AECOM

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Memorandum

To	Christopher Johnson – Cumberland Farms, Inc.	Page 1
CC		
Subject	*DRAFT* - Baseline Environmental Review: Gulf Service Station – Facility #118503/V1261, 1650 Commonwealth Avenue, Brighton, MA	
From	Lauren Roberts and David Espy – AECOM	
Date	January 21, 2011	

On behalf of Cumberland Farms, Inc. (CFI), AECOM Environment (AECOM) has prepared this memorandum for the above-referenced site in accordance with AECOM's Work Scope/Cost Estimate Proposal dated November 17, 2010. CFI is evaluating the possibility of removing the current underground storage tank (UST) system and redeveloping the property with a 5-store residential building. As a result, CFI requested that the current environmental conditions at the site be evaluate. This memo provides a summary of general site information and environmental conditions based on a review of the 1995 Immediate Response Action Completion (IRAC) (Class B-1 Response Action Outcome [RAO]) report and the drilling and groundwater sampling activities completed in December 2010. Using the December 2010 subsurface data, AECOM has prepared best, likely, and worst-case environmental lifecycle cost estimates for the site. All findings and opinions made in this memorandum are based solely upon the information provided and reviewed, and are subject to the Service Constraints included in **Attachment I**.

General Information:

- Current Regulatory Status[1][2]: INACTIVE
  - Release Tracking Number (RTN) 3-11933 – Closed in 1995
- Current Site Use[1]: "Commonwealth Ave. Gulf" – Retail Petroleum and Automobile Repair Station
  - One on-site building containing two service bays
  - Three single-walled, 8,000-gallon gasoline USTs installed in 1985
  - One single-walled, 500-gallon waste oil UST installed in 1986
  - One single-walled, 1,000-gallon heating oil UST installed in 1986 and used to provide heat to the on-site building
- Site Utilities[1]:
  - Municipal water and sanitary sewer
- Surrounding Properties[3]:

(1) Based on information obtained in the 1995 IRAC (Class B-1 RAO) report for RTN 3-11933
(2) Based on information obtained from the MA DEP website
(3) Based on AECOM's site reconnaissance

- North (across Commonwealth Ave.): Street-level Subway/T-Green Line, residential apartment buildings
- East (across Mt. Hood Rd.): Boston International Academy
- South: Best Western/Terrace Inn
- West: Residential apartment building

- Known (Former) Site Impacts[1]:
  - In 1994, an ullage air ingress tank failure was discovered in the waste oil UST.
  - A loose fitting was identified and repaired, and the UST ultimately passed a tank tightness test.
  - During associated site assessment activities, five soil borings were advanced. Refusal on presumed bedrock was encountered at each between 3 and 5.5 feet below surface grade (bsg). Groundwater was not encountered and no monitoring wells were installed.
  - Five soil samples were collected around the tank for the analysis of volatile organic compounds (VOCs) and methyl tert-butyl ether (MTBE) by U.S. Environmental Protection Agency (EPA) Method 8260, total petroleum hydrocarbons (TPH) by EPA Method 8100 and/or Resource Conservation and Recovery Act (RCRA) 8 metals. All compounds were below Method 1 S-1/GW-2 standards.
  - In 1995, an IRAC Report (also referred to as a Class B-1 RAO within the document) was submitted to the Massachusetts Department of Environmental Protection (MA DEP).

- Potential Site Receptors[1][3]:
  - Groundwater, indoor air within the facility building, basement/below grade living space at the adjacent apartment building, nearby surface water (Chestnut Hill Reservoir located 3,000 feet southeast of the site, and the Charles River located approximately 7,000 feet north to northeast of the site)

- Other Pertinent Information[1][3]:
  - The site is located on a localized, topographic highpoint
  - Soil at the site consists mainly of gravel and cobbles, with little fine to medium sand and fill material to approximately 2 to 5 feet bsg, below which is bedrock
  - Bedrock outcrops observed within the immediate vicinity of the site

Reimbursement[2]:

There are currently no active RTNs for the subject property. Therefore, no reimbursement is currently being received through the Massachusetts UST Petroleum Product Cleanup Fund (i.e. 21J). However, based on the Massachusetts Department of Environmental Protection's (MADEP) January 4, 2011 UST Compliance Report, the property currently has an issued Certificate of Compliance (COC) (#14493) which expires on March 4, 2014.

Proposed Scope of Work:

On November 19, 2010, CFI approved AECOM's Work Scope/Cost Estimate Proposal dated November 17, 2010 which included the following scope of work:

(1) Based on information obtained in the 1995 IRA/RAO report for RTN 3-11933
(2) Based on information obtained from the MA DEP website
(3) Based on AECOM's site reconnaissance

- Review the 1995 IRAC/Class B-1 RAO report.
- Develop a scope of work for drilling and groundwater sampling activities.
- Complete one day of drilling to install up to three monitoring wells using vacuum-extraction pre-clearing and a hollow stem-auger rig and development of the new monitoring wells.
- Within approximately one week of the drilling event, return to the site to collect groundwater samples (via bailer) from the newly installed monitoring wells.
- Evaluate the soil and groundwater data and determine if any new reporting conditions have been triggered (soil or groundwater concentrations above the applicable Reportable Category for S-1 [RCS-1] and GW-2 [RCGW-2] values).
- Using the new subsurface data, prepare best, likely, and worst-case environmental lifecycle cost estimates for the site.
- Prepare a summary memo to provide to CFI.

Additionally, in an email December 6, 2010, CFI approved the collection of an additional soil sample in the vicinity of the USTs to be analyzed for waste characterization parameters in order to pre-classify soil for the tentative UST removal activities.

Details of Work Completed[3]:

Report Review:

AECOM completed a review of the 1995 IRAC/Class B-1 RAO report prepared by J.B. Plunkett Associates, Inc. The report documented the Immediate Response Actions associated with RTN 3-11933 and was used, in part, to obtain information about the subject property.

Field Investigation Activities

The following presents a summary of the subsurface investigation activities as described above and approved by CFI:

On November 29, 2010, AECOM perform Dig-safe marking at the site.

On December 10, 2010, AECOM oversaw the installation of three monitoring wells, one additional soil boring and the collection of soil samples. The monitoring well/soil boring locations were selected to assess general site conditions associated with the current/historic use of the property as a retail petroleum dispensing and automobile repair facility. Since the site sits on a localized topographic highpoint and no groundwater flow direction at the site had historically been determined, AECOM based the monitoring well/soil boring locations on an assumed groundwater flow direction towards the nearest, major, influential water body - the Charles River, located to the north to northeast.

AECOM oversaw Crawford Drilling Services, Inc. (CDR) of Westminster, Massachusetts pre-clear four soil boring locations using a vac-truck to between approximately two and five feet bsg or to bedrock, whichever was shallower. Since no evidence of groundwater or measureable, visual and/or olfactory impacts were observed to bedrock, AECOM directed CDR to advance the soil borings to 15 feet bsg using the hollow-stem auger drill rig and air hammer. With concurrence from CFI, the boring depths were limited to 15 feet bsg since the purpose was to assess environmental

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(2) Based on information obtained from the MA DEP website
(3) Based on AECOM's site reconnaissance

risk associated with the potential redevelopment of the site with a potential apartment building (i.e. occupied structure). Therefore, the object was to determine if any Method 1 GW-2 standards would be exceeded (groundwater within 15 feet of the ground surface and within 30 feet of an occupied structure).

Soil borings MW-1, MW-2 and MW-3 were completed as 2-inch diameter monitoring wells to 15 feet bsg. Soil boring SB-1 was not completed as a monitoring well and was used only to assess soil conditions in the vicinity of the dispenser islands and service bays. Refer to **Figure 1** for the locations of the monitoring wells and soil boring.

Overburden soil was field screened with a 10.6 electron volt (eV) photoionization (PID) calibrated to 100 part-per-million (ppm) isobutylene. All PID readings were below detection limits in soil from borings MW-3 and SB-1. Soil from borings MW-1 and MW-2 was not field screened due to insufficient sample volume and soil type (mainly large gravel and cobbles). Since an air hammer was used to advance the borings into bedrock, no samples were screened or collected within the bedrock. Refer to **Attachment II** for copies of the boring logs.

One overburden soil sample from borings MW-1, MW-3 and SB-1 was collected for laboratory analysis, two between the 0 to 3 foot interval and one greater than three feet. A soil sample from boring MW-2 was not submitted for analysis due to insufficient sample volume and soil type (mainly large gravel). The soil samples were submitted to Groundwater Analytical, Inc. (GAI) of Buzzards Bay, Massachusetts for the following analyses:

- MW-1 (1') and SB-1 (4'): VOCs by EPA Method 8260 full list, MA DEP volatile petroleum hydrocarbons (VPH) with target analytes, MA DEP extractable petroleum hydrocarbons (EPH) with target analytes, ethylene dibromide (EDB) by EPA Method 8011, polychlorinated biphenyls (PCBs) by EPA Method 8082, and RCRA 8 metals by EPA Methods 6010B or 7470A
- MW-3 (1-2'): MA DEP VPH and EPH with target analytes, EDB by EPA Method 8011, and lead by EPA Method 6010B
- Trip Blank: VOCs by EPA Method 8260 full list and MA DEP VPH with target analytes

Note that additional soil disposal parameters were not analyzed for UST removal pre-characterization, as originally planned, since shallow bedrock was encountered and soil collected from the overburden would not be indicative of soil within the presumed, blasted bedrock tank pit.

Upon completion of the monitoring well installation activities, AECOM gauged the newly installed monitoring wells. Groundwater was only observed in the last installed monitoring well, MW-1, at approximately 8 feet bsg and exhibited a sheen. AECOM attempted to develop this monitoring well using purge and surge techniques that day until the monitoring well went dry. No groundwater recovered into monitoring wells MW-2 and MW-3 prior to AECOM's departure on December 10, 2010.

On December 14, 2010, AECOM conducted a site visit to perform well development, surveying, and groundwater gauging and sampling. Upon arrival, AECOM completed a survey of the elevation of the newly installed monitoring wells (top of well casing), using an arbitrary datum point measured at 100.00 feet. Prior to developing the monitoring wells, groundwater was gauged using an oil-water interface probe. Refer to **Table 2** for a summary of the groundwater gauging data. As presented,

(1) Based on information obtained in the 1995 IRA/RAO report for RTN 3-11933
(2) Based on information obtained from the MA DEP website
(3) Based on AECOM's site reconnaissance

there was very little groundwater recovery in monitoring well MW-3 and poor recharge in monitoring wells MW-1 and MW-2. It is AECOM's opinion that the data presented in **Table 2** is not likely indicative of static groundwater conditions in bedrock and therefore, no groundwater topography map was generated.

As groundwater recharged after purging, AECOM collected groundwater samples using dedicated, disposable polyethylene bailers. A peristaltic pump with dedicated, disposable polyethylene tubing and a 0.45 micron filter were used to sample and field filter groundwater for the metals analysis only. Groundwater was collected for laboratory analysis at GAI for the following analyses:

- MW-1: VOCs by EPA Method 8260 full list, MA DEP VPH and EPH with target analytes, SVOCs by EPA Method 8270, EDB and 2-Dibromo-3-chloropropane (DBCP) by EPA Method 8011, and dissolved RCRA 8 metals by EPA Method 6010B or 7470A
- MW-2: VOCs by EPA Method 8260 full list, MA DEP VPH with target analytes, EDB and DBCP by EPA Method 8011, and dissolved lead by EPA Method 6010B
- Trip Blank: VOCs by EPA Method 8260 full list

Note that a groundwater sample from monitoring well MW-3 could not be collected due to insufficient presence of groundwater during the sampling event.

Summary of Results

Metals, EPH and target analytes were detected in soil. All detected compounds were below the applicable reportable concentration (RCS-1), with the exception of lead in soil from MW-3 (1-2'). The lead concentration also exceeded Method 1 S-1/GW-2 and S-1/GW-3 soil standards, as well as Method 1 S-3/GW-2 and S-3/GW-3. Refer to **Table 1** for a summary of the soil analytical data and to **Attachment III** for copies of the analytical data report.

Following the receipt of the soil analytical data, AECOM notified CFI on Monday, December 20, 2010 of the RCS-1 exceedence of lead; however, AECOM contacted the laboratory to return the soil samples from the site in order to evaluate if the sample contained urban fill and coal ash material (a possible MCP reporting exemption). Upon inspection of the soil sample from MW-3 (1-2'), AECOM observed coal ash fragments amongst the sample. Refer to **Attachment IV** for a photo log of the coal ash fragments. It is AECOM's opinion that the exceedence of lead in soil sample MW-3 (1-2') is exempt from regulatory reporting under 310 CMR 40.0317 of the the Massachusetts Contingency Plan (MCP). This based on the following:

- Coal ash fragments were present in the sample.
- Low levels of polyaromatic hydrocarbons (PAHs), which are commonly associated with urban fill material, were detected in the sample.
- The sample was collected at a shallow depth (1 to 2 feet bsg) within the vadose zone approximately 15 feet from the dispenser islands and approximately 35 feet from the USTs (potential source areas). It is unlikely that a petroleum-related release at the site would have migrated to this sample location to cause the elevated lead levels.
- The presence of urban fill material is common throughout the Brighton (e.g. Boston) area, especially at shallow depths.

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(3) Based on AECOM's site reconnaissance

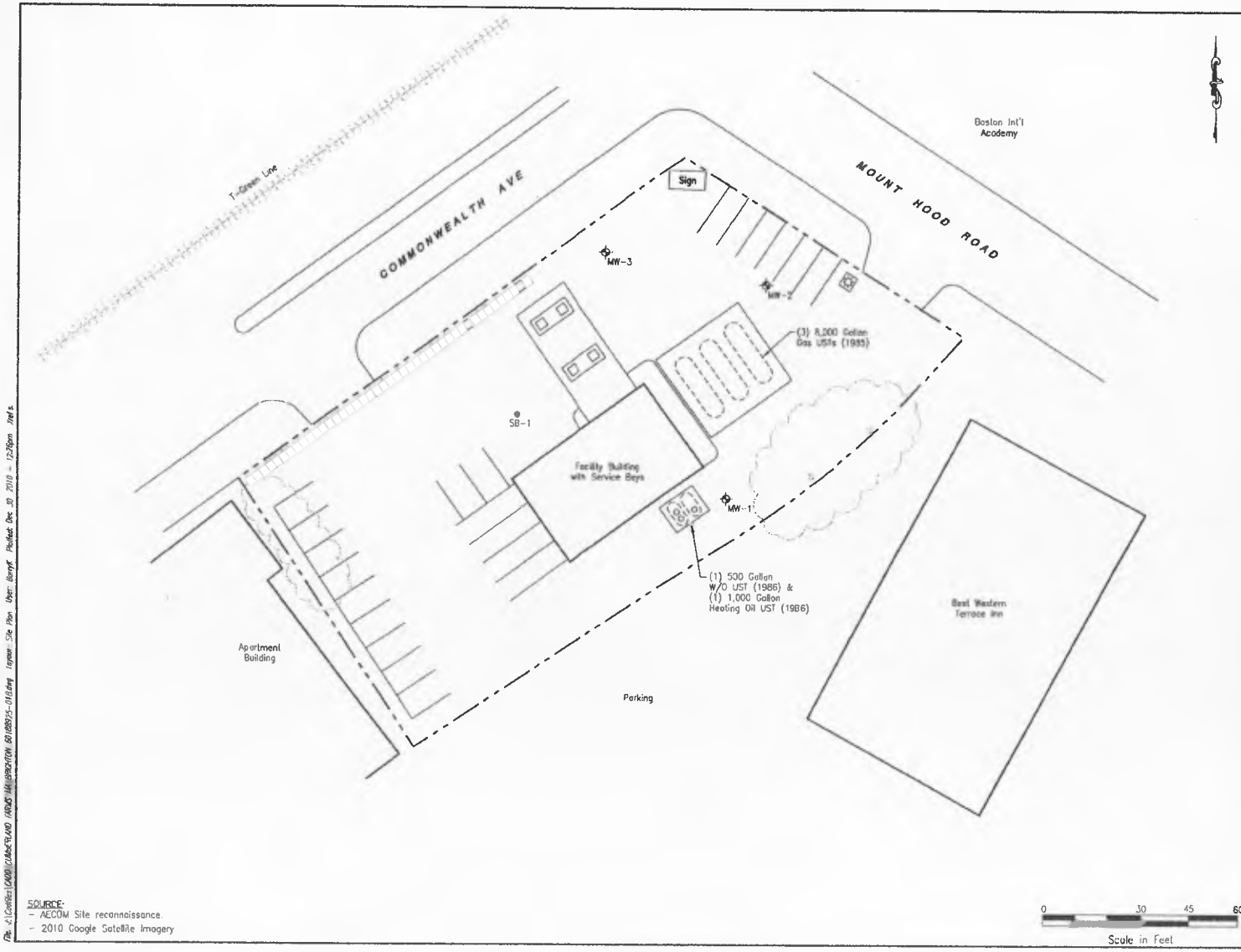
VOCs, VPH, EPH, PAHs, EDB, arsenic and barium were detected in the two groundwater samples collected from the site; however, all compounds were below the applicable groundwater reportable concentrations for RCGW-2. Refer to **Table 3** for a summary of the groundwater analytical data and to **Attachment III** for copies of the analytical data report.

Summary and Recommendations:

Based on the soil and groundwater data collected at the site in 1995 and 2010, evidence of petroleum-related impacts associated with the historical operation of the site as a retail petroleum dispensing and automobile repair facility and urban fill impacts are present at the site, including elevated levels of lead. Although these concentrations do not represent a reportable condition and do not currently have to be regulated under the MCP, AECOM recommends that soil and/or groundwater are properly managed during future site construction activities.

(1) Based on information obtained in the 1995 IRA/RAO report for RTN 3-11933
(2) Based on information obtained from the MA DEP website
(3) Based on AECOM's site reconnaissance

Figure



LEGEND:
- Site Boundary
- Drain
- light
- Tree
- SB-1 Soil Boring
- MW-1 Monitoring Well

SOURCE:
- AECOM Site reconnaissance.
- 2010 Google Satellite Imagery

CLIENT
Cumberland Farms
Business Support Campus
100 Crossing Boulevard
Framingham, Massachusetts 01702

PROJECT TITLE
Gulf Service Station #118503
1650 Commonwealth Ave.
Brighton, Massachusetts

FIGURE TITLE
Site Plan

APPROVED BY	REVIEWED BY
D. Espy	L. Roberts
DRAWN BY	SCALE
K. Barry	1" = 30'
JOB NUMBER	DATE
60188925	December 2010

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Figure 1

SHEET

AECOM

Tables

Table 1

Summary of Soil Analytical Data - December 10, 2010

Cumberland Farms Facility # 118503
1650 Commonwealth Avenue
Brighton, Masachusetts

Sample ID	MW-1	MW-3	SB-01	Trip Blank	Reportable Conc.	Method 1 Soil Standards			
Depth (feet)	(1)	(1-2)	(4)	--	RCS-1	S-1/GW-2	S-1/GW-3	S-3/GW-2	S-3/GW-3
PID Reading	NA	0	0	--	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Metals by EPA 6010B or 7470A (mg/Kg)									
Arsenic, Total	<3.5	NA	<3.3	NA	20	20	20	20	20
Barium, Total	56	NA	43	NA	1,000	1,000	1,000	5,000	5,000
Cadmium, Total	1.6	NA	0.71	NA	2	2	2	30	30
Chromium, Total	19	NA	10	NA	30	30	30	200	200
Lead, Total	150	330	25	NA	300	300	300	300	300
Selenium, Total	<5.9	NA	<5.5	NA	400	400	400	800	800
Silver, Total	<1.2	NA	<1.1	NA	100	100	100	200	200
Mercury, Total	0.13	NA	0.35	NA	20	20	20	30	30
Low Level EDB by EPA 8011 (mg/Kg)									
1,2-Dibromoethane (EDB)	<0.0021	<0.0021	<0.002	NA	0.1	0.1	0.7	0.1	30
PCBs by EPA 8082 (mg/Kg)									
Total PCBs	ND	NA	ND	NA	2	2	2	3	3
VOCs by EPA 8260B (mg/Kg)									
1,4-Dioxane	<7.9	NA	<5	<5	0.2	6	70	6	500
Other VOCs	ND	NA	ND	ND	NSA	NSA	NSA	NSA	NSA
MA DEP EPH with Target Analytes (mg/Kg)									
n-C9 to n-C18 Aliphatic Hydrocarbons	<22	<21	<21	NA	1,000	1,000	1,000	5,000	5,000
n-C19 to n-C36 Aliphatic Hydrocarbons	57	76	39	NA	3,000	3,000	3,000	5,000	5,000
n-C11 to n-C22 Aromatic Hydrocarbons	75	98	<21	NA	1,000	1,000	1,000	5,000	5,000
Phenanthrene	1.2	0.73	<0.53	NA	10	500	500	3,000	3,000
Fluoranthene	1.4	2.1	<0.53	NA	1,000	1,000	1,000	5,000	5,000
Pyrene	1.3	2.1	<0.53	NA	1,000	1,000	1,000	5,000	5,000
Benzo[a]anthracene	0.6	1.2	<0.53	NA	7	7	7	300	300
Chrysene	0.77	1.5	<0.53	NA	70	70	70	3,000	3,000
Benzo[b]fluoranthene	0.63	2	<0.53	NA	7	7	7	300	300
Benzo[k]fluoranthene	0.62	0.88	<0.53	NA	70	70	70	3,000	3,000
Benzo[a]pyrene	0.66	1.5	<0.53	NA	2	2	2	30	30
Indeno[1,2,3-c,d]pyrene	<0.56	1.1	<0.53	NA	7	7	7	300	300
Benzo[g,h,i]perylene	<0.56	1.1	<0.53	NA	1,000	1,000	1,000	5,000	5,000
MA DEP VPH with Target Analytes (mg/Kg)									
n-C5 to n-C8 Aliphatic Hydrocarbons	<1.5	<1.1	<1	NA	100	100	100	500	500
n-C9 to n-C12 Aliphatic Hydrocarbons	<1.5	<1.1	<1	NA	1,000	1,000	1,000	5,000	5,000
n-C9 to n-C10 Aromatic Hydrocarbons	<1.5	<1.1	<1	NA	100	100	100	500	500
Methyl tert-butyl Ether (MTBE)	<0.07	<0.05	<0.05	NA	0.1	100	100	100	500
Benzene	<0.15	<0.11	<0.1	NA	2	30	30	700	900
Toluene	<0.15	<0.11	<0.1	NA	30	500	500	2,000	3,000
Ethylbenzene	<0.15	<0.11	<0.1	NA	40	500	500	1,000	3,000
Naphthalene	<0.37	<0.28	<0.26	NA	4	40	500	40	3,000
Total Xylenes	<0.30	<0.22	<0.2	NA	300	300	500	300	3,000

Notes:
Only detected compounds or those with detection limits reaching or exceeding a standard were tabulated, unless otherwise presented
NA - Not analyzed
ND - Not detected
NSA - No standard available
mg/kg - milligrams per kilogram
EPA - U.S. Environmental Protection Agency
PID - photoionization detector (10.6 electron volt lamp calibrated to 100 parts per million isobutylene)
EDB - ethylene dibromide
Bold - Compound was not detected; however, the detection limit reaches or exceeds a reportable concentration and/or standard
Highlighted - Detectable concentration reaches or exceeds a reportable concentration and/or Method 1 standard
PCBs - Polyctlorinated Biphenyls
VOCs - volatile organic compounds
MA DEP EPH - Massachusetts Department of Enviornmental Protection Extractable Petroleum Hydrocarbons
MA DEP VPH - Massachusetts Department of Enviornmental Protection Volatile Petroleum Hydrocarbons
Method 1 Standards and Reportable Concentrations = Standards promulgated in the June 26, 2009 revision to the MA Contingency Plan (MCP), 310 CMR 40.0000

Table 2

Groundwater Measurements - December 14, 2010

Cumberland Farms Facility #118503
1650 Commonwealth Avenue
Brighton, Massachusetts

Well ID	Well Elevation	Depth to Water [1]	Depth to Product	Depth to Bottom	Water Table Elevation
MW-1	98.16	7.07	ND	14.83	91.09
MW-2	100.46	8.70	ND	13.61	91.76
MW-3	99.28	15.49	ND	15.66	83.79

Notes:

Note [1] - Due to slow/minimal groundwater recharge in the monitoring wells, the depth to water may not represent static groundwater levels.

