

ALPHA ANALYTICAL LABORATORIES

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MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

Client: ERM-New England Laboratory Job Number: L0309996
Address: 399 Boylston Street
6th Floor
Boston, MA 02116 Date Received: 03-OCT-2003
Attn: Mr. Tim Pac Date Reported: 10-OCT-2003
Project Number: 1922.09.2 Delivery Method: Alpha
Site: RAYTHEON

The following questions pertain only to MCP Analytical Methods

An affirmative response to questions A,B,C & D is required for "Presumptive Certainty" status

- A. Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set? YES
- B. Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines? YES
- C. Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in section 2.0 of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"? YES
- D. **VPH and EPH methods only:** Was the VPH or EPH method run without significant modifications, as specified in Section 11.3? NA

A response to questions E and F is required for "Presumptive Certainty" status

- E. Were all QC performance standards and recommendations for the specified method(s) achieved? NO
- F. Were results for all analyte-list compounds/elements for the specified method(s) reported? NO

Any answers of NO to the above questions are addressed in the case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by: Scott McLean
This document electronically signed

ALPHA ANALYTICAL LABORATORIES

Laboratory Job Number: L0309996

Date Reported: 10-OCT-2003

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0309996-01	MW-117	WAYLAND, MA
L0309996-02	MW-118	WAYLAND, MA

ALPHA ANALYTICAL LABORATORIES
NARRATIVE REPORT

Laboratory Job Number: L0309996

MCP Related Narratives

Metals

In reference to question F, at the client's request, the samples were analyzed only for Dissolved Chromium, Manganese and Sodium.

Due to elevated Sodium concentrations, L0309996-01 required a 5x dilution, and L0309996-02 required a 10x dilution, prior to re-analysis for Sodium.

Volatile Organics

In reference to question F, at the client's request, only those compounds specified on the chain of custody are reported.

L0309996-02 has elevated limits of detection due to the dilutions required by the elevated concentrations of target compounds in the sample.

In reference to question E, the LCS % recovery for Bromomethane (34%) is below the acceptance criteria for the method.

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0309996-01
 MW-117

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Volatile Organics by MCP 8260B continued				54 8260B	1007 02:25		BT
Dichlorodifluoromethane	ND	ug/l	5.0				
1,2-Dibromoethane	ND	ug/l	2.5				
1,3-Dichloropropane	ND	ug/l	2.5				
1,1,1,2-Tetrachloroethane	ND	ug/l	0.50				
o-Chlorotoluene	ND	ug/l	2.5				
p-Chlorotoluene	ND	ug/l	2.5				
Hexachlorobutadiene	ND	ug/l	2.5				
1,2,4-Trichlorobenzene	ND	ug/l	2.5				
Surrogate(s)	Recovery			QC Criteria			
1,2-Dichloroethane-d4	92.0	%		70-130			
Toluene-d8	90.0	%		70-130			
4-Bromofluorobenzene	95.0	%		70-130			
Dibromofluoromethane	89.0	%		70-130			

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS**

Laboratory Sample Number: L0309996-02
MW-118

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Volatile Organics by MCP 8260B continued				54 8260B	1007 03:10		BT
Dichlorodifluoromethane	ND	ug/l	12.				
1,2-Dibromoethane	ND	ug/l	6.2				
1,3-Dichloropropane	ND	ug/l	6.2				
1,1,1,2-Tetrachloroethane	ND	ug/l	1.2				
o-Chlorotoluene	ND	ug/l	6.2				
p-Chlorotoluene	ND	ug/l	6.2				
Hexachlorobutadiene	ND	ug/l	6.2				
1,2,4-Trichlorobenzene	ND	ug/l	6.2				
Surrogate(s)	Recovery			QC Criteria			
1,2-Dichloroethane-d4	90.0	%		70-130			
Toluene-d8	89.0	%		70-130			
4-Bromofluorobenzene	92.0	%		70-130			
Dibromofluoromethane	85.0	%		70-130			

