



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

**5 Post Office Square, Suite 100
BOSTON, MA 02109-3912**

CERTIFIED MAIL RETURN RECEIPT REQUESTED

JUL 17 2012

Lee Blackwell
Project Manager
Dimeo Construction
1211 Chapel Street
New Haven, CT 06511

Re: Authorization to discharge under the Remediation General Permit (RGP) –
MAG910000. Old Quincy Residence All site located at 58 Plympton Street, Cambridge
MA 02139, Middlesex County; Authorization # MAG910546

Dear Mr. Blackwell:

Based on the review of a Notice of Intent (NOI) submitted on behalf of the President and Fellows of Harvard College by the firm GZA GeoEnvironmental, Inc., for the site referenced above, the U.S. Environmental Protection Agency (EPA) hereby authorizes you, as the named Operator, to discharge in accordance with the provisions of the RGP at that site. Your authorization number is listed above.

The checklist enclosed with this RGP authorization indicates the pollutants which you are required to monitor. Also indicated on the checklist are the effluent limits, test methods and minimum levels (MLs) for each pollutant. Please note that the checklist does not represent the complete requirements of the RGP. Operators must comply with all of the applicable requirements of this permit, including influent and effluent monitoring, narrative water quality standards, record keeping, and reporting requirements, found in Parts I and II, and Appendices I – VIII of the RGP. See EPA's website for the complete RGP and other information at: <http://www.epa.gov/region1/npdes/mass.html#dgp>.

Please note the enclosed checklist includes parameters that exceeded Appendix III limits. The checklist also includes other parameters for which your laboratory reports indicated there was insufficient sensitivity to detect these parameters at the minimum levels established in Appendix VI of the RGP.

Also, please note that the metals included on the checklist are dilution dependent pollutants and subject to limitations based on a dilution factor range (DFR), due to the ample dilution at the point of discharge (111) the DFR applicable for this pollutant is within a dilution range greater than one hundred (>100) established in the RGP. (See the RGP Appendix IV for Massachusetts facilities). Therefore, the limit for antimony of 141

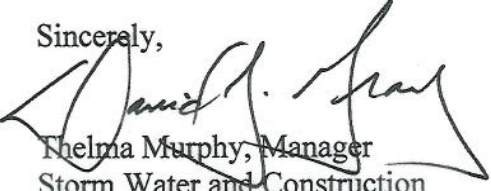
ug/L, arsenic of 540 ug/L, cadmium of 20 ug/L, hexavalent chromium of 1,710 ug/L, lead of 132 ug/L, and iron of 5,000 ug/L, shall not be exceeded in the discharge.

Finally, please note the checklist of pollutants attached to this authorization is subject to a recertification if the operations at the site result in a discharge lasting longer than six months. A recertification can be submitted to EPA within six (6) to twelve (12) months of operations in accordance with the 2010 RGP regulations.

This general permit and authorization to discharge will expire on September 9, 2015. You have reported that this project will terminate on June 14, 2013. If for any reason the discharge terminates sooner you are required to submit a Notice of Termination (NOT) to the attention of the contact person indicated below within 30 days of project completion.

Thank you in advance for your cooperation in this matter. Please contact Victor Alvarez at 617-918-1572 or Alvarez.Victor@epa.gov, if you have any questions.

Sincerely,


Thelma Murphy, Manager
Storm Water and Construction
Permits Section

Enclosure

cc: Kathleen Keohane, MassDEP
Lisa Peterson, Cambridge PWD
Matthew Smith, GZA GeoEnvironmental, Inc.

**2010 Remediation General Permit
Summary of Monitoring Parameters^[1]**

NPDES Authorization Number:	MAG910546
Authorization Issued:	July, 2012
Facility/Site Name:	Old Quincy Residence Hall
Facility/Site Address:	58 Plympton Street, Cambridge, MA 02139, Middlesex County
	Email address of owner: mark_roberts@harvard.edu
Legal Name of Operator:	Dimeo Construction
Operator contact name, title, and Address:	Lee Blackwell, Project Manager, 211 Chapel Street, New Haven CT 06511
	Email: lblackwell@dimeo.com
Estimated date of Completion:	June 14, 2013
Category and Sub-Category:	Category III- Contaminated Construction Dewatering. Subcategory A. General Urban Fill Sites
RGP Termination Date:	September 10, 2015
Receiving Water:	Charles River

Monitoring & Limits are applicable if checked. All samples are to be collected as grab samples

	<u>Parameter</u>	<u>Effluent Limit/Method#/ML</u> (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
✓	1. Total Suspended Solids (TSS)	30 milligrams/liter (mg/L) **, 50 mg/L for hydrostatic testing **, Me#60.2/ML5ug/L
✓	2. Total Residual Chlorine (TRC) ¹	Freshwater = 11 ug/L ** Saltwater = 7.5 ug/L **/ Me#330.5/ML 20ug/L
	3. Total Petroleum Hydrocarbons (TPH)	5.0 mg/L/ Me# 1664A/ML 5.0mg/L
	4. Cyanide (CN) ^{2, 3}	Freshwater = 5.2 ug/l ** Saltwater = 1.0 ug/L **/ Me#335.4/ML 10ug/L
	5. Benzene (B)	5ug/L /50.0 ug/L for hydrostatic testing only/ Me#8260C/ML 2 ug/L
	6. Toluene (T)	(limited as ug/L total BTEX)/ Me#8260C/ ML 2ug/L
	7. Ethylbenzene (E)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L
	8. (m,p,o) Xylenes (X)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L
	9. Total Benzene, Toluene, Ethyl Benzene, and Xylenes (BTEX) ⁴	100 ug/L/ Me#8260C/ ML 2ug/L

	<u>Parameter</u>	<u>Effluent Limit/Method#/ML</u> (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	10. Ethylene Dibromide (EDB) (1,2- Dibromoethane)	0.05 ug/l/ Me#8260C/ ML 10ug/L
	11. Methyl-tert-Butyl Ether (MtBE)	70.0 ug/l/Me#8260C/ML 10ug/L
✓	12.tert-Butyl Alcohol (TBA) (TertiaryButanol)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	13. tert-Amyl Methyl Ether (TAME)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	14. Naphthalene ⁵	20 ug/L /Me#8260C/ML 2ug/L
	15. Carbon Tetrachloride	4.4 ug/L /Me#8260C/ ML 5ug/L
	16. 1,2 Dichlorobenzene (o-DCB)	600 ug/L /Me#8260C/ ML 5ug/L
	17. 1,3 Dichlorobenzene (m-DCB)	320 ug/L /Me#8260C/ ML 5ug/L
✓	18. 1,4 Dichlorobenzene (p-DCB)	5.0 ug/L /Me#8260C/ ML 5ug/L
	18a. Total dichlorobenzene	763 ug/L - NH only /Me#8260C/ ML 5ug/L
	19. 1,1 Dichloroethane (DCA)	70 ug/L /Me#8260C/ ML 5ug/L
	20. 1,2 Dichloroethane (DCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
	21. 1,1 Dichloroethene (DCE)	3.2 ug/L/Me#8260C/ ML 5ug/L
	22. cis-1,2 Dichloroethene (DCE)	70 ug/L/Me#8260C/ ML 5ug/L
	23. Methylene Chloride	4.6 ug/L/Me#8260C/ ML 5ug/L
	24. Tetrachloroethene (PCE)	5.0 ug/L/Me#8260C/ ML 5ug/L
	25. 1,1,1 Trichloro-ethane (TCA)	200 ug/L/Me#8260C/ ML 5ug/L
	26. 1,1,2 Trichloro-ethane (TCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
	27. Trichloroethene (TCE)	5.0 ug/L /Me#8260C/ ML 5ug/L
	28. Vinyl Chloride (Chloroethene)	2.0 ug/L /Me#8260C/ ML 5ug/L
	29. Acetone	Monitor Only(ug/L)/Me#8260C/ML 50ug/L
	30. 1,4 Dioxane	Monitor Only /Me#1624C/ML 50ug/L
	31. Total Phenols	300 ug/L Me#420.1&420.2/ML 2 ug/L/ Me# 420.4 /ML 50ug/L
✓	32. Pentachlorophenol (PCP)	1.0 ug/L /Me#8270D/ML 5ug/L,Me#604 &625/ML 10ug/L
	33. Total Phthalates (Phthalate esters) ⁶	3.0 ug/L ** /Me#8270D/ML 5ug/L, Me#606/ML 10ug/L& Me#625/ML 5ug/L
	34. Bis (2-Ethylhexyl) Phthalate [Di- (ethylhexyl) Phthalate]	6.0 ug/L /Me#8270D/ML 5ug/L,Me#606/ML 10ug/L & Me#625/ML 5ug/L
	35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)	10.0 ug/L
✓	a. Benzo(a) Anthracene ⁷	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L

	<u>Parameter</u>	<u>Effluent Limit/Method#/ML</u> (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
✓	b. Benzo(a) Pyrene ⁷	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
✓	c. Benzo(b)Fluoranthene ⁷	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
✓	d. Benzo(k)Fluoranthene ⁷	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
✓	e. Chrysene ⁷	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
✓	f. Dibenzo(a,h)anthracene ⁷	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
✓	g. Indeno(1,2,3-cd) Pyrene ⁷	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)	100 ug/L
✓	h. Acenaphthene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	i. Acenaphthylene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	j. Anthracene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	k. Benzo(ghi) Perylene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	l. Fluoranthene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	m. Fluorene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	n. Naphthalene ⁵	20 ug/L / Me#8270/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	o. Phenanthrene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	p. Pyrene	X/Me#8270D/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
✓	37. Total Polychlorinated Biphenyls (PCBs) ^{8,9}	0.000064 ug/L/Me# 608/ ML 0.5 ug/L
✓	38. Chloride	Monitor only/Me# 300.0/ ML 100 ug/L

	<u>Metal parameter</u>	<u>Total Recoverable Metal Limit @ H ¹⁰ = 50 mg/l CaCO3 for discharges in Massachusetts (ug/l)</u> _{11/12}		<u>Minimum level=ML</u>
		<u>Freshwater</u>	<u>Saltwater</u>	
✓	39. Antimony	141/ML 10		
✓	40. Arsenic **	540/ML 20	36/ML 20	

	Metal parameter	Total Recoverable Metal Limit @ $H^{10} = 50$ mg/l $CaCO_3$ for discharges in Massachusetts (ug/l) 11/12		Minimum level=ML	
		Freshwater	Saltwater		
✓	41. Cadmium **	20/ML10	8.9/ML 10		
✓	42. Chromium III (trivalent) **	1,710/ML15	100/ML 15		
	43. Chromium VI (hexavalent) **	11.4/ML10	50.3/ML 10		
	44. Copper **	5.2/ML15	3.7/ML 15		
✓	45. Lead **	132/ML20	8.5/ML 20		
	46. Mercury **	0.9/ML0.2	1.1/ML 0.2		
	47. Nickel **	29/ML20	8.2/ML 20		
	48. Selenium **	5/ML20	71/ML 20		
	49. Silver	1.2/ML10	2.2/ML 10		
	50. Zinc **	66.6/ML15	85.6/ML 15		
✓	51. Iron	5,000/ML 20			

	Other Parameters	Limit
✓	52. Instantaneous Flow	Site specific in CFS
✓	53. Total Flow	Site specific in CFS
✓	54. pH Range for Class A & Class B Waters in MA	6.5-8.3; 1/Month/Grab ¹³
	55. pH Range for Class SA & Class SB Waters in MA	6.5-8.3; 1/Month/Grab ¹³
	56. pH Range for Class B Waters in NH	6.5-8; 1/Month/Grab ¹³
	57. Daily maximum temperature - Warm water fisheries	83°F; 1/Month/Grab ¹⁴
	58. Daily maximum temperature - Cold water fisheries	68°F; 1/Month/Grab ¹⁴
	59. Maximum Change in Temperature in MA - Any Class A water body	1.5°F; 1/Month/Grab ¹⁴
	60. Maximum Change in Temperature in MA - Any Class B water body- Warm Water	5°F; 1/Month/Grab ¹⁴
	61. Maximum Change in Temperature in MA - Any Class B water body - Cold water and Lakes/Ponds	3°F; 1/Month/Grab ¹⁴
	62. Maximum Change in Temperature in MA - Any Class SA water body - Coastal	1.5°F; 1/Month/Grab ¹⁴
	63. Maximum Change in Temperature in MA - Any Class SB water body - July to September	1.5°F; 1/Month/Grab ¹⁴
	64. Maximum Change in Temperature in MA -Any Class SB water body - October to June	4°F; 1/Month/Grab ¹⁴

Footnotes:

¹ Although the maximum values for TRC are 11ug/l and 7.5 ug/l for freshwater, and saltwater respectively, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., Method 330.5, 20 ug/l).

² Limits for cyanide are based on EPA's water quality criteria expressed as micrograms per liter. There is currently no EPA approved test method for free cyanide. Therefore, total cyanide must be reported.

³ Although the maximum values for cyanide are 5.2 ug/l and 1.0 ug/l for freshwater and saltwater, respectively, the compliance limits are equal to the minimum level (ML) of the Method 335.4 as listed in Appendix VI (i.e., 10 ug/l).

⁴ BTEX = sum of Benzene, Toluene, Ethylbenzene, and total Xylenes.

⁵ Naphthalene can be reported as both a purgeable (VOC) and extractable (SVOC) organic compound. If both VOC and SVOC are analyzed, the highest value must be used unless the QC criteria for one of the analyses is not met. In such cases, the yvalue from the analysis meeting the QC criteria must be used.

⁶ The sum of individual phthalate compounds(not including the #34, Bis (2-Ethylhexyl) Phthalate . The compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.

Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measurement of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.

⁷ Although the maximum value for the individual PAH compounds is 0.0038 ug/l, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.

⁸ In the November 2002 WQC, EPA has revised the definition of Total PCBs for aquatic life as total PCBs is the sum of all homologue, all isomer, all congener, or all "Oroclor analyses."Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measure of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.

⁹ Although the maximum value for total PCBs is 0.000064 ug/l, the compliance limit is equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., 0.5 ug/l for Method 608 or 0.00005 ug/l when Method 1668a is approved).

¹⁰ Hardness. Cadmium, Chromium III, Copper, Lead, Nickel, Silver, and Zinc are Hardness Dependent.

¹¹ For a Dilution Factor (DF) from 1 to 5, metals limits are calculated using DF times the base limit for the metal. See Appendix IV. For example, iron limits are calculated using $DF \times 1,000\text{ug/L}$ (the iron base limit). Therefore DF is 1.5, the iron limit will be 1,500 ug/L; DF 2, then iron limit = $1,000 \times 2 = 2,000 \text{ ug/L}$, etc. not to exceed the DF=5.

¹² Minimum Level (ML) is the lowest level at which the analytical system gives a recognizable signal and acceptable calibration point for the analyte. The ML represents the lowest concentration at which an analyte can be measured with a known level of confidence. The ML is calculated by multiplying the laboratory-determined method detection limit by 3.18 (see 40 CFR Part 136, Appendix B).

¹³ pH sampling for compliance with permit limits may be performed using field methods as provided for in EPA test Method 150.1.

¹⁴ Temperature sampling per Method 170.1

Revised June 7, 2012
File No. 170977.00

Mr. Victor Alvarez
United States Environmental Protection Agency – Region 1
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023



One Edgewater Drive
Norwood
Massachusetts
02062
781-278-3700
FAX 781-278-5701
<http://www.gza.com>

Re: Submittal of Notice of Intent (NOI)
Remedial General Permit
Old Quincy Residence Hall, Plympton Street
Cambridge, Massachusetts

Dear Mr. Alvarez:

GZA GeoEnvironmental, Inc. (GZA), on behalf of our client, the President and Fellows of Harvard College, is submitting the attached revised Notice of Intent (NOI) form (Attachment 1) for the Remedial General Permit (RGP) for the Old Quincy Residence Hall project (the Site). This revised NOI is being submitted to include additional groundwater environmental testing data from a recently obtained sample at well OQ-6 at the Site.

BACKGROUND

Old Quincy Residence Hall is a U-shaped, brick masonry structure that was constructed in 1930. The Site is located approximately 450 feet north of the Charles River in Cambridge and is abutted to the west by Plympton Street, to the south by Mill Street, to the east by landscape areas, and to the north by a garden and brick courtyard (Attachment 2). Existing ground surface at the Site ranges from approximately elevation 21 to 23 feet, and generally increases from south to north.

PLANNED IMPROVEMENTS/RENOVATION WORK

Planned improvements and renovation to the Old Quincy Residence Hall include the following: (1) foundation improvements, (2) permanent landscape changes, (3) structural and aesthetic modifications to the existing building and (4) upgrades to Site utilities including water, sewage, drainage and electric.

During this renovation work, foundation excavations will be dewatered using open sump dewatering methods as needed. GZA is submitting this NOI to request authorization for dewatered groundwater from the Site to be discharged to the existing stormwater drainage system, subsequent to treatment. The proposed treatment system will consist of one 5,000 gallon settling (frac) tank with weirs, two bag filters in series per parallel line (4 filters total) and a totalizing flow meter. A Process Flow Diagram for the treatment system is available in Attachment 3.

NOTICE OF INTENT

This NOI has included a review of literature pertaining to Areas of Critical Environmental Concern (ACEC), Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA), as documented below:

- Review of Appendix I “Areas of Critical Environmental Concern” (June 2009) found that there are no ACEC located in the City of Cambridge, Massachusetts.



- Review of Appendix II “Federally Listed Endangered and Threatened Species in Massachusetts” (July 2008) found that there are no listed species in the City of Cambridge, Massachusetts.
- Review of the Interactive Priority and Estimated Habitats provided by the MassWildlife online viewer (2008) shows that neither the Site nor the discharge point are located within a National Heritage & Endangered Species Program (NHESP) Priority Habitats of Rare Species area or Estimated Habitats of Rare Wildlife area. As shown on the map generated by the MassWildlife online viewer, which can be found in Attachment 7, there are no Endangered Species or Critical Habitat Areas in proximity of the Site or discharge location. The Review of Appendices I and II and the Interactive Priority and Estimated Habitats indicates that permit eligibility meets “Criterion A.”
- An electronic review of the Massachusetts Cultural Resource Information System database, made available through Massachusetts Historical Commission, found that Old Quincy Residence Hall is a historic building. However, the historic building will not be affected by the discharge or identified in the path of the discharge. In addition, Old Quincy Residence Hall is not located where the installation of the proposed treatment system is planned. Therefore, permit eligibility meets “Criterion 2.”

ANALYTICAL RESULTS

Section 3 of the attached NOI lists parameters applicable to the sub-category into which the Site discharge is defined (Category III, sub-category A). The groundwater testing data in this revised NOI includes previously submitted laboratory test reports and the recent laboratory test reports which provide data for previously missing, but identified as not believed to be present, Volatile Organic Compounds (VOCs) and Semi Volatile Organic Compounds (SVOCs). Also, we have included soil testing data obtained from two boring locations within proposed excavation areas of the Site (to be dewatered) that includes Polychlorinated Biphenyl (PCB) testing results (via EPA 8082 test methods). The reported concentrations for PCBs for samples from both locations was below detection levels. It is our opinion that this data provides adequate information that PCBs are not present at the Site. During dewatering, GZA plans to collect samples (as part of system initial and monthly testing) from the treatment system (both influent and effluent) for the following parameters that have not yet been analyzed: Total Residual Chlorine, Cyanide, Chloride, Antimony, Silver, and Hexavalent Chromium. These parameters along with the parameters identified as “believed present” as stated on the NOI will be tested as part of the routine sampling.

Please do not hesitate to contact the undersigned at (781) 278-3700, if you have any questions or require further information.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "M. Smith".

Matthew M. Smith, P.E.
Senior Project Manager

A handwritten signature in blue ink, appearing to read "John A. Colbert".

John A. Colbert, P.E.
Senior Project Manager

Attachments:

- Attachment 1: NOI Form
- Attachment 2: Figure 1 – Site Locus Map
- Attachment 3: Figure C1.02 – Site Plan
- Attachment 4: Process Flow Diagram
- Attachment 5: Laboratory Analytical Results



Attachment 6: Dilution Factor Calculations
Attachment 7: NHESP Map
Attachment 8: Operator Certification

cc: MassDEP – Northeastern Region
Mark Roberts, P.E.- Harvard University
Lee Blackwell- Dimeo Construction

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ATTACHMENT 1

NOI FORM

B. Suggested Form for Notice of Intent (NOI) for the Remediation General Permit

1. General facility/site information. Please provide the following information about the site:

a) Name of facility/site :		Facility/site mailing address:	
Location of facility/site : longitude: _____ latitude: _____	Facility SIC code(s):	Street:	
b) Name of facility/site owner :	President and Fellows of Harvard College	Town:	
Email address of facility/site owner:	State:	Zip:	County:
Telephone no. of facility/site owner :			
Fax no. of facility/site owner :	Owner is (check one): 1. Federal____ 2. State/Tribal____ 3. Private____ 4. Other ____ if so, describe:		
Address of owner (if different from site):			
Street:			
Town:	State:	Zip:	County:
c) Legal name of operator :	Operator telephone no:		
	Operator fax no.:		Operator email:
Operator contact name and title:			
Address of operator (if different from owner):	Street:		
Town:	State:	Zip:	County:

d) Check Y for “yes” or N for “no” for the following: 1. Has a prior NPDES permit exclusion been granted for the discharge? Y___ N___, if Y, number:_____ 2. Has a prior NPDES application (Form 1 & 2C) ever been filed for the discharge? Y___ N___, if Y, date and tracking #:_____ 3. Is the discharge a “new discharge” as defined by 40 CFR 122.2? Y___ N___ 4. For sites in Massachusetts, is the discharge covered under the Massachusetts Contingency Plan (MCP) and exempt from state permitting? Y___ N___	
e) Is site/facility subject to any State permitting, license, or other action which is causing the generation of discharge? Y___ N___ If Y, please list: 1. site identification # assigned by the state of NH or MA: _____ 2. permit or license # assigned: _____ 3. state agency contact information: name, location, and telephone number: _____	f) Is the site/facility covered by any other EPA permit, including: 1. Multi-Sector General Permit? Y___ N___, if Y, number: _____ 2. Final Dewatering General Permit? Y___ N___, if Y, number: _____ 3. EPA Construction General Permit? Y___ N___, if Y, number: _____ 4. Individual NPDES permit? Y___ N___, if Y, number: _____ 5. any other water quality related individual or general permit? Y___ N___, if Y, number: _____
g) Is the site/facility located within or does it discharge to an Area of Critical Environmental Concern (ACEC)? Y___ N___	
h) Based on the facility/site information and any historical sampling data, identify the sub-category into which the potential discharge falls.	
<u>Activity Category</u>	<u>Activity Sub-Category</u>
I - Petroleum Related Site Remediation	A. Gasoline Only Sites _____ B. Fuel Oils and Other Oil Sites (including Residential Non-Business Remediation Discharges) _____ C. Petroleum Sites with Additional Contamination _____
II - Non Petroleum Site Remediation	A. Volatile Organic Compound (VOC) Only Sites _____ B. VOC Sites with Additional Contamination _____ C. Primarily Heavy Metal Sites _____
III - Contaminated Construction Dewatering	A. General Urban Fill Sites _____ B. Known Contaminated Sites _____

IV - Miscellaneous Related Discharges	A. Aquifer Pump Testing to Evaluate Formerly Contaminated Sites ____ B. Well Development/Rehabilitation at Contaminated/Formerly Contaminated Sites ____ C. Hydrostatic Testing of Pipelines and Tanks ____ D. Long-Term Remediation of Contaminated Sumps and Dikes ____ E. Short-term Contaminated Dredging Drain Back Waters (if not covered by 401/404 permit) ____
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2. Discharge information. Please provide information about the discharge, (attaching additional sheets as necessary) including:

a) Describe the discharge activities for which the owner/applicant is seeking coverage:	
b) Provide the following information about each discharge:	
1) Number of discharge points:	2) What is the maximum and average flow rate of discharge (in cubic feet per second, ft ³ /s)? Max. flow _____ Is maximum flow a design value ? Y ____ N ____ Average flow (include units) _____ Is average flow a design value or estimate? _____
3) Latitude and longitude of each discharge within 100 feet: pt.1: lat. _____ long. _____; pt.2: lat. _____ long. _____; pt.3: lat. _____ long. _____; pt.4: lat. _____ long. _____; pt.5: lat. _____ long. _____; pt.6: lat. _____ long. _____; pt.7: lat. _____ long. _____; pt.8: lat. _____ long. _____; etc.	
4) If hydrostatic testing, total volume of the discharge (gals): _____	5) Is the discharge intermittent ____ or seasonal ____? Is discharge ongoing? Y ____ N ____
c) Expected dates of discharge (mm/dd/yy): start _____ end _____	
d) Please attach a line drawing or flow schematic showing water flow through the facility including: 1. sources of intake water, 2. contributing flow from the operation, 3. treatment units, and 4. discharge points and receiving waters(s).	

