detect results are flagged "J" or "UJ" as estimated.

Duplicate

5. The Duplicate Analysis for Barium was outside the control limits for all samples. All positive and non-detect results are flagged "UJ" or "J", as estimated.

5. The Duplicate Analysis for Lead was outside the control limits for samples 03L008-022 and -023. All positive and non-detect results are flagged "UJ" or "J", as estimated.

LCS

6. The LCS for Lead was above the control limit. All positive results are flagged "J", as estimated.

Serial Dilution

No deficiencies in this section.

MSA

7. The analytical spiking results for the following analytes were outside the control limits on the low side. Therefore, all positive and non-detect results are flagged "J" or "UJ", as estimated.

Analyte	Samples
Arsenic	1902M1, 1906M1, A304M1, A305M1, A401M1, A402M0 and A402M1
Lead	1903M1
Selenium	1902M1, A301M1 and A406M1
Thallium	1901M1, 1902M1, 190311, 1903M1, 1904M1, 1905M1, 1906M1, A302M1, A303M1, A304M1, A305M1, A306M1, A307M1, A401M1, A402M0, A402M1, A402M2, A405M1 AND A406M1.

8. The analytical spiking results for the following analytes were outside the control limits on the high side. Therefore, all positive results are flagged "J", as estimated.

Analyte	Samples
Selenium	1906M1 and 1905M1

Inorganics Data Assessment Narrative (continued - Page 3)

9. The analytical spiking results for sample A301M1 for Thallium was below 10% for the original and diluted analysis. Therefore, all positive and non-detect results are rejected for this analyte.

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SUMMARY OF DATA QUALIFICATIONS

SPECIFIC SAMPLE ID	ANALYTE	DL	QL	FINDING
03L008-001 thru 021	Sb and Cd	+/U	J/UJ	1
03L008-018	Pb	+/U	J/UJ	2
03L008-016 and 017	Pb	+/U	J/UJ	3
03L008-001 thru 021	Tl	+/U	J/UJ	4
All samples	Ba	+/U	J/UJ	5
03L008-022 and 023	Pb	+/U	J/UJ	5
All samples	Pb	+/U	J/UJ	6
1902M1, 1906M1, A304M1, A305M1, A401M1, A402M0 and A402M1	As	+/U	J/UJ	7
1903M1	Pb	+/U	J/UJ	7
1902M1, A301M1 and A406M1	Se	+/U	J/UJ	7
1901M1, 1902M1, 190311, 1903M1, 1904M1, 1905M1, 1906M1, A302M1, A303M1, A304M1, A305M1, A306M1, A307M1, A401M1, A402M0, A402M1, A402M2, A405M1 and A406M1	Tl	+/U	J/UJ	7
19005M1 and 1906M1	Se	+	J	8
A301M1	Tl	+/U	R	9

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 04/24/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L008

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	19-001-M001	Cyanide, Total	0.010	u	MG/L	0.010
-002	19-002-M001	Cyanide, Total	0.010	u	MG/L	0.010
-003	19-003-M001	Cyanide, Total	0.010	u	MG/L	0.010
-004	19-003-M101	Cyanide, Total	0.010	u	MG/L	0.010
-005	19-003-M201	Cyanide, Total	0.010	u	MG/L	0.010
-006	19-004-M001	Cyanide, Total	0.010	u	MG/L	0.010
-007	19-005-M001	Cyanide, Total	0.010	u	MG/L	0.010
-008	19-006-M001	Cyanide, Total	0.010	u	MG/L	0.010
-009	04-001-M001	Cyanide, Total	0.020	u	MG/L	0.020
-010	04-002-M001	Cyanide, Total	0.010	u	MG/L	0.010
-011	04-002-M101	Cyanide, Total	0.010	u	MG/L	0.010
-012	04-005-M001	Cyanide, Total	0.010	u	MG/L	0.010
-013	04-006-M001	Cyanide, Total	0.010	u	MG/L	0.010
-015	03-001-M001	Cyanide, Total	0.010	u	MG/L	0.010
-016	03-002-M001	Cyanide, Total	0.020	u	MG/L	0.020
-017	03-003-M001	Cyanide, Total	0.020	u	MG/L	0.020
-018	03-004-M001	Cyanide, Total	0.010	u	MG/L	0.010
-019	03-005-M001	Cyanide, Total	0.010	u	MG/L	0.010
-020	03-006-M001	Cyanide, Total	0.010	u	MG/L	0.010
-021	03-007-M001	Cyanide, Total	0.010	u	MG/L	0.010
-022	03-007-M201	Cyanide, Total	0.010	u	MG/L	0.010
-023	04-002-M201	Cyanide, Total	0.010	u	MG/L	0.010

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

1901M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-001

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4040			P	
7440-36-0	Antimony	23.0	B		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	68.6	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	7400			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	47.1			P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	7.5	B		P	
7439-89-6	Iron	5430			P	
7439-92-1	Lead	4.8		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	13000			P	
7439-96-5	Manganese	23.8			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	6.4	B		P	
7440-09-7	Potassium	1710	B		P	
7782-49-2	Selenium	3.9	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	4430	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,87 PBH 7/14/91
7440-31-5	Tin				NR	
7440-62-2	Vanadium	21.3	B		P	
7440-66-6	Zinc	4.7	U		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

1902M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-002

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	30000			P	
7440-36-0	Antimony	18.2	U		P	J 1
7440-38-2	Arsenic	2.7	B	W	F	J 7
7440-39-3	Barium	59.4	B	*	P	J 5
7440-41-7	Beryllium	3.7	B		P	
7440-43-9	Cadmium	13.3			P	J 1
7440-70-2	Calcium	12200			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	765			P	
7440-48-4	Cobalt	22.9	B		P	
7440-50-8	Copper	18.2	B		P	
7439-89-6	Iron	99000			P	
7439-92-1	Lead	37.7		*	F	J 5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	9970			P	
7439-96-5	Manganese	164			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	56.1			P	
7440-09-7	Potassium	19600			P	
7782-49-2	Selenium	1.1	U	W	F	J 7
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	3990	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J 7,4
7440-31-5	Tin				NR	
7440-62-2	Vanadium	442			P	
7440-66-6	Zinc	96.6			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

190311

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-004

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3830			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	39.7	B	*	P	J5
7440-41-7	Beryllium	0.60	B		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	9710			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	29.5			P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	4.7	B		P	
7439-89-6	Iron	4940			P	
7439-92-1	Lead	4.0		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	2700	B		P	
7439-96-5	Manganese	9.9	B		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	8.7	B		P	
7440-09-7	Potassium	1320	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	3180	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	18.7	B		P	
7440-66-6	Zinc	29.1			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

1903M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-003

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3630			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	39.5	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	9940			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	24.3			P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	5.1	B		P	
7439-89-6	Iron	4780			P	
7439-92-1	Lead	3.0		*W	F	J5,6,7
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	2380	B		P	
7439-96-5	Manganese	8.9	B		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	7.4	B		P	
7440-09-7	Potassium	1200	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2750	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	16.4	B		P	
7440-66-6	Zinc	26.1			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

1903M2

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-005

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	47.6	B		P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	4.4	U	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	121	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	2.8	B		P	
7439-89-6	Iron	45.1	B		P	
7439-92-1	Lead	1.7	B	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	44.9	B		P	
7439-96-5	Manganese	1.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	94.8	U		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	383	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	N	F	J4
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	4.7	U		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

1904M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-006

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	18300			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	3.7	B		F	
7440-39-3	Barium	91.3	B	*	P	J5
7440-41-7	Beryllium	0.80	B		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	9300			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	172			P	
7440-48-4	Cobalt	7.5	B		P	
7440-50-8	Copper	18.2	B		P	
7439-89-6	Iron	30300			P	
7439-92-1	Lead	19.3		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	5100			P	
7439-96-5	Manganese	122			P	
7439-97-6	Mercury	0.20			CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	27.4	B		P	
7440-09-7	Potassium	6230			P	
7782-49-2	Selenium	2.5	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2970	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	101			P	
7440-66-6	Zinc	230			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

1905M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-007

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2620			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	30.3	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	1490	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	59.2			P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	4.7	B		P	
7439-89-6	Iron	12500			P	
7439-92-1	Lead	4.8		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1350	B		P	
7439-96-5	Manganese	13.7	B		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	5.5	B		P	
7440-09-7	Potassium	1620	B		P	
7782-49-2	Selenium	1.1	U	W	F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	4810	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	40.2	B		P	
7440-66-6	Zinc	35.8			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

55

SAMPLE NO.

1906M1

1

INORGANIC ANALYSIS DATA SHEET

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-008

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	35500			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	8.4	B	W	F	J7
7440-39-3	Barium	87.8	B	*	P	J5
7440-41-7	Beryllium	4.1	B		P	
7440-43-9	Cadmium	7.3			P	J1
7440-70-2	Calcium	11800			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	853			P	
7440-48-4	Cobalt	26.5	B		P	
7440-50-8	Copper	34.1			P	
7439-89-6	Iron	106000			P	
7439-92-1	Lead	54.5		*S	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	8060			P	
7439-96-5	Manganese	252			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	82.3			P	
7440-09-7	Potassium	20200			P	
7782-49-2	Selenium	2.2	B	W	F	J8
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	1880	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	626			P	
7440-66-6	Zinc	198			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

56

ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A301M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-015

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11200			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	374			F	
7440-39-3	Barium	45.7	B	*	P	J5
7440-41-7	Beryllium	1.2	B		P	
7440-43-9	Cadmium	43.8			P	J1
7440-70-2	Calcium	1330	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	82.3			P	
7440-48-4	Cobalt	8.1	B		P	
7440-50-8	Copper	10.7	B		P	
7439-89-6	Iron	244000			P	
7439-92-1	Lead	34.8		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	743	B		P	
7439-96-5	Manganese	52.9			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	1720	B		P	
7782-49-2	Selenium	3.8	B	W	F	J7
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	3170	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	7.0	U	EN	F	J4R9
7440-31-5	Tin				NR	
7440-62-2	Vanadium	491			P	
7440-66-6	Zinc	87.3			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Elevated detection limit for Thallium due to matrix interferences.

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A302M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-016

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1440			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	37.0	B	*	P	J5
7440-41-7	Beryllium	0.60	B		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	1300	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	3.3	B		P	
7439-89-6	Iron	10900			P	
7439-92-1	Lead	2.0	B	*	F	J5,6,3
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	576	B		P	
7439-96-5	Manganese	37.4			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	4.5	B		P	
7440-09-7	Potassium	493	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2100	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	41.8			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A303M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-017

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1400			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	24.0	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	903	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	813			P	
7439-92-1	Lead	1.4	U	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	316	B		P	
7439-96-5	Manganese	38.7			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	250	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2230	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	67.4			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

1

SAMPLE NO.

A304M1

INORGANIC ANALYSIS DATA SHEET

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-018

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1470			P	
7440-36-0	Antimony	25.0	B		P	J1
7440-38-2	Arsenic	1.4	B	W	F	J7
7440-39-3	Barium	202		*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	18600			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	7.1	B		P	
7440-50-8	Copper	4.2	B		P	
7439-89-6	Iron	170000			P	
7439-92-1	Lead	11.1		*S	F	J5,6,2
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1400	B		P	
7439-96-5	Manganese	452			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	1930	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	1740	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.3	B		P	
7440-66-6	Zinc	260			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

60

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A305M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-019

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8040			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	4.8	B	W	F	J7
7440-39-3	Barium	124	B	*	P	J5
7440-41-7	Beryllium	1.1	B		P	
7440-43-9	Cadmium	21.1			P	J1
7440-70-2	Calcium	17800			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	59.6			P	
7440-48-4	Cobalt	15.7	B		P	
7440-50-8	Copper	27.1			P	
7439-89-6	Iron	41300			P	
7439-92-1	Lead	29.8		*S	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	2620	B		P	
7439-96-5	Manganese	932			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	22.1	B		P	
7440-09-7	Potassium	2820	B		P	
7782-49-2	Selenium	2.1	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2310	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	42.2	B		P	
7440-66-6	Zinc	324			P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A306M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-020

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7530			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	41.1	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	24300			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	41.2			P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	13.1	B		P	
7439-89-6	Iron	20700			P	
7439-92-1	Lead	21.8		*S	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	6160			P	
7439-96-5	Manganese	103			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	1870	B		P	
7782-49-2	Selenium	1.1	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	1940	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	32.7	B		P	
7440-66-6	Zinc	15.7	B		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A307M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-021

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4430			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	34.8	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	1960	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	18.2			P	
7440-48-4	Cobalt	3.2	B		P	
7440-50-8	Copper	4.7	B		P	
7439-89-6	Iron	9160			P	
7439-92-1	Lead	6.8		*S	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	811	B		P	
7439-96-5	Manganese	59.7			P	
7439-97-6	Mercury	0.43			CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	1360	B		P	
7782-49-2	Selenium	1.8	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2150	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	16.5	B		P	
7440-66-6	Zinc	15.3	B		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A307M2

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-022

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17.7	U		P	
7440-36-0	Antimony	20.9	B		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	4.4	U	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	89.9	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	27.4	B		P	
7439-92-1	Lead	1.4	U	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	35.9	U		P	
7439-96-5	Manganese	1.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	136	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	413	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	N	F	J4
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	4.7	U		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A401M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-009

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3520			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U	W	F	J7
7440-39-3	Barium	33.4	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	3440	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	7.9	B		P	
7439-89-6	Iron	3310			P	
7439-92-1	Lead	1.9	B	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1230	B		P	
7439-96-5	Manganese	23.4			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	797	B		P	
7782-49-2	Selenium	1.1	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2630	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	4.6	B		P	
7440-66-6	Zinc	15.7	B		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A402M0

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-010

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1530			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U	W	F	J7
7440-39-3	Barium	15.0	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	29900			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	3.7	B		P	
7439-89-6	Iron	44000			P	
7439-92-1	Lead	2.3	B	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	14400			P	
7439-96-5	Manganese	187			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	4790	B		P	
7782-49-2	Selenium	1.5	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	3480	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	5.2	B		P	
7440-66-6	Zinc	4.7	U		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A402M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-011

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1410			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U	W	F	J7
7440-39-3	Barium	27.1	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	34800			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	53200			P	
7439-92-1	Lead	4.1		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	16400			P	
7439-96-5	Manganese	215			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	5170			P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	3510	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	5.4	B		P	
7440-66-6	Zinc	4.7	U		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A402M2

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-023

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	18.9	B		P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	4.4	U	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	95.8	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	5.5	B		P	
7439-89-6	Iron	80.9	B		P	
7439-92-1	Lead	1.4	U	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	35.9	U		P	
7439-96-5	Manganese	1.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	140	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	284	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	4.7	U		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A405M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-012

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9550			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	61.2	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	8890			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	26.4			P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	14.9	B		P	
7439-89-6	Iron	29300			P	
7439-92-1	Lead	13.2		*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1450	B		P	
7439-96-5	Manganese	154			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	1960	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2120	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	27.8	B		P	
7440-66-6	Zinc	15.0	B		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A406M1

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP008

Matrix (soil/water): WATER Lab Sample ID: 03L008-013

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	980			P	
7440-36-0	Antimony	18.2	U		P	J1
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	51.1	B	*	P	J5
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	J1
7440-70-2	Calcium	2820	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	5.1	B		P	
7439-89-6	Iron	2670			P	
7439-92-1	Lead	2.7	B	*	F	J5,6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1140	B		P	
7439-96-5	Manganese	47.2			P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	750	B		P	
7782-49-2	Selenium	1.1	U	W	F	J7
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	2120	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U	NW	F	J4,7
7440-31-5	Tin				NR	
7440-62-2	Vanadium	3.3	B		P	
7440-66-6	Zinc	10.1	B		P	

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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

Date: Feb. 1990
Number: HW-2
Revision: 10

	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 or on file?	[__]	__	✓
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.			

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

Date: Feb. 1990
Number: HW-2
Revision: 10

	YES	NO	N/A
A.1.6 Form I (Final Data) - Are all Form I's present and complete?	[✓]	__	__
ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
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 EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]	__	__
Are computation/transcription errors less than 10% of reported values?	[✓]	__	__
Are all "less than IDL" values properly coded with "U"?	[✓]	__	__
Was a brief physical description of samples given on Form I's?	[✓]	__	__
Were the result qualifiers used correctly with final data?	[✓]	__	__
ACTION: If no for any of the above, prepare Telephone Record Log, and contract laboratory for corrected data.			
Were any samples diluted beyond requirements of contract?	__	[✓]	__
If yes, were dilutions noted on Form I's?	[✓]	__	__
ACTION: If no, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			

A.1.7 Holding Times - (aqueous and soil samples)

(Examine sample traffic reports and digestion/distillation logs.)

Mercury analysis (28 days). . . . . exceeded?	__	[✓]	__
Cyanide distillation (14 days). . . . . exceeded?	__	[✓]	__

	YES	NO	N/A
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 Raw Data

A.1.8.1	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?	[___]	___	✓
	Ar preparation dates present on Digestion Log?	[✓]	___	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	___	___

	YES	NO	N/A
A.1.8.3 Are all raw data to support all sample analyses and QC operations present?	[✓]	__	__
Legible?	[✓]	__	__
Properly Labeled?	[✓]	__	__

ACTION: If no for any of the above, write Telephone Record Log and contact laboratory. Flag metal data as estimated if pH of sample is greater than 2. Flag cyanide data as estimated if pH sample is less than 12.

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

A.1.9.1.1 Is record of at least 2 point calibration present for ICP analysis?	[✓]	__	__
Is record of 5 point calibration present for Hg analysis?	[✓]	__	__

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

A.1.9.1.2 Is record of 4 point calibration present for: Flame AA?	[__]	__	✓
Furnace AA?	[✓]	__	__
Cyanides?	[✓]	__	__

NOTE: 1. If less than 4 standards are measured in absorbance mode, then the remaining standards in concentration mode must be run immediately after calibration and be within ±10% of true value.
2. For all AA (except Hg) and Cyanide analyses, one calibration standard is at CRDL level. If not, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
ACTION: Flag associated data as estimated if standards are not within ±10% of true values (except CRDL calibration standard). Do not flag the data as estimated in linear range indicated by good recovery of standard.			
A.1.9.1.3 Is correlation *coefficient less than 0.995 for:			
Mercury Analysis?	___	[✓]	___
Cyanide Analysis?	___	[✓]	___
Atomic Absorption Analysis?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated.			
A.1.9.2 Form II A (Initial and Continuing Calibration Verification)-			
A.1.9.2.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for AA and ICP when both are used for same analyte?	[✓]	___	___
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
A.1.9.2.2 Circle all values on data summary sheet that are outside contract windows. Are all calibration standards (initial and continuing) within control limits?			
Metals 90-110%	[✓]	___	___
Hg - 80-120%	[✓]	___	___
Cyanides 85-115%	[✓]	___	___

* The reviewer will calculate correlation coefficient.

	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.

Was continuing calibration performed every 10 samples or every 2 hours? [✓] __ __

ACTION: If no, flag the excess samples (eleventh and up) data as estimated (J).

Was ICV for cyanides distilled? [__] ✓ __

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

A.1.9.3 Form II B (CRDL Standards for AA and ICP) -

A.1.9.3.1 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.

* Find the results of mid-range standard in the raw data.
**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
A.1.9.3.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and for every four hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.9.3.3	Circle all values on summary sheet that are outside 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 data within the affected ranges if the recovery of the standard is between 50-79%; flag only positive data if the recovery is between 121-150%; reject (red line) all data if the recovery is less than 50%; reject only positive data if the recovery is greater than 150%.			
A.1.9.4	Form III (Initial and Continuing Calibration Blanks)			
A.1.9.4.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (whichever is more frequent)?	[✓]		
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the contract-problems/ non-compliance section of the Data Assessment Narrative.			

		YES	NO	N/A
A.1.9.4.2	Circle all calibration blank values on Data Summary Sheet that are above CRDL (or 2 x IDL when IDL > CRDL). Are all calibration blanks (when IDL<CRDL) less than or equal to Contract Required Detection Limits (CRDL)?	[✓]	___	___
	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) all positive data less than or equal to calibration blank values 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.			
A.1.9.5	FORM III (Preparation Blank) -			
	(Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.9.5.1	Was one prep. blank analyzed for: each 20 samples?	[✓]	___	___
	each batch?	[✓]	___	___
	each matrix type?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[___]	___	✓
	ACTION: If no for any of the above, flag as estimated (J) all 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).			
A.1.9.5.2	Is concentration of prep. blank greater than 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 value?	___	[✓]	___

		YES	NO	N/A
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value found in the raw data.			
A.1.9.5.3	Do concentrations of prep. blank fall below two times IDL when IDL is greater than CRDL?	[✓]	__	__
	ACTION: If no, reject (red-line) all positive data that has a concentration less than 10 times the prep. blank value in the raw data.			
A.1.9.5.4	Is concentration of prep. blank below the negative CRDL?	__	[✓]	__
	ACTION: If yes, reject (red-line) all associated data that has a concentration less than 10xCRDL.			
A.1.9.6	Form IV (ICP Interference Check Sample)			
A.1.9.6.1	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 samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.8.6.2	Circle all values on Data Summary Sheet that are more than + 20% of true or established mean value. Are all Interference Check Sample results inside of control limits (+ 20%)?	[✓]	__	__
	If no, is concentration of Al, Ca, Fe, or Mg lower than in ICS?	[__]	__	✓
	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").			

		YES	NO	N/A
A.1.9.7	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.1.9.7.1	Present and complete for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each conc. range (i.e. low, med., high)?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[✓]	__	__
	ACTION: If no for any of the above, flag as estimated (J) all positive data less than four times spiking level 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.1.9.7.2	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.			
	NOTE: Matrix spike analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.7.3	Circle all values on Data Summary Sheet 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?	[✓]	[✓]	__
	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.			

PBH
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	YES	NO	N/A
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.1.9.7.4 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".

NOTE: If pre-digestion spike result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, disregard spike recovery on Form V. Flag the associated data as estimated(J).

A.1.9.7.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	__	[__]	✓
(b) between 10-74%?	__	[__]	✓
(c) between 126-200%?	__	[__]	✓
(d) greater than 200%?	__	[__]	✓

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".

		YES	NO	N/A
A.1.9.8	**Form VI (Lab Duplicates)**			
A.1.9.8.1	Present and complete for: each 20 samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[___]	___	✓
	ACTION: If no for any the above, flag as estimated (J) all 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 Hg/L on wet weight basis and calculate RPD or Difference for each analyte.			
A.1.9.8.2	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.			
	NOTE: Duplicate analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.8.3	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".			
	NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.			

* Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
	2. If lab duplicate result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria.			
A.1.9.8.4	Is any value for sample duplicate pair less than CRDL* and other value greater than or equal to 10 x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated (J).			
A.1.9.8.5	Aqueous Circle all values on Data Summary Sheet 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.1.9.8.6	Soil/Sediment Circle all values on Data Summary Sheet 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.1.9.9	Field Duplicates			
A.1.9.9.1	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.1.9.9.2	Is any value for sample duplicate pair less than *CRDL and other value greater than or equal to 10 x *CRDL?		[✓]	
	ACTION: If yes, flag the associated data as estimated.			
A.1.9.9.3	Aqueous			
	Circle all values on 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.1.9.9.4 Soil/Sediment

Circle all values on 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.1.9.10 Form VII (Laboratory Control Sample) (Note: LCS - not required for aqueous Hg and cyanide analyses.)

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [✓] _ _ ___

every 20 solid samples? [___] _ _ ✓

both AA and ICP when both are used for 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 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.1.9.10.2 Aqueous LCS			
Circle all LCS values outside control limits (80 - 120%- except 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.1.9.10.3 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.1.9.11	**Form IX (ICP Serial Dilution) -**			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.9.11.1	Was Serial Dilution analysis performed for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each concentration range (i.e. low, med.)?	[✓]	__	__
	ACTION: If no for any of the above, flag all positive data greater than or equal to 10xIDLs as estimated (J) for which Serial Dilution Analysis was not performed, and summarize the deficiency on the DPO report.			
A.1.9.11.2	Was field blank(s) used for Serial Dilution Analysis?	__	[✓]	__
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J).			
	NOTE: Serial dilution analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.11.3	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.1.9.11.4	Circle all values on Data Summary Sheet that are outside control limit 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 associated equal to or greater than 10xIDLs for which percent difference is greater than 10% but less than 100%. Reject (red-line) all associated sample results equal to or greater than 10xIDLs for which PD is greater than or equal to 100%.			
A.1.9.12	Furnace Atomic Absorption (AA) QC Analysis			
A.1.9.12.1	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.1.9.12.2	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 post digestion spike recovery less than 40%?	[✓]	__	__
	ACTION: If no for any of the above, flag all the associated data as estimated (J).			
A.1.9.12.3	Is *post digestion spike recovery less than 10% or greater than 150% for any result?	✓	[__]	__
	ACTION: If yes, reject (red-line) the affected data if recovery is <10%; reject data not flagged with "U" if spike recovery is >150%.			
	NOTE: Reject the data only if the affected sample was not subsequently analyzed by Method of Standard Addition.			

* Post digestion spike is not required on the pre-digestion spiked sample when predigestion spike recovery is within control limits of 75-125% or when SR>4xSA.

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

Date: Feb. 1990
Number: HW-2
Revision: 10

		YES	NO	N/A
A.1.9.13	Form VIII (Method of Standard Addition Results)			
A.1.9.13.1	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.1.9.13.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	__	[✓]	__
	ACTION: If yes, reject (red-line) affected data.			
A.1.9.13.3	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.1.9.13.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-16 through E-17?	[✓]	__	__
	ACTION: If no, note exception under contract problem/ non-compliance of data assessment narrative, or prepare a separate list.			
A.1.9.14	Dissolved/Total or Inorganic/Total Analytes -			
A.1.9.14.1	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)?	__	[✓]	__

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

	YES	NO	N/A

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.1.9.14.2 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%? — [✓] —

A.1.9.14.3 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.1.9.15 Form I to IX

A.1.9.15.1 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".

	YES	NO	N/A
A.1.9.15.2 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.

A.1.9.16 Form I (Field Blank) -

Circle all field blank values on Data Summary Sheet that are greater than CRDL, 2 x IDL when IDL > CRDL.

Do concentrations of field blank(s) fall below CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	__	✓
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.

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

Date: Feb. 1990
Number: HW-2
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	YES	NO	N/A
A.1.9.17 Form X, XI, XII (Verification of Instrumental Parameters).			
A.1.9.17.1 Is verification report present for:			
Instrument Detection Limits (quarterly)?	[✓]	___	___
ICP Interelement Correction Factors (annually)?	[✓]	___	___
ICP Linear Ranges (quarterly)?	[✓]	___	___
ACTION: If no, contact DPO of the lab.			
A.1.9.17.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)			
Are IDLs present for: all the analytes?	[✓]	___	___
all the instruments used?	[✓]	___	___
For both AA and ICP when both are used for same analyte?	[✓]	___	___
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
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?	[✓]	___	___
ACTION: If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			

	YES	NO	N/A
A.1.9.17.3 Form XI (Linear Ranges)			
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.1.9.18 Percent Solids of Sediments			
Is soil content in sediment(s) less than 50%?	___	[__]	✓
ACTION: If yes, qualify as estimated all data not previously rejected or flagged due to other QC criteria.			

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

Case# _____ Site Colts Neck Naval Weapons Sta. Matrix: Soil _____

SDG# CLP008 Lab Gulf Coast Water ✓

Contractor Roy F. Weston Reviewer Paul B. Humburg Heartland ESI Other _____

A.2.1 The case description and exceptions, if any, are noted below with reason(s) for rejection or qualification as estimated value(s) J.

The CRDL Standard for Antimony and Cadmium were below the control limit for samples 03L008-001 thru 21. All positive and non-detect results are flagged as estimated.

The CRDL Standard for Lead for sample 03L008-018 was below the control limit. All positive and non-detect results are flagged as estimated.

The CRDL Standard for Lead for samples 03L008-016 and 017 was above the control limit. All positive results are flagged as estimated.

The Matrix Spike Recovery for Thallium was below the control limit. All positive and non-detect results are flagged as estimated. This is for samples 03L008-001-21.

The Duplicate analysis for Barium was outside the control limit. for samples 03L008-001 thru 23,

A.2.1 (continuation)

The Duplicate Analysis for Lead for samples 03L008 -022 and 023 was outside the control limit. All positive and non-detect results are flagged as estimated.

The LCS for Pb for all samples was above the control limit. All positive results ~~and non-detect results~~ PBH 7/14/91 are flagged as estimated.

The post digestion spike recoveries were below the control limit. All positive and non-detect results are flagged as estimated.

As 1902M1, 06M1, A304M1, 05M1, A401M1, 02M0 and 02M1

Pb 1903M1

Se 1902M1, A301M1, A406M1

Tl 1901M1, 02M1, 0311, 03M1, 04M1, 05M1, 06M1, A302M1, 03M1, 04M1, 05M1, 06M1 07M1, A401M1, 02M0, 02M1, 02M2, 05M1 and 06M1

The post digestion spike recovery was above the control limit. All positive results are flagged as estimated.

Se 1905M1 and 1906M1

Titl : Evaluation of Metals Data for the
Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
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A.2.1 (continuation)

The post digestion spike Recovey for thallium for sample #301M1 was below 10%. All positive and non-detect results are rejectal.

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Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
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..2.2 Contract-Problems/Non-Compliance

The Laboratory failed to distill the ICV and mid range verification standard as required by contract.

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M&B Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hamby Date: 7/14/91
Signature

Verified by: Evelyn D. Templeton Date: 7/15/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: GLP 008

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: 03L008-001 thru 8 and 015 thru 23

FIELD DUP. #'S: NA LAB DUP. #'S: 1901M1 Field Blank NA MATRIX SPIKE #: 1901M1

SERIAL DILUTION SAMPLE NO. 1901M1 COMPLETION DATE: 7/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB LA EP N	ICP ICS % R		MS Spk rix	Lab Dup RPD/ Diff.	LCS % R	Ser Dil % D	Meth
					Continued						Continued										
Parameter	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3		Init	Fin					
Al	200	17.7	NA	101	100	94	97			U	18	U	29	43	100	93	107	3.8	100	6.8	P
Sb	60	18.2		101	98	98	100	85	(79)	28	26	26	25	U			89	200	92	100	P
As	10	0.8		99	97	94	92	89		-1.3	-1.6	-1.6	-1.4	-1.6			88		97		F
Ba	200	4.4		101	100	93	96			U	U	14	10	24	98	93	95	(158)	99	13	P
Be	5	0.6		100	98	95	96	104	96	U	U	U	U	U	95	89	98		98		P
Cd	5	2.7		100	100	97	99	(52)	(74)	-3.1	-4.5	-4.7	-4.4	U	105	103	105		115		P
Ca	5000	14.3		99	97	97	98			U	20	37	44	76	97	94		1.3	98	4.1	P
Cr	10	6.9		107	106	103	105	119.5	96	U	U	U	U	U	93	87	106	12.5	107	22	P
Co	50	3.0		103	102	99	101	102	97	U	U	U	U	U	92	88	101		102		P
Cu	25	2.5		101	100	92	96	102	94	U	U	U	-3.7	U	97	91	97	20.6	100	100	P
Fe	100	4.3		102	101	97	100			-5.6	U	U	6.7	36	95	89	104	6.7	102	3.5	P
Pb	PBH 7/14/91 5	1.5 12.9		97	101	107	104	93		U	U	U	U	U			117	31.6	109		F
Mg	5000	35.9		100	99	96	98			U	U	U	U	46	102	96		2.1	98	5.3	P
Mn	15	1.0		102	101	97	100	105	100	U	U	2.1	1.2	U	97	92	99	4.7	101	7.1	P
Hg	0.2	0.2		95	99	99	100			U	U	U	U	U			95				CV
Ni	40	3.9		101	100	98	100	101	96	-5.1	U	U	-4.6	U	89	85	98	200	100		P
K	5000	94.8		110	109	102	106			U	U	U	U	U				9.5	98	100	P
Se	5	1.1		99	100	98	99	86		U	U	U	U	U			116	24	105	14	F
Ag	10	3.8		102	100	97	99	95	87	U	U	U	U	U	97	92	97		103		P
Na	5000	21.4		100	99	92	95			U	U	U	U	78				0.4	99	8.5	P
Tl	10	1.4		102	100	96	99	108		U	U	U	U	U			(68)		98		F
V	50	2.0		104	103	98	100	103	94	U	U	U	U	U	96	90	100	0.5	102	27	P
Zn	20	4.7		101	99	98	100	86	81	-16	-19	-14	-19	-18	92	89	97		100		P
CN	10	10		106	101	100				U	U	U	U	U			104		113		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. ~~788~~ SAMPLE TYPE/SDG: CLP 008

SITE/STUDY DESCRIPTION: Naval Weapon Sta. SAMPLE NOS: 03L008-001 thru 023

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III					IV		V		VI	VII	IX	
ara-eter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICP ICS % R		MS Matrix	Spike	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin						
Al	200	17.7																		101		P
Sb	60	18.2						97	85											94		P
As	10	0.8			94	95	97				-1.5	-1.6	-1.5	4.6						98		F
Ba	200	4.4																		100		P
Be	5	0.6						105	104											99		P
Cd	5	2.7						105	88											115		P
Ca	5000	14.3																		100		P
Cr	10	6.9						109	105											107		P
Co	50	3.0						103	104											105		P
Cu	25	2.5						107	105											101		P
Fe	100	4.3																		103		P
Pb	5	1.5			110			(73)			U									(122)		F
Mg	5000	35.9																		99		P
Mn	15	1.0						102	100											102		P
Hg	0.2	0.2			102	101	97				U	U	U	U								CV
Ni	40	3.9						106	107											101		P
K	5000	94.8																		99		P
Se	5	1.1						108												101		F
Ag	10	3.8						93	92											104		P
Na	5000	21.4																		100		P
Tl	10	1.4			101	99	105	(121)												100		F
V	50	2.0						102	101											103		P
Zn	20	4.7						104	101											101		P
CN	10	10		98	94	96	95			U	U	U	U				83			160		AS

00057

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA 2nd ICP Run

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 008

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 03L008-001 thru 23

FIELD DUP. #'S: NA LAB DUP. #'S: A307M2 Field Blank NA MATRIX SPIKE #: A307M2

SERIAL DILUTION SAMPLE NO. A307M2 COMPLETION DATE: 7/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBL EAN	ICP ICS % R		MS tpix k	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin					
Al	200	17.7	NA	102	105	104	102			U	U	U	U	46	103	99	102		105		P
Sb	60	18.2		102	102	101	100			U	24	27	38	U			87	200	95	100	P
As	10	0.8	PBH	~~101~~	96		9										95		96		F
Ba	200	4.4	7/14/91	102	104	103	101			U	U	U	U	U	101	98	97	200	104		P
Be	5	0.6		101	102	101	100			U	U	U	U	U	97	94	93		103		P
Cd	5	2.7		98	97	95	94			U	U	U	U	U	102	98	99		85		P
Ca	5000	14.3		100	103	101	100			U	U	U	U	77	100	96		12.2	103	100	P
Cr	10	6.9		107	107	108	107			U	U	U	U	U	93	93	103		106		P
Co	50	3.0		104	108	106	105			U	U	U	U	U	95	91	101		108		P
Cu	25	2.5		103	105	104	102			U	U	U	U	U	101	98	100	200	105		P
Fe	100	4.3		103	106	105	104			-8.4	-8.1	U	14	36	97	94	101	4.4	106	100	P
Pb	5	1.5		98	105			80									110	200	104		F
Mg	5000	35.9		101	103	102	101			U	U	U	U	61	104	100			103		P
Mn	15	1.0		103	106	104	103			U	U	U	U	U	99	95	99		106		P
Hg	0.2	0.2			99	98															CV
Ni	40	3.9		102	105	103	102			4.6	U	U	U	U	92	88	99		105		P
K	5000	94.8		109	109	109	109			U	U	U	U	139				200	99	377	P
Se	5	1.1		105	102	105	98			U	U	U	U	U			111		110		F
Ag	10	3.8		103	103	102	101			U	U	U	U	U	98	95	103		110		P
Na	5000	21.4		101	103	102	100			U	U	U	U	96				4.4	103	48	P
Tl	10	1.4			104	102		103		U	U	U	U	U			96		100		F
V	50	2.0		105	108	106	105			U	U	U	U	U	99	95	99		108		P
Zn	20	4.7		102	104	103	102			-12	-9	-8	-14	-9	95	91	98		104		P
CN	10	10	V	99	100	98				U	U	U					113		92		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 088

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 03L008-001 thru 23

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 2/14/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff.	LCS	Ser Dil	Meth
Analyte	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin			% R	% D	
Al	200	17.7			105						U								101		P
Sb	60	18.2			101						34								93		P
As	10	0.8									-1.4	-1.5	-1.6						83		F
Ba	200	4.4			103						U								99		P
Be	5	0.6			102						U								97		P
Cd	5	2.7			92						U								86		P
Ca	5000	14.3			102						17								98		P
Cr	10	6.9			107						U	U							105		P
Co	50	3.0			106						U								102		P
Cu	25	2.5			101						U								99		P
Fe	100	4.3			105						7.2								103		P
Pb	5	1.5		102	104	108		(67)		1.8	U								(147)		F
Mg	5000	35.9			103						U								98		P
Mn	15	1.0			101						U								101		P
Hg	0.2	0.2	PBW 2/14/91	104							U	U	U								CV
Ni	40	3.9			104						U								100		P
K	5000	94.8			101						U	U							98		P
Se	5	1.1									U	U							108		F
Ag	10	3.8			102						U								106		P
Na	5000	21.4			103						27								99		P
Tl	10	1.4						(121)			U	U	U						101		F
V	50	2.0			107						U								102		P
Zn	20	4.7			103						-8.4								100		P
CN	10	10																	94		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP OLM

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 03L008-001 thru 23

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L			Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB RL EA PN		ICP ICS % R		MS Mtrix	Lab Dup RPD/Diff.	LCS	Ser Dil	
Analyte	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3			Init	Fin			% R	% D	Method
Al	200	17.7																				P
Sb	60	18.2																				P
As	10	0.8			99	99	97				-1.4	-1.7	-1.5									F
Ba	200	4.4																				P
Be	5	0.6																				P
Cd	5	2.7			93																	P
Ca	5000	14.3																				P
Cr	10	6.9			108																	P
Co	50	3.0																				P
Cu	25	2.5																				P
Fe	100	4.3																				P
Pb	5	1.5		106	104			83		U	U	-1.4										F
Mg	5000	35.9																				P
Mn	15	1.0		PBH 7/14/91 8																		P
Hg	0.2	0.2			89																	CV
Ni	40	3.9																				P
K	5000	94.8			109																	P
Se	5	1.1			102																	F
Ag	10	3.8																				P
Na	5000	21.4																				P
Tl	10	1.4			99	103				U												F
V	50	2.0																				P
Zn	20	4.7																				P
CN	10	10																		117		AS

00060

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 008

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: 03L008-001 thru 23

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 2/13/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB RL EP AN	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff.	LCS	Ser Dil	Method
Parameter	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin			% R	% D	
Al	200	17.7																			
Sb	60	18.2																			
As	10	0.8			99	98					-1.5										F
Ba	200	4.4																			
Be	5	0.6																			
Cd	5	2.7																			
Ca	5000	14.3																			
Cr	10	6.9																			
Co	50	3.0																			
Cu	25	2.5																			
Fe	100	4.3																			
Pb	5	1.5		98	97			(123)		-1.6	-1.9										F
Mg	5000	35.9																			
Mn	15	1.0																			
Hg	0.2	0.2																			
Ni	40	3.9																			
K	5000	94.8																			
Se	5	1.1																			
Ag	10	3.8																			
Na	5000	21.4																			
Tl	10	1.4		109	100	101	97			U	U	U	U								F
V	50	2.0																			
Zn	20	4.7																			
CN	10	10																	115		AS

00061

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 008

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 03L008-001 thru 23

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 2/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
Analyte	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Method
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin					
Al	200	17.7																			
Sb	60	18.2																			
As	10	0.8																			
Ba	200	4.4																			
Be	5	0.6																			
Cd	5	2.7																			
Ca	5000	14.3																			
Cr	10	6.9																			
Co	50	3.0																			
Cu	25	2.5																			
Fe	100	4.3																			
Pb	5	1.5		102	107					U	U										F
Mg	5000	35.9																			
Mn	15	1.0																			
Hg	0.2	0.1																			
Ni	40	3.9																			
K	5000	94.8																			
Se	5	1.1																			
Ag	10	3.8																			
Na	5000	21.4																			
Tl	10	1.4			98	101	101				U	U	U								F
V	50	2.0																			
Zn	20	4.7																			
CN	10	10.																			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

Date: Feb. 1990
Number: HW-2
Revision: 10

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 7/14/91 Case #:

Site: Colt Neches Naval Weapon Station Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 22 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
ICP														
Flame AA														
Furnace AA												1	1	
Mercury														
Total												1	1	
Other														

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

ICP		2					1						3	
Flame AA														
Furnace AA		1				1				1		4	7	
Mercury														
Total		3				1	1			1		4	10	
Other														

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

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.7: CLP Data Assessment Checklist
Inorganic Analysis

Date: Feb. 1990
Number: HW-2
Revision: 10

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. _____

SITE Colts Neck Naval Weapons Sta.

LABORATORY Gulf Coast

NO. OF SAMPLES/ MATRIX 22 waters + 2 MS/D

SDG# CLP 008

REVIEWER (IF NOT ESD) _____

SOW# 788

REVIEWER'S NAME Paul B. Humbury
Heart/and ESE

DPO: ACTION: _____ FYI _____

COMPLETION DATE 2/14/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	O	O	O	O
2.	CALIBRATIONS	O	O	O	O
3.	BLANKS	O	O	O	O
4.	ICS	O			
5.	LCS	O	O		
6.	DUPLICATE ANALYSIS	O	O	O	O
7.	MATRIX SPIKE	O	O	O	O
8.	MSA		O		
9.	SERIAL DILUTION	O			
10.	SAMPLE VERIFICATION	O	O	O	O
11.	OTHER QC				
12.	OVERALL ASSESSMENT	O	O	O	O

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

July 15, 1991

To: John Williams
Roy F. Weston Inc.
One Weston Way
Lionville, PA

From: Paul B. Humburg
Project Manager
Heartland ESI

Subject: Data Validation Services using EPA Region II guidelines for Inorganic analyses. The samples reviewed consisted of three soils for full TAL metals plus Cyanide plus 1 MS/D. The analyses were performed by Roy F. Weston's Gulf Coast Laboratory.

EPA ID	Gulf Coast ID	EPA ID	Gulf Coast ID
	Soil Samples (full TAL)		
10-004	03L043-001	A7-001D	03L043-003D
A7-001	03L043-003	A7-007	03L043-004
A7-001MS	03L043-003MS		

Heartland ESI has reviewed the data for the samples listed above for the TAL list for Metals plus Cyanide using EPA Region II CLP Inorganic Data Assessment Protocol, Standard Operating Procedure HW-2, Revision 10, February 1990. Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to the requirements and deliverables of U.S. EPA CLP Region II. This screening assumes that the analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Individual fraction was reviewed as follows:

* Metals plus Cyanide by Paul B. Humburg with secondary review by Christopher D. Scarpellino

Please refer to the Form Is and detailed Data Validation Report for additional information. The Cyanide Data Summary List is included in this report because the laboratory did not submit the Cyanides on the Forms Is in the CLP package. The Form Is included in the Data Validation Report are annotated with the standard validation qualifiers as well as footnotes which refer to the specific findings listed numerically in the Data Assessment Narrative section. Specific comments are provided in the following case narrative.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

INORGANICS DATA ASSESSMENT NARRATIVE

General

The overall package quality was good. The Form Is contained in this data package did not include Cyanide as a target analyte. The laboratory prepared the Cyanide analytical results as a separate package. This reviewer has included the Cyanides in our TAL Metals package.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (ICV) standard for Cyanide as required by EPA Region II protocol.

No field blanks were apparently associated with this set of samples. The Chain-of-Custodies associated with these samples do not indicate that the water samples are equipment or field blanks. Therefore, the soil samples were not qualified based on results from the water samples. The water samples were simply reviewed as additional field samples.
All other contractual requirements were met.

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

Holding Times

The holding times were met as specified by QA protocol.

Calibration

1. The CRDL Standard for Zinc was below the lower control limit. All positive and non-detect results are flagged "UJ or "J", as estimated.

Preparation and Field Blanks

2. The Prep Blank was contaminted with Iron. All samples were compared to the value in the prep blank times 10. None of the samples required flagging.

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike Recovery for Lead was below 10%. All positive and non-detect results are rejected.

Inorganics Data Assessment Narrative (continued- page 2)

4. The Matrix Spike Recovery for Antimony was below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Duplicate

No deficiencies in this section.

LCS

5. The Soil LCS for Mercury was analyzed by the Laboratory. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Serial Dilution

No deficiencies in this section.

