16977 O.K. QA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : April 12, 1989

SUBJECT: Inorganic Data Validation for the Eastern Diversified Site
Case 10923

FROM : Theresa A. Simpson TAS
Region III Acting ESAT DPO (3ES23)

TO : Suzanne Billings
Regional Project Manager (3HW12)

THRU : Pat Krantz TAS for
Chief, QA Section (3ES23)

Attached is the inorganic data review for the Eastern Diversified Site (Case 10923) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have questions regarding this review, please call me.

Attachment

cc: Mark diFeliciantonio, CDM
Virginia Nicholas, GCL
Elaine Spiewak (3HW10) (w/o attachments)
File: TID 03890226 Task #1556

WESTON
MANAGERS DESIGNERS/CONSULTANTS

ESAT PROJECT
SUITE 300
2568 RIVA ROAD
ANNAPOLIS, MD 21401

DATE: April 4, 1989

SUBJECT: INORGANIC DATA VALIDATION, CASE 10923
SITE: EASTERN DIVERSIFIED

FROM: IVAN B. DELOATCH
ESAT SENIOR DATA REVIEW OVERSIGHT CHEMIST

TO: TERRY SIMPSON
ACTING ESAT DEPUTY PROJECT OFFICER

THRU: CHARLES MATKOVICH for
ESAT TEAM MANAGER

OVERVIEW

The sample set for Case 10923 contained five (5) aqueous samples, which were analyzed through the Contract Laboratory (CLP) Routine Analytical Services. The sample set contained one (1) equipment blank and one (1) field duplicate pair.

SUMMARY

All analytes with the exception of those qualified "R", were successfully analyzed in all samples. Areas of concern with respect to data usability are listed according to the seriousness of the problem. These include:

MAJOR PROBLEM

The matrix spike recovery was extremely low (<30%) for the Sb analyte. The quantitation limits for the Sb analyte in the samples may be biased extremely low and, therefore, have been qualified "R" (unreliable).

MINOR ISSUES

The equipment blank had reported results that were > IDL for the Ba, Ca, Fe, Pb, Na and Zn analytes. The reported results for these analytes in the samples which are < 5X the blank concentration may be biased high and, therefore, have been qualified "B".

The percent difference (%D) of the serial dilution for the Mg analyte was greater than the 10% limit. Therefore, the reported results for the Mg analyte in the samples have been qualified estimated, "J".

The matrix spike recoveries were low for the Mn, Hg, Ag and Tl analytes. The quantitation limits and reported results for these analytes in the samples may be biased low and, therefore, have been qualified "UL" and "L", respectively.

The technical holding time for the analysis of the Hg analyte in the samples was exceeded by seven (7) days. The reported result and quantitation limits for Hg in the samples may be biased low and, therefore, have been qualified "L" and "UL", respectively.

NOTE

The data was reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the laboratory's results during evaluation.

ATTACHMENTS

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	DATA SUMMARY FORM
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM I
APPENDIX B	DPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION

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TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Sb	All samples		R	Extremely Low	A (28%)
Ba	MCY954; MCY955; MCY957	B		High	B (19.0 ppb)
Ca	MCY955	B		High	B (716 ppb)
Fe	MCY954	B		High	B (67 ppb)
Pb	MCY954; MCY956; MCY957	B		High	B (2.6 ppb)
Mg	MCY954 - MCY957	J			C (639%)
Mn	All samples	L	UL	Low	D (70%)
Hg	All samples	L	UL	Low	D (67%) E
Ag	All samples		UL	Low	D (30%)
Na	MCY954 - MCY957	B		High	B (1270 ppb)
Tl	All samples		UL	Low	D (46%)
Zn	MCY954 - MCY957	B		High	B (9.0 ppb)

* See explanation of comments in Table 1B

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TABLE 1B

CODES USED IN COMMENTS COLUMN

A = Due to an extremely low (<30%) matrix spike recovery (% recovery in parentheses), the quantitation limits may be biased extremely low.

B = The equipment blank had a result > IDL (the result is in parentheses) and the reported results were < 5X the blank. The reported results may be biased high.