ND - Not Detected

All measurements are in feet

Well head elevations (MW-1, MW-2, MW-3) were surveyed to an arbitrary datum of 100 feet on December 14, 2010

Table 3

Summary of Groundwater Analytical Data - December 14, 2010

Cumberland Farms Facility # 118503
1650 Commonwealth Avenue
Brighton, Masachusetts

				Reportable Conc.	Method 1 Soil Standards	
Sample ID	**MW-1**	**MW-2**	**Trip Blank**	**MA RCGW-2**	**MA GW-2**	**MA GW-3**
Sample Date	**12/17/2010**	**12/17/2010**	**12/17/2010**	**(ug/L)**	**(ug/L)**	**(ug/L)**
Metals by EPA 6010B or 7470A (ug/L)						
Arsenic, Dissolved	10	NA	NA	900	NSA	900
Barium, Dissolved	370	NA	NA	50,000	NSA	50,000
Cadmium, Dissolved	<4	NA	NA	4	NSA	4
Chromium, Dissolved	<10	NA	NA	300	NSA	300
Lead, Dissolved	<5	<5	NA	10	NSA	10
Selenium, Dissolved	<50	NA	NA	100	NSA	100
Silver, Dissolved	<7	NA	NA	7	NSA	7
Mercury, Dissolved	<0.2	NA	NA	20	NSA	20
EDB and DBCP by EPA 8011 (ug/L)						
1,2-Dibromoethane (EDB)	<0.02	0.03	NA	2	2	50,000
1,2-Dibromo-3-chloropropane (DBCP)	<0.02	<0.02	NA	1,000	NSA	NSA
VOCs by EPA 8260B (ug/L)						
Methyl tert-butyl Ether (MTBE)	2	5	<0.5	5,000	50,000	50,000
Ethylbenzene	<0.5	0.8	<0.5	5,000	20,000	5,000
Isopropylbenzene	2	0.7	<0.5	NSA	NSA	NSA
n-Propylbenzene	2	0.9	<0.5	NSA	NSA	NSA
1,3,5-Trimethylbenzene	<0.5	31	<0.5	NSA	NSA	NSA
1,2,4-Trimethylbenzene	<0.5	1	<0.5	NSA	NSA	NSA
sec-Butylbenzene	4	<0.5	<0.5	NSA	NSA	NSA
4-Isopropyltoluene	1	1	<0.5	NSA	NSA	NSA
Total Xylenes	<1.0	5	<1.0	5,000	9,000	5,000
Other VOCs	ND	ND	ND	NSA	NSA	NSA
MA DEP EPH with Target Analytes (ug/L)						
n-C9 to n-C18 Aliphatic Hydrocarbons	1,200	NA	NA	5,000	5,000	50,000
n-C19 to n-C36 Aliphatic Hydrocarbons	250	NA	NA	50,000	NSA	50,000
n-C11 to n-C22 Aromatic Hydrocarbons	880	NA	NA	5,000	50,000	5,000
Phenanthrene	6	NA	NA	10,000	NSA	10,000
Fluorene	7	NA	NA	40	NSA	40
Other Target Analytes	ND	NA	NA	NSA	NSA	NSA
MA DEP VPH with Target Analytes (ug/L)						
n-C5 to n-C8 Aliphatic Hydrocarbons	43	560	NA	3,000	3,000	50,000
n-C9 to n-C12 Aliphatic Hydrocarbons	69	130	NA	5,000	5,000	50,000
n-C9 to n-C10 Aromatic Hydrocarbons	130	280	NA	7,000	7,000	50,000
Methyl tert-butyl Ether (MTBE)	<5	6	NA	5,000	50,000	50,000
Benzene	<1	<1	NA	2,000	2,000	10,000
Toluene	<5	<5	NA	40,000	50,000	40,000
Ethylbenzene	<5	<5	NA	5,000	20,000	5,000
Naphthalene	<5	<5	NA	1,000	1,000	20,000
Total Xylenes	<10	<10	NA	5	9,000	5,000

Notes:
Only detected compounds or those with detection limits reaching or exceeding a standard were tabulated, unless otherwise presented
NA - Not analyzed
ND - Not detected
NSA - No standard available
ug/L - micrograms per liter
EPA - U.S. Environmental Protection Agency
VOCs - volatile organic compounds
MA DEP EPH - Massachusetts Department of Enviornmental Protection Extractable Petroleum Hydrocarbons
MA DEP VPH - Massachusetts Department of Enviornmental Protection Volatile Petroleum Hydrocarbons
Method 1 Standards and Reportable Concentrations = Standards promulgated in the June 26, 2009 revision to the MA Contingency Plan (MCP), 310 C

Attachment I – Service Constraints

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Service Constraints

1. Preliminary Findings

The following limitation is applicable if the report is stamped "DRAFT" or otherwise identified as preliminary: AECOM Inc. dba AECOM Environment (AECOM) has prepared this Preliminary Report at the specific request of the client. Due to Client imposed time, information, and financial restrictions, AECOM has not performed the services necessary for it to render any opinions or reach any conclusions. Accordingly, the studies, data, information, and findings contained in this Preliminary Report are not the final conclusions of AECOM, but merely basic information requested by the client upon which the Client may draw its own conclusions. Client agrees that AECOM shall not be liable for any claims, loss, damage, or expenses incurred by the Client or others arising out of the use of, or reliance on, any information contained in this Preliminary Report.

2. General

- This Report was prepared for the exclusive use of the Client. No other party is entitled to rely on the conclusions, observations, specifications, or data contained therein without the express written consent of AECOM.
- This Report was prepared pursuant to an Agreement between the Client and AECOM. All uses of and reliance upon this Report are subject to, and deemed acceptance of, the conditions and restrictions contained therein.

3. Purpose of Report

It is AECOM's understanding that this Report is to be used for the purpose described in the introduction of the Report. This stated purpose has been a significant factor in determining the scope and level of services provided for in the Agreement. Should the purpose for which the Report is to be used, or the proposed use of the site(s) change, this Report is no longer valid, and use of this Report by Client or others without AECOM's review and written authorization shall be at the user's sole risk. Should AECOM be required to review the Report after its date of submission, AECOM shall be entitled to additional compensation at then existing rates or such other terms as agreed between AECOM and the Client.

4. Scope of Services

The observations and conclusions described in this Report are based solely on the Scope of Services provided pursuant to the Agreement between Client and AECOM and summarized in the introduction of this Report. AECOM has not performed any additional observations, investigations, studies, or testing not specifically stated therein. AECOM shall not be liable for the existence of any condition, the discovery of which required the performance of services not authorized under the Agreement. Unless otherwise specified in the introduction of this Report, AECOM did not evaluate

the presence of asbestos, electromagnetic fields, lead paint, lead or copper in water, radon gas or other radioactive or infectious materials.

5. Time

The passage of time may result in changes in technology, economic conditions, site variations, or regulatory provisions which would render the Report inaccurate. Accordingly, neither the Client, nor any other party, shall rely on the information or conclusions contained in this Report after three (3) months from its date of submission without the express written consent of AECOM. Reliance on the Report after such period of time shall be at the user's sole risk. Should AECOM be required to review the Report after three (3) months from its date of submission, AECOM shall be entitled to additional compensation at then existing rates or such other terms as may be agreed upon between AECOM and the Client.

6. Conclusions

The conclusions stated in this Report are based upon: observations of existing physical and/or economic conditions; our interpretation of site history and site usage information; information provided by the Client; and information and/or analyses provided by independent testing and information services or laboratories upon which AECOM is entitled to reasonably rely. AECOM was not authorized and did not attempt to independently verify the accuracy or completeness of information or materials received from third parties during the performance of its services. AECOM shall not be liable for any conditions, information, or conclusion, the discovery of which required information not available or independent investigation of information provided to AECOM unless otherwise indicated. Any site drawing(s) provided within this Report is not meant to be an accurate base plan, but is used to present the general, relative locations of features on, and surrounding, the site.

Attachment II – Boring Logs

AECOM

Project: Cumberland Farms, Inc. 1650 Commonwealth Ave. Brighton, MA	Boring ID No.: MW-1 Well ID No.: MW-1 Sheet 1 of 1
Project Manager: Lauren Roberts	Project Number: 60188925-200

Boring Location: See site plan		
Ground Elevation:	NA	Not Available
Depth to First Water:	NA	feet BGS
Depth to Static Water:	~8.82	feet BGS
Stabilization Time:	NA	

Dated Started: 12/10/10
Drill Type: Vac-preclearance; Hollow Stem Auger & Air Hammer
Drill Rig and Model Number: ---
Drilling Company: Crawford Drilling Services
Driller's Name:
AECOM Representative: J. Chambert
Owner: Cumberland Farms, Inc. (Gulf Service Station)

Sampler
Type: Post-hole digger
Hammer:
Fall:

Notes:
Background PID reading: BDL

Depth (feet)	Blow Counts	Penetration / Recovery (inches)	Sample I.D.	Sample Depth (feet bgs)	PID (ppm/v)	USCS Class.	Description of Sample	Well Construction	Depth (feet)
-1-	NA	NA	NA	NA	NA	--	ASPHALT	Roadbox & Concrete pad	
-2-	NA	NA	MW-1 (1')	1	NA	--	ROCKS, little brown, fine to medium sand and cobbles (not enough sand to screen with PID)	Native Fill	
-3-								Bentonite	
-4-	NA	NA	NA	NA	NA	--		2" PVC Riser Silica Sand	
-5-									
-6-							BEDROCK		
-7-								2" PVC slotted screen (0.010" slots)	
-8-									
-9-									
-10-									
-11-									
-12-									
-13-									
-14-									
-15-							End of Boring at 15 feet	Bottom of Well at 15'	
-16-									
-17-									
-18-									
-19-									
-20-									
-21-									
-22-									
-23-									
-24-							BDL - Below Detection Limits		
-25-									

Proportions Used

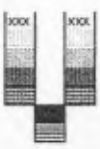
Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35 to 50%

Change in Material Type
Change in Deposit Type

Penetration Resistance ("Blow Counts")

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	Hard
		31+	Very Hard

Concrete
Silica Sand Pack
Native Fill
Bentonite Seal
Rock
PVC
Screen



AECOM

		Project: Cumberland Farms, Inc. 1650 Commonwealth Ave. Brighton, MA	Boring ID No.: MW-2 Well ID No.: MW-2 Sheet 1 of 1
Boring Location: See site plan		Project Manager: Lauren Roberts	Project Number: 60188925-200
Ground Elevation:	NA Not Available	Dated Started: 12/10/10	
Depth to First Water:	NA feet BGS	Drill Type: Vac-preclearance, Hollow Stem Auger & Air Hammer	
Depth to Static Water:	NA feet BGS	Drill Rig and Model Number: --	
Stabilization Time:	NA	Drilling Company: Crawford Drilling Services	
Sampler	Notes:	Driller's Name:	
Type: Post-hole digger	Background PID reading: BDL	AECOM Representative: J. Chambert	
Hammer:		Owner: Cumberland Farms, Inc. (Gulf Service Station)	
Falt:			

Depth (feet)	Blow Counts	Penetration / Recovery (inches)	Sample I.D.	Sample Depth (feet bgs)	PID (ppm/v)	USCS Class.	Description of Sample	Well Construction	Depth (feet)
-1-	NA	NA	NA	NA	NA	--	ASPHALT	Roadbox & Concrete pad	
-2-	NA	NA	MW-2 (1-2')	1-2	NA	--	ROCKS, little brown, fine to medium sand and cobbles (not enough sand to screen with PID)	Native Fill	
-3-	NA	NA	NA	NA	NA	--	BEDROCK	Bentonite	
-4-								2" PVC Riser Silica Sand	
-5-									
-6-								2" PVC slotted screen (0.010" slots)	
-7-									
-8-									
-9-									
-10-									
-11-									
-12-									
-13-									
-14-									
-15-							End of Boring at 15 feet	Bottom of Well at 15'	
-16-									
-17-									
-18-									
-19-									
-20-									
-21-									
-22-									
-23-									
-24-							BDL - Below Detection Limits		
-25-									

Proportions Used

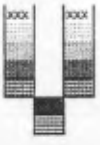
Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35 to 50%

Change in Material Type
Change in Deposit Type

Penetration Resistance ("Blow Counts")

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	Hard
		31+	Very Hard

Concrete
Silica Sand Pack
Native Fill
Bentonite Seal
Rock
PVC
Screen



AECOM

Project: Cumberland Farms, Inc. 1650 Commonwealth Ave. Brighton, MA	Boring ID No.: MW-3 Well ID No.: MW-3 Sheet 1 of 1		
Boring Location: See site plan		Project Manager: Lauren Roberts	Project Number: 60188925-200
Ground Elevation: NA Not Available		Dated Started: 12/10/10	
Depth to First Water: NA feet BGS		Drill Type: Vac-preclearance; Hollow Stem Auger & Air Hammer	
Depth to Static Water: NA feet BGS		Drill Rig and Model Number: ---	
Stabilization Time: NA		Drilling Company: Crawford Drilling Services	
Sampler	Notes:	Driller's Name:	
Type: Post-hole digger	Background PID reading: BDL	AECOM Representative: J. Chambert	
Hammer:		Owner: Cumberland Farms, Inc. (Gulf Service Station)	
Fall:			

Depth (feet)	Blow Counts	Penetration / Recovery (inches)	Sample I.D.	Sample Depth (feet bgs)	PID (ppm/v)	USCS Class	Description of Sample	Well Construction	Depth (feet)
-1-	NA	NA	NA	NA	NA	--	ASPHALT	Roadbox & Concrete pad	
-2-	NA	NA	MW-3 (1-2')	NA	BDL	--	ROCKS, little brown, fine to medium sand and cobbles	Native Fill	
-3-								Bentonite	
-4-								2" PVC Riser	
-5-								Silica Sand	
-6-	NA	NA	NA	NA	NA	--	BEDROCK		
-7-								2" PVC slotted screen (0.010" slots)	
-8-									
-9-									
-10-									
-11-									
-12-									
-13-									
-14-									
-15-							End of Boring at 15 feet	Bottom of Well at 15'	
-16-									
-17-									
-18-									
-19-									
-20-									
-21-									
-22-									
-23-									
-24-							BDL - Below Detection Limits		
-25-									

Proportions Used

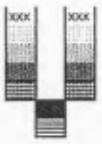
Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35 to 50%

Change in Material Type
Change in Deposit Type

Penetration Resistance ("Blow Counts")

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	Hard
		31+	Very Hard

Concrete
Silica Sand Pack
Native Fill
Bentonite Seal
Rock
PVC
Screen



AECOM

Project: Cumberland Farms, Inc. 1650 Commonwealth Ave. Brighton, MA	Boring ID No.: SB-1 Well ID No.: SB-1 Sheet 1 of 1		
Boring Location: See site plan		Project Manager: Lauren Roberts	Project Number: 60188925-200
Ground Elevation: NA Not Available		Dated Started: 12/10/10	
Depth to First Water: NA feet BGS		Drill Type: Vac-preclearance; Hollow Stem Auger & Air Hammer	
Depth to Static Water: NA feet BGS		Drill Rig and Model Number: ---	
Stabilization Time: NA		Drilling Company: Crawford Drilling Services	
Sampler Type: Post-hole digger Hammer: Fall:	Notes: Background PID reading: BDL	Driller's Name: AECOM Representative: J. Chambert Owner: Cumberland Farms, Inc. (Gulf Service Station)	

Depth (feet)	Blow Counts	Penetration / Recovery (inches)	Sample I.D.	Sample Depth (feet bgs)	PID (ppm/v)	USCS Class.	Description of Sample	Well Construction	Depth (feet)
-1-	NA	NA	NA	NA	NA	--	ASPHALT	No Well Installed	
-2-	NA	NA	NA	2-3	BDL	--	Large COBBLES, little fine to medium sand		
-3-									
-4-	NA	NA	SB-01 (4')	4	BDL	--			
-5-							Refusal on Bedrock at ~5 feet		
-6-							End of Boring		
-7-									
-8-									
-9-									
-10-									
-11-									
-12-									
-13-									
-14-									
-15-									
-16-									
-17-									
-18-									
-19-									
-20-									
-21-									
-22-									
-23-									
-24-							BDL - Below Detection Limits		
-25-									

Proportions Used

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35 to 50%

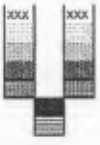
Change in Material Type

Change in Deposit Type

Penetration Resistance ("Blow Counts")

Cohesionless Density		Cohesive Consistency	
0-4	Very Loose	0-2	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	M/Stiff
30-49	Dense	9-15	Stiff
50+	Very Dense	16-30	Hard
		31+	Very Hard

Concrete
Silica Sand Pack
Native Fill
Bentonite Seal
Rock
PVC
Screen



Attachment III – Laboratory Data Packages

Groundwater Analytical, Inc.
P.O.Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone: (508) 759-4441
FAX: (508) 759-4475

GROUNDWATER ANALYTICAL

e-mail

To:	Lauren Roberts	**From:**	e-mail reporting GWA
	AECOM-Westford	**Pages:**	45
e-mail:	LAUREN.L.ROBERTS@	**Date:**	12/17/2010 14:02:55
Re:	138511	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply**

● **Comments:**

Final Project Report for CFI #V1261/118503/60188925, Lab ID 138511, Received 12-10-10

Confidential

GROUNDWATER ANALYTICAL

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475
www.groundwateranalytical.com

December 17, 2010

Ms. Lauren Roberts
AECOM Environment
2 Technology Park Drive
Westford, MA 01886

LABORATORY REPORT

Project: **CFI #V1261/118503/60188925**
Lab ID: **138511**
Received: **12-10-10**

Dear Lauren:

Enclosed are the analytical results for the above referenced project. The project was processed for Priority turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC standards, except as may be specifically noted, or described in the project narrative. The analytical results relate only to the samples received. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Eric H. Jensen
Operations Manager

EHJ/elm
Enclosures

GROUNDWATER ANALYTICAL

Sample Receipt Report

Project: **CFI #V1261/118503/60188925**
Client: **AECOM Environment**
Lab ID: **138511**

Delivery: **GWA Courier**
Airbill: **n/a**
Lab Receipt: **12-10-10**

Temperature: **2.0°C**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-1	MW-1 (1)		Soil	12/10/10 9:00	EPA 8260B Volatile Organics with Oxygenates				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1317057	40 mL VOA Vial	Proline	BX38105	Methanol	R-6291D	12-08-10	n/a		
C1317466	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		
C1317465	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		
C1317464	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-2	MW-1 (1)		Soil	12/10/10 9:00	MA DEP VPH with Targets				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1317085	40 mL VOA Vial	Proline	BX38105	Methanol	R-6291D	12-08-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-3	MW-3 (1-2)		Soil	12/10/10 12:00	MA DEP VPH with Targets				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1317077	40 mL VOA Vial	Proline	BX38105	Methanol	R-6291D	12-08-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-4	SB -01 (4)		Soil	12/10/10 13:00	EPA 8260B Volatile Organics with Oxygenates				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1317094	40 mL VOA Vial	Proline	BX38105	Methanol	R-6291D	12-08-10	n/a		
C1317472	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		
C1317471	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		
C1317470	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-5	SB -01 (4)		Soil	12/10/10 13:00	MA DEP VPH with Targets				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1317065	40 mL VOA Vial	Proline	BX38105	Methanol	R-6291D	12-08-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-6	Trip Blank		Soil	12/10/10 0:00	EPA 8260B Volatile Organics with Oxygenates				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1317076	40 mL VOA Vial	Proline	BX38105	Methanol	R-6291D	12-08-10	n/a		
C1317491	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		
C1317481	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		
C1317478	40 mL VOA Vial	Proline	BX38159	n/a	R-6288A	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138511-7	MW-1 (1)		Soil	12/10/10 9:00	EPA 6010B/7471A 8 RCRA Metals EPA 8011 Mod EDB EPA 8082 PCBs MA DEP EPH with PAHs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1297681	120 mL Amber Glass	[redacted]	BX37505	None	n/a	n/a	n/a		

GROUNDWATER ANALYTICAL

Sample Receipt Report (Continued)

Project: **CFI #V1261/118503/60188925**
Client: **AECOM Environment**
Lab ID: **138511**

Delivery: **GWA Courier**
Airbill: **n/a**
Lab Receipt: **12-10-10**

Temperature: **2.0°C**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID	Matrix	Sampled	Method	Notes
138511-8	MW-3 (1-2)	Soil	12/10/10 12:00	EPA 6010B Pb EPA 8011 Mod EDB MA DEP EPH with PAHs	

Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship
C1297680	120 mL Amber Glass	[illegible]	BX37505	None	n/a	n/a	n/a
C1297678	120 mL Amber Glass	[illegible]	BX37505	None	n/a	n/a	n/a
C1299838	250 mL Amber Glass	Proline	BX37877	None	n/a	n/a	n/a

Lab ID	Field ID	Matrix	Sampled	Method	Notes
138511-9	SB -01 (4)	Soil	12/10/10 13:00	EPA 6010B/7471A 8 RCRA Metals EPA 8011 Mod EDB EPA 8082 PCBs MA DEP EPH with PAHs	

Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship
C1297686	120 mL Amber Glass	[illegible]	BX37505	None	n/a	n/a	n/a
C1297679	120 mL Amber Glass	[illegible]	BX37505	None	n/a	n/a	n/a
C1299830	250 mL Amber Glass	Proline	BX37877	None	n/a	n/a	n/a

GROUNDWATER ANALYTICAL

Data Certification

Project: **CFI #V1261/118503/60188925** Lab ID: **138511**
Client: **AECOM Environment** Received: **12-10-10 17:45**

Mass DEP Analytical Protocol Certification Form

Project Location: **n/a** MA DEP RTN: **n/a**

This Form provides certifications for the following data set:

EPA 8260B:	138511-1,-4,-6
EPA 8082:	138511-7,-9
MA DEP VPH:	138511-2,-3,-5
MA DEP EPH:	138511-7,-8,-9
EPA 6010B:	138511-7,-8,-9
EPA 7470A/1A:	138511-7,-9

Sample Matrices: Groundwater/Surface ( ) Soil/Sediment (X) Drinking Water ( ) Air ( ) Other ( )

CAM Protocol (check all that apply below):

8260 VOC CAM II A (X)	7470/7471 Hg CAM III B (X)	Mass DEP VPH CAM IV A (X)	8081 Pesticides CAM V B ( )	7196 Hex Cr CAM VI B ( )	Mass DEP APH CAM IX A ( )
8270 SVOC CAM II B ( )	7010 Metals CAM III C ( )	Mass DEP EPH CAM IV B (X)	8151 Herbicides CAM V C ( )	8330 Explosives CAM VIII A ( )	TO-15 VOC CAM IX B ( )
6010 Metals CAM III A (X)	6020 Metals CAM III D ( )	8082 PCB CAM V A (X)	9012 Cyanide/PAC CAM VI A ( )	6860 Perchlorate CAM VIII B ( )	

An affirmative response to questions A through F are required for "Presumptive Certainty" status.

A.	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratoratory, and prepared/analyzed within method holding times?	Yes
B.	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes
C.	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes
D.	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes
E.	VPH, EPH and APH methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes
F.	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes

Responses to questions G, H and I below are required for "Presumptive Certainty" status.

G.	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	Yes

Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40.1056(2)(k) and WSC-07-350.

