Memorandum

Environmental Resources Management

399 Boylston Street, 6th Floor
Boston, Massachusetts 02116
(617) 267-8377
(617) 267-6447 (fax)

To: Louis Burkhardt, Raytheon Company

cc: Ben Gould, CMG Environmental
Public Repositories

From: ERM Project Team

Date: 2 April 2007

Subject: MW-40 Area Chloroform Sampling

Environmental Resources Management (ERM) has prepared this memorandum to summarize sampling efforts conducted at monitoring wells MW-40 and MW-40S in the Eastern Area of the Former Raytheon Facility at 430 Boston Post Road in Wayland, Massachusetts (Site). These sampling events were conducted to evaluate the concentrations of chloroform, bromodichloromethane, and dibromochloromethane in those wells.

Background

As detailed in the 20 November 2006 Remedy Operation Status (ROS) Submittal, chloroform, bromodichloromethane (BDCM), and dibromochloromethane (DBCM) were detected above their applicable Reportable Concentrations for groundwater (RCGW-1) at MW-40.

A summary of chloroform, BDCM, and DBCM concentrations in MW-40 and MW-40S are presented in Table 1 and Table 2, respectively.

Well construction logs, included as Attachment A, show that MW-40 is screened from 12 to 22 feet below ground surface (bgs) and that MW-40S is screened from 25 to 30 feet bgs.

Response to Contaminant Detections

Additional groundwater sampling was conducted on 15 November, 29 December 2006 and 15 January 2007. The resulting analytical data confirmed concentrations of chloroform, BDCM, and DBCM were above GW-1 standards at MW-40.

On 29 December ERM personnel observed a nearby fire control system standpipe, labeled "R-8", leaking at a rate of 1.6 liters per minute. Attachment B contains photographs of the standpipe taken on that day;

Figure 1 shows the location of the standpipe and the monitoring wells. Standpipe R-8 is located on the side of the building, approximately 24 feet from the well couplet. From the photographs it can be seen that a pool of water had collected on the grass beneath the standpipe.

On 15 January 2006 Standpipe R-8 was not leaking. However, another standpipe attached to the side of the building was leaking at a rate of nearly 3 liters per minute. This "unnamed standpipe" standpipe is not labeled and lies approximately 20 feet from the well couplet. Photographs 3 and 4 in Attachment B show the "unnamed standpipe" and it's proximity to the monitoring wells.

A sample of the water leaking from the "unnamed standpipe" was collected during the January sampling event, labeled "STANDPIPE-20070115-01" and submitted to the laboratory for analysis of chlorinated volatile organic compounds by U.S. Environmental Protection Agency Method 8260B. The corresponding analytical laboratory report is included as Attachment C. Chloroform, BDCM, and DBCM were detected in the "unnamed standpipe" sample in the following concentrations: 15 micrograms per liter (µg/L) chloroform, 7.8 µg/L BDCM, and 1.8 µg/L DBCM. The relative percentages of these compounds are 61% chloroform, 32% BDCM, and 7.3% DBCM. The sample collected from MW-40 on the same day contained 7.4 µg/L chloroform, 3.6 µg/L BDCM, and 0.87 µg/L DBCM. The relative percentages of compounds in this sample, (62% chloroform, 30% BDCM, and 7.3% DBCM), are nearly identical to those in the "unnamed standpipe" sample.

Conclusion

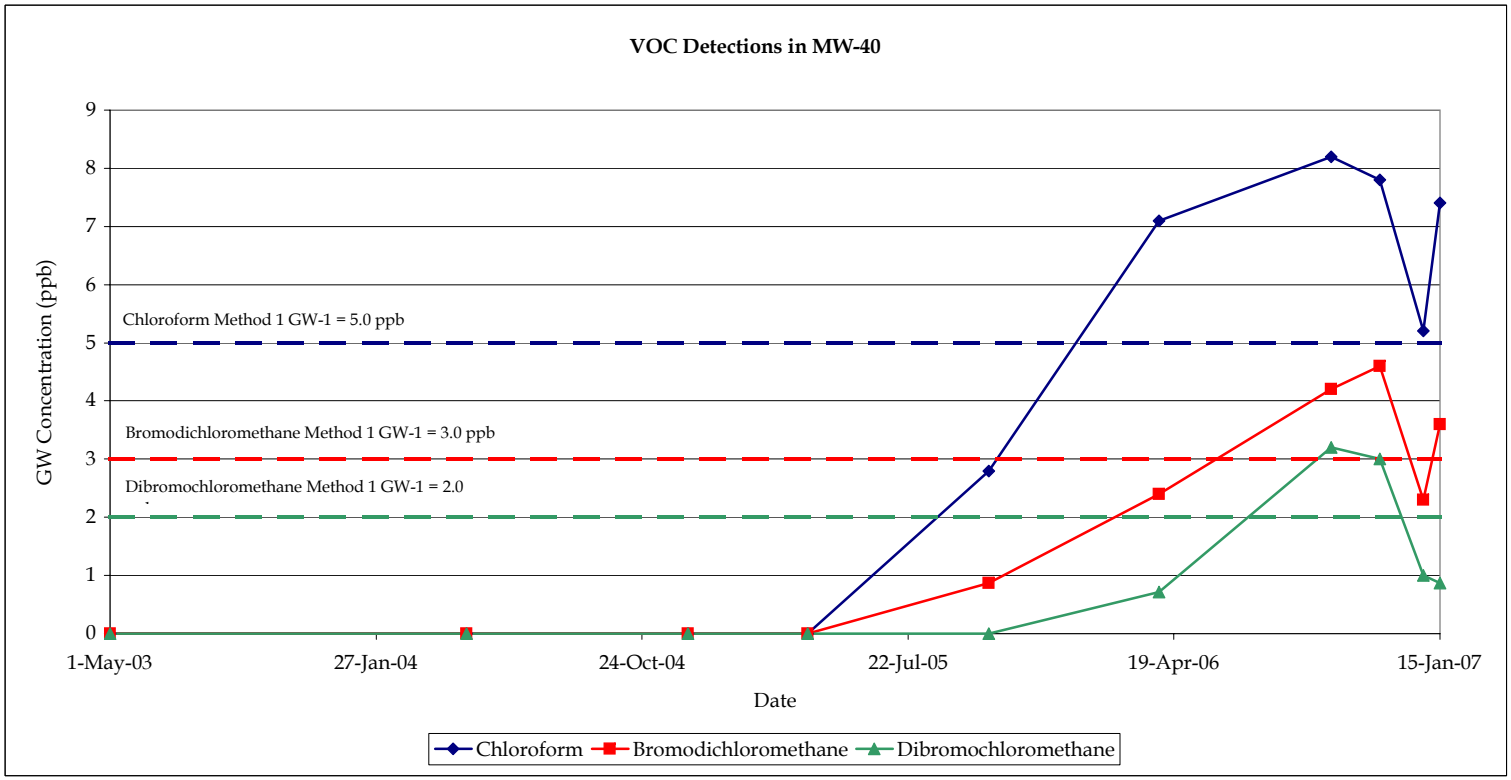
The analytical data revealed concentrations of chloroform, BDCM, and DBCM in the water leaking from the standpipes to be similar to those found in groundwater. The presence of higher concentrations of those compounds in the shallower of the two wells suggests the contaminants are migrating downward from a source above the well screens. The close proximity of the well couplet to the standpipes and the unpaved area onto which the leaking water is pooling make the standpipes a likely source of the contamination.