C = The percent difference (%D) of the serial dilution was greater than 10% limit (%D is in parentheses). Therefore, the reported results are estimated.

D = Due to a low matrix spike recovery (% recovery in parentheses), the quantitation limits and/or reported results may be biased low.

E = Due to an exceeded holding time for the analysis, the reported result and quantitation limits may be biased low.

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TABLE 2

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Table 3

DATA SUMMARY FORM: I N O R G A N I C S

Site Name: Eastern Diversified

WATER SAMPLES (ug/L)

Case #: 10923 Sampling Date(s): 11/15+16/09

+Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

CRDL	ANALYTE	MCY954		MCY955		MCY956		MCY957		MCY958	
	Dilution Factor	1		1		1		1		1	
	Location	MW3-0		MW1-S		MW7-I Dupe of MCY957		GW1-I Dupe of MCY957		Equipment Blank	
200	Aluminum							[96]			
60	Antimony		R		R		R		R		R
10	*Arsenic										
200	Barium	[24]	B	[41]	B			[5.0]	B	[19]	
5	Beryllium										
5	*Cadmium										
5000	Calcium	6890		[2040]	B	11800		10700		[716]	
10	*Chromium										
50	Cobalt										
25	Copper										
100	Iron	[21]	B	7250		1940		1770		[67]	
5	*Lead	[1.8]	B			[2.1]	B	[1.4]	B	[2.6]	
5000	Magnesium	[1520]	J	[994]	J	[931]	J	[890]	J		
15	Manganese	1720	L	457	L	100	L	97	L		UL
0.2	Mercury		UL		UL	0.20	L		UL		UL
40	*Nickel										
5000	Potassium	[550]		[1670]		[770]		[740]			
5	Selenium										
10	Silver		UL		UL		UL		UL		UL
5000	Sodium	[4220]	B	5650	B	[1300]	B	[1500]	B	[1270]	
10	Thallium		UL		UL		UL		UL		UL
50	Vanadium										
20	Zinc	[24]	B	[17]	B	[12]	B	[15]	B	[9.0]	
10	*Cyanide										

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/08

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APPENDIX A

RESULTS REPORTED BY LABORATORY

FORM I'S

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MW 954 MW 3/6

Date 2/16/89

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. CASE NO. 10923

SOW NO. 7/85 Lab Receipt Date 11/18/88

LAB SAMPLE ID. NO. 6921 QC REPORT NO. 84

Elements Identified and Measured

Concentration: Low ✓ Medium ____

Matrix: Water ✓ Soil ____ Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	93 uP	13.	Magnesium	[520] P
2.	Antimony	60 uFN	14.	Manganese	KH 2/14/89 ~~[1720] P~~ 1720 PN
3.	Arsenic	4.2 uF	15.	Mercury	0.19 uCVN
4.	Barium	[24] P	16.	Nickel	21 uP
5.	Beryllium	2.1 uP	17.	Potassium	[550] P
6.	Cadmium	4.6 uP	18.	Selenium	1.6 uF
7.	Calcium	6890 P	19.	Silver	KH 2/14/89 ~~1.0 uF~~ 1.84 FN
8.	Chromium	7.97 uF	20.	Sodium	[4220] P
9.	Cobalt	8.5 uP	21.	Thallium	2.9 uFN
10.	Copper	17 uP	22.	Vanadium	11 uP
11.	Iron	[2] P	23.	Zinc	[24] P
12.	Lead	[1.8] F		Percent Solids (%)	

Cyanide 10 u

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample Description: Colorless Clear
E = serial dilution out of control.

Lab Manager AR 30 1975

IFB Amend. One

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MCU955 MW1/5

Date 2/16/89

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC.