H.	Were all QC performance standards specified in the CAM protocol(s) achieved?	No
I.	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	No

All negative responses must be addressed in an attached laboratory 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 analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: EHJ Position: Operations Manager

Printed Name: Eric H. Jensen Date: 12-17-10

GROUNDWATER ANALYTICAL

EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	MW-1 (1)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	40 mL VOA Vial
Client:	AECOM Environment	Preservation:	Frozen
Laboratory ID:	138511-1	QC Batch ID:	VM1-2977-S
Sampled:	12-10-10 09:00	Instrument ID:	MS-1 HP 5890
Received:	12-10-10 17:45	Sample Weight:	3.6 g
Analyzed:	12-13-10 01:47	% Solids:	88
Analyst:	EMC	Dilution Factor:	1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/Kg	16
74-87-3	Chloromethane	BRL		ug/Kg	16
75-01-4	Vinyl Chloride	BRL		ug/Kg	16
74-83-9	Bromomethane	BRL		ug/Kg	16
75-00-3	Chloroethane	BRL		ug/Kg	16
75-69-4	Trichlorofluoromethane	BRL		ug/Kg	16
60-29-7	Diethyl Ether	BRL		ug/Kg	16
75-35-4	1,1-Dichloroethene	BRL		ug/Kg	8
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/Kg	79
67-64-1	Acetone	BRL		ug/Kg	320
75-15-0	Carbon Disulfide	BRL		ug/Kg	79
75-09-2	Methylene Chloride	BRL		ug/Kg	79
107-13-1	Acrylonitrile	BRL		ug/Kg	8
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/Kg	8
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/Kg	8
75-34-3	1,1-Dichloroethane	BRL		ug/Kg	8
594-20-7	2,2-Dichloropropane	BRL		ug/Kg	8
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/Kg	8
78-93-3	2-Butanone (MEK)	BRL		ug/Kg	79
74-97-5	Bromochloromethane	BRL		ug/Kg	8
109-99-9	Tetrahydrofuran (THF)	BRL		ug/Kg	79
67-66-3	Chloroform	BRL		ug/Kg	8
71-55-6	1,1,1-Trichloroethane	BRL		ug/Kg	8
56-23-5	Carbon Tetrachloride	BRL		ug/Kg	8
563-58-6	1,1-Dichloropropene	BRL		ug/Kg	8
71-43-2	Benzene	BRL		ug/Kg	8
107-06-2	1,2-Dichloroethane	BRL		ug/Kg	8
79-01-6	Trichloroethene	BRL		ug/Kg	8
78-87-5	1,2-Dichloropropane	BRL		ug/Kg	8
74-95-3	Dibromomethane	BRL		ug/Kg	8
75-27-4	Bromodichloromethane	BRL		ug/Kg	8
123-91-1	1,4-Dioxane	BRL		ug/Kg	7,900
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/Kg	8
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/Kg	79
108-88-3	Toluene	BRL		ug/Kg	8
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/Kg	8
79-00-5	1,1,2-Trichloroethane	BRL		ug/Kg	8
127-18-4	Tetrachloroethene	BRL		ug/Kg	8
142-28-9	1,3-Dichloropropane	BRL		ug/Kg	8
591-78-6	2-Hexanone	BRL		ug/Kg	79
124-48-1	Dibromochloromethane	BRL		ug/Kg	8
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	8
108-90-7	Chlorobenzene	BRL		ug/Kg	8
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/Kg	8
100-41-4	Ethylbenzene	BRL		ug/Kg	8
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/Kg	8

GROUNDWATER ANALYTICAL

EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	**MW-1 (1)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**Frozen**
Laboratory ID:	**138511-1**	QC Batch ID:	**VM1-2977-S**
Sampled:	**12-10-10 09:00**	Instrument ID:	**MS-1 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**3.6 g**
Analyzed:	**12-13-10 01:47**	% Solids:	**88**
Analyst:	**EMC**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	*ortho*-Xylene	BRL		ug/Kg	8
100-42-5	Styrene	BRL		ug/Kg	8
75-25-2	Bromoform	BRL		ug/Kg	8
98-82-8	Isopropylbenzene	BRL		ug/Kg	8
108-86-1	Bromobenzene	BRL		ug/Kg	8
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/Kg	8
96-18-4	1,2,3-Trichloropropane	BRL		ug/Kg	8
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/Kg	79
103-65-1	*n*-Propylbenzene	BRL		ug/Kg	8
95-49-8	2-Chlorotoluene	BRL		ug/Kg	8
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/Kg	8
106-43-4	4-Chlorotoluene	BRL		ug/Kg	8
98-06-6	*tert*-Butylbenzene	BRL		ug/Kg	8
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/Kg	8
135-98-8	*sec*-Butylbenzene	BRL		ug/Kg	8
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	8
99-87-6	4-Isopropyltoluene	BRL		ug/Kg	8
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	8
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	8
104-51-8	*n*-Butylbenzene	BRL		ug/Kg	8
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/Kg	8
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/Kg	8
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	8
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	8
91-20-3	Naphthalene	BRL		ug/Kg	8
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/Kg	8
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/Kg	320
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/Kg	8
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/Kg	8
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/Kg	8

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	50	53	**106 %**	70 - 130 %
1,2-Dichloroethane-d_4	50	47	**94 %**	70 - 130 %
Toluene-d_8	50	50	**100 %**	70 - 130 %
4-Bromofluorobenzene	50	60	**121 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	**SB -01 (4)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**Frozen**
Laboratory ID:	**138511-4**	QC Batch ID:	**VM1-2977-S**
Sampled:	**12-10-10 13:00**	Instrument ID:	**MS-1 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**6.4 g**
Analyzed:	**12-13-10 02:23**	% Solids:	**92**
Analyst:	**EMC**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/Kg	10
74-87-3	Chloromethane	BRL		ug/Kg	10
75-01-4	Vinyl Chloride	BRL		ug/Kg	10
74-83-9	Bromomethane	BRL		ug/Kg	10
75-00-3	Chloroethane	BRL		ug/Kg	10
75-69-4	Trichlorofluoromethane	BRL		ug/Kg	10
60-29-7	Diethyl Ether	BRL		ug/Kg	10
75-35-4	1,1-Dichloroethene	BRL		ug/Kg	5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/Kg	50
67-64-1	Acetone	BRL		ug/Kg	200
75-15-0	Carbon Disulfide	BRL		ug/Kg	50
75-09-2	Methylene Chloride	BRL		ug/Kg	50
107-13-1	Acrylonitrile	BRL		ug/Kg	5
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/Kg	5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/Kg	5
75-34-3	1,1-Dichloroethane	BRL		ug/Kg	5
594-20-7	2,2-Dichloropropane	BRL		ug/Kg	5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/Kg	5
78-93-3	2-Butanone (MEK)	BRL		ug/Kg	50
74-97-5	Bromochloromethane	BRL		ug/Kg	5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/Kg	50
67-66-3	Chloroform	BRL		ug/Kg	5
71-55-6	1,1,1-Trichloroethane	BRL		ug/Kg	5
56-23-5	Carbon Tetrachloride	BRL		ug/Kg	5
563-58-6	1,1-Dichloropropene	BRL		ug/Kg	5
71-43-2	Benzene	BRL		ug/Kg	5
107-06-2	1,2-Dichloroethane	BRL		ug/Kg	5
79-01-6	Trichloroethene	BRL		ug/Kg	5
78-87-5	1,2-Dichloropropane	BRL		ug/Kg	5
74-95-3	Dibromomethane	BRL		ug/Kg	5
75-27-4	Bromodichloromethane	BRL		ug/Kg	5
123-91-1	1,4-Dioxane	BRL		ug/Kg	5,000
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/Kg	5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/Kg	50
108-88-3	Toluene	BRL		ug/Kg	5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/Kg	5
79-00-5	1,1,2-Trichloroethane	BRL		ug/Kg	5
127-18-4	Tetrachloroethene	BRL		ug/Kg	5
142-28-9	1,3-Dichloropropane	BRL		ug/Kg	5
591-78-6	2-Hexanone	BRL		ug/Kg	50
124-48-1	Dibromochloromethane	BRL		ug/Kg	5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	5
108-90-7	Chlorobenzene	BRL		ug/Kg	5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/Kg	5
100-41-4	Ethylbenzene	BRL		ug/Kg	5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/Kg	5

GROUNDWATER ANALYTICAL

EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	SB -01 (4)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	40 mL VOA Vial
Client:	AECOM Environment	Preservation:	Frozen
Laboratory ID:	138511-4	QC Batch ID:	VM1-2977-S
Sampled:	12-10-10 13:00	Instrument ID:	MS-1 HP 5890
Received:	12-10-10 17:45	Sample Weight:	6.4 g
Analyzed:	12-13-10 02:23	% Solids:	92
Analyst:	EMC	Dilution Factor:	1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	*ortho*-Xylene	BRL		ug/Kg	5
100-42-5	Styrene	BRL		ug/Kg	5
75-25-2	Bromoform	BRL		ug/Kg	5
98-82-8	Isopropylbenzene	BRL		ug/Kg	5
108-86-1	Bromobenzene	BRL		ug/Kg	5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/Kg	5
96-18-4	1,2,3-Trichloropropane	BRL		ug/Kg	5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/Kg	50
103-65-1	*n*-Propylbenzene	BRL		ug/Kg	5
95-49-8	2-Chlorotoluene	BRL		ug/Kg	5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/Kg	5
106-43-4	4-Chlorotoluene	BRL		ug/Kg	5
98-06-6	*tert*-Butylbenzene	BRL		ug/Kg	5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/Kg	5
135-98-8	*sec*-Butylbenzene	BRL		ug/Kg	5
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	5
99-87-6	4-Isopropyltoluene	BRL		ug/Kg	5
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	5
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	5
104-51-8	*n*-Butylbenzene	BRL		ug/Kg	5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/Kg	5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/Kg	5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	5
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	5
91-20-3	Naphthalene	BRL		ug/Kg	5
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/Kg	5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/Kg	200
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/Kg	5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/Kg	5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/Kg	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	50	52	104 %	70 - 130 %
1,2-Dichloroethane-d_4	50	47	93 %	70 - 130 %
Toluene-d_8	50	49	99 %	70 - 130 %
4-Bromofluorobenzene	50	51	102 %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample preparation performed by EPA Method 5030B. Results are reported on an as received basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	**Trip Blank**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**Frozen**
Laboratory ID:	**138511-6**	QC Batch ID:	**VM1-2977-S**
Sampled:	**12-10-10 00:00**	Instrument ID:	**MS-1 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**5.0 g**
Analyzed:	**12-13-10 03:00**	% Solids:	**100**
Analyst:	**EMC**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/Kg	10
74-87-3	Chloromethane	BRL		ug/Kg	10
75-01-4	Vinyl Chloride	BRL		ug/Kg	10
74-83-9	Bromomethane	BRL		ug/Kg	10
75-00-3	Chloroethane	BRL		ug/Kg	10
75-69-4	Trichlorofluoromethane	BRL		ug/Kg	10
60-29-7	Diethyl Ether	BRL		ug/Kg	10
75-35-4	1,1-Dichloroethene	BRL		ug/Kg	5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/Kg	50
67-64-1	Acetone	BRL		ug/Kg	200
75-15-0	Carbon Disulfide	BRL		ug/Kg	50
75-09-2	Methylene Chloride	BRL		ug/Kg	50
107-13-1	Acrylonitrile	BRL		ug/Kg	5
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/Kg	5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/Kg	5
75-34-3	1,1-Dichloroethane	BRL		ug/Kg	5
594-20-7	2,2-Dichloropropane	BRL		ug/Kg	5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/Kg	5
78-93-3	2-Butanone (MEK)	BRL		ug/Kg	50
74-97-5	Bromochloromethane	BRL		ug/Kg	5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/Kg	50
67-66-3	Chloroform	BRL		ug/Kg	5
71-55-6	1,1,1-Trichloroethane	BRL		ug/Kg	5
56-23-5	Carbon Tetrachloride	BRL		ug/Kg	5
563-58-6	1,1-Dichloropropene	BRL		ug/Kg	5
71-43-2	Benzene	BRL		ug/Kg	5
107-06-2	1,2-Dichloroethane	BRL		ug/Kg	5
79-01-6	Trichloroethene	BRL		ug/Kg	5
78-87-5	1,2-Dichloropropane	BRL		ug/Kg	5
74-95-3	Dibromomethane	BRL		ug/Kg	5
75-27-4	Bromodichloromethane	BRL		ug/Kg	5
123-91-1	1,4-Dioxane	BRL		ug/Kg	5,000
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/Kg	5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/Kg	50
108-88-3	Toluene	BRL		ug/Kg	5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/Kg	5
79-00-5	1,1,2-Trichloroethane	BRL		ug/Kg	5
127-18-4	Tetrachloroethene	BRL		ug/Kg	5
142-28-9	1,3-Dichloropropane	BRL		ug/Kg	5
591-78-6	2-Hexanone	BRL		ug/Kg	50
124-48-1	Dibromochloromethane	BRL		ug/Kg	5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	5
108-90-7	Chlorobenzene	BRL		ug/Kg	5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/Kg	5
100-41-4	Ethylbenzene	BRL		ug/Kg	5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/Kg	5

GROUNDWATER ANALYTICAL

EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	**Trip Blank**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**Frozen**
Laboratory ID:	**138511-6**	QC Batch ID:	**VM1-2977-S**
Sampled:	**12-10-10 00:00**	Instrument ID:	**MS-1 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**5.0 g**
Analyzed:	**12-13-10 03:00**	% Solids:	**100**
Analyst:	**EMC**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	*ortho*-Xylene	BRL		ug/Kg	5
100-42-5	Styrene	BRL		ug/Kg	5
75-25-2	Bromoform	BRL		ug/Kg	5
98-82-8	Isopropylbenzene	BRL		ug/Kg	5
108-86-1	Bromobenzene	BRL		ug/Kg	5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/Kg	5
96-18-4	1,2,3-Trichloropropane	BRL		ug/Kg	5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/Kg	50
103-65-1	*n*-Propylbenzene	BRL		ug/Kg	5
95-49-8	2-Chlorotoluene	BRL		ug/Kg	5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/Kg	5
106-43-4	4-Chlorotoluene	BRL		ug/Kg	5
98-06-6	*tert*-Butylbenzene	BRL		ug/Kg	5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/Kg	5
135-98-8	sec-Butylbenzene	BRL		ug/Kg	5
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	5
99-87-6	4-Isopropyltoluene	BRL		ug/Kg	5
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	5
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	5
104-51-8	*n*-Butylbenzene	BRL		ug/Kg	5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/Kg	5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/Kg	5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	5
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	5
91-20-3	Naphthalene	BRL		ug/Kg	5
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/Kg	5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/Kg	200
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/Kg	5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/Kg	5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/Kg	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	50	49	**99 %**	70 - 130 %
1,2-Dichloroethane-d_4	50	49	**98 %**	70 - 130 %
Toluene-d_8	50	48	**96 %**	70 - 130 %
4-Bromofluorobenzene	50	53	**106 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample preparation performed by EPA Method 5030B. Results are reported on an as received basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	**MW-1 (1)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**5035 Methanol**
Laboratory ID:	**138511-02**	QC Batch ID:	**VP-1725-E**
Sampled:	**12-10-10 09:00**	Instrument ID:	**GC-1 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**13 g**
Analyzed:	**12-15-10 18:30**	Final Volume:	**15 mL**
Analyst:	**TRA**	% Solids:	**88**
		Dilution Factor:	**1**

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	BRL		mg/Kg	1.5
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	BRL		mg/Kg	1.5
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL		mg/Kg	1.5
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL		mg/Kg	1.5
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL		mg/Kg	1.5

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	BRL		mg/Kg	0.07
71-43-2	Benzene ¤	BRL		mg/Kg	0.15
108-88-3	Toluene ¤	BRL		mg/Kg	0.15
100-41-4	Ethylbenzene ‡	BRL		mg/Kg	0.15
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		mg/Kg	0.15
95-47-6	*ortho*- Xylene ‡	BRL		mg/Kg	0.15
91-20-3	Naphthalene	BRL		mg/Kg	0.37

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	3.7	3.4	92 %	70 - 130 %
2,5-Dibromotoluene (FID)	3.7	3.5	95 %	70 - 130 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Results are reported on a dry weight basis.

Report Notations:

- BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
- † Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
- ◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.
- ⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.
- ¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.
- ‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	**MW-3 (1-2)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**5035 Methanol**
Laboratory ID:	**138511-03**	QC Batch ID:	**VP-1725-E**
Sampled:	**12-10-10 12:00**	Instrument ID:	**GC-1 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**16 g**
Analyzed:	**12-15-10 19:11**	Final Volume:	**15 mL**
Analyst:	**TRA**	% Solids:	**92**
		Dilution Factor:	**1**

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	BRL		mg/Kg	1.1
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	BRL		mg/Kg	1.1
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL		mg/Kg	1.1
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL		mg/Kg	1.1
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL		mg/Kg	1.1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	BRL		mg/Kg	0.05
71-43-2	Benzene ¤	BRL		mg/Kg	0.11
108-88-3	Toluene ¤	BRL		mg/Kg	0.11
100-41-4	Ethylbenzene ‡	BRL		mg/Kg	0.11
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		mg/Kg	0.11
95-47-6	*ortho*- Xylene ‡	BRL		mg/Kg	0.11
91-20-3	Naphthalene	BRL		mg/Kg	0.28

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	2.8	2.5	91 %	70 - 130 %
2,5-Dibromotoluene (FID)	2.8	2.5	91 %	70 - 130 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	SB -01 (4)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	40 mL VOA Vial
Client:	AECOM Environment	Preservation:	5035 Methanol
Laboratory ID:	138511-05	QC Batch ID:	VP-1725-E
Sampled:	12-10-10 13:00	Instrument ID:	GC-1 HP 5890
Received:	12-10-10 17:45	Sample Weight:	18 g
Analyzed:	12-15-10 19:51	Final Volume:	15 mL
Analyst:	TRA	% Solids:	92
		Dilution Factor:	1

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	BRL		mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	BRL		mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL		mg/Kg	1.0
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons	BRL		mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons	1.1		mg/Kg	1.0

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	BRL		mg/Kg	0.05
71-43-2	Benzene ¤	BRL		mg/Kg	0.10
108-88-3	Toluene ¤	BRL		mg/Kg	0.10
100-41-4	Ethylbenzene ‡	BRL		mg/Kg	0.10
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		mg/Kg	0.10
95-47-6	*ortho*- Xylene ‡	BRL		mg/Kg	0.10
91-20-3	Naphthalene	BRL		mg/Kg	0.26

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	2.6	2.5	98 %	70 - 130 %
2,5-Dibromotoluene (FID)	2.6	2.5	98 %	70 - 130 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Results are reported on a dry weight basis.

Report Notations:

- BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
- † Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
- ◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.
- ⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.
- ¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.
- ‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**MW-1 (1)**	Matrix:	Soil
Project:	**CFI #V1261/118503/60188925**	Container:	**120 mL Amber Glass**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138511-7**	QC Batch ID:	**EP-3174-M**
Sampled:	**12-10-10 09:00**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**12-10-10 17:45**	Sample Weight:	**15 g**
Extracted:	**12-14-10 21:30**	Final Volume:	**1 mL**
Analyzed (AL):	**12-16-10 23:01**	% Solids:	**88**
Analyzed (AR):	**12-16-10 23:44**	Aliphatic Dilution Factor:	**1**
Analyst:	**KM**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	22
n-C19 to n-C36 Aliphatic Hydrocarbons †	**57**		mg/Kg	22
n-C11 to n-C22 Aromatic Hydrocarbons †◊	**75**		mg/Kg	22
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	84		mg/Kg	22

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		mg/Kg	0.56
91-57-6	2-Methylnaphthalene	BRL		mg/Kg	0.56
85-01-8	Phenanthrene	**1.2**		mg/Kg	0.56
83-32-9	Acenaphthene	BRL		mg/Kg	0.56
208-96-8	Acenaphthylene	BRL		mg/Kg	0.56
86-73-7	Fluorene	BRL		mg/Kg	0.56
120-12-7	Anthracene	BRL		mg/Kg	0.56
206-44-0	Fluoranthene	**1.4**		mg/Kg	0.56
129-00-0	Pyrene	**1.3**		mg/Kg	0.56
56-55-3	Benzo[a]anthracene	**0.60**		mg/Kg	0.56
218-01-9	Chrysene	**0.77**		mg/Kg	0.56
205-99-2	Benzo[b]fluoranthene	**0.63**		mg/Kg	0.56
207-08-9	Benzo[k]fluoranthene	**0.62**		mg/Kg	0.56
50-32-8	Benzo[a]pyrene	**0.66**		mg/Kg	0.56
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		mg/Kg	0.56
53-70-3	Dibenzo[a,h]anthracene	BRL		mg/Kg	0.56
191-24-2	Benzo[g,h,i]perylene	BRL		mg/Kg	0.56

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.0	2.7	**91** %	40 - 140 %
	2-Bromonaphthalene	3.0	2.6	**86** %	40 - 140 %
Extraction:	Chloro-octadecane	3.0	2.4	**81** %	40 - 140 %
	ortho-Terphenyl	3.0	2.8	**96** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	MW-3 (1-2)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	120 mL Amber Glass
Client:	AECOM Environment	Preservation:	Cool
Laboratory ID:	138511-8	QC Batch ID:	EP-3174-M
Sampled:	12-10-10 12:00	Instrument ID:	GC-9 Agilent 6890
Received:	12-10-10 17:45	Sample Weight:	16 g
Extracted:	12-14-10 21:30	Final Volume:	1 mL
Analyzed (AL):	12-17-10 00:29	% Solids:	92
Analyzed (AR):	12-17-10 01:12	Aliphatic Dilution Factor:	1
Analyst:	KM	Aromatic Dilution Factor:	1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	21
n-C19 to n-C36 Aliphatic Hydrocarbons †	76		mg/Kg	21
n-C11 to n-C22 Aromatic Hydrocarbons †◊	98		mg/Kg	21
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	110		mg/Kg	21

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		mg/Kg	0.52
91-57-6	2-Methylnaphthalene	BRL		mg/Kg	0.52
85-01-8	Phenanthrene	0.73		mg/Kg	0.52
83-32-9	Acenaphthene	BRL		mg/Kg	0.52
208-96-8	Acenaphthylene	BRL		mg/Kg	0.52
86-73-7	Fluorene	BRL		mg/Kg	0.52
120-12-7	Anthracene	BRL		mg/Kg	0.52
206-44-0	Fluoranthene	2.1		mg/Kg	0.52
129-00-0	Pyrene	2.1		mg/Kg	0.52
56-55-3	Benzo[a]anthracene	1.2		mg/Kg	0.52
218-01-9	Chrysene	1.5		mg/Kg	0.52
205-99-2	Benzo[b]fluoranthene	2.0		mg/Kg	0.52
207-08-9	Benzo[k]fluoranthene	0.88		mg/Kg	0.52
50-32-8	Benzo[a]pyrene	1.5		mg/Kg	0.52
193-39-5	Indeno[1,2,3-c,d]pyrene	1.1		mg/Kg	0.52
53-70-3	Dibenzo[a,h]anthracene	BRL		mg/Kg	0.52
191-24-2	Benzo[g,h,i]perylene	1.1		mg/Kg	0.52

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.8	2.5	91 %	40 - 140 %
	2-Bromonaphthalene	2.8	2.5	90 %	40 - 140 %
Extraction:	Chloro-octadecane	2.8	1.9	69 %	40 - 140 %
	ortho-Terphenyl	2.8	2.6	92 %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	SB -01 (4)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	120 mL Amber Glass
Client:	AECOM Environment	Preservation:	Cool
Laboratory ID:	138511-9	QC Batch ID:	EP-3174-M
Sampled:	12-10-10 13:00	Instrument ID:	GC-9 Agilent 6890
Received:	12-10-10 17:45	Sample Weight:	15 g
Extracted:	12-14-10 21:30	Final Volume:	1 mL
Analyzed (AL):	12-17-10 01:56	% Solids:	92
Analyzed (AR):	12-17-10 02:40	Aliphatic Dilution Factor:	1
Analyst:	KM	Aromatic Dilution Factor:	1

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	21
n-C19 to n-C36 Aliphatic Hydrocarbons †	39		mg/Kg	21
n-C11 to n-C22 Aromatic Hydrocarbons † ◊	BRL		mg/Kg	21
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	22		mg/Kg	21

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		mg/Kg	0.53
91-57-6	2-Methylnaphthalene	BRL		mg/Kg	0.53
85-01-8	Phenanthrene	BRL		mg/Kg	0.53
83-32-9	Acenaphthene	BRL		mg/Kg	0.53
208-96-8	Acenaphthylene	BRL		mg/Kg	0.53
86-73-7	Fluorene	BRL		mg/Kg	0.53
120-12-7	Anthracene	BRL		mg/Kg	0.53
206-44-0	Fluoranthene	BRL		mg/Kg	0.53
129-00-0	Pyrene	BRL		mg/Kg	0.53
56-55-3	Benzo[a]anthracene	BRL		mg/Kg	0.53
218-01-9	Chrysene	BRL		mg/Kg	0.53
205-99-2	Benzo[b]fluoranthene	BRL		mg/Kg	0.53
207-08-9	Benzo[k]fluoranthene	BRL		mg/Kg	0.53
50-32-8	Benzo[a]pyrene	BRL		mg/Kg	0.53
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		mg/Kg	0.53
53-70-3	Dibenzo[a,h]anthracene	BRL		mg/Kg	0.53
191-24-2	Benzo[g,h,i]perylene	BRL		mg/Kg	0.53

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.8	2.5	89 %	40 - 140 %
	2-Bromonaphthalene	2.8	2.6	91 %	40 - 140 %
Extraction:	Chloro-octadecane	2.8	2.3	82 %	40 - 140 %
	ortho-Terphenyl	2.8	2.6	92 %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8011 (Modified)
EDB by GC/ECD

Field ID:	MW-1 (1)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	120 mL Amber Glass
Client:	AECOM Environment	Preservation:	Cool
Laboratory ID:	138511-07	QC Batch ID:	PV-0223-S
Sampled:	12-10-10 09:00	Instrument ID:	GC-5 HP 5890
Received:	12-10-10 17:45	Sample Weight:	5.4 g
Extracted:	12-14-10 17:00	Final Volume:	1 mL
Analyzed:	12-15-10 22:33	Percent Solids:	88
Analyst:	CRL	Dilution Factor:	1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	2.1

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	1,1,1,2-Tetrachloroethane	4.2	3.6	84 %	70 - 130 %
Second Column	1,1,1,2-Tetrachloroethane	4.2	3.7	88 %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Modified with guidance from "Determination of 1,2-Dibromoethane (EDB) in Field Soils: Implications for Volatile Organic Compounds," B.L. Sawhney, J.J. Pignatello, and S.M. Steinberg, Journal of Environmental Quality, Vol. 17, No. 1, January - March 1988. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Trace Metals

Field ID:	MW-2	Matrix:	Aqueous
Project:	CFI #118503/60188925	Container:	250 mL Plastic
Client:	AECOM Environment	Preservation:	HNO3 / Cool
Laboratory ID:	138693-10	Preserved:	12-17-10 14:15
Sampled:	12-17-10 14:15	Filtered:	12-17-10 14:15
Received:	12-17-10 18:00		

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 6010B[1]	MB-4275-W	EPA 3010A	12-20-10 00:00	50 mL	ICP-1 PE 3000	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7439-92-1	Lead, Dissolved	BRL		mg/L	0.005	1	12-20-10 21:47	EPA 6010B[1]

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

Project Narrative

Project:	**CFI #118503/60188925**	Lab ID:	**138693**
Client:	**AECOM Environment**	Received:	**12-17-10 18:00**

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1. Sample 138693-10 was analyzed for Lead instead of Iron, per Floyd Burton, 12-20-10.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1. EPA 6010B Note: Samples 138693-9,-10. Samples were analyzed for selected target analytes, as requested by client.
2. Sample 138693-3 was not received with sample collection time listed on the Chain of Custody. Sample was reported with a sampling collection time of 00:00 by the laboratory.
3. EPA 8260B Note: Sample 138693-3. %Ds for Tetrachloroethene, Dibromochloromethane, m&p Xylene, Styrene, trans-1,4-dichloro-2-butene and 1,2,3-Trichlorobenzene were above the recommended limit in the CCV.
4. EPA 8260B Note: Sample 138693-3. Acetone did not meet the required minimum average response factor in the ICAL. Response was also below the recommended limit in the CCV/LCS.
5. MA DEP EPH Non-conformance: Laboratory control sample (LCS) had analytes and RPDs outside QC limits for QC batch EP-2373-F.
6. EPA 8260B Non-conformance: Samples 138693-1 and -2.Laboratory control sample (LCS) analyte Trichlorofluoromethane had an RPD above the recommended limit for QC batch VM10-1215-W.
7. EPA 8260B Note: Samples 138693-1, -2. %D for trans-1,4-dichloro-2-butene was above the recommended limit in the CCV.
8. EPA 8260B Note: Samples 138693-1, -2. Acetone did not meet the required minimum average response factor in the ICAL. Response was also below the recommended limit in the CCV/LCS.
9. EPA 8011 EDB: Sample 138693-07 was received in a 1 liter amber bottle instead of the recommended 40ml vial.