A Release Notification Form will not be filed on behalf of Raytheon because Raytheon is not responsible for this release of hazardous materials. Additionally, as per 310 CMR 40.0317 (20), notification is not required for the release of chloroform to groundwater attributable to leakage or discharge from a public water supply system.

Tables

Table 1
Summary of COC Detections in MW-40
Former Raytheon Facility
Wayland, Massachusetts

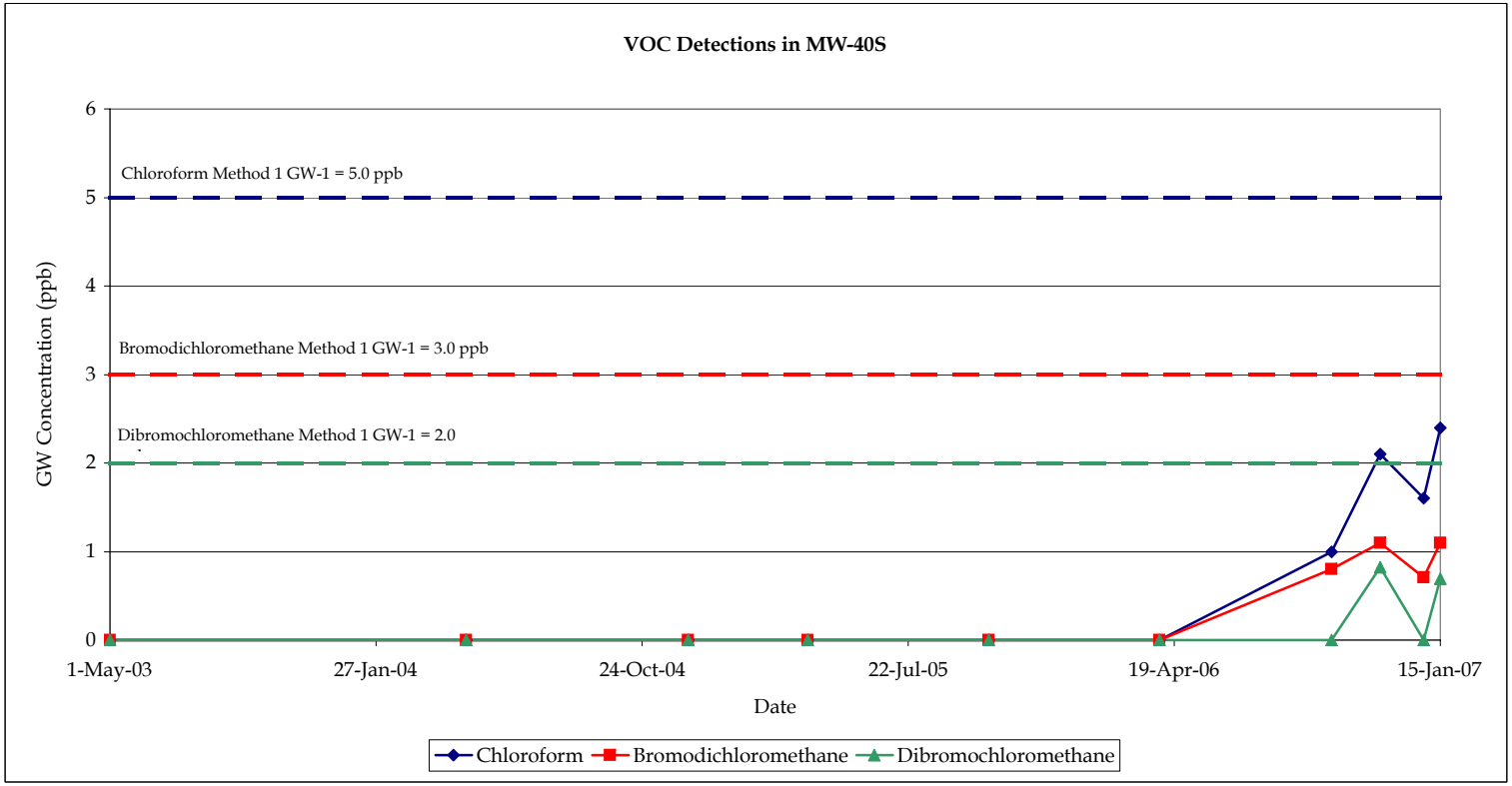
Compound	27-May-98	18-Nov-98	29-Jul-99	5-Apr-00	27-Aug-01	4-Mar-02	1-May-03	28-Apr-04	10-Dec-04	11-Apr-05	12-Oct-05	4-Apr-06	26-Sep-06	15-Nov-06	29-Dec-06	15-Jan-07
Chloroform	ND	ND	ND	ND	ND	ND	< 0.50	< 0.75	< 0.75	< 0.75	2.8	**7.1**	**8.2**	**7.8**	**5.2**	**7.4**
Bromodichloromethane	ND	ND	ND	ND	ND	ND	< 0.50	< 0.50	< 0.50	< 0.50	0.87	2.4	**4.2**	**4.6**	2.3	**3.6**
Dibromochloromethane	ND	ND	ND	ND	ND	ND	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	0.72	**3.2**	**3.0**	1.0	0.87