MSA

No deficiencies in this section.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SPECIFIC SAMPLE ID	ANALYTE	DL	QL	FINDING
All samples	Zn	+/U	J/UJ	1
All samples	Fe(200mg/kg)	+	J	2
All samples	Pb	+/U	R	3
All samples	Sb	+/U	J/UJ	4
All samples	Hg	+/U	J/UJ	5

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 05/08/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L043

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	10-004-T001	% Solids	87.7	%	0.10
		Cyanide, Total	0.28 u	MG/KG	0.28
-003	07-001-T001	% Solids	90.2	%	0.10
		Cyanide, Total	0.26 u	MG/KG	0.26
-004	07-007-T001	% Solids	79.1	%	0.10
		Cyanide, Total	0.32 u	MG/KG	0.32

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

10-004

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP043

Matrix (soil/water): SOIL Lab Sample ID: 03L043-001

Level (low/med): LOW Date Received: 03/22/91

% Solids: 87.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7550			P	
7440-36-0	Antimony	3.2	U	N	P	J4
7440-38-2	Arsenic	5.3			F	
7440-39-3	Barium	6.0	B		P	
7440-41-7	Beryllium	0.69	B		P	
7440-43-9	Cadmium	0.48	U		P	
7440-70-2	Calcium	117	B		P	
7440-47-3	Chromium	94.4			P	
7440-48-4	Cobalt	0.55	B		P	
7440-50-8	Copper	0.44	U		P	
7439-89-6	Iron	20000			P	
7439-92-1	Lead	~~2.6~~		N	~~F~~	R3
7439-95-4	Magnesium	1480			P	
7439-96-5	Manganese	11.8			P	
7439-97-6	Mercury	0.10	U		CV	J5
7440-02-0	Nickel	0.69	U		P	
7440-09-7	Potassium	4240			P	
7782-49-2	Selenium	0.52	B		F	
7440-22-4	Silver	0.67	U		P	
7440-23-5	Sodium	19.6	B		P	
7440-28-0	Thallium	0.29	U		F	
7440-62-2	Vanadium	76.4			P	
7440-66-6	Zinc	8.9			P	J1

Color Before: Brown Clarity Before: Texture: Medium

Color After: Yellow Clarity After: Artifacts:

Comments:

ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A7-001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP043

Matrix (soil/water): SOIL Lab Sample ID: 03L043-003

Level (low/med): LOW Date Received: 03/22/91

% Solids: 90.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7260			P	
7440-36-0	Antimony	3.4	U	N	P	J4
7440-38-2	Arsenic	11.9			F	
7440-39-3	Barium	14.2	B		P	
7440-41-7	Beryllium	0.32	B		P	
7440-43-9	Cadmium	0.51	U		P	
7440-70-2	Calcium	165	B		P	
7440-47-3	Chromium	24.3			P	
7440-48-4	Cobalt	1.3	B		P	
7440-50-8	Copper	3.1	B		P	
7439-89-6	Iron	15200			P	
7439-92-1	Lead	~~13.8~~		NS	~~F~~	R3
7439-95-4	Magnesium	555	B		P	
7439-96-5	Manganese	15.1			P	
7439-97-6	Mercury	0.11	U		CV	J5
7440-02-0	Nickel	1.4	B		P	
7440-09-7	Potassium	733	B		P	
7782-49-2	Selenium	0.56	B		F	
7440-22-4	Silver	0.71	U		P	
7440-23-5	Sodium	162	B		P	
7440-28-0	Thallium	0.29	U		F	
7440-62-2	Vanadium	36.2			P	
7440-66-6	Zinc	13.3			P	J1

Color Before: Brown Clarity Before: Texture: Medium

Color After: Yellow Clarity After: Artifacts:

Comments:

ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

A7-007

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP043

Matrix (soil/water): SOIL Lab Sample ID: 03L043-004

Level (low/med): LOW Date Received: 03/22/91

% Solids: 79.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5740			P	
7440-36-0	Antimony	4.4	U	N	P	J4
7440-38-2	Arsenic	18.3			F	
7440-39-3	Barium	8.4	B		P	
7440-41-7	Beryllium	0.31	B		P	
7440-43-9	Cadmium	0.65	U		P	
7440-70-2	Calcium	146	B		P	
7440-47-3	Chromium	22.3			P	
7440-48-4	Cobalt	0.72	U		P	
7440-50-8	Copper	3.3	B		P	
7439-89-6	Iron	11600			P	
7439-92-1	Lead	~~6.0~~		~~N~~	~~F~~	R3
7439-95-4	Magnesium	358	B		P	
7439-96-5	Manganese	6.2			P	
7439-97-6	Mercury	0.11	U		CV	J5
7440-02-0	Nickel	0.94	U		P	
7440-09-7	Potassium	500	B		P	
7782-49-2	Selenium	0.50	B		F	
7440-22-4	Silver	0.91	U		P	
7440-23-5	Sodium	54.0	B		P	
7440-28-0	Thallium	0.33	U		F	
7440-62-2	Vanadium	26.1			P	
7440-66-6	Zinc	10.2			P	J1

Color Before: Brown Clarity Before: Texture: Medium

Color After: Yellow Clarity After: Artifacts:

Comments:

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

Date: Feb. 1990
Number: HW-2
Revision: 10

	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 or on file?	[ ]		✓
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.			

	YES	NO	N/A
A.1.6 Form I (Final Data) - Are all Form I's present and complete?	[✓]		
ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
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 EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]		
Are computation/transcription errors less than 10% of reported values?	[✓]		
Are all "less than IDL" values properly coded with "U"?	[✓]		
Was a brief physical description of samples given on Form I's?	[✓]		
Were the result qualifiers used correctly with final data?	[✓]		
ACTION: If no for any of the above, prepare Telephone Record Log, and contract laboratory for corrected data.			
Were any samples diluted beyond requirements of contract?		[✓]	
If yes, were dilutions noted on Form I's?	[ ]		✓
ACTION: If no, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			

A.1.7 Holding Times - (aqueous and soil samples)

(Examine sample traffic reports and digestion/distillation logs.)

Mercury analysis (28 days). . . . . exceeded?		[✓]	
Cyanide distillation (14 days). . . . . exceeded?		[✓]	

	YES	NO	N/A
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 Raw Data

A.1.8.1	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 Digestion Log?	[✓]	__	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	__	✓
	Furnace AA	[✓]	__	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	__	___

	YES	NO	N/A
A.1.8.3 Are all raw data to support all sample analyses and QC operations present?	[✓]	__	__
Legible?	[✓]	__	__
Properly Labeled?	[✓]	__	__

ACTION: If no for any of the above, write Telephone Record Log and contact laboratory. Flag metal data as estimated if pH of sample is greater than 2. Flag cyanide data as estimated if pH sample is less than 12.

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

A.1.9.1.1 Is record of at least 2 point calibration present for ICP analysis?	[✓]	__	__
Is record of 5 point calibration present for Hg analysis?	[✓]	__	__

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

A.1.9.1.2 Is record of 4 point calibration present for:			
Flame AA?	[___]	__	✓
Furnace AA?	[✓]	___	__
Cyanides?	[✓]	___	__

NOTE:
1. If less than 4 standards are measured in absorbance mode, then the remaining standards in concentration mode must be run immediately after calibration and be within ±10% of true value.
2. For all AA (except Hg) and Cyanide analyses, one calibration standard is at CRDL level. If not, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
ACTION: Flag associated data as estimated if standards are not within ±10% of true values (except CRDL calibration standard). Do not flag the data as estimated in linear range indicated by good recovery of standard.			
A.1.9.1.3 Is correlation *coefficient less than 0.995 for:			
Mercury Analysis?	___	[✓]	___
Cyanide Analysis?	___	[✓]	___
Atomic Absorption Analysis?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated.			
A.1.9.2 Form II A (Initial and Continuing Calibration Verification)-			
A.1.9.2.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for AA and ICP when both are used for same analyte?	[✓]	___	___
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
A.1.9.2.2 Circle all values on data summary sheet that are outside contract windows. Are all calibration standards (initial and continuing) within control limits?			
Metals 90-110%	[✓]	___	___
Hg - 80-120%	[✓]	___	___
Cyanides 85-115%	[✓]	___	___

* The reviewer will calculate correlation coefficient.

	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.

Was continuing calibration performed every 10 samples or every 2 hours? [✓] -- --

ACTION: If no, flag the excess samples (eleventh and up) data as estimated (J).

Was ICV for cyanides distilled? [ ] ✓ --

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

A.1.9.3 Form II B (CRDL Standards for AA and ICP) -

A.1.9.3.1 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.

* Find the results of mid-range standard in the raw data.
**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
A.1.9.3.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and for every four hours of ICP run?	[✓]	__	__
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.9.3.3	Circle all values on summary sheet that are outside 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 data within the affected ranges if the recovery of the standard is between 50-79%; flag only positive data if the recovery is between 121-150%; reject (red line) all data if the recovery is less than 50%; reject only positive data if the recovery is greater than 150%.			
A.1.9.4	Form III (Initial and Continuing Calibration Blanks)			
A.1.9.4.1	Present and complete?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[✓]	__	__
	Was an initial calibration blank analyzed?	[✓]	__	__
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (whichever is more frequent)?	[✓]	__	__
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the contract-problems/ non-compliance section of the Data Assessment Narrative.			

		YES	NO	N/A
A.1.9.4.2	Circle all calibration blank values on Data Summary Sheet that are above CRDL (or 2 x IDL when IDL > CRDL). Are all calibration blanks (when IDL<CRDL) less than or equal to Contract Required Detection Limits (CRDL)?	[✓]	__	__
	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) all positive data less than or equal to calibration blank values 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.			
A.1.9.5	FORM III (Preparation Blank) -			
	(Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.9.5.1	Was one prep. blank analyzed for: each 20 samples?	[✓]	__	__
	each batch?	[✓]	__	__
	each matrix type?	[✓]	__	__
	both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all 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).			
A.1.9.5.2	Is concentration of prep. blank greater than 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 value?	__	[✓]	__

		YES	NO	N/A
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value found in the raw data.			
A.1.9.5.3	Do concentrations of prep. blank fall below two times IDL when IDL is greater than CRDL?	[✓]	__	__
	ACTION: If no, reject (red-line) all positive data that has a concentration less than 10 times the prep. blank value in the raw data.			
A.1.9.5.4	Is concentration of prep. blank below the negative CRDL?	__	[✓]	__
	ACTION: If yes, reject (red-line) all associated data that has a concentration less than 10xCRDL.			
A.1.9.6	Form IV (ICP Interference Check Sample)			
A.1.9.6.1	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 samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.8.6.2	Circle all values on Data Summary Sheet that are more than + 20% of true or established mean value. Are all Interference Check Sample results inside of control limits (+ 20%)?	[✓]	__	__
	If no, is concentration of Al, Ca, Fe, or Mg lower than in ICS?	[✓]	__	__
	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").			

		YES	NO	N/A
A.1.9.7	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.1.9.7.1	Present and complete for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each conc. range (i.e. low, med., high)?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all positive data less than four times spiking level 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.1.9.7.2	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.			
	NOTE: Matrix spike analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.7.3	Circle all values on Data Summary Sheet 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?	[__]	✓	__
	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.			

	YES	NO	N/A
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.1.9.7.4 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.1.9.7.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	✓	[__]	__
(b) between 10-74%?	✓	[__]	__
(c) between 126-200%?	__	[✓]	__
(d) greater than 200%?	__	[✓]	__

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".

		YES	NO	N/A
A.1.9.8	**Form VI (Lab Duplicates)**			
A.1.9.8.1	Present and complete for: each 20 samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[✓]	___	___

ACTION: If no for any the above, flag as estimated (J) all 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 Hg/L on wet weight basis and calculate RPD or Difference for each analyte.

A.1.9.8.2	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.

NOTE: Duplicate analysis should be performed on a field blank when it is the only aqueous sample in SDG.

A.1.9.8.3	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".

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.

* Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
	2. If lab duplicate result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria.			
A.1.9.8.4	Is any value for sample duplicate pair less than CRDL* and other value greater than or equal to 10 x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated (J).			
A.1.9.8.5	Aqueous Circle all values on Data Summary Sheet 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.1.9.8.6	Soil/Sediment Circle all values on Data Summary Sheet 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.1.9.9	Field Duplicates			
A.1.9.9.1	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.1.9.9.2	Is any value for sample duplicate pair less than *CRDL and other value greater than or equal to 10 x *CRDL?		[✓]	
	ACTION: If yes, flag the associated data as estimated.			
A.1.9.9.3	Aqueous			
	Circle all values on 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.1.9.9.4 Soil/Sediment

Circle all values on 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.1.9.10 Form VII (Laboratory Control Sample) (Note: LCS - not required for aqueous Hg and cyanide analyses.)

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [___] ___ [✓]

every 20 solid samples? [✓] ___ ___

both AA and ICP when both are used for 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 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.1.9.10.2 Aqueous LCS

Circle all LCS values outside control limits (80 - 120%- except 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.1.9.10.3 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.1.9.11	Form IX (ICP Serial Dilution) -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.9.11.1	Was Serial Dilution analysis performed for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each concentration range (i.e. low, med.)?	[✓]	__	__
	ACTION: If no for any of the above, flag all positive data greater than or equal to 10xIDLs as estimated (J) for which Serial Dilution Analysis was not performed, and summarize the deficiency on the DPO report.			
A.1.9.11.2	Was field blank(s) used for Serial Dilution Analysis?	__	[✓]	__
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J).			
	NOTE: Serial dilution analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.11.3	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.1.9.11.4	Circle all values on Data Summary Sheet that are outside control limit 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 associated equal to or greater than 10xIDLs for which percent difference is greater than 10% but less than 100%. Reject (red-line) all associated sample results equal to or greater than 10xIDLs for which PD is greater than or equal to 100%.

A.1.9.12 Furnace Atomic Absorbtion (AA) QC Analysis

A.1.9.12.1 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.1.9.12.2 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 post digestion spike recovery less than 40%? [ ] _ ✓

ACTION: If no for any of the above, flag all the associated data as estimated (J).

A.1.9.12.3 Is *post digestion spike recovery less than 10% or greater than 150% for any result? _ [✓] _

ACTION: If yes, reject (red-line) the affected data if recovery is <10%; reject data not flagged with "U" if spike recovery is >150%.

NOTE: Reject the data only if the affected sample was not subsequently analyzed by Method of Standard Addition.

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

		YES	NO	N/A
A.1.9.13	Form VIII (Method of Standard Addition Results)			
A.1.9.13.1	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.1.9.13.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	__	[✓]	__
	ACTION: If yes, reject (red-line) affected data.			
A.1.9.13.3	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.1.9.13.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-16 through E-17?	[✓]	__	__
	ACTION: If no, note exception under contract problem/ non-compliance of data assessment narrative, or prepare a separate list.			
A.1.9.14	Dissolved/Total or Inorganic/Total Analytes -			
A.1.9.14.1	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)?	__	[✓]	__

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

	YES	NO	N/A

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.1.9.14.2 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%? — [✓] —

A.1.9.14.3 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.1.9.15 Form I to IX

A.1.9.15.1 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".

	YES	NO	N/A
A.1.9.15.2 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.

A.1.9.16 Form I (Field Blank) -

Circle all field blank values on Data Summary Sheet that are greater than CRDL, 2 x IDL when IDL > CRDL.

Do concentrations of field blank(s) fall below CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓
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.

	YES	NO	N/A
A.1.9.17 Form X, XI, XII (Verification of Instrumental Parameters).			
A.1.9.17.1 Is verification report present for:			
Instrument Detection Limits (quarterly)?	[✓]	__	__
ICP Interelement Correction Factors (annually)?	[✓]	__	__
ICP Linear Ranges (quarterly)?	[✓]	__	__
ACTION: If no, contact DPO of the lab.			
A.1.9.17.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)			
Are IDLs present for: all the analytes?	[✓]	__	__
all the instruments used?	[✓]	__	__
For both AA and ICP when both are used for same analyte?	[✓]	__	__
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
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?	[✓]	__	__
ACTION: If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			

	YES	NO	N/A
A.1.9.17.3 Form XI (Linear Ranges)			
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.1.9.18 Percent Solids of Sediments			
Is soil content in sediment(s) less than 50%?	___	[✓]	___
ACTION: If yes, qualify as estimated all data not previously rejected or flagged due to other QC criteria.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

Case# _____ Site Naval Weapons Sta. Matrix: Soil ✓

SDG# CLP 043 Lab Gulf Coast Water _____

Contractor Roy F. Weston Reviewer Paul B. Humburg
Heartland ESE Other _____

A.2.1 The case description and exceptions, if any, are noted below with reason(s) for rejection or qualification as estimated value(s) J.

The CRDL Standard for Zinc and Lead (Sample A7-001) were below the control limit. All positive and non-detect results are flagged as estimated. The Prep blank showed contamination for Iron. All samples were greater than 10 times the prep blank contamination. The Matrix Spike Recovery for Lead was below 10%. All positive and non-detect results are rejected. The Matrix Spike Recovery for Antimony was below the control limit. All positive and non-detect results are flagged as estimated. No LCS for Mercury all data estimated.

PBH 7/13/91

PBH 7/13/91

A.2.2 Contract-Problems/Non-Compliance

The Laboratory failed to distill an ICV or mid-range verification standard. The Laboratory failed to run a soil LCS for mercury.

PBH 7/13/91

MMB Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hamby Date: 7/13/91
Signature

Verified by: Christopher D. Scarpelli Date: 7/15/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 043

SITE/STUDY DESCRIPTION: Naval Weapons Station SAMPLE NOS: 10-004, A7-001 and A7-007

FIELD DUP. #'S: NA LAB DUP. #'S: A7-001 Field Blank NA MATRIX SPIKE #: A7-001

SERIAL DILUTION SAMPLE NO. A7-001 COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB RLEAPN	ICP ICS % R		MS Stpirk	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Meth
					Continued						Continued										
Iraeter	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3		Init	Fin					
Al	200	17.7	NA	98	98	97	96			U	U	U	U	18.5	97	97	584	5.1	96	4.6	P
Sb	60	18.2		103	100	101	99	81	81	31	34	36	32	U			39.5		92		P
As	10	0.8		98	99	100	102	88		-1.2	-1.1	-1.0	-1.3	0.2			121	4.5	94		P
Ba	200	4.4		99	99	97	97			U	U	U	U	U	96	96	96	4.5	96	17.3	P
Be	5	0.6		99	98	97	96	103	103	U	U	U	U	U	94	94	94	19.8	94	224	P
Cd	5	2.7		101	99	101	98	107	98	2.7	U	U	U	U	100	101	107		105		P
Ca	5000	14.3		98	97	96	95			U	U	U	U	23.9	95	95		3.1	94	5.6	P
Cr	10	6.9		107	107	105	104	92	87	U	U	U	U	U	91	92	94	2.0	103	9.2	P
Co	50	3.0		103	102	100	99	100	99	U	U	U	U	U	90	90	99	0.4	98	100	P
Cu	25	2.5		100	101	99	98	94	96	U	U	U	U	U	95	95	96	3.3	97	23	P
Fe	100	4.3		101	101	100	99			U	4.4	8.0	4.3	20	93	93		0.9	98	4.1	P
Pb	5	1.5		104	106	105	106	107		U	U	U	U	U			-70	18.1	103		F
Mg	5000	35.9		100	99	98	98			U	U	U	U	22.4	100	101		0.8	95	6.1	P
Mn	15	1.0		102	101	100	99	101	102	U	U	U	U	0.28	94	94	97	11.7	98	7.5	P
Hg	0.2	0.2		95	99	99	100			U	U	U	U	U			102				CV
Ni	40	3.9		100	100	98	97	100	99	U	U	U	U	U	88	87	96	8.8	96	100	P
K	5000	94.8		108	108	107	106			-138	-104	U	U	U				4.8	95	0.8	P
Se	5	1.1		99	97	100	100	100		U	U	U	U	U			108	8.7	105		F
Ag	10	3.8		103	101	102	100	97	91	U	U	U	U	U	97	97	89		102		P
Na	5000	21.4		98	98	97	97			U	U	U	U	6.7				5.7	95	29.9	P
Tl	10	1.4		102	100	96	99	108		U	U	U	U	U			102		114		F
V	50	2.0		103	102	101	100	102	101	U	U	3.4	2.3	U	95	94	95	4.8	99	2	P
Zn	20	4.7		100	100	99	98	79	79	-8.6	-7.6	-8.7	-7.8	-1.12	91	91	95	24.0	94	38	P
CN	10	10	↓	98	97	97	101			U	U	U	U	U			101	0.1	100		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 043

SITE/STUDY DESCRIPTION: Naval Weapons Station SAMPLE NOS: 10-004, A7-001 and A7-002

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/23/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICS %R	MS Matrix	Lab Dup RPD/Diff.	LCS	Ser Dil	Method
Analyte	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init Fin			% R	% D	
Al	200	17.7			97	97	99				U	U	U					95		P
Sb	60	18.2			99	99	101				33	38	26					92		P
As	10	0.8			102	105	101	84			-1.1	-1.5	-1.1					91		F
Ba	200	4.4			97	98	99				U	U	U					96		P
Be	5	0.6			97	97	99				U	U	U					93		P
Cd	5	2.7			99	101	103				-2.7	U	U					106		P
Ca	5000	14.3			96	96	98				U	U	U					99		P
Cr	10	6.9			105	106	107				U	U	U					103		P
Co	50	3.0			100	101	102				U	U	U					98		P
Cu	25	2.5			99	100	101				U	U	U					97		P
Fe	100	4.3			100	100	102				14.6	U	5.3					98		P
Pb	5	1.5			98	98	98	(63)			U	U	U					108		F
Mg	5000	35.9			99	99	100				U	U	U					95		P
Mn	15	1.0			100	100	102				U	U	U					98		P
Hg	0.2	0.2			102	101	97				U	U	U							CV
Ni	40	3.9			98	99	100				U	U	U					96		P
K	5000	94.8			107	107	108				-101	U	-118					95		P
Se	5	1.1			101	102	104				U	U	U					105		F
Ag	10	3.8			101	100	101				U	U	U					102		P
Na	5000	21.4			97	97	98				U	U	U					96		P
Tl	10	1.4			101	99	105				U	U	U					120		F
V	50	2.0			101	101	102				U	U	2.2					99		P
Zn	20	4.7			99	99	101				-7.8	-7.8	-7.0					95		P
CN	10	10			103	103	103				U	U	U					93		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 043

SITE/STUDY DESCRIPTION: Naval Weapons Station SAMPLE NOS: 10-004, A7-001 and A7-007