Version 10-201

GROUNDWATER ANALYTICAL

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CHAIN-OF-CUSTODY RECORD AND WORK ORDER

Project Name: CFI #118503	Firm: AECOM - Westford
Project Number: 60198925	Address: 2 Technology Park Drive
Sampler Name: Floyd Buston	City / State / Zip: Westford MA
Project Manager: LAUREN ROBERTS	Telephone: 978-589-3000

INSTRUCTIONS: Use separate line for each container (except replicates).

TURNAROUND

- ☐ 10 Business Days
- ☑ 5 Business Days
- ☐ RUSH (RAN- _____)
  (Rush requires Rush Authorization Number)
- ☑ Please Email to: Lauren.L.Roberts@aecom.com
- ☐ Please FAX to: _____

BILLING

- ☑ Purchase Order No: 33156
- ☐ Third Party Billing: _____
- ☐ GWA Quote: _____

ANALYSIS REQUEST

Volatiles; Semivolatiles; Pest/Herb/PCBs/Extractable; Metals; Total Petroleum Hydrocarbons; Haz Waste; General Chemistry; Other

Sampling DATE	Sampling TIME	SAMPLE IDENTIFICATION	Matrix	Type	Container(s)	Preservation	LABORATORY NUMBER (Lab Use Only)
12/7	1345	MW-1	X	X	11	4	
12/7	1415	MW-2	X	X	4	1	
12/7	LAB	Trip Blank	X	X	2	2	

REMARKS / SPECIAL INSTRUCTIONS

- ☑ YES ☐ NO MCP Data Certification required.
- ☐ YES ☑ NO MCP Drinking Water Sample Included.
  (Volatile analytes require duplicate collection and Trip Blanks).
- ☐ Analyze Duplicates and Trips Blanks only if positive results.
- ☐ YES ☐ NO CT RCP Data Certification required.

Signature: _____

DATA QUALITY OBJECTIVES

Regulatory Program

State	Standard	Deliverables
☐ CT	☐ MCP GW-1/S-1	☐ PWS Form
☐ ME	☑ MCP GW-2/S-2	☐ MWRA
☒ MA	☐ NY STARS	☐ _____
☐ NH	☐ Drinking Water	
☐ NY	☐ Wastewater	
☐ RI	☐ Waste Disposal	
☐ VT	☐ Dredge Material	
☐ _____	☐ _____	

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless pre-arranged. Project specific QC samples are charged on a per sample basis. Each MS, MSD and Sample Duplicate requires an additional sample aliquot.

Project Specific QC Required	Selection of QC Sample
☐ Sample Duplicate	☐ Please use sample _____
☐ Matrix Spike	
☐ Matrix Spike Duplicate	

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

	Date	Time			
Relinquished by Sampler:	12/7/10	1600	Received by:	12/7/10 1600	Receipt Temperature: 3.4 °C (Blank) °C (Sample)
Relinquished by:	12/7/10	1800	Received by:		Container Count: 22
Relinquished by:	Date	Time	Received by Laboratory:		Shipping Airbill Number:

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express ☐ UPS ☐ Hand ☐ _____

Custody Seal Number:

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans,* US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste,* US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

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Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	MA DEP EPH Method	Instrument ID:	GC-9 Agilent 6890	Instrument ID:	GC-9 Agilent 6890
QC Batch ID:	EP-2373-F	Extracted:	12-20-10 11:30	Extracted:	12-20-10 11:30
Matrix:	Aqueous	Analyzed (AL):	12-20-10 21:20	Analyzed (AL):	12-20-10 22:48
Units:	ug/L	Analyzed (AR):	12-20-10 22:04	Analyzed (AR):	12-20-10 23:32
		Analyst:	KM	Analyst:	KM

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
111-84-2	*n*-Nonane (C_9)	50	23	47 %	50	14	27 % q	52 % q	30 - 140 %	25%
124-18-5	*n*-Decane (C_{10})	50	29	59 %	50	17	34 % q	54 % q	40 - 140 %	25%
112-40-3	*n*-Dodecane (C_{12})	50	34	67 %	50	20	39 % q	53 % q	40 - 140 %	25%
629-59-4	*n*-Tetradecane (C_{14})	50	36	71 %	50	22	45 %	46 % q	40 - 140 %	25%
544-76-3	*n*-Hexadecane (C_{16})	50	40	81 %	50	32	64 %	23 %	40 - 140 %	25%
593-45-3	*n*-Octadecane (C_{18})	50	47	93 %	50	41	81 %	14 %	40 - 140 %	25%
n/a	*n*-C9 to *n*-C18 Group	300	210	70 %	300	150	48 %	36 % q	40 - 140 %	25%
629-92-5	*n*-Nonadecane (C_{19})	50	48	97 %	50	42	85 %	13 %	40 - 140 %	25%
112-95-8	*n*-Eicosane (C_{20})	50	48	96 %	50	42	84 %	12 %	40 - 140 %	25%
629-97-0	*n*-Docosane (C_{22})	50	45	90 %	50	39	78 %	13 %	40 - 140 %	25%
646-31-1	*n*-Tetracosane (C_{24})	50	46	92 %	50	40	80 %	13 %	40 - 140 %	25%
630-01-3	*n*-Hexacosane (C_{26})	50	45	90 %	50	39	78 %	13 %	40 - 140 %	25%
630-02-4	*n*-Octacosane (C_{28})	50	44	89 %	50	39	78 %	13 %	40 - 140 %	25%
638-68-6	*n*-Triacontane (C_{30})	50	44	88 %	50	39	77 %	13 %	40 - 140 %	25%
630-06-8	*n*-Hexatriacontane (C_{36})	50	42	83 %	50	36	71 %	16 %	40 - 140 %	25%
n/a	*n*-C19 to *n*-C36 Group	400	360	90 %	400	320	79 %	13 %	40 - 140 %	25%
91-20-3	Naphthalene	50	34	67 %	50	23	47 %	36 % q	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	50	36	71 %	50	24	49 %	37 % q	40 - 140 %	25%
208-96-8	Acenaphthylene	50	41	82 %	50	32	64 %	25 %	40 - 140 %	25%
83-32-9	Acenaphthene	50	40	81 %	50	31	61 %	27 % q	40 - 140 %	25%
86-73-7	Fluorene	50	42	84 %	50	34	69 %	20 %	40 - 140 %	25%
85-01-8	Phenanthrene	50	48	96 %	50	41	82 %	15 %	40 - 140 %	25%
120-12-7	Anthracene	50	48	97 %	50	42	85 %	13 %	40 - 140 %	25%
206-44-0	Fluoranthene	50	51	102 %	50	46	92 %	10 %	40 - 140 %	25%
129-00-0	Pyrene	50	52	104 %	50	47	94 %	10 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	50	43	86 %	50	39	77 %	10 %	40 - 140 %	25%
218-01-9	Chrysene	50	51	102 %	50	47	94 %	8 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	50	47	94 %	50	43	86 %	9 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	50	50	99 %	50	46	92 %	8 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	50	50	100 %	50	46	92 %	9 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	50	50	99 %	50	46	91 %	9 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	50	52	103 %	50	48	96 %	7 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	50	51	103 %	50	46	92 %	11 %	40 - 140 %	25%
n/a	PAH Group	850	780	92 %	850	680	80 %	14 %	40 - 140 %	25%

QC Surrogate Compound		Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	40	39	97 %	40	36	90 %	40 - 140 %
	2-Bromonaphthalene	40	39	98 %	40	36	89 %	40 - 140 %
Extraction:	Chloro-octadecane	40	37	92 %	40	32	81 %	40 - 140 %
	ortho-Terphenyl	40	40	100 %	40	36	89 %	40 - 140 %

Fractionation Breakthrough Evaluation						QC Limits
91-20-3	Naphthalene	LCS	0 %	LCSD	0 %	5%
91-57-6	2-Methylnaphthalene	LCS	0 %	LCSD	0 %	5%

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Sample extraction performed by separatory funnel technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

The LCS and LCSD are prepared from separate source standards than those used for calibration.

q Recovery outside recommended limits.

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Quality Control Report
Method Blank

Category:	MA DEP EPH	Instrument ID:	GC-9 Agilent 6890
QC Batch ID:	EP-2373-F	Extracted:	12-20-10 11:30
Matrix:	Aqueous	Analyzed (AL):	12-21-10 00:16
		Analyzed (AR):	12-21-10 00:59
		Analyst:	KM

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	500
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	500
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	150
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	150

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	5
91-57-6	2-Methylnaphthalene	BRL		ug/L	5
85-01-8	Phenanthrene	BRL		ug/L	5
83-32-9	Acenaphthene	BRL		ug/L	5
208-96-8	Acenaphthylene	BRL		ug/L	5
86-73-7	Fluorene	BRL		ug/L	5
120-12-7	Anthracene	BRL		ug/L	5
206-44-0	Fluoranthene	BRL		ug/L	5
129-00-0	Pyrene	BRL		ug/L	5
56-55-3	Benzo[a]anthracene	BRL		ug/L	5
218-01-9	Chrysene	BRL		ug/L	5
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	5
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	5
50-32-8	Benzo[a]pyrene	BRL		ug/L	5
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	5
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	5
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	5

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	40	36	89 %	40 - 140 %
	2-Bromonaphthalene	40	34	86 %	40 - 140 %
Extraction:	Chloro-octadecane	40	37	93 %	40 - 140 %
	ortho-Terphenyl	40	37	92 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

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Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	MA DEP VPH	Instrument ID:	GC-10 HP 5890	Instrument ID:	GC-10 HP 5890
QC Batch ID:	VGA-4670-W	Analyzed:	06-01-10 12:14	Analyzed:	06-01-10 12:54
Matrix:	Aqueous	Analyst:	CRL	Analyst:	CRL
Units:	ug/L				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
109-66-0	*n*-Pentane	50	41	81 %	50	39	78 %	4 %	70 - 130 %	25%
107-83-5	2-Methylpentane	50	46	92 %	50	44	88 %	4 %	70 - 130 %	25%
540-84-1	2,2,4-Trimethylpentane	50	52	104 %	50	50	100 %	4 %	70 - 130 %	25%
n/a	Aliphatic Group 1	150	140	93 %	150	130	87 %	7 %	70 - 130 %	25%
111-84-2	*n*-Nonane	50	48	96 %	50	46	93 %	3 %	70 - 130 %	25%
124-18-5	*n*-Decane	50	47	95 %	50	46	91 %	4 %	70 - 130 %	25%
1678-93-9	*n*-Butylcyclohexane	50	50	100 %	50	46	91 %	9 %	70 - 130 %	25%
n/a	Aliphatic Group 2	150	150	100 %	150	140	93 %	7 %	70 - 130 %	25%
1634-04-4	Methyl *tert*-butyl Ether	50	54	107 %	50	53	106 %	1 %	70 - 130 %	25%
71-43-2	Benzene	50	53	107 %	50	53	105 %	1 %	70 - 130 %	25%
108-88-3	Toluene	50	55	109 %	50	54	108 %	1 %	70 - 130 %	25%
100-41-4	Ethylbenzene	50	54	108 %	50	53	107 %	1 %	70 - 130 %	25%
108-38-3 and 106-42-3	*meta*-Xylene and *para*-Xylene	100	110	110 %	100	110	110 %	0 %	70 - 130 %	25%
95-47-6	*ortho*- Xylene	50	55	109 %	50	54	108 %	1 %	70 - 130 %	25%
95-63-6	1,2,4-Trimethylbenzene	50	55	110 %	50	54	108 %	2 %	70 - 130 %	25%
91-20-3	Naphthalene	50	59	119 %	50	57	113 %	5 %	70 - 130 %	25%
n/a	Aromatic Group	450	490	109 %	450	490	109 %	0 %	70 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2,5-Dibromotoluene (PID)	50	49	98 %	50	45	90 %		70 - 130 %
2,5-Dibromotoluene (FID)	50	50	100 %	50	44	88 %		70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

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Quality Control Report
Method Blank

Category:	MA DEP VPH	Instrument ID:	GC-10 Agilent 6890
QC Batch ID:	VGA-4670-W	Analyzed:	06-01-10 13:35
Matrix:	Aqueous	Analyst:	CRL

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	BRL		ug/L	20
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	BRL		ug/L	20
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL		ug/L	20

Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL		ug/L	20
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL		ug/L	20

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	BRL		ug/L	5
71-43-2	Benzene ¤	BRL		ug/L	1
108-88-3	Toluene ¤	BRL		ug/L	5
100-41-4	Ethylbenzene ‡	BRL		ug/L	5
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		ug/L	5
95-47-6	*ortho*- Xylene ‡	BRL		ug/L	5
91-20-3	Naphthalene	BRL		ug/L	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	50	44	89 %	70 - 130 %
2,5-Dibromotoluene (FID)	50	44	88 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

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Quality Control Report
Laboratory Control Sample

Category:	**EPA Method 8011**	Instrument ID:	**GC-6 HP 5890**
QC Batch ID:	**PV-1010-E**	Extracted:	**12-21-10 10:30**
Matrix:	**Aqueous**	Analyzed:	**12-21-10 13:51**
Units:	**ug/L**	Analyst:	**CRL**

CAS Number	Analyte	Spiked	Measured		Recovery		QC Limits
			1st Column	2nd Column	1st Column	2nd Column	
106-93-4	1,2-Dibromoethane (EDB)	0.20	0.19	0.19	**95 %**	**97 %**	70 - 130 %
96-12-8	1,2-Dibromo-3-Chloropropane (DBCP)	0.20	0.19	0.20	**95 %**	**98 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

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Quality Control Report
Method Blank

Category:	**EPA Method 8011**	Instrument ID:	**GC-6 HP 5890**
QC Batch ID:	**PV-1010-E**	Extracted:	**12-21-10 10:30**
Matrix:	**Aqueous**	Analyzed:	**12-21-10 15:19**
		Analyst:	**CRL**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.02
96-12-8	1,2-Dibromo-3-Chloropropane (DBCP)	BRL		ug/L	0.02

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

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Quality Control Report
Laboratory Control Samples

Category: Metals
Matrix: Aqueous
Units: mg/L

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 6010B	MB-4275-WL	EPA 3010A	12-20-10 00:00	12-20-10 21:22	ICP-1 PE 3000	JK
LCS	EPA 7470A	MP-2349-WL	EPA 7470A	12-23-10 00:00	12-27-10 14:49	CVAA-1 PE FIMS	LMS
LCSD	EPA 6010B	MB-4275-WL	EPA 3010A	12-20-10 00:00	12-20-10 21:27	ICP-1 PE 3000	JK
LCSD	EPA 7470A	MP-2349-WL	EPA 7470A	12-23-10 00:00	12-27-10 14:52	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits		Method
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
7440-38-2	Arsenic	5.0	4.5	90%	5.0	4.2	83%	4 %	80-120 %	20 %	EPA 6010B
7440-39-3	Barium	5.0	4.4	88%	5.0	5.1	103%	8 %	80-120 %	20 %	EPA 6010B
7440-43-9	Cadmium	1.0	0.9	93%	1.0	0.9	87%	3 %	80-120 %	20 %	EPA 6010B
7440-47-3	Chromium	1.0	0.9	91%	1.0	0.9	86%	3 %	80-120 %	20 %	EPA 6010B
7439-92-1	Lead	5.0	4.8	96%	5.0	4.3	86%	5 %	80-120 %	20 %	EPA 6010B
7439-97-6	Mercury	0.0010	0.0011	106%	0.0010	0.0009	89%	9 %	80-120 %	20 %	EPA 7470A
7782-49-2	Selenium	5.0	4.4	88%	5.0	4.1	82%	4 %	80-120 %	20 %	EPA 6010B
7440-22-4	Silver	0.5	0.5	104%	0.5	0.6	118%	6 %	80-120 %	20 %	EPA 6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **Metals**
Matrix: **Aqueous**

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 6010B	MB-4275-WB	EPA 3010A	12-20-10 00:00	50 mL	ICP-1 PE 3000	JK
EPA 7470A	MP-2349-WB	EPA 7470A	12-23-10 00:00	25 mL	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic	BRL		mg/L	0.01	1	12-20-10 21:17	EPA 6010B
7440-39-3	Barium	BRL		mg/L	0.05	1	12-20-10 21:17	EPA 6010B
7440-43-9	Cadmium	BRL		mg/L	0.004	1	12-20-10 21:17	EPA 6010B
7440-47-3	Chromium	BRL		mg/L	0.01	1	12-20-10 21:17	EPA 6010B
7439-92-1	Lead	BRL		mg/L	0.005	1	12-20-10 21:17	EPA 6010B
7439-97-6	Mercury	BRL		mg/L	0.0002	1	12-27-10 14:49	EPA 7470A
7782-49-2	Selenium	BRL		mg/L	0.05	1	12-20-10 21:17	EPA 6010B
7440-22-4	Silver	BRL		mg/L	0.007	1	12-20-10 21:17	EPA 6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	EPA Method 8260B	Instrument ID:	MS-10 HP 6890	Instrument ID:	MS-10 HP 6890
QC Batch ID:	VM10-1214-W	Analyzed:	12-20-10 07:17	Analyzed:	12-20-10 07:40
Matrix:	Aqueous	Analyst:	LMG	Analyst:	LMG
Units:	ug/L				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
75-71-8	Dichlorodifluoromethane	10	11	108 %	10	11	107 %	2 %	70 - 130 %	20%
74-87-3	Chloromethane	10	9.3	93 %	10	9.3	93 %	0 %	70 - 130 %	20%
75-01-4	Vinyl Chloride	10	9.4	94 %	10	9.2	92 %	2 %	70 - 130 %	20%
74-83-9	Bromomethane	10	11	106 %	10	11	106 %	0 %	70 - 130 %	20%
75-00-3	Chloroethane	10	10	100 %	10	9.5	95 %	5 %	70 - 130 %	20%
75-69-4	Trichlorofluoromethane	10	12	120 %	10	12	119 %	1 %	70 - 130 %	20%
60-29-7	Diethyl Ether	20	20	98 %	20	20	100 %	2 %	70 - 130 %	20%
75-35-4	1,1-Dichloroethene	10	10	102 %	10	10	103 %	0 %	70 - 130 %	20%
76-13-1	1,1,2-Trichlorotrifluoroethane	20	23	115 %	20	23	117 %	2 %	70 - 130 %	20%
67-64-1	Acetone	20	18	88 %	20	18	88 %	0 %	70 - 130 %	20%
75-15-0	Carbon Disulfide	20	21	106 %	20	21	106 %	0 %	70 - 130 %	20%
75-09-2	Methylene Chloride	10	10	103 %	10	9.5	95 %	8 %	70 - 130 %	20%
107-13-1	Acrylonitrile	10	9.4	94 %	10	9.8	98 %	4 %	70 - 130 %	20%
156-60-5	*trans*-1,2-Dichloroethene	10	10	103 %	10	10	104 %	1 %	70 - 130 %	20%
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	10	10	100 %	10	10	103 %	2 %	70 - 130 %	20%
75-34-3	1,1-Dichloroethane	10	9.6	96 %	10	9.9	99 %	2 %	70 - 130 %	20%
594-20-7	2,2-Dichloropropane	10	11	106 %	10	11	108 %	3 %	70 - 130 %	20%
156-59-2	*cis*-1,2-Dichloroethene	10	11	106 %	10	11	107 %	1 %	70 - 130 %	20%
78-93-3	2-Butanone (MEK)	20	18	88 %	20	17	87 %	1 %	70 - 130 %	20%
74-97-5	Bromochloromethane	10	11	111 %	10	11	109 %	2 %	70 - 130 %	20%
109-99-9	Tetrahydrofuran (THF)	20	20	101 %	20	20	98 %	3 %	70 - 130 %	20%
67-66-3	Chloroform	10	10	102 %	10	10	104 %	2 %	70 - 130 %	20%
71-55-6	1,1,1-Trichloroethane	10	10	103 %	10	10	104 %	1 %	70 - 130 %	20%
56-23-5	Carbon Tetrachloride	10	10	104 %	10	10	104 %	0 %	70 - 130 %	20%
563-58-6	1,1-Dichloropropene	10	10	100 %	10	9.9	99 %	0 %	70 - 130 %	20%
71-43-2	Benzene	10	10	102 %	10	10	103 %	1 %	70 - 130 %	20%
107-06-2	1,2-Dichloroethane	10	9.7	97 %	10	9.9	99 %	2 %	70 - 130 %	20%
79-01-6	Trichloroethene	10	9.8	98 %	10	10	100 %	1 %	70 - 130 %	20%
78-87-5	1,2-Dichloropropane	10	9.7	97 %	10	9.9	99 %	2 %	70 - 130 %	20%
74-95-3	Dibromomethane	10	10	102 %	10	10	103 %	1 %	70 - 130 %	20%
75-27-4	Bromodichloromethane	10	10	104 %	10	10	102 %	2 %	70 - 130 %	20%
123-91-1	1,4-Dioxane	200	180	89 %	200	200	101 %	12 %	70 - 130 %	20%
10061-01-5	*cis*-1,3-Dichloropropene	10	9.2	92 %	10	9.3	93 %	2 %	70 - 130 %	20%
108-10-1	4-Methyl-2-Pentanone (MIBK)	20	20	102 %	20	21	104 %	2 %	70 - 130 %	20%
108-88-3	Toluene	10	11	106 %	10	10	104 %	1 %	70 - 130 %	20%
10061-02-6	*trans*-1,3-Dichloropropene	10	9.7	97 %	10	9.8	98 %	1 %	70 - 130 %	20%
79-00-5	1,1,2-Trichloroethane	10	11	113 %	10	11	111 %	2 %	70 - 130 %	20%
127-18-4	Tetrachloroethene	10	13	126 %	10	11	112 %	12 %	70 - 130 %	20%
142-28-9	1,3-Dichloropropane	10	11	110 %	10	11	110 %	0 %	70 - 130 %	20%
591-78-6	2-Hexanone	20	22	112 %	20	23	114 %	2 %	70 - 130 %	20%
124-48-1	Dibromochloromethane	10	12	121 %	10	12	122 %	0 %	70 - 130 %	20%
106-93-4	1,2-Dibromoethane (EDB)	10	12	119 %	10	12	118 %	1 %	70 - 130 %	20%
108-90-7	Chlorobenzene	10	11	114 %	10	11	113 %	1 %	70 - 130 %	20%
630-20-6	1,1,1,2-Tetrachloroethane	10	12	120 %	10	12	121 %	1 %	70 - 130 %	20%
100-41-4	Ethylbenzene	10	12	118 %	10	12	117 %	1 %	70 - 130 %	20%
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	20	24	122 %	20	24	119 %	2 %	70 - 130 %	20%
95-47-6	*ortho*-Xylene	10	12	118 %	10	12	116 %	2 %	70 - 130 %	20%
100-42-5	Styrene	10	12	122 %	10	12	122 %	0 %	70 - 130 %	20%
75-25-2	Bromoform	10	11	110 %	10	11	112 %	2 %	70 - 130 %	20%

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	EPA Method 8260B	Instrument ID:	MS-10 HP 6890	Instrument ID:	MS-10 HP 6890
QC Batch ID:	VM10-1214-W	Analyzed:	12-20-10 07:17	Analyzed:	12-20-10 07:40
Matrix:	Aqueous	Analyst:	LMG	Analyst:	LMG
Units:	ug/L				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
98-82-8	Isopropylbenzene	10	9.2	92 %	10	9.2	92 %	0 %	70 - 130 %	20%
108-86-1	Bromobenzene	10	11	108 %	10	11	109 %	1 %	70 - 130 %	20%
79-34-5	1,1,2,2-Tetrachloroethane	10	11	105 %	10	10	104 %	1 %	70 - 130 %	20%
96-18-4	1,2,3-Trichloropropane	10	11	107 %	10	10	103 %	4 %	70 - 130 %	20%
110-57-6	*trans*-1,4-Dichloro-2-butene	200	250	126 %	200	250	124 %	1 %	70 - 130 %	20%
103-65-1	*n*-Propylbenzene	10	11	107 %	10	10	104 %	3 %	70 - 130 %	20%
95-49-8	2-Chlorotoluene	10	11	108 %	10	11	106 %	2 %	70 - 130 %	20%
108-67-8	1,3,5-Trimethylbenzene	10	11	109 %	10	11	106 %	3 %	70 - 130 %	20%
106-43-4	4-Chlorotoluene	10	11	105 %	10	10	103 %	2 %	70 - 130 %	20%
98-06-6	*tert*-Butylbenzene	10	11	106 %	10	10	103 %	3 %	70 - 130 %	20%
95-63-6	1,2,4-Trimethylbenzene	10	12	116 %	10	11	112 %	3 %	70 - 130 %	20%
135-98-8	*sec*-Butylbenzene	10	11	108 %	10	11	105 %	3 %	70 - 130 %	20%
541-73-1	1,3-Dichlorobenzene	10	11	105 %	10	11	106 %	0 %	70 - 130 %	20%
99-87-6	4-Isopropyltoluene	10	11	112 %	10	11	110 %	2 %	70 - 130 %	20%
106-46-7	1,4-Dichlorobenzene	10	10	104 %	10	10	102 %	3 %	70 - 130 %	20%
95-50-1	1,2-Dichlorobenzene	10	11	107 %	10	11	105 %	1 %	70 - 130 %	20%
104-51-8	*n*-Butylbenzene	10	11	112 %	10	11	110 %	2 %	70 - 130 %	20%
96-12-8	1,2-Dibromo-3-chloropropane	10	10	105 %	10	11	105 %	0 %	70 - 130 %	20%
108-70-3	1,3,5-Trichlorobenzene	10	11	113 %	10	11	112 %	0 %	70 - 130 %	20%
120-82-1	1,2,4-Trichlorobenzene	10	12	117 %	10	12	115 %	2 %	70 - 130 %	20%
87-68-3	Hexachlorobutadiene	10	12	119 %	10	11	114 %	4 %	70 - 130 %	20%
91-20-3	Naphthalene	10	11	106 %	10	11	106 %	0 %	70 - 130 %	20%
87-61-6	1,2,3-Trichlorobenzene	10	12	122 %	10	12	119 %	2 %	70 - 130 %	20%
75-65-0	*tert*-Butyl Alcohol (TBA)	200	180	89 %	200	190	95 %	7 %	70 - 130 %	20%
108-20-3	Di-isopropyl Ether (DIPE)	10	8.1	81 %	10	8.2	82 %	2 %	70 - 130 %	20%
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	10	8.2	82 %	10	8.3	83 %	1 %	70 - 130 %	20%
994-05-8	*tert*-Amyl Methyl Ether (TAME)	10	8.5	85 %	10	8.2	82 %	4 %	70 - 130 %	20%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
Dibromofluoromethane	10	12	118 %	10	12	122 %		70 - 130 %
1,2-Dichloroethane-d_4	10	11	110 %	10	11	113 %		70 - 130 %
Toluene-d_8	10	12	118 %	10	12	123 %		70 - 130 %
4-Bromofluorobenzene	10	11	113 %	10	11	114 %		70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: EPA Method 8260B
QC Batch ID: VM10-1214-W
Matrix: Aqueous