Notes:
Screened Interval = 12'-22' bgs
Exceedanes of MCP Method 1GW-1 Standards are in bold.
< = Compound was not detected at or above the indicated method detetion limit.
ND = Compound was not detected.

Table 2
Summary of COC Detections in MW-40S
Former Raytheon Facility
Wayland, Massachusetts

Compound	27-May-98	18-Nov-98	29-Jul-99	5-Apr-00	27-Aug-01	4-Mar-02	1-May-03	28-Apr-04	10-Dec-04	11-Apr-05	12-Oct-05	4-Apr-06	26-Sep-06	15-Nov-06	29-Dec-06	15-Jan-07
Chloroform	ND	ND	ND	ND	ND	ND	< 0.50	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	1.0	2.1	1.6	2.4
Bromodichloromethane	ND	ND	ND	ND	ND	ND	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.8	1.1	0.71	1.1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.82	< 0.50	0.69



Notes:
Screened Interval = 25'-30' bgs
Exceedanes of MCP Method 1GW-1 Standards are in bold.
< = Compound was not detected at or above the indicated method detetion limit.
ND = Compound was not detected.

Figures

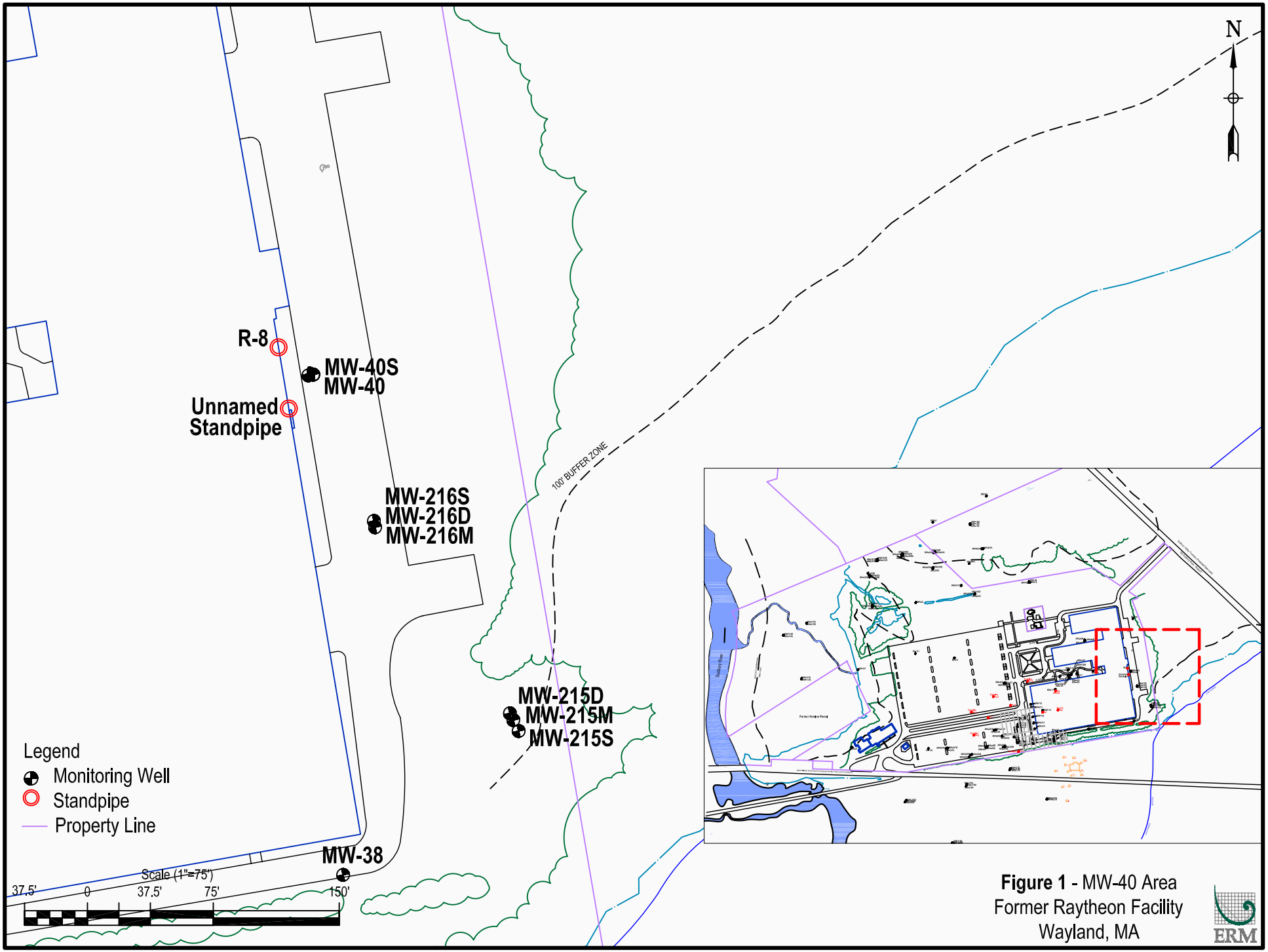


Figure 1 - MW-40 Area
Former Raytheon Facility
Wayland, MA

ERM

R:\Raytheon\Wayland - 1922\Raytheon Mw-40 Area.dwg (01/26/2007 - 10:19am Boston)

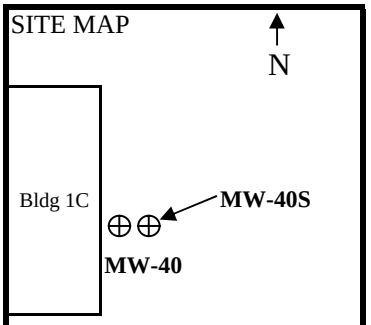
Attachment A
Well Construction Logs

DRILLING LOG for Well #: MW-40

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Raytheon - Wayland	Project Number:	143.45		
Client:	Raytheon	Logged by:	Ryan Bagley		
Drilling Co:	Geosearch, Inc.	Driller:	AJ/Rodney K.		
Date Started:	12-May-98	Date Finished:	12-May-98		
Location:	Wayland, Massachusetts	Drilling Method:	4.25 ID HSA		
Screen Diam:	2"	Length:	10'	Slot Size:	0.01
Casing Diam:	2"	Length:	12'	Type:	PVC
Boring Depth:	22'	Well Depth	22'	Boring Diam.:	8"
Surface Elev.:	135.21'	MP:	PVC	Depth to GW:	13.65'
		MP Elev.:	134.88'		

SITE MAP



Notes: Depth to GW measured on 5/18/98