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	RL ANA	ICP % R	ICS % R	MS Matrix	Spk	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Meth
Parameter	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3			Init	Fin						
Al	200	17.7			97						29											P
Sb	60	18.2			98						23											P
As	10	0.8			103	104	104				-1.3	-1.2	U									F
Ba	200	4.4			96						U											P
Be	5	0.6			96						U											P
Cd	5	2.7			99						U											P
Ca	5000	14.3			95						47											P
Cr	10	6.9			103						U											P
Co	50	3.0			99						U											P
Cu	25	2.5			98						U											P
Fe	100	4.3			99						21											P
Pb	5	1.5			102	100	93				U	U	U									F
Mg	5000	35.9			97						U											P
Mn	15	1.0			98						U											P
Hg	0.2	0.2			99	98	90				U	U	U									CV
Ni	40	3.9			97						U											P
K	5000	94.8			106						U											P
Se	5	1.1																				F
Ag	10	3.9			100						U											P
Na	5000	21.4			96						U											P
Tl	10	1.4			104						U											F
V	50	2.0			99						U											P
Zn	20	4.7			97						-6.8											P
CN	10	10									U											AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 043

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: 10-004, A7-001 and A7-002

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PB/L

	X	I	IIA				IIB		III				IV		V	VI		VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP ICS % R							
				Continued						Continued										
Analyte	CRDL	IDL	Field Blank	Init	1	2	3	Init	Fin	Init	1	2	3	PBL EAP N	Init	Fin	Mtrix k	Spik Diff.	LCS % R	Ser Dil % D	Meth
Al	200																				
Sb	60																				
As	10	0.8			104						-1.1										F
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	5	1.5			104	102	105				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2	0.2			100	99	99				U	U	U								CV
Ni	40																				
K	5000																				
Se	5	1.1																			
Ag	10																				
Na	5000																				
Tl	10	1.4																			
V	50																				
Zn	20																				
CN	10																				

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 043

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 10-004, A7-001 and A7-007

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP % R				Lab Dup		Ser Dil	
Analyte	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PBL PREP	ICS % R Init	ICS % R Fin	Mtrx Spik	LCS % R	RPD/Diff. % D	Method
Al	200																			
Sb	60																			
As	10	0.8		96	96	95	95			-1.8	-1.8	-2.2	-1.6							F
Ba	200																			
Be	5																			
Cd	5																			
Ca	5000																			
Cr	10																			
Co	50																			
Cu	25																			
Fe	100																			
Pb	5	1.5			106	109					U	U								F
Mg	5000																			
Mn	15																			
Hg	0.2	0.2			104	97					U	U	U							CV
Ni	40																			
K	5000																			
Se	5	1.1																		
Ag	10																			
Na	5000																			
Tl	10	1.4																		
V	50																			
Zn	20																			
CN	10																			

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 043

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 10-004, A7-001 and A7-007

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP % R				Lab Dup		Ser Dil	
Analyte	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PREP	BLANK	Init	Fin	Mtrix	Spik	RPD/Diff.	LCS % R	% D	Meth
Al	200																						
Sb	60																						
As	10				95	PBH 7/13/91																	F
Ba	200																						
Be	5																						
Cd	5																						
Ca	5000																						
Cr	10																						
Co	50																						
Cu	25																						
Fe	100																						
Pb	5	1.5		100	102	100	102			U	U	U	U										F
Mg	5000																						
Mn	15																						
Hg	0.2				99	97					U												CV
Ni	40																						
K	5000																						
Se	5																						
Ag	10																						
Na	5000																						
Tl	10																						
V	50																						
Zn	20																						
CN	10																						

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Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

Date: Feb. 1990
Number: HW-2
Revision: 10

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 7/13/91 Case #:

Site: Colts Neck Naval Weapons Station Lab Name: Gulf Coast

Reviewer's Initials: PDH Number of Samples: 3

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
ICP														
Flame AA														
Furnace AA						1							1	
Mercury														
Total						1							1	
Other														

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

ICP		1				1							2	
Flame AA														
Furnace AA		1											1	
Mercury										1			1	
Total		2				1				1			4	
Other														

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

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.7: CLP Data Assessment Checklist
Inorganic Analysis

Date: Dec. 1988
Number: HW-2
Revision: 8

INORGANIC REGIONAL DATA ASSESSMENT Region II

CASE NO. _____ SITE Naval Weapons Station

LABORATORY Gulf Coast NO. OF SAMPLES/ MATRIX 3 soils

SDG# CLP 043 REVIEWER (IF NOT ESD) _____

SOW# 788 REVIEWER'S NAME Paul B. Humbury Heartland ESI

DPO: ACTION _____ FYI _____ COMPLETION DATE 7/13/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	O	O	O	O
2.	CALIBRATIONS	O	O	O	O
3.	BLANKS	O	O	O	O
4.	ICS	O			
5.	LCS	O	O		
6.	DUPLICATE ANALYSIS	O	O	O	O
7.	MATRIX SPIKE	O	O	O	O
8.	MSA		O		
9.	SERIAL DILUTION	O			
10.	SAMPLE VERIFICATION	O	O	O	O
11.	OTHER QC				
12.	OVERALL ASSESSMENT	O	O	O	O

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

July 15, 1991

To: John Williams
Roy F. Weston Inc.
One Weston Way
Lionville, PA

From: Paul B. Humburg
Project Manager
Heartland ESI

Subject: Data Validation Services using EPA Region II guidelines for Inorganic analyses. The samples reviewed consisted of one water for full TAL metals plus Cyanide plus 1 MS/D and eight soils for full TAL metals plus Cyanide plus 1 MS/D. The analyses were performed by Roy F. Weston's Gulf Coast Laboratory.

EPA ID	Gulf Coast ID	EPA ID	Gulf Coast ID
	Water Samples (full TAL)		
104201	03L007-009	104201MS	03L007-009MS
104201D	03L007-009D		
	Soil Samples (full TAL)		
34T001	03L007-001	42T001	03L007-003
34T001MS	03L007-001MS	43T001	03L007-004
34T001D	03L007-001D	51T001	03L007-006
37T001	03L007-002	51T101	03L007-007
3TP031	03L007-010	53T001	03L007-008

Heartland ESI has reviewed the data for the samples listed above for the TAL list for Metals plus Cyanide using EPA Region II CLP Inorganic Data Assessment Protocol, Standard Operating Procedure HW-2, Revision 10, February 1990. Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to the requirements and deliverables of U.S. EPA CLP Region II. This screening assumes that the analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Individual fraction was reviewed as follows:

* Metals plus Cyanide by Paul B. Humburg with secondary review by Christopher D. Scarpellino

Please refer to the Form Is and detailed Data Validation Report for additional information. The Cyanide Data Summary List is included in this report because the laboratory did not submit the

Cyanides on the Forms Is in the CLP package. The Form Is included in the Data Validation Report are annotated with the standard validation qualifiers as well as footnotes which refer to the specific findings listed numerically in the Data Assessment Narrative section. Specific comments are provided in the following case narrative.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

INORGANICS DATA ASSESSMENT NARRATIVE

General

The overall package quality was good. The Form Is contained in this data package did not include Cyanide as a target analyte. The laboratory prepared the Cyanide analytical results as a separate package. This reviewer has included the Cyanides in our TAL Metals package.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (ICV) standard for Cyanide as required by EPA Region II protocol.

No field blanks were apparently associated with this set of samples. The Chain-of-Custodies associated with these samples do not indicate that the water samples are equipment or field blanks. Therefore, the soil samples were not qualified based on results from the water samples. The water samples were simply reviewed as additional field samples.
All other contractual requirements were met.

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

Holding Times

The holding times were met as specified by QA protocol.

Calibration

1. The CRDL Standard for Zinc for soils was below the control limit. All positive and non-detect results are flagged "UJ" or "J" , as estimated.

2. The CRDL Standard for Antimony and Lead for waters were below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Preparation and Field Blanks

3. The prep blank exhibited contamination for Iron (20mg/kg). All samples were compared to ten times this amount and were found to be acceptable. Therefore, no flagging of data for prep blank contamination was required.

Interferences

No significant interferences were observed.

Spike Recovery

4. The Matrix Spike Recovery for Barium for soils was below the lower control limit. All positive and non-detect results are flagged "J" or "UJ" as estimated.

5. The Matrix Spike Recovery for Aluminum for soils was above 200%. All positive results are rejected.

Duplicate

6. The Duplicate Analysis for Barium was outside the control limits for soils. All positive and non-detect results are flagged "UJ" or "J", as estimated.

7. The Duplicate Analysis for Zinc was outside the control limits for waters. All positive and non-detect results are flagged "UJ" or "J", as estimated.

LCS

9. The LCS for Mercury was not analyzed as required by the protocol. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Serial Dilution

8. The Serial Dilution Analyese for Aluminum and Manganese were outside the control limits. All positive and non-detect results are flagged "UJ" or "J", as estimated.

MSA

10. The analytical spiking results for the following analytes were outside the control limits on the low side. Therefore, all positive and non-detect results are flagged "J" or "UJ", as estimated.

Analyte	Samples
Selenium	104201

11. The analytical spiking results for the following analytes were outside the control limits on the high side. Therefore, all positive results are flagged "J", as estimated.

Analyte	Samples
Selenium	37T001 and 42T001

HEARTLAND ENVIRONMENTAL SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SPECIFIC SAMPLE ID	ANALYTE	DL	QL	FINDING
All soils	Zn	+/U	J/UJ	1
All waters	Sb and PB	+/U	J/UJ	2
All soils	Fe(200mg/kg)	+	J	3
All soils	Ba	+/U	J/UJ	4
All soils	Al	+	R	5
All soils	Ba	+/U	J/UJ	6
All waters	Zn	+/U	J/UJ	7
All soils	Al and Mn	+/U	J/UJ	8
All soils	Hg	+/U	J/UJ	9
104201	Se	+/U	J/UJ	10
37T001 and 42T001	Se	+	J	11

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 04/10/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L007

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	03-004-T001	% Solids	90.9	%	0.10
		Cyanide, Total	0.92	MG/KG	0.50
-002	03-007-T001	% Solids	84.0	%	0.10
		Cyanide, Total	0.58 u	MG/KG	0.58
-003	04-002-T001	% Solids	93.2	%	0.10
		Cyanide, Total	0.48 u	MG/KG	0.48
-004	04-003-T001	% Solids	86.8	%	0.10
		Cyanide, Total	0.58 u	MG/KG	0.58
-006	05-001-T001	% Solids	82.2	%	0.10
		Cyanide, Total	0.60 u	MG/KG	0.60
-007	05-001-T101	% Solids	81.3	%	0.10
		Cyanide, Total	0.56 u	MG/KG	0.56
-008	05-003-T001	% Solids	77.9	%	0.10
		Cyanide, Total	0.54 u	MG/KG	0.54
-009	10-004-T201	Cyanide, Total	0.033 u	MG/L	0.033
-010	03-TP03-001	% Solids	67.6	%	0.10
		Cyanide, Total	0.70 u	MG/KG	0.70

ENVIROFORMS/CLP 788

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

104201

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): WATER Lab Sample ID: 03L007-009

Level (low/med): LOW Date Received: 03/20/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	118	B		P	
7440-36-0	Antimony	18.2	U		P	J2
7440-38-2	Arsenic	0.90	U		F	
7440-39-3	Barium	4.4	U		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	4.5	B		P	
7440-70-2	Calcium	188	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.9	U		P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	4.0	B		P	
7439-89-6	Iron	105			P	
7439-92-1	Lead	1.5	U		F	J2
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	82.1	B		P	
7439-96-5	Manganese	1.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	5.4	B		P	
7440-09-7	Potassium	94.8	U		P	
7782-49-2	Selenium	1.1	U	W	F	J10
7440-21-3	Silicon				NR	
7440-22-4	Silver	3.8	U		P	
7440-23-5	Sodium	403	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	1.4	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.0	U		P	
7440-66-6	Zinc	27.4		*	P	J7

COLORLESS Clarity Before: CLEAR Texture:

COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

34T001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-001

Level (low/med): LOW Date Received: 03/20/91

% 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	~~1250~~		EN	P	R S
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	0.46	B		F	
7440-39-3	Barium	1320		*N	P	J 4,6
7440-41-7	Beryllium	0.16	B		P	
7440-43-9	Cadmium	0.56	U		P	
7440-70-2	Calcium	85.2	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	7.3			P	
7440-48-4	Cobalt	1.6	B		P	
7440-50-8	Copper	12.1			P	
7439-89-6	Iron	3210		*	P	
7439-92-1	Lead	32.4			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	66.2	B		P	
7439-96-5	Manganese	11.6		E	P	J8
7439-97-6	Mercury	0.10	U		CV	J9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	2.9	B		P	
7440-09-7	Potassium	96.2	B		P	
7782-49-2	Selenium	0.23	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	0.78	U		P	
7440-23-5	Sodium	31.6	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.29	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	6.9	B		P	
7440-66-6	Zinc	34.7			P	J 1

BROWN Clarity Before: Texture: MEDIUM

COLORLESS Clarity After: Artifacts:

Comments:

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ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

37T001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-002

Level (low/med): LOW Date Received: 03/20/91

% Solids: 84.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~1080~~		~~EN~~	~~P~~	R S
7440-36-0	Antimony	3.9	U		P	
7440-38-2	Arsenic	0.33	B		F	
7440-39-3	Barium	4.8	B	*N	P	J 4,6
7440-41-7	Beryllium	0.13	U		P	
7440-43-9	Cadmium	0.58	U		P	
7440-70-2	Calcium	27.8	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	7.7			P	
7440-48-4	Cobalt	0.64	U		P	
7440-50-8	Copper	1.0	B		P	
7439-89-6	Iron	1040		*	P	
7439-92-1	Lead	3.3			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	29.9	B		P	
7439-96-5	Manganese	5.5		E	P	J 8
7439-97-6	Mercury	0.11	U		CV	J 9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	1.3	B		P	
7440-09-7	Potassium	141	B		P	
7782-49-2	Selenium	0.26	U	W	F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	0.81	U		P	
7440-23-5	Sodium	29.1	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.33	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	5.0	B		P	
7440-66-6	Zinc	21.5			P	J 1

BROWN Clarity Before: Texture: MEDIUM

COLORLESS Clarity After: Artifacts: 39

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

3TP031

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-010

Level (low/med): LOW Date Received: 03/20/91

% Solids: 67.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~1220~~		~~EN~~	~~P~~	R S
7440-36-0	Antimony	5.1	U		P	
7440-38-2	Arsenic	0.99	B		F	
7440-39-3	Barium	73.5		*N	P	J 4,6
7440-41-7	Beryllium	0.17	U		P	
7440-43-9	Cadmium	0.76	U		P	
7440-70-2	Calcium	7420			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	2.0	B		P	
7440-48-4	Cobalt	1.8	B		P	
7440-50-8	Copper	16.3			P	
7439-89-6	Iron	3590		*	P	
7439-92-1	Lead	13.4		S	F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1150	B		P	
7439-96-5	Manganese	43.7		E	P	J8
7439-97-6	Mercury	0.14	U		CV	J9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	1.1	U		P	
7440-09-7	Potassium	110	B		P	
7782-49-2	Selenium	0.34	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	1.1	U		P	
7440-23-5	Sodium	43.4	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.36	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	6.7	B		P	
7440-66-6	Zinc	17.8			P	J1

BLACK Clarity Before: Texture: MEDIUM

BROWN Clarity After: Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

42T001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-003

Level (low/med): LOW Date Received: 03/20/91

% Solids: 93.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~2060~~		~~EN~~	~~P~~	R 5
7440-36-0	Antimony	3.5	U		P	
7440-38-2	Arsenic	0.48	B		F	
7440-39-3	Barium	20.8	B	*N	P	J4,6
7440-41-7	Beryllium	0.17	B		P	
7440-43-9	Cadmium	0.52	U		P	
7440-70-2	Calcium	201	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	5.6			P	
7440-48-4	Cobalt	1.5	B		P	
7440-50-8	Copper	5.9			P	
7439-89-6	Iron	3200		*	P	
7439-92-1	Lead	13.8		S	F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	80.8	B		P	
7439-96-5	Manganese	8.0		E	P	J8
7439-97-6	Mercury	0.10	U		CV	J9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.3	B		P	
7440-09-7	Potassium	177	B		P	
7782-49-2	Selenium	0.22	U	W	F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	0.73	U		P	
7440-23-5	Sodium	35.4	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.28	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	7.9	B		P	
7440-66-6	Zinc	71.1			P	J1

BROWN Clarity Before: Texture: MEDIUM

COLORLESS Clarity After: Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

43T001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-004

Level (low/med): LOW Date Received: 03/20/91

% Solids: 86.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~1720~~		~~EN~~	~~P~~	R S
7440-36-0	Antimony	4.1	U		P	
7440-38-2	Arsenic	0.41	B		F	
7440-39-3	Barium	10.1	B	*N	P	J4,6
7440-41-7	Beryllium	0.16	B		P	
7440-43-9	Cadmium	0.61	U		P	
7440-70-2	Calcium	168	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	2.2	B		P	
7440-48-4	Cobalt	0.79	B		P	
7440-50-8	Copper	0.57	U		P	
7439-89-6	Iron	2210		*	P	
7439-92-1	Lead	2.4			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	20.4	B		P	
7439-96-5	Manganese	20.4		E	P	J8
7439-97-6	Mercury	0.11	U		CV	J9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.88	U		P	
7440-09-7	Potassium	161	B		P	
7782-49-2	Selenium	0.24	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	0.86	U		P	
7440-23-5	Sodium	20.3	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.30	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	3.8	B		P	
7440-66-6	Zinc	38.2			P	J1

BROWN Clarity Before: Texture: MEDIUM

COLORLESS Clarity After: Artifacts:

Comments:

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ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

51T001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-006

Level (low/med): LOW Date Received: 03/20/91

% Solids: 82.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~3930~~		~~EN~~	~~P~~	R 5
7440-36-0	Antimony	4.3	U		P	
7440-38-2	Arsenic	4.7			F	
7440-39-3	Barium	2.9	B	*N	P	J 4 | 6
7440-41-7	Beryllium	0.66	B		P	
7440-43-9	Cadmium	0.64	U		P	
7440-70-2	Calcium	224	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	117			P	
7440-48-4	Cobalt	0.78	B		P	
7440-50-8	Copper	0.83	B		P	
7439-89-6	Iron	26200		*	P	
7439-92-1	Lead	4.8			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1170	B		P	
7439-96-5	Manganese	8.6		E	P	J 8
7439-97-6	Mercury	0.12	U		CV	J 9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.92	U		P	
7440-09-7	Potassium	3880			P	
7782-49-2	Selenium	1.0	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	0.90	U		P	
7440-23-5	Sodium	63.5	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.31	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	103			P	
7440-66-6	Zinc	70.5			P	J 1

BROWN Clarity Before: Texture: MEDIUM

YELLLOW Clarity After: Artifacts:

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Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

51T101

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-007

Level (low/med): LOW Date Received: 03/20/91

% Solids: 81.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~4220~~		~~EN~~	~~P~~	R 5
7440-36-0	Antimony	3.6	U		P	
7440-38-2	Arsenic	5.6			F	
7440-39-3	Barium	2.8	B	*N	P	J 4, 6
7440-41-7	Beryllium	0.72	B		P	
7440-43-9	Cadmium	0.54	U		P	
7440-70-2	Calcium	236	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	126			P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	1.5	B		P	
7439-89-6	Iron	28200		*	P	
7439-92-1	Lead	4.4			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1230			P	
7439-96-5	Manganese	9.0		E	P	J 8
7439-97-6	Mercury	0.08	U		CV	J 9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.78	U		P	
7440-09-7	Potassium	4200			P	
7782-49-2	Selenium	0.97	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	0.76	U		P	
7440-23-5	Sodium	48.6	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.32	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	106			P	
7440-66-6	Zinc	98.9			P	J 1

BROWN Clarity Before: Texture: MEDIUM

YELLOW Clarity After: Artifacts:

Comments:

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ENVIROFORMS/CLP 788

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

53T001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP007

Matrix (soil/water): SOIL Lab Sample ID: 03L007-008

Level (low/med): LOW Date Received: 03/20/91

% Solids: 77.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~1630~~		EN	P	R S
7440-36-0	Antimony	3.9	U		P	
7440-38-2	Arsenic	2.7			F	
7440-39-3	Barium	5.6	B	*N	P	J 4, 6
7440-41-7	Beryllium	0.28	B		P	
7440-43-9	Cadmium	0.58	U		P	
7440-70-2	Calcium	110	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	30.3			P	
7440-48-4	Cobalt	0.65	U		P	
7440-50-8	Copper	2.2	B		P	
7439-89-6	Iron	5410		*	P	
7439-92-1	Lead	16.0			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	273	B		P	
7439-96-5	Manganese	5.9		E	P	J 8
7439-97-6	Mercury	0.09	U		CV	J 9
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.93	B		P	
7440-09-7	Potassium	870	B		P	
7782-49-2	Selenium	0.30	B		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.3			P	
7440-23-5	Sodium	18.6	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	0.32	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	26.1			P	
7440-66-6	Zinc	30.2			P	J 1

BROWN Clarity Before: Texture: MEDIUM

COLORLESS Clarity After: Artifacts:

Comments:

15

	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 or on file?	[ ]		✓
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?	[✓] PBH 7/13/91		✓
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.			

	YES	NO	N/A
A.1.6 Form I (Final Data) - Are all Form I's present and complete?	[✓]		
ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
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 EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]		
Are computation/transcription errors less than 10% of reported values?	[✓]		
Are all "less than IDL" values properly coded with "U"?	[✓]		
Was a brief physical description of samples given on Form I's?	[✓]		
Were the result qualifiers used correctly with final data?	[✓]		
ACTION: If no for any of the above, prepare Telephone Record Log, and contract laboratory for corrected data.			
Were any samples diluted beyond requirements of contract?	[ ]	[✓]	
If yes, were dilutions noted on Form I's?	[ ]		✓
ACTION: If no, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			

A.1.7 Holding Times - (aqueous and soil samples)

(Examine sample traffic reports and digestion/distillation logs.)

Mercury analysis (28 days). . . . . exceeded?		[✓]	
Cyanide distillation (14 days). . . . . exceeded?		[✓]	

	YES	NO	N/A
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 Raw Data

A.1.8.1	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 Digestion Log?	[✓]	__	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	__	✓
	Furnace AA	[✓]	__	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	__	___

	YES	NO	N/A
A.1.8.3 Are all raw data to support all sample analyses and QC operations present?	[✓]	__	__
Legible?	[✓]	__	__
Properly Labeled?	[✓]	__	__

ACTION: If no for any of the above, write Telephone Record Log and contact laboratory. Flag metal data as estimated if pH of sample is greater than 2. Flag cyanide data as estimated if pH sample is less than 12.