Instrument ID: **MS-10 HP 6890**
Analyzed: **12-20-10 08:03**
Analyst: **LMG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	0.5
74-87-3	Chloromethane	BRL		ug/L	0.5
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
74-83-9	Bromomethane	BRL		ug/L	0.5
75-00-3	Chloroethane	BRL		ug/L	0.5
75-69-4	Trichlorofluoromethane	BRL		ug/L	0.5
60-29-7	Diethyl Ether	BRL		ug/L	2
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	5
67-64-1	Acetone	BRL		ug/L	10
75-15-0	Carbon Disulfide	BRL		ug/L	5
75-09-2	Methylene Chloride	BRL		ug/L	3
107-13-1	Acrylonitrile	BRL		ug/L	3
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/L	0.5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
594-20-7	2,2-Dichloropropane	BRL		ug/L	0.5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL		ug/L	5
74-97-5	Bromochloromethane	BRL		ug/L	0.5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	5
67-66-3	Chloroform	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
563-58-6	1,1-Dichloropropene	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL		ug/L	0.5
74-95-3	Dibromomethane	BRL		ug/L	0.5
75-27-4	Bromodichloromethane	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/L	0.4
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	5
108-88-3	Toluene	BRL		ug/L	0.5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/L	0.4
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
142-28-9	1,3-Dichloropropane	BRL		ug/L	0.5
591-78-6	2-Hexanone	BRL		ug/L	5
124-48-1	Dibromochloromethane	BRL		ug/L	0.5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.5
108-90-7	Chlorobenzene	BRL		ug/L	0.5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	0.5
100-41-4	Ethylbenzene	BRL		ug/L	0.5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/L	0.5
95-47-6	*ortho*-Xylene	BRL		ug/L	0.5
100-42-5	Styrene	BRL		ug/L	0.5
75-25-2	Bromoform	BRL		ug/L	0.5

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8260B**	Instrument ID:	**MS-10 HP 6890**
QC Batch ID:	**VM10-1214-W**	Analyzed:	**12-20-10 08:03**
Matrix:	**Aqueous**	Analyst:	**LMG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
98-82-8	Isopropylbenzene	BRL		ug/L	0.5
108-86-1	Bromobenzene	BRL		ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	0.5
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	0.5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/L	25
103-65-1	*n*-Propylbenzene	BRL		ug/L	0.5
95-49-8	2-Chlorotoluene	BRL		ug/L	0.5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/L	0.5
106-43-4	4-Chlorotoluene	BRL		ug/L	0.5
98-06-6	*tert*-Butylbenzene	BRL		ug/L	0.5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/L	0.5
135-98-8	*sec*-Butylbenzene	BRL		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
99-87-6	4-Isopropyltoluene	BRL		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
104-51-8	*n*-Butylbenzene	BRL		ug/L	0.5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	0.5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/L	0.5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	0.5
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
91-20-3	Naphthalene	BRL		ug/L	3
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	0.5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	20
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	0.5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	0.5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	12	**118** %	70 - 130 %
1,2-Dichloroethane-d_4	10	12	**116** %	70 - 130 %
Toluene-d_8	10	12	**124** %	70 - 130 %
4-Bromofluorobenzene	10	11	**111** %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	EPA Method 8260B	Instrument ID:	MS-10 HP 6890	Instrument ID:	MS-10 HP 6890
QC Batch ID:	VM10-1215-W	Analyzed:	12-21-10 07:00	Analyzed:	12-21-10 07:23
Matrix:	Aqueous	Analyst:	LMG	Analyst:	LMG
Units:	ug/L				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
75-71-8	Dichlorodifluoromethane	10	10	101 %	10	10	101 %	0 %	70 - 130 %	20%
74-87-3	Chloromethane	10	9.1	91 %	10	9.0	90 %	2 %	70 - 130 %	20%
75-01-4	Vinyl Chloride	10	9.3	93 %	10	8.9	89 %	5 %	70 - 130 %	20%
74-83-9	Bromomethane	10	10	105 %	10	10	103 %	2 %	70 - 130 %	20%
75-00-3	Chloroethane	10	9.5	95 %	10	9.5	95 %	0 %	70 - 130 %	20%
75-69-4	Trichlorofluoromethane	10	8.1	81 %	10	11	110 %	31 % q	70 - 130 %	20%
60-29-7	Diethyl Ether	20	20	98 %	20	20	98 %	0 %	70 - 130 %	20%
75-35-4	1,1-Dichloroethene	10	9.7	97 %	10	9.7	97 %	0 %	70 - 130 %	20%
76-13-1	1,1,2-Trichlorotrifluoroethane	20	22	110 %	20	22	109 %	1 %	70 - 130 %	20%
67-64-1	Acetone	20	18	90 %	20	17	87 %	3 %	70 - 130 %	20%
75-15-0	Carbon Disulfide	20	20	100 %	20	20	99 %	1 %	70 - 130 %	20%
75-09-2	Methylene Chloride	10	9.9	99 %	10	9.7	97 %	2 %	70 - 130 %	20%
107-13-1	Acrylonitrile	10	9.6	96 %	10	9.6	96 %	1 %	70 - 130 %	20%
156-60-5	*trans*-1,2-Dichloroethene	10	10	101 %	10	10	100 %	1 %	70 - 130 %	20%
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	10	10	102 %	10	10	103 %	1 %	70 - 130 %	20%
75-34-3	1,1-Dichloroethane	10	9.5	95 %	10	9.6	96 %	2 %	70 - 130 %	20%
594-20-7	2,2-Dichloropropane	10	9.9	99 %	10	10	103 %	3 %	70 - 130 %	20%
156-59-2	*cis*-1,2-Dichloroethene	10	11	105 %	10	10	103 %	2 %	70 - 130 %	20%
78-93-3	2-Butanone (MEK)	20	17	86 %	20	17	87 %	1 %	70 - 130 %	20%
74-97-5	Bromochloromethane	10	11	109 %	10	11	111 %	2 %	70 - 130 %	20%
109-99-9	Tetrahydrofuran (THF)	20	21	103 %	20	20	99 %	4 %	70 - 130 %	20%
67-66-3	Chloroform	10	10	102 %	10	10	101 %	1 %	70 - 130 %	20%
71-55-6	1,1,1-Trichloroethane	10	10	100 %	10	10	100 %	0 %	70 - 130 %	20%
56-23-5	Carbon Tetrachloride	10	9.7	97 %	10	9.9	99 %	2 %	70 - 130 %	20%
563-58-6	1,1-Dichloropropene	10	9.6	96 %	10	9.5	95 %	0 %	70 - 130 %	20%
71-43-2	Benzene	10	10	100 %	10	10	100 %	0 %	70 - 130 %	20%
107-06-2	1,2-Dichloroethane	10	9.7	97 %	10	9.5	95 %	2 %	70 - 130 %	20%
79-01-6	Trichloroethene	10	9.6	96 %	10	9.6	96 %	0 %	70 - 130 %	20%
78-87-5	1,2-Dichloropropane	10	9.9	99 %	10	9.7	97 %	2 %	70 - 130 %	20%
74-95-3	Dibromomethane	10	10	102 %	10	10	100 %	2 %	70 - 130 %	20%
75-27-4	Bromodichloromethane	10	10	102 %	10	9.9	99 %	3 %	70 - 130 %	20%
123-91-1	1,4-Dioxane	200	180	90 %	200	150	76 %	16 %	70 - 130 %	20%
10061-01-5	*cis*-1,3-Dichloropropene	10	8.9	89 %	10	8.8	88 %	1 %	70 - 130 %	20%
108-10-1	4-Methyl-2-Pentanone (MIBK)	20	20	101 %	20	20	100 %	1 %	70 - 130 %	20%
108-88-3	Toluene	10	10	103 %	10	10	101 %	2 %	70 - 130 %	20%
10061-02-6	*trans*-1,3-Dichloropropene	10	8.4	84 %	10	8.6	86 %	2 %	70 - 130 %	20%
79-00-5	1,1,2-Trichloroethane	10	10	102 %	10	10	100 %	2 %	70 - 130 %	20%
127-18-4	Tetrachloroethene	10	11	113 %	10	11	112 %	1 %	70 - 130 %	20%
142-28-9	1,3-Dichloropropane	10	10	101 %	10	10	100 %	0 %	70 - 130 %	20%
591-78-6	2-Hexanone	20	21	104 %	20	20	100 %	4 %	70 - 130 %	20%
124-48-1	Dibromochloromethane	10	11	107 %	10	11	105 %	2 %	70 - 130 %	20%
106-93-4	1,2-Dibromoethane (EDB)	10	11	106 %	10	11	106 %	1 %	70 - 130 %	20%
108-90-7	Chlorobenzene	10	10	102 %	10	10	101 %	2 %	70 - 130 %	20%
630-20-6	1,1,1,2-Tetrachloroethane	10	11	106 %	10	11	107 %	0 %	70 - 130 %	20%
100-41-4	Ethylbenzene	10	10	103 %	10	10	103 %	1 %	70 - 130 %	20%
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	20	22	109 %	20	21	107 %	2 %	70 - 130 %	20%
95-47-6	*ortho*-Xylene	10	11	106 %	10	10	105 %	1 %	70 - 130 %	20%
100-42-5	Styrene	10	11	108 %	10	11	107 %	1 %	70 - 130 %	20%
75-25-2	Bromoform	10	9.7	97 %	10	9.5	95 %	2 %	70 - 130 %	20%

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	EPA Method 8260B	Instrument ID:	MS-10 HP 6890	Instrument ID:	MS-10 HP 6890
QC Batch ID:	VM10-1215-W	Analyzed:	12-21-10 07:00	Analyzed:	12-21-10 07:23
Matrix:	Aqueous	Analyst:	LMG	Analyst:	LMG
Units:	ug/L				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
98-82-8	Isopropylbenzene	10	9.0	90 %	10	8.7	87 %	4 %	70 - 130 %	20%
108-86-1	Bromobenzene	10	11	107 %	10	11	106 %	1 %	70 - 130 %	20%
79-34-5	1,1,2,2-Tetrachloroethane	10	10	103 %	10	10	101 %	1 %	70 - 130 %	20%
96-18-4	1,2,3-Trichloropropane	10	10	102 %	10	10	102 %	0 %	70 - 130 %	20%
110-57-6	*trans*-1,4-Dichloro-2-butene	200	250	124 %	200	240	119 %	3 %	70 - 130 %	20%
103-65-1	*n*-Propylbenzene	10	10	102 %	10	9.9	99 %	3 %	70 - 130 %	20%
95-49-8	2-Chlorotoluene	10	11	106 %	10	10	102 %	4 %	70 - 130 %	20%
108-67-8	1,3,5-Trimethylbenzene	10	11	105 %	10	10	102 %	3 %	70 - 130 %	20%
106-43-4	4-Chlorotoluene	10	10	102 %	10	10	100 %	2 %	70 - 130 %	20%
98-06-6	*tert*-Butylbenzene	10	10	102 %	10	9.8	98 %	4 %	70 - 130 %	20%
95-63-6	1,2,4-Trimethylbenzene	10	11	110 %	10	11	108 %	2 %	70 - 130 %	20%
135-98-8	*sec*-Butylbenzene	10	10	102 %	10	9.9	99 %	3 %	70 - 130 %	20%
541-73-1	1,3-Dichlorobenzene	10	10	103 %	10	10	102 %	2 %	70 - 130 %	20%
99-87-6	4-Isopropyltoluene	10	11	107 %	10	10	104 %	3 %	70 - 130 %	20%
106-46-7	1,4-Dichlorobenzene	10	10	103 %	10	10	100 %	3 %	70 - 130 %	20%
95-50-1	1,2-Dichlorobenzene	10	10	105 %	10	10	103 %	2 %	70 - 130 %	20%
104-51-8	*n*-Butylbenzene	10	11	105 %	10	10	102 %	3 %	70 - 130 %	20%
96-12-8	1,2-Dibromo-3-chloropropane	10	10	103 %	10	9.8	98 %	5 %	70 - 130 %	20%
108-70-3	1,3,5-Trichlorobenzene	10	11	107 %	10	11	107 %	1 %	70 - 130 %	20%
120-82-1	1,2,4-Trichlorobenzene	10	11	113 %	10	11	112 %	1 %	70 - 130 %	20%
87-68-3	Hexachlorobutadiene	10	11	110 %	10	11	108 %	1 %	70 - 130 %	20%
91-20-3	Naphthalene	10	10	104 %	10	10	102 %	2 %	70 - 130 %	20%
87-61-6	1,2,3-Trichlorobenzene	10	12	118 %	10	12	118 %	0 %	70 - 130 %	20%
75-65-0	*tert*-Butyl Alcohol (TBA)	200	180	89 %	200	170	85 %	5 %	70 - 130 %	20%
108-20-3	Di-isopropyl Ether (DIPE)	10	8.2	82 %	10	8.2	82 %	0 %	70 - 130 %	20%
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	10	8.2	82 %	10	8.3	83 %	1 %	70 - 130 %	20%
994-05-8	*tert*-Amyl Methyl Ether (TAME)	10	8.0	80 %	10	8.2	82 %	2 %	70 - 130 %	20%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
Dibromofluoromethane	10	12	119 %	10	12	121 %		70 - 130 %
1,2-Dichloroethane-d_4	10	11	112 %	10	11	113 %		70 - 130 %
Toluene-d_8	10	12	118 %	10	12	121 %		70 - 130 %
4-Bromofluorobenzene	10	11	112 %	10	11	111 %		70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

q Recovery outside recommended limits.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	EPA Method 8260B	Instrument ID:	MS-10 HP 6890
QC Batch ID:	VM10-1215-W	Analyzed:	12-21-10 08:10
Matrix:	Aqueous	Analyst:	LMG

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	0.5
74-87-3	Chloromethane	BRL		ug/L	0.5
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
74-83-9	Bromomethane	BRL		ug/L	0.5
75-00-3	Chloroethane	BRL		ug/L	0.5
75-69-4	Trichlorofluoromethane	BRL		ug/L	0.5
60-29-7	Diethyl Ether	BRL		ug/L	2
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	5
67-64-1	Acetone	BRL		ug/L	10
75-15-0	Carbon Disulfide	BRL		ug/L	5
75-09-2	Methylene Chloride	BRL		ug/L	3
107-13-1	Acrylonitrile	BRL		ug/L	3
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/L	0.5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
594-20-7	2,2-Dichloropropane	BRL		ug/L	0.5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL		ug/L	5
74-97-5	Bromochloromethane	BRL		ug/L	0.5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	5
67-66-3	Chloroform	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
563-58-6	1,1-Dichloropropene	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL		ug/L	0.5
74-95-3	Dibromomethane	BRL		ug/L	0.5
75-27-4	Bromodichloromethane	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/L	0.4
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	5
108-88-3	Toluene	BRL		ug/L	0.5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/L	0.4
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
142-28-9	1,3-Dichloropropane	BRL		ug/L	0.5
591-78-6	2-Hexanone	BRL		ug/L	5
124-48-1	Dibromochloromethane	BRL		ug/L	0.5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.5
108-90-7	Chlorobenzene	BRL		ug/L	0.5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	0.5
100-41-4	Ethylbenzene	BRL		ug/L	0.5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/L	0.5
95-47-6	*ortho*-Xylene	BRL		ug/L	0.5
100-42-5	Styrene	BRL		ug/L	0.5
75-25-2	Bromoform	BRL		ug/L	0.5

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	EPA Method 8260B	Instrument ID:	MS-10 HP 6890
QC Batch ID:	VM10-1215-W	Analyzed:	12-21-10 08:10
Matrix:	Aqueous	Analyst:	LMG

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
98-82-8	Isopropylbenzene	BRL		ug/L	0.5
108-86-1	Bromobenzene	BRL		ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	0.5
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	0.5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/L	25
103-65-1	*n*-Propylbenzene	BRL		ug/L	0.5
95-49-8	2-Chlorotoluene	BRL		ug/L	0.5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/L	0.5
106-43-4	4-Chlorotoluene	BRL		ug/L	0.5
98-06-6	*tert*-Butylbenzene	BRL		ug/L	0.5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/L	0.5
135-98-8	*sec*-Butylbenzene	BRL		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
99-87-6	4-Isopropyltoluene	BRL		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
104-51-8	*n*-Butylbenzene	BRL		ug/L	0.5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	0.5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/L	0.5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	0.5
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
91-20-3	Naphthalene	BRL		ug/L	0.5
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	0.5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	20
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	0.5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	0.5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	12	116 %	70 - 130 %
1,2-Dichloroethane-d_4	10	12	118 %	70 - 130 %
Toluene-d_8	10	12	122 %	70 - 130 %
4-Bromofluorobenzene	10	11	110 %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states.
Copies of our current certificates may be obtained from our website:

http://www.groundwateranalytical.com/qualifications.htm

CONNECTICUT

Department of Health Services, PH-0586 — Potable Water, Wastewater, Solid Waste and Soil
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/Out_State.pdf

MASSACHUSETTS

Department of Environmental Protection, M-MA-103 — Potable Water and Non-Potable Water
http://public.dep.state.ma.us/labcert/labcert.aspx

Department of Labor,
Division of Occupational Safety, AA000195 — Asbestos Analytical Services, Class A
http://www.mass.gov/dos/forms/la-rpt_list_aa.pdf

NEW HAMPSHIRE

Department of Environmental Services, 202708 — Potable Water, Non-Potable Water, Solid and Chemical Materials
http://www4.egov.nh.gov/DES/NHELAP

NEW YORK

Department of Health, 11754 — Potable Water, Non-Potable Water, Solid and Hazardous Waste
http://www.wadsworth.org/labcert/elap/comm.html

RHODE ISLAND

Department of Health,
Division of Laboratories, LAO00054 — Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry
http://www.health.ri.gov/labs/outofstatelabs.pdf

U.S. DEPARTMENT OF AGRICULTURE

USDA, Soil Permit, S-53921 — Foreign soil import permit

VERMONT

Department of Health, VT-87643 — Potable Water
http://healthvermont.gov/enviro/ph_lab/water_test.aspx#cert

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS — **Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Potable Water (Drinking Water)

Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Alkalinity, Total	SM 2320-B
Antimony	EPA 200.8
Arsenic	EPA 200.8
Barium	EPA 200.7
Barium	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G
Chromium	EPA 200.7
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G
Fecal Coliform (Source Water)	MF SM 9222-D
Fluoride	EPA 300.0
Fluoride	SM 4500-F-C
Haloacetic Acids	EPA 552.2
Heterotrophic Plate Count	SM 9215-B
Lead	EPA 200.8
Mercury	EPA 245.1
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Nitrite-N	EPA 300.0
Nitrite-N	Lachat 10-107-04-1-C
pH	SM 4500-H-B
Selenium	EPA 200.8
Silver	EPA 200.7
Silver	EPA 200.8
Sodium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.8
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223
Total Coliform (Treatment and Distribution)	MF SM 9222-B
Total Dissolved Solids	SM 2540-C
Trihalomethanes	EPA 524.2
Turbidity	SM 2130-B
Volatile Organic Compounds	EPA 524.2

Non-Potable Water (Wastewater)

Analyte	Method
Aldrin	EPA 608
Alkalinity, Total	SM 2320-B
Alpha-BHC	EPA 608
Aluminum	EPA 200.7

Non-Potable Water (Wastewater)

Analyte	Method
Aluminum	EPA 200.8
Ammonia-N	Lachat 10-107-06-1-B
Antimony	EPA 200.7
Antimony	EPA 200.8
Arsenic	EPA 200.7
Arsenic	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Beta-BHC	EPA 608
Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chemical Oxygen Demand	SM 5220-D
Chlordane	EPA 608
Chloride	EPA 300.0
Chlorine, Total Residual	SM 4500-CL-G
Chromium	EPA 200.7
Chromium	EPA 200.8
Cobalt	EPA 200.7
Cobalt	EPA 200.8
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
DDD	EPA 608
DDE	EPA 608
DDT	EPA 608
Delta-BHC	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan II	EPA 608
Endosulfan Sulfate	EPA 608
Endrin	EPA 608
Endrin Aldehyde	EPA 608
Gamma-BHC	EPA 608
Hardness (CaCO3), Total	EPA 200.7
Hardness (CaCO3), Total	SM 2340-B
Heptachlor	EPA 608
Heptachlor Epoxide	EPA 608
Iron	EPA 200.7
Kjeldahl-N	Lachat 10-107-06-02-D
Lead	EPA 200.7
Magnesium	EPA 200.7
Manganese	EPA 200.7
Manganese	EPA 200.8
Mercury	EPA 245.1
Molybdenum	EPA 200.7
Molybdenum	EPA 200.8
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Non-Filterable Residue	SM 2540-D
Oil and Grease	EPA 1664

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS	Department of Environmental Protection, M-MA-103

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Non-Potable Water (Wastewater)

Analyte	Method
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.8
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
SVOC-Acid Extractables	EPA 625
SVOC-Base/Neutral Extractables	EPA 625
Thallium	EPA 200.7
Thallium	EPA 200.8
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Toxaphene	EPA 608
Vanadium	EPA 200.7
Vanadium	EPA 200.8
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7
Zinc	EPA 200.8

Attachment VI – Photo Log

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Cumberland Farms, Inc.	Facility # 1185031, 1650 Commonwealth Drive, Brighton, MA	60188925

Photo No.	Date:
1	1/5/11

Direction Photo Taken:

From above

Description:

Coal Ash Evidence

MW-3 (1-2 feet below surface grade)

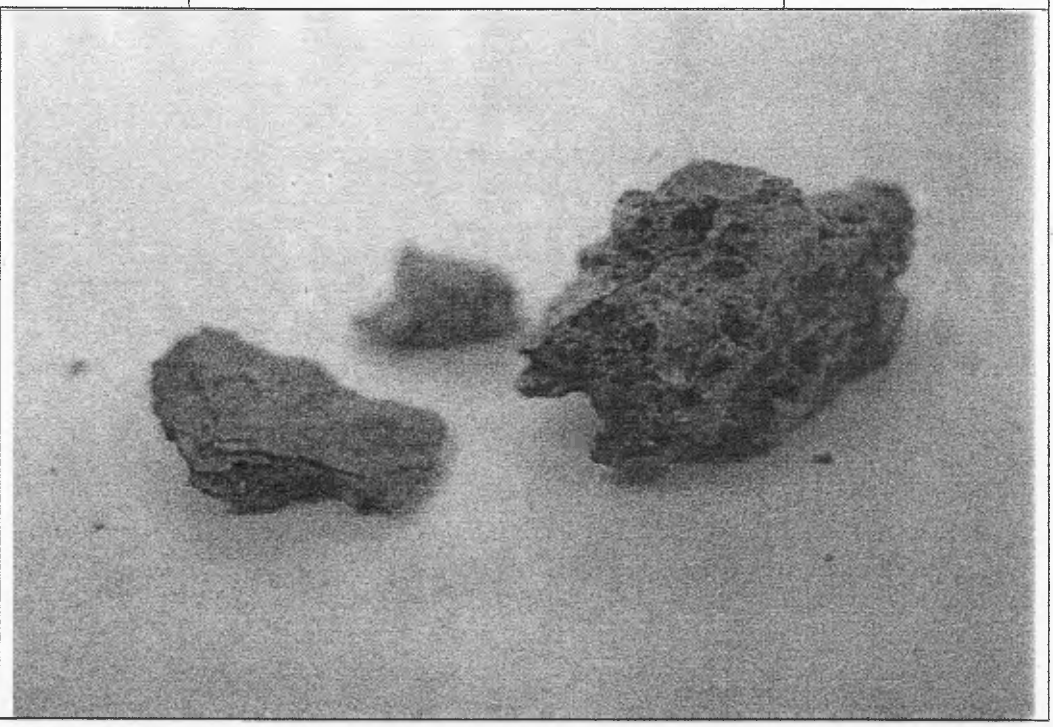

Photo No.	Date:
2	1/5/11

Direction Photo Taken:

From Above

Description:

Coal Ash Evidence (size reference)

MW-3 (1-2 feet below surface grade)

GROUNDWATER ANALYTICAL

EPA Method 8011 (Modified)
EDB by GC/ECD

Field ID:	**MW-3 (1-2)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**120 mL Amber Glass**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138511-08**	QC Batch ID:	**PV-0223-S**
Sampled:	**12-10-10 12:00**	Instrument ID:	**GC-5 HP 5890**
Received:	**12-10-10 17:45**	Sample Weight:	**5.3 g**
Extracted:	**12-14-10 17:00**	Final Volume:	**1 mL**
Analyzed:	**12-15-10 23:26**	Percent Solids:	**92**
Analyst:	**CRL**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	2.1