See Cover Letter for explanation of why parameters not tested are believed to be absent. Minimum levels are in ug/L. RL indicates that the number is the reporting limit because the minimum level of test method is unavailable in Appendix VI.

NPDES Permit No. MAG910000
NPDES Permit No. NHG910000

3. Contaminant information.

a) Based on the sub-category selected (see Appendix III), indicate whether each listed chemical is **believed present** or **believed absent** in the potential discharge. Attach additional sheets as needed.

<u>Parameter *</u>	<u>CAS Number</u>	<u>Believed Absent</u>	<u>Believed Present</u>	<u># of Samples</u>	<u>Sample Type (e.g., grab)</u>	<u>Analytical Method Used (method #)</u>	<u>Minimum Level (ML) of Test Method</u>	<u>Maximum daily value</u>		<u>Average daily value</u>	
								<u>concentration (ug/l)</u>	<u>mass (kg)</u>	<u>concentration (ug/l)</u>	<u>mass (kg)</u>
1. Total Suspended Solids (TSS)											
2. Total Residual Chlorine (TRC)											
3. Total Petroleum Hydrocarbons (TPH)											
4. Cyanide (CN)	57125										
5. Benzene (B)	71432										
6. Toluene (T)	108883										
7. Ethylbenzene (E)	100414										
8. (m,p,o) Xylenes (X)	108883; 106423; 95476; 1330207										
9. Total BTEX ²	n/a										
10. Ethylene Dibromide (EDB) (1,2-Dibromoethane) ³	106934										
11. Methyl-tert-Butyl Ether (MtBE)	1634044										
12. tert-Butyl Alcohol (TBA) (Tertiary-Butanol)	75650										

* Numbering system is provided to allow cross-referencing to Effluent Limits and Monitoring Requirements by Sub-Category included in Appendix III, as well as the Test Methods and Minimum Levels associated with each parameter provided in Appendix VI.

² BTEX = Sum of Benzene, Toluene, Ethylbenzene, total Xylenes.

³ EDB is a groundwater contaminant at fuel spill and pesticide application sites in New England.

<u>Parameter *</u>	<u>CAS Number</u>	<u>Believed Absent</u>	<u>Believed Present</u>	<u># of Samples</u>	<u>Sample Type (e.g., grab)</u>	<u>Analytical Method Used (method #)</u>	<u>Minimum Level (ML) of Test Method</u>	<u>Maximum daily value</u>		<u>Average daily value</u>	
								<u>concentration (ug/l)</u>	<u>mass (kg)</u>	<u>concentration (ug/l)</u>	<u>mass (kg)</u>
13. tert-Amyl Methyl Ether (TAME)	9940508										
14. Naphthalene	91203										
15. Carbon Tetrachloride	56235										
16. 1,2 Dichlorobenzene (o-DCB)	95501										
17. 1,3 Dichlorobenzene (m-DCB)	541731										
18. 1,4 Dichlorobenzene (p-DCB)	106467										
18a. Total dichlorobenzene											
19. 1,1 Dichloroethane (DCA)	75343										
20. 1,2 Dichloroethane (DCA)	107062										
21. 1,1 Dichloroethene (DCE)	75354										
22. cis-1,2 Dichloroethene (DCE)	156592										
23. Methylene Chloride	75092										
24. Tetrachloroethene (PCE)	127184										
25. 1,1,1 Trichloro-ethane (TCA)	71556										
26. 1,1,2 Trichloro-ethane (TCA)	79005										
27. Trichloroethene (TCE)	79016										

<u>Parameter *</u>	<u>CAS Number</u>	<u>Believed Absent</u>	<u>Believed Present</u>	<u># of Samples</u>	<u>Sample Type (e.g., grab)</u>	<u>Analytical Method Used (method #)</u>	<u>Minimum Level (ML) of Test Method</u>	<u>Maximum daily value</u>		<u>Average daily value</u>	
								<u>concentration (ug/l)</u>	<u>mass (kg)</u>	<u>concentration (ug/l)</u>	<u>mass (kg)</u>
28. Vinyl Chloride (Chloroethene)	75014										
29. Acetone	67641										
30. 1,4 Dioxane	123911										
31. Total Phenols	108952										
32. Pentachlorophenol (PCP)	87865										
33. Total Phthalates (Phthalate esters) ⁴											
34. Bis (2-Ethylhexyl) Phthalate [Di- (ethylhexyl) Phthalate]	117817										
35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)											
a. Benzo(a) Anthracene	56553										
b. Benzo(a) Pyrene	50328										
c. Benzo(b)Fluoranthene	205992										
d. Benzo(k)Fluoranthene	207089										
e. Chrysene	21801										
f. Dibenzo(a,h)anthracene	53703										
g. Indeno(1,2,3-cd) Pyrene	193395										
36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)											

⁴The sum of individual phthalate compounds.

<u>Parameter *</u>	<u>CAS Number</u>	<u>Believed Absent</u>	<u>Believed Present</u>	<u># of Samples</u>	<u>Sample Type (e.g., grab)</u>	<u>Analytical Method Used (method #)</u>	<u>Minimum Level (ML) of Test Method</u>	<u>Maximum daily value</u>		<u>Average daily value</u>	
								<u>concentration (ug/l)</u>	<u>mass (kg)</u>	<u>concentration (ug/l)</u>	<u>mass (kg)</u>
h. Acenaphthene	83329										
i. Acenaphthylene	208968										
j. Anthracene	120127										
k. Benzo(ghi) Perylene	191242										
l. Fluoranthene	206440										
m. Fluorene	86737										
n. Naphthalene	91203										
o. Phenanthrene	85018										
p. Pyrene	129000										
37. Total Polychlorinated Biphenyls (PCBs)	85687; 84742; 117840; 84662; 131113; 117817.										
38. Chloride	16887006										
39. Antimony	7440360										
40. Arsenic	7440382										
41. Cadmium	7440439										
42. Chromium III (trivalent)	16065831										
43. Chromium VI (hexavalent)	18540299										
44. Copper	7440508										
45. Lead	7439921										
46. Mercury	7439976										
47. Nickel	7440020										
48. Selenium	7782492										
49. Silver	7440224										
50. Zinc	7440666										
51. Iron	7439896										
Other (describe):											

<u>Parameter *</u>	<u>CAS Number</u>	<u>Believed Absent</u>	<u>Believed Present</u>	<u># of Samples</u>	<u>Sample Type (e.g., grab)</u>	<u>Analytical Method Used (method #)</u>	<u>Minimum Level (ML) of Test Method</u>	<u>Maximum daily value</u>		<u>Average daily value</u>	
								<u>concentration (ug/l)</u>	<u>mass (kg)</u>	<u>concentration (ug/l)</u>	<u>mass (kg)</u>

b) For discharges where **metals** are believed present, please fill out the following (attach results of any calculations):

<i>Step 1:</i> Do any of the metals in the influent exceed the effluent limits in Appendix III (i.e., the limits set at zero dilution)? Y____ N____	If yes, which metals?
<i>Step 2:</i> For any metals which exceed the Appendix III limits, calculate the dilution factor (DF) using the formula in Part I.A.3.c (step 2) of the NOI instructions or as determined by the State prior to the submission of this NOI. What is the dilution factor for applicable metals? Metal:_____ DF:_____ Metal:_____ DF:_____ Metal:_____ DF:_____ Metal:_____ DF:_____ Etc.	Look up the limit calculated at the corresponding dilution factor in Appendix IV. Do any of the metals in the influent have the potential to exceed the corresponding effluent limits in Appendix IV (i.e., is the influent concentration above the limit set at the calculated dilution factor)? Y____ N____ If Y, list which metals:

4. Treatment system information. Please describe the treatment system using separate sheets as necessary, including:

a) A description of the treatment system, including a schematic of the proposed or existing treatment system:						
b) Identify each applicable treatment unit (check all that apply):	Frac. tank	Air stripper	Oil/water separator	Equalization tanks	Bag filter	GAC filter
	Chlorination	De-chlorination	Other (please describe):			

c) Proposed **average** and **maximum flow rates** (gallons per minute) for the discharge and the **design flow rate(s)** (gallons per minute) of the treatment system:

Average flow rate of discharge _____ gpm Maximum flow rate of treatment system _____ gpm

Design flow rate of treatment system _____ gpm

d) A description of chemical additives being used or planned to be used (attach MSDS sheets):

5. Receiving surface water(s). Please provide information about the receiving water(s), using separate sheets as necessary:

a) Identify the discharge pathway:	Direct to receiving water _____	Within facility (sewer) _____	Storm drain _____	Wetlands _____	Other (describe): _____
b) Provide a narrative description of the discharge pathway, including the name(s) of the receiving waters:					
c) Attach a detailed map(s) indicating the site location and location of the outfall to the receiving water:				See Attachment 3.	
1. For multiple discharges, number the discharges sequentially.					
2. For indirect dischargers, indicate the location of the discharge to the indirect conveyance and the discharge to surface water					
The map should also include the location and distance to the nearest sanitary sewer as well as the locus of nearby sensitive receptors (based on USGS topographical mapping), such as surface waters, drinking water supplies, and wetland areas.					
d) Provide the state water quality classification of the receiving water _____					
e) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water _____ cfs Please attach any calculation sheets used to support stream flow and dilution calculations.					
f) Is the receiving water a listed 303(d) water quality impaired or limited water? Y____ N____ If yes, for which pollutant(s)? _____					
Is there a final TMDL? Y____ N____ If yes, for which pollutant(s)? _____					

6. ESA and NHPA Eligibility.

Please provide the following information according to requirements of Permit Parts I.A.4 and I.A.5 Appendices II and VII.

- a) Using the instructions in Appendix VII and information on Appendix II, under which criterion listed in Part I.C are you eligible for coverage under this general permit?
A ____ B ____ C ____ D ____ E ____ F ____
- b) If you selected Criterion D or F, has consultation with the federal services been completed? Y ____ N ____ Underway ____
- c) If consultation with U.S. Fish and Wildlife Service and/or NOAA Fisheries Service was completed, was a written concurrence finding that the discharge is “not likely to adversely affect” listed species or critical habitat received? Y ____ N ____
- d) Attach documentation of ESA eligibility as described in the NOI instructions and required by Appendix VII, Part I.C, Step 4.
- e) Using the instructions in Appendix VII, under which criterion listed in Part II.C are you eligible for coverage under this general permit?
1 ____ 2 ____ 3 ____
- f) If Criterion 3 was selected, attach all written correspondence with the State or Tribal historic preservation officers, including any terms and conditions that outline measures the applicant must follow to mitigate or prevent adverse effects due to activities regulated by the RGP.

7. Supplemental information.

Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit.

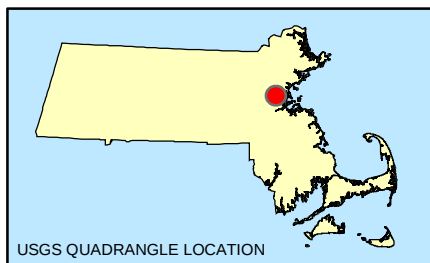
8. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22, including the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility/Site Name:	Old Quincy Residence Hall
Operator signature:	
Printed Name & Title:	Lee Blackwell, Project Manager, Dimeo Construction
Date:	6/7/2012

ATTACHMENT 2

FIGURE 1 – SITE LOCUS MAP



SOURCE : SCANNED USGS TOPOGRAPHIC QUADRANGLES
SCANNED BY THE MASSACHUSETTS EXECUTIVE OFFICE OF
ENVIRONMENTAL AFFAIRS, MASSGIS. DISTRIBUTED JUNE, 2001.

Data Supplied by :



0 1,000 2,000 4,000 6,000
Feet



PROJ. MGR.: MMS
DESIGNED BY: MMS
REVIEWED BY: RDH
OPERATOR: JRC

DATE: 08-5-2011

LOCUS PLAN
SHOWING 500 FOOT & 1/2 MILE RADII

OLD QUINCY HOUSE
HARVARD UNIVERSITY
CAMBRIDGE, MA

JOB NO.
01.0170977.00

FIGURE NO.
1

ATTACHMENT 3

FIGURE C1.02 – SITE PLAN

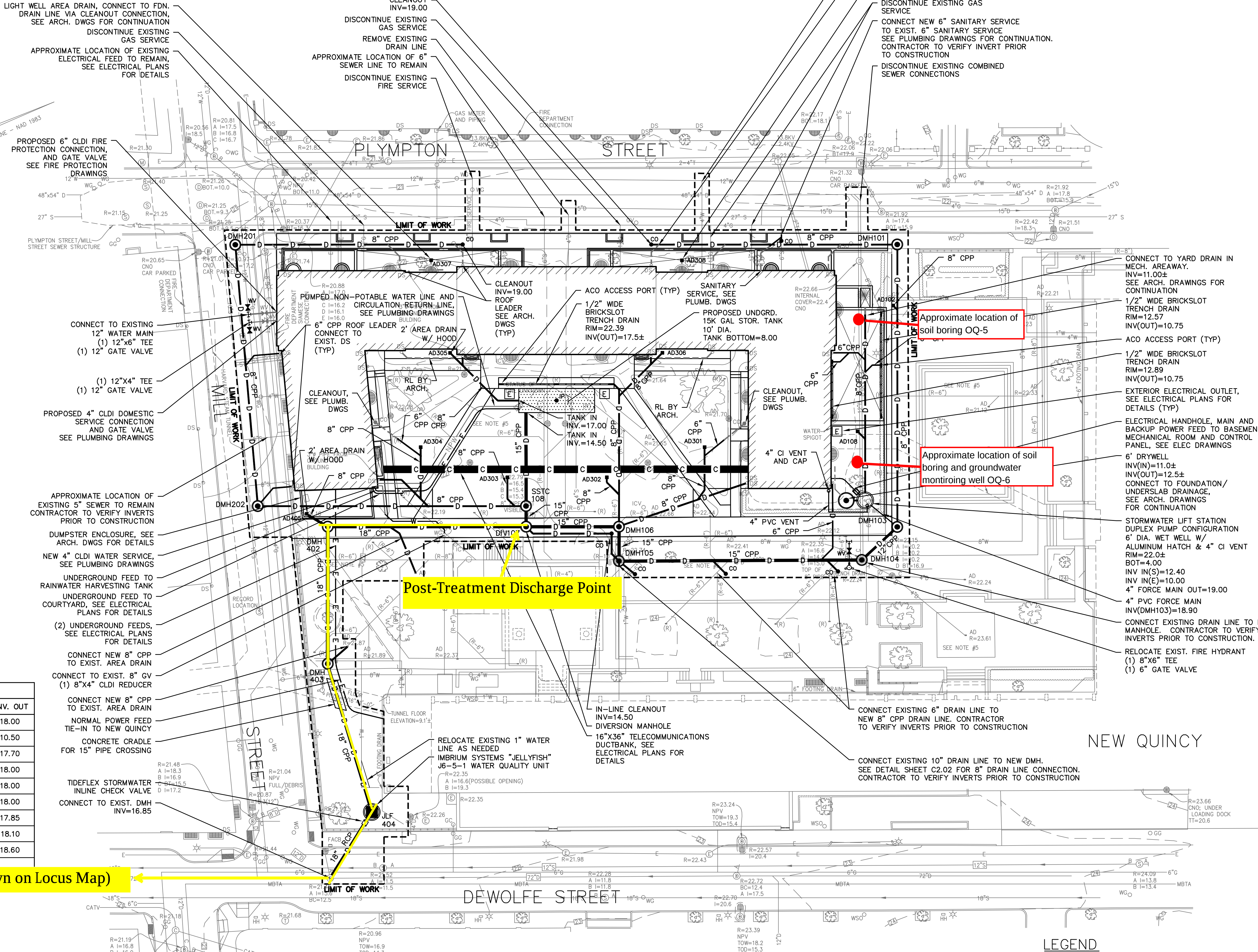
UTILITY NOTES:

- THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE CONSIDERED APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY UTILITY CONNECTIONS OR CROSSINGS OF PROPOSED UTILITIES AND EXISTING UTILITIES. THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES RELATIVE TO THE LOCATIONS AND ELEVATIONS OF THEIR LINES. THE CONTRACTOR SHALL KEEP A RECORD OF ANY DISCREPANCIES OR CHANGES IN THE LOCATIONS OF ANY UTILITIES SHOWN OR ENCOUNTERED DURING CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE OWNER AND NITSCH ENGINEERING.
- THE CONTRACTOR SHALL COMPLY WITH MASSACHUSETTS GENERAL LAWS CHAPTER 82, SECTION 40, AS AMENDED, WHICH STATES THAT NO ONE MAY EXCAVATE IN THE COMMONWEALTH OF MASSACHUSETTS EXCEPT IN AN EMERGENCY WITHOUT 72 HOURS NOTICE, EXCLUSIVE OF SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS. TO NATURAL GAS PIPELINE COMPANIES, AND MUNICIPAL UTILITY DEPARTMENTS THAT SUPPLY GAS, ELECTRICITY, TELEPHONE, OR CABLE TELEVISION SERVICE IN OR TO THE CITY OR TOWN WHERE THE EXCAVATION IS TO BE MADE. THE CONTRACTOR SHALL CALL "DIG SAFE" AT 1-888-DIG-SAFE.
- ALL UTILITY CONNECTIONS ARE SUBJECT TO THE APPROVAL OF, AND GRANTING OF PERMITS BY, THE CITY OF CAMBRIDGE. IT SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO SEE THAT ALL PERMITS AND APPROVALS ARE OBTAINED BEFORE STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAKING ALL NECESSARY ARRANGEMENTS FOR AND FOR PERFORMING ANY NECESSARY WORK INVOLVED IN CONNECTION WITH OR THE DISCONTINUANCE OF ANY UTILITIES WITHIN THE JURISDICTION OF ANY UTILITY COMPANIES, SUCH AS ELECTRICITY, TELEPHONE, WATER, GAS, AND ANY SYSTEM OR SYSTEMS WHICH WILL BE AFFECTED BY THE WORK TO BE PERFORMED UNDER THIS CONTRACT. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE AGENCIES, DEPARTMENTS, AND UTILITY COMPANIES, IN WRITING, AT LEAST 48 HOURS AND NOT MORE THAN 30 DAYS PRIOR TO ANY CONSTRUCTION.
- CONSTRUCTION SHALL NOT INTERFERE WITH OR INTERRUPT UTILITIES WHICH ARE TO REMAIN IN OPERATION.
- ALL WATER, SEWER, AND DRAIN WORK SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS AND STANDARD SPECIFICATIONS OF THE CITY OF CAMBRIDGE.
- GAS, TELEPHONE AND ELECTRIC SERVICES ARE TO BE DESIGNED BY EACH UTILITY COMPANY IN COORDINATION WITH THE MECHANICAL, ELECTRIC AND PLUMBING CONSULTANTS. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES AND DESIGN OF NEW UTILITIES WITH ELECTRIC, CABLE TELEVISION AND TELECOMMUNICATION UTILITIES.
- INSTALL WATER LINES WITH A MINIMUM OF FIVE FEET OF COVER AND A MAXIMUM OF SEVEN FEET COVER FROM THE FINAL DESIGN GRADES.
- MAINTAIN 10 FEET HORIZONTAL SEPARATION AND 18" VERTICAL SEPARATION (WATER OVER SEWER) BETWEEN SEWER AND WATER LINES. WHEREVER THERE IS LESS THAN 10 FEET OF HORIZONTAL SEPARATION AND 18" OF VERTICAL SEPARATION BETWEEN A PROPOSED OR EXISTING SEWER LINE TO REMAIN AND A PROPOSED OR EXISTING WATER LINE TO REMAIN BOTH WATER MAIN AND SEWER MAIN SHALL BE CONSTRUCTED OF MECHANICAL JOINT CEMENT LINED DUCTILE IRON PIPE FOR A DISTANCE OF 10- FEET ON EITHER SIDE OF THE CROSSING. ONE (1) FULL LENGTH OF WATER PIPE SHALL BE CENTERED OVER THE SEWER AT THE CROSSING.
- UTILITY STRUCTURES TO BE ABANDONED SHALL BE REMOVED TO A DEPTH OF NO LESS THAN 3 FEET BELOW FINISHED GRADE, THE BOTTOMS OF THE STRUCTURES SHALL BE BROKEN AND THE STRUCTURES SHALL BE BACKFILLED WITH GRAVEL BORROW AND COMPACTED.
- CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES EXCEPT THOSE NOTED TO BE ABANDONED AND/OR REMOVED & DISPOSED.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR TRENCHING, BACKFILLING, AND SURFACE RESTORATION FOR THE GAS LINE INSTALLATION.
- ALL ON-SITE UTILITIES SHALL BE INSTALLED UNDERGROUND UNLESS OTHERWISE NOTED.
- MANHOLE FRAMES, COVERS, VALVES, CLEANOUTS, ETC. SHALL BE RAISED TO FINISHED GRADE PRIOR TO FINAL PAVING CONSTRUCTION.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, REGULATIONS AND SAFETY CODES IN THE CONSTRUCTION OF ALL IMPROVEMENTS.
- RESET ALL RIMS WITHIN THE LIMIT OF WORK TO PROPOSED GRADE.
- LOCATIONS OF ROOF DRAIN AND UNDERDRAIN CONNECTIONS ARE APPROXIMATE AND SUBJECT TO CHANGE.
- CONTRACTOR TO PROTECT AND MAINTAIN EXISTING LIGHTPOLES, BASES, AND CONDUIT DURING CONSTRUCTION.
- ROOF LEADERS SHALL BE INSTALLED TO MINIMUM 1:48 SLOPE (2.08%) U.N.O.
- REFER TO LANDSCAPE ARCHITECTURE PLANS FOR FINISHED GRADING.