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

A.1.9.1.1 Is record of at least 2 point calibration present for ICP analysis?	[✓]	__	__
Is record of 5 point calibration present for Hg analysis?	[✓]	__	__

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

A.1.9.1.2 Is record of 4 point calibration present for:			
Flame AA?	[__]	__	✓
Furnace AA?	[✓]	__	__
Cyanides?	[✓]	__	__

NOTE:
1. If less than 4 standards are measured in absorbance mode, then the remaining standards in concentration mode must be run immediately after calibration and be within ±10% of true value.
2. For all AA (except Hg) and Cyanide analyses, one calibration standard is at CRDL level. If not, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
ACTION: Flag associated data as estimated if standards are not within ±10% of true values (except CRDL calibration standard). Do not flag the data as estimated in linear range indicated by good recovery of standard.			
A.1.9.1.3 Is correlation *coefficient less than 0.995 for:			
Mercury Analysis?	___	[✓]	___
Cyanide Analysis?	___	[✓]	___
Atomic Absorption Analysis?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated.			
A.1.9.2 Form II A (Initial and Continuing Calibration Verification)-			
A.1.9.2.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for AA and ICP when both are used for same analyte?	[✓]	___	___
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
A.1.9.2.2 Circle all values on data summary sheet that are outside contract windows. Are all calibration standards (initial and continuing) within control limits?			
Metals 90-110%	[✓]	___	___
Hg - 80-120%	[✓]	___	___
Cyanides 85-115%	[✓]	___	___

* The reviewer will calculate correlation coefficient.

	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.

Was continuing calibration performed every 10 samples or every 2 hours? [✓] __ __

ACTION: If no, flag the excess samples (eleventh and up) data as estimated (J).

Was ICV for cyanides distilled? [__] ✓ __

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

A.1.9.3 Form II B (CRDL Standards for AA and ICP) -

A.1.9.3.1 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.

* Find the results of mid-range standard in the raw data.
**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
A.1.9.3.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and for every four hours of ICP run?	[✓]	__	__
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.9.3.3	Circle all values on summary sheet that are outside 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 data within the affected ranges if the recovery of the standard is between 50-79%; flag only positive data if the recovery is between 121-150%; reject (red line) all data if the recovery is less than 50%; reject only positive data if the recovery is greater than 150%.			
A.1.9.4	Form III (Initial and Continuing Calibration Blanks)			
A.1.9.4.1	Present and complete?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[✓]	__	__
	Was an initial calibration blank analyzed?	[✓]	__	__
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (whichever is more frequent)?	[✓]	__	__
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the contract-problems/ non-compliance section of the Data Assessment Narrative.			

		YES	NO	N/A
A.1.9.4.2	Circle all calibration blank values on Data Summary Sheet that are above CRDL (or 2 x IDL when IDL > CRDL). Are all calibration blanks (when IDL<CRDL) less than or equal to Contract Required Detection Limits (CRDL)?	[✓]	__	__
	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) all positive data less than or equal to calibration blank values 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.			
A.1.9.5	FORM III (Preparation Blank) -			
	(Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.9.5.1	Was one prep. blank analyzed for: each 20 samples?	[✓]	__	__
	each batch?	[✓]	__	__
	each matrix type?	[✓]	__	__
	both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all 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).			
A.1.9.5.2	Is concentration of prep. blank greater than 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 value?	__	[✓]	__

		YES	NO	N/A
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value found in the raw data.			
A.1.9.5.3	Do concentrations of prep. blank fall below two times IDL when IDL is greater than CRDL?	[✓]	__	__
	ACTION: If no, reject (red-line) all positive data that has a concentration less than 10 times the prep. blank value in the raw data.			
A.1.9.5.4	Is concentration of prep. blank below the negative CRDL?	__	[✓]	__
	ACTION: If yes, reject (red-line) all associated data that has a concentration less than 10xCRDL.			
A.1.9.6	Form IV (ICP Interference Check Sample)			
A.1.9.6.1	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 samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.8.6.2	Circle all values on Data Summary Sheet that are more than + 20% of true or established mean value. Are all Interference Check Sample results inside of control limits (+ 20%)?	[✓]	__	__
	If no, is concentration of Al, Ca, Fe, or Mg lower than in ICS?	[__]	__	✓
	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").			

		YES	NO	N/A
A.1.9.7	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.1.9.7.1	Present and complete for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each conc. range (i.e. low, med., high)?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all positive data less than four times spiking level 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.1.9.7.2	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.			
	NOTE: Matrix spike analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.7.3	Circle all values on Data Summary Sheet 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?	[__]	✓	__
	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.			

	YES	NO	N/A
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.1.9.7.4 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.1.9.7.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	__	[✓]	__
(b) between 10-74%?	✓	[__]	__
(c) between 126-200%?	__	[✓]	__
(d) greater than 200%?	__	[✓]	__

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".

		YES	NO	N.A
A.1.9.8	Form VI (Lab Duplicates)			
A.1.9.8.1	Present and complete for: each 20 samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[___]	___	✓

ACTION: If no for any the above, flag as estimated (J) all 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 Hg/L on wet weight basis and calculate RPD or Difference for each analyte.

A.1.9.8.2	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.

NOTE: Duplicate analysis should be performed on a field blank when it is the only aqueous sample in SDG.

A.1.9.8.3	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".

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.

* Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
	2. If lab duplicate result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria.			
A.1.9.8.4	Is any value for sample duplicate pair less than CRDL* and other value greater than or equal to 10 x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated (J).			
A.1.9.8.5	Aqueous Circle all values on Data Summary Sheet 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.1.9.8.6	Soil/Sediment Circle all values on Data Summary Sheet 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.1.9.9	Field Duplicates			
A.1.9.9.1	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.1.9.9.2	Is any value for sample duplicate pair less than *CRDL and other value greater than or equal to 10 x *CRDL?	___	[_ _]	✓
	ACTION: If yes, flag the associated data as estimated.			
A.1.9.9.3	Aqueous			
	Circle all values on 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.1.9.9.4 Soil/Sediment

Circle all values on 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.1.9.10 Form VII (Laboratory Control Sample) (Note: LCS - not required for aqueous Hg and cyanide analyses.)

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [✓] _ _ ___

every 20 solid samples? [✓] _ _ ___

both AA and ICP when both are used for 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 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.1.9.10.2 Aqueous LCS

Circle all LCS values outside control limits (80 - 120%- except 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.1.9.10.3 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.1.9.11	Form IX (ICP Serial Dilution) -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.9.11.1	Was Serial Dilution analysis performed for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each concentration range (i.e. low, med.)?	[__]	__	✓
	ACTION: If no for any of the above, flag all positive data greater than or equal to 10xIDLs as estimated (J) for which Serial Dilution Analysis was not performed, and summarize the deficiency on the DPO report.			
A.1.9.11.2	Was field blank(s) used for Serial Dilution Analysis?	__	[✓]	__
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J).			
	NOTE: Serial dilution analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.11.3	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.1.9.11.4	Circle all values on Data Summary Sheet that are outside control limit 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 associated equal to or greater than 10xIDLs for which percent difference is greater than 10% but less than 100%. Reject (red-line) all associated sample results equal to or greater than 10xIDLs for which PD is greater than or equal to 100%.

A.1.9.12 Furnace Atomic Absorption (AA) QC Analysis

A.1.9.12.1 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.1.9.12.2 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 post digestion spike recovery less than 40%? [___] ___ ✓

ACTION: If no for any of the above, flag all the associated data as estimated (J).

A.1.9.12.3 Is *post digestion spike recovery less than 10% or greater than 150% for any result? ___ [✓] ___

ACTION: If yes, reject (red-line) the affected data if recovery is <10%; reject data not flagged with "U" if spike recovery is >150%.

NOTE: Reject the data only if the affected sample was not subsequently analyzed by Method of Standard Addition.

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

		YES	NO	N/A
A.1.9.13	Form VIII (Method of Standard Addition Results)			
A.1.9.13.1	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.1.9.13.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	__	[✓]	__
	ACTION: If yes, reject (red-line) affected data.			
A.1.9.13.3	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.1.9.13.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-16 through E-17?	[✓]	__	__
	ACTION: If no, note exception under contract problem/ non-compliance of data assessment narrative, or prepare a separate list.			
A.1.9.14	Dissolved/Total or Inorganic/Total Analytes -			
A.1.9.14.1	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)?	__	[✓]	__

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

	YES	NO	N/A

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.1.9.14.2 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%? — [✓] —

A.1.9.14.3 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.1.9.15 Form I to IX

A.1.9.15.1 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".

	YES	NO	N/A
A.1.9.15.2 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.

A.1.9.16 Form I (Field Blank) -

Circle all field blank values on Data Summary Sheet that are greater than CRDL, 2 x IDL when IDL > CRDL.

Do concentrations of field blank(s) fall below CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓
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.

	YES	NO	N/A
A.1.9.17 Form X, XI, XII (Verification of Instrumental Parameters).			
A.1.9.17.1 Is verification report present for:			
Instrument Detection Limits (quarterly)?	[✓]	__	__
ICP Interelement Correction Factors (annually)?	[✓]	__	__
ICP Linear Ranges (quarterly)?	[✓]	__	__
ACTION: If no, contact DPO of the lab.			
A.1.9.17.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)			
Are IDLs present for: all the analytes?	[✓]	__	__
all the instruments used?	[✓]	__	__
For both AA and ICP when both are used for same analyte?	[✓]	__	__
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
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?	[✓]	__	__
ACTION: If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			

	YES	NO	N/A
A.1.9.17.3 Form XI (Linear Ranges)			
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.1.9.18 Percent Solids of Sediments			
Is soil content in sediment(s) less than 50%?	___	[✓]	___
ACTION: If yes, qualify as estimated all data not previously rejected or flagged due to other QC criteria.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

Case# _____ Site Naval Weapons Sta. Matrix: Soil ✓

SDG# CLP007 Lab Gulf Coast Water ✓

Contractor Roy F. Weston Reviewer Paul B. Humburg Heartland ESI Other ____

A.2.1 The case description and exceptions, if any, are noted below with reason(s) for rejection or qualification as estimated value(s) J.

Soils only

The CRDL for Zinc was below the lower control limit. All positive and non-detect results are flagged as estimated.

The Prep Blank for Iron was above the CRDL but all samples were greater than 10 times the prep blank value, No action is necessary.

The Matrix Spike Recovery for Barium was below the control limit. All positive and non-detect results are flagged as estimated.

The Matrix Spike Recovery for Aluminum was greater than 200%. All positive data is rejected.

The Duplicate Analysis for Barium was outside the control limits. All positive

A.2.1 (continuation)

and non-detect data are flagged as estimated. The Serial Dilution analysis for Aluminum and Manganese were outside the control limits. All positive and non-detect results are flagged as estimated. The laboratory failed to run an LCS for Mercury. All positive and non-detect results are flagged as estimated. The Analytical Spike Recoveries for Selenium for Samples 37T001 and 42T001 were above the control limit. Flag all positive data as estimated.

Waters only

The CRDL for Antimony and Lead were below the control limit. All positive and non-detect results are Flagged as estimated. The Duplicate Analysis for Zinc was outside the control limits. All positive and non-detect results are flagged as estimated. The Analytical Spike Recovery for Selenium for Sample 104201 was below the control

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

A.2.1 (continuation)

limit. All positive and non-detect results are flagged as estimated.

PBH 7/13/91

PBH 7/13/91

A.2.2 Contract-Problems/Non-Compliance

The Laboratory failed to distille the ICV or mid-range verification standard for Cyanides. The Laboratory Failed to analysis a soil LCS for Mercury as required.

PBH 7/13/91

MMB Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul H. Hamby Date: 7/13/91
Signature

Verified by: Kristopher D. Fengelli Date: 7/15/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA Soil

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 007

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 104201, 34, 37, 42, 43, 51 and 53T001, 51T101 and 3TP031

FIELD DUP. #'S: NA LAB DUP. #'S: 34T001 Field Blank NA MATRIX SPIKE #: 34T001

SERIAL DILUTION SAMPLE NO. 34T001 COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB R L E A P N	ICP ICS % R		MS Mt pi rx k	Lab Dup RPD/ Diff.	LCS % R	Ser Dil % D	Me th
					Continued						Continued				PBH						
Iter	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3		Init	Fin					
Al	200	17.7	NA	98	98	97	96			U	U	U	U	18.5 ~~104~~	97	97	259	2	96	13	P
Sb	60	18.2		103	100	101	99	81	81	31	34	37	32	U			77		92		P
As	10	0.8		101	98	99	99	89		-1.7	-1.9	-1.7	-2.0	-.2			83	5.3	94		F
Ba	200	4.4		99	99	97	97			U	U	U	U	U	96	96	56	124	96	5	P
Be	5	0.6		99	98	97	96	103	103	U	U	U	U	U	94	94	92	29	94	100	P
Cd	5	2.7		101	99	101	98	107	98	2.7	U	U	U	U	100	101	110		105		P
Ca	5000	14.3		98	97	96	95			U	U	U	U	23.9	95	95		7.8	94	285	P
Cr	10	6.9		107	107	105	104	92	87	U	U	U	U	U	91	92	100	7.2	103	100	P
Co	50	3.0		103	102	100	99	100	99	U	U	U	U	U	90	90	98	80.3	98	100	P
Cu	25	2.5		100	101	99	98	94	96	U	U	U	U	U	95	95	91	17.3	97	9	P
Fe	100	4.3		101	101	100	99			U	4.4	8.0	4.3	20.	93	93		35	98	9.4	P
Pb	5	1.5		98	100	100	97	77		U	U	U	U	U			-42	4.1	103		F
Mg	5000	35.9		100	99	98	98			U	U	U	U	22.4	100	101		15	95	39	P
Mn	15	1.0		102	101	100	99	101	102	U	U	U	U	0.28	94	94	93	14.4	98	29	P
Hg	0.2	0.2		95	99	99	100			U	U	U	U	U					—		EV
Ni	40	3.9		100	100	98	97	100	99	U	U	U	U	U	88	87	95	14.4	96	88	P
K	5000	94.8		108	108	107	106			-138	-104	U	U	U				7.5	95	100	P
Se	5	1.1		98	95	91	91	86		U	U	U	U	U			102		105		F
Ag	10	3.8		103	101	102	100	97	91	U	U	U	U	U	97	97	103		102		P
Na	5000	21.4		98	98	97	97			U	U	U	U	6.7				45.7	95	7	P
Tl	10	1.4		102	100	109	109	91		-1.5	-2.0	U	U	U			105		114		F
V	50	2.0		103	102	101	100	101	101	U	U	3.4	2.3	U	95	94	97	3.1	99	8	P
Zn	20	4.7		100	100	99	98	79	79	-8.6	-7.6	-8.7	-9.8	-1.0	91	91	89	10.7	94	6	P
CN	10	10		106	101					V	U			U			106		113		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 007

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 104201, 34, 37, 42, 43, 51 and S3T001, S1T001 and 3TP031

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III					IV		V		VI	VII	IX	
	Detection Limits UG/L			Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICP ICS % R		MS Matrix	Lab Dup RPD Diff.	LCS	Ser Dil	
					Continued						Continued											
Parameter	CRDL	IDL	Field Blank	Init	1	2	3	Init	Fin	Init	1	2	3	PREP	Init	Fin			% R	% D	Method
Al	200	17.7	NA		97	97	99				U	U	U								P
Sb	60	18.2			99	99	101				33	38	26								P
As	10	0.8			98	102	102	88			-1.9	-1.5	-2.0								F
Ba	200	4.4			97	98	99				U	U	U								P
Be	5	0.16			97	97	99				U	U	U								P
Cd	5	2.7			99	101	103				-2.7	U	U								P
Ca	5000	14.3			96	96	98				U	U	U								P
Cr	10	6.9			105	106	107				U	U	U								P
Co	50	3.0			100	101	102				U	U	U								P
Cu	25	2.5			99	100	101				U	U	U								P
Fe	100	4.3			100	100	102				14.6	U	5.3								P
Pb	5	1.5			100	101	100	107			U	U	U								F
Mg	5000	35.9			99	99	100				U	U	U								P
Mn	15	1.0			100	100	102				U	U	U								P
Hg	0.2	0.2			100	101	97				U	U	U								CV
Ni	40	3.9			98	99	100				U	U	U								P
K	5000	94.8			107	107	108				-101	95	-118								P
Se	5	1.1			90	91	91	100			U	-1.1	U								F
Ag	10	3.8			101	100	101				U	U	U								P
Na	5000	21.4			97	97	98				U	U	U								P
Tl	10	1.4		PBH 7/12/91	97 ~~104~~	98	100	108			U	U	U								F
V	50	2.0			101	101	102				U	U	2.2								P
Zn	20	4.7			99	99	101				-7.8	-7.8	-7.0								P
CN	10	10		98	94	96				U	U	U	U				93				AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP007

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 104201, 34, 37, 42, 43, 51 and 53T001, 51T101 and 3TP031

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PSH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Field	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff	LCS	Ser Dil	Method
Iraeter	CRDL	IDL	Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin			% R	% D	
Al	200	17.7	NA		97						29										P
Sb	60	18.2			98						23										P
As	10	0.8			103	103	103			-1.2	-1.1	-1.0	-1.3								F
Ba	200	4.4			96						U										P
Be	5	0.6			96						U										P
Cd	5	2.7			99						U										P
Ca	5000	14.3			95						47										P
Cr	10	6.9			103						U										P
Co	50	3.0			99						U										P
Cu	25	2.5			98						U										P
Fe	100	4.3			99						21										P
Pb	5	1.5		104	106	105	106	(63)			U	U	U								F
Mg	5000	35.9			97						U										P
Mn	15	1.0			98						U										P
Hg	0.2	0.2			99	98	90				U										CV
Ni	40	3.9			97						U										P1
K	5000	94.8			106						U										P
Se	5	1.1		99	97	100	100				U	U									F
Ag	10	3.8			100						U										P
Na	5000	21.4			96						U										P
Tl	10	1.4			106	104	105				U	U	U								F
V	50	2.0			99						U										P
Zn	20	4.3			97						6.8										P
CN	10		V	99	100	95	94				U	U	U				85				AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 007

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 104201, 34, 37, 42, 43, 51 and 53T001, 51T101 and 3TP031

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBM

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB PREP	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Meth
					Continued						Continued										
Parameter	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3		Init	Fin					
Al	200																				P
Sb	60																				P
As	10			98	99	100	102				-1.1	-1.5	-1.1								F
Ba	200																				P
Be	5																				P
Cd	5																				P
Ca	5000																				P
Cr	10																				P
Co	50																				P
Cu	25																				P
Fe	100																				P
Pb	5	1.5			98	98	98				U	U	U								F
Mg	5000																				P
Mn	15										U	U	U								P
Hg	0.2	0.2			~~100~~ 90	~~99~~ 100	99														CV
Ni	40				PB H 7/12/91																P
K	5000	94.8		109	107	108	109			U	U	U	U								P
Se	5	0.8			101	102															F
Ag	10																				P
Na	5000																				P
Tl	10	1.5			102	106	105				U	U	-1.7								F
V	50																				P
Zn	20																				P
CN	10			98	97	92	96			U	U	U									AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 007

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 104201, 34, 37, 42, 43, 51, and S3T001, S1T101 and 3TP031

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP % R		MS		Lab Dup	LCS	Ser Dil	
Analyte	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PREP	BLANK	Init	Fin	Matrix	Spike RPD/Diff.	% R	% D	Method
Al	200																					P
Sb	60																					P
As	10	0.8			102	105	101				-1.3	-1.2	U									F
Ba	200																					P
Be	5																					P
Cd	5																					P
Ca	5000																					P
Cr	10																					P
Co	50																					P
Cu	25																					P
Fe	100																					P
Pb	5				102	100	93				U	U	U									F
Mg	5000																					P
Mn	15																					P
Hg	0.2				104	97	99															CV
Ni	40																					P
K	5000	94.8			108	108					U	U										P
Se	5																					F
Ag	10																					P
Na	5000																					P
Tl	10				107	98	101				-1.6	U	U									F
V	50																					P
Zn	20																					P
CN	10									U	U	U										AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA Water

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 007

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 104201, 34, 37, 42, 43, 51, and 53T001, 51T101 and 3TP031

FIELD DUP. #'S: NA LAB DUP. #'S: 104201 Field Blank NA MATRIX SPIKE #: 104201

SERIAL DILUTION SAMPLE NO. 104201 COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB EP	ICP ICS % R		MS Dup	Lab Dup RPD/Diff.	LCS	Ser Dil	Meth
Iraeter	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PN	Init	Fin	%R		%R	%D	
Al	200	17.7	NA	100	100	101				U	68	54		109	92	92	92	42	95	100	P
Sb	60	18.2		94	94	95		79	81	U	U	U		-28			85		89		P
As	10	0.8			103	104								-2			97		99		F
Ba	200	4.4		100	102	100				U	5.4	4.5		U	98	100	90		94		P
Be	5	0.6		98	102	102		97	101	U	U	U		U	96	99	84		92		P
Cd	5	2.7		94	93	94		106	108	U	U	U		U	102	102	91	200	106	100	P
Ca	5000	14.3		98	101	102				U	U	29		141	91	94		62	94	15	P
Cr	10	6.9		106	108	108		87	97	U	U	U		U	94	95	96		102		P
Co	50	3.0		102	104	104		95	99	U	U	U		U	91	94	93		98		P
Cu	25	2.5		99	100	100		91	93	U	U	U		7	97	98	88	200	95	100	P
Fe	100	4.3		101	103	103				U	U	7.0		66	87	89	91	92	97	67	P
Pb	5	1.5			104	102	105			U	U	U		U			102		108		F
Mg	5000	35.9		99	101	101				U	U	U		124	94	96	92 PBH 7/13/91	41.8	93	100	P
Mn	15	1.0		101	103	103		94	98	U	1.1	U		U	95	97	92		96		P
Hg	0.2	0.2 ~~3.4~~	PBH 7/12/91		99									U			93				CV
Ni	40	3.9	NA	99	102	102		94	98	U	U	U		U	89	91	91	200	96	100	P
K	5000	94.8		99	100	100				U	U	U		U					94		P
Se	5	1.1												U			81		93		F
Ag	10	3.8		96	96	95		97	85	U	U	U		U	97	98	90		98		P
Na	5000	21.4		99	100	100				U	U	U		53				47	93	7.7	P
Tl	10	1.4			103	105	103			-1.8	-1.7	U		U			85		90		F
V	50	2.0		101	103	103		92	95	U	U	U	X	U	95	97	91		97		P
Zn	20	4.7		99	101	102		86	83	U	8.9 U	U	X	U	93	95	86	200	95	100	P
CN	10	10	↓								PBH 7/13/91		PBH	U			117				AS

00048

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

Date: Feb. 1990
Number: HW-2
Revision: 10

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 2/13/91 Case #:

Site: Naval Weapons Station, N.J. Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 9 + 2MS/D

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
ICP						1							1	
Flame AA														
Furnace AA														
Mercury														
Total						1							1	
Other														

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

ICP		2				1	2				2		7	
Flame AA														
Furnace AA		1										1	2	
Mercury										1	PBH	1	1	
Total		3				1	2			1	2 7/13/91	1	9	
Other														

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

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.7: CLP Data Assessment Checklist
Inorganic Analysis

Date: Dec. 1988
Number: HW-2
Revision: 8

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. _____

SITE Colts Neck Naval Weapons Sta.