CASE NO. 10923

SOW NO. 7/85

Lab Receipt Date 11/18/88

LAB SAMPLE ID. NO. 6922

QC REPORT NO. 84

Elements Identified and Measured

Concentration: Low ✓ Medium ____

Matrix: Water ✓ Soil ____ Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	93UP	13.	Magnesium	[994]P
2.	Antimony	60UFN	14.	Manganese	457PN
3.	Arsenic	4.2UF	15.	Mercury	0.19UCVN
4.	Barium	[4]P	16.	Nickel	21UP
5.	Beryllium	2.1UP	17.	Potassium	[1670]P
6.	Cadmium	4.6UP	18.	Selenium	1.6UF
7.	Calcium	[2040]P	19.	Silver	10UFN
8.	Chromium	0.97UF	20.	Sodium	5650P
9.	Cobalt	8.5UP	21.	Thallium	10UFN
10.	Copper	17UP	22.	Vanadium	11UP
11.	Iron	7250P	23.	Zinc	[17]P
12.	Lead	5.0UF		Percent Solids (%)	
	Cyanide	10UF			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample Description: Colorless, Clear
E = serial dilution out of control.

Lab Manager [signature]

AR301976

IFB Amend. One

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MW 956 MW 7/I

Date 2/16/89

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC.

CASE NO. 10923

SOW NO. 7/85

Lab Receipt Date 11/18/88

LAB SAMPLE ID. NO. 6923

QC REPORT NO. 84

Elements Identified and Measured

Concentration: Low ✓ Medium _____

Matrix: Water ✓ Soil _____ Sludge _____ Other _____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	95UP	13.	Magnesium	[93] P
2.	Antimony	60UFN	14.	Manganese	100PN
3.	Arsenic	4.2UF	15.	Mercury	0.20CVN
4.	Barium	3.5UP	16.	Nickel	21UP
5.	Beryllium	2.1UP	17.	Potassium	[770] P
6.	Cadmium	4.6UP	18.	Selenium	1.6UF
7.	Calcium	11800P	19.	Silver	~~10UF~~ 1.8UFN
8.	Chromium	0.97UF	20.	Sodium	[1300] P
9.	Cobalt	8.5UP	21.	Thallium	10UFN
10.	Copper	17UP	22.	Vanadium	11UP
11.	Iron	1940P	23.	Zinc	[12] P
12.	Lead	[2.1] F		Percent Solids (%)	
	Cyanide	10U			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample Description: Colorless, Clear
E = serial dilution out of control.

Lab Manager [signature] MAR 20 1977

IFB Amend. One

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MC4957

Dup MW 7-I

Date 2/16/89

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC.

CASE NO. 10923

SOW NO. 7/85

Lab Receipt Date 11/18/88

LAB SAMPLE ID. NO. 6924

QC REPORT NO. 84

Elements Identified and Measured

Concentration: Low ✓ Medium ____

Matrix: Water ✓ Soil ____ Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	[96]P	13.	Magnesium	[890]P
2.	Antimony	60UFN	14.	Manganese	97PN
3.	Arsenic	4.2UF	15.	Mercury	0.19UCVN
4.	Barium	[5.0]P	16.	Nickel	21UP
5.	Beryllium	2.1UP	17.	Potassium	[740]P
6.	Cadmium	4.6UP	18.	Selenium	1.6UF
7.	Calcium	10700P	19.	Silver	~~1.0UF~~ 2/14/89 1.8UFN
8.	Chromium	0.97UF	20.	Sodium	[1500]P
9.	Cobalt	8.5UP	21.	Thallium	2.9UFN
10.	Copper	17UP	22.	Vanadium	11UP
11.	Iron	1770P	23.	Zinc	[15]P
12.	Lead	[1.4]F		Percent Solids (%)	
	Cyanide	10U			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample Description: Colorless Clear
E = serial dilution out of control.

AR301878

Lab Manager [signature]

IFB Amend. One

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MCL958 Equip. Blank

Date 2/16/89

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. CASE NO. 10923

SOW NO. 7/85 Lab Receipt Date 11/18/88

LAB SAMPLE ID. NO. 6825 QC REPORT NO. 84

Elements Identified and Measured

Concentration: Low ✓ Medium ____

Matrix: Water ✓ Soil ____ Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	93UP	13.	Magnesium	19UP
2.	Antimony	60UFN	14.	Manganese	3.2UPN
3.	Arsenic	4.2UF	15.	Mercury	0.19UCUN
4.	Barium	[19] P	16.	Nickel	21UP
5.	Beryllium	2.1UP	17.	Potassium	496UP
6.	Cadmium	4.6UP	18.	Selenium	1.6UF
7.	Calcium	[716] P	19.	Silver	10UFN
8.	Chromium	0.97UF	20.	Sodium	[270] P
9.	Cobalt	8.5UP	21.	Thallium	10UFN
10.	Copper	17UP	22.	Vanadium	10.9UP
11.	Iron	[67] P	23.	Zinc	[9.0] P
12.	Lead	[2.6] F		Percent Solids (%)	
	Cyanide	10U			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample Description: Colorless, Clear
E = serial dilution out of control.