Depth	Well Log	Stratigraphy	Blowcounts per 6 inches	Recovery	Split Spoon Description/Soil Classification	Sample # & Depth	HS Conc. (ppm)	Lab Sample # & Analyses
0-2		SAND & SILT	17,14 12,11	12"	Brown fine SAND and SILT, trace Gravel, dry to damp	S-1 0'-2'	0.0	
2-4		SAND & SILT	7,7 6,4	14"	Brown fine SAND and SILT, trace Gravel, dry to damp	S-2 2'-4'	0.0	
4-6		SAND & SILT	6,6 8,7	20"	Brown fine SAND and SILT, trace Clay, wet	S-3 4'-6'	0.0	
6-8		SAND & SILT	7,11 10,9	16"	Brown fine SAND and SILT, trace Clay, damp to wet	S-4 6'-8'	0.0	
8-10		SAND & SILT	6,9 10,9	14"	Brown fine SAND and SILT, well sorted, damp	S-5 8'-10'	0.0	
10-12		SAND & SILT	5,7 8,9	17"	Brown fine SAND and SILT, well sorted, damp	S-6 10'-12'	0.0	
12-14		SAND & SILT	15,17 23,22	16"	Brown fine SAND and SILT, trace Clay, well sorted, damp to wet	S-7 12'-14'	0.0	
14-16		SAND & SILT	7,14 21,27	18"	Brown fine SAND and SILT, trace Clay, well sorted, saturated	S-8 14'-16'	0.0	
16-20								
20-22		SAND & SILT	8,12 14,18	24"	Brown medium to fine SAND and SILT, trace Clay, saturated	S-9 20'-22'	0.0	
22-23					Well Construction Details on Following Page			

Footnotes for Blowcounts
(1) 140 lb. Hammer
(2) 300 lb. Hammer
(3) Slide Hammer

Key to Well Construction
Sandpack, Well Screen, Drill Cuttings, Bentonite Seal, Cement

DRILLING LOG for Well #: MW-40

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

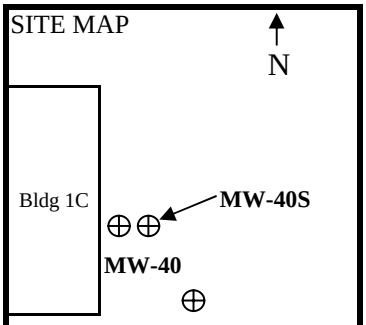
Depth	Well Log	Stratigraphy	Blowcounts per 6 inches	Recovery	Split Spoon Description/Soil Classification	Sample # & Depth	PID Conc. (ppm) spoon/HS	Lab Sample # & Analyses
					Well Construction Details:			
					Protective Flushmount Roadbox			
					0'-1' Concrete surface seal			
					1'-9' Native backfill			
					9'-11' Bentonite chip seal			
					11'-22' # 1 silica sand filter pack			
					12'-22' 0.010" slotted PVC well screen			
					22' Bottom of boring			