LABORATORY Gulf Coast

NO. OF SAMPLES/ MATRIX 1 water + 8 soils

SDG# CLP 007

REVIEWER (IF NOT ESD) _____

SOW# 788

REVIEWER'S NAME Paul B. Hamburg
Heartland ESI

DPO: ACTION _____ FYI _____

COMPLETION DATE 7/13/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	O	O	O	O
2.	CALIBRATIONS	O	O	O	O
3.	BLANKS	O	O	O	O
4.	ICS	O			
5.	LCS	O	O		
6.	DUPLICATE ANALYSIS	O	O	O	O
7.	MATRIX SPIKE	Z	O	O	O
8.	MSA		O		
9.	SERIAL DILUTION	O			
10.	SAMPLE VERIFICATION	O	O	O	O
11.	OTHER QC	O	O	O	O
12.	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

July 15, 1991

To: John Williams
Roy F. Weston Inc.
One Weston Way
Lionville, PA

From: Paul B. Humburg
Project Manager
Heartland ESI

Subject: Data Validation Services using EPA Region II guidelines for Inorganic analyses. The samples reviewed consisted of seventeen waters for full TAL metals plus Cyanide plus 2 MS/Ds. The analyses were performed by Roy F. Weston's Gulf Coast Laboratory.

EPA ID	Gulf Coast ID	EPA ID	Gulf Coast ID
	Water Samples (full TAL)		
501M00	03L042-008	508M00D	03L042-017D
502M00	03L042-009	701M00	03L042-001
503M00	03L042-010	702M00	03L042-002
504M00	03L042-011	703M00	03L042-005
504M10	03L042-012	703M00MS	03L042-005MS
504M20	03L042-013	703M00D	03L042-005D
505M00	03L042-014	702M10	03L042-003
506M00	03L042-015	702M20	03L042-004
507M00	03L042-016	704M00	03L042-006
508M00	03L042-017	705M00	03L042-007
508M00MS	03L042-017MS		

Heartland ESI has reviewed the data for the samples listed above for the TAL list for Metals plus Cyanide using EPA Region II CLP Inorganic Data Assessment Protocol, Standard Operating Procedure HW-2, Revision 10, February 1990. Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to the requirements and deliverables of U.S. EPA CLP Region II. This screening assumes that the analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Individual fraction was reviewed as follows:

* Metals plus Cyanide by Paul B. Humburg with secondary review by Christopher D. Scarpellino

Please refer to the Form Is and detailed Data Validation Report for additional information. The Cyanide Data Summary List is included in this report because the laboratory did not submit the

Cyanides on the Forms Is in the CLP package. The Form Is included in the Data Validation Report are annotated with the standard validation qualifiers as well as footnotes which refer to the specific findings listed numerically in the Data Assessment Narrative section. Specific comments are provided in the following case narrative.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

INORGANICS DATA ASSESSMENT NARRATIVE

General

The overall package quality was good. The Form Is contained in this data package did not include Cyanide as a target analyte. The laboratory prepared the Cyanide analytical results as a separate package. This reviewer has included the Cyanides in our TAL Metals package.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (ICV) standard for Cyanide as required by EPA Region II protocol.

No field blanks were apparently associated with this set of samples. The Chain-of-Custodies associated with these samples do not indicate that the water samples are equipment or field blanks. Therefore, the soil samples were not qualified based on results from the water samples. The water samples were simply reviewed as additional field samples.
All other contractual requirements were met.

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

Holding Times

The holding times were met as specified by QA protocol.

Calibration

Samples 502M00,503M00,504M00,504M10,504M20 and 505M00

1. The CRDL Standard for Lead was below the lower control limit. All positive and non-detect results are flagged "UJ or "J", as estimated.

Samples 507M00 and 508M00

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

Preparation and Field Blanks

No defieciencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike Recovery for Antimony, Selenium, Silver and Thallium were below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

4. The Matrix Spike Recovery for Arsenic was below 30%. All positive and non-detect results are rejected.

5. The Matrix Spike Recovery for Vanadium was above 150%. All positive results are rejected.

Duplicate

No deficiencies in this section.

LCS

6. The LCS for Lead was above the upper control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Serial Dilution

No deficiencies in this section.

MSA

7. The analytical spiking results for the following analytes were outside the control limits on the low side. Therefore, all positive and non-detect results are flagged "UJ" or "J", as estimated.

Analyte	Samples
Arsenic	502M00 and 507M00
Lead	702M20
Selenium	507M00 and 701M00
Thallium	501M00, 502M00, 503M00, 504M00, 504M20, 505M00, 506M00, 507M00, 508M00, 701M00, 702M00, 702M10, 703M00, 704M00 and 705M00.

8. The analytical spiking results for the following analytes were outside the control limits on the high side. Therefore, all positive results are flagged "J", as estimated.

Analyte	Samples
Selenium	501M00, 502M00, 703M00 and 705M00.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SPECIFIC SAMPLE ID	ANALYTE	DL	QL	FINDING
502M00,503M00,504M00,504M10, 504M20 and 505M00	Pb	+/U	J/UJ	1
507M00 and 508M00	Pb	+/U	J/UJ	2
All samples	Sb, Se, Ag and Tl	+/U	J/UJ	3
All samples	As	+/U	R	4
All samples	V	+	R	5
All samples	Pb	+/U	J/UJ	6
502M00 and 507M00	As	+/U	J/UJ	7
507M00 and 701M00	Se	+/U	J/UJ	7
702M00	Pb	+/U	J/UJ	7
501M00,502M00,503M00,504M00, 504M10,504M20,505M00,506M00, 507M00,508M00,701M00,702M00, 703M00,704M00 and 705M00.	Tl	+/U	J/UJ	7
501M00,502M00,503M00 and 505M00	Se	+	J	8

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 05/08/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L042

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	07-001-M001	Cyanide, Total	0.010	u	MG/L	0.010
-002	07-002-M001	Cyanide, Total	0.010	u	MG/L	0.010
-003	07-002-M101	Cyanide, Total	0.010	u	MG/L	0.010
-004	07-002-M201	Cyanide, Total	0.010	u	MG/L	0.010
-005	07-003-M001	Cyanide, Total	0.010	u	MG/L	0.010
-006	07-004-M001	Cyanide, Total	0.010	u	MG/L	0.010
-007	07-005-M001	Cyanide, Total	0.010	u	MG/L	0.010
-008	05-001-M001	Cyanide, Total	0.010	u	MG/L	0.010
-009	05-002-M001	Cyanide, Total	0.010	u	MG/L	0.010
-010	05-003-M001	Cyanide, Total	0.010	u	MG/L	0.010
-011	05-004-M001	Cyanide, Total	0.010	u	MG/L	0.010
-012	05-004-M101	Cyanide, Total	0.010	u	MG/L	0.010
-013	05-004-M201	Cyanide, Total	0.010	u	MG/L	0.010
-014	05-005-M001	Cyanide, Total	0.010	u	MG/L	0.010
-015	05-006-M001	Cyanide, Total	0.010	u	MG/L	0.010
-016	05-007-M001	Cyanide, Total	0.010	u	MG/L	0.010
-017	05-008-M001	Cyanide, Total	0.010	u	MG/L	0.010

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

501M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-008

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11700		*	P	PBH 7/13/91
7440-36-0	Antimony	18.2	U	N	P	J 3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~P~~	R 4
7440-39-3	Barium	45.3	B		P	
7440-41-7	Beryllium	1.8	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	687	B		P	
7440-47-3	Chromium	305		*	P	
7440-48-4	Cobalt	3.0	B		P	
7440-50-8	Copper	6.0	B		P	
7439-89-6	Iron	45800		*	P	
7439-92-1	Lead	5.4			F	J 6
7439-95-4	Magnesium	2930	B	*	P	
7439-96-5	Manganese	31.8			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	8430		*	P	
7782-49-2	Selenium	1.1	U	WN	F	J 3 PBH 7/13/91
7440-22-4	Silver	3.8	U	N	P	J 3
7440-23-5	Sodium	2610	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J 3
7440-62-2	Vanadium	~~247~~		~~N*~~	~~P~~	R 5
7440-66-6	Zinc	36.1		*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Clear Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

502M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-009

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9970		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	U	WN	F	R4
7440-39-3	Barium	39.8	B		P	
7440-41-7	Beryllium	1.3	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	4150	B		P	
7440-47-3	Chromium	170		*	P	
7440-48-4	Cobalt	6.6	B		P	
7440-50-8	Copper	4.5	B		P	
7439-89-6	Iron	26200		*	P	
7439-92-1	Lead	4.2			F	J1,6
7439-95-4	Magnesium	4630	B	*	P	
7439-96-5	Manganese	66.7			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	15.2	B		P	
7440-09-7	Potassium	7850		*	P	
7782-49-2	Selenium	1.1	U	WN	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	3330	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~116~~		N*	P	R5
7440-66-6	Zinc	22.5		*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Clear Artifacts:

Comments:

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SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

503M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-010

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10600		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	36.4	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	2620	B		P	
7440-47-3	Chromium	21.0		*	P	
7440-48-4	Cobalt	8.2	B		P	
7440-50-8	Copper	3.5	B		P	
7439-89-6	Iron	2560		*	P	
7439-92-1	Lead	3.4			F	J1,6
7439-95-4	Magnesium	1320	B	*	P	
7439-96-5	Manganese	90.0			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	28.7	B		P	
7440-09-7	Potassium	2930	B	*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	4040	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~10.4~~	~~B~~	~~N*~~	~~P~~	R5
7440-66-6	Zinc	61.2		*	P	

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

504M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-011

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	618		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	U	N	F	R4
7440-39-3	Barium	21.3	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	2150	B		P	
7440-47-3	Chromium	16.3		*	P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	4.5	B		P	
7439-89-6	Iron	5880		*	P	
7439-92-1	Lead	12.7			F	J1,6
7439-95-4	Magnesium	1660	B	*	P	
7439-96-5	Manganese	71.7			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	4.6	B		P	
7440-09-7	Potassium	1150	B	*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	1900	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~12.9~~	B	~~N*~~	~~P~~	R5
7440-66-6	Zinc	4.7	U	*	P	

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

504M10

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-012

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	593		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	21.3	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	2130	B		P	
7440-47-3	Chromium	12.6		*	P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	3.5	B		P	
7439-89-6	Iron	5760		*	P	
7439-92-1	Lead	10.7			F	J1,6
7439-95-4	Magnesium	1570	B	*	P	
7439-96-5	Manganese	71.0			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	1130	B	*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	1880	B		P	
7440-28-0	Thallium	1.4	U	N	F	J3
7440-62-2	Vanadium	~~12.3~~	~~B~~	~~N*~~	~~P~~	R5
7440-66-6	Zinc	4.7	U	*	P	

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

504M20

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-013

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	25.0	B	*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	4.4	U		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	121	B		P	
7440-47-3	Chromium	6.9	U	*	P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	28.7	B	*	P	
7439-92-1	Lead	1.4	B		F	J1,6
7439-95-4	Magnesium	35.9	U	*	P	
7439-96-5	Manganese	1.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	159	B	*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	357	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	2.0	U	N*	P	
7440-66-6	Zinc	4.7	U	*	P	

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

505M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-014

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7950		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	83.9	B		P	
7440-41-7	Beryllium	1.3	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	13100			P	
7440-47-3	Chromium	171		*	P	
7440-48-4	Cobalt	4.7	B		P	
7440-50-8	Copper	6.0	B		P	
7439-89-6	Iron	27700		*	P	
7439-92-1	Lead	27.5			F	J1,6
7439-95-4	Magnesium	8610		*	P	
7439-96-5	Manganese	175			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	13.3	B		P	
7440-09-7	Potassium	6190		*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	6790			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~128~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	59.7		*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Colorless Clarity After: Cloudy Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

506M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-015

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	114000		*	P	
7440-36-0	Antimony	62.1		N	P	J3
7440-38-2	Arsenic	~~0.90~~	U	N	F	R4
7440-39-3	Barium	181	B		P	
7440-41-7	Beryllium	16.8			P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	55900			P	
7440-47-3	Chromium	4150		*	P	
7440-48-4	Cobalt	35.5	B		P	
7440-50-8	Copper	51.4			P	
7439-89-6	Iron	571000		*	P	
7439-92-1	Lead	61.2			F	J6
7439-95-4	Magnesium	27700		*	P	
7439-96-5	Manganese	1200			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	58.0			P	
7440-09-7	Potassium	74400		*	P	
7782-49-2	Selenium	5.5	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	21400			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~2220~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	991		*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Cloudy Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

507M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-016

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	69600		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~WN~~	~~F~~	R4
7440-39-3	Barium	70.9	B		P	
7440-41-7	Beryllium	3.8	B		P	
7440-43-9	Cadmium	34.3			P	
7440-70-2	Calcium	53700			P	
7440-47-3	Chromium	691		*	P	
7440-48-4	Cobalt	66.3			P	
7440-50-8	Copper	19.1	B		P	
7439-89-6	Iron	120000		*	P	
7439-92-1	Lead	26.0		S	F	J2,6
7439-95-4	Magnesium	16700		*	P	
7439-96-5	Manganese	724			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	140			P	
7440-09-7	Potassium	21600		*	P	
7782-49-2	Selenium	1.1	U	WN	F	J3,7
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	15200			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~381~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	1850		*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Cloudy Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

508M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-017

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	43200		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	93.3	B		P	
7440-41-7	Beryllium	4.5	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	19300			P	
7440-47-3	Chromium	1240		*	P	
7440-48-4	Cobalt	11.8	B		P	
7440-50-8	Copper	21.6	B		P	
7439-89-6	Iron	150000		*	P	
7439-92-1	Lead	38.4		S	F	J2,6
7439-95-4	Magnesium	10600		*	P	
7439-96-5	Manganese	224			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	17.5	B		P	
7440-09-7	Potassium	28400		*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	4130	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~723~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	116		*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Cloudy Artifacts:

Comments:

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SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

701M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-001

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	27800		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~40.4~~		~~SN~~	~~F~~	R4
7440-39-3	Barium	52.6	B		P	
7440-41-7	Beryllium	1.3	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	1620	B		P	
7440-47-3	Chromium	40.9		*	P	
7440-48-4	Cobalt	12.7	B		P	
7440-50-8	Copper	24.7	B		P	
7439-89-6	Iron	43000		*	P	
7439-92-1	Lead	18.8			F	J6
7439-95-4	Magnesium	2660	B	*	P	
7439-96-5	Manganese	83.7			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	41.9			P	
7440-09-7	Potassium	3160	B	*	P	
7782-49-2	Selenium	3.9	B	WN	F	J3,7
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	4440	B		P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~59.4~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	61.2		*	P	

Color Before: Green Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

702M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-002

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1970		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	36.2	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	4900	B		P	
7440-47-3	Chromium	6.9	U	*	P	
7440-48-4	Cobalt	5.7	B		P	
7440-50-8	Copper	5.5	B		P	
7439-89-6	Iron	3140		*	P	
7439-92-1	Lead	4.0			F	J6
7439-95-4	Magnesium	1440	B	*	P	
7439-96-5	Manganese	155			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	4.9	B		P	
7440-09-7	Potassium	1130	B	*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	11800			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	2.0	U	N*	P	
7440-66-6	Zinc	86.8		*	P	

Color Before: Colorless Clarity Before: Cloudy Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

702M10

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-003

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1970		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~P~~	R4
7440-39-3	Barium	37.1	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	4910	B		P	
7440-47-3	Chromium	6.9	U	*	P	
7440-48-4	Cobalt	5.1	B		P	
7440-50-8	Copper	6.5	B		P	
7439-89-6	Iron	3000		*	P	
7439-92-1	Lead	5.6			F	J6
7439-95-4	Magnesium	1430	B	*	P	
7439-96-5	Manganese	157			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.3	B		P	
7440-09-7	Potassium	1130	B	*	P	
7782-49-2	Selenium	1.1	B	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	12700			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~3.2~~	~~B~~	~~N*~~	~~P~~	R5
7440-66-6	Zinc	86.2		*	P	

Color Before: Colorless Clarity Before: Cloudy Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

702M20

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-004

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	24.0	B	*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~0.90~~	~~U~~	~~N~~	~~F~~	R4
7440-39-3	Barium	4.4	U		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	71.0	B		P	
7440-47-3	Chromium	6.9	U	*	P	
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	3.0	B		P	
7439-89-6	Iron	53.7	B	*	P	
7439-92-1	Lead	1.4	U	W	F	~~J6~~ J7 PBH 7/13/91
7439-95-4	Magnesium	35.9	U	*	P	
7439-96-5	Manganese	1.0	U		P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	3.9	U		P	
7440-09-7	Potassium	191	B	*	P	
7782-49-2	Selenium	1.1	U	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	280	B		P	
7440-28-0	Thallium	1.4	U	N	F	J3
7440-62-2	Vanadium	2.0	U	N*	P	
7440-66-6	Zinc	4.7	U	*	P	

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

703M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-005

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10400		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~2.6~~	~~B~~	~~N~~	~~F~~	R4
7440-39-3	Barium	43.5	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	1730	B		P	
7440-47-3	Chromium	30.5		*	P	
7440-48-4	Cobalt	13.6	B		P	
7440-50-8	Copper	11.6	B		P	
7439-89-6	Iron	30300		*	P	
7439-92-1	Lead	10.3			F	J6
7439-95-4	Magnesium	2080	B	*	P	
7439-96-5	Manganese	97.2			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.5	B		P	
7440-09-7	Potassium	3150	B	*	P	
7782-49-2	Selenium	1.1	U	WN	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	5040			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~55.7~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	11.3	B	*	P	

Color Before: Orange Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Clear Artifacts:

Comments:

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SAMPLE NO.

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INORGANIC ANALYSIS DATA SHEET

704M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-006

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13300		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~10.9~~		~~N~~	~~F~~	R4
7440-39-3	Barium	107	B		P	
7440-41-7	Beryllium	0.90	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	5750			P	
7440-47-3	Chromium	46.9		*	P	
7440-48-4	Cobalt	9.4	B		P	
7440-50-8	Copper	24.2	B		P	
7439-89-6	Iron	45100		*	P	
7439-92-1	Lead	16.7			F	J6
7439-95-4	Magnesium	4330	B	*	P	
7439-96-5	Manganese	172			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	23.9	B		P	
7440-09-7	Potassium	3220	B	*	P	
7782-49-2	Selenium	1.7	B	N	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	5600			P	
7440-28-0	Thallium	1.4	U	WN	F	J3,7
7440-62-2	Vanadium	~~62.2~~		~~N*~~	~~P~~	R5
7440-66-6	Zinc	63.1		*	P	

Color Before: Brown Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Clear Artifacts:

Comments:

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

705M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP042

Matrix (soil/water): WATER Lab Sample ID: 03L042-007

Level (low/med): LOW Date Received: 03/22/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7840		*	P	
7440-36-0	Antimony	18.2	U	N	P	J3
7440-38-2	Arsenic	~~7.1~~	~~B~~	~~N~~	~~F~~	R4
7440-39-3	Barium	101	B		P	
7440-41-7	Beryllium	0.60	B		P	
7440-43-9	Cadmium	2.7	U		P	
7440-70-2	Calcium	5940			P	
7440-47-3	Chromium	13.8		*	P	
7440-48-4	Cobalt	11.8	B		P	
7440-50-8	Copper	9.1	B		P	
7439-89-6	Iron	11200		*	P	
7439-92-1	Lead	8.1			F	J6
7439-95-4	Magnesium	5630		*	P	
7439-96-5	Manganese	122			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	23.3	B		P	
7440-09-7	Potassium	2640	B	*	P	
7782-49-2	Selenium	1.1	U	WN	F	J3
7440-22-4	Silver	3.8	U	N	P	J3
7440-23-5	Sodium	15300			P	
7440-28-0	Thallium	1.4	U	WN	F	J3, 7
7440-62-2	Vanadium	~~18.1~~	~~B~~	~~N*~~	~~P~~	R5
7440-66-6	Zinc	46.4		*	P	

Color Before: Brown Clarity Before: Opaque Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

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

Date: Feb. 1990
Number: HW-2
Revision: 10

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		1/
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 or on file?	[ ]		✓
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.			

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

Date: Feb. 1990
Number: HW-2
Revision: 10

	YES	NO	N/A
A.1.6 Form I (Final Data) - Are all Form I's present and complete?	[✓]		
ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
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?	[✓] PBH 7/13/91		✓
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?	[✓]		
Are computation/transcription errors less than 10% of reported values?	[✓]		
Are all "less than IDL" values properly coded with "U"?	[✓]		
Was a brief physical description of samples given on Form I's?	[✓]		
Were the result qualifiers used correctly with final data?	[✓]		
ACTION: If no for any of the above, prepare Telephone Record Log, and contract laboratory for corrected data.			
Were any samples diluted beyond requirements of contract?		[✓]	
If yes, were dilutions noted on Form I's?	[ ]		✓
ACTION: If no, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			

A.1.7 Holding Times - (aqueous and soil samples)

(Examine sample traffic reports and digestion/distillation logs.)

Mercury analysis (28 days). . . . . exceeded?		[✓]	
Cyanide distillation (14 days). . . . . exceeded?		[✓]	

	YES	NO	N/A
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 Raw Data

A.1.8.1	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 Digestion Log?	[✓]	__	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	__	✓
	Furnace AA	[✓]	__	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	__	___

	YES	NO	N/A
A.1.8.3 Are all raw data to support all sample analyses and QC operations present?	[✓]	__	__
Legible?	[✓]	__	__
Properly Labeled?	[✓]	__	__

ACTION: If no for any of the above, write Telephone Record Log and contact laboratory. Flag metal data as estimated if pH of sample is greater than 2. Flag cyanide data as estimated if pH sample is less than 12.