STRUCTURE UTILITY TABLE			
STRUCTURE	RIM	INV. IN	INV. OUT
DMH 101	22.2±ME	18.00	17.90
DMH 103	22.4±ME	16.90	16.80
DMH 104	22.35±ME	16.70	16.60
DMH 105	22.8±ME	15.75(N)	15.65(15")
		14.75±(E)	14.65(8"D)
DMH 106	22.83	16.30 (W)	15.45
		16.50 (N)	
		15.55 (E)	
DIV 107	22.83	14.05(8"D)	15.00 (W)
		15.10(15")	18.25 (S)
SSTC 108	22.56	15.80 (S)	14.70
		14.95 (E)	
DMH 201	20.7±ME	18.00	17.90
DMH 202	21.3±ME	17.00	16.90
		17.50±(NW)	
DMH 402	21.72	17.90	17.90
DMH 403	21.75±ME	17.70	17.70
JLF 404	22.1±ME	17.50	17.00

INLET STRUCTURE UTILITY TABLE			
STRUCTURE	RIM	INV. IN	INV. OUT
AD 102	21.8±ME		18.00
AD 108	13.19		10.50
AD 301	21.99		17.70
AD 302	21.91		18.00
AD 303	21.91		18.00
AD 304	21.99		18.00
AD 305	22.01		17.85
AD 306	22.01		18.10
AD 405	21.20		18.60

To Outfall (Shown on Locus Map)

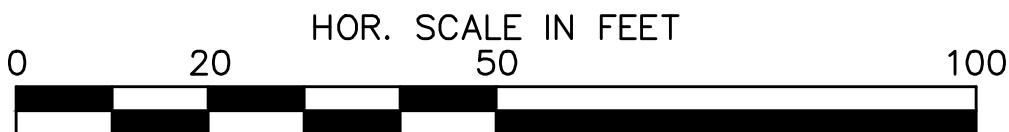


Post-Treatment Discharge Point

NEW QUINCY

LEGEND

- DMH
- AD
- CO
- P
- WV
- STC
- JLF
- D
- S
- W
- E
- NPW
- C
- TIDEFLEX CHECK VALVE
- ELECTRICAL STRUCTURE
- DRAIN MANHOLE
- AREA DRAIN
- CLEANOUT
- INSPECTION PORT
- HYDRANT
- WATER VALVE
- SUBMERGED-TYPE STORMCEPTOR WATER QUALITY UNIT
- IMBRIUM "JELLYFISH" WATER QUALITY UNIT
- DRAIN LINE
- SEWER LINE
- WATER LINE
- ELECTRIC LINE
- NON-POTABLE WATER
- TELECOMMUNICATIONS LINE



Discharge and Drainage Information
RGP Permit Application
Old Quincy Renovation Project
Cambridge, Massachusetts

ARCHITECT
KIERANTIMBERLAKE
420 NORTH 20TH STREET
PHILADELPHIA, PA 19130
V 215-922-4600
F 215-922-4680
kieran@timberlake.com

STRUCTURAL ENGINEER AND ENVELOPE CONSULTANT
CVM STRUCTURAL ENGINEERS
400 CRESSON BOULEVARD, SUITE 300, PO BOX 398
OWAS, PA 19456
V 610-989-3800
F 610-989-3677

M/E/P/FP ENGINEER
BVH INTEGRATED SERVICES
50 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
V 860-286-9171
F 860-242-0236

LANDSCAPE ARCHITECT
STEPHEN STIMSON ASSOCIATES
288 NORFOLK STREET
CAMBRIDGE, MA 02139
V 617-876-8960
F 617-876-8966

CIVIL ENGINEER
NITSCH ENGINEERING
186 LINCOLN STREET, SUITE 200
BOSTON, MA 02111-2403
V 617-338-0063
F 617-338-6472

ELEVATOR CONSULTANT
EVAN DEUSEN & ASSOCIATES
198 TREMONT STREET, SUITE 443
BOSTON, MA 02116-4705
V 888-503-3222
F 617-249-0790

HOUSE RENEWAL
OLD QUINCY
PILOT PROJECT

HARVARD UNIVERSITY

58 PLYMPTON STREET
CAMBRIDGE, MA

KT PROJECT NO. 819



REVISIONS

NO.	DATE	DESCRIPTION
-----	------	-------------

COMPOSITE UTILITY
PLAN

SCALE:
DRAWN BY: SPS
CHECKED BY: NH
CAD FILE: C1.02 COMPOSITE UTILITY PLAN - ALT2.DWG
DATE: 31 OCT 2011

C1.02
100% CONSTRUCTION DOCUMENTS
NOT FOR CONSTRUCTION

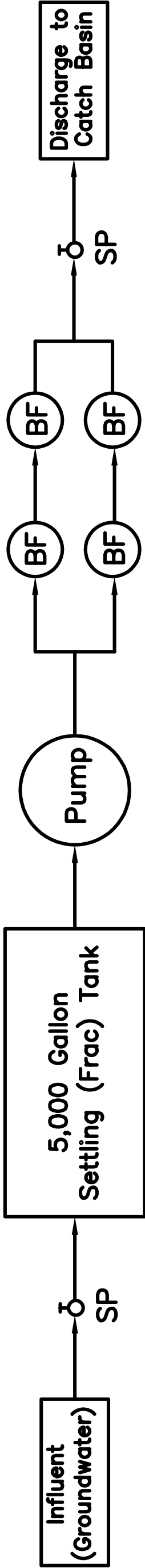
ATTACHMENT 4
PROCESS FLOW DIAGRAM

Process Flow Diagram

Treatment System

Old Quincy Residence Hall

Plympton Street, Cambridge MA



LEGEND:

SP = Sample Port

BF = Bag Filter

2			
1			
NO.	ISSUE/DESCRIPTION	BY	DATE
OLD QUINCY RESIDENCE HALL NOTICE OF INTENT CAMBRIDGE, MA			
PROCESS FLOW DIAGRAM			
PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists		PREPARED FOR: PRESIDENT AND FELLOWS OF HARVARD COLLEGE	
PROJ MGR:	MMS	REVIEWED BY:	MMS
DESIGNED BY:		DRAWN BY:	AHG
DATE:	6/1/2012	PROJECT NO.	170977.00
		REVISION NO.	
		FIGURE	1
		SHEET NO. 1-OF-1	

ATTACHMENT 5

LABORATORY ANALYTICAL RESULTS



GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Laboratory Identification Numbers:
MA and ME: **MA092** NH: **2028**
CT: **PH0579** RI: **LAO00236**
NELAC - NYS DOH: **11063**

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Project No.: **01.0170977.00**
Work Order No.: **1107-00044**
Date Received: **07/13/2011**
Date Reported: **07/20/2011**

Matt Smith

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
07/13/2011	Aqueous	1107-00044 001	Old Quincy S-1
07/13/2011	Aqueous	1107-00044 002	Old Quincy S-1 Filtered



MassDEP Analytical Protocol Certification Form

Laboratory Name: **GZA GeoEnvironmental, Inc.**Project #: **01.0170977.00**Project Location: **Old Quincy House-Harvard Univ.**

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
1107-00044

Matrices: ☒ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses 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 laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
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 ☐ No
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 ☐ No
E	VPH, EPH, APH, and TO-15 only: a. 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). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
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 ☐ No

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 ☐ No ¹
----------	---	--

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?	☐ Yes ☒ No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes ☒ No ¹

¹All 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: Laboratory SupervisorPrinted Name: Andrew YaroshewskiDate: 07/20/11



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/13/2011**
Date Reported: **07/20/2011**
Work Order No.: **1107-00044**

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 07/13/11 via x GZA courier, EC, FEDEX, or hand delivered.
The samples were received intact for all requested analyses.

The following questions are answered upon sample receipt to determine compliance with MADEP Defined "Presumptive Certainty":

Were the samples received at ≤ 6 degrees C (Temperature = 3.2 degrees C)? (x) yes () no
Were any samples received above 6 degrees C, received within 8 hours of collection and on ice? () yes () no (x) n/a

Were the samples received with method specific preservatives within holding time? (x) yes () no
* The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.

Were all constituents for the MCP Method(s) selected assigned on the COC? () yes (x) no

* Full MCP14 Metals () yes (x) no () not assigned
* Full EPA 8270 SVOCs () yes () no (x) not assigned
* Full EPA 8260 VOCs () yes (x) no () not assigned

2. Subcontracted Analyses

Analyses for TSS and Oil & Grease were performed by R.I. Analytical Laboratories, Inc, Warwick RI.

Certification MA: MA-RI015, NH: 253700 A&B, CT: PH-0508, ME: RI015, RI: RI-033, NY:11726

3. EPA Method 150.2 – pH

The pH of sample Old Quincy S-1 (1107-44-001) was measured outside of the method specified Hold Time (HT) of analyze immediately.

The pH was measured at 16.0 C.

4. EPA Method 6010C/7470A - Metals

Question H

The Laboratory Control Sample Duplicate (LCSD) (07/15/11) had MA MCP 6010C list analytes outside of the 80-120% QC acceptance limits. Specific outliers includes copper (139%), selenium (123%) and zinc (124%).

Question I

Per the client's request, only a subset of the MCP analyte list for SW-846 Method 6010C Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) is reported.



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Hopkinton, MA 01748
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ANALYTICAL REPORT

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Attach QC 6010C 07/15/11 - Aqueous
Attach QC 7470A 07/15/11 - Aqueous

5. Total Petroleum Hydrocarbons

Attach QC TPH 07/14/11 – Aqueous

6. EPA Method 624 - VOCs

Question I

EPA 624 is not a MA MCP method.

Attach QC 624 7/18/11 "S" - Aqueous



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Date Received: **07/13/2011**
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Work Order No.: **1107-00044**

LABORATORY STATEMENTS:

NELAC certification, as indicated by the NELAC ID Number, is per analyte. For a complete list of NELAC validated analytes, please contact the laboratory.

MA Certification: MA DEP certifies for wastewater and drinking water matrices only. GZA is certified by MA DEP for EPA Methods 624, 524.2, 625, 245.1, 300.0 (Cl, SO₄, NO₃) and 200.7 (Sb, As, Be, Cd, Cr, Pb, Ni, Se, Ag, Tl, Zn, Al, Co, Fe, Mn, Mo, V.) The certification requirements were followed.

Abbreviations:

% R = % Recovery
DF = Dilution Factor
CF = Calculation Factor
DO = Diluted Out

Method Key:

Method 8260: The current version of the method is 8260B.
Method 8270: The current version of the method is 8270D.
Method 6010: The current version of the method is 6010C.
Method 8081: The current version of the method is 8081B.
Method 8082: The current version of the method is 8082A.
Method 7471: The current version of the method is 7471B.

The current Metals preparation methods are: 3010A (aqueous) and 3051 (solid).

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.



ANALYTICAL REPORT

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Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/13/2011**
Date Reported: **07/20/2011**
Work Order No.: **1107-00044**

Sample ID: **Old Quincy S-1**

Sample No.: **001**

Sample Date: **07/13/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
VOLATILE ORGANIC COMPOUNDS	EPA 624				MQS	07/19/11	
Dichlorodifluoromethane	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
Chloromethane	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
Vinyl Chloride	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Bromomethane	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
Chloroethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Trichlorofluoromethane	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
1,1-Dichloroethene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Acrolein	EPA 624	<10	10	ug/L	MQS	07/19/11	1:09
Dichloromethane	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
Carbon Disulfide	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
Acrylonitrile	EPA 624	<10	10	ug/L	MQS	07/19/11	1:09
trans-1,2-Dichloroethene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Vinyl Acetate	EPA 624	<2.0	2.0	ug/L	MQS	07/19/11	1:09
1,1-Dichloroethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
cis-1,2-Dichloroethene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Chloroform	EPA 624	1.8	1.0	ug/L	MQS	07/19/11	1:09
1,1,1-Trichloroethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Carbon Tetrachloride	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,2-Dichloroethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Benzene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Trichloroethene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,2-Dichloropropane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Bromodichloromethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
2-Chloroethylvinylether	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
cis-1,3-Dichloropropene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Toluene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
trans-1,3-Dichloropropene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,1,2-Trichloroethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Tetrachloroethene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Dibromochloromethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Chlorobenzene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Ethylbenzene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
m&p-Xylene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
o-Xylene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/13/2011**
Date Reported: **07/20/2011**
Work Order No.: **1107-00044**

Sample ID: **Old Quincy S-1**

Sample No.: **001**

Sample Date: **07/13/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
Styrene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Bromoform	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,1,2,2-Tetrachloroethane	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,3-Dichlorobenzene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,4-Dichlorobenzene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
1,2-Dichlorobenzene	EPA 624	<1.0	1.0	ug/L	MQS	07/19/11	1:09
Surrogates:	EPA 624						
***1,2-Dichloroethane-D4	EPA 624	95.1	70-130	% R	MQS	07/19/11	1:09
***Toluene-D8	EPA 624	105	70-130	% R	MQS	07/19/11	1:09
***4-Bromofluorobenzene	EPA 624	89.5	70-130	% R	MQS	07/19/11	1:09
Preparation		0.2		DF	MQS	07/18/11	
TOTAL PETROLEUM HYDROCARBON Mod. EPA 8100					RJD	07/18/11	
Hydrocarbon Content		<200	200	ug/L	RJD	07/18/11	7:54
Surrogate:							
***p-Terphenyl		40.2		% R	RJD	07/18/11	7:54
Extraction	EPA 3510C	1.0		DF	BAF	07/14/11	
TOTAL METALS							
Arsenic	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Barium	EPA 6010C	0.066	0.0050	mg/L	AJY	07/18/11	10:27
Cadmium	EPA 6010C	<0.0050	0.0050	mg/L	AJY	07/18/11	10:27
Chromium	EPA 6010C	0.0053	0.0050	mg/L	AJY	07/18/11	10:27
Copper	EPA 6010C	<0.015	0.015	mg/L	AJY	07/15/11	11:54
Lead	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Mercury	EPA 7470A	<0.00020	0.00020	mg/L	GDD	07/18/11	15:26
Nickel	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Selenium	EPA 6010C	0.029	0.025	mg/L	AJY	07/18/11	10:27
Zinc	EPA 6010C	0.025	0.010	mg/L	AJY	07/18/11	10:27
Iron	EPA 6010C	3.3	0.025	mg/L	AJY	07/18/11	10:27
pH	EPA 150.2	7.07		std units	GDD	07/13/11	16:15
SUBCONTRACTED ANALYTES							
Total Suspended Solids	SM-2540D	300	2.0	mg/L	XXX	07/15/11	14:18
Oil & Grease	EPA 1664	1.0	0.5	mg/L	XXX	07/19/11	14:18



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
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781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/13/2011**
Date Reported: **07/20/2011**
Work Order No.: **1107-00044**

Sample ID: **Old Quincy S-1 Filtered**

Sample No.: **002**

Sample Date: **07/13/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
DISSOLVED METALS							
Arsenic	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Barium	EPA 6010C	0.045	0.0050	mg/L	AJY	07/18/11	10:27
Cadmium	EPA 6010C	<0.0050	0.0050	mg/L	AJY	07/18/11	10:27
Chromium	EPA 6010C	<0.0050	0.0050	mg/L	AJY	07/18/11	10:27
Copper	EPA 6010C	<0.015	0.015	mg/L	AJY	07/15/11	11:54
Lead	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Mercury	EPA 7470A	<0.00020	0.00020	mg/L	GDD	07/18/11	15:26
Nickel	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Selenium	EPA 6010C	<0.025	0.025	mg/L	AJY	07/18/11	10:27
Zinc	EPA 6010C	<0.010	0.010	mg/L	AJY	07/18/11	10:27
Iron	EPA 6010C	0.036	0.025	mg/L	AJY	07/18/11	10:27

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 106 SOUTH ST, HOPKINTON, MA 01748
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 6010C ANALYSIS
Metals by ICP

QUALITY CONTROL - AQUEOUS

DATE PREPARED: 7/15/2011

QC Sample	Method Blank	Lab Control Sample	LC Duplicate	LC/LCD Diff.
Units	mg/L	% Recovery	% Recovery	RPD
Acceptance Limits	Results	80-120	80-120	<20
Analyte				
Silver (Ag)	NA	NA	NA	NA
Aluminum (Al)	NA	NA	NA	NA
Arsenic (As)	<0.010	116	99.8	15.2
Boron (B)	NA	NA	NA	NA
Barium (Ba)	<0.0050	116	102	13.4
Beryllium (Be)	NA	NA	NA	NA
Calcium (Ca)	NA	NA	NA	NA
Cadmium (Cd)	<0.0050	118	103	14.0
Cobalt (Co)	NA	NA	NA	NA
Chromium (Cr)	<0.0050	114	99.7	13.4
Copper (Cu)	<0.015	119	139	15.5
Iron (Fe)	<0.025	115	101	13.2
Magnesium (Mg)	NA	NA	NA	NA
Manganese (Mn)	NA	NA	NA	NA
Molybdenum (Mo)	NA	NA	NA	NA
Nickel (Ni)	<0.010	117	103	13.2
Lead (Pb)	<0.010	115	101	13.0
Antimony (Sb)	NA	NA	NA	NA
Selenium (Se)	<0.025	107	123	13.9
Tin (Sn)	NA	NA	NA	NA
Titanium (Ti)	NA	NA	NA	NA
Thallium (Tl)	NA	NA	NA	NA
Vanadium (V)	NA	NA	NA	NA
Zinc (Zn)	<0.010	108	124	14.0

RPD = Relative Percent Difference
 NA = Not Applicable
 NC = Not Calculated
 CRM = Certified Reference Material

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106 SOUTH ST, HOPKINTON, MA 01748
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 7470A ANALYSIS
Mercury by Cold Vapor Atomic Absorption

QUALITY CONTROL - AQUEOUS

Date Prepared : 07/15/11

QC Sample	Method Blank	Lab Control Sample	Lab Control Sample Duplicate	LC/LCD Difference
Units	mg/L	% Recovery	% Recovery	RPD
Acceptance Limits	Results	80-120	80-120	20%
Analyte				
Mercury (Hg)	<0.00020	97.2	97.6	0.41

RPD = Relative Percent Difference
LC concentration = 0.0005 mg/L

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 106 SOUTH STREET, HOPKINTON, MA 01748 (508)435-9244
 MASSACHUSETTS LABORATORY I.D. NO. MA092

TPH
TOTAL PETROLEUM HYDROCARBONS IN AQUEOUS AND/OR SOLID MATRIX

QUALITY CONTROL

EXT. DATE: 07/14/11 Aqueous

METHOD BLANK	AQUEOUS	SOLID	
	ug/L-PPB	mg/kg - PPM	
TPH	<200	<10	
Surrogate:	Recovery (%)	Limits-Aqueous	Limits-Solid
***p-Terphenyl	71.1	40-130	40-130

LABORATORY CONTROL SAMPLE /	LCS	LCSD			
DUPLICATE LCS	Recovery (%)	Recovery (%)	Limits	RPD	Limits
TPH	61.8	54.2	40-150	13	<30
Surrogate:					
***p-Terphenyl	76.8	53.0			

*Matrix Spike / Duplicate Spike performed as per method and reported if assigned on the Chain of Custody.

GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748

EPA Method 624 Aqueous Method Blank (MB) and QC Check Sample (CCV/LCS) Data

Method Blank 2

Date Analyzed:	07/18/11	
Volatile Organics	Conc. ug/L	Acceptance Limit
dichlorodifluoromethane	< 2.0	< 2.0
chloromethane	< 2.0	< 2.0
vinyl chloride	< 1.0	< 1.0
bromomethane	< 1.0	< 1.0
chloroethane	< 1.0	< 1.0
trichlorofluoromethane	< 2.0	< 2.0
acrolein	< 10	< 10
acetone	< 25	< 25
1,1-dichloroethene	< 1.0	< 1.0
carbon disulfide	< 1.0	< 1.0
dichloromethane	< 1.0	< 1.0
acrylonitrile	< 1.0	< 1.0
methyl-tert-butyl-ether	< 1.0	< 1.0
trans-1,2-dichloroethene	< 1.0	< 1.0
1,1-dichloroethane	< 1.0	< 1.0
vinyl acetate	< 1.0	< 1.0
2-butanone	< 25	< 25
cis-1,2-dichloroethene	< 1.0	< 1.0
chloroform	< 1.0	< 1.0
1,1,1-trichloroethane	< 1.0	< 1.0
carbon tetrachloride	< 1.0	< 1.0
1,2-dichloroethane	< 1.0	< 1.0
benzene	< 1.0	< 1.0
trichloroethene	< 1.0	< 1.0
1,2-dichloropropane	< 1.0	< 1.0
bromodichloromethane	< 1.0	< 1.0
2-chloroethyl vinyl ether	< 1.0	< 1.0
4-methyl-2-pentanone	< 25	< 25
cis-1,3-dichloropropene	< 1.0	< 1.0
toluene	< 1.0	< 1.0
trans-1,3-dichloropropene	< 1.0	< 1.0
1,1,2-trichloroethane	< 1.0	< 1.0
2-hexanone	< 25	< 25
tetrachloroethene	< 1.0	< 1.0
dibromochloromethane	< 1.0	< 1.0
chlorobenzene	< 1.0	< 1.0
ethylbenzene	< 1.0	< 1.0
1,1,2,2-tetrachloroethane	< 1.0	< 1.0
m&p-xylene	< 2.0	< 2.0
o-xylene	< 1.0	< 1.0
styrene	< 1.0	< 1.0
bromoform	< 1.0	< 1.0
1,3-dichlorobenzene	< 1.0	< 1.0
1,4-dichlorobenzene	< 1.0	< 1.0
1,2-dichlorobenzene	< 1.0	< 1.0

QC Check Sample 2

Date Analyzed:	07/18/11		
Spike Concentration = 20ug/L	% Recovery	Acceptance Limits*	Verdict
dichlorodifluoromethane	111	NTC	ok
chloromethane	122	D-273	ok
vinyl chloride	106	D-251	ok
bromomethane	105	D-242	ok
chloroethane	111	14-230	ok
trichlorofluoromethane	100	17-181	ok
acrolein	96.7	NTC	ok
acetone	97.7	NTC	ok
1,1-dichloroethene	102	D-234	ok
carbon disulfide	108	NTC	ok
dichloromethane	88.7	D-221	ok
acrylonitrile	110	NTC	ok
methyl-tert-butyl-ether	90.3	NTC	ok
trans-1,2-dichloroethene	94.5	54-156	ok
1,1-dichloroethane	102	59-155	ok
vinyl acetate	98.1	NTC	ok
2-butanone	97.4	NTC	ok
cis-1,2-dichloroethene	97.0	NTC	ok
chloroform	98.7	51-138	ok
1,1,1-trichloroethane	98.1	52-162	ok
carbon tetrachloride	102	70-140	ok
1,2-dichloroethane	103	49-155	ok
benzene	98.5	37-151	ok
trichloroethene	91.2	71-157	ok
1,2-dichloropropane	101	D-210	ok
bromodichloromethane	97.1	35-155	ok
2-chloroethyl vinyl ether	99.6	D-305	ok
4-methyl-2-pentanone	102	NTC	ok
cis-1,3-dichloropropene	97.0	D-227	ok
toluene	102	47-150	ok
trans-1,3-dichloropropene	96.6	17-183	ok
1,1,2-trichloroethane	95.5	52-150	ok
2-hexanone	102	NTC	ok
tetrachloroethene	92.7	64-148	ok
dibromochloromethane	98.9	53-149	ok
chlorobenzene	98.7	35-160	ok
ethylbenzene	102	37-162	ok
1,1,2,2-tetrachloroethane	97.8	46-157	ok
m&p-xylene	98.4	NTC	ok
o-xylene	100	NTC	ok
styrene	99.9	NTC	ok
bromoform	93.3	45-169	ok
1,3-dichlorobenzene	98.2	59-456	ok
1,4-dichlorobenzene	96.3	18-190	ok
1,2-dichlorobenzene	96.1	18-190	ok

Surrogates:	Recovery (%)	Acceptance Limits	Surrogates:	Recovery (%)	Acceptance Limits	Verdict
DIBROMOFLUOROMETHANE	106	70-130	DIBROMOFLUOROMETHANE	103	70-130	ok
1,2-DICHLOROETHANE-D4	104	70-130	1,2-DICHLOROETHANE-D4	95.5	70-130	ok
TOLUENE-D8	106	70-130	TOLUENE-D8	104	70-130	ok
4-BROMOFLUOROBENZENE	89.0	70-130	4-BROMOFLUOROBENZENE	96.8	70-130	ok
1,2-DICHLOROBENZENE-D4	92.4	70-130	1,2-DICHLOROBENZENE-D4	105	70-130	ok

*Acceptance Limits from Table 5 of EPA Method 624

W.O. # 1167-0004
(for lab use only)

[illegible]



ESS Laboratory

*Division of Thielsch Engineering,
Inc.*

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



Laboratory Identification Numbers:
MA and ME: **MA092** NH: **2028**
CT: **PH0579** RI: **LAO00236**
NELAC - NYS DOH: **11063**

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Project No.: **01.0170977.00**
Work Order No.: **1112-00007**
Date Received: **12/01/2011**
Date Reported: **12/13/2011**

Matt Smith, Jason Mello

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
12/01/2011	Aqueous	1112-00007 001	OQ-6_ 12/1/11
12/01/2011	Aqueous	1112-00007 002	OQ-6_ 12/1/11 Dissolved

106 South Street, Hopkinton MA 01748 (781)278-4700

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.



ESS Laboratory
Division of Thielsch Engineering,
Inc.

BAL Laboratory
The Microbiology Division
of Thielsch Engineering, Inc.



MassDEP Analytical Protocol Certification Form

Laboratory Name: **ESS Laboratory**

Project #: **01.0170977.00**

Project Location: **Old Quincy House-Harvard Univ.**

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
1112-00007

Matrices: ☒ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	MassDEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses 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 laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
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 ☐ No
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 ☐ No
E	VPH, EPH, APH, and TO-15 only: a. 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). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
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 ☐ No

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 ☐ No ¹
----------	---	--

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?	☒ Yes ☐ No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes ☒ No ¹

¹All 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: **Hopkinton Laboratory Supervisor**

Printed Name: **Andrew Yaroshefski**

Date: **12/13/11**



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith, Jason Mello

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **12/01/2011**
Date Reported: **12/13/2011**
Work Order No.: **1112-00007**

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 12/1/11 via x ESS courier, EC, FEDEX, or hand delivered.
The samples were received intact for all requested analyses.

The following questions are answered upon sample receipt to determine compliance with MADEP Defined "Presumptive Certainty":

Were the samples received at ≤ 6 degrees C (Temperature = 4.6 degrees C)? (x) yes () no
Were any samples received above 6 degrees C, received within 8 hours of collection and on ice? () yes () no (x) n/a

Were the samples received with method specific preservatives within holding time? (x) yes () no
* The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.

Were all constituents for the MCP Method(s) selected assigned on the COC? () yes (x) no
* Full MCP14 Metals () yes (x) no () not assigned
* Full EPA 8270 SVOCs () yes () no (x) not assigned
* Full EPA 8260 VOCs (x) yes () no () not assigned

2. Subcontracted Analyses

Analyses for Dissolved Oxygen, Odor, Sodium, TSS, TDS, Ammonia and VOC were performed by ESS Laboratory, Cranston, RI.

Analyses for Hydrogen Sulfide were performed by Test America.

3. EPA Method 300.0 - Anions

Attach QC 300.0 12/02/11

4. EPA Method 6010C - Metals

Question I

Per the client's request, only a subset of the MCP analyte list for SW-846 Method 6010C Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) is reported.

Attach QC 6010C 12/05/11 - Aqueous



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith, Jason Mello

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **12/01/2011**
Date Reported: **12/13/2011**
Work Order No.: **1112-00007**

LABORATORY STATEMENTS:

ESS Laboratory - Hopkinton location has NELAC validation for the following methods:

Wastewater: Methods 624,625,245.1,150.2,120.1, 200.7 (PP13, RCRA 8, and Fe, Mg, Mn, Al, Cr+6, V, Co, Mo, Sn, Ti).

Aqueous: Methods 8260B, 8270D, 8081B, 8082A, 7470, 150.2, 120.1, 1311, 6010C (PP13, RCRA 8, and Fe, Mg, Mn, Al, Cr+6, V, Co, Mo, Sn, Ti), 300.0 (Cl, F, SO₄, NO₃, NO₂, Ophos), MA DEP EPH/VPH.

Soil: Methods 8260B, 8270D, 8081B, 8082A, 7471B, 9045, 1311, 6010C (PP13, RCRA8, and Fe, Mg, Mn, Al, V, Co, Mo, Sn, Ca), MA DEP VPH/EPH.

Abbreviations:

% R = % Recovery
DF = Dilution Factor
CF = Calculation Factor
DO = Diluted Out

Method Key:

Method 8260: The current version of the method is 8260B.
Method 8270: The current version of the method is 8270D.
Method 6010: The current version of the method is 6010C.
Method 8081: The current version of the method is 8081B.
Method 8082: The current version of the method is 8082A.
Method 7471: The current version of the method is 7471B.

The current Metals preparation methods are: 3010A (aqueous) and 3051 (solid).

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
 One Edgewater Drive
 Norwood, MA 02062
 781-278-3700

Matt Smith, Jason Mello

Project Name.: **Old Quincy House-Harvard Univ.**
 Project No.: **01.0170977.00**

Date Received: **12/01/2011**
 Date Reported: **12/13/2011**
 Work Order No.: **1112-00007**

Sample ID: **OQ-6_12/1/11**

Sample No.: **001**

Sample Date: **12/01/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
TOTAL METALS							
Iron	EPA 6010C	63	0.025	mg/L	LLZ	12/05/11	16:23
Manganese	EPA 6010C	1.4	0.0050	mg/L	LLZ	12/05/11	16:23
ANIONS - ION CHROMATOGRAPHY					TAJ	12/02/11	
Fluoride	EPA 300.0	0.20	0.20	mg/L	TAJ	12/02/11	14:09
Sulfate	EPA 300.0	20	0.60	mg/L	TAJ	12/02/11	14:09
SUBCONTRACTED ANALYTES							
Dissolved Oxygen	4500O C	2.64	1.00	mg/L	XXX	12/01/11	19:15
Odor(TON)	SM2150B	2		Units	XXX	12/02/11	20:35
Total Suspended Solids	SM-2540D	1420	10	mg/L	XXX	12/06/11	12:45
Total Dissolved Solids	SM 2540C	460	10	mg/L	XXX	12/06/11	12:00
Sodium	EPA 200.7	23.5	5.0	mg/L	XXX	12/05/11	22:50
Ammonia	350.1	0.21	0.10	mg/L	XXX	12/06/11	12:38
Hydrogen Sulfide	SM4500 S2 H	<1.0	1.0	mg/L	XXX	12/12/11	17:24
VOLATILE ORGANIC COMPOUNDS					XXX		
pH	SM 4500 H+ B	7.51	0.100	SU	XXX	12/12/11	16:09
Specific Conductance	SM2510B	460	1.0	umhos/cm	XXX	12/03/11	14:27



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith, Jason Mello

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **12/01/2011**
Date Reported: **12/13/2011**
Work Order No.: **1112-00007**

Sample ID: **OQ-6_12/1/11 Dissolved**

Sample No.: **002**

Sample Date: **12/01/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
DISSOLVED METALS							
Iron	EPA 6010C	<0.025	0.025	mg/L	LLZ	12/05/11	16:23
Manganese	EPA 6010C	0.42	0.0050	mg/L	LLZ	12/05/11	16:23

ENVIRONMENTAL CHEMISTRY LABORATORY
106 SOUTH ST, HOPKINTON, MA 01748
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 300.0 ANALYSIS
Anions by Ion Chromatography

QUALITY CONTROL - AQUEOUS

DATE PREPARED: 12/02/11

QC Sample	Method Blank	Lab Control Sample	Lab Control Sample Duplicate	LC/LCD Difference
Units	mg/L	% Recovery	% Recovery	RPD
Acceptance Limits	Results	90-110%	90-110%	20%
Analyte				
Fluoride	<0.20	105	104	0.94
Chloride	NA	NA	NA	NA
Nitrite	NA	NA	NA	NA
Nitrate	<0.20	107	107	0.43
Phosphate	NA	NA	NA	NA
Sulfate	<0.60	104	103	0.60

RPD = Relative Percent Difference

ESS LABORATORY, DIVISION OF THIELSCH ENGINEERING
ENVIRONMENTAL CHEMISTRY LABORATORY
106 SOUTH ST, HOPKINTON, MA 01748
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 6010C ANALYSIS
Metals by ICP

QUALITY CONTROL - AQUEOUS

DATE PREPARED: 12/5/2011

QC Sample	Method Blank	Lab Control Sample	LC Duplicate	LC/LCD Diff.
Units	mg/L	% Recovery	% Recovery	RPD
Acceptance Limits	Results	80-120	80-120	<20
Analyte				
Silver (Ag)	NA	NA	NA	NA
Aluminum (Al)	NA	NA	NA	NA
Arsenic (As)	<0.010	104	103	0.42
Boron (B)	NA	NA	NA	NA
Barium (Ba)	NA	NA	NA	NA
Beryllium (Be)	NA	NA	NA	NA
Calcium (Ca)	NA	NA	NA	NA
Cadmium (Cd)	NA	NA	NA	NA
Cobalt (Co)	NA	NA	NA	NA
Chromium (Cr)	NA	NA	NA	NA
Copper (Cu)	<0.015	108	107	1.03
Iron (Fe)	<0.025	104	104	0.22
Magnesium (Mg)	NA	NA	NA	NA
Manganese (Mn)	<0.0050	108	106	1.10
Molybdenum (Mo)	NA	NA	NA	NA
Nickel (Ni)	NA	NA	NA	NA
Lead (Pb)	NA	NA	NA	NA
Antimony (Sb)	NA	NA	NA	NA
Selenium (Se)	<0.025	108	108	0.07
Tin (Sn)	NA	NA	NA	NA
Titanium (Ti)	NA	NA	NA	NA
Thallium (Tl)	NA	NA	NA	NA
Vanadium (V)	NA	NA	NA	NA
Zinc (Zn)	NA	NA	NA	NA

RPD = Relative Percent Difference

NA = Not Applicable

NC = Not Calculated

CRM = Certified Reference Material

CHAIN OF CUSTODY

Division of Thielsch Engineering, Inc.

106 South Street, Hopkinton, MA 01748

Tel. (508) 435-9244 Fax (508) 435-9912

www.esslaboratory.com

Co. Name

Contact Person	Ty. / M. S.
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City *Vienna*

	Tel.	Fax:
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[illegible]

ESS Lab ID	Date	Collection Time	Con
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[illegible][illegible]

257/

[illegible]

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[illegible]

[illegible]

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[illegible]

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOX

Coiler Present	Vas	Ni

11/23/21 12:00:00

Seals Intact Yes No NA:

Cooler Temperature: _____

Relinquished by: (Signature, Date & Time)

1

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
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* By circling MA-MCP, client acknowledges sampels were

collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy

2 (Yellow) Client Receipt

2018

ESS Laboratory

Division of Thielsch Engineering, Inc.

106 South Street, Hopkinton, MA 01748

Tel. (508) 435-9244 Fax (508) 435-9912

www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time Standard Other _____

Regulatory State: MA R) CT NH NJ NY ME Other _____

Is this project for any of the following: (please circle)

MA-MCP Navy USACE CT DEP Other _____

Project # 170977 Project Name Harvard University

Address 1 Edgewater Drive PO # _____

City Needham State MA Zip 02452

Tel. 781-278-3300 Fax _____ email: _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers 11 Type of Container P/G/V

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

ESS Lab ID _____ Date _____ Collection Time _____

Grab-G Composite-C _____ Matrix _____ Sample ID _____

Pres Code _____ # of Containers _____ Type of Container _____

Vol of Container _____ Analysis _____

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____ Yes _____ No _____ Internal Use Only _____

Seals Intact _____ Yes _____ No NA: _____ [] Pickup

Cooler Temperature: 4.6 TB 11/14 [] Technician _____

Received by: (Signature, Date & Time) _____

Relinquished by: (Signature, Date & Time) _____

Received by: (Signature, Date & Time) _____

Relinquished by: (Signature, Date & Time) _____

Received by: (Signature, Date & Time) _____

Relinquished by: (Signature, Date & Time) _____

Received by: (Signature, Date & Time) _____

Relinquished by: (Signature, Date & Time) _____

Received by: (Signature, Date & Time) _____

Relinquished by: (Signature, Date & Time) _____

Received by: (Signature, Date & Time) _____

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy

2 (Yellow) Client Receipt

10 F2



CERTIFICATE OF ANALYSIS

Matt Smith
GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062

RE: Harvard (01.0170977 Task 8)
ESS Laboratory Work Order Number: 1206046

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 4:57 pm, Jun 06, 2012

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.



ESS Laboratory
Division of Thielsch Engineering, Inc.

BAL Laboratory

*The Microbiology Division
of Thielsch Engineering, Inc.*



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

SAMPLE RECEIPT

The following samples were received on June 05, 2012 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	SampleName	Matrix	Analysis
1206046-01	OQ-6	Ground Water	8260B, 8270D



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

PROJECT NARRATIVE

8270D Semi-Volatile Organic Compounds

CVF0035-CCV1 [Calibration required quadratic regression \(Q\).](#)

2,4-Dinitrophenol (90% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard
Client Sample ID: OQ-6
Date Sampled: 06/04/12 14:30
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1206046
ESS Laboratory Sample ID: 1206046-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,1,1-Trichloroethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,1,2,2-Tetrachloroethane	ND (0.5)		1	06/05/12 12:36	CVF0027	CF20510
1,1,2-Trichloroethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,1-Dichloroethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,1-Dichloroethene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,1-Dichloropropene	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2,3-Trichlorobenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2,3-Trichloropropane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2,4-Trichlorobenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2,4-Trimethylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2-Dibromo-3-Chloropropane	ND (5.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2-Dibromoethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2-Dichlorobenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2-Dichloroethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,2-Dichloropropane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,3,5-Trimethylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,3-Dichlorobenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,3-Dichloropropane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,4-Dichlorobenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
1,4-Dioxane - Screen	ND (500)		1	06/05/12 12:36	CVF0027	CF20510
2,2-Dichloropropane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
2-Butanone	ND (10.0)		1	06/05/12 12:36	CVF0027	CF20510
2-Chlorotoluene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
2-Hexanone	ND (10.0)		1	06/05/12 12:36	CVF0027	CF20510
4-Chlorotoluene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
4-Isopropyltoluene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
4-Methyl-2-Pentanone	ND (10.0)		1	06/05/12 12:36	CVF0027	CF20510
Acetone	ND (10.0)		1	06/05/12 12:36	CVF0027	CF20510
Benzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Bromobenzene	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard
Client Sample ID: OQ-6
Date Sampled: 06/04/12 14:30
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1206046
ESS Laboratory Sample ID: 1206046-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Bromodichloromethane	ND (0.6)		1	06/05/12 12:36	CVF0027	CF20510
Bromoform	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Bromomethane	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
Carbon Disulfide	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Carbon Tetrachloride	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Chlorobenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Chloroethane	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
Chloroform	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Chloromethane	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
cis-1,2-Dichloroethene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
cis-1,3-Dichloropropene	ND (0.4)		1	06/05/12 12:36	CVF0027	CF20510
Dibromochloromethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Dibromomethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Dichlorodifluoromethane	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
Diethyl Ether	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Di-isopropyl ether	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Ethyl tertiary-butyl ether	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Ethylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Hexachlorobutadiene	ND (0.6)		1	06/05/12 12:36	CVF0027	CF20510
Hexachloroethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Isopropylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Methyl tert-Butyl Ether	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Methylene Chloride	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
Naphthalene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
n-Butylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
n-Propylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
sec-Butylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Styrene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
tert-Butylbenzene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Tertiary-amyl methyl ether	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard
Client Sample ID: OQ-6
Date Sampled: 06/04/12 14:30
Percent Solids: N/A
Initial Volume: 5
Final Volume: 5
Extraction Method: 5030B

ESS Laboratory Work Order: 1206046
ESS Laboratory Sample ID: 1206046-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD

8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Tetrachloroethene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Tetrahydrofuran	ND (5.0)		1	06/05/12 12:36	CVF0027	CF20510
Toluene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
trans-1,2-Dichloroethene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
trans-1,3-Dichloropropene	ND (0.4)		1	06/05/12 12:36	CVF0027	CF20510
Trichloroethene	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Trichlorofluoromethane	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Vinyl Chloride	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Xylene O	ND (1.0)		1	06/05/12 12:36	CVF0027	CF20510
Xylene P,M	ND (2.0)		1	06/05/12 12:36	CVF0027	CF20510
Xylenes (Total)	ND (3.0)		1	06/05/12 12:36		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	97 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	92 %		70-130
<i>Surrogate: Toluene-d8</i>	103 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard
Client Sample ID: OQ-6
Date Sampled: 06/04/12 14:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 1206046
ESS Laboratory Sample ID: 1206046-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/5/12 9:30

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2,4-Trichlorobenzene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
1,2-Dichlorobenzene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
1,3-Dichlorobenzene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
1,4-Dichlorobenzene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2,4,5-Trichlorophenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2,4,6-Trichlorophenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2,4-Dichlorophenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2,4-Dimethylphenol	ND (46.7)		1	06/06/12 11:22	CVF0035	CF20401
2,4-Dinitrophenol	ND (46.7)		1	06/06/12 11:22	CVF0035	CF20401
2,4-Dinitrotoluene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2,6-Dinitrotoluene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2-Chloronaphthalene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2-Chlorophenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2-Methylnaphthalene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2-Methylphenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
2-Nitrophenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
3,3'-Dichlorobenzidine	ND (18.7)		1	06/06/12 11:22	CVF0035	CF20401
3+4-Methylphenol	ND (18.7)		1	06/06/12 11:22	CVF0035	CF20401
4-Bromophenyl-phenylether	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
4-Chloroaniline	ND (18.7)		1	06/06/12 11:22	CVF0035	CF20401
4-Nitrophenol	ND (46.7)		1	06/06/12 11:22	CVF0035	CF20401
Acenaphthene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Acenaphthylene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Acetophenone	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Aniline	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Anthracene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Azobenzene	ND (18.7)		1	06/06/12 11:22	CVF0035	CF20401
Benzo(a)anthracene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Benzo(a)pyrene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Benzo(b)fluoranthene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Benzo(g,h,i)perylene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard
Client Sample ID: OQ-6
Date Sampled: 06/04/12 14:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 1206046
ESS Laboratory Sample ID: 1206046-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/5/12 9:30

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Benzo(k)fluoranthene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
bis(2-Chloroethoxy)methane	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
bis(2-Chloroethyl)ether	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
bis(2-chloroisopropyl)Ether	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
bis(2-Ethylhexyl)phthalate	ND (5.6)		1	06/06/12 11:22	CVF0035	CF20401
Butylbenzylphthalate	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Chrysene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Dibenzo(a,h)Anthracene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Dibenzofuran	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Diethylphthalate	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Dimethylphthalate	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Di-n-butylphthalate	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Di-n-octylphthalate	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Fluoranthene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Fluorene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Hexachlorobenzene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Hexachlorobutadiene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Hexachloroethane	ND (4.7)		1	06/06/12 11:22	CVF0035	CF20401
Indeno(1,2,3-cd)Pyrene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Isophorone	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Naphthalene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Nitrobenzene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
N-Nitrosodimethylamine	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Pentachlorophenol	ND (46.7)		1	06/06/12 11:22	CVF0035	CF20401
Phenanthrene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Phenol	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401
Pyrene	ND (9.3)		1	06/06/12 11:22	CVF0035	CF20401

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	66 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	83 %		15-110
<i>Surrogate: 2-Chlorophenol-d4</i>	67 %		15-110
<i>Surrogate: 2-Fluorobiphenyl</i>	70 %		30-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard
Client Sample ID: OQ-6
Date Sampled: 06/04/12 14:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 1206046
ESS Laboratory Sample ID: 1206046-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 6/5/12 9:30