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	1,1,1,2-Tetrachloroethane	4.1	3.8	**93 %**	70 - 130 %
Second Column	1,1,1,2-Tetrachloroethane	4.1	3.8	**93 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Modified with guidance from "Determination of 1,2-Dibromoethane (EDB) in Field Soils: Implications for Volatile Organic Compounds," B.L. Sawhney, J.J. Pignatello, and S.M. Steinberg, Journal of Environmental Quality, Vol. 17, No. 1, January - March 1988. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

EPA Method 8011 (Modified)
EDB by GC/ECD

Field ID:	SB -01 (4)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	120 mL Amber Glass
Client:	AECOM Environment	Preservation:	Cool
Laboratory ID:	138511-09	QC Batch ID:	PV-0223-S
Sampled:	12-10-10 13:00	Instrument ID:	GC-5 HP 5890
Received:	12-10-10 17:45	Sample Weight:	5.5 g
Extracted:	12-14-10 17:00	Final Volume:	1 mL
Analyzed:	12-16-10 00:19	Percent Solids:	92
Analyst:	CRL	Dilution Factor:	1

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	2.0

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	1,1,1,2-Tetrachloroethane	4.0	3.6	91 %	70 - 130 %
Second Column	1,1,1,2-Tetrachloroethane	4.0	3.6	92 %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Modified with guidance from "Determination of 1,2-Dibromoethane (EDB) in Field Soils: Implications for Volatile Organic Compounds," B.L. Sawhney, J.J. Pignatello, and S.M. Steinberg, Journal of Environmental Quality, Vol. 17, No. 1, January - March 1988. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**MW-1 (1)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**120 mL Amber Glass**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138511-07**	QC Batch ID:	**PB-3651-P**
Sampled:	**12-10-10 09:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**12-10-10 17:45**	Sample Weight:	**16 g**
Extracted:	**12-13-10 18:00**	Final Volume:	**1 mL**
Cleaned Up:	**12-13-10 21:30**	Percent Solids:	**88**
Analyzed:	**12-14-10 14:17**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	86
11104-28-2	Aroclor 1221	BRL		ug/Kg	86
11141-16-5	Aroclor 1232	BRL		ug/Kg	86
53469-21-9	Aroclor 1242	BRL		ug/Kg	86
12672-29-6	Aroclor 1248	BRL		ug/Kg	86
11097-69-1	Aroclor 1254	BRL		ug/Kg	86
11096-82-5	Aroclor 1260	BRL		ug/Kg	86
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	86
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	86

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	14	12	**83 %**	30 - 150 %
	Decachlorobiphenyl	14	13	**92 %**	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	14	11	**78 %**	30 - 150 %
	Decachlorobiphenyl	14	11	**75 %**	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	SB -01 (4)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	120 mL Amber Glass
Client:	AECOM Environment	Preservation:	Cool
Laboratory ID:	138511-09	QC Batch ID:	PB-3651-P
Sampled:	12-10-10 13:00	Instrument ID:	GC-13 Agilent 6890
Received:	12-10-10 17:45	Sample Weight:	15 g
Extracted:	12-13-10 18:00	Final Volume:	1 mL
Cleaned Up:	12-13-10 21:30	Percent Solids:	92
Analyzed:	12-14-10 15:04	Dilution Factor:	1
Analyst:	CRL		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	84
11104-28-2	Aroclor 1221	BRL		ug/Kg	84
11141-16-5	Aroclor 1232	BRL		ug/Kg	84
53469-21-9	Aroclor 1242	BRL		ug/Kg	84
12672-29-6	Aroclor 1248	BRL		ug/Kg	84
11097-69-1	Aroclor 1254	BRL		ug/Kg	84
11096-82-5	Aroclor 1260	BRL		ug/Kg	84
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	84
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	84

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	14	12	84 %	30 - 150 %
	Decachlorobiphenyl	14	13	96 %	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	14	11	79 %	30 - 150 %
	Decachlorobiphenyl	14	11	79 %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

Trace Metals

Field ID:	MW-1 (1)	Matrix:	Soil
Project:	CFI #V1261/118503/60188925	Container:	120 mL Glass
Client:	AECOM Environment	Preservation:	Cool
Laboratory ID:	138511-7	Percent Solids:	88
Sampled:	12-10-10 09:00		
Received:	12-10-10 17:45		

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Weight	Instrument ID	Analyst
EPA 6010B[1]	MB-01946-S	EPA 3050B	12-15-10 00:00	0.485 g	ICP-1 PE 3000	LMS
EPA 7471A[2]	MP-2614-S	EPA 7471A	12-16-10 00:00	0.6 g	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic, Total	BRL		mg/Kg	3.5	1	12-15-10 18:30	EPA 6010B[1]
7440-39-3	Barium, Total	**56**		mg/Kg	5.9	1	12-15-10 18:30	EPA 6010B[1]
7440-43-9	Cadmium, Total	**1.6**		mg/Kg	0.59	1	12-15-10 18:30	EPA 6010B[1]
7440-47-3	Chromium, Total	**19**		mg/Kg	1.2	1	12-15-10 18:30	EPA 6010B[1]
7439-92-1	Lead, Total	**150**		mg/Kg	5.9	1	12-15-10 18:30	EPA 6010B[1]
7439-97-6	Mercury, Total	**0.13**		mg/Kg	0.018	1	12-10-10 12:29	EPA 7471A[2]
7782-49-2	Selenium, Total	BRL		mg/Kg	5.9	1	12-15-10 18:30	EPA 6010B[1]
7440-22-4	Silver, Total	BRL		mg/Kg	1.2	1	12-15-10 18:30	EPA 6010B[1]

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

Trace Metals

Field ID:	**MW-3 (1-2)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**120 mL Glass**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138511-8**	Percent Solids:	**92**
Sampled:	**12-10-10 12:00**		
Received:	**12-10-10 17:45**		

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Weight	Instrument ID	Analyst
EPA 6010B[1]	MB-01946-S	EPA 3050B	12-15-10 00:00	0.51 g	ICP-1 PE 3000	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7439-92-1	Lead, Total	**330**		mg/Kg	5.3	1	12-15-10 18:48	EPA 6010B[1]

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
DF Dilution Factor.

GROUNDWATER ANALYTICAL

Trace Metals

Field ID:	**SB -01 (4)**	Matrix:	**Soil**
Project:	**CFI #V1261/118503/60188925**	Container:	**120 mL Glass**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138511-9**	Percent Solids:	**92**
Sampled:	**12-10-10 13:00**		
Received:	**12-10-10 17:45**		

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Weight	Instrument ID	Analyst
EPA 6010B[1]	MB-01946-S	EPA 3050B	12-15-10 00:00	0.495 g	ICP-1 PE 3000	LMS
EPA 7471A[2]	MP-2614-S	EPA 7471A	12-16-10 00:00	0.6 g	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic, Total	BRL		mg/Kg	3.3	1	12-15-10 18:55	EPA 6010B[1]
7440-39-3	Barium, Total	**43**		mg/Kg	5.5	1	12-15-10 18:54	EPA 6010B[1]
7440-43-9	Cadmium, Total	**0.71**		mg/Kg	0.55	1	12-15-10 18:55	EPA 6010B[1]
7440-47-3	Chromium, Total	**10**		mg/Kg	1.1	1	12-15-10 18:54	EPA 6010B[1]
7439-92-1	Lead, Total	**25**		mg/Kg	5.5	1	12-15-10 18:55	EPA 6010B[1]
7439-97-6	Mercury, Total	**0.35**		mg/Kg	0.018	1	12-10-10 12:39	EPA 7471A[2]
7782-49-2	Selenium, Total	BRL		mg/Kg	5.5	1	12-15-10 18:55	EPA 6010B[1]
7440-22-4	Silver, Total	BRL		mg/Kg	1.1	1	12-15-10 18:54	EPA 6010B[1]

Method Reference: Test Methods for Evaluating Solid Waste, U5 EPA, 5W-846, Third Edition, Update III (1996).
Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

Project Narrative

Project:	**CFI #V1261/118503/60188925**	Lab ID:	**138511**
Client:	**AECOM Environment**	Received:	**12-10-10 17:45**

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1. No documentation discrepancies, changes, or amendments were noted.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1. EPA 6010B Note: Samples 138511-7, -8 and -9. Samples were analyzed for selected target analytes, as requested by client.
2. Sample 138511-6 was not received with sample collection time listed on the Chain of Custody. Sample was reported with a sampling collection time of 00:00 by the laboratory.
3. EPA 8260B Note: Samples 135811-1, -4 and -6. Recovery of Carbon Disulfide was below the recommended limit in the ICV.
4. EPA 8260B Note: Samples 135811-1, -4 and -6. Acetone did not meet the required minimum average response factor in the ICAL. Response factors for Acetone and 2-Butanone were below the recommended limit in the CCV/LCS.
5. EPA 8260B Note: Samples 135811-1, -4 and -6. Relative percent deviations for trans-1,3-Dichloropropene, Isopropylbenzene, 1,2-Dichlorobenzene, 1,2-Dibromo-3-chloropropane and Hexachlorobutadiene were above the recommended limit in the CCV.
6. EPA 8260B Non-conformance: Laboratory control sample (LCS) analyte Methyl tert-butyl Ether had an RPD recovery outside recommended recovery limits for QC batch VM1-2977-S.

Version 10-2010

GROUNDWATER ANALYTICAL

228 Main Street, P.O. Box 1200
Buzzards Bay, MA 02532
Telephone (508) 759-4441 / FAX (508) 759-4475
www.groundwateranalytical.com

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

Project Name: CEI #V1261/118503	Firm: AECOM
Project Number: 60188925	Address: 2 Technology Park Drive
Sampler Name: J. Chamber	City / State / Zip:: Westford, MA 01886
Project Manager: Lauren Roberts	Telephone: 978-589-3000

INSTRUCTIONS: Use separate line for each container (except replicates).

TURNAROUND

- ☐ 10 Business Days
- ☒ 5 Business Days
- ☐ RUSH (RAN- _____)
  (Rush requires Rush Authorization Number)
- ☐ Please Email to: _____
- ☐ Please FAX to: _____

BILLING

- ☐ Purchase Order No.: 33156
- ☐ Third Party Billing: _____
- ☐ GWA Quote: _____

ANALYSIS REQUEST

Sampling DATE	Sampling TIME	SAMPLE IDENTIFICATION	Matrix	Type	Container(s) NUMBER	Preservation	Filtered	LABORATORY NUMBER (Lab Use Only)
12/15/10	900	MW-1 (1)	GW	C	6	HCl		
↓	1200	MW-3 (1-7)	↓	↓	4	↓		
↓	1300	SB-01 (4)	↓	↓	3	↓		
		TRIP BLANK			4			

REMARKS / SPECIAL INSTRUCTIONS

☒ YES ☐ NO MCP Data Certification required

☐ YES ☐ NO MCP Drinking Water Sample Included
(Volatile analyses require duplicate collection and Trip Blanks).

☐ Analyze Duplicates and Trips Blanks only if positive results.

☐ YES ☐ NO CT RCP Data Certification required

Signature: _____

DATA QUALITY OBJECTIVES

Regulatory Program

State	Standard	Deliverables
☐ CT	☐ MCP GW-1/S-1	☐ PWS Form
☐ ME	☐ MCP GW-2/S-2	☐ MWRA
☒ MA	☐ NY STARS	☐ _____
☐ NH	☐ Drinking Water	
☐ NY	☐ Wastewater	
☐ RI	☐ Waste Disposal	
☐ VT	☐ Dredge Material	
☐ _____	☐ _____	

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. Each MS, MSD and Sample Duplicate requires an additional sample aliquot.

Project Specific QC Required	Selection of QC Sample
☐ Sample Duplicate	☐ Please use sample: _____
☐ Matrix Spike	
☐ Matrix Spike Duplicate	

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

Relinquished by Sampler:	Date	Time	Received by	Receipt Temperature:
Julia Chamber	12/16/10	16:00	Alan Maddigan	As Determined at Laboratory: 2.0°C
Relinquished by:	Date	Time	Received by:	Container Count:
Alan Maddigan	12/16/10	5:45		22
Relinquished by:	Date	Time	Received by Laboratory:	Shipping/AWB Number:

Method of Shipment: ☒ GWA Courier ☐ Express Mail ☐ Federal Express ☐ UPS ☐ Hand ☐ _____

Custody Seal Number:

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste*, US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	MA DEP EPH Method	Instrument ID:	GC-9 Agilent 6890	Instrument ID:	GC-9 Agilent 6890
QC Batch ID:	EP-3174-M	Extracted:	12-14-10 21:30	Extracted:	12-14-10 21:30
Matrix:	Soil	Analyzed (AL):	12-16-10 18:38	Analyzed (AL):	12-16-10 20:05
Units:	mg/Kg	Analyzed (AR):	12-16-10 19:22	Analyzed (AR):	12-16-10 20:49
		Analyst:	KM	Analyst:	KM

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
111-84-2	*n*-Nonane (C_9)	3.3	1.7	51 %	3.3	1.7	53 %	4 %	30 - 140 %	25%
124-18-5	*n*-Decane (C_{10})	3.3	1.9	58 %	3.3	2.0	60 %	4 %	40 - 140 %	25%
112-40-3	*n*-Dodecane (C_{12})	3.3	2.0	61 %	3.3	2.1	63 %	3 %	40 - 140 %	25%
629-59-4	*n*-Tetradecane (C_{14})	3.3	2.1	63 %	3.3	2.1	63 %	0 %	40 - 140 %	25%
544-76-3	*n*-Hexadecane (C_{16})	3.3	2.3	70 %	3.3	2.3	68 %	2 %	40 - 140 %	25%
593-45-3	*n*-Octadecane (C_{18})	3.3	2.5	77 %	3.3	2.5	75 %	3 %	40 - 140 %	25%
n/a	*n*-C9 to *n*-C18 Group	20	13	63 %	20	13	64 %	1 %	40 - 140 %	25%
629-92-5	*n*-Nonadecane (C_{19})	3.3	2.6	78 %	3.3	2.5	75 %	3 %	40 - 140 %	25%
112-95-8	*n*-Eicosane (C_{20})	3.3	2.4	74 %	3.3	2.4	72 %	3 %	40 - 140 %	25%
629-97-0	*n*-Docosane (C_{22})	3.3	2.3	68 %	3.3	2.2	67 %	2 %	40 - 140 %	25%
646-31-1	*n*-Tetracosane (C_{24})	3.3	2.3	71 %	3.3	2.3	69 %	3 %	40 - 140 %	25%
630-01-3	*n*-Hexacosane (C_{26})	3.3	2.3	69 %	3.3	2.2	67 %	3 %	40 - 140 %	25%
630-02-4	*n*-Octacosane (C_{28})	3.3	2.3	69 %	3.3	2.2	67 %	3 %	40 - 140 %	25%
638-68-6	*n*-Triacontane (C_{30})	3.3	2.3	69 %	3.3	2.2	68 %	2 %	40 - 140 %	25%
630-06-8	*n*-Hexatriacontane (C_{36})	3.3	2.2	66 %	3.3	2.1	63 %	5 %	40 - 140 %	25%
n/a	*n*-C19 to *n*-C36 Group	26	19	70 %	26	18	68 %	3 %	40 - 140 %	25%
91-20-3	Naphthalene	3.3	2.3	70 %	3.3	2.3	71 %	1 %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	3.3	2.5	76 %	3.3	2.5	75 %	0 %	40 - 140 %	25%
208-96-8	Acenaphthylene	3.3	2.7	81 %	3.3	2.6	78 %	3 %	40 - 140 %	25%
83-32-9	Acenaphthene	3.3	2.7	81 %	3.3	2.6	77 %	4 %	40 - 140 %	25%
86-73-7	Fluorene	3.3	2.7	81 %	3.3	2.5	77 %	5 %	40 - 140 %	25%
85-01-8	Phenanthrene	3.3	3.0	90 %	3.3	2.8	84 %	7 %	40 - 140 %	25%
120-12-7	Anthracene	3.3	3.1	93 %	3.3	2.9	86 %	8 %	40 - 140 %	25%
206-44-0	Fluoranthene	3.3	3.1	93 %	3.3	2.8	86 %	8 %	40 - 140 %	25%
129-00-0	Pyrene	3.3	3.1	95 %	3.3	2.9	88 %	8 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	3.3	2.6	78 %	3.3	2.4	72 %	8 %	40 - 140 %	25%
218-01-9	Chrysene	3.3	3.0	91 %	3.3	2.8	85 %	7 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	3.3	2.8	85 %	3.3	2.6	79 %	7 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	3.3	2.9	89 %	3.3	2.7	83 %	7 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	3.3	3.0	91 %	3.3	2.8	84 %	7 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	3.3	3.0	91 %	3.3	2.8	84 %	7 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	3.3	3.1	94 %	3.3	2.9	87 %	7 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	3.3	3.0	91 %	3.3	2.8	85 %	7 %	40 - 140 %	25%
n/a	PAH Group	56	48	86 %	56	46	81 %	6 %	40 - 140 %	25%

QC Surrogate Compound		Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.5	93 %	2.7	2.5	93 %		40 - 140 %
	2-Bromonaphthalene	2.7	2.2	81 %	2.7	2.3	85 %		40 - 140 %
Extraction:	Chloro-octadecane	2.7	1.9	70 %	2.7	1.9	70 %		40 - 140 %
	ortho-Terphenyl	2.7	2.5	93 %	2.7	2.3	85 %		40 - 140 %

Fractionation Breakthrough Evaluation						QC Limits
91-20-3	Naphthalene	LCS	0 %	LCSD	0 %	5%
91-57-6	2-Methylnaphthalene	LCS	0 %	LCSD	0 %	5%

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

The LCS and LCSD are prepared from separate source standards than those used for calibration.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	MA DEP EPH	Instrument ID:	GC-9 Agilent 6890
QC Batch ID:	EP-3174-M	Extracted:	12-14-10 21:30
Matrix:	Soil	Analyzed (AL):	12-16-10 21:33
		Analyzed (AR):	12-16-10 22:17
		Analyst:	KM

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	30

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		mg/Kg	0.50
91-57-6	2-Methylnaphthalene	BRL		mg/Kg	0.50
85-01-8	Phenanthrene	BRL		mg/Kg	0.50
83-32-9	Acenaphthene	BRL		mg/Kg	0.50
208-96-8	Acenaphthylene	BRL		mg/Kg	0.50
86-73-7	Fluorene	BRL		mg/Kg	0.50
120-12-7	Anthracene	BRL		mg/Kg	0.50
206-44-0	Fluoranthene	BRL		mg/Kg	0.50
129-00-0	Pyrene	BRL		mg/Kg	0.50
56-55-3	Benzo[a]anthracene	BRL		mg/Kg	0.50
218-01-9	Chrysene	BRL		mg/Kg	0.50
205-99-2	Benzo[b]fluoranthene	BRL		mg/Kg	0.50
207-08-9	Benzo[k]fluoranthene	BRL		mg/Kg	0.50
50-32-8	Benzo[a]pyrene	BRL		mg/Kg	0.50
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		mg/Kg	0.50
53-70-3	Dibenzo[a,h]anthracene	BRL		mg/Kg	0.50
191-24-2	Benzo[g,h,i]perylene	BRL		mg/Kg	0.50

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.4	91 %	40 - 140 %
	2-Bromonaphthalene	2.7	2.3	87 %	40 - 140 %
Extraction:	Chloro-octadecane	2.7	2.1	80 %	40 - 140 %
	ortho-Terphenyl	2.7	2.3	86 %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Sample extraction performed by microwave accelerated solvent extraction technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	MA DEP VPH	Instrument ID:	GC-1 HP 5890	Instrument ID:	GC-1 HP 5890
QC Batch ID:	VP-1725-E	Analyzed:	12-15-10 13:33	Analyzed:	12-15-10 14:14
Matrix:	Soil	Analyst:	TRA	Analyst:	TRA
Units:	mg/Kg				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
109-66-0	*n*-Pentane	2.5	2.1	**85 %**	2.5	2.1	**84 %**	**1 %**	70 - 130 %	25%
107-83-5	2-Methylpentane	2.5	2.3	**91 %**	2.5	2.3	**91 %**	**0 %**	70 - 130 %	25%
540-84-1	2,2,4-Trimethylpentane	2.5	2.5	**99 %**	2.5	2.5	**99 %**	**0 %**	70 - 130 %	25%
n/a	Aliphatic Group 1	7.5	6.9	**92 %**	7.5	6.8	**91 %**	**0 %**	70 - 130 %	25%
111-84-2	*n*-Nonane	2.5	2.3	**91 %**	2.5	2.3	**93 %**	**2 %**	70 - 130 %	25%
124-18-5	*n*-Decane	2.5	2.4	**98 %**	2.5	2.4	**96 %**	**2 %**	70 - 130 %	25%
1678-93-9	*n*-Butylcyclohexane	2.5	2.4	**97 %**	2.5	2.4	**98 %**	**1 %**	70 - 130 %	25%
n/a	Aliphatic Group 2	7.5	7.1	**95 %**	7.5	7.2	**95 %**	**0 %**	70 - 130 %	25%
1634-04-4	Methyl *tert*-butyl Ether	2.5	2.5	**98 %**	2.5	2.4	**96 %**	**2 %**	70 - 130 %	25%
71-43-2	Benzene	2.5	2.5	**102 %**	2.5	2.5	**100 %**	**2 %**	70 - 130 %	25%
108-88-3	Toluene	2.5	2.6	**104 %**	2.5	2.6	**102 %**	**2 %**	70 - 130 %	25%
100-41-4	Ethylbenzene	2.5	2.6	**105 %**	2.5	2.6	**103 %**	**2 %**	70 - 130 %	25%
108-38-3 and 106-42-3	*meta*-Xylene and *para*-Xylene	5.0	5.2	**104 %**	5.0	5.1	**103 %**	**1 %**	70 - 130 %	25%
95-47-6	*ortho*- Xylene	2.5	2.5	**98 %**	2.5	2.4	**97 %**	**2 %**	70 - 130 %	25%
95-63-6	1,2,4-Trimethylbenzene	2.5	2.6	**106 %**	2.5	2.6	**104 %**	**1 %**	70 - 130 %	25%
91-20-3	Naphthalene	2.5	2.4	**94 %**	2.5	2.3	**92 %**	**2 %**	70 - 130 %	25%
n/a	Aromatic Group	23	23	**102 %**	23	23	**102 %**	**0 %**	70 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2,5-Dibromotoluene (PID)	2.5	2.5	**100 %**	2.5	2.5	**98 %**		70 - 130 %
2,5-Dibromotoluene (FID)	2.5	2.5	**101 %**	2.5	2.5	**99 %**		70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	MA DEP VPH	Instrument ID:	GC-1 HP 5890
QC Batch ID:	VP-1725-E	Analyzed:	12-15-10 14:54
Matrix:	Soil	Analyst:	TRA

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	BRL		mg/Kg	1.0
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	BRL		mg/Kg	1.0
n-C9 to n-C10 Aromatic Hydrocarbons †	BRL		mg/Kg	1.0

Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	BRL		mg/Kg	1.0
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	BRL		mg/Kg	1.0

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	BRL		mg/Kg	0.05
71-43-2	Benzene ¤	BRL		mg/Kg	0.10
108-88-3	Toluene ¤	BRL		mg/Kg	0.10
100-41-4	Ethylbenzene ¤	BRL		mg/Kg	0.10
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		mg/Kg	0.10
95-47-6	*ortho*- Xylene ‡	BRL		mg/Kg	0.10
91-20-3	Naphthalene	BRL		mg/Kg	0.50

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	2.5	2.4	96 %	70 - 130 %
2,5-Dibromotoluene (FID)	2.5	2.4	96 %	70 - 130 %

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8082**	Instrument ID:	**GC-13 Agilent 6890**	Instrument ID:	**GC-13 Agilent 6890**
QC Batch ID:	**PB-3651-P**	Extracted:	**12-13-10 18:00**	Extracted:	**12-13-10 18:00**
Matrix:	**Soil**	Cleaned Up:	**12-13-10 21:30**	Cleaned Up:	**12-13-10 21:30**
Units:	**ug/Kg**	Analyzed:	**12-14-10 13:29**	Analyzed:	**12-14-10 13:53**
		Analyst:	**CRL**	Analyst:	**CRL**

CAS Number	Analyte	LCS					LCS Duplicate							QC Limits	
		Spiked	Measured		Recovery		Spiked	Measured		Recovery		RPD			
			1st Col	2nd Col	1st Col	2nd Col		1st Col	2nd Col	1st Col	2nd Col	1st Col	2nd Col	Spike	RPD
12674-11-2	Aroclor 1016	330	290	260	88%	78%	330	300	270	90%	82%	3 %	5 %	40 - 140%	30 %
11096-82-5	Aroclor 1260	330	290	240	88%	72%	330	310	250	92%	75%	5 %	4 %	40 - 140%	30 %

QC Surrogate Compound	Surrogate Recovery											QC Limits
Tetrachloro-*m*-xylene	13	11	9.6	79%	72%	13	11	9.8	80%	73%		30 - 150 %
Decachlorobiphenyl	13	11	8.2	85%	61%	13	13	8.8	95%	66%		30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8082**	Instrument ID:	**GC-13 Agilent 6890**
QC Batch ID:	**PB-3651-P**	Extracted:	**12-13-10 18:00**
Matrix:	**Soil**	Cleaned Up:	**12-13-10 21:30**
		Analyzed:	**12-14-10 13:05**
		Analyst:	**CRL**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	80
11104-28-2	Aroclor 1221	BRL		ug/Kg	80
11141-16-5	Aroclor 1232	BRL		ug/Kg	80
53469-21-9	Aroclor 1242	BRL		ug/Kg	80
12672-29-6	Aroclor 1248	BRL		ug/Kg	80
11097-69-1	Aroclor 1254	BRL		ug/Kg	80
11096-82-5	Aroclor 1260	BRL		ug/Kg	80
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	80
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	80