DRILLING LOG for Well #: MW-40S

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Raytheon - Wayland	Project Number:	143.45		
Client:	Raytheon	Logged by:	Ryan Bagley		
Drilling Co:	Geosearch, Inc.	Driller:	AJ/Rodney K.		
Date Started:	14-May-98	Date Finished:	14-May-98		
Location:	Wayland, Massachusetts	Drilling Method:	4.25 ID HSA		
Screen Diam:	2"	Length:	5'	Slot Size:	0.01
Casing Diam:	2"	Length:	25'	Type:	PVC
Boring Depth:	30'	Well Depth:	30'	Boring Diam.:	8"
Surface Elev.:	135.21'	MP:	PVC	Depth to GW:	13.64'
		MP Elev.:	134.87'		

SITE MAP



Notes: Depth to GW measured on 5/18/98

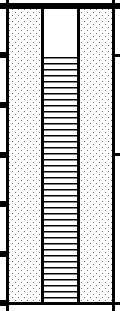
Depth	Well Log	Stratigraphy	Blowcounts per 6 inches	Recovery	Split Spoon Description/Soil Classification	Sample # & Depth	HS Conc. (ppm)	Lab Sample # & Analyses
0								
1								
2								
3								
4								
5								
6								
7					Well Couplet with MW-40			
8					No split spoons advanced prior to 25' bgs			
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								

Footnotes for Blowcounts
(1) 140 lb. Hammer
(2) 300 lb. Hammer
(3) Slide Hammer

Key to Well Construction
Sandpack
Well Screen
Portland Cement/Bentonite Grou
Bentonite Seal
Cement

DRILLING LOG for Well #: MW-40S

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth	Well Log	Stratigraphy	Blowcounts per 6 inches	Recovery	Split Spoon Description/Soil Classification	Sample # & Depth	PID Conc. (ppm) spoon/HS	Lab Sample # & Analyses
25								
26		SAND	21,24	20"	Brown medium SAND, some Silt, trace Clay	S-1	0.0	
27			26,28		and Gravel, saturated	25'-27'		
28								
29								
30								
31		SAND &	11,11	14"	Grey fine SAND and SILT, trace Clay,	S-2	0.0	
32		SILT	15,20		saturated	30'-32'		
33		SAND &	12,10	16"	Grey fine SAND and SILT, trace Clay,	S-3	0.0	
34		SILT	11,11		saturated	32'-34'		

Well Construction Details:

Protective Flushmount Roadbox

0'-1'	Concrete surface seal
1'-22'	Portland cement & bentonite grout
22'-24'	Bentonite chip seal
24'-30'	# 1 silica sand filter pack
25'-30'	0.010" slotted PVC well screen
30'	Bottom of boring

Attachment B
Site Photos

Photograph 1 – Leaking Standpipe R-8 (29 December 2006)

Photograph 2 – MW-40 & MW-40S with R-8 in Background (29 December 2006)

Photograph 3 – Unnamed Standpipe (23 January 2007)

Photograph 4 – MW-40 & MW-40S with Standpipe in Background (23 January 2007)

Attachment C
Laboratory Analytical Report

ANALYTICAL REPORT

Lab Number:	L0700670
Client:	ERM-New England 399 Boylston Street 6th Floor Boston, MA 02116
ATTN:	Jason Flattery
Project Name:	RAYTHEON
Project Number:	43034
Report Date:	01/16/07

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (200305), NJ (MA935), RI (LAO00065), ME (2006012), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: RAYTHEON
Project Number: 43034

Lab Number: L0700670
Report Date: 01/16/07

Alpha Sample ID	Client ID	Sample Location
L0700670-01	MW-40-20070115-01	WAYLAND, MA
L0700670-02	MW-40S-20070115-01	WAYLAND, MA
L0700670-03	STANDPIPE-20070115-01	WAYLAND, MA
L0700670-04	DUP-001-20070115-01	WAYLAND, MA

Project Name:	RAYTHEON	**Lab Number:**	L0700670
Project Number:	43034	**Report Date:**	01/16/07

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. 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 methods(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

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: RAYTHEON **Lab Number:** L0700670
Project Number: 43034 **Report Date:** 01/16/07

Case Narrative

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

MCP Related Narratives

Volatile Organics

L0700670-01 through -04 were processed against a calibration curve that utilized a quadratic fit for Vinyl chloride and Bromomethane.

In reference to question E:

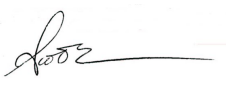
The LCSD % recovery for Dichlorodifluoromethane is above method acceptance criteria.

The following LCS/LCSD RPDs are above method acceptance criteria: Tetrachloroethene, Chlorobenzene, Ethylbenzene, 4-Chlorotoluene, 1,3-Dichlorobenzene, 1,1,1,2-Tetrachloroethene, n-Propylbenzene, 1,2,4-Trimethylbenzene, o-Xylene, tert-Butylbenzene, m/p-Xylene, Styrene, Isopropylbenzene, Hexachlorobutadiene, 1,3,5-Trimethylbenzene, sec-Butylbenzene and p-Isopropyltoluene.

In reference to question F:

At the client's request, all submitted samples were not analyzed for the full MCP list of compounds specified for the Method.