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Surrogate: 2-Fluorophenol	57 %	15-110				
Surrogate: Nitrobenzene-d5	67 %	30-130				
Surrogate: Phenol-d6	66 %	15-110				
Surrogate: p-Terphenyl-d14	55 %	30-130				



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CF20510 - 5030B

Blank

1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1-Dichloropropene	ND	2.0	ug/L
1,2,3-Trichlorobenzene	ND	1.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
1,2,4-Trichlorobenzene	ND	1.0	ug/L
1,2,4-Trimethylbenzene	ND	1.0	ug/L
1,2-Dibromo-3-Chloropropane	ND	5.0	ug/L
1,2-Dibromoethane	ND	1.0	ug/L
1,2-Dichlorobenzene	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
1,3,5-Trimethylbenzene	ND	1.0	ug/L
1,3-Dichlorobenzene	ND	1.0	ug/L
1,3-Dichloropropane	ND	1.0	ug/L
1,4-Dichlorobenzene	ND	1.0	ug/L
1,4-Dioxane - Screen	ND	500	ug/L
2,2-Dichloropropane	ND	1.0	ug/L
2-Butanone	ND	10.0	ug/L
2-Chlorotoluene	ND	1.0	ug/L
2-Hexanone	ND	10.0	ug/L
4-Chlorotoluene	ND	1.0	ug/L
4-Isopropyltoluene	ND	1.0	ug/L
4-Methyl-2-Pentanone	ND	10.0	ug/L
Acetone	ND	10.0	ug/L
Benzene	ND	1.0	ug/L
Bromobenzene	ND	2.0	ug/L
Bromochloromethane	ND	1.0	ug/L
Bromodichloromethane	ND	0.6	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
Carbon Disulfide	ND	1.0	ug/L
Carbon Tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	1.0	ug/L
Chloromethane	ND	2.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	0.4	ug/L
Dibromochloromethane	ND	1.0	ug/L



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CF20510 - 5030B

Dibromomethane	ND	1.0	ug/L							
Dichlorodifluoromethane	ND	2.0	ug/L							
Diethyl Ether	ND	1.0	ug/L							
Di-isopropyl ether	ND	1.0	ug/L							
Ethyl tertiary-butyl ether	ND	1.0	ug/L							
Ethylbenzene	ND	1.0	ug/L							
Hexachlorobutadiene	ND	0.6	ug/L							
Hexachloroethane	ND	1.0	ug/L							
Isopropylbenzene	ND	1.0	ug/L							
Methyl tert-Butyl Ether	ND	1.0	ug/L							
Methylene Chloride	ND	2.0	ug/L							
Naphthalene	ND	1.0	ug/L							
n-Butylbenzene	ND	1.0	ug/L							
n-Propylbenzene	ND	1.0	ug/L							
sec-Butylbenzene	ND	1.0	ug/L							
Styrene	ND	1.0	ug/L							
tert-Butylbenzene	ND	1.0	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tetrachloroethene	ND	1.0	ug/L							
Tetrahydrofuran	ND	5.0	ug/L							
Toluene	ND	1.0	ug/L							
trans-1,2-Dichloroethene	ND	1.0	ug/L							
trans-1,3-Dichloropropene	ND	0.4	ug/L							
Trichloroethene	ND	1.0	ug/L							
Trichlorofluoromethane	ND	1.0	ug/L							
Vinyl Chloride	ND	1.0	ug/L							
Xylene O	ND	1.0	ug/L							
Xylene P,M	ND	2.0	ug/L							
Surrogate: 1,2-Dichloroethane-d4	19.5		ug/L	25.00		78	70-130			
Surrogate: 4-Bromofluorobenzene	20.5		ug/L	25.00		82	70-130			
Surrogate: Dibromofluoromethane	19.0		ug/L	25.00		76	70-130			
Surrogate: Toluene-d8	20.3		ug/L	25.00		81	70-130			

LCS

1,1,1,2-Tetrachloroethane	8.8		ug/L	10.00		88	70-130			
1,1,1-Trichloroethane	9.7		ug/L	10.00		97	70-130			
1,1,2,2-Tetrachloroethane	9.3		ug/L	10.00		93	70-130			
1,1,2-Trichloroethane	8.9		ug/L	10.00		89	70-130			
1,1-Dichloroethane	9.0		ug/L	10.00		90	70-130			
1,1-Dichloroethene	10.1		ug/L	10.00		101	70-130			
1,1-Dichloropropene	8.9		ug/L	10.00		89	70-130			
1,2,3-Trichlorobenzene	9.1		ug/L	10.00		91	70-130			
1,2,3-Trichloropropane	8.8		ug/L	10.00		88	70-130			
1,2,4-Trichlorobenzene	9.7		ug/L	10.00		97	70-130			
1,2,4-Trimethylbenzene	9.3		ug/L	10.00		93	70-130			
1,2-Dibromo-3-Chloropropane	9.7		ug/L	10.00		97	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CF20510 - 5030B

1,2-Dibromoethane	8.8		ug/L	10.00		88	70-130			
1,2-Dichlorobenzene	8.6		ug/L	10.00		86	70-130			
1,2-Dichloroethane	9.0		ug/L	10.00		90	70-130			
1,2-Dichloropropane	9.1		ug/L	10.00		91	70-130			
1,3,5-Trimethylbenzene	9.8		ug/L	10.00		98	70-130			
1,3-Dichlorobenzene	8.4		ug/L	10.00		84	70-130			
1,3-Dichloropropane	9.5		ug/L	10.00		95	70-130			
1,4-Dichlorobenzene	9.0		ug/L	10.00		90	70-130			
1,4-Dioxane - Screen	439		ug/L	200.0		219	0-332			
2,2-Dichloropropane	9.4		ug/L	10.00		94	70-130			
2-Butanone	51.0		ug/L	50.00		102	70-130			
2-Chlorotoluene	8.8		ug/L	10.00		88	70-130			
2-Hexanone	49.2		ug/L	50.00		98	70-130			
4-Chlorotoluene	8.5		ug/L	10.00		85	70-130			
4-Isopropyltoluene	8.7		ug/L	10.00		87	70-130			
4-Methyl-2-Pentanone	46.9		ug/L	50.00		94	70-130			
Acetone	63.1		ug/L	50.00		126	70-130			
Benzene	9.5		ug/L	10.00		95	70-130			
Bromobenzene	9.4		ug/L	10.00		94	70-130			
Bromochloromethane	9.4		ug/L	10.00		94	70-130			
Bromodichloromethane	9.4		ug/L	10.00		94	70-130			
Bromoform	8.8		ug/L	10.00		88	70-130			
Bromomethane	10.9		ug/L	10.00		109	70-130			
Carbon Disulfide	10.0		ug/L	10.00		100	70-130			
Carbon Tetrachloride	9.2		ug/L	10.00		92	70-130			
Chlorobenzene	8.6		ug/L	10.00		86	70-130			
Chloroethane	10.0		ug/L	10.00		100	70-130			
Chloroform	9.0		ug/L	10.00		90	70-130			
Chloromethane	8.7		ug/L	10.00		87	70-130			
cis-1,2-Dichloroethene	9.9		ug/L	10.00		99	70-130			
cis-1,3-Dichloropropene	8.9		ug/L	10.00		89	70-130			
Dibromochloromethane	9.6		ug/L	10.00		96	70-130			
Dibromomethane	8.8		ug/L	10.00		88	70-130			
Dichlorodifluoromethane	8.9		ug/L	10.00		89	70-130			
Diethyl Ether	9.2		ug/L	10.00		92	70-130			
Di-isopropyl ether	9.4		ug/L	10.00		94	70-130			
Ethyl tertiary-butyl ether	9.2		ug/L	10.00		92	70-130			
Ethylbenzene	9.4		ug/L	10.00		94	70-130			
Hexachlorobutadiene	11.7		ug/L	10.00		117	70-130			
Hexachloroethane	9.2		ug/L	10.00		92	70-130			
Isopropylbenzene	8.8		ug/L	10.00		88	70-130			
Methyl tert-Butyl Ether	9.3		ug/L	10.00		93	70-130			
Methylene Chloride	9.6		ug/L	10.00		96	70-130			
Naphthalene	8.8		ug/L	10.00		88	70-130			
n-Butylbenzene	9.6		ug/L	10.00		96	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CF20510 - 5030B

n-Propylbenzene	8.7		ug/L	10.00		87	70-130			
sec-Butylbenzene	9.0		ug/L	10.00		90	70-130			
Styrene	9.3		ug/L	10.00		93	70-130			
tert-Butylbenzene	8.7		ug/L	10.00		87	70-130			
Tertiary-amyl methyl ether	9.0		ug/L	10.00		90	70-130			
Tetrachloroethene	8.9		ug/L	10.00		89	70-130			
Tetrahydrofuran	10.9		ug/L	10.00		109	70-130			
Toluene	9.4		ug/L	10.00		94	70-130			
trans-1,2-Dichloroethene	9.7		ug/L	10.00		97	70-130			
trans-1,3-Dichloropropene	8.7		ug/L	10.00		87	70-130			
Trichloroethene	9.0		ug/L	10.00		90	70-130			
Trichlorofluoromethane	9.3		ug/L	10.00		93	70-130			
Vinyl Chloride	10.6		ug/L	10.00		106	70-130			
Xylene O	8.8		ug/L	10.00		88	70-130			
Xylene P,M	18.6		ug/L	20.00		93	70-130			
Surrogate: 1,2-Dichloroethane-d4	24.1		ug/L	25.00		96	70-130			
Surrogate: 4-Bromofluorobenzene	23.1		ug/L	25.00		92	70-130			
Surrogate: Dibromofluoromethane	23.1		ug/L	25.00		93	70-130			
Surrogate: Toluene-d8	23.9		ug/L	25.00		96	70-130			

LCS Dup

1,1,1,2-Tetrachloroethane	9.0		ug/L	10.00		90	70-130	2	25	
1,1,1-Trichloroethane	9.7		ug/L	10.00		97	70-130	0.4	25	
1,1,2,2-Tetrachloroethane	9.5		ug/L	10.00		95	70-130	2	25	
1,1,2-Trichloroethane	9.7		ug/L	10.00		97	70-130	9	25	
1,1-Dichloroethane	8.9		ug/L	10.00		89	70-130	1	25	
1,1-Dichloroethene	10.1		ug/L	10.00		101	70-130	0	25	
1,1-Dichloropropene	8.9		ug/L	10.00		89	70-130	0.2	25	
1,2,3-Trichlorobenzene	8.7		ug/L	10.00		87	70-130	5	25	
1,2,3-Trichloropropane	9.8		ug/L	10.00		98	70-130	11	25	
1,2,4-Trichlorobenzene	9.2		ug/L	10.00		92	70-130	6	25	
1,2,4-Trimethylbenzene	9.1		ug/L	10.00		91	70-130	2	25	
1,2-Dibromo-3-Chloropropane	8.8		ug/L	10.00		88	70-130	10	25	
1,2-Dibromoethane	9.2		ug/L	10.00		92	70-130	3	25	
1,2-Dichlorobenzene	8.3		ug/L	10.00		83	70-130	3	25	
1,2-Dichloroethane	9.2		ug/L	10.00		92	70-130	2	25	
1,2-Dichloropropane	9.6		ug/L	10.00		96	70-130	6	25	
1,3,5-Trimethylbenzene	9.6		ug/L	10.00		96	70-130	2	25	
1,3-Dichlorobenzene	8.2		ug/L	10.00		82	70-130	3	25	
1,3-Dichloropropane	9.5		ug/L	10.00		95	70-130	0.2	25	
1,4-Dichlorobenzene	9.2		ug/L	10.00		92	70-130	2	25	
1,4-Dioxane - Screen	422		ug/L	200.0		211	0-332	4	200	
2,2-Dichloropropane	9.4		ug/L	10.00		94	70-130	0.3	25	
2-Butanone	49.6		ug/L	50.00		99	70-130	3	25	
2-Chlorotoluene	8.7		ug/L	10.00		87	70-130	0.6	25	
2-Hexanone	48.4		ug/L	50.00		97	70-130	2	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CF20510 - 5030B

4-Chlorotoluene	8.1		ug/L	10.00		81	70-130	4	25	
4-Isopropyltoluene	8.4		ug/L	10.00		84	70-130	3	25	
4-Methyl-2-Pentanone	47.7		ug/L	50.00		95	70-130	2	25	
Acetone	51.6		ug/L	50.00		103	70-130	20	25	
Benzene	9.5		ug/L	10.00		95	70-130	0.6	25	
Bromobenzene	9.0		ug/L	10.00		90	70-130	4	25	
Bromochloromethane	9.3		ug/L	10.00		93	70-130	0.6	25	
Bromodichloromethane	9.5		ug/L	10.00		95	70-130	0.7	25	
Bromoform	8.8		ug/L	10.00		88	70-130	0	25	
Bromomethane	11.2		ug/L	10.00		112	70-130	3	25	
Carbon Disulfide	9.9		ug/L	10.00		99	70-130	0.5	25	
Carbon Tetrachloride	9.4		ug/L	10.00		94	70-130	1	25	
Chlorobenzene	8.4		ug/L	10.00		84	70-130	3	25	
Chloroethane	10.2		ug/L	10.00		102	70-130	2	25	
Chloroform	9.0		ug/L	10.00		90	70-130	0.1	25	
Chloromethane	8.7		ug/L	10.00		87	70-130	0.2	25	
cis-1,2-Dichloroethene	10.1		ug/L	10.00		101	70-130	2	25	
cis-1,3-Dichloropropene	9.2		ug/L	10.00		92	70-130	4	25	
Dibromochloromethane	9.5		ug/L	10.00		95	70-130	1	25	
Dibromomethane	8.9		ug/L	10.00		89	70-130	1	25	
Dichlorodifluoromethane	9.4		ug/L	10.00		94	70-130	5	25	
Diethyl Ether	9.0		ug/L	10.00		90	70-130	2	25	
Di-isopropyl ether	9.4		ug/L	10.00		94	70-130	0.2	25	
Ethyl tertiary-butyl ether	9.4		ug/L	10.00		94	70-130	2	25	
Ethylbenzene	9.3		ug/L	10.00		93	70-130	2	25	
Hexachlorobutadiene	10.6		ug/L	10.00		106	70-130	10	25	
Hexachloroethane	8.8		ug/L	10.00		88	70-130	5	25	
Isopropylbenzene	8.7		ug/L	10.00		87	70-130	0.5	25	
Methyl tert-Butyl Ether	9.2		ug/L	10.00		92	70-130	1	25	
Methylene Chloride	9.9		ug/L	10.00		99	70-130	3	25	
Naphthalene	8.6		ug/L	10.00		86	70-130	3	25	
n-Butylbenzene	9.0		ug/L	10.00		90	70-130	6	25	
n-Propylbenzene	8.5		ug/L	10.00		85	70-130	2	25	
sec-Butylbenzene	8.4		ug/L	10.00		84	70-130	6	25	
Styrene	9.0		ug/L	10.00		90	70-130	4	25	
tert-Butylbenzene	8.4		ug/L	10.00		84	70-130	4	25	
Tertiary-amyl methyl ether	9.1		ug/L	10.00		91	70-130	0.4	25	
Tetrachloroethene	9.2		ug/L	10.00		92	70-130	3	25	
Tetrahydrofuran	12.2		ug/L	10.00		122	70-130	11	25	
Toluene	9.3		ug/L	10.00		93	70-130	1	25	
trans-1,2-Dichloroethene	10.0		ug/L	10.00		100	70-130	3	25	
trans-1,3-Dichloropropene	8.5		ug/L	10.00		85	70-130	2	25	
Trichloroethene	9.2		ug/L	10.00		92	70-130	2	25	
Trichlorofluoromethane	9.2		ug/L	10.00		92	70-130	1	25	
Vinyl Chloride	10.5		ug/L	10.00		105	70-130	1	25	



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8260B Volatile Organic Compounds

Batch CF20510 - 5030B

Xylene O	8.6		ug/L	10.00		86	70-130	2	25	
Xylene P,M	17.9		ug/L	20.00		89	70-130	4	25	
Surrogate: 1,2-Dichloroethane-d4	24.5		ug/L	25.00		98	70-130			
Surrogate: 4-Bromofluorobenzene	22.6		ug/L	25.00		90	70-130			
Surrogate: Dibromofluoromethane	23.0		ug/L	25.00		92	70-130			
Surrogate: Toluene-d8	24.0		ug/L	25.00		96	70-130			

8270D Semi-Volatile Organic Compounds

Batch CF20401 - 3520C

Blank

1,2,4-Trichlorobenzene	ND	10.0	ug/L
1,2-Dichlorobenzene	ND	10.0	ug/L
1,3-Dichlorobenzene	ND	10.0	ug/L
1,4-Dichlorobenzene	ND	10.0	ug/L
2,4,5-Trichlorophenol	ND	10.0	ug/L
2,4,6-Trichlorophenol	ND	10.0	ug/L
2,4-Dichlorophenol	ND	10.0	ug/L
2,4-Dimethylphenol	ND	50.0	ug/L
2,4-Dinitrophenol	ND	50.0	ug/L
2,4-Dinitrotoluene	ND	10.0	ug/L
2,6-Dinitrotoluene	ND	10.0	ug/L
2-Chloronaphthalene	ND	10.0	ug/L
2-Chlorophenol	ND	10.0	ug/L
2-Methylnaphthalene	ND	10.0	ug/L
2-Methylphenol	ND	10.0	ug/L
2-Nitrophenol	ND	10.0	ug/L
3,3'-Dichlorobenzidine	ND	20.0	ug/L
3+4-Methylphenol	ND	20.0	ug/L
4-Bromophenyl-phenylether	ND	10.0	ug/L
4-Chloroaniline	ND	20.0	ug/L
4-Nitrophenol	ND	50.0	ug/L
Acenaphthene	ND	10.0	ug/L
Acenaphthylene	ND	10.0	ug/L
Acetophenone	ND	10.0	ug/L
Aniline	ND	10.0	ug/L
Anthracene	ND	10.0	ug/L
Azobenzene	ND	20.0	ug/L
Benzo(a)anthracene	ND	10.0	ug/L
Benzo(a)pyrene	ND	10.0	ug/L
Benzo(b)fluoranthene	ND	10.0	ug/L
Benzo(g,h,i)perylene	ND	10.0	ug/L
Benzo(k)fluoranthene	ND	10.0	ug/L
bis(2-Chloroethoxy)methane	ND	10.0	ug/L
bis(2-Chloroethyl)ether	ND	10.0	ug/L
bis(2-chloroisopropyl)Ether	ND	10.0	ug/L



CERTIFICATE OF ANALYSIS

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Quality Control Data

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8270D Semi-Volatile Organic Compounds

Batch CF20401 - 3520C

bis(2-Ethylhexyl)phthalate	ND	6.0	ug/L							
Butylbenzylphthalate	ND	10.0	ug/L							
Chrysene	ND	10.0	ug/L							
Dibenzo(a,h)Anthracene	ND	10.0	ug/L							
Dibenzofuran	ND	10.0	ug/L							
Diethylphthalate	ND	10.0	ug/L							
Dimethylphthalate	ND	10.0	ug/L							
Di-n-butylphthalate	ND	10.0	ug/L							
Di-n-octylphthalate	ND	10.0	ug/L							
Fluoranthene	ND	10.0	ug/L							
Fluorene	ND	10.0	ug/L							
Hexachlorobenzene	ND	10.0	ug/L							
Hexachlorobutadiene	ND	10.0	ug/L							
Hexachloroethane	ND	5.0	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	10.0	ug/L							
Isophorone	ND	10.0	ug/L							
Naphthalene	ND	10.0	ug/L							
Nitrobenzene	ND	10.0	ug/L							
N-Nitrosodimethylamine	ND	10.0	ug/L							
Pentachlorophenol	ND	50.0	ug/L							
Phenanthrene	ND	10.0	ug/L							
Phenol	ND	10.0	ug/L							
Pyrene	ND	10.0	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	69.0		ug/L	100.0		69	30-130			
Surrogate: 2,4,6-Tribromophenol	135		ug/L	150.0		90	15-110			
Surrogate: 2-Chlorophenol-d4	83.4		ug/L	150.0		56	15-110			
Surrogate: 2-Fluorobiphenyl	76.3		ug/L	100.0		76	30-130			
Surrogate: 2-Fluorophenol	50.6		ug/L	150.0		34	15-110			
Surrogate: Nitrobenzene-d5	75.3		ug/L	100.0		75	30-130			
Surrogate: Phenol-d6	86.5		ug/L	150.0		58	15-110			
Surrogate: p-Terphenyl-d14	88.5		ug/L	100.0		88	30-130			

LCS

1,2,4-Trichlorobenzene	64.9	10.0	ug/L	100.0		65	40-140			
1,2-Dichlorobenzene	63.9	10.0	ug/L	100.0		64	40-140			
1,3-Dichlorobenzene	62.1	10.0	ug/L	100.0		62	40-140			
1,4-Dichlorobenzene	62.3	10.0	ug/L	100.0		62	40-140			
2,4,5-Trichlorophenol	73.9	10.0	ug/L	100.0		74	30-130			
2,4,6-Trichlorophenol	70.5	10.0	ug/L	100.0		70	30-130			
2,4-Dichlorophenol	63.4	10.0	ug/L	100.0		63	30-130			
2,4-Dimethylphenol	69.6	50.0	ug/L	100.0		70	30-130			
2,4-Dinitrophenol	54.4	50.0	ug/L	100.0		54	30-130			
2,4-Dinitrotoluene	70.2	10.0	ug/L	100.0		70	40-140			
2,6-Dinitrotoluene	75.2	10.0	ug/L	100.0		75	40-140			
2-Chloronaphthalene	67.5	10.0	ug/L	100.0		67	40-140			
2-Chlorophenol	49.0	10.0	ug/L	100.0		49	30-130			



CERTIFICATE OF ANALYSIS

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Quality Control Data

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8270D Semi-Volatile Organic Compounds