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	13	9.6	**72 %**	30 - 150 %
Column	Decachlorobiphenyl	13	11	**81 %**	30 - 150 %
Second	Tetrachloro-*m*-xylene	13	8.9	**67 %**	30 - 150 %
Column	Decachlorobiphenyl	13	8.3	**63 %**	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3545. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Sample

Category:	**EPA 8011 (Modified)**	Instrument ID:	**GC-5 HP 5890**
QC Batch ID:	**PV-0223-S**	Extracted:	**12-14-10 17:00**
Matrix:	**Soil**	Analyzed:	**12-15-10 21:10**
Units:	**ug/Kg**	Analyst:	**CRL**

CAS Number	Analyte	Spiked	Measured		Recovery		QC Limits
			1st Column	2nd Column	1st Column	2nd Column	
106-93-4	1,2-Dibromoethane (EDB)	16	15	15	95 %	93 %	70 - 130 %

QC Surrogate Compound	Spiked	Measured		Recovery		QC Limits
1,1,1,2-Tetrachloroethane	4.0	4.0	3.9	99 %	98 %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Modified with guidance from "Determination of 1,2-Dibromoethane (EDB) in Field Soils: Implications for Volatile Organic Compounds," B.L. Sawhney, J.J. Pignatello, and S.M. Steinberg, Journal of Environmental Quality, Vol. 17, No. 1, January - March 1988.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8011 (Modified)**	Instrument ID:	**GC-5 HP 5890**
QC Batch ID:	**PV-0223-S**	Extracted:	**12-14-10 17:00**
Matrix:	**Soil**	Analyzed:	**12-15-10 22:03**
		Analyst:	**CRL**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	2.0

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	1,1,1,2-Tetrachloroethane	4.0	3.9	**98 %**	70 - 130 %
Second Column	1,1,1,2-Tetrachloroethane	4.0	3.9	**97 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Modified with guidance from "Determination of 1,2-Dibromoethane (EDB) in Field Soils: Implications for Volatile Organic Compounds," B.L. Sawhney, J.J. Pignatello, and S.M. Steinberg, Journal of Environmental Quality, Vol. 17, No. 1, January - March 1988.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

Category: **Metals**
Matrix: **Soil**
Units: **mg/Kg**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 6010B	MB-1946-SL	EPA 3050B	12-15-10 00:00	12-15-10 18:18	ICP-1 PE 3000	JK
LCS	EPA 7471A	MP-2614-SL	EPA 7471A	12-16-10 00:00	12-10-10 12:23	CVAA-1 PE FIMS	LMS
LCSD	EPA 6010B	MB-1946-SL	EPA 3050B	12-15-10 00:00	12-15-10 18:24	ICP-1 PE 3000	JK
LCSD	EPA 7471A	MP-2614-SL	EPA 7471A	12-16-10 00:00	12-10-10 12:26	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits		Method
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
7440-38-2	Arsenic	140	120	90%	140	120	89%	1 %	83-118 %	30 %	EPA 6010B
7440-39-3	Barium	290	270	93%	290	270	94%	1 %	83-118 %	30 %	EPA 6010B
7440-43-9	Cadmium	85	74	87%	85	75	89%	1 %	80-120 %	30 %	EPA 6010B
7440-47-3	Chromium	170	160	97%	170	160	94%	2 %	82-118 %	30 %	EPA 6010B
7439-92-1	Lead	120	120	96%	120	110	94%	1 %	83-117 %	30 %	EPA 6010B
7439-97-6	Mercury	7.7	9.2	120%	7.7	9.9	129%	4 %	71-129 %	30 %	EPA 7471A
7782-49-2	Selenium	44	34	78%	44	37	85%	4 %	78-122 %	30 %	EPA 6010B
7440-22-4	Silver	55	50	90%	55	48	87%	2 %	66-134 %	30 %	EPA 6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: Metals
Matrix: Soil

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 6010B	MB-1946-SB	EPA 3050B	12-15-10 00:00	0.5 g	ICP-1 PE 3000	JK
EPA 7471A	MP-2614-SB	EPA 7471A	12-16-10 00:00	0.6 g	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic	BRL		mg/Kg	3.0	1	12-15-10 18:06	EPA 6010B
7440-39-3	Barium	BRL		mg/Kg	5.0	1	12-15-10 18:06	EPA 6010B
7440-43-9	Cadmium	BRL		mg/Kg	0.50	1	12-15-10 18:06	EPA 6010B
7440-47-3	Chromium	BRL		mg/Kg	1.0	1	12-15-10 18:05	EPA 6010B
7439-92-1	Lead	BRL		mg/Kg	5.0	1	12-15-10 18:06	EPA 6010B
7439-97-6	Mercury	BRL		mg/Kg	0.017	1	12-10-10 12:23	EPA 7471A
7782-49-2	Selenium	BRL		mg/Kg	5.0	1	12-15-10 18:06	EPA 6010B
7440-22-4	Silver	BRL		mg/Kg	1.0	1	12-15-10 18:05	EPA 6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	EPA Method 8260B	Instrument ID:	MS-1 HP 5890	Instrument ID:	MS-1 HP 5890
QC Batch ID:	VM1-2977-S	Analyzed:	12-12-10 16:28	Analyzed:	12-12-10 17:05
Matrix:	Soil	Analyst:	EMC	Analyst:	EMC
Units:	ug/kg				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
75-71-8	Dichlorodifluoromethane	50	47	93 %	50	48	95 %	2 %	70 - 130 %	20%
74-87-3	Chloromethane	50	47	94 %	50	46	91 %	3 %	70 - 130 %	20%
75-01-4	Vinyl Chloride	50	52	103 %	50	55	111 %	7 %	70 - 130 %	20%
74-83-9	Bromomethane	50	53	106 %	50	55	111 %	5 %	70 - 130 %	20%
75-00-3	Chloroethane	50	49	97 %	50	52	105 %	7 %	70 - 130 %	20%
75-69-4	Trichlorofluoromethane	50	41	83 %	50	41	81 %	2 %	70 - 130 %	20%
60-29-7	Diethyl Ether	100	96	96 %	100	97	97 %	2 %	70 - 130 %	20%
75-35-4	1,1-Dichloroethene	50	49	98 %	50	49	98 %	0 %	70 - 130 %	20%
76-13-1	1,1,2-Trichlorotrifluoroethane	100	110	106 %	100	110	108 %	2 %	70 - 130 %	20%
67-64-1	Acetone	100	90	90 %	100	95	95 %	6 %	70 - 130 %	20%
75-15-0	Carbon Disulfide	100	85	85 %	100	88	88 %	3 %	70 - 130 %	20%
75-09-2	Methylene Chloride	50	48	95 %	50	51	102 %	7 %	70 - 130 %	20%
107-13-1	Acrylonitrile	50	49	98 %	50	51	101 %	3 %	70 - 130 %	20%
156-60-5	*trans*-1,2-Dichloroethene	50	45	90 %	50	48	97 %	7 %	70 - 130 %	20%
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	50	45	90 %	50	55	110 %	21 % q	70 - 130 %	20%
75-34-3	1,1-Dichloroethane	50	42	83 %	50	43	86 %	3 %	70 - 130 %	20%
594-20-7	2,2-Dichloropropane	50	44	88 %	50	43	87 %	1 %	70 - 130 %	20%
156-59-2	*cis*-1,2-Dichloroethene	50	45	90 %	50	46	92 %	3 %	70 - 130 %	20%
78-93-3	2-Butanone (MEK)	100	85	85 %	100	93	93 %	9 %	70 - 130 %	20%
74-97-5	Bromochloromethane	50	46	93 %	50	48	97 %	4 %	70 - 130 %	20%
109-99-9	Tetrahydrofuran (THF)	100	91	91 %	100	90	90 %	1 %	70 - 130 %	20%
67-66-3	Chloroform	50	44	87 %	50	46	93 %	6 %	70 - 130 %	20%
71-55-6	1,1,1-Trichloroethane	50	45	89 %	50	45	89 %	0 %	70 - 130 %	20%
56-23-5	Carbon Tetrachloride	50	44	89 %	50	44	88 %	0 %	70 - 130 %	20%
563-58-6	1,1-Dichloropropene	50	45	91 %	50	48	96 %	5 %	70 - 130 %	20%
71-43-2	Benzene	50	46	92 %	50	47	95 %	3 %	70 - 130 %	20%
107-06-2	1,2-Dichloroethane	50	42	84 %	50	41	82 %	2 %	70 - 130 %	20%
79-01-6	Trichloroethene	50	42	83 %	50	45	90 %	8 %	70 - 130 %	20%
78-87-5	1,2-Dichloropropane	50	46	92 %	50	48	96 %	4 %	70 - 130 %	20%
74-95-3	Dibromomethane	50	44	89 %	50	44	87 %	2 %	70 - 130 %	20%
75-27-4	Bromodichloromethane	50	41	82 %	50	45	90 %	9 %	70 - 130 %	20%
123-91-1	1,4-Dioxane	1,000	880	88 %	1,000	930	93 %	5 %	70 - 130 %	20%
10061-01-5	*cis*-1,3-Dichloropropene	50	44	89 %	50	49	97 %	9 %	70 - 130 %	20%
108-10-1	4-Methyl-2-Pentanone (MIBK)	100	95	95 %	100	110	109 %	14 %	70 - 130 %	20%
108-88-3	Toluene	50	44	87 %	50	47	95 %	8 %	70 - 130 %	20%
10061-02-6	*trans*-1,3-Dichloropropene	50	40	79 %	50	41	83 %	5 %	70 - 130 %	20%
79-00-5	1,1,2-Trichloroethane	50	45	91 %	50	46	92 %	1 %	70 - 130 %	20%
127-18-4	Tetrachloroethene	50	44	88 %	50	43	85 %	3 %	70 - 130 %	20%
142-28-9	1,3-Dichloropropane	50	45	91 %	50	44	88 %	3 %	70 - 130 %	20%
591-78-6	2-Hexanone	100	87	87 %	100	98	98 %	12 %	70 - 130 %	20%
124-48-1	Dibromochloromethane	50	43	86 %	50	44	89 %	3 %	70 - 130 %	20%
106-93-4	1,2-Dibromoethane (EDB)	50	47	93 %	50	46	93 %	1 %	70 - 130 %	20%
108-90-7	Chlorobenzene	50	45	90 %	50	42	83 %	7 %	70 - 130 %	20%
630-20-6	1,1,1,2-Tetrachloroethane	50	43	86 %	50	45	90 %	4 %	70 - 130 %	20%
100-41-4	Ethylbenzene	50	43	87 %	50	45	90 %	4 %	70 - 130 %	20%
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	100	91	91 %	100	93	93 %	3 %	70 - 130 %	20%
95-47-6	*ortho*-Xylene	50	44	88 %	50	41	82 %	7 %	70 - 130 %	20%
100-42-5	Styrene	50	48	96 %	50	48	96 %	0 %	70 - 130 %	20%
75-25-2	Bromoform	50	45	91 %	50	47	93 %	3 %	70 - 130 %	20%

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	EPA Method 8260B	Instrument ID:	MS-1 HP 5890	Instrument ID:	MS-1 HP 5890
QC Batch ID:	VM1-2977-S	Analyzed:	12-12-10 16:28	Analyzed:	12-12-10 17:05
Matrix:	Soil	Analyst:	EMC	Analyst:	EMC
Units:	ug/kg				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
98-82-8	Isopropylbenzene	50	38	77 %	50	41	81 %	6 %	70 - 130 %	20%
108-86-1	Bromobenzene	50	41	82 %	50	45	90 %	10 %	70 - 130 %	20%
79-34-5	1,1,2,2-Tetrachloroethane	50	44	88 %	50	48	95 %	8 %	70 - 130 %	20%
96-18-4	1,2,3-Trichloropropane	50	42	85 %	50	48	96 %	12 %	70 - 130 %	20%
110-57-6	*trans*-1,4-Dichloro-2-butene	200	220	109 %	200	230	114 %	4 %	70 - 130 %	20%
103-65-1	*n*-Propylbenzene	50	43	87 %	50	46	92 %	6 %	70 - 130 %	20%
95-49-8	2-Chlorotoluene	50	42	85 %	50	42	84 %	1 %	70 - 130 %	20%
108-67-8	1,3,5-Trimethylbenzene	50	44	87 %	50	46	92 %	6 %	70 - 130 %	20%
106-43-4	4-Chlorotoluene	50	41	83 %	50	44	87 %	6 %	70 - 130 %	20%
98-06-6	*tert*-Butylbenzene	50	42	83 %	50	45	89 %	7 %	70 - 130 %	20%
95-63-6	1,2,4-Trimethylbenzene	50	44	88 %	50	46	92 %	5 %	70 - 130 %	20%
135-98-8	*sec*-Butylbenzene	50	44	88 %	50	45	91 %	3 %	70 - 130 %	20%
541-73-1	1,3-Dichlorobenzene	50	41	81 %	50	43	86 %	5 %	70 - 130 %	20%
99-87-6	4-Isopropyltoluene	50	45	90 %	50	46	93 %	2 %	70 - 130 %	20%
106-46-7	1,4-Dichlorobenzene	50	41	81 %	50	43	85 %	4 %	70 - 130 %	20%
95-50-1	1,2-Dichlorobenzene	50	40	80 %	50	43	85 %	6 %	70 - 130 %	20%
104-51-8	*n*-Butylbenzene	50	45	89 %	50	44	89 %	0 %	70 - 130 %	20%
96-12-8	1,2-Dibromo-3-chloropropane	50	40	79 %	50	44	88 %	10 %	70 - 130 %	20%
108-70-3	1,3,5-Trichlorobenzene	50	45	91 %	50	47	94 %	4 %	70 - 130 %	20%
120-82-1	1,2,4-Trichlorobenzene	50	44	87 %	50	40	80 %	8 %	70 - 130 %	20%
87-68-3	Hexachlorobutadiene	50	39	78 %	50	37	74 %	5 %	70 - 130 %	20%
91-20-3	Naphthalene	50	46	93 %	50	43	87 %	6 %	70 - 130 %	20%
87-61-6	1,2,3-Trichlorobenzene	50	44	87 %	50	40	80 %	8 %	70 - 130 %	20%
75-65-0	*tert*-Butyl Alcohol (TBA)	1,000	900	90 %	1,000	930	93 %	3 %	70 - 130 %	20%
108-20-3	Di-isopropyl Ether (DIPE)	50	44	87 %	50	45	89 %	3 %	70 - 130 %	20%
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	50	45	90 %	50	43	85 %	6 %	70 - 130 %	20%
994-05-8	*tert*-Amyl Methyl Ether (TAME)	50	43	85 %	50	43	87 %	2 %	70 - 130 %	20%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
Dibromofluoromethane	50	42	83 %	50	43	87 %		70 - 130 %
1,2-Dichloroethane-d_4	50	52	104 %	50	44	88 %		70 - 130 %
Toluene-d_8	50	48	96 %	50	50	99 %		70 - 130 %
4-Bromofluorobenzene	50	46	92 %	50	46	92 %		70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5035A.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

q Recovery outside recommended limits.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **EPA Method 8260B**
QC Batch ID: **VM1-2977-S**
Matrix: **Soil**

Instrument ID: **MS-1 HP 5890**
Analyzed: **12-12-10 17:41**
Analyst: **EMC**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/Kg	10
74-87-3	Chloromethane	BRL		ug/Kg	10
75-01-4	Vinyl Chloride	BRL		ug/Kg	10
74-83-9	Bromomethane	BRL		ug/Kg	10
75-00-3	Chloroethane	BRL		ug/Kg	10
75-69-4	Trichlorofluoromethane	BRL		ug/Kg	10
60-29-7	Diethyl Ether	BRL		ug/Kg	10
75-35-4	1,1-Dichloroethene	BRL		ug/Kg	5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/Kg	50
67-64-1	Acetone	BRL		ug/Kg	200
75-15-0	Carbon Disulfide	BRL		ug/Kg	50
75-09-2	Methylene Chloride	BRL		ug/Kg	50
107-13-1	Acrylonitrile	BRL		ug/Kg	5
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/Kg	5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/Kg	5
75-34-3	1,1-Dichloroethane	BRL		ug/Kg	5
594-20-7	2,2-Dichloropropane	BRL		ug/Kg	5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/Kg	5
78-93-3	2-Butanone (MEK)	BRL		ug/Kg	50
74-97-5	Bromochloromethane	BRL		ug/Kg	5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/Kg	50
67-66-3	Chloroform	BRL		ug/Kg	5
71-55-6	1,1,1-Trichloroethane	BRL		ug/Kg	5
56-23-5	Carbon Tetrachloride	BRL		ug/Kg	5
563-58-6	1,1-Dichloropropene	BRL		ug/Kg	5
71-43-2	Benzene	BRL		ug/Kg	5
107-06-2	1,2-Dichloroethane	BRL		ug/Kg	5
79-01-6	Trichloroethene	BRL		ug/Kg	5
78-87-5	1,2-Dichloropropane	BRL		ug/Kg	5
74-95-3	Dibromomethane	BRL		ug/Kg	5
75-27-4	Bromodichloromethane	BRL		ug/Kg	5
123-91-1	1,4-Dioxane	BRL		ug/Kg	5,000
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/Kg	5
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/Kg	50
108-88-3	Toluene	BRL		ug/Kg	5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/Kg	5
79-00-5	1,1,2-Trichloroethane	BRL		ug/Kg	5
127-18-4	Tetrachloroethene	BRL		ug/Kg	5
142-28-9	1,3-Dichloropropane	BRL		ug/Kg	5
591-78-6	2-Hexanone	BRL		ug/Kg	50
124-48-1	Dibromochloromethane	BRL		ug/Kg	5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/Kg	5
108-90-7	Chlorobenzene	BRL		ug/Kg	5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/Kg	5
100-41-4	Ethylbenzene	BRL		ug/Kg	5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/Kg	5
95-47-6	*ortho*-Xylene	BRL		ug/Kg	5
100-42-5	Styrene	BRL		ug/Kg	5
75-25-2	Bromoform	BRL		ug/Kg	5

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	EPA Method 8260B	Instrument ID:	MS-1 HP 5890
QC Batch ID:	VM1-2977-S	Analyzed:	12-12-10 17:41
Matrix:	Soil	Analyst:	EMC

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
98-82-8	Isopropylbenzene	BRL		ug/Kg	5
108-86-1	Bromobenzene	BRL		ug/Kg	5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/Kg	5
96-18-4	1,2,3-Trichloropropane	BRL		ug/Kg	5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/Kg	50
103-65-1	*n*-Propylbenzene	BRL		ug/Kg	5
95-49-8	2-Chlorotoluene	BRL		ug/Kg	5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/Kg	5
106-43-4	4-Chlorotoluene	BRL		ug/Kg	5
98-06-6	*tert*-Butylbenzene	BRL		ug/Kg	5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/Kg	5
135-98-8	*sec*-Butylbenzene	BRL		ug/Kg	5
541-73-1	1,3-Dichlorobenzene	BRL		ug/Kg	5
99-87-6	4-Isopropyltoluene	BRL		ug/Kg	5
106-46-7	1,4-Dichlorobenzene	BRL		ug/Kg	5
95-50-1	1,2-Dichlorobenzene	BRL		ug/Kg	5
104-51-8	*n*-Butylbenzene	BRL		ug/Kg	5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/Kg	5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/Kg	5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/Kg	5
87-68-3	Hexachlorobutadiene	BRL		ug/Kg	5
91-20-3	Naphthalene	BRL		ug/Kg	5
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/Kg	5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/Kg	200
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/Kg	5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/Kg	5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/Kg	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	50	51	102 %	70 - 130 %
1,2-Dichloroethane-d_4	50	44	89 %	70 - 130 %
Toluene-d_8	50	56	112 %	70 - 130 %
4-Bromofluorobenzene	50	59	118 %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5035A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states.
Copies of our current certificates may be obtained from our website:

http://www.groundwateranalytical.com/qualifications.htm

CONNECTICUT

Department of Health Services, PH-0586 — Potable Water, Wastewater, Solid Waste and Soil
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/Out_State.pdf

MASSACHUSETTS

Department of Environmental Protection, M-MA-103 — Potable Water and Non-Potable Water
http://public.dep.state.ma.us/labcert/labcert.aspx

Department of Labor,
Division of Occupational Safety, AA000195 — Asbestos Analytical Services, Class A
http://www.mass.gov/dos/forms/la-rpt_list_aa.pdf

NEW HAMPSHIRE

Department of Environmental Services, 202708 — Potable Water, Non-Potable Water, Solid and Chemical Materials
http://www4.egov.nh.gov/DES/NHELAP

NEW YORK

Department of Health, 11754 — Potable Water, Non-Potable Water, Solid and Hazardous Waste
http://www.wadsworth.org/labcert/elap/comm.html

RHODE ISLAND

Department of Health,
Division of Laboratories, LAO00054 — Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry
http://www.health.ri.gov/labs/outofstatelabs.pdf

U.S. DEPARTMENT OF AGRICULTURE

USDA, Soil Permit, S-53921 — Foreign soil import permit

VERMONT

Department of Health, VT-87643 — Potable Water
http://healthvermont.gov/enviro/ph_lab/water_test.aspx#cert

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS — **Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Potable Water (Drinking Water)

Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Alkalinity, Total	SM 2320-B
Antimony	EPA 200.8
Arsenic	EPA 200.8
Barium	EPA 200.7
Barium	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G
Chromium	EPA 200.7
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G
Fecal Coliform (Source Water)	MF SM 9222-D
Fluoride	EPA 300.0
Fluoride	SM 4500-F-C
Haloacetic Acids	EPA 552.2
Heterotrophic Plate Count	SM 9215-B
Lead	EPA 200.8
Mercury	EPA 245.1
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Nitrite-N	EPA 300.0
Nitrite-N	Lachat 10-107-04-1-C
pH	SM 4500-H-B
Selenium	EPA 200.8
Silver	EPA 200.7
Silver	EPA 200.8
Sodium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.8
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223
Total Coliform (Treatment and Distribution)	MF SM 9222-B
Total Dissolved Solids	SM 2540-C
Trihalomethanes	EPA 524.2
Turbidity	SM 2130-B
Volatile Organic Compounds	EPA 524.2

Non-Potable Water (Wastewater)

Analyte	Method
Aldrin	EPA 608
Alkalinity, Total	SM 2320-B
Alpha-BHC	EPA 608
Aluminum	EPA 200.7

Non-Potable Water (Wastewater)

Analyte	Method
Aluminum	EPA 200.8
Ammonia-N	Lachat 10-107-06-1-B
Antimony	EPA 200.7
Antimony	EPA 200.8
Arsenic	EPA 200.7
Arsenic	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Beta-BHC	EPA 608
Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chemical Oxygen Demand	SM 5220-D
Chlordane	EPA 608
Chloride	EPA 300.0
Chlorine, Total Residual	SM 4500-CL-G
Chromium	EPA 200.7
Chromium	EPA 200.8
Cobalt	EPA 200.7
Cobalt	EPA 200.8
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
DDD	EPA 608
DDE	EPA 608
DDT	EPA 608
Delta-BHC	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan II	EPA 608
Endosulfan Sulfate	EPA 608
Endrin	EPA 608
Endrin Aldehyde	EPA 608
Gamma-BHC	EPA 608
Hardness (CaCO3), Total	EPA 200.7
Hardness (CaCO3), Total	SM 2340-B
Heptachlor	EPA 608
Heptachlor Epoxide	EPA 608
Iron	EPA 200.7
Kjeldahl-N	Lachat 10-107-06-02-D
Lead	EPA 200.7
Magnesium	EPA 200.7
Manganese	EPA 200.7
Manganese	EPA 200.8
Mercury	EPA 245.1
Molybdenum	EPA 200.7
Molybdenum	EPA 200.8
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Non-Filterable Residue	SM 2540-D
Oil and Grease	EPA 1664

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS	Department of Environmental Protection, M-MA-103

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Non-Potable Water (Wastewater)

Analyte	Method
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.8
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
SVOC-Acid Extractables	EPA 625
SVOC-Base/Neutral Extractables	EPA 625
Thallium	EPA 200.7
Thallium	EPA 200.8
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Toxaphene	EPA 608
Vanadium	EPA 200.7
Vanadium	EPA 200.8
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7
Zinc	EPA 200.8

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GROUNDWATER ANALYTICAL

e-mail

To:	Lauren Roberts	**From:**	e-mail reporting GWA
	AECOM-Westford	**Pages:**	40
e-mail:	LAUREN.L.ROBERTS@	**Date:**	12/29/2010 15:57:24
Re:	138693	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply**

● **Comments:**

Final Project Report for CFI #118503/60188925, Lab ID 138693, Received 12-17-10

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GROUNDWATER ANALYTICAL

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December 29, 2010

Ms. Lauren Roberts
AECOM Environment
2 Technology Park Drive
Westford, MA 01886

LABORATORY REPORT

Project: **CFI #118503/60188925**
Lab ID: **138693**
Received: **12-17-10**

Dear Lauren:

Enclosed are the analytical results for the above referenced project. The project was processed for Priority turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC standards, except as may be specifically noted, or described in the project narrative. The analytical results relate only to the samples received. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Jonathan R. Sanford
President

JRS/ker
Enclosures

GROUNDWATER ANALYTICAL

Sample Receipt Report

Project: **CFI #118503/60188925**
Client: **AECOM Environment**
Lab ID: **138693**