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0309996

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Chloride for sample(s) 01-02 (L0310039-01, WG152945)					
Chloride	6.4	6.3	mg/l	2	7
Hexavalent Chromium by MCP 7196A for sample(s) 01-02 (L0309996-02, WG152488)					
Chromium, Hexavalent	ND	ND	mg/l	NC	20

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0309996

Parameter	% Recovery	QC Criteria
Chloride LCS for sample(s) 01-02 (WG152945)		
Chloride	100	84-110
Hexavalent Chromium by MCP 7196A LCS for sample(s) 01-02 (WG152488)		
Chromium, Hexavalent	102	80-120
Dissolved Metals LCS for sample(s) 01-02 (WG152585)		
Chromium, Dissolved	95	80-120
Manganese, Dissolved	96	80-120
Sodium, Dissolved	100	80-120
Volatile Organics by MCP 8260B LCS for sample(s) 01-02 (WG152627)		
Methylene chloride	85	70-130
1,1-Dichloroethane	100	70-130
Chloroform	98	70-130
Carbon tetrachloride	100	70-130
1,2-Dichloropropane	101	70-130
Dibromochloromethane	93	70-130
1,1,2-Trichloroethane	101	70-130
Tetrachloroethene	100	70-130
Chlorobenzene	100	70-130
Trichlorofluoromethane	101	70-130
1,2-Dichloroethane	100	70-130
1,1,1-Trichloroethane	102	70-130
Bromodichloromethane	98	70-130
trans-1,3-Dichloropropene	91	70-130
cis-1,3-Dichloropropene	96	70-130
1,1-Dichloropropene	97	70-130
Bromoform	93	70-130
1,1,2,2-Tetrachloroethane	93	70-130
Benzene	90	70-130
Toluene	100	70-130
Ethylbenzene	102	70-130
Chloromethane	79	70-130
Bromomethane	34	70-130
Vinyl chloride	91	70-130
Chloroethane	97	70-130
1,1-Dichloroethene	95	70-130
trans-1,2-Dichloroethene	97	70-130
Trichloroethene	103	70-130
1,2-Dichlorobenzene	97	70-130
1,3-Dichlorobenzene	97	70-130
1,4-Dichlorobenzene	98	70-130
Methyl tert butyl ether	95	70-130
p/m-Xylene	102	70-130
o-Xylene	102	70-130
cis-1,2-Dichloroethene	102	70-130
Dibromomethane	104	70-130
1,2,3-Trichloropropane	98	70-130

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0309996

Continued

Parameter	% Recovery	QC Criteria
Volatile Organics by MCP 8260B LCS for sample(s) 01-02 (WG152627)		
Styrene	103	70-130
Dichlorodifluoromethane	83	70-130
Acetone	73	70-130
Carbon disulfide	91	70-130
2-Butanone	72	70-130
4-Methyl-2-pentanone	90	70-130
2-Hexanone	71	70-130
Bromochloromethane	103	70-130
Tetrahydrofuran	94	70-130
2,2-Dichloropropane	102	70-130
1,2-Dibromoethane	101	70-130
1,3-Dichloropropane	100	70-130
1,1,1,2-Tetrachloroethane	102	70-130
Bromobenzene	99	70-130
n-Butylbenzene	94	70-130
sec-Butylbenzene	98	70-130
tert-Butylbenzene	98	70-130
o-Chlorotoluene	99	70-130
p-Chlorotoluene	97	70-130
1,2-Dibromo-3-chloropropane	104	70-130
Hexachlorobutadiene	98	70-130
Isopropylbenzene	95	70-130
p-Isopropyltoluene	97	70-130
Naphthalene	73	70-130
n-Propylbenzene	98	70-130
1,2,3-Trichlorobenzene	90	70-130
1,2,4-Trichlorobenzene	93	70-130
1,3,5-Trimethylbenzene	99	70-130
1,2,4-Trimethylbenzene	102	70-130
Ethyl ether	91	70-130
Isopropyl Ether	87	70-130
Ethyl-Tert-Butyl-Ether	87	70-130
Tertiary-Amyl Methyl Ether	91	70-130
1,4-Dioxane	108	70-130
Surrogate(s)		
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	91	70-130
4-Bromofluorobenzene	95	70-130
Dibromofluoromethane	92	70-130
Chloride SPIKE for sample(s) 01-02 (L0310039-07, WG152945)		
Chloride	95	58-140
Hexavalent Chromium by MCP 7196A SPIKE for sample(s) 01-02 (L0309996-01, WG152488)		
Chromium, Hexavalent	100	75-125