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

A.1.9.1.1 Is record of at least 2 point calibration present for ICP analysis?	[✓]	__	__
Is record of 5 point calibration present for Hg analysis?	[✓]	__	__

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

A.1.9.1.2 Is record of 4 point calibration present for:			
Flame AA?	[__]	__	✓
Furnace AA?	[✓]	__	__
Cyanides?	[✓]	__	__

NOTE:
1. If less than 4 standards are measured in absorbance mode, then the remaining standards in concentration mode must be run immediately after calibration and be within ±10% of true value.
2. For all AA (except Hg) and Cyanide analyses, one calibration standard is at CRDL level. If not, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
ACTION: Flag associated data as estimated if standards are not within ±10% of true values (except CRDL calibration standard). Do not flag the data as estimated in linear range indicated by good recovery of standard.			
A.1.9.1.3 Is correlation *coefficient less than 0.995 for:			
Mercury Analysis?	___	[✓]	___
Cyanide Analysis?	___	[✓]	___
Atomic Absorption Analysis?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated.			
A.1.9.2 Form II A (Initial and Continuing Calibration Verification)-			
A.1.9.2.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for AA and ICP when both are used for same analyte?	[✓]	___	___
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
A.1.9.2.2 Circle all values on data summary sheet that are outside contract windows. Are all calibration standards (initial and continuing) within control limits?			
Metals 90-110%	[✓]	___	___
Hg - 80-120%	[✓]	___	___
Cyanides 85-115%	[✓]	___	___

* The reviewer will calculate correlation coefficient.

	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.

Was continuing calibration performed every 10 samples or every 2 hours? [✓] __ __

ACTION: If no, flag the excess samples (eleventh and up) data as estimated (J).

Was ICV for cyanides distilled? [__] ✓ __

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

A.1.9.3 Form II B (CRDL Standards for AA and ICP) -

A.1.9.3.1 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.

* Find the results of mid-range standard in the raw data.
**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
A.1.9.3.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and for every four hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.9.3.3	Circle all values on summary sheet that are outside 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 data within the affected ranges if the recovery of the standard is between 50-79%; flag only positive data if the recovery is between 121-150%; reject (red line) all data if the recovery is less than 50%; reject only positive data if the recovery is greater than 150%.			
A.1.9.4	Form III (Initial and Continuing Calibration Blanks)			
A.1.9.4.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (whichever is more frequent)?	[✓]		
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the contract-problems/ non-compliance section of the Data Assessment Narrative.			

		YES	NO	N/A
A.1.9.4.2	Circle all calibration blank values on Data Summary Sheet that are above CRDL (or 2 x IDL when IDL > CRDL). Are all calibration blanks (when IDL<CRDL) less than or equal to Contract Required Detection Limits (CRDL)?	[✓]		
	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) all positive data less than or equal to calibration blank values 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.			
A.1.9.5	FORM III (Preparation Blank) -			
	(Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.9.5.1	Was one prep. blank analyzed for: each 20 samples?	[✓]		
	each batch?	[✓]		
	each matrix type?	[✓]		
	both AA and ICP when both are used for same analyte?	[ ]		✓
	ACTION: If no for any of the above, flag as estimated (J) all 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).			
A.1.9.5.2	Is concentration of prep. blank greater than 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 value?		[✓]	

		YES	NO	N/A
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value found in the raw data.			
A.1.9.5.3	Do concentrations of prep. blank fall below two times IDL when IDL is greater than CRDL?	[✓]	__	__
	ACTION: If no, reject (red-line) all positive data that has a concentration less than 10 times the prep. blank value in the raw data.			
A.1.9.5.4	Is concentration of prep. blank below the negative CRDL?	__	[✓]	__
	ACTION: If yes, reject (red-line) all associated data that has a concentration less than 10xCRDL.			
A.1.9.6	Form IV (ICP Interference Check Sample)			
A.1.9.6.1	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 samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.8.6.2	Circle all values on Data Summary Sheet that are more than + 20% of true or established mean value. Are all Interference Check Sample results inside of control limits (+ 20%)?	[✓]	__	__
	If no, is concentration of Al, Ca, Fe, or Mg lower than in ICS?	[__]	__	✓
	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").			

		YES	NO	N/A
A.1.9.7	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.1.9.7.1	Present and complete for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each conc. range (i.e. low, med., high)?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all positive data less than four times spiking level 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.1.9.7.2	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.			
	NOTE: Matrix spike analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.7.3	Circle all values on Data Summary Sheet 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?	[__]	✓	__
	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.			

	YES	NO	N/A
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.1.9.7.4 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.1.9.7.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	__	[__]	✓
(b) between 10-74%?	__	[__]	✓
(c) between 126-200%?	__	[__]	✓
(d) greater than 200%?	__	[__]	✓

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".

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

Date: Feb. 1990
Number: HW-2
Revision: 10

		YES	NO	N/A
A.1.9.8	Form VI (Lab Duplicates)			
A.1.9.8.1	Present and complete for: each 20 samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[✓]	___	___

ACTION: If no for any the above, flag as estimated (J) all 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 Hg/L on wet weight basis and calculate RPD or Difference for each analyte.

A.1.9.8.2	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.

NOTE: Duplicate analysis should be performed on a field blank when it is the only aqueous sample in SDG.

A.1.9.8.3	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".

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.

* Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
	2. If lab duplicate result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria.			
A.1.9.8.4	Is any value for sample duplicate pair less than CRDL* and other value greater than or equal to 10 x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated (J).			
A.1.9.8.5	Aqueous Circle all values on Data Summary Sheet 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.1.9.8.6	Soil/Sediment Circle all values on Data Summary Sheet 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.1.9.9	Field Duplicates			
A.1.9.9.1	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.1.9.9.2	Is any value for sample duplicate pair less than *CRDL and other value greater than or equal to 10 x *CRDL?	___	[_ _]	✓
	ACTION: If yes, flag the associated data as estimated.			
A.1.9.9.3	Aqueous			
	Circle all values on 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.1.9.9.4 Soil/Sediment

Circle all values on 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.1.9.10 Form VII (Laboratory Control Sample) (Note: LCS - not required for aqueous Hg and cyanide analyses.)

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [✓] _ _

every 20 solid samples? [___] _ _ ✓

both AA and ICP when both are used for 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 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.1.9.10.2 Aqueous LCS

Circle all LCS values outside control limits (80 - 120%- except 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.1.9.10.3 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.1.9.11	Form IX (ICP Serial Dilution) -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.9.11.1	Was Serial Dilution analysis performed for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each concentration range (i.e. low, med.)?	[✓]	__	__
	ACTION: If no for any of the above, flag all positive data greater than or equal to 10xIDLs as estimated (J) for which Serial Dilution Analysis was not performed, and summarize the deficiency on the DPO report.			
A.1.9.11.2	Was field blank(s) used for Serial Dilution Analysis?	__	[✓]	__
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J).			
	NOTE: Serial dilution analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.11.3	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.1.9.11.4	Circle all values on Data Summary Sheet that are outside control limit 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 associated equal to or greater than 10xIDLs for which percent difference is greater than 10% but less than 100%. Reject (red-line) all associated sample results equal to or greater than 10xIDLs for which PD is greater than or equal to 100%.

A.1.9.12 Furnace Atomic Absorption (AA) QC Analysis

A.1.9.12.1 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.1.9.12.2 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 post digestion spike recovery less than 40%? [ ] _ ✓

ACTION: If no for any of the above, flag all the associated data as estimated (J).

A.1.9.12.3 Is *post digestion spike recovery less than 10% or greater than 150% for any result? _ [✓] _

ACTION: If yes, reject (red-line) the affected data if recovery is <10%; reject data not flagged with "U" if spike recovery is >150%.

NOTE: Reject the data only if the affected sample was not subsequently analyzed by Method of Standard Addition.

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

		YES	NO	N/A
A.1.9.13	Form VIII (Method of Standard Addition Results)			
A.1.9.13.1	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.1.9.13.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	__	[✓]	__
	ACTION: If yes, reject (red-line) affected data.			
A.1.9.13.3	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.1.9.13.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-16 through E-17?	[✓]	__	__
	ACTION: If no, note exception under contract problem/ non-compliance of data assessment narrative, or prepare a separate list.			
A.1.9.14	Dissolved/Total or Inorganic/Total Analytes -			
A.1.9.14.1	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)?	__	[✓]	__

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

	YES	NO	N/A

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.1.9.14.2 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%? — [✓] —

A.1.9.14.3 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.1.9.15 Form I to IX

A.1.9.15.1 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".

	YES	NO	N/A
A.1.9.15.2 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.

A.1.9.16 Form I (Field Blank) -

Circle all field blank values on Data Summary Sheet that are greater than CRDL, 2 x IDL when IDL > CRDL.

Do concentrations of field blank(s) fall below CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓
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.

	YES	NO	N/A
A.1.9.17 Form X, XI, XII (Verification of Instrumental Parameters).			
A.1.9.17.1 Is verification report present for:			
Instrument Detection Limits (quarterly)?	[✓]	__	__
ICP Interelement Correction Factors (annually)?	[✓]	__	__
ICP Linear Ranges (quarterly)?	[✓]	__	__
ACTION: If no, contact DPO of the lab.			
A.1.9.17.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)			
Are IDLs present for: all the analytes?	[✓]	__	__
all the instruments used?	[✓]	__	__
For both AA and ICP when both are used for same analyte?	[✓]	__	__
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
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?	[✓]	__	__
ACTION: If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			

	YES	NO	N/A
A.1.9.17.3 Form XI (Linear Ranges)			
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.1.9.18 Percent Solids of Sediments			
Is soil content in sediment(s) less than 50%?	___	[___]	✓
ACTION: If yes, qualify as estimated all data not previously rejected or flagged due to other QC criteria.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

Case# _____ Site Naval Weapons Sta. Matrix: Soil ____

SDG# CLP 042 Lab Gulf Coast Water ✓

Contractor Roy F. Weston Reviewer Paul B. Humburg
Heartland EST Other ____

A.2.1 The case description and exceptions, if any, are noted below with reason(s) for rejection or qualification as estimated value(s) J.

The CRDL Standard for Lead for Samples S02M00, S03M00, S04M00, S04M10, S04M20 and S05M00 was below the control limit. All positive and non-detect results are flagged as estimated.
The CRDL Standard for Lead for Samples S07M00 and S08M00 was below the control limit. All positive and non-detect results are flagged as estimated.
The Matrix Spike Recoveries for Antimony, Selenium, Silver and Thallium were below the control limits. All positive and non-detect results are flagged as estimated.
The Matrix Spike Recovery for Arsenic was below 30%. All positive and non-detect results are flagged as ~~estimated~~ rejected. PBH 7/23/91
The Matrix Spike Recovery for Vanadium was greater than 150%. All positive

A.2.1 (continuation)

data are flagged as rejected.
The LCS for Lead was 147%. All positive results are flagged as estimated.
The following samples have their positive and non-detect results flagged as estimated, due poor low recovery of analytical spikes.
As SO2 M00 and SO7 M00,
Se SO7 M00, 701 M00, 703 M00 and 705 M00.
Pb 702 M20
TL SO1 M00, SO2 M00, SO3 M00, SO4 M00, SO4 M20, SO5 M00, SO6 M00, SO7 M00, SO8 M00, 701 M00, 702 M00, 702 M10, 703 M00, 704 M00 and 705 M00.
The following samples have their positive results flagged as estimated due to high recovery of analytical spikes.
Se SO1 M00, SO2 M00, SO3 M00 and SO5 M00.

PBH 7/13/91

PBH 7/13/91

A.2.2 Contract-Problems/Non-Compliance

The Laboratory failed to distill the ICV or mid-range verification standard for the Cyanide analysis.

PBH 7/13/91

MMB Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hamby Date: 7/13/91
Signature

Verified by: Christopher D. Lampelkin Date: 7/15/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 042

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: 501-08 M00, 701-05 M00, 504 M10 and 504 M20

FIELD DUP. #'S: NA LAB DUP. #'S: 508 M00 Field Blank NA MATRIX SPIKE #: 508 M00

SERIAL DILUTION SAMPLE NO. 508 M00 COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III					IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. XR Init	Continued 1	2	3	CRDL Std Ver. % R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PBRLEAPN	ICP % R Init	Fin	MStprixk	Lab Dup RPD/Diff.	LCS % R	Ser Dil % D	Meth
Al	200	17.7		102	105	104	102			U	U	U	U	46	103	99	532	3.6	105	2.5	P
Sb	60	18.2		102	102	101	100	97	85	U	24	27	38	U			84		95		P
As	10	0.8		99	97	94	92	89		-1.3	-1.6	-1.6	-1.4	-1.6			(45)	27	96		F
Ba	200	4.4		102	104	103	101			U	U	U	U	U	101	98	99	2	104	10	P
Be	5	0.6		101	102	101	100	105	104	U	U	U	U	U	97	94	100		103	33	P
Cd	5	2.7		98	97	95	94	105	88	U	U	-3.2 U		U	102	98	121		85		P
Ca	5000	14.3		100	103	101	100			U	U	U	U	77	100	96		2	103	2	P
Cr	10	6.9		107	107	108	107	109	105	U	U	U	U	U	93	93	111	6	106	1.6	P
Co	50	3.0		104	104	106	105	103	104	U	U	U	U	U	95	91	104	13	108	100	P
Cu	25	2.5		103	105	104	102	107	105	U	U	U	U	U	101	98	101	8	105	27	P
Fe	100	4.3		103	106	105	104			-8.4	-8.1	U	14.3	35.6	97	94	337	0.1	106	3	P
Pb	3	2.5		102	104	108	105	80		U	U	U	U	U			78	8	104		F
Mg	5000	35.9		101	103	102	101			U	U	U	U	60.9	104	100		0.1	103	3	P
Mn	15	1.0		103	106	104	103	102	100	U	U	U	U	U	99	95	102	0.4	106	3	P
Hg	0.2	0.2		95	99	99	100			U	U	U	U	U			104				CV
Ni	40	3.9		102	105	103	102	106	107	4.6	U	U	U	U	92	89	101	200	105	37	P
K	5000	94.8		109	109	109	109			U	U	U	U	139				0.8	99	0.2	P
Se	5	1.1		105	102	101	98	108		U	U	U	U	U			122		110		F
Ag	10	3.8		103	103	102	101	93	92	U	U	U	U	U	98	95	92		110		P
Na	5000	21.4		101	103	102	100			U	U	U	U	96				45	103	3	P
Tl	10	1.4		102	100	96	99	108		U	U	U	U	U			(68)		100		F
V	50	2.0		105	108	106	105	102	101	U	U	U	U	U	99	95	105	1.6	108	3	P
Zn	20	4.7		102	104	103	102	104	101	-12.3	-9.0	-8.4	-13.6	-9.2	95	91	100	7.3	104	33	P
CN	10	10		98	97	97	101			U	U	U	U	U			88	0	93		AS

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 042

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 506-08M00, 701-05M00, 504M10 and 504M20.

FIELD DUP. #'S: NA LAB DUP. #'S: 703M00 Field Blank NA MATRIX SPIKE #: 703M00

SERIAL DILUTION SAMPLE NO. 703M00 COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. %R Init	Continued 1	2	3	CRDL Std Ver. %R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PBL PBN	ICP %R Init	ICS %R Fin	MS %rec	Lab Dup RPD/Diff	LCS %R	Ser Dil %D	Meth
Al	200	17.7		105						U							109	26	101	2	P
Sb	60	18.2		101				89	(76)	34							(53)	200	93		P
As	10	0.8		94	95	97		92		-1.5	-1.6	-1.5					(6)		83		F
Ba	200	4.4		103						U							96	0.4	99	16	P
Be	5	0.6		102						U							105	65	97		P
Cd	5	2.7		92	93					U	U						95		86		P
Ca	5000	14.3		102						17								2	98	1	P
Cr	10	6.9		107	108					U	U						352	28	105	100	P
[illegible]	50	3.0		106						U							99	10	102	18	P
Cu	25	2.5		105						U							98	15	99	100	P
Fe	100	4.3		105						7.2							1000	44	103	3	P
Pb	3	1.5		108				(67)		U							94	14	(147)		F
Mg	5000	35.9		103						U								41	98	1	P
Mn	15	1.0		105						U							97	3	101	1	P
Hg	0.2	0.2		102	101	97				U	U	U					107				CV
Ni	40	3.9		104	109					U							96	0.6	100	100	P
K	5000	94.8		108						U	U							47	98	12	P
Se	5	1.1		99	102	101		84		U	U	U					(56)		108		F
Ag	10	3.8		102						U							(34)		106		P
Na	5000	21.4		103						27								2.1	99	7	P
Tl	10	1.4		101	99	105				U	U	U					(70)		101		F
V	50	2.0		107				95	89	U					95	94	(190)	45	102	5	P
Zn	20	4.7		103						-8.4							108	27	100	100	P
CN	10	10			103	103				U	U						91	0	108	51	CV

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 042

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: 501-08M00, 701-05M00, 504M10 and 504M20.

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. %R Init	Continued 1	2	3	CRDL Std Ver. %R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PB RL EAP N	ICP ICS %R Init	Fin	Stpr ixk	Lab Dup RPD/Diff	LCS %R	Ser Dil %D	Method
Al	200																				
Sb	60			94	95					U	U										P
As	10				96	97					-1.4	-1.5	-1.5								F
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3			106	104	102		93		-1.6 U	-1.9	-1.4									F
Mg	5000								PBH -1/13/91												
Mn	15																				
Hg	0.2				99	98					U	U	U								CV
Ni	40																				
K	5000																				
Se	5			97	98	102		108		U	U	U	U								P
Ag	10																				
Na	5000																				
Tl	10										U	U	U								F
V	50			104	101	104	102			U	U										P
Zn	20																				
CN	10			97	99	97				U	U	U									

00052

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 042

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 501+08M00, 701-05M00, 504M10 and 504M20.

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. %R		Calibration Blanks				ICP %R	ICS %R	MS Matrix	Lab Dup RPD/Diff.	LCS %R	Ser Dil %D	Method
	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PREP	Init	Fin					
Al	200																				
Sb	60																				
As	10				99	99	97				-1.4	-1.7	-1.5								F
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3			94	98	98	102	(57)		U	U	U	-1.6								F
Mg	5000																				
Mn	15																				
Hg	0.2				90	100	99				U	U	U								CV
Ni	40																				
K	5000																				
Se	5				104	106					U										F
Ag	10																				
Na	5000																				
Tl	10				99	103	97				U	U	U								F
V	50																				
Zn	20																				
CN	10																				

00053

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 042

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 501-08M00, 701-05M00, 504M10 and 504M20.

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ Field Blank _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PDH

	X	I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP ICS % R				Lab Dup RPD/Diff	LCS	Ser Dil	
Parameter	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PBL EAP PN	Init	Fin	Matrix		% R	% D	Meth
Al	200																			
Sb	60																			
As	10				99					-1.1	U									F
Ba	200																			
Be	5																			
Cd	5																			
Ca	5000																			
Cr	10																			
Co	50																			
Cu	25																			
Fe	100																			
Pb	5			100	97	98	100				U									F
Mg	5000																			
Mn	15																			
Hg	0.2				99															CV
Ni	40																			
K	5000																			
Se	5			99	99	99				U	U	U	U							F
Ag	10																			
Na	5000																			
Tl	10				99						U	U	U							F
V	50																			
Zn	20																			
CN	10																			

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 042

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 506-08M00, 701-05M00, 504 M10 and 504M20

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: 7/13/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L		Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP ICS % R		Matrix		Lab Dup RPD/Diff.	LCS	Ser Dil	
Parameter	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	PBL EAP N	Init	Fin	Spik		% R	% D	Meth
Al	200																				
Sb	60																				
As	10			99	98																F
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	5									U	U	U									F
Mg	5000																				
Mn	15																				
Hg	0.2																				
Ni	40																				
K	5000																				
Se	5				105	102	100				U	U	U								F
Ag	10																				
Na	5000																				
Tl	10				99	98	96														F
V	50																				
Zn	20																				
CN	10																				

00055

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

Date: Feb. 1990
Number: HW-2
Revision: 10

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 7/13/91 Case #:

Site: Colts Neck Naval Weapons Station Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 17 + 2 MS/D

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
ICP						1							1	
Flame AA														
Furnace AA						1							1	
Mercury														
Total						2							2	
Other														

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

ICP						2							2	
Flame AA														
Furnace AA		1				2				1		4	8	
Mercury														
Total		1				4				1		4	10	
Other														

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

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.7: CLP Data Assessment Checklist
Inorganic Analysis

Date: Dec. 1988
Number: HW-2
Revision: 8

INORGANIC REGIONAL DATA ASSESSMENT Region II

CASE NO. _____ SITE Co Hs Neck Naval Weapon Sta.

LABORATORY Gulf Coast NO. OF SAMPLES/ MATRIX 17 waters + 2 MS/D

SDG# CLP 042 REVIEWER (IF NOT ESD) _____

SOW# 788 REVIEWER'S NAME Paul B. Humburg Heartland ESF

DPO: ACTION _____ FYI _____ COMPLETION DATE 2/13/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	O	O	O	O
2.	CALIBRATIONS	O	O	O	O
3.	BLANKS	O	O	O	O
4.	ICS	O			
5.	LCS	O	O		
6.	DUPLICATE ANALYSIS	O	O	O	O
7.	MATRIX SPIKE	Z	Z	O	O
8.	MSA		O		
9.	SERIAL DILUTION	O			
10.	SAMPLE VERIFICATION	O	O	O	O
11.	OTHER QC				
12.	OVERALL ASSESSMENT	O	O	O	O

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

July 15, 1991

To: John Williams
Roy F. Weston Inc.
One Weston Way
Lionville, PA

From: Paul B. Humburg
Project Manager
Heartland ESI

Subject: Data Validation Services using EPA Region II guidelines for Inorganic analyses. The samples reviewed consisted of one water for full TAL metals plus Cyanide plus 1 MS/D. The analyses were performed by Roy F. Weston's Gulf Coast Laboratory.

EPA ID	Gulf Coast ID	EPA ID	Gulf Coast ID
	Water Samples (full TAL)		
106M00	03L090-001	106M00MS	03L090-001MS
106M00D	03L090-001D		

Heartland ESI has reviewed the data for the samples listed above for the TAL list for Metals plus Cyanide using EPA Region II CLP Inorganic Data Assessment Protocol, Standard Operating Procedure HW-2, Revision 10, February 1990. Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to the requirements and deliverables of U.S. EPA CLP Region II. This screening assumes that the analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Individual fraction was reviewed as follows:

* Metals plus Cyanide by Paul B. Humburg with secondary review by Christopher D. Scarpellino

Please refer to the Form Is and detailed Data Validation Report for additional information. The Cyanide Data Summary List is included in this report because the laboratory did not submit the Cyanides on the Forms Is in the CLP package. The Form Is included in the Data Validation Report are annotated with the standard validation qualifiers as well as footnotes which refer to the specific findings listed numerically in the Data Assessment Narrative section. Specific comments are provided in the following case narrative.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

INORGANICS DATA ASSESSMENT NARRATIVE

General

The overall package quality was good. The Form Is contained in this data package did not include Cyanide as a target analyte. The laboratory prepared the Cyanide analytical results as a separate package. This reviewer has included the Cyanides in our TAL Metals package.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (ICV) standard for Cyanide as required by EPA Region II protocol.