Delivery: **GWA Courier**
Airbill: **n/a**
Lab Receipt: **12-17-10**

Temperature: **2.4°C**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-1	MW-1		Aqueous	12/17/10 13:45	EPA 8260B Volatile Organics with Oxygenates				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1332650	40 mL VOA Vial	Proline	BX38157	HCL	R-5915D	12-09-10	n/a		
C1332649	40 mL VOA Vial	Proline	BX38157	HCL	R-5915D	12-09-10	n/a		
C1332648	40 mL VOA Vial	Proline	BX38157	HCL	R-5915D	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-2	MW-2		Aqueous	12/17/10 14:15	EPA 8260B Volatile Organics with Oxygenates				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1317833	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		
C1317823	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		
C1317813	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-3	Trip Blank		Aqueous	12/17/10 0:00	EPA 8260B Volatile Organics with Oxygenates				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1317843	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		
C1317842	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-4	MW-1		Aqueous	12/17/10 13:45	MA DEP VPH with Targets				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1317832	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		
C1317822	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		
C1317812	40 mL VOA Vial	Proline	BX38156	HCL	R-5915D	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-5	MW-2		Aqueous	12/17/10 14:15	MA DEP VPH with Targets				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1332629	40 mL VOA Vial	Proline	BX38157	HCL	R-5915D	12-09-10	n/a		
C1332628	40 mL VOA Vial	Proline	BX38157	HCL	R-5915D	12-09-10	n/a		
C1332618	40 mL VOA Vial	Proline	BX38157	HCL	R-5915D	12-09-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-6	MW-2		Aqueous	12/17/10 14:15	EPA 8011 EDB and DBCP by GC/ECD				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1315143	40 mL VOA Vial	n/a	n/a	HCL	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-7	MW-1		Aqueous	12/17/10 13:45	EPA 8011 EDB and DBCP by GC/ECD				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1332339	1 L Amber Glass	Proline	BX38111	None	n/a	n/a	n/a		
C1332338	1 L Amber Glass	Proline	BX38111	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-8	MW-1		Aqueous	12/17/10 13:45	MA DEP EPH with PAHs				
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship		
C1322809	1 L Amber Glass	Proline	BX37981	H2SO4	R-4252H	12-02-10	n/a		
C1322807	1 L Amber Glass	Proline	BX37981	H2SO4	R-4252H	12-02-10	n/a		

GROUNDWATER ANALYTICAL

Sample Receipt Report (Continued)

Project:	**CFI #118503/60188925**	Delivery:	**GWA Courier**	Temperature:	**2.4°C**
Client:	**AECOM Environment**	Airbill:	**n/a**	Chain of Custody:	**Present**
Lab ID:	**138693**	Lab Receipt:	**12-17-10**	Custody Seal(s):	**n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-9	MW-1		Aqueous	12/17/10 13:45	EPA 6010B/7470A 8 RCRA Metals Dissolved				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1303573	250 mL Plastic	Proline	BX37919	HNO3	R-6283A	11-30-10	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
138693-10	MW-2		Aqueous	12/17/10 14:15	EPA 6010B Pb Dissolved				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1308438	250 mL Plastic	Proline	BX37567	HNO3	R-6283A	11-30-10	n/a		

GROUNDWATER ANALYTICAL

Data Certification

Project: CFI #118503/60188925
Client: AECOM Environment

Lab ID: 138693
Received: 12-17-10 18:00

Mass DEP Analytical Protocol Certification Form

Project Location: n/a MA DEP RTN: n/a

This Form provides certifications for the following data set:

EPA 8260B: 138693-1,-2,-3
MA DEP VPH: 138693-4,-5
MA DEP EPH: 138693-8
EPA 6010B: 138693-9,-10
EPA 7470A/1A: 138693-9

Sample Matrices: Groundwater/Surface (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other ( )

CAM Protocol (check all that apply below):

8260 VOC CAM II A (X)	7470/7471 Hg CAM III B (X)	Mass DEP VPH CAM IV A (X)	8081 Pesticides CAM V B ( )	7196 Hex Cr CAM VI B ( )	Mass DEP APH CAM IX A ( )
8270 SVOC CAM II B ( )	7010 Metals CAM III C ( )	Mass DEP EPH CAM IV B (X)	8151 Herbicides CAM V C ( )	8330 Explosives CAM VIII A ( )	TO-15 VOC CAM IX B ( )
6010 Metals CAM III A (X)	6020 Metals CAM III D ( )	8082 PCB CAM V A ( )	9012 Cyanide/PAC CAM VI A ( )	6860 Perchlorate CAM VIII B ( )	

An affirmative response to questions A through F are required for "Presumptive Certainty" status.

A.	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratoratory, and prepared/analyzed within method holding times?	Yes
B.	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes
C.	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes
D.	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, 'Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes
E.	VPH, EPH and APH methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes
F.	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes

Responses to questions G, H and I below are required for "Presumptive Certainty" status.

G.	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	Yes

Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40.1056(2)(k) and WSC-07-350.

H.	Were all QC performance standards specified in the CAM protocol(s) achieved?	No
I.	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	No

All negative responses must be addressed in an attached laboratory 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 analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Position: President
Printed Name: Jonathan R. Sanford Date: 12-29-10

GROUNDWATER ANALYTICAL

EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	MW-1	Matrix:	Aqueous
Project:	CFI #118503/60188925	Container:	40 mL VOA Vial
Client:	AECOM Environment	Preservation:	HCl/ Cool
Laboratory ID:	138693-1	QC Batch ID:	VM10-1215-W
Sampled:	12-17-10 13:45	Instrument ID:	MS-10 HP 6890
Received:	12-17-10 18:00	Sample Volume:	5 mL
Analyzed:	12-21-10 08:33	Dilution Factor:	1
Analyst:	LMG		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	0.5
74-87-3	Chloromethane	BRL		ug/L	0.5
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
74-83-9	Bromomethane	BRL		ug/L	0.5
75-00-3	Chloroethane	BRL		ug/L	0.5
75-69-4	Trichlorofluoromethane	BRL		ug/L	0.5
60-29-7	Diethyl Ether	BRL		ug/L	2
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	5
67-64-1	Acetone	BRL		ug/L	10
75-15-0	Carbon Disulfide	BRL		ug/L	5
75-09-2	Methylene Chloride	BRL		ug/L	3
107-13-1	Acrylonitrile	BRL		ug/L	3
156-60-5	*trans*- 1,2-Dichloroethene	BRL		ug/L	0.5
1634-04-4	Methyl *tert*- butyl Ether (MTBE)	2		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
594-20-7	2,2-Dichloropropane	BRL		ug/L	0.5
156-59-2	*cis*- 1,2-Dichloroethene	BRL		ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL		ug/L	5
74-97-5	Bromochloromethane	BRL		ug/L	0.5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	5
67-66-3	Chloroform	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
563-58-6	1,1-Dichloropropene	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL		ug/L	0.5
74-95-3	Dibromomethane	BRL		ug/L	0.5
75-27-4	Bromodichloromethane	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
10061-01-5	*cis*- 1,3-Dichloropropene	BRL		ug/L	0.4
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	5
108-88-3	Toluene	BRL		ug/L	0.5
10061-02-6	*trans*- 1,3-Dichloropropene	BRL		ug/L	0.4
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
142-28-9	1,3-Dichloropropane	BRL		ug/L	0.5
591-78-6	2-Hexanone	BRL		ug/L	5
124-48-1	Dibromochloromethane	BRL		ug/L	0.5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.5
108-90-7	Chlorobenzene	BRL		ug/L	0.5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	0.5
100-41-4	Ethylbenzene	BRL		ug/L	0.5
108-38-3/106-42-3	*meta*- Xylene and *para*- Xylene	BRL		ug/L	0.5

GROUNDWATER ANALYTICAL

EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	**MW-1**	Matrix:	**Aqueous**
Project:	**CFI #118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**HCl/ Cool**
Laboratory ID:	**138693-1**	QC Batch ID:	**VM10-1215-W**
Sampled:	**12-17-10 13:45**	Instrument ID:	**MS-10 HP 6890**
Received:	**12-17-10 18:00**	Sample Volume:	**5 mL**
Analyzed:	**12-21-10 08:33**	Dilution Factor:	**1**
Analyst:	**LMG**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	*ortho*-Xylene	BRL		ug/L	0.5
100-42-5	Styrene	BRL		ug/L	0.5
75-25-2	Bromoform	BRL		ug/L	0.5
98-82-8	Isopropylbenzene	2		ug/L	0.5
108-86-1	Bromobenzene	BRL		ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	0.5
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	0.5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/L	25
103-65-1	*n*-Propylbenzene	2		ug/L	0.5
95-49-8	2-Chlorotoluene	BRL		ug/L	0.5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/L	0.5
106-43-4	4-Chlorotoluene	BRL		ug/L	0.5
98-06-6	*tert*-Butylbenzene	0.6		ug/L	0.5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/L	0.5
135-98-8	*sec*-Butylbenzene	4		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
99-87-6	4-Isopropyltoluene	1		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
104-51-8	*n*-Butylbenzene	BRL		ug/L	0.5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	0.5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/L	0.5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	0.5
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
91-20-3	Naphthalene	BRL		ug/L	3
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	0.5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	20
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	0.5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	0.5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	12	**116** %	70 - 130 %
1,2-Dichloroethane-d_4	10	12	**116** %	70 - 130 %
Toluene-d_8	10	12	**120** %	70 - 130 %
4-Bromofluorobenzene	10	11	**108** %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	**MW-2**	Matrix:	**Aqueous**
Project:	**CFI #118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**HCl/ Cool**
Laboratory ID:	**138693-2**	QC Batch ID:	**VM10-1215-W**
Sampled:	**12-17-10 14:15**	Instrument ID:	**MS-10 HP 6890**
Received:	**12-17-10 18:00**	Sample Volume:	**5 mL**
Analyzed:	**12-21-10 15:51**	Dilution Factor:	**1**
Analyst:	**LMG**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	0.5
74-87-3	Chloromethane	BRL		ug/L	0.5
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
74-83-9	Bromomethane	BRL		ug/L	0.5
75-00-3	Chloroethane	BRL		ug/L	0.5
75-69-4	Trichlorofluoromethane	BRL		ug/L	0.5
60-29-7	Diethyl Ether	BRL		ug/L	2
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	5
67-64-1	Acetone	BRL		ug/L	10
75-15-0	Carbon Disulfide	BRL		ug/L	5
75-09-2	Methylene Chloride	BRL		ug/L	3
107-13-1	Acrylonitrile	BRL		ug/L	3
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/L	0.5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	5		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
594-20-7	2,2-Dichloropropane	BRL		ug/L	0.5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL		ug/L	5
74-97-5	Bromochloromethane	BRL		ug/L	0.5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	5
67-66-3	Chloroform	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
563-58-6	1,1-Dichloropropene	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL		ug/L	0.5
74-95-3	Dibromomethane	BRL		ug/L	0.5
75-27-4	Bromodichloromethane	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/L	0.4
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	5
108-88-3	Toluene	BRL		ug/L	0.5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/L	0.4
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
142-28-9	1,3-Dichloropropane	BRL		ug/L	0.5
591-78-6	2-Hexanone	BRL		ug/L	5
124-48-1	Dibromochloromethane	BRL		ug/L	0.5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.5
108-90-7	Chlorobenzene	BRL		ug/L	0.5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	0.5
100-41-4	Ethylbenzene	0.8		ug/L	0.5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	2		ug/L	0.5

GROUNDWATER ANALYTICAL

EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	MW-2	Matrix:	**Aqueous**
Project:	CFI #118503/60188925	Container:	**40 mL VOA Vial**
Client:	AECOM Environment	Preservation:	**HCl/ Cool**
Laboratory ID:	**138693-2**	QC Batch ID:	**VM10-1215-W**
Sampled:	**12-17-10 14:15**	Instrument ID:	**MS-10 HP 6890**
Received:	**12-17-10 18:00**	Sample Volume:	**5 mL**
Analyzed:	**12-21-10 15:51**	Dilution Factor:	**1**
Analyst:	LMG		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	*ortho*-Xylene	**3**		ug/L	0.5
100-42-5	Styrene	BRL		ug/L	0.5
75-25-2	Bromoform	BRL		ug/L	0.5
98-82-8	Isopropylbenzene	**0.7**		ug/L	0.5
108-86-1	Bromobenzene	BRL		ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	0.5
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	0.5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/L	25
103-65-1	*n*-Propylbenzene	**0.9**		ug/L	0.5
95-49-8	2-Chlorotoluene	BRL		ug/L	0.5
108-67-8	1,3,5-Trimethylbenzene	**31**		ug/L	0.5
106-43-4	4-Chlorotoluene	BRL		ug/L	0.5
98-06-6	*tert*-Butylbenzene	BRL		ug/L	0.5
95-63-6	1,2,4-Trimethylbenzene	**1**		ug/L	0.5
135-98-8	*sec*-Butylbenzene	BRL		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
99-87-6	4-Isopropyltoluene	**1**		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
104-51-8	*n*-Butylbenzene	BRL		ug/L	0.5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	0.5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/L	0.5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	0.5
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
91-20-3	Naphthalene	BRL		ug/L	3
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	0.5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	20
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	0.5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	0.5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	11	**112 %**	70 - 130 %
1,2-Dichloroethane-d_4	10	11	**111 %**	70 - 130 %
Toluene-d_8	10	13	**125 %**	70 - 130 %
4-Bromofluorobenzene	10	12	**115 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	**Trip Blank**	Matrix:	**Aqueous**
Project:	**CFI #118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**HCl/ Cool**
Laboratory ID:	**138693-3**	QC Batch ID:	**VM10-1214-W**
Sampled:	**12-17-10 00:00**	Instrument ID:	**MS-10 HP 6890**
Received:	**12-17-10 18:00**	Sample Volume:	**5 mL**
Analyzed:	**12-20-10 10:04**	Dilution Factor:	**1**
Analyst:	**LMG**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	0.5
74-87-3	Chloromethane	BRL		ug/L	0.5
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
74-83-9	Bromomethane	BRL		ug/L	0.5
75-00-3	Chloroethane	BRL		ug/L	0.5
75-69-4	Trichlorofluoromethane	BRL		ug/L	0.5
60-29-7	Diethyl Ether	BRL		ug/L	2
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	5
67-64-1	Acetone	BRL		ug/L	10
75-15-0	Carbon Disulfide	BRL		ug/L	5
75-09-2	Methylene Chloride	BRL		ug/L	3
107-13-1	Acrylonitrile	BRL		ug/L	3
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/L	0.5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
594-20-7	2,2-Dichloropropane	BRL		ug/L	0.5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL		ug/L	5
74-97-5	Bromochloromethane	BRL		ug/L	0.5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	5
67-66-3	Chloroform	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
563-58-6	1,1-Dichloropropene	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL		ug/L	0.5
74-95-3	Dibromomethane	BRL		ug/L	0.5
75-27-4	Bromodichloromethane	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/L	0.4
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	5
108-88-3	Toluene	BRL		ug/L	0.5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/L	0.4
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
142-28-9	1,3-Dichloropropane	BRL		ug/L	0.5
591-78-6	2-Hexanone	BRL		ug/L	5
124-48-1	Dibromochloromethane	BRL		ug/L	0.5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.5
108-90-7	Chlorobenzene	BRL		ug/L	0.5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	0.5
100-41-4	Ethylbenzene	BRL		ug/L	0.5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/L	0.5

GROUNDWATER ANALYTICAL

EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	**Trip Blank**	Matrix:	**Aqueous**
Project:	**CFI #118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**HCl/ Cool**
Laboratory ID:	**138693-3**	QC Batch ID:	**VM10-1214-W**
Sampled:	**12-17-10 00:00**	Instrument ID:	**MS-10 HP 6890**
Received:	**12-17-10 18:00**	Sample Volume:	**5 mL**
Analyzed:	**12-20-10 10:04**	Dilution Factor:	**1**
Analyst:	**LMG**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
95-47-6	*ortho*-Xylene	BRL		ug/L	0.5
100-42-5	Styrene	BRL		ug/L	0.5
75-25-2	Bromoform	BRL		ug/L	0.5
98-82-8	Isopropylbenzene	BRL		ug/L	0.5
108-86-1	Bromobenzene	BRL		ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	0.5
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	0.5
110-57-6	*trans*-1,4-Dichloro-2-butene	BRL		ug/L	25
103-65-1	*n*-Propylbenzene	BRL		ug/L	0.5
95-49-8	2-Chlorotoluene	BRL		ug/L	0.5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/L	0.5
106-43-4	4-Chlorotoluene	BRL		ug/L	0.5
98-06-6	*tert*-Butylbenzene	BRL		ug/L	0.5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/L	0.5
135-98-8	*sec*-Butylbenzene	BRL		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
99-87-6	4-Isopropyltoluene	BRL		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
104-51-8	*n*-Butylbenzene	BRL		ug/L	0.5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	0.5
108-70-3	1,3,5-Trichlorobenzene	BRL		ug/L	0.5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	0.5
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
91-20-3	Naphthalene	BRL		ug/L	3
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	0.5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	20
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	0.5
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	0.5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	12	**119 %**	70 - 130 %
1,2-Dichloroethane-d_4	10	12	**117 %**	70 - 130 %
Toluene-d_8	10	12	**120 %**	70 - 130 %
4-Bromofluorobenzene	10	11	**110 %**	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	MW-1	Matrix:	Aqueous
Project:	CFI #118503/60188925	Container:	40 mL VOA Vial
Client:	AECOM Environment	Preservation:	HCl/ Cool
Laboratory ID:	138693-04	QC Batch ID:	VGA-4670-W
Sampled:	12-17-10 13:45	Instrument ID:	GC-10 Agilent 6890
Received:	12-17-10 18:00	Sample Volume:	5 mL
Analyzed:	12-22-10 16:29	Dilution Factor:	1
Analyst:	GY		

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	43		ug/L	20
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	69		ug/L	20
n-C9 to n-C10 Aromatic Hydrocarbons †	130		ug/L	20
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	45		ug/L	20
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	200		ug/L	20

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	BRL		ug/L	5
71-43-2	Benzene ‡	BRL		ug/L	1
108-88-3	Toluene ¤	BRL		ug/L	5
100-41-4	Ethylbenzene †	BRL		ug/L	5
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		ug/L	5
95-47-6	*ortho*- Xylene ‡	BRL		ug/L	5
91-20-3	Naphthalene	BRL		ug/L	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	50	48	96 %	70 - 130 %
2,5-Dibromotoluene (FID)	50	50	99 %	70 - 130 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

Massachusetts DEP VPH Method
Volatile Petroleum Hydrocarbons by GC/PID/FID

Field ID:	MW-2	Matrix:	Aqueous
Project:	CFI #118503/60188925	Container:	40 mL VOA Vial
Client:	AECOM Environment	Preservation:	HCl/ Cool
Laboratory ID:	138693-05	QC Batch ID:	VGA-4670-W
Sampled:	12-17-10 14:15	Instrument ID:	GC-10 Agilent 6890
Received:	12-17-10 18:00	Sample Volume:	5 mL
Analyzed:	12-22-10 17:09	Dilution Factor:	1
Analyst:	GY		

VPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C5 to n-C8 Aliphatic Hydrocarbons †◊	560		ug/L	20
n-C9 to n-C12 Aliphatic Hydrocarbons †⊗	130		ug/L	20
n-C9 to n-C10 Aromatic Hydrocarbons †	280		ug/L	20
Unadjusted n-C5 to n-C8 Aliphatic Hydrocarbons †	570		ug/L	20
Unadjusted n-C9 to n-C12 Aliphatic Hydrocarbons †	420		ug/L	20

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
1634-04-4	Methyl *tert*-butyl Ether ¤	6		ug/L	5
71-43-2	Benzene ¤	BRL		ug/L	1
108-88-3	Toluene ¤	BRL		ug/L	5
100-41-4	Ethylbenzene ‡	BRL		ug/L	5
108-38-3 and 106-42-3	*meta*- Xylene and *para*-Xylene ‡	BRL		ug/L	5
95-47-6	*ortho*- Xylene ‡	BRL		ug/L	5
91-20-3	Naphthalene	BRL		ug/L	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2,5-Dibromotoluene (PID)	50	43	87 %	70 - 130 %
2,5-Dibromotoluene (FID)	50	43	87 %	70 - 130 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.2.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Volatile Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C5 to n-C8 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations.

⊗ n-C9 to n-C12 Aliphatic Hydrocarbons range data excludes the method target analyte concentrations and the concentration for the n-C9 to n-C10 Aromatic Hydrocarbons range.

¤ Analyte elutes in the n-C5 to n-C8 Aliphatic Hydrocarbons range.

‡ Analyte elutes in the n-C9 to n-C12 Aliphatic Hydrocarbons range.

GROUNDWATER ANALYTICAL

EPA Method 8011
EDB and DBCP by GC/ECD

Field ID:	**MW-2**	Matrix:	**Aqueous**
Project:	**CFI #118503/60188925**	Container:	**40 mL VOA Vial**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138693-06**	QC Batch ID:	**PV-1010-E**
Sampled:	**12-17-10 14:15**	Instrument ID:	**GC-6 HP 5890**
Received:	**12-17-10 18:00**	Sample Volume:	**35 mL**
Extracted:	**12-21-10 16:30**	Final Volume:	**1 mL**
Analyzed:	**12-21-10 19:30**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	**0.03**	1C (0.006)*	ug/L	0.02
96-12-8	1,2-Dibromo-3-Chloropropane (DBCP)	BRL		ug/L	0.02

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations:
- BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
- * Confirmatory column quantification.
- 1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8011
EDB and DBCP by GC/ECD

Field ID:	**MW-1**	Matrix:	**Aqueous**
Project:	**CFI #118503/60188925**	Container:	**1L Amber Glass**
Client:	**AECOM Environment**	Preservation:	**Cool**
Laboratory ID:	**138693-07**	QC Batch ID:	**PV-1010-E**
Sampled:	**12-17-10 13:45**	Instrument ID:	**GC-6 HP 5890**
Received:	**12-17-10 18:00**	Sample Volume:	**34 mL**
Extracted:	**12-21-10 16:30**	Final Volume:	**1 mL**
Analyzed:	**12-21-10 19:59**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.02
96-12-8	1,2-Dibromo-3-Chloropropane (DBCP)	BRL		ug/L	0.02

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	MW-1	Matrix:	Aqueous
Project:	CFI #118503/60188925	Container:	1 L Amber Glass
Client:	AECOM Environment	Preservation:	H2SO4/ Cool
Laboratory ID:	138693-8	QC Batch ID:	EP-2373-F
Sampled:	12-17-10 13:45	Instrument ID:	GC-9 Agilent 6890
Received:	12-17-10 18:00	Sample Volume:	1000 mL
Extracted:	12-20-10 11:30	Final Volume:	1 mL
Analyzed (AL):	12-21-10 13:33	Aliphatic Dilution Factor:	1
Analyzed (AR):	12-21-10 14:17	Aromatic Dilution Factor:	1
Analyst:	KM		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	1,200		ug/L	100
n-C19 to n-C36 Aliphatic Hydrocarbons †	250		ug/L	100
n-C11 to n-C22 Aromatic Hydrocarbons †◊	880		ug/L	100
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	900		ug/L	100

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	5
91-57-6	2-Methylnaphthalene	BRL		ug/L	5
85-01-8	Phenanthrene	6		ug/L	5
83-32-9	Acenaphthene	BRL		ug/L	5
208-96-8	Acenaphthylene	BRL		ug/L	5
86-73-7	Fluorene	7		ug/L	5
120-12-7	Anthracene	BRL		ug/L	5
206-44-0	Fluoranthene	BRL		ug/L	5
129-00-0	Pyrene	BRL		ug/L	5
56-55-3	Benzo[a]anthracene	BRL		ug/L	5
218-01-9	Chrysene	BRL		ug/L	5
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	5
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	5
50-32-8	Benzo[a]pyrene	BRL		ug/L	5
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	5
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	5
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	5

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	40	35	89 %	40 - 140 %
	2-Bromonaphthalene	40	33	82 %	40 - 140 %
Extraction:	Chloro-octadecane	40	32	81 %	40 - 140 %
	ortho-Terphenyl	40	37	93 %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

Trace Metals

Field ID:	MW-1	Matrix:	Aqueous
Project:	CFI #118503/60188925	Container:	250 mL Plastic
Client:	AECOM Environment	Preservation:	HNO3 / Cool
Laboratory ID:	138693-9	Preserved:	12-17-10 13:45
Sampled:	12-17-10 13:45	Filtered:	12-17-10 13:45
Received:	12-17-10 18:00		

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 6010B[1]	MB-4275-W	EPA 3010A	12-20-10 00:00	50 mL	ICP-1 PE 3000	LMS
EPA 7470A[2]	MP-2349-W	EPA 7470A	12-23-10 00:00	25 mL	CVAA-1 PE FIMS	LMS

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-38-2	Arsenic, Dissolved	**0.01**		mg/L	0.01	1	12-20-10 21:33	EPA 6010B[1]
7440-39-3	Barium, Dissolved	**0.37**		mg/L	0.05	1	12-20-10 21:33	EPA 6010B[1]
7440-43-9	Cadmium, Dissolved	BRL		mg/L	0.004	1	12-20-10 21:33	EPA 6010B[1]
7440-47-3	Chromium, Dissolved	BRL		mg/L	0.01	1	12-20-10 21:33	EPA 6010B[1]
7439-92-1	Lead, Dissolved	BRL		mg/L	0.005	1	12-20-10 21:33	EPA 6010B[1]
7439-97-6	Mercury, Dissolved	BRL		mg/L	0.0002	1	12-27-10 15:09	EPA 7470A[2]
7782-49-2	Selenium, Dissolved	BRL		mg/L	0.05	1	12-20-10 21:33	EPA 6010B[1]
7440-22-4	Silver, Dissolved	BRL		mg/L	0.007	1	12-20-10 21:33	EPA 6010B[1]

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.