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

Authorized Signature: 

Title: Technical Director Date: 01/16/07

ORGANICS

VOLATILES

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID:	L0700670-01	Date Collected:	01/15/07 08:55
Client ID:	MW-40-20070115-01	Date Received:	01/15/07
Sample Location:	WAYLAND, MA	Field Prep:	Not Specified
Matrix:	Water		
Anaytical Method:	60,8260B		
Analytical Date:	01/15/07 13:29		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
Methylene chloride	ND		ug/l	5.0	1
1,1-Dichloroethane	ND		ug/l	0.75	1
Chloroform	7.4		ug/l	0.75	1
Carbon tetrachloride	ND		ug/l	0.50	1
1,2-Dichloropropane	ND		ug/l	1.8	1
Dibromochloromethane	0.87		ug/l	0.50	1
1,1,2-Trichloroethane	ND		ug/l	0.75	1
Tetrachloroethene	1.0		ug/l	0.50	1
Chlorobenzene	ND		ug/l	0.50	1
1,2-Dichloroethane	ND		ug/l	0.50	1
1,1,1-Trichloroethane	ND		ug/l	0.50	1
Bromodichloromethane	3.6		ug/l	0.50	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	1
Bromoform	ND		ug/l	2.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	1
Chloromethane	ND		ug/l	2.5	1
Vinyl chloride	ND		ug/l	1.0	1
Chloroethane	ND		ug/l	1.0	1
1,1-Dichloroethene	ND		ug/l	0.50	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	1
Trichloroethene	2.9		ug/l	0.50	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	1
1,2-Dibromoethane	ND		ug/l	2.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	1

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID: L0700670-01 Date Collected: 01/15/07 08:55

Client ID: MW-40-20070115-01 Date Received: 01/15/07

Sample Location: WAYLAND, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
o-Chlorotoluene	ND		ug/l	2.5	1
p-Chlorotoluene	ND		ug/l	2.5	1
Hexachlorobutadiene	ND		ug/l	0.60	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	110		70-130
Dibromofluoromethane	99		70-130

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID:	L0700670-02	Date Collected:	01/15/07 10:05
Client ID:	MW-40S-20070115-01	Date Received:	01/15/07
Sample Location:	WAYLAND, MA	Field Prep:	Not Specified
Matrix:	Water		
Anaytical Method:	60,8260B		
Analytical Date:	01/15/07 14:05		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
Methylene chloride	ND		ug/l	5.0	1
1,1-Dichloroethane	ND		ug/l	0.75	1
Chloroform	2.4		ug/l	0.75	1
Carbon tetrachloride	ND		ug/l	0.50	1
1,2-Dichloropropane	ND		ug/l	1.8	1
Dibromochloromethane	0.69		ug/l	0.50	1
1,1,2-Trichloroethane	ND		ug/l	0.75	1
Tetrachloroethene	ND		ug/l	0.50	1
Chlorobenzene	ND		ug/l	0.50	1
1,2-Dichloroethane	ND		ug/l	0.50	1
1,1,1-Trichloroethane	ND		ug/l	0.50	1
Bromodichloromethane	1.1		ug/l	0.50	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	1
Bromoform	ND		ug/l	2.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	1
Chloromethane	ND		ug/l	2.5	1
Vinyl chloride	ND		ug/l	1.0	1
Chloroethane	ND		ug/l	1.0	1
1,1-Dichloroethene	ND		ug/l	0.50	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	1
Trichloroethene	0.60		ug/l	0.50	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	1
1,2-Dibromoethane	ND		ug/l	2.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	1

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID: L0700670-02 Date Collected: 01/15/07 10:05

Client ID: MW-40S-20070115-01 Date Received: 01/15/07

Sample Location: WAYLAND, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
o-Chlorotoluene	ND		ug/l	2.5	1
p-Chlorotoluene	ND		ug/l	2.5	1
Hexachlorobutadiene	ND		ug/l	0.60	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	109		70-130
Dibromofluoromethane	103		70-130

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID:	L0700670-03	Date Collected:	01/15/07 09:30
Client ID:	STANDPIPE-20070115-01	Date Received:	01/15/07
Sample Location:	WAYLAND, MA	Field Prep:	Not Specified
Matrix:	Water		
Anaytical Method:	60,8260B		
Analytical Date:	01/15/07 14:42		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
Methylene chloride	ND		ug/l	5.0	1
1,1-Dichloroethane	ND		ug/l	0.75	1
Chloroform	15		ug/l	0.75	1
Carbon tetrachloride	ND		ug/l	0.50	1
1,2-Dichloropropane	ND		ug/l	1.8	1
Dibromochloromethane	1.8		ug/l	0.50	1
1,1,2-Trichloroethane	ND		ug/l	0.75	1
Tetrachloroethene	ND		ug/l	0.50	1
Chlorobenzene	ND		ug/l	0.50	1
1,2-Dichloroethane	ND		ug/l	0.50	1
1,1,1-Trichloroethane	ND		ug/l	0.50	1
Bromodichloromethane	7.8		ug/l	0.50	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	1
Bromoform	ND		ug/l	2.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	1
Chloromethane	ND		ug/l	2.5	1
Vinyl chloride	ND		ug/l	1.0	1
Chloroethane	ND		ug/l	1.0	1
1,1-Dichloroethene	ND		ug/l	0.50	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	1
Trichloroethene	ND		ug/l	0.50	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	1
1,2-Dibromoethane	ND		ug/l	2.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	1

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID: L0700670-03 Date Collected: 01/15/07 09:30