Batch CF20401 - 3520C

2-Methylnaphthalene	68.4	10.0	ug/L	100.0		68	40-140			
2-Methylphenol	57.6	10.0	ug/L	100.0		58	30-130			
2-Nitrophenol	63.2	10.0	ug/L	100.0		63	30-130			
3,3'-Dichlorobenzidine	70.7	20.0	ug/L	100.0		71	40-140			
3+4-Methylphenol	132	20.0	ug/L	200.0		66	30-130			
4-Bromophenyl-phenylether	71.2	10.0	ug/L	100.0		71	40-140			
4-Chloroaniline	63.6	20.0	ug/L	100.0		64	40-140			
4-Nitrophenol	69.0	50.0	ug/L	100.0		69	30-130			
Acenaphthene	73.4	10.0	ug/L	100.0		73	40-140			
Acenaphthylene	66.0	10.0	ug/L	100.0		66	40-140			
Acetophenone	68.3	10.0	ug/L	100.0		68	40-140			
Aniline	57.5	10.0	ug/L	100.0		58	40-140			
Anthracene	76.2	10.0	ug/L	100.0		76	40-140			
Azobenzene	68.0	20.0	ug/L	100.0		68	40-140			
Benzo(a)anthracene	75.8	10.0	ug/L	100.0		76	40-140			
Benzo(a)pyrene	74.0	10.0	ug/L	100.0		74	40-140			
Benzo(b)fluoranthene	78.4	10.0	ug/L	100.0		78	40-140			
Benzo(g,h,i)perylene	76.5	10.0	ug/L	100.0		77	40-140			
Benzo(k)fluoranthene	79.2	10.0	ug/L	100.0		79	40-140			
bis(2-Chloroethoxy)methane	67.1	10.0	ug/L	100.0		67	40-140			
bis(2-Chloroethyl)ether	62.6	10.0	ug/L	100.0		63	40-140			
bis(2-chloroisopropyl)Ether	63.0	10.0	ug/L	100.0		63	40-140			
bis(2-Ethylhexyl)phthalate	72.0	6.0	ug/L	100.0		72	40-140			
Butylbenzylphthalate	74.9	10.0	ug/L	100.0		75	40-140			
Chrysene	75.8	10.0	ug/L	100.0		76	40-140			
Dibenzo(a,h)Anthracene	78.5	10.0	ug/L	100.0		79	40-140			
Dibenzofuran	71.2	10.0	ug/L	100.0		71	40-140			
Diethylphthalate	75.1	10.0	ug/L	100.0		75	40-140			
Dimethylphthalate	72.7	10.0	ug/L	100.0		73	40-140			
Di-n-butylphthalate	76.6	10.0	ug/L	100.0		77	40-140			
Di-n-octylphthalate	74.1	10.0	ug/L	100.0		74	40-140			
Fluoranthene	74.6	10.0	ug/L	100.0		75	40-140			
Fluorene	75.5	10.0	ug/L	100.0		76	40-140			
Hexachlorobenzene	72.6	10.0	ug/L	100.0		73	40-140			
Hexachlorobutadiene	69.3	10.0	ug/L	100.0		69	40-140			
Hexachloroethane	62.6	5.0	ug/L	100.0		63	40-140			
Indeno(1,2,3-cd)Pyrene	78.0	10.0	ug/L	100.0		78	40-140			
Isophorone	66.5	10.0	ug/L	100.0		66	40-140			
Naphthalene	68.0	10.0	ug/L	100.0		68	40-140			
Nitrobenzene	67.2	10.0	ug/L	100.0		67	40-140			
N-Nitrosodimethylamine	59.9	10.0	ug/L	100.0		60	40-140			
Pentachlorophenol	70.8	50.0	ug/L	100.0		71	30-130			
Phenanthrene	75.3	10.0	ug/L	100.0		75	40-140			
Phenol	48.8	10.0	ug/L	100.0		49	30-130			
Pyrene	75.8	10.0	ug/L	100.0		76	40-140			



CERTIFICATE OF ANALYSIS

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Semi-Volatile Organic Compounds

Batch CF20401 - 3520C

Surrogate: 1,2-Dichlorobenzene-d4	62.7		ug/L	100.0		63	30-130			
Surrogate: 2,4,6-Tribromophenol	124		ug/L	150.0		82	15-110			
Surrogate: 2-Chlorophenol-d4	79.5		ug/L	150.0		53	15-110			
Surrogate: 2-Fluorobiphenyl	70.0		ug/L	100.0		70	30-130			
Surrogate: 2-Fluorophenol	52.6		ug/L	150.0		35	15-110			
Surrogate: Nitrobenzene-d5	68.5		ug/L	100.0		69	30-130			
Surrogate: Phenol-d6	82.0		ug/L	150.0		55	15-110			
Surrogate: p-Terphenyl-d14	75.2		ug/L	100.0		75	30-130			

LCS Dup

1,2,4-Trichlorobenzene	70.0	10.0	ug/L	100.0		70	40-140	7	20	
1,2-Dichlorobenzene	70.6	10.0	ug/L	100.0		71	40-140	10	20	
1,3-Dichlorobenzene	68.6	10.0	ug/L	100.0		69	40-140	10	20	
1,4-Dichlorobenzene	68.5	10.0	ug/L	100.0		68	40-140	9	20	
2,4,5-Trichlorophenol	79.7	10.0	ug/L	100.0		80	30-130	8	20	
2,4,6-Trichlorophenol	74.2	10.0	ug/L	100.0		74	30-130	5	20	
2,4-Dichlorophenol	67.2	10.0	ug/L	100.0		67	30-130	6	20	
2,4-Dimethylphenol	73.7	50.0	ug/L	100.0		74	30-130	6	20	
2,4-Dinitrophenol	64.2	50.0	ug/L	100.0		64	30-130	16	20	
2,4-Dinitrotoluene	76.4	10.0	ug/L	100.0		76	40-140	8	20	
2,6-Dinitrotoluene	81.3	10.0	ug/L	100.0		81	40-140	8	20	
2-Chloronaphthalene	72.0	10.0	ug/L	100.0		72	40-140	6	20	
2-Chlorophenol	55.2	10.0	ug/L	100.0		55	30-130	12	20	
2-Methylnaphthalene	73.7	10.0	ug/L	100.0		74	40-140	8	20	
2-Methylphenol	62.7	10.0	ug/L	100.0		63	30-130	9	20	
2-Nitrophenol	67.9	10.0	ug/L	100.0		68	30-130	7	20	
3,3'-Dichlorobenzidine	78.0	20.0	ug/L	100.0		78	40-140	10	20	
3+4-Methylphenol	135	20.0	ug/L	200.0		67	30-130	2	20	
4-Bromophenyl-phenylether	76.9	10.0	ug/L	100.0		77	40-140	8	20	
4-Chloroaniline	69.2	20.0	ug/L	100.0		69	40-140	8	20	
4-Nitrophenol	73.5	50.0	ug/L	100.0		73	30-130	6	20	
Acenaphthene	78.5	10.0	ug/L	100.0		78	40-140	7	20	
Acenaphthylene	71.5	10.0	ug/L	100.0		71	40-140	8	20	
Acetophenone	75.3	10.0	ug/L	100.0		75	40-140	10	20	
Aniline	64.0	10.0	ug/L	100.0		64	40-140	11	20	
Anthracene	81.8	10.0	ug/L	100.0		82	40-140	7	20	
Azobenzene	72.7	20.0	ug/L	100.0		73	40-140	7	20	
Benzo(a)anthracene	82.0	10.0	ug/L	100.0		82	40-140	8	20	
Benzo(a)pyrene	81.1	10.0	ug/L	100.0		81	40-140	9	20	
Benzo(b)fluoranthene	84.9	10.0	ug/L	100.0		85	40-140	8	20	
Benzo(g,h,i)perylene	83.7	10.0	ug/L	100.0		84	40-140	9	20	
Benzo(k)fluoranthene	87.5	10.0	ug/L	100.0		88	40-140	10	20	
bis(2-Chloroethoxy)methane	71.8	10.0	ug/L	100.0		72	40-140	7	20	
bis(2-Chloroethyl)ether	69.2	10.0	ug/L	100.0		69	40-140	10	20	
bis(2-chloroisopropyl)Ether	69.0	10.0	ug/L	100.0		69	40-140	9	20	
bis(2-Ethylhexyl)phthalate	77.6	6.0	ug/L	100.0		78	40-140	8	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

8270D Semi-Volatile Organic Compounds

Batch CF20401 - 3520C

Butylbenzylphthalate	81.6	10.0	ug/L	100.0		82	40-140	8	20	
Chrysene	82.2	10.0	ug/L	100.0		82	40-140	8	20	
Dibenzo(a,h)Anthracene	85.6	10.0	ug/L	100.0		86	40-140	9	20	
Dibenzofuran	76.0	10.0	ug/L	100.0		76	40-140	7	20	
Diethylphthalate	80.4	10.0	ug/L	100.0		80	40-140	7	20	
Dimethylphthalate	78.4	10.0	ug/L	100.0		78	40-140	8	20	
Di-n-butylphthalate	81.7	10.0	ug/L	100.0		82	40-140	6	20	
Di-n-octylphthalate	81.1	10.0	ug/L	100.0		81	40-140	9	20	
Fluoranthene	78.9	10.0	ug/L	100.0		79	40-140	6	20	
Fluorene	81.3	10.0	ug/L	100.0		81	40-140	7	20	
Hexachlorobenzene	77.3	10.0	ug/L	100.0		77	40-140	6	20	
Hexachlorobutadiene	73.4	10.0	ug/L	100.0		73	40-140	6	20	
Hexachloroethane	68.8	5.0	ug/L	100.0		69	40-140	9	20	
Indeno(1,2,3-cd)Pyrene	85.3	10.0	ug/L	100.0		85	40-140	9	20	
Isophorone	71.8	10.0	ug/L	100.0		72	40-140	8	20	
Naphthalene	73.2	10.0	ug/L	100.0		73	40-140	7	20	
Nitrobenzene	72.0	10.0	ug/L	100.0		72	40-140	7	20	
N-Nitrosodimethylamine	71.5	10.0	ug/L	100.0		72	40-140	18	20	
Pentachlorophenol	76.5	50.0	ug/L	100.0		77	30-130	8	20	
Phenanthrene	81.0	10.0	ug/L	100.0		81	40-140	7	20	
Phenol	54.3	10.0	ug/L	100.0		54	30-130	11	20	
Pyrene	83.3	10.0	ug/L	100.0		83	40-140	9	20	
Surrogate: 1,2-Dichlorobenzene-d4	66.9		ug/L	100.0		67	30-130			
Surrogate: 2,4,6-Tribromophenol	127		ug/L	150.0		84	15-110			
Surrogate: 2-Chlorophenol-d4	84.2		ug/L	150.0		56	15-110			
Surrogate: 2-Fluorobiphenyl	71.5		ug/L	100.0		72	30-130			
Surrogate: 2-Fluorophenol	61.1		ug/L	150.0		41	15-110			
Surrogate: Nitrobenzene-d5	70.0		ug/L	100.0		70	30-130			
Surrogate: Phenol-d6	86.7		ug/L	150.0		58	15-110			
Surrogate: p-Terphenyl-d14	77.8		ug/L	100.0		78	30-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Harvard

ESS Laboratory Work Order: 1206046

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)

A2LA Accredited: Testing Cert# 2864.01

<http://www.a2la.org/scopepdf/2864-01.pdf>

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/labs/waterlabs-instate.php>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water: RI0002

http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/labcert/labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://www4.egov.nh.gov/des/nhelap/namesearch.asp>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301

http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01

Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)

<http://www.A2LA.org/dirsearchnew/newsearch.cfm>

CPSC ID# 1141

Lead Paint, Lead in Children's Metals Jewelry

<http://www.cpsc.gov/cgi-bin/labapplist.aspx>

Sample and Cooler Receipt Checklist

Client: GZA GeoEnvironmental, Inc.
Client Project ID: _____
Shipped/Delivered Via: ESS Courier

ESS Project ID: 12060046
Date Project Due: 6/7/12
Days For Project: 2 Day

Items to be checked upon receipt:

1. Air Bill Manifest Present?

☐ * No

Air No.:

2. Were Custody Seals Present?

☐ N/A

3. Were Custody Seals Intact?

☐ N/A

4. Is Radiation count < 100 CPM?

☐ Yes

5. Is a cooler present?

☐ YesCooler Temp: 2.6Iced With: Ice

6. Was COC included with samples?

☐ Yes

7. Was COC signed and dated by client?

☐ Yes

8. Does the COC match the sample

☐ Yes

9. Is COC complete and correct?

☐ Yes

10. Are the samples properly preserved?

☐ Yes

11. Proper sample containers used?

☐ Yes

12. Any air bubbles in the VOA vials?

☐ No

13. Holding times exceeded?

☐ No

14. Sufficient sample volumes?

☐ Yes

15. Any Subcontracting needed?

☐ No

16. Are ESS labels on correct containers?

☒ Yes ☐ No

17. Were samples received intact?

☒ Yes ☐ No

ESS Sample IDs: _____

Sub Lab: _____

Analysis: _____

TAT: _____

18. Was there need to call project manager to discuss status? If yes, please explain.

Who was called?: _____

By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
---------------	--------------------	----------------	-----------------	--------------

1	Yes	1 L Glass	1	NP
1	Yes	40 ml - VOA	3	HCL

Completed By: _____

Date/Time: 6/5/12Reviewed By: JPDDate/Time: 6-5-12



GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Laboratory Identification Numbers:
MA and ME: **MA092** NH: **2028**
CT: **PH0579** RI: **LAO00236**
NELAC - NYS DOH: **11063**

ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Project No.: **01.0170977.00**
Work Order No.: **1107-00037**
Date Received: **07/11/2011**
Date Reported: **07/28/2011**

Matt Smith

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
07/08/2011	Solid	1107-00037 001	OQ-5 Comp
07/08/2011	Solid	1107-00037 002	OQ-6 Comp


MassDEP Analytical Protocol Certification Form

 Laboratory Name: **GZA GeoEnvironmental, Inc.**

 Project #: **01.0170977.00**

 Project Location: **Old Quincy House-Harvard Univ.**

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
1107-00037

 Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
8270 SVOC CAM II B ☒	7010 Metals CAM III C ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	8082 PCB CAM V A ☒	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐	

Affirmative Responses 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 laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
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 ☐ No
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 ☐ No
E	VPH, EPH, APH, and TO-15 only: a. 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). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
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 ☐ No

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 ☒ No ¹
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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?	☐ Yes ☒ No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☐ Yes ☒ No ¹

¹All 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: Laboratory Supervisor

 Printed Name: Andrew Yaroshefski

 Date: 07/28/11



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 07/11/11 via x GZA courier, EC, FEDEX, or hand delivered.
The samples were received intact for all requested analyses.

The following questions are answered upon sample receipt to determine compliance with MADEP Defined "Presumptive Certainty":

Were the samples received at ≤ 6 degrees C (Temperature = 2.1 degrees C)? (x) yes () no
Were any samples received above 6 degrees C, received within 8 hours of collection and on ice? () yes () no (x) n/a

Were the samples received with method specific preservatives within holding time? (x) yes () no
* The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.

Were all constituents for the MCP Method(s) selected assigned on the COC? () yes (x) no

* Full MCP14 Metals () yes (x) no () not assigned
* Full EPA 8270 SVOCs (x) yes () no () not assigned
* Full EPA 8260 VOCs (x) yes () no () not assigned.

2. Subcontracted Analyses

Analyses pH and ORP were subcontracted to Rhode Island Analytical, Warwick RI (RIAL);
Certification MA: MA-RI015, NH: 253700 A&B, CT: PH-0508, ME: RI015, RI: RI-033, NY:11726,

The data is included in GZA's report for ease of electronic data transfer and is indicated by "XXX" in the tech column. The data report from the subcontractor is attached.

3. EPA Method 6010C/7471B - Metals

Question H

The soil samples were submitted without an assigned matrix spike.

Question I

Per the client's request, only a subset of the MCP analyte list for SW-846 Method 6010C Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) is reported.

Attach QC 6010C 07/12/11 A - Solid
Attach QC 7471B 07/13/11 - Solid

4. Total Petroleum Hydrocarbons (TPH)

Attach QC TPH 07/11/11 - Solid



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
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Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

5. EPA Method 8260 - VOCs

The reporting limit (RL) for 1,4-dioxane is elevated due to the poor analytical sensitivity of this analyte. If 1,4-dioxane is a contaminant of concern, the MA CAM requires special analytical techniques be used.

The following analyte(s) in the lowest ICAL (Initial Calibration) standard did not meet the minimum RF criteria specified in Table 4 of Method 8260C, but were above 0.050: acetone (0.070).

The following analytes in the CCV did not meet the minimum RF criteria specified in Table 4 of Method 8260C, but were above 0.050: acetone (0.071)

The Continuing Calibration Verification Standard (CCV) (7/13/2011 S) had an MA MCP 8260 List analyte outside of the 80-120% acceptance criteria. Specific outlier includes: chloromethane (121%). MA CAM permits up to 14 outliers if within 60-140%.

The Laboratory Control Sample (LCS) (7/13/2011 S) had a(n) MA MCP 8260 List analyte outside of the 70-130% acceptance criteria. Specific outlier includes: chloromethane (136%).

The Laboratory Control Sample Duplicate (LCSD) (7/13/2011 S) had a(n) MA MCP 8260 List analyte outside of the 70-130% acceptance criteria. Specific outlier includes: chloromethane (132%).

Attach QC 8260 7/13/2011 "S" - Solid

6. EPA Method 8082 - PCBs

Attach QC 8082 07/11/11 - Solid

7. EPA Method 8270 - SVOCs

Question H

The Initial Calibration (ICAL) (06/04/11) (IABN209) had an analyte whose RF value did not meet the minimum values (Table 4, EPA 8270D), however, the RF value was greater than 0.050. The specific outlier includes 2-chloronaphthalene.

The % Recovery for 3,3'-dichlorobenzidine (141%) was outside method required QC acceptance limits of 70-130% Recovery in the mid-level secondary source standard following the ICAL (IABN209). The MACAM allows five (5) target analytes to exceed 70-130% R, and to narrate any analytes which are outside 70-130% R.

The RF value for 2-chloronaphthalene did not achieve the MACAM required level in the CCV for 07/13/11, however, the RF value was greater than 0.050.

The RF % DEV for 2,4-dinitrophenol (24.2%) was greater than the method required QC acceptance limits of <20% DEV in the CCV for 07/13/11. MA CAM Method 8270D allows up to 20% of analytes which have RF >20% DEV, as long as they are <40%.



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106 South Street
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ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
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Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

The Laboratory Control Sample Duplicate (LCSD) (7/12/2011 I) had a(n) MA RCP 8270 List analyte outside of the 40-140% (Base/Neutral Extractables) / 30-130% (Acid Extractables) acceptance criteria. Specific outlier includes: aniline (39.2%).

Attach QC 8270 7/12/2011 "I" - Solid



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ANALYTICAL REPORT

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Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

LABORATORY STATEMENTS:

NELAC certification, as indicated by the NELAC ID Number, is per analyte. For a complete list of NELAC validated analytes, please contact the laboratory.

MA Certification: MA DEP certifies for wastewater and drinking water matrices only. GZA is certified by MA DEP for EPA Methods 624, 524.2, 625, 245.1, 300.0 (Cl, SO₄, NO₃) and 200.7 (Sb, As, Be, Cd, Cr, Pb, Ni, Se, Ag, Tl, Zn, Al, Co, Fe, Mn, Mo, V.) The certification requirements were followed.

Abbreviations:

% R = % Recovery
DF = Dilution Factor
CF = Calculation Factor
DO = Diluted Out

Method Key:

Method 8260: The current version of the method is 8260B.
Method 8270: The current version of the method is 8270D.
Method 6010: The current version of the method is 6010C.
Method 8081: The current version of the method is 8081B.
Method 8082: The current version of the method is 8082A.
Method 7471: The current version of the method is 7471B.

The current Metals preparation methods are: 3010A (aqueous) and 3051 (solid).

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-5 Comp**

Sample No.: **001**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
PERCENT SOLID		82.5		%	TAJ	07/12/11	9:40
VOLATILE ORGANICS	EPA 8260				MQS	07/13/11	
Dichlorodifluoromethane	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Chloromethane	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Vinyl chloride	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Bromomethane	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Chloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Trichlorofluoromethane	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Diethylether	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Acetone	EPA 8260	<1700	1700	ug/kg	MQS	07/13/11	12:59
1,1-Dichloroethene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Carbon disulfide	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Dichloromethane	EPA 8260	<260	260	ug/kg	MQS	07/13/11	12:59
Methyl tert-butyl ether	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
trans-1,2-Dichloroethene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,1-Dichloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Diisopropyl ether (DIPE)	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Ethyl tert-butyl ether ETBE	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
2-Butanone (MEK)	EPA 8260	<1700	1700	ug/kg	MQS	07/13/11	12:59
2,2-Dichloropropane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
cis-1,2-Dichloroethene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Chloroform	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Bromochloromethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Tetrahydrofuran	EPA 8260	<650	650	ug/kg	MQS	07/13/11	12:59
1,1,1-Trichloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,1-Dichloropropene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Carbon tetrachloride	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,2-Dichloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Benzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
tert-Amyl methyl ether TAME	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Trichloroethene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,4-Dioxane	EPA 8260	<6500	6500	ug/kg	MQS	07/13/11	12:59
1,2-Dichloropropane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Bromodichloromethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Dibromomethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-5 Comp**

Sample No.: **001**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
4-Methyl-2-pentanone (MIBK)	EPA 8260	<1700	1700	ug/kg	MQS	07/13/11	12:59
cis-1,3-Dichloropropene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Toluene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
trans-1,3-Dichloropropene	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
1,1,2-Trichloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
2-Hexanone	EPA 8260	<1700	1700	ug/kg	MQS	07/13/11	12:59
1,3-Dichloropropane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Tetrachloroethene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Dibromochloromethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,2-Dibromoethane (EDB)	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Chlorobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,1,1,2-Tetrachloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Ethylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
m&p-Xylene	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
o-Xylene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Styrene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Bromoform	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
Isopropylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,1,2,2-Tetrachloroethane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,2,3-Trichloropropane	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Bromobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
n-Propylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
2-Chlorotoluene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,3,5-Trimethylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
4-Chlorotoluene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
tert-Butylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,2,4-Trimethylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
sec-Butylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
p-Isopropyltoluene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,3-Dichlorobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,4-Dichlorobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
n-Butylbenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,2-Dichlorobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
1,2-Dibromo-3-chloropropane	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
1,2,4-Trichlorobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-5 Comp**

Sample No.: **001**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
Hexachlorobutadiene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Naphthalene	EPA 8260	<130	130	ug/kg	MQS	07/13/11	12:59
1,2,3-Trichlorobenzene	EPA 8260	<65	65	ug/kg	MQS	07/13/11	12:59
Surrogates:	EPA 8260						
***1,2-Dichloroethane-D4	EPA 8260	112	70-130	% R	MQS	07/13/11	12:59
***Toluene-D8	EPA 8260	116	70-130	% R	MQS	07/13/11	12:59
***4-Bromofluorobenzene	EPA 8260	104	70-130	% R	MQS	07/13/11	12:59
Preparation	EPA 5035	13		CF	MQS	07/13/11	
SEMI-VOLATILE ORGANICS	EPA 8270				CMG	07/13/11	
Phenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2-Chlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2-Methylphenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
3&4-Methylphenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2-Nitrophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,4-Dimethylphenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,4-Dichlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,4,6-Trichlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,4,5-Trichlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,4-Dinitrophenol	EPA 8270	<3300	3300	ug/kg	CMG	07/13/11	22:38
4-Nitrophenol	EPA 8270	<1700	1700	ug/kg	CMG	07/13/11	22:38
Pentachlorophenol	EPA 8270	<1700	1700	ug/kg	CMG	07/13/11	22:38
bis(2-Chloroethyl)Ether	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
1,3-Dichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
1,4-Dichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
1,2-Dichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
bis(2-Chloroisopropyl)Ether	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Acetophenone	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Hexachloroethane	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Nitrobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Isophorone	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
bis(2-Chloroethoxy)Methane	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
1,2,4-Trichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Naphthalene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
4-Chloroaniline	EPA 8270	<660	660	ug/kg	CMG	07/13/11	22:38
Hexachlorobutadiene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38