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0309996

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01-02 (WG152945-2)							
Chloride	ND	mg/l	1.0	1 9251		1009 20:56	DD
Blank Analysis for sample(s) 01-02 (WG152488-1)							
Hexavalent Chromium by MCP 7196A							
Chromium, Hexavalent	ND	mg/l	0.02	55 7196A		1004 01:30	1004 01:30 JT
Blank Analysis for sample(s) 01-02 (WG152585-1)							
Dissolved Metals							
Chromium, Dissolved	ND	mg/l	0.01	54 6010B		1008 09:57	RW
Manganese, Dissolved	ND	mg/l	0.01	54 6010B		1008 09:57	RW
Sodium, Dissolved	ND	mg/l	2.0	54 6010B		1008 09:57	RW
Blank Analysis for sample(s) 01-02 (WG152627-2)							
Volatile Organics by MCP 8260B							
				54 8260B		1006 17:11	BT
Methylene chloride	ND	ug/l	5.0				
1,1-Dichloroethane	ND	ug/l	0.75				
Chloroform	ND	ug/l	0.75				
Carbon tetrachloride	ND	ug/l	0.50				
1,2-Dichloropropane	ND	ug/l	1.8				
Dibromochloromethane	ND	ug/l	0.50				
1,1,2-Trichloroethane	ND	ug/l	0.75				
Tetrachloroethene	ND	ug/l	0.50				
Chlorobenzene	ND	ug/l	0.50				
Trichlorofluoromethane	ND	ug/l	2.5				
1,2-Dichloroethane	ND	ug/l	0.50				
1,1,1-Trichloroethane	ND	ug/l	0.50				
Bromodichloromethane	ND	ug/l	0.50				
trans-1,3-Dichloropropene	ND	ug/l	0.50				
cis-1,3-Dichloropropene	ND	ug/l	0.50				
1,1-Dichloropropene	ND	ug/l	2.5				
Bromoform	ND	ug/l	2.0				
1,1,2,2-Tetrachloroethane	ND	ug/l	0.50				
Benzene	ND	ug/l	0.50				
Toluene	ND	ug/l	0.75				
Ethylbenzene	ND	ug/l	0.50				
Chloromethane	ND	ug/l	2.5				
Bromomethane	ND	ug/l	1.0				
Vinyl chloride	ND	ug/l	1.0				
Chloroethane	ND	ug/l	1.0				
1,1-Dichloroethene	ND	ug/l	0.50				
trans-1,2-Dichloroethene	ND	ug/l	0.75				
Trichloroethene	ND	ug/l	0.50				
1,2-Dichlorobenzene	ND	ug/l	2.5				
1,3-Dichlorobenzene	ND	ug/l	2.5				
1,4-Dichlorobenzene	ND	ug/l	2.5				

ALPHA ANALYTICAL LABORATORIES
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0309996