No field blanks were apparently associated with this set of samples. The Chain-of-Custodies associated with these samples do not indicate that the water samples are equipment or field blanks. Therefore, the soil samples were not qualified based on results from the water samples. The water samples were simply reviewed as additional field samples.
All other contractual requirements were met.

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

Holding Times

The holding times were met as specified by QA protocol.

Calibration

1. The CRDL Standard for Antimony and Silver were below the control limit. All positive and non-detect results are flagged "UJ" or "J" , as estimated.

2. The CRDL Standard for Lead and Thallium were above the upper control limit. All positive results are flagged "J", as estimated.

3. The CRDL Standard for Chromium was above 150%. All positive results are rejected.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

4. The Matrix Spike Recovery for Lead and Thallium were below the lower control limit. All positive and non-detect results are flagged "J" or "UJ" as estimated.

5. The Matrix Spike Recovery for Cadmium was above the upper control limit. All positive results are flagged "J", as estimated.

6. The Matrix Spike Recovery for Aluminum was above 150%. All positive results are rejected.

Duplicate

No deficiencies in this section.

LCS

7. The LCS for Thallium was below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Serial Dilution

8. The Serial Dilution Analyses for Aluminum, Calcium, Iron and Sodium were outside the control limits. All positive and non-detect results are flagged "UJ" or "J", as estimated.

MSA

9. The analytical spiking results for the following analytes were outside the control limits on the low side. Therefore, all positive and non-detect results are flagged "J" or "UJ", as estimated.

Analyte	Samples
Thallium	106M00

HEARTLAND ENVIRONMENTAL SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SPECIFIC SAMPLE ID	ANALYTE	DL	QL	FINDING
All samples	Sb and Ag	+/U	J/UJ	1
All samples	Pb and Tl	+	J	2
All samples	Cr	+	R	3
All samples	Pb and Tl	+/U	J/UJ	4
All samples	Cd	+	J	5
All samples	Al	+	R	6
All samples	Tl	+/U	J/UJ	7
All samples	Al, Ca, Fe and Na	+/U	J/UJ	8
All samples	Tl	+/U	J/UJ	9

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 04/15/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L090

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	MW10-006-M001	Cyanide, Total	0.020	u	MG/L	0.020

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

106M00

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP090

Matrix (soil/water): WATER Lab Sample ID: 03L090-001

Level (low/med): LOW Date Received: 03/28/91

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	~~3790~~		EN	~~P~~	R 6
7440-36-0	Antimony	18.2	U		P	J 1
7440-38-2	Arsenic	2.2	B		F	
7440-39-3	Barium	60.3	B		P	
7440-41-7	Beryllium	0.60	U		P	
7440-43-9	Cadmium	2.7	U	N	P	
7440-70-2	Calcium	1940	B	E	P	J 8
7440-47-3	Chromium	~~43.3~~		*	~~P~~	R 3
7440-48-4	Cobalt	3.0	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	7990		E	P	J 8
7439-92-1	Lead	18.4		N	F	J 2,4
7439-95-4	Magnesium	1330	B		P	
7439-96-5	Manganese	27.6			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.5	B		P	
7440-09-7	Potassium	2010	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-22-4	Silver	3.8	U		P	J 1
7440-23-5	Sodium	5050		E	P	J 8
7440-28-0	Thallium	1.4	U	NW	F	J 4,7,9
7440-62-2	Vanadium	33.3	B		P	
7440-66-6	Zinc	90.4			P	

Brown Clarity Before: Opaque Texture:

Yellow Clarity After: Clear Artifacts:

Comments:

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	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 or on file?	[ ]		✓
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.			

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

Date: Feb. 1990
Number: HW-2
Revision: 10

	YES	NO	N/A
A.1.6 Form I (Final Data) - Are all Form I's present and complete?	[✓]		
ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
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 EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]		
Are computation/transcription errors less than 10% of reported values?	[✓]		
Are all "less than IDL" values properly coded with "U"?	[✓]		
Was a brief physical description of samples given on Form I's?	[✓]		
Were the result qualifiers used correctly with final data?	[✓]		
ACTION: If no for any of the above, prepare Telephone Record Log, and contract laboratory for corrected data.			
Were any samples diluted beyond requirements of contract?		[✓]	
If yes, were dilutions noted on Form I's?	[✓]		
ACTION: If no, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.7 Holding Times - (aqueous and soil samples)			
(Examine sample traffic reports and digestion/distillation logs.)			
Mercury analysis (28 days). . . . . exceeded?		[✓]	
Cyanide distillation (14 days). . . . . exceeded?		[✓]	

	YES	NO	N/A
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 Raw Data

A.1.8.1	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 Digestion Log?	[✓]	__	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	__	✓
	Furnace AA	[✓]	__	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	__	___

	YES	NO	N/A
A.1.8.3 Are all raw data to support all sample analyses and QC operations present?	[✓]	__	__
Legible?	[✓]	__	__
Properly Labeled?	[✓]	__	__

ACTION: If no for any of the above, write Telephone Record Log and contact laboratory. Flag metal data as estimated if pH of sample is greater than 2. Flag cyanide data as estimated if pH sample is less than 12.

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

A.1.9.1.1 Is record of at least 2 point calibration present for ICP analysis?	[✓]	__	__
Is record of 5 point calibration present for Hg analysis?	[✓]	__	__

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

A.1.9.1.2 Is record of 4 point calibration present for:			
Flame AA?	[__]	__	✓
Furnace AA?	[✓]	__	__
Cyanides?	[✓]	__	__

NOTE:
1. If less than 4 standards are measured in absorbance mode, then the remaining standards in concentration mode must be run immediately after calibration and be within ±10% of true value.
2. For all AA (except Hg) and Cyanide analyses, one calibration standard is at CRDL level. If not, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A

ACTION: Flag associated data as estimated if standards are not within ±10% of true values (except CRDL calibration standard). Do not flag the data as estimated in linear range indicated by good recovery of standard.

A.1.9.1.3 Is correlation *coefficient less than 0.995 for:

Mercury Analysis?	___	[✓]	___
Cyanide Analysis?	___	[✓]	___
Atomic Absorption Analysis?	___	[✓]	___

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

A.1.9.2 Form II A (Initial and Continuing Calibration Verification)-

A.1.9.2.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for AA and ICP when both are used for same analyte?	[✓]	___	___

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

A.1.9.2.2 Circle all values on data summary sheet that are outside contract windows. Are all calibration standards (initial and continuing) within control limits?

Metals 90-110%	[✓]	___	___
Hg - 80-120%	[✓]	___	___
Cyanides 85-115%	[✓]	___	___

* The reviewer will calculate correlation coefficient.

	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.

Was continuing calibration performed every 10 samples or every 2 hours? [✓] -- --

ACTION: If no, flag the excess samples (eleventh and up) data as estimated (J).

Was ICV for cyanides distilled? [ ] ✓ --

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

A.1.9.3 Form II B (CRDL Standards for AA and ICP) -

A.1.9.3.1 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.

* Find the results of mid-range standard in the raw data.
**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
A.1.9.3.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and for every four hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.9.3.3	Circle all values on summary sheet that are outside 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 data within the affected ranges if the recovery of the standard is between 50-79%; flag only positive data if the recovery is between 121-150%; reject (red line) all data if the recovery is less than 50%; reject only positive data if the recovery is greater than 150%.			
A.1.9.4	Form III (Initial and Continuing Calibration Blanks)			
A.1.9.4.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (whichever is more frequent)?	[✓]		
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the contract-problems/ non-compliance section of the Data Assessment Narrative.			

		YES	NO	N/A
A.1.9.4.2	Circle all calibration blank values on Data Summary Sheet that are above CRDL (or 2 x IDL when IDL > CRDL). Are all calibration blanks (when IDL<CRDL) less than or equal to Contract Required Detection Limits (CRDL)?	[✓]		
	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) all positive data less than or equal to calibration blank values 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.			
A.1.9.5	FORM III (Preparation Blank) -			
	(Note: The preparation blank for mercury is the same as the calibration blank.)			
A.1.9.5.1	Was one prep. blank analyzed for: each 20 samples?	[✓]		
	each batch?	[✓]		
	each matrix type?	[ ]		✓
	both AA and ICP when both are used for same analyte?	[ ]		✓
	ACTION: If no for any of the above, flag as estimated (J) all 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).			
A.1.9.5.2	Is concentration of prep. blank greater than 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 value?		[ ]	✓

		YES	NO	N/A
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value found in the raw data.			
A.1.9.5.3	Do concentrations of prep. blank fall below two times IDL when IDL is greater than CRDL?	[ ]	__	✓
	ACTION: If no, reject (red-line) all positive data that has a concentration less than 10 times the prep. blank value in the raw data.			
A.1.9.5.4	Is concentration of prep. blank below the negative CRDL?	__	[✓]	__
	ACTION: If yes, reject (red-line) all associated data that has a concentration less than 10xCRDL.			
A.1.9.6	Form IV (ICP Interference Check Sample)			
A.1.9.6.1	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 samples for which Al, Ca, Fe, or Mg is higher than in ICS.			
A.1.8.6.2	Circle all values on Data Summary Sheet that are more than + 20% of true or established mean value. Are all Interference Check Sample results inside of control limits (+ 20%)?	[✓]	__	__
	If no, is concentration of Al, Ca, Fe, or Mg lower than in ICS?	[ ]	__	✓
	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").			

		YES	NO	N/A
A.1.9.7	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.1.9.7.1	Present and complete for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each conc. range (i.e. low, med., high)?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all positive data less than four times spiking level 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.1.9.7.2	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.			
	NOTE: Matrix spike analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.7.3	Circle all values on Data Summary Sheet 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?	[__]	✓	__
	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.			

	YES	NO	N/A
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.1.9.7.4 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.1.9.7.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	__	[__]	✓
(b) between 10-74%?	__	[__]	✓
(c) between 126-200%?	__	[__]	✓
(d) greater than 200%?	__	[__]	✓

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".

		YES	NO	N/A
A.1.9.8	Form VI (Lab Duplicates)			
A.1.9.8.1	Present and complete for: each 20 samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[___]	___	✓

ACTION: If no for any the above, flag as estimated (J) all 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 Hg/L on wet weight basis and calculate RPD or Difference for each analyte.

A.1.9.8.2	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.

NOTE: Duplicate analysis should be performed on a field blank when it is the only aqueous sample in SDG.

A.1.9.8.3	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".

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.

* Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N/A
	2. If lab duplicate result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria.			
A.1.9.8.4	Is any value for sample duplicate pair less than CRDL* and other value greater than or equal to 10 x *CRDL?	___	[✓]	___
	ACTION: If yes, flag the associated data as estimated (J).			
A.1.9.8.5	Aqueous Circle all values on Data Summary Sheet 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.1.9.8.6	Soil/Sediment Circle all values on Data Summary Sheet 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.1.9.9 Field Duplicates

A.1.9.9.1 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.1.9.9.2 Is any value for sample duplicate pair less than *CRDL and other value greater than or equal to 10 x *CRDL? ___ [✓] ___

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

A.1.9.9.3 Aqueous

Circle all values on 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.1.9.9.4 Soil/Sediment

Circle all values on 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.1.9.10 Form VII (Laboratory Control Sample) (Note: LCS - not required for aqueous Hg and cyanide analyses.)

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [✓] _ _ _

every 20' solid samples? [___] _ _ ✓

both AA and ICP when both are used for 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 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.1.9.10.2	Aqueous LCS			
	Circle all LCS values outside control limits (80 - 120%- except 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.1.9.10.3	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.1.9.11	Form IX (ICP Serial Dilution) -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.9.11.1	Was Serial Dilution analysis performed for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each concentration range (i.e. low, med.)?	[✓]	__	__
	ACTION: If no for any of the above, flag all positive data greater than or equal to 10xIDLs as estimated (J) for which Serial Dilution Analysis was not performed, and summarize the deficiency on the DPO report.			
A.1.9.11.2	Was field blank(s) used for Serial Dilution Analysis?	__	[✓]	__
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J).			
	NOTE: Serial dilution analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.11.3	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.1.9.11.4	Circle all values on Data Summary Sheet that are outside control limit 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 associated equal to or greater than 10xIDLs for which percent difference is greater than 10% but less than 100%. Reject (red-line) all associated sample results equal to or greater than 10xIDLs for which PD is greater than or equal to 100%.

A.1.9.12 Furnace Atomic Absorbtion (AA) QC Analysis

A.1.9.12.1 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.1.9.12.2 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 post digestion spike recovery less than 40%? [✓] _ _

ACTION: If no for any of the above, flag all the associated data as estimated (J).

A.1.9.12.3 Is *post digestion spike recovery less than 10% or greater than 150% for any result? _ [✓] _

ACTION: If yes, reject (red-line) the affected data if recovery is <10%; reject data not flagged with "U" if spike recovery is >150%.

NOTE: Reject the data only if the affected sample was not subsequently analyzed by Method of Standard Addition.

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

		YES	NO	N/A
A.1.9.13	Form VIII (Method of Standard Addition Results)			
A.1.9.13.1	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.1.9.13.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	--	[✓]	--
	ACTION: If yes, reject (red-line) affected data.			
A.1.9.13.3	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.1.9.13.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-16 through E-17?	[✓]	--	--
	ACTION: If no, note exception under contract problem/ non-compliance of data assessment narrative, or prepare a separate list.			
A.1.9.14	Dissolved/Total or Inorganic/Total Analytes -			
A.1.9.14.1	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)?	--	[✓]	--

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

	YES	NO	N/A
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.1.9.14.2 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?	__	[✓]	__
A.1.9.14.3 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.1.9.15 Form I to IX

A.1.9.15.1 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".

	YES	NO	N/A
A.1.9.15.2 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.

A.1.9.16 Form I (Field Blank) -

Circle all field blank values on Data Summary Sheet that are greater than CRDL, 2 x IDL when IDL > CRDL.

Do concentrations of field blank(s) fall below CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓
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.

	YES	NO	N/A
A.1.9.17 Form X, XI, XII (Verification of Instrumental Parameters).			
A.1.9.17.1 Is verification report present for:			
Instrument Detection Limits (quarterly)?	[✓]	__	__
ICP Interelement Correction Factors (annually)?	[✓]	__	__
ICP Linear Ranges (quarterly)?	[✓]	__	__
ACTION: If no, contact DPO of the lab.			
A.1.9.17.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)			
Are IDLs present for: all the analytes?	[✓]	__	__
all the instruments used?	[✓]	__	__
For both AA and ICP when both are used for same analyte?	[✓]	__	__
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
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?	[✓]	__	__
ACTION: If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			

	YES	NO	N/A
A.1.9.17.3 Form XI (Linear Ranges)			
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.1.9.18 Percent Solids of Sediments			
Is soil content in sediment(s) less than 50%?	___	[___]	✓
ACTION: If yes, qualify as estimated all data not previously rejected or flagged due to other QC criteria.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

Case# _____ Site Naval Weapons Sta. Matrix: Soil ____

SDG# CLP090 Lab Gulf Coast Water V

Contractor Roy F. Weston Reviewer Paul B. Humburg
Heartland EST

Other ____

A.2.1 The case description and exceptions, if any, are noted below with reason(s) for rejection or qualification as estimated value(s) J.

All samples

1. The CRDL for Antimony and Silver were below the control limits. All positive and non-detect results are flagged as estimated.
2. The CRDL for Lead and Thallium were above the control limits. All positive results are flagged as estimated.
3. The CRDL for Chromium was above 150%. All positive results are rejected.
4. The Matrix Spike Recovery for Lead and Thallium were below the lower control limit. All positive and non-detect results are flagged as estimated.
5. The Mutrix Spike Recovery for Cadmium was above the control limits. All positive results are flagged as estimated.
6. The Matrix Spike Recovery for Aluminum

A.2.1 (continuation)

was above 150%. All positive results are rejected.

7. The LCS for Thallium was below the control limits. All positive and non-detect results are flagged as estimated.

8. The Serial Dilution results for Aluminum, Calcium, Iron and Sodium was outside the control limits. All positive and non-detect results are flagged as estimated.

9. The analytical spike recovery for Thallium was below the control limit. All positive and non-detect results are flagged as estimated.

PBH 7/13/91

PBH 7/13/91

A.2.2 Contract-Problems/Non-Compliance

The laboratory failed to distill the ICV and the mid-range verification standard as required by contract and CLP guidelines (Reg II).

PBH 7/13/91

MMB Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hamby Date: 7/13/91
Signature

Verified by: Kathleen D. Scarpelli Date: 7/15/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 288 SAMPLE TYPE/SDG: CLP 090

SITE/STUDY DESCRIPTION: Naval Weapons Sta. N.T. SAMPLE NOS: 106M00

FIELD DUP. #'S: NA LAB DUP. #'S: 106M00 Field Blank NA MATRIX SPIKE #: 106M00

SERIAL DILUTION SAMPLE NO. 106M00 COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV			V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBL EAN	ICP ICS % R		MS tpix k	Lab Dup RPD Diff.	LCS % R	Ser Dil % D	Meth
					Continued						Continued										
Parameter	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3	P N	Init	Fin					
Al	200	17.7	NA	100.7	99	101	101			U	U	U	U	86	98	95	243	11.2	93	45.2	P
Sb	60	18.2		96	95	96	96	74	73	U	U	U	U	U			80		88		P
As	10	0.9		103	103	102	102	87		-2	-2	-2	-2	-2			93	4.7	98		F
Ba	200	4.4		101	99	100	100			U	U	U	U	U	99	93	91	0.2	92	44	P
Be	5	0.6		99	99	99	99	98	95	U	U	U	U	U	95	88	91		92		P
Cd	5	2.7		96	92	94	95	103	97	U	U	U	U	U	99	95	149		100		P
Ca	5000	14.7		99	97	97	97			U	U	U	14.9	123	95	90		0.2	91	44	P
Cr	10	6.9		108	106	107	107	82	122	U	U	U	U	U	92	91	109	21.6	99	29	P
Co	50	3.0		103	100	101	101	100	103	U	U	U	U	U	90	86	94	PBH 7/12/91	94		P
Cu	25	2.5		101	100	101	101	100	98	-4.3	U	U	U	-3.8	96	92	94		93		P
Fe	100	4.3		102	100	102	100			U	U	31.7	U	54.1	92	89	363	13.9	94	43	P
Pb	5	1.5		108	110	97		133		U	U	U		U			65	6.2	113		F
Mg	5000	35.9		100	99	100	100			U	U	U	U	100	100	96		10.9	92	41	P PBH 7/12/91
Mn	15	1.0		102	100	101	101	101	107	U	U	1.1	U	U	95	90	92	0.9	93	56	P
Hg	0.2	0.2 3.4	PBH 7/12/91	102	101	104	95			U	U	U	U	U			90				CU
Ni	40	3.9		101	98	99	99	101	120.4	U	U	U	U	U	87	85	91	10.3	92	100	P
K	5000	94.8		100	98	99	99			U	U	U	U	U				12.5	91	43	P
Se	5	1.1		96	95	99		100		U	U	U		U			103		96		F
Ag	10	3.8		97	96	97	97	101	72	U	U	U	U	U	97	92	107	0.9	97		P
Na	5000	21.4		100	100	102	101			U	U	U	30.7	122					94	46	P
Tl	10	1.4		105	96	93		121		U	U	U		U			53		78		F
V	50	2.0		103	100	101	101	98	98	U	U	U	U	U	94	89	94	10.5	94	50	P
Zn	20	4.7		101	99	100	100	85	92	U	U	U	U	U	92	88	91	0.8	92	34	P
CN	10	10		90	92	93	99			U	U	U	U	U			100		86		

00033

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP90

SITE/STUDY DESCRIPTION: Naval Weapons Sta. SAMPLE NOS: 106M00

Field Blank NA

FIELD DUP. #'S: NA LAB DUP. #'S: 106M00 MATRIX SPIKE #: 106M00

SERIAL DILUTION SAMPLE NO. 106M00 COMPLETION DATE: 7/12/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V		VI	VII	IX	
	Detection Limits UG/L			Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP % R				Lab Dup RPD/ Diff.		Ser Dil	
Parameter	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	Init	Fin				LCS % R	% D	
Al	200	17.7	NA	101	101	99				20.3	26.1	34.5		97	93						
Sb	60	18.2																			
As	10	0.9																			
Ba	200	4.4																			
Be	5	0.6																			
Cd	5	2.7		96	96	93		49	63	U	U	U		106	102						
Ca	5000	14.7																			
Cr	10	6.9																			
Co	50	3.0																			
Cu	25	2.5																			
Fe	100	4.3																			
Pb	5	1.5																			
Mg	5000	35.9																			
Mn	15	1.0																			
Hg	0.2	0.2			99	103	93				U	U	U								
Ni	40	3.9																			
K	5000	94.8																			
Se	5	1.1																			
Ag	10	3.8																			
Na	5000	21.4																			
Tl	10	1.4																			
V	50	2.0																			
Zn	20	4.7	✓																		
CN	10																				

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

Date: Feb. 1990
Number: HW-2
Revision: 10

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 7/13/91 Case #:

Site: Naval Weapons Station N.J. Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 1 + MS/D

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
ICP		1				1							2	
Flame AA														
Furnace AA														
Mercury														
Total		1				1							2	
Other		X												

PBH 7/13/91

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

ICP		2				1					4		7	
Flame AA														
Furnace AA		2				2				1		1	6	
Mercury														
Total		4				3				1	4	1	13	
Other						3				X	4	X		

PBH 7/13/91 PBH PBH PBH 7/13/91

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

Title: Evaluation of Metals Data f r the Contract Laboratory Program
Appendix A.7: CLP Data Assessment Checklist
Inorganic Analysis

Date: Dec. 1988
Number: HW-2
Revision: 8

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. _____

SITE Naval Weapons Station NJ.

LABORATORY Gulf Coast

NO. OF SAMPLES/ MATRIX 1 water

SDG# CLP 090

REVIEWER (IF NOT ESD) _____

SOW# 7/88

REVIEWER'S NAME Paul B. Humburg. Heartland ESI

DPO: ACTION _____ FYI _____

COMPLETION DATE 7/13/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	O	O	O	O
2.	CALIBRATIONS	Z	O	O	O
3.	BLANKS	O	O	O	O
4.	ICS	O			
5.	LCS	O	O		
6.	DUPLICATE ANALYSIS	O	O	O	O
7.	MATRIX SPIKE	Z	O	O	O
8.	MSA		O		
9.	SERIAL DILUTION	O			
10.	SAMPLE VERIFICATION	O	O	O	O
11.	OTHER QC				
12.	OVERALL ASSESSMENT	O	O	O	O

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: _____