Client ID: STANDPIPE-20070115-01 Date Received: 01/15/07

Sample Location: WAYLAND, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
o-Chlorotoluene	ND		ug/l	2.5	1
p-Chlorotoluene	ND		ug/l	2.5	1
Hexachlorobutadiene	ND		ug/l	0.60	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	111		70-130
Dibromofluoromethane	104		70-130

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID:	L0700670-04	Date Collected:	01/15/07 00:00
Client ID:	DUP-001-20070115-01	Date Received:	01/15/07
Sample Location:	WAYLAND, MA	Field Prep:	Not Specified
Matrix:	Water		
Anaytical Method:	60,8260B		
Analytical Date:	01/15/07 15:20		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
Methylene chloride	ND		ug/l	5.0	1
1,1-Dichloroethane	ND		ug/l	0.75	1
Chloroform	2.4		ug/l	0.75	1
Carbon tetrachloride	ND		ug/l	0.50	1
1,2-Dichloropropane	ND		ug/l	1.8	1
Dibromochloromethane	0.64		ug/l	0.50	1
1,1,2-Trichloroethane	ND		ug/l	0.75	1
Tetrachloroethene	ND		ug/l	0.50	1
Chlorobenzene	ND		ug/l	0.50	1
1,2-Dichloroethane	ND		ug/l	0.50	1
1,1,1-Trichloroethane	ND		ug/l	0.50	1
Bromodichloromethane	1.0		ug/l	0.50	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	1
Bromoform	ND		ug/l	2.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	1
Chloromethane	ND		ug/l	2.5	1
Vinyl chloride	ND		ug/l	1.0	1
Chloroethane	ND		ug/l	1.0	1
1,1-Dichloroethene	ND		ug/l	0.50	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	1
Trichloroethene	0.60		ug/l	0.50	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	1
1,2-Dibromoethane	ND		ug/l	2.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	1

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

SAMPLE RESULTS

Lab ID: L0700670-04 Date Collected: 01/15/07 00:00

Client ID: DUP-001-20070115-01 Date Received: 01/15/07

Sample Location: WAYLAND, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Volatile Organics by MCP 8260B					
o-Chlorotoluene	ND		ug/l	2.5	1
p-Chlorotoluene	ND		ug/l	2.5	1
Hexachlorobutadiene	ND		ug/l	0.60	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	102		70-130

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

Method Blank Analysis
Batch Quality Control

Analytical Method: 60,8260B
Analytical Date: 01/15/07 12:03
Analyst: PD

Parameter	Result	Qualifier	Units	RDL
Volatile Organics by MCP 8260B for sample(s): 01-04 Batch: WG267617-3				
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
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
Bromoform	ND		ug/l	2.0
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50
Chloromethane	ND		ug/l	2.5
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
cis-1,2-Dichloroethene	ND		ug/l	0.50
Dichlorodifluoromethane	ND		ug/l	5.0
1,2-Dibromoethane	ND		ug/l	2.0
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

Project Name: RAYTHEON **Lab Number:** L0700670

Project Number: 43034 **Report Date:** 01/16/07

Method Blank Analysis
Batch Quality Control

Analytical Method: 60,8260B
Analytical Date: 01/15/07 12:03
Analyst: PD

Parameter	Result	Qualifier	Units	RDL
Volatile Organics by MCP 8260B for sample(s): 01-04 Batch: WG267617-3				
p-Chlorotoluene	ND		ug/l	2.5
Hexachlorobutadiene	ND		ug/l	0.60
1,2,4-Trichlorobenzene	ND		ug/l	2.5

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	102		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: RAYTHEON

Project Number: 43034

Lab Number: L0700670

Report Date: 01/16/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organics by MCP 8260B Associated sample(s): 01-04 Batch: WG267617-1 WG267617-2					
Methylene chloride	92	111	70-130	19	25
1,1-Dichloroethane	89	111	70-130	22	25
Chloroform	82	101	70-130	21	25
Carbon tetrachloride	87	108	70-130	22	25
1,2-Dichloropropane	88	110	70-130	22	25
Dibromochloromethane	84	107	70-130	24	25
1,1,2-Trichloroethane	87	109	70-130	22	25
Tetrachloroethene	85	110	70-130	**26**	25
Chlorobenzene	84	109	70-130	**26**	25
Trichlorofluoromethane	97	123	70-130	24	25
1,2-Dichloroethane	88	108	70-130	20	25
1,1,1-Trichloroethane	85	109	70-130	25	25
Bromodichloromethane	84	106	70-130	23	25
trans-1,3-Dichloropropene	84	108	70-130	25	25
cis-1,3-Dichloropropene	84	105	70-130	22	25
1,1-Dichloropropene	86	110	70-130	24	25
Bromoform	96	120	70-130	22	50
1,1,2,2-Tetrachloroethane	94	112	70-130	17	25
Benzene	87	109	70-130	22	25
Toluene	84	108	70-130	25	25
Ethylbenzene	82	107	70-130	**26**	25