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01-02 (WG152627-2)							
Volatile Organics by MCP 8260B continued				54 8260B		1006 17:11	BT
Methyl tert butyl ether	ND	ug/l	1.0				
p/m-Xylene	ND	ug/l	0.50				
o-Xylene	ND	ug/l	0.50				
cis-1,2-Dichloroethene	ND	ug/l	0.50				
Dibromomethane	ND	ug/l	5.0				
1,2,3-Trichloropropane	ND	ug/l	5.0				
Styrene	ND	ug/l	0.50				
Dichlorodifluoromethane	ND	ug/l	5.0				
Acetone	ND	ug/l	5.0				
Carbon disulfide	ND	ug/l	5.0				
2-Butanone	ND	ug/l	5.0				
4-Methyl-2-pentanone	ND	ug/l	5.0				
2-Hexanone	ND	ug/l	5.0				
Bromochloromethane	ND	ug/l	2.5				
Tetrahydrofuran	ND	ug/l	10.				
2,2-Dichloropropane	ND	ug/l	2.5				
1,2-Dibromoethane	ND	ug/l	2.5				
1,3-Dichloropropane	ND	ug/l	2.5				
1,1,1,2-Tetrachloroethane	ND	ug/l	0.50				
Bromobenzene	ND	ug/l	2.5				
n-Butylbenzene	ND	ug/l	0.50				
sec-Butylbenzene	ND	ug/l	0.50				
tert-Butylbenzene	ND	ug/l	2.5				
o-Chlorotoluene	ND	ug/l	2.5				
p-Chlorotoluene	ND	ug/l	2.5				
1,2-Dibromo-3-chloropropane	ND	ug/l	2.5				
Hexachlorobutadiene	ND	ug/l	2.5				
Isopropylbenzene	ND	ug/l	0.50				
p-Isopropyltoluene	ND	ug/l	0.50				
Naphthalene	ND	ug/l	2.5				
n-Propylbenzene	ND	ug/l	0.50				
1,2,3-Trichlorobenzene	ND	ug/l	2.5				
1,2,4-Trichlorobenzene	ND	ug/l	2.5				
1,3,5-Trimethylbenzene	ND	ug/l	2.5				
1,2,4-Trimethylbenzene	ND	ug/l	2.5				
Ethyl ether	ND	ug/l	2.5				
Isopropyl Ether	ND	ug/l	2.0				
Ethyl-Tert-Butyl-Ether	ND	ug/l	2.0				
Tertiary-Amyl Methyl Ether	ND	ug/l	2.0				
1,4-Dioxane	ND	ug/l	250				
Surrogate(s)	Recovery		QC Criteria				
1,2-Dichloroethane-d4	93.0	%	70-130				
Toluene-d8	89.0	%	70-130				
4-Bromofluorobenzene	94.0	%	70-130				
Dibromofluoromethane	82.0	%	70-130				

**ALPHA ANALYTICAL LABORATORIES
ADDENDUM I**

REFERENCES

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.
54. Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods. MADEP BWSC. Final Methods. May 2003.
55. Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods. MADEP BWSC. Final Methods. 30 July 2003.

GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.
METHOD Method number by which analysis was performed.
ID Initials of the analyst.
ND Not detected in comparison to the reported detection limit.

Please note that all solid samples are reported on dry weight basis unless noted otherwise.

LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

ALPHA ANALYTICAL LABORATORIES
LOGIN SPECIFIC INFORMATION

Laboratory Job Number: L0309996

Were project specific reporting limits specified? YES

Cooler Information

Cooler Custody Seal

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0309996-01A	Vial HCl preserved	A	NA	4.1 C	Y	Absent	MCP-8260
L0309996-01B	Vial HCl preserved	A	NA	4.1 C	Y	Absent	MCP-8260
L0309996-01C	Plastic 250ml unpreserved	A	7	4.1 C	Y	Absent	CL-9251, MCP-HEXCR-7196
L0309996-01D	Plastic 250ml HNO3 preserved	A	<2	4.1 C	Y	Absent	CR-SI, MN-SI, NA-SI
L0309996-02A	Vial HCl preserved	A	NA	4.1 C	Y	Absent	MCP-8260
L0309996-02B	Vial HCl preserved	A	NA	4.1 C	Y	Absent	MCP-8260
L0309996-02C	Plastic 250ml unpreserved	A	7	4.1 C	Y	Absent	CL-9251, MCP-HEXCR-7196
L0309996-02D	Plastic 250ml HNO3 preserved	A	<2	4.1 C	Y	Absent	CR-SI, MN-SI, NA-SI

Container Comments

Container ID Comments