ANALYTICAL REPORT

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One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: Old Quincy House-Harvard Univ.
Project No.: 01.0170977.00

Date Received: 07/11/2011
Date Reported: 07/28/2011
Work Order No.: 1107-00037

Sample ID: OQ-5 Comp

Sample No.: 001

Sample Date: 07/08/2011

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
2-Methylnaphthalene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Aniline	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2-Chloronaphthalene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Dimethylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Acenaphthylene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,6-Dinitrotoluene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Acenaphthene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Dibenzofuran	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
2,4-Dinitrotoluene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Diethylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Fluorene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Azobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
4-Bromophenyl Phenyl Ether	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Hexachlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Phenanthrene	EPA 8270	350	330	ug/kg	CMG	07/13/11	22:38
Anthracene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
di-n-Butylphthalate	EPA 8270	<500	500	ug/kg	CMG	07/13/11	22:38
Fluoranthene	EPA 8270	2800	330	ug/kg	CMG	07/13/11	22:38
Pyrene	EPA 8270	2500	330	ug/kg	CMG	07/13/11	22:38
Butylbenzylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Benzo [a] Anthracene	EPA 8270	1800	330	ug/kg	CMG	07/13/11	22:38
3,3'-Dichlorobenzidine	EPA 8270	<660	660	ug/kg	CMG	07/13/11	22:38
Chrysene	EPA 8270	1300	330	ug/kg	CMG	07/13/11	22:38
bis(2-Ethylhexyl)Phthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
di-n-Octylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Benzo [b] Fluoranthene	EPA 8270	1600	330	ug/kg	CMG	07/13/11	22:38
Benzo [k] Fluoranthene	EPA 8270	600	330	ug/kg	CMG	07/13/11	22:38
Benzo [a] Pyrene	EPA 8270	1000	330	ug/kg	CMG	07/13/11	22:38
Indeno [1,2,3-cd] Pyrene	EPA 8270	470	330	ug/kg	CMG	07/13/11	22:38
Dibenzo [a,h] Anthracene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	22:38
Benzo [g,h,i] Perylene	EPA 8270	490	330	ug/kg	CMG	07/13/11	22:38
Surrogates:							
***2-Fluorophenol	EPA 8270	59.3	30-130	% R	CMG	07/13/11	22:38
***Phenol-D6	EPA 8270	62.0	30-130	% R	CMG	07/13/11	22:38
***Nitrobenzene-D5	EPA 8270	65.0	30-130	% R	CMG	07/13/11	22:38



ANALYTICAL REPORT

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One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-5 Comp**

Sample No.: **001**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
***2-Fluorobiphenyl	EPA 8270	64.0	30-130	% R	CMG	07/13/11	22:38
***2,4,6-Tribromophenol	EPA 8270	87.8	30-130	% R	CMG	07/13/11	22:38
***P-Terphenyl-D14	EPA 8270	92.7	30-130	% R	CMG	07/13/11	22:38
Extraction	EPA 3545	1.0		DF	KEF	07/12/11	
POLYCHLORINATED BIPHENYLS	EPA 8082				TAJ	07/13/11	
Aroclor 1268	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1262	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1260	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1254	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1248	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1242/1016	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1232	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Aroclor 1221	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:04
Surrogates:	EPA 8082						
***Tetrachloro-m-xylene	EPA 8082	70.7	30-150	% R	TAJ	07/13/11	6:04
***Tetrachloro-m-xylene	EPA 8082	67.4	30-150	% R	TAJ	07/13/11	6:04
***Decachlorobiphenyl	EPA 8082	130	30-150	% R	TAJ	07/13/11	6:04
***Decachlorobiphenyl	EPA 8082	115	30-150	% R	TAJ	07/13/11	6:04
Extraction	EPA 3545	1.0		DF	KMM	07/11/11	
TOTAL PETROLEUM HYDROCARBON Mod. EPA 8100					RJD	07/13/11	
Hydrocarbon Content		66	12	mg/kg	RJD	07/13/11	15:20
Surrogate:							
***p-Terphenyl		103	30-130	% R	RJD	07/13/11	15:20
Extraction	EPA 3545	1.2		DF	KMM	07/11/11	
Conductivity		206		uS/cm	GDD	07/13/11	10:30
METALS							
Arsenic	EPA 6010C	4.9	0.84	mg/kg	LLZ	07/12/11	15:07
Cadmium	EPA 6010C	1.9	0.42	mg/kg	LLZ	07/12/11	15:07
Chromium	EPA 6010C	21	0.42	mg/kg	LLZ	07/12/11	15:07
Lead	EPA 6010C	210	0.84	mg/kg	LLZ	07/12/11	15:07
Mercury	EPA 7471B	0.32	0.013	mg/kg	GDD	07/13/11	14:13
SUBCONTRACTED ANALYTES							
ORP		-43		mv	XXX	07/08/11	11:53
pH	SW-846 9045C	7.3		SU	XXX	07/08/11	11:53
Metals Preparation	EPA 3051	69.1		DFS	AJY	07/12/11	11:05



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Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-5 Comp**
Sample Date: **07/08/2011**

Sample No.: **001**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
Sulfide Reactivity	EPA 7.3.4	<2.5	2.5	mg/kg	XXX	07/27/11	14:14
Cyanide Reactivity	EPA 7.3.3	<0.10	0.10	mg/kg	XXX	07/27/11	14:14



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Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-6 Comp**

Sample No.: **002**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
PERCENT SOLID		87.9		%	TAJ	07/12/11	9:40
VOLATILE ORGANICS	EPA 8260				MQS	07/13/11	
Dichlorodifluoromethane	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Chloromethane	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Vinyl chloride	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Bromomethane	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Chloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Trichlorofluoromethane	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Diethylether	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Acetone	EPA 8260	<1300	1300	ug/kg	MQS	07/13/11	13:35
1,1-Dichloroethene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Carbon disulfide	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Dichloromethane	EPA 8260	<200	200	ug/kg	MQS	07/13/11	13:35
Methyl tert-butyl ether	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
trans-1,2-Dichloroethene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,1-Dichloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Diisopropyl ether (DIPE)	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Ethyl tert-butyl ether ETBE	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
2-Butanone (MEK)	EPA 8260	<1300	1300	ug/kg	MQS	07/13/11	13:35
2,2-Dichloropropane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
cis-1,2-Dichloroethene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Chloroform	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Bromochloromethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Tetrahydrofuran	EPA 8260	<500	500	ug/kg	MQS	07/13/11	13:35
1,1,1-Trichloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,1-Dichloropropene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Carbon tetrachloride	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,2-Dichloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Benzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
tert-Amyl methyl ether TAME	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Trichloroethene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,4-Dioxane	EPA 8260	<5000	5000	ug/kg	MQS	07/13/11	13:35
1,2-Dichloropropane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Bromodichloromethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Dibromomethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35



ANALYTICAL REPORT

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Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
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Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-6 Comp**

Sample No.: **002**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
4-Methyl-2-pentanone (MIBK)	EPA 8260	<1300	1300	ug/kg	MQS	07/13/11	13:35
cis-1,3-Dichloropropene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Toluene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
trans-1,3-Dichloropropene	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
1,1,2-Trichloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
2-Hexanone	EPA 8260	<1300	1300	ug/kg	MQS	07/13/11	13:35
1,3-Dichloropropane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Tetrachloroethene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Dibromochloromethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,2-Dibromoethane (EDB)	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Chlorobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,1,1,2-Tetrachloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Ethylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
m&p-Xylene	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
o-Xylene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Styrene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Bromoform	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
Isopropylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,1,2,2-Tetrachloroethane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,2,3-Trichloropropane	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Bromobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
n-Propylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
2-Chlorotoluene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,3,5-Trimethylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
4-Chlorotoluene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
tert-Butylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,2,4-Trimethylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
sec-Butylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
p-Isopropyltoluene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,3-Dichlorobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,4-Dichlorobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
n-Butylbenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,2-Dichlorobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
1,2-Dibromo-3-chloropropane	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
1,2,4-Trichlorobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: Old Quincy House-Harvard Univ.
Project No.: 01.0170977.00

Date Received: 07/11/2011
Date Reported: 07/28/2011
Work Order No.: 1107-00037

Sample ID: OQ-6 Comp

Sample No.: 002

Sample Date: 07/08/2011

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
Hexachlorobutadiene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Naphthalene	EPA 8260	<100	100	ug/kg	MQS	07/13/11	13:35
1,2,3-Trichlorobenzene	EPA 8260	<50	50	ug/kg	MQS	07/13/11	13:35
Surrogates:	EPA 8260						
***1,2-Dichloroethane-D4	EPA 8260	104	70-130	% R	MQS	07/13/11	13:35
***Toluene-D8	EPA 8260	117	70-130	% R	MQS	07/13/11	13:35
***4-Bromofluorobenzene	EPA 8260	105	70-130	% R	MQS	07/13/11	13:35
Preparation	EPA 5035	10		CF	MQS	07/13/11	
SEMI-VOLATILE ORGANICS	EPA 8270				CMG	07/13/11	
Phenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2-Chlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2-Methylphenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
3&4-Methylphenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2-Nitrophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,4-Dimethylphenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,4-Dichlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,4,6-Trichlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,4,5-Trichlorophenol	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,4-Dinitrophenol	EPA 8270	<3300	3300	ug/kg	CMG	07/13/11	23:12
4-Nitrophenol	EPA 8270	<1700	1700	ug/kg	CMG	07/13/11	23:12
Pentachlorophenol	EPA 8270	<1700	1700	ug/kg	CMG	07/13/11	23:12
bis(2-Chloroethyl)Ether	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
1,3-Dichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
1,4-Dichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
1,2-Dichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
bis(2-Chloroisopropyl)Ether	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Acetophenone	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Hexachloroethane	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Nitrobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Isophorone	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
bis(2-Chloroethoxy)Methane	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
1,2,4-Trichlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Naphthalene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
4-Chloroaniline	EPA 8270	<660	660	ug/kg	CMG	07/13/11	23:12
Hexachlorobutadiene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062
781-278-3700

Matt Smith

Project Name.: Old Quincy House-Harvard Univ.
Project No.: 01.0170977.00

Date Received: 07/11/2011
Date Reported: 07/28/2011
Work Order No.: 1107-00037

Sample ID: OQ-6 Comp

Sample No.: 002

Sample Date: 07/08/2011

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
2-Methylnaphthalene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Aniline	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2-Chloronaphthalene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Dimethylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Acenaphthylene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,6-Dinitrotoluene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Acenaphthene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Dibenzofuran	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
2,4-Dinitrotoluene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Diethylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Fluorene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Azobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
4-Bromophenyl Phenyl Ether	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Hexachlorobenzene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Phenanthrene	EPA 8270	1800	330	ug/kg	CMG	07/13/11	23:12
Anthracene	EPA 8270	440	330	ug/kg	CMG	07/13/11	23:12
di-n-Butylphthalate	EPA 8270	<500	500	ug/kg	CMG	07/13/11	23:12
Fluoranthene	EPA 8270	2200	330	ug/kg	CMG	07/13/11	23:12
Pyrene	EPA 8270	1900	330	ug/kg	CMG	07/13/11	23:12
Butylbenzylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Benzo [a] Anthracene	EPA 8270	1000	330	ug/kg	CMG	07/13/11	23:12
3,3'-Dichlorobenzidine	EPA 8270	<660	660	ug/kg	CMG	07/13/11	23:12
Chrysene	EPA 8270	830	330	ug/kg	CMG	07/13/11	23:12
bis(2-Ethylhexyl)Phthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
di-n-Octylphthalate	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Benzo [b] Fluoranthene	EPA 8270	680	330	ug/kg	CMG	07/13/11	23:12
Benzo [k] Fluoranthene	EPA 8270	540	330	ug/kg	CMG	07/13/11	23:12
Benzo [a] Pyrene	EPA 8270	570	330	ug/kg	CMG	07/13/11	23:12
Indeno [1,2,3-cd] Pyrene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Dibenzo [a,h] Anthracene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Benzo [g,h,i] Perylene	EPA 8270	<330	330	ug/kg	CMG	07/13/11	23:12
Surrogates:							
***2-Fluorophenol	EPA 8270	63.3	30-130	% R	CMG	07/13/11	23:12
***Phenol-D6	EPA 8270	65.6	30-130	% R	CMG	07/13/11	23:12
***Nitrobenzene-D5	EPA 8270	68.8	30-130	% R	CMG	07/13/11	23:12



ANALYTICAL REPORT

GZA GeoEnvironmental, Inc.
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781-278-3700

Matt Smith

Project Name.: **Old Quincy House-Harvard Univ.**
Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-6 Comp**

Sample No.: **002**

Sample Date: **07/08/2011**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
***2-Fluorobiphenyl	EPA 8270	71.5	30-130	% R	CMG	07/13/11	23:12
***2,4,6-Tribromophenol	EPA 8270	88.1	30-130	% R	CMG	07/13/11	23:12
***P-Terphenyl-D14	EPA 8270	86.7	30-130	% R	CMG	07/13/11	23:12
Extraction	EPA 3545	1.0		DF	KEF	07/12/11	
POLYCHLORINATED BIPHENYLS	EPA 8082				TAJ	07/13/11	
Aroclor 1268	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1262	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1260	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1254	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1248	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1242/1016	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1232	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Aroclor 1221	EPA 8082	<100	100	ug/kg	TAJ	07/13/11	6:44
Surrogates:	EPA 8082						
***Tetrachloro-m-xylene	EPA 8082	65.0	30-150	% R	TAJ	07/13/11	6:44
***Tetrachloro-m-xylene	EPA 8082	62.4	30-150	% R	TAJ	07/13/11	6:44
***Decachlorobiphenyl	EPA 8082	123	30-150	% R	TAJ	07/13/11	6:44
***Decachlorobiphenyl	EPA 8082	126	30-150	% R	TAJ	07/13/11	6:44
Extraction	EPA 3545	1.0		DF	KMM	07/11/11	
TOTAL PETROLEUM HYDROCARBON Mod. EPA 8100					RJD	07/13/11	
Hydrocarbon Content		79	11	mg/kg	RJD	07/13/11	16:03
Surrogate:							
***p-Terphenyl		118	30-130	% R	RJD	07/13/11	16:03
Extraction	EPA 3545	1.1		DF	KMM	07/11/11	
Conductivity		125		uS/cm	GDD	07/13/11	10:30
METALS							
Arsenic	EPA 6010C	5.3	0.62	mg/kg	LLZ	07/12/11	15:07
Cadmium	EPA 6010C	1.3	0.31	mg/kg	LLZ	07/12/11	15:07
Chromium	EPA 6010C	17	0.31	mg/kg	LLZ	07/12/11	15:07
Lead	EPA 6010C	82	0.62	mg/kg	LLZ	07/12/11	15:07
Mercury	EPA 7471B	0.26	0.011	mg/kg	GDD	07/13/11	14:13
SUBCONTRACTED ANALYTES							
ORP		-24		mv	XXX	07/08/11	11:53
pH	SW-846 9045C	7.0		SU	XXX	07/08/11	11:53
Metals Preparation	EPA 3051	54.9		DFS	AJY	07/12/11	11:05



ANALYTICAL REPORT

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781-278-3700

Matt Smith

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Project No.: **01.0170977.00**

Date Received: **07/11/2011**
Date Reported: **07/28/2011**
Work Order No.: **1107-00037**

Sample ID: **OQ-6 Comp**
Sample Date: **07/08/2011**

Sample No.: **002**

Test Performed	Method	Results	Reporting Limit	Units	Tech	Analysis Date	Analysis Time
Sulfide Reactivity	EPA 7.3.4	<2.5	2.5	mg/kg	XXX	07/27/11	14:14
Cyanide Reactivity	EPA 7.3.3	<0.10	0.10	mg/kg	XXX	07/27/11	14:14

GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
106 SOUTH ST, HOPKINTON, MA 01748
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 6010C ANALYSIS
Metals by ICP

QUALITY CONTROL - SOLID

DATE PREPARED: 7/12/2011 A

QC Sample	Method Blank	Lab Control Sample	LC Duplicate	LCS CRM		LC/LCD Diff.
Units	mg/kg	% Recovery	% Recovery	Acceptance Limits		RPD
Acceptance Limits	Results	Varies	Varies	Lower	Upper	<30
Analyte						
Silver (Ag)	NA	NA	NA	75.4	125	NA
Aluminum (Al)	NA	NA	NA	78.8	121	NA
Arsenic (As)	<1.00	94.6	97.0	78.6	121	2.43
Boron (B)	NA	NA	NA	75.3	125	NA
Barium (Ba)	<0.500	97.9	100	87.2	113	2.32
Beryllium (Be)	NA	NA	NA	84.1	116	NA
Calcium (Ca)	NA	NA	NA	81.1	119	NA
Cadmium (Cd)	<0.500	99.5	102	83.0	117	2.19
Cobalt (Co)	NA	NA	NA	85.2	115	NA
Chromium (Cr)	<0.500	101	104	84.5	116	3.10
Copper (Cu)	NA	NA	NA	83.9	117	NA
Iron (Fe)	NA	NA	NA	63.1	137	NA
Magnesium (Mg)	NA	NA	NA	80.1	120	NA
Manganese (Mn)	NA	NA	NA	82.4	117	NA
Molybdenum (Mo)	NA	NA	NA	85.3	115	NA
Nickel (Ni)	NA	NA	NA	84.0	115	NA
Lead (Pb)	<1.00	93.8	96.6	82.9	117	2.93
Antimony (Sb)	NA	NA	NA	74.0	125	NA
Selenium (Se)	<2.50	94.9	97.4	81.0	119	2.66
Tin (Sn)	NA	NA	NA	86.0	114	NA
Titanium (Ti)	NA	NA	NA	67.7	132	NA
Thallium (Tl)	NA	NA	NA	71.3	128	NA
Vanadium (V)	NA	NA	NA	87.4	113	NA
Zinc (Zn)	NA	NA	NA	82.0	118	NA

RPD = Relative Percent Difference

NA = Not Applicable

NC = Not Calculated

CRM = Certified Reference Material

GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
106 SOUTH ST, HOPKINTON, MA 01748
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 7471B ANALYSIS
Mercury by Cold Vapor Atomic Absorption

QUALITY CONTROL - Solid

Date Prepared: 07/13/11

QC Sample	Method Blank	Lab Control Sample	Lab Control Sample Duplicate	LC/LCD Difference
Units	mg/kg	% Recovery	% Recovery	RPD
Acceptance Limits	Results	68-131	68-131	30%
Analyte				
Mercury (Hg)	<0.020	124	139	11.3

RPD = Relative Percent Difference

LCS recovery limits are the suppliers 95% confidence Limits.

LCS Certified concentration (mg/Kg): 0.71

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 106 SOUTH STREET, HOPKINTON, MA 01748 (508)435-9244
 MASSACHUSETTS LABORATORY I.D. NO. MA092

TPH
TOTAL PETROLEUM HYDROCARBONS IN AQUEOUS AND/OR SOLID MATRIX

QUALITY CONTROL

EXT. DATE: 07/11/11 Solid

METHOD BLANK	AQUEOUS	SOLID	
	ug/L-PPB	mg/kg - PPM	
TPH	<100	<10	
Surrogate:	Recovery (%)	Limits-Aqueous	Limits-Solid
***p-Terphenyl	83.6	40-130	40-130

LABORATORY CONTROL SAMPLE /	LCS	LCSD			
DUPLICATE LCS	Recovery (%)	Recovery (%)	Limits	RPD	Limits
TPH	64.5	64.2	40-150	0.47	<30
Surrogate:					
***p-Terphenyl	87.7	79.4			

*Matrix Spike / Duplicate Spike performed as per method and reported if assigned on the Chain of Custody.