Lab Control Sample Analysis
Batch Quality Control

Project Name: RAYTHEON
Project Number: 43034

Lab Number: L0700670
Report Date: 01/16/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organics by MCP 8260B Associated sample(s): 01-04 Batch: WG267617-1 WG267617-2					
Chloromethane	92	115	70-130	22	50
Bromomethane	96	113	70-130	16	50
Vinyl chloride	106	128	70-130	19	25
Chloroethane	89	110	70-130	21	25
1,1-Dichloroethene	89	114	70-130	25	25
trans-1,2-Dichloroethene	85	105	70-130	21	25
Trichloroethene	84	106	70-130	23	25
1,2-Dichlorobenzene	85	106	70-130	22	25
1,3-Dichlorobenzene	83	108	70-130	**26**	25
1,4-Dichlorobenzene	82	104	70-130	24	25
Methyl tert butyl ether	81	101	70-130	22	25
p/m-Xylene	81	108	70-130	**29**	25
o-Xylene	79	105	70-130	**28**	25
cis-1,2-Dichloroethene	86	107	70-130	22	25
Dibromomethane	85	104	70-130	20	25
1,2,3-Trichloropropane	103	122	70-130	17	25
Styrene	81	108	70-130	**29**	25
Dichlorodifluoromethane	116	**143**	70-130	21	50
Acetone	84	97	70-130	14	50
Carbon disulfide	82	103	70-130	23	25
2-Butanone	96	112	70-130	15	50

Lab Control Sample Analysis
Batch Quality Control

Project Name: RAYTHEON
Project Number: 43034

Lab Number: L0700670
Report Date: 01/16/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organics by MCP 8260B Associated sample(s): 01-04 Batch: WG267617-1 WG267617-2					
4-Methyl-2-pentanone	90	112	70-130	22	50
2-Hexanone	92	116	70-130	23	50
Bromochloromethane	87	107	70-130	21	25
Tetrahydrofuran	85	98	70-130	14	25
2,2-Dichloropropane	88	112	70-130	24	50
1,2-Dibromoethane	86	107	70-130	22	25
1,3-Dichloropropane	88	110	70-130	22	25
1,1,1,2-Tetrachloroethane	85	111	70-130	**27**	25
Bromobenzene	94	114	70-130	19	25
n-Butylbenzene	92	114	70-130	21	25
sec-Butylbenzene	80	108	70-130	**30**	25
tert-Butylbenzene	82	109	70-130	**28**	25
o-Chlorotoluene	87	110	70-130	23	25
p-Chlorotoluene	84	109	70-130	**26**	25
1,2-Dibromo-3-chloropropane	94	112	70-130	17	50
Hexachlorobutadiene	72	96	70-130	**29**	25
Isopropylbenzene	85	114	70-130	**29**	25
p-Isopropyltoluene	79	107	70-130	**30**	25
Naphthalene	94	108	70-130	14	25
n-Propylbenzene	84	110	70-130	**27**	25
1,2,3-Trichlorobenzene	95	112	70-130	16	25

Lab Control Sample Analysis

Batch Quality Control

Project Name: RAYTHEON

Project Number: 43034

Lab Number: L0700670

Report Date: 01/16/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organics by MCP 8260B Associated sample(s): 01-04 Batch: WG267617-1 WG267617-2					
1,2,4-Trichlorobenzene	95	114	70-130	18	25
1,3,5-Trimethylbenzene	80	108	70-130	**30**	25
1,2,4-Trimethylbenzene	79	104	70-130	**27**	25
Ethyl ether	87	106	70-130	20	25
Isopropyl Ether	88	111	70-130	23	25
Ethyl-Tert-Butyl-Ether	88	109	70-130	21	25
Tertiary-Amyl Methyl Ether	86	107	70-130	22	25
1,4-Dioxane	94	96	70-130	2	50

Surrogate	LCS %Recovery	Qualifier	LCSD %Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		98		70-130
Toluene-d8	102		101		70-130
4-Bromofluorobenzene	109		104		70-130
Dibromofluoromethane	101		99		70-130

Project Name: RAYTHEON
Project Number: 43034

Lab Number: L0700670
Report Date: 01/16/07

Sample Receipt and Container Information

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
L0700670-01A	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-01B	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-02A	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-02B	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-03A	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-03B	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-04A	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04
L0700670-04B	Vial HCl preserved	A	NA	4C	Y	Absent	MCP-8260-04

Project Name:	RAYTHEON	**Lab Number:**	L0700670
Project Number:	43034	**Report Date:**	01/16/07

GLOSSARY

Acronyms

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

ND - Not detected at the reported detection limit for the sample.

RDL - Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

J - Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified

REFERENCES

60 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). May 2004.

LIMITATION OF LIABILITIES

Alpha Woods Hole Labs 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 Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs 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 Woods Hole Labs.

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

01160715:35

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 1·15·07

ALPHA Job #: L0700670

ALPHA WOODS HOLE LABS

WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193

RAYNHAM, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: ERM

Address: 399 Boylston St 6TH FL Boston MA 02116

Phone: 617 646 7800

Fax: 617 267 6447

Email: jason.flattery@ERM.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: RAYTHEON

Project Location: WAYLAND, MA

Project #: 43034

Project Manager: Jason Flattery

ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved!)

Date Due: 01·16·2007 Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
MCP	GW-1

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

24-HR TAT

ANALYSIS: 8021/c by 8260

SAMPLE HANDLING

Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	8021/c by 8260	Sample Specific Comments	TOTAL # BOTTLES
670.1	MW-40-20070115-01	1·15·07	08:55	GW	TD	2		2
.2	MW-40S-20070115-01	1·15·07	10:05	GW	TD	2		2
.3	STANDPIPE-20070115-01	1·15·07	09:30	X1	TD	2	X1 = Water collected from Fire standpipe, not GW or SW	2
	TB-001-20070115-01	1·15·07				1		
.4	DUP-001-20070115-01	1·15·07	0:00	GW	TD	2		
	Container Type					V		
	Preservative					B		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Tim D'Price	01-15-2007	Leo [illegible]	1-15-07 1025
Leo [illegible]	1·15·07 1100	[illegible]	1·15·07 1100

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

FORM NO: 01-01 (rev. 10-OCT-05)