Lab Manager [signature]

IFB Amend. One

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APPENDIX B

DPO REPORT

INORGANIC DATA VALIDATION SUMMARY

WESTON

Date Review Completed: 4-04-89
Case No.: 10923
Site Name: Eastern Diversified
Sample Nos.: MCY954-MCY958

Contract Lab.:Hittman Ebasco
Contract No.: 68-W8-0006
Lab DPO: Chuck Sands
Reviewer: Ivan B. DeLoatch
from Region III/ESAT
Phone: (301) 266-9887

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/solid				
aqueous	5			
other				

ICP	OK	FYI	Action	COMMENTS
Holding Time	X			
Calibration Blanks	X			
Initial Calibration	X			
Preparation Blank	X			
Interference Check Sample	X			
Lab Control Sample	X			
Lab Duplicate	X			
Matrix Spike		X		Sb(28%),Mn(70%),Ag(30%)
Serial Dilution		X		Mn(639%)

FURNACE	OK	FYI	Action	COMMENTS
Holding Time	X			
Calibration Blanks	X			
Initial Calibration	X			
Continuing Calibration	X			
Preparation Blank	X			
Lab Control Sample	X			
Lab Duplicate	X			
Matrix Spike		X		Tl(46%)
Duplicate Injections	X			
Analytical Spike	X			

MERCURY & CYANIDE	OK	FYI	Action	COMMENTS
Holding Time			X	Hg (5 days)
Calibration Blank	X			
Initial Calibration	X			
Continuing Calibration	X			
Preparation Blank	X			
Lab Duplicate	X			
Matrix Spike		X		Hg (67%)

REVIEWER'S COMMENTS:

AR301981

DOCUMENTATION ATTACHED (see following pages)

DPO ISSUES

1. The laboratory did not qualify the results "E" for the exceeded serial dilution limit for Mn on the Form Is of the samples. See Appendix C, p. 4, for an example.

APPENDIX C

SUPPORT DOCUMENTATION

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No. MCL 954

Date 2/16/89

INORGANIC ANALYSIS DATA SHEET

LAB NAME HITTMAN EBASCO ASSOC. CASE NO. 10923

SOW NO. 7/85 Lab Receipt Date 11/18/88

LAB SAMPLE ID. NO. 6921 QC REPORT NO. 84

Elements Identified and Measured

Concentration: Low ✓ Medium ____

Matrix: Water ✓ Soil ____ Sludge ____ Other ____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	931 uP	13.	Magnesium	[5220]P
2.	Antimony	60 uFN	14.	Manganese	~~[1320]P~~ 1720PN
3.	Arsenic	4.2 uF	15.	Mercury	0.19 uCVN
4.	Barium	[24]P	16.	Nickel	21 uP
5.	Beryllium	2.1 uP	17.	Potassium	[550]P
6.	Cadmium	4.6 uP	18.	Selenium	1.6 uF
7.	Calcium	6890 P	19.	Silver	~~[1] uF~~ 1.84 FN
8.	Chromium	1.97 uF	20.	Sodium	[4220]P
9.	Cobalt	8.5 uP	21.	Thallium	2.9 uFN
10.	Copper	17 uP	22.	Vanadium	11 uP
11.	Iron	[21]P	23.	Zinc	[24]P
12.	Lead	[1.8]F		Percent Solids (%)	
	Cyanide	10 u			

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

Comments: Sample Description: Colorless Clear
E = serial dilution out of control.

AR301984

Lab Manager [signature]

IFB Amend. One