EPA Method 8260 Solid Method Blank (MB) and Laboratory Control Sample/Duplicate (LCS/LCSD) Data

Method Blank

Date Analyzed:	7/13/2011	
Volatile Organics	Conc. ug/kg	Acceptance Limit
dichlorodifluoromethane	< 100	< 100
chloromethane	< 100	< 100
vinyl chloride	< 50	< 50
bromomethane	< 100	< 100
chloroethane	< 50	< 50
trichlorofluoromethane	< 100	< 100
diethyl ether	< 250	< 250
acetone	< 1000	< 1000
1,1-dichloroethene	< 50	< 50
carbon disulfide	< 500	< 500
dichloromethane	< 100	< 100
methyl-tert-butyl-ether	< 50	< 50
trans-1,2-dichloroethene	< 50	< 50
1,1-dichloroethane	< 50	< 50
di-isopropyl ether (DIPE)	< 100	< 100
ethyl tert-butyl ether (EtBE)	< 100	< 100
2-butanone	< 1000	< 1000
2,2-dichloropropane	< 50	< 50
cis-1,2-dichloroethene	< 50	< 50
chloroform	< 50	< 50
bromochloromethane	< 50	< 50
tetrahydrofuran	< 500	< 500
1,1,1-trichloroethane	< 50	< 50
1,1-dichloropropene	< 50	< 50
carbon tetrachloride	< 50	< 50
1,2-dichloroethane	< 50	< 50
benzene	< 50	< 50
tert-amyl methyl ether (TAME)	< 100	< 100
trichloroethene	< 50	< 50
1,2-dichloropropane	< 50	< 50
bromodichloromethane	< 50	< 50
1,4-Dioxane	< 5000	< 5000
dibromomethane	< 50	< 50
4-methyl-2-pentanone	< 1000	< 1000
cis-1,3-dichloropropene	< 50	< 50
toluene	< 50	< 50
trans-1,3-dichloropropene	< 100	< 100
1,1,2-trichloroethane	< 50	< 50
2-hexanone	< 1000	< 1000
1,3-dichloropropane	< 50	< 50
tetrachloroethene	< 50	< 50
dibromochloromethane	< 50	< 50
1,2-dibromomethane (EDB)	< 100	< 100
chlorobenzene	< 50	< 50
1,1,1,2-tetrachloroethane	< 50	< 50
ethylbenzene	< 50	< 50
1,1,2,2-tetrachloroethane	< 50	< 50
m&p-xylene	< 100	< 100
o-xylene	< 50	< 50
styrene	< 50	< 50
bromoform	< 100	< 100
isopropylbenzene	< 50	< 50
1,2,3-trichloropropane	< 50	< 50
bromobenzene	< 50	< 50
n-propylbenzene	< 50	< 50
2-chlorotoluene	< 50	< 50
1,3,5-trimethylbenzene	< 50	< 50
4-chlorotoluene	< 50	< 50
tert-butyl-benzene	< 50	< 50
1,2,4-trimethylbenzene	< 50	< 50
sec-butyl-benzene	< 50	< 50
p-isopropyltoluene	< 50	< 50
1,3-dichlorobenzene	< 50	< 50
1,4-dichlorobenzene	< 50	< 50
n-butylbenzene	< 50	< 50
1,2-dichlorobenzene	< 50	< 50
1,2-dibromo-3-chloropropane	< 250	< 250
1,2,4-trichlorobenzene	< 50	< 50
hexachlorobutadiene	< 50	< 50
naphthalene	< 100	< 100
1,2,3-trichlorobenzene	< 50	< 50

Laboratory Control Sample

Date Analyzed:	7/13/2011	
Spike Concentration = 2500ug/kg	% Recovery	Acceptance Limits
dichlorodifluoromethane	119	70-130
chloromethane	136	70-130
vinyl chloride	114	70-130
bromomethane	76.7	70-130
chloroethane	80.6	70-130
trichlorofluoromethane	92.4	70-130
diethyl ether	78.6	70-130
acetone	101	70-130
1,1-dichloroethene	101	70-130
carbon disulfide	121	70-130
dichloromethane	94.9	70-130
methyl-tert-butyl-ether	95.5	70-130
trans-1,2-dichloroethene	101	70-130
1,1-dichloroethane	105	70-130
di-isopropyl ether (DIPE)	102	70-130
ethyl tert-butyl ether (EtBE)	102	70-130
2-butanone	97.4	70-130
2,2-dichloropropane	114	70-130
cis-1,2-dichloroethene	102	70-130
chloroform	102	70-130
bromochloromethane	95.6	70-130
tetrahydrofuran	102	70-130
1,1,1-trichloroethane	107	70-130
1,1-dichloropropene	105	70-130
carbon tetrachloride	105	70-130
1,2-dichloroethane	104	70-130
benzene	103	70-130
tert-amyl methyl ether (TAME)	106	70-130
trichloroethene	99.0	70-130
1,2-dichloropropane	103	70-130
bromodichloromethane	100	70-130
1,4-Dioxane	94.8	70-130
dibromomethane	91.5	70-130
4-methyl-2-pentanone	100	70-130
cis-1,3-dichloropropene	104	70-130
toluene	104	70-130
trans-1,3-dichloropropene	100	70-130
1,1,2-trichloroethane	99.7	70-130
2-hexanone	102	70-130
1,3-dichloropropane	101	70-130
tetrachloroethene	99.9	70-130
dibromochloromethane	105	70-130
1,2-dibromomethane (EDB)	102	70-130
chlorobenzene	106	70-130
1,1,1,2-tetrachloroethane	103	70-130
ethylbenzene	110	70-130
1,1,2,2-tetrachloroethane	98.0	70-130
m&p-xylene	109	70-130
o-xylene	103	70-130
styrene	101	70-130
bromoform	95.8	70-130
isopropylbenzene	106	70-130
1,2,3-trichloropropane	95.9	70-130
bromobenzene	96.7	70-130
n-propylbenzene	108	70-130
2-chlorotoluene	104	70-130
1,3,5-trimethylbenzene	105	70-130
4-chlorotoluene	104	70-130
tert-butyl-benzene	104	70-130
1,2,4-trimethylbenzene	103	70-130
sec-butyl-benzene	106	70-130
p-isopropyltoluene	105	70-130
1,3-dichlorobenzene	99.4	70-130
1,4-dichlorobenzene	99.1	70-130
n-butylbenzene	110	70-130
1,2-dichlorobenzene	99.1	70-130
1,2-dibromo-3-chloropropane	89.2	70-130
1,2,4-trichlorobenzene	99.5	70-130
hexachlorobutadiene	102	70-130
naphthalene	94.7	70-130
1,2,3-trichlorobenzene	95.5	70-130

Laboratory Control Sample Duplicate

Date Analyzed:	7/13/2011					
	% Recovery	Acceptance Limits	Verdict	RPD	Limit	Verdict
dichlorodifluoromethane	116	70-130	ok	2.53	<25	ok
chloromethane	132	70-130	out	2.90	<25	ok
vinyl chloride	110	70-130	ok	4.30	<25	ok
bromomethane	70.2	70-130	ok	8.78	<25	ok
chloroethane	73.1	70-130	ok	9.83	<25	ok
trichlorofluoromethane	87.0	70-130	ok	6.01	<25	ok
diethyl ether	75.6	70-130	ok	3.92	<25	ok
acetone	95.3	70-130	ok	5.35	<25	ok
1,1-dichloroethene	94.0	70-130	ok	7.25	<25	ok
carbon disulfide	113	70-130	ok	6.71	<25	ok
dichloromethane	91.2	70-130	ok	4.00	<25	ok
methyl-tert-butyl-ether	90.9	70-130	ok	4.91	<25	ok
trans-1,2-dichloroethene	98.7	70-130	ok	2.42	<25	ok
1,1-dichloroethane	100	70-130	ok	5.25	<25	ok
di-isopropyl ether (DIPE)	97.3	70-130	ok	5.15	<25	ok
ethyl tert-butyl ether (EtBE)	95.3	70-130	ok	6.40	<25	ok
2-butanone	89.2	70-130	ok	8.88	<25	ok
2,2-dichloropropane	105	70-130	ok	8.16	<25	ok
cis-1,2-dichloroethene	97.5	70-130	ok	4.20	<25	ok
chloroform	94.3	70-130	ok	8.20	<25	ok
bromochloromethane	92.4	70-130	ok	3.46	<25	ok
tetrahydrofuran	98.8	70-130	ok	2.84	<25	ok
1,1,1-trichloroethane	97.8	70-130	ok	8.85	<25	ok
1,1-dichloropropene	100	70-130	ok	4.62	<25	ok
carbon tetrachloride	100	70-130	ok	4.04	<25	ok
1,2-dichloroethane	95.1	70-130	ok	8.71	<25	ok
benzene	101	70-130	ok	2.86	<25	ok
tert-amyl methyl ether (TAME)	97.7	70-130	ok	8.32	<25	ok
trichloroethene	96.4	70-130	ok	2.66	<25	ok
1,2-dichloropropane	100	70-130	ok	2.69	<25	ok
bromodichloromethane	91.5	70-130	ok	8.86	<25	ok
1,4-Dioxane	93.2	70-130	ok	1.71	<25	ok
dibromomethane	86.4	70-130	ok	5.75	<25	ok
4-methyl-2-pentanone	91.6	70-130	ok	9.26	<25	ok
cis-1,3-dichloropropene	99.9	70-130	ok	4.09	<25	ok
toluene	99.2	70-130	ok	4.80	<25	ok
trans-1,3-dichloropropene	95.0	70-130	ok	5.31	<25	ok
1,1,2-trichloroethane	88.9	70-130	ok	11.5	<25	ok
2-hexanone	92.1	70-130	ok	10.4	<25	ok
1,3-dichloropropane	89.5	70-130	ok	11.7	<25	ok
tetrachloroethene	94.1	70-130	ok	5.89	<25	ok
dibromochloromethane	95.0	70-130	ok	9.53	<25	ok
1,2-dibromomethane (EDB)	90.6	70-130	ok	12.3	<25	ok
chlorobenzene	93.6	70-130	ok	12.0	<25	ok
1,1,1,2-tetrachloroethane	92.6	70-130	ok	11.1	<25	ok
ethylbenzene	99.4	70-130	ok	9.95	<25	ok
1,1,2,2-tetrachloroethane	85.7	70-130	ok	13.4	<25	ok
m&p-xylene	99.2	70-130	ok	9.10	<25	ok
o-xylene	98.9	70-130	ok	3.63	<25	ok
styrene	97.7	70-130	ok	3.14	<25	ok
bromoform	89.6	70-130	ok	6.67	<25	ok
isopropylbenzene	100	70-130	ok	5.44	<25	ok
1,2,3-trichloropropane	84.9	70-130	ok	12.1	<25	ok
bromobenzene	90.6	70-130	ok	6.47	<25	ok
n-propylbenzene	101	70-130	ok	6.15	<25	ok
2-chlorotoluene	99.2	70-130	ok	4.52	<25	ok
1,3,5-trimethylbenzene	99.9	70-130	ok	4.69	<25	ok
4-chlorotoluene	98.4	70-130	ok	5.40	<25	ok
tert-butyl-benzene	98.8	70-130	ok	5.01	<25	ok
1,2,4-trimethylbenzene	100	70-130	ok	3.29	<25	ok
sec-butyl-benzene	101	70-130	ok	4.64	<25	ok
p-isopropyltoluene	101	70-130	ok	4.36	<25	ok
1,3-dichlorobenzene	95.4	70-130	ok	4.16	<25	ok
1,4-dichlorobenzene	94.7	70-130	ok	4.55	<25	ok
n-butylbenzene	105	70-130	ok	4.02	<25	ok
1,2-dichlorobenzene	94.5	70-130	ok	4.83	<25	ok
1,2-dibromo-3-chloropropane	84.5	70-130	ok	5.45	<25	ok
1,2,4-trichlorobenzene	94.7	70-130	ok	4.95	<25	ok
hexachlorobutadiene	99.8	70-130	ok	2.00	<25	ok
naphthalene	90.9	70-130	ok	4.16	<25	ok
1,2,3-trichlorobenzene	91.7	70-130	ok	4.13	<25	ok

Surrogates:	Recovery (%)	Acceptance Limits	Surrogates:	Recovery (%)	Acceptance Limits	Verdict	Recovery (%)	Acceptance Limits	Verdict	RPD	Acceptance Limit	Verdict
DIBROMOFLUOROMETHANE	104	70-130	DIBROMOFLUOROMETHANE	111	70-130	ok	109	70-130	ok	1.87	<25	ok
1,2-DICHLOROETHANE-D4	99.4	70-130	1,2-DICHLOROETHANE-D4	108	70-130	ok	105	70-130	ok	2.10	<25	ok
TOLUENE-D8	106	70-130	TOLUENE-D8	116	70-130	ok	110	70-130	ok	5.25	<25	ok
4-BROMOFLUOROBENZENE	95.2	70-130	4-BROMOFLUOROBENZENE	107	70-130	ok	102	70-130	ok	4.82	<25	ok

GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
106 SOUTH STREET, HOPKINTON, MA 01748
MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8082 ANALYSIS
QUALITY CONTROL SOLID

DATE EXTRACTED: 7/11/2011

DATE ANALYZED: 7/13/2011

METHOD BLANK	Concentration		Quantitation Limit
POLYCHLORINATED BIPHENYLS as AROCLORS	ug/kg-PPB		ug/kg-PPB
Aroclor 1268	ND		100
Aroclor 1262	ND		100
Aroclor 1260	ND		100
Aroclor 1254	ND		100
Aroclor 1248	ND		100
Aroclor 1242/1016	ND		100
Aroclor 1232	ND		100
Aroclor 1221	ND		100
Surrogates:	(A)	(B)	
Tetrachloro-m-xylene	89.4	90.5	30-150
Decachlorobiphenyl	103	105	30-150

LABORATORY CONTROL SAMPLE (LCS)	% Recovery		Acceptance Limits
Aroclor 1016	85.2	80.9	40-140
Aroclor 1260	109	105	40-140
Surrogates:			
Tetrachloro-m-xylene	64.1	63.5	30-150
Decachlorobiphenyl	86.9	87.0	30-150

LABORATORY CONTROL SAMPLE DUPLICATE (LCSD)	% Recovery		Acceptance Limits
Aroclor 1016	93.9	89.6	40-140
Aroclor 1260	103	100	40-140
Surrogates:			
Tetrachloro-m-xylene	74.6	74.8	30-150
Decachlorobiphenyl	90.5	90.7	30-150

RELATIVE PERCENT DIFFERENCE (RPD)	RPD		Acceptance Limits
Aroclor 1016	9.72	10.2	<30
Aroclor 1260	5.66	4.88	<30
Surrogates:			
Tetrachloro-m-xylene	15.1	16.3	<30
Decachlorobiphenyl	4.06	4.16	<30

*Matrix Spike/Duplicate Spike performed as per method and reported if assigned on Chain of Custody.

EPA Method 8270 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Method Blank

Date Extracted:	07/12/11	
Date Analyzed:	7/13/2011	
File Name:	M8853	
Semi-Volatile Organics	Result	Reporting Limit
phenol	ND	330
bis(2-chloroethyl)ether	ND	330
2-chlorophenol	ND	330
1,3-dichlorobenzene	ND	330
1,4-dichlorobenzene	ND	330
1,2-dichlorobenzene	ND	330
2-methylphenol	ND	330
bis(2-chloroisopropyl)ether	ND	330
3&4-methylphenol	ND	330
acetophenone	ND	330
hexachloroethane	ND	330
nitrobenzene	ND	330
isophrone	ND	330
2-nitrophenol	ND	330
2,4-dimethylphenol	ND	330
bis(2-chloroethoxy)methane	ND	330
2,4-dichlorophenol	ND	330
1,2,4-trichlorobenzene	ND	330
naphthalene	ND	330
4-chloroaniline	ND	660
hexachlorobutadiene	ND	330
2-methylnaphthalene	ND	330
aniline	ND	330
2,4,6-trichlorophenol	ND	330
2,4,5-trichlorophenol	ND	330
2-chloronaphthalene	ND	330
dimethylphthalate	ND	330
acenaphthylene	ND	330
2,6-dinitrotoluene	ND	330
acenaphthene	ND	330
2,4-dinitrophenol	ND	3300
dibenzofuran	ND	330
4-nitrophenol	ND	1700
2,4-dinitrotoluene	ND	330
diethylphthalate	ND	330
fluorene	ND	330
azobenzene	ND	330
4-bromophenyl phenyl ether	ND	330
hexachlorobenzene	ND	330
pentachlorophenol	ND	1700
phenanthrene	ND	330
anthracene	ND	330
di-n-butylphthalate	ND	500
fluoranthene	ND	330
pyrene	ND	330
butylbenzylphthalate	ND	330
benz [a] anthracene	ND	330
3,3'-dichlorobenzidine	ND	660
chrysene	ND	330
bis(2-ethylhexyl)phthalate	ND	330
di-n-octylphthalate	ND	330
benzo [b] fluoranthene	ND	330
benzo [k] fluoranthene	ND	330
benzo [a] pyrene	ND	330
indeno [1,2,3-cd] pyrene	ND	330
dibenz [a,h] anthracene	ND	330
benzo [ghi] perylene	ND	330

Surrogates:	Recovery (%)	Acceptance Limits
2-FLUOROPHENOL	51.3	30-130
PHENOL-D6	52.4	30-130
NITROBENZENE-D5	54.8	30-130
2-FLUOROBIPHENYL	58.8	30-130
2,4,6-TRIBROMOPHENOL	72.7	30-130
p-TERPHENYL-D14	97.6	30-130

EPA Method 8270 Solid Method Blank (MB) and Laboratory Control Sample (LCS) Data

Laboratory Control Sample

Date Extracted:	07/12/11		
Date Analyzed:	7/13/2011		
File Name:	M8854		
Spike Concentration = 20ug/L	% Recovery	Acceptance Limits	Verdict
phenol	66.0	30-130	ok
bis(2-chloroethyl)ether	69.0	40-140	ok
2-chlorophenol	64.0	30-130	ok
1,3-dichlorobenzene	60.3	40-140	ok
1,4-dichlorobenzene	63.5	40-140	ok
1,2-dichlorobenzene	59.8	40-140	ok
2-methylphenol	63.3	30-130	ok
bis(2-chloroisopropyl)ether	54.0	40-140	ok
3&4-methylphenol	62.1	30-130	ok
acetophenone	64.1	40-140	ok
hexachloroethane	61.9	40-140	ok
nitrobenzene	59.8	40-140	ok
isophrone	61.8	40-140	ok
2-nitrophenol	63.8	30-130	ok
2,4-dimethylphenol	56.2	30-130	ok
bis(2-chloroethoxy)methane	68.0	40-140	ok
2,4-dichlorophenol	65.5	30-130	ok
1,2,4-trichlorobenzene	64.4	40-140	ok
naphthalene	64.1	40-140	ok
4-chloroaniline	59.2	40-140	ok
hexachlorobutadiene	69.7	40-140	ok
2-methylnaphthalene	62.3	40-140	ok
aniline	45.0	40-140	ok
2,4,6-trichlorophenol	60.5	30-130	ok
2,4,5-trichlorophenol	73.1	30-130	ok
2-chloronaphthalene	65.8	40-140	ok
dimethylphthalate	80.7	40-140	ok
acenaphthylene	69.2	40-140	ok
2,6-dinitrotoluene	76.0	40-140	ok
acenaphthene	66.5	40-140	ok
2,4-dinitrophenol	52.6	30-130	ok
dibenzofuran	68.2	40-140	ok
4-nitrophenol	83.0	30-130	ok
2,4-dinitrotoluene	80.5	40-140	ok
diethylphthalate	90.9	40-140	ok
fluorene	73.0	40-140	ok
azobenzene	66.5	40-140	ok
4-bromophenyl phenyl ether	88.7	40-140	ok
hexachlorobenzene	95.5	40-140	ok
pentachlorophenol	77.4	30-130	ok
phenanthrene	87.3	40-140	ok
anthracene	85.1	40-140	ok
di-n-butylphthalate	103	40-140	ok
fluoranthene	97.6	40-140	ok
pyrene	101	40-140	ok
butylbenzylphthalate	103	40-140	ok
benz [a] anthracene	107	40-140	ok
3,3'-dichlorobenzidine	120	40-140	ok
chrysene	91.8	40-140	ok
bis(2-ethylhexyl)phthalate	98.3	40-140	ok
di-n-octylphthalate	95.1	40-140	ok
benzo [b] fluoranthene	97.1	40-140	ok
benzo [k] fluoranthene	99.5	40-140	ok
benzo [a] pyrene	101	40-140	ok
indeno [1,2,3-cd] pyrene	95.9	40-140	ok
dibenz [a,h] anthracene	94.7	40-140	ok
benzo [ghi] perylene	94.8	40-140	ok

Laboratory Control Sample Duplicate

Date Extracted: 07/12/11

Date Analyzed: 7/13/2011

File Name: M8855

% Recovery

Acceptance Limits

Verdict

Relative % Diff.

Limits

Verdict

58.3	30-130	ok	12	<30	ok
54.0	40-140	ok	24	<30	ok
55.3	30-130	ok	14	<30	ok
50.1	40-140	ok	18	<30	ok
51.1	40-140	ok	22	<30	ok
50.3	40-140	ok	17	<30	ok
52.6	30-130	ok	18	<30	ok
46.7	40-140	ok	15	<30	ok
58.4	30-130	ok	6.2	<30	ok
55.6	40-140	ok	14	<30	ok
51.4	40-140	ok	19	<30	ok
56.8	40-140	ok	5.0	<30	ok
55.9	40-140	ok	10	<30	ok
55.1	30-130	ok	15	<30	ok
47.3	30-130	ok	17	<30	ok
60.3	40-140	ok	12	<30	ok
58.6	30-130	ok	11	<30	ok
58.2	40-140	ok	10	<30	ok
58.5	40-140	ok	9.2	<30	ok
54.7	40-140	ok	8.0	<30	ok
59.9	40-140	ok	15	<30	ok
57.6	40-140	ok	7.9	<30	ok
39.2	40-140	out	14	<30	ok
58.2	30-130	ok	3.8	<30	ok
67.4	30-130	ok	8.1	<30	ok
59.5	40-140	ok	10	<30	ok
71.3	40-140	ok	12	<30	ok
62.5	40-140	ok	10	<30	ok
71.3	40-140	ok	6.3	<30	ok
58.6	40-140	ok	13	<30	ok
46.9	30-130	ok	11	<30	ok
62.1	40-140	ok	9.5	<30	ok
75.5	30-130	ok	9.4	<30	ok
73.8	40-140	ok	8.7	<30	ok
81.4	40-140	ok	11	<30	ok
67.1	40-140	ok	8.4	<30	ok
62.5	40-140	ok	6.1	<30	ok
80.9	40-140	ok	9.2	<30	ok
87.7	40-140	ok	8.6	<30	ok
74.0	30-130	ok	4.5	<30	ok
76.1	40-140	ok	14	<30	ok
78.6	40-140	ok	8.0	<30	ok
90.0	40-140	ok	13	<30	ok
89.0	40-140	ok	9.3	<30	ok
92.4	40-140	ok	8.9	<30	ok
92.3	40-140	ok	11	<30	ok
94.8	40-140	ok	12	<30	ok
108	40-140	ok	11	<30	ok
85.0	40-140	ok	7.6	<30	ok
86.0	40-140	ok	13	<30	ok
83.7	40-140	ok	13	<30	ok
92.7	40-140	ok	4.6	<30	ok
83.4	40-140	ok	18	<30	ok
89.3	40-140	ok	12	<30	ok
85.7	40-140	ok	11	<30	ok
87.0	40-140	ok	8.5	<30	ok
83.0	40-140	ok	13	<30	ok

CAM criteria allows 15% of analytes to exceed criteria.

Surrogates:	Recovery (%)	Acceptance Limits	Verdict	Recovery (%)	Acceptance Limits	Verdict	Relative % Diff.	Limits	Verdict
2-FLUOROPHENOL	62.5	30-130	ok	58.1	30-130	ok	7.2	<30	ok
PHENOL-D6	63.7	30-130	ok	58.8	30-130	ok	8.1	<30	ok
NITROBENZENE-D5	62.2	30-130	ok	59.5	30-130	ok	4.4	<30	ok
2-FLUOROBIPHENYL	66.8	30-130	ok	63.1	30-130	ok	5.7	<30	ok
2,4,6-TRIBROMOPHENOL	104	30-130	ok	95.7	30-130	ok	8.4	<30	ok
p-TERPHENYL-D14	103.5	30-130	ok	94.7	30-130	ok	8.9	<30	ok

W.O. # 1107-00037
(for lab use only)

[illegible]

ATTACHMENT 6

DILUTION FACTOR CALCULATIONS

DILUTION FACTOR CALCULATIONS
NOTICE OF INTENT FOR THE REMEDIATION GENERAL PERMIT
Old Quincy Residence Hall, Plympton Street, Cambridge, Massachusetts

$$DF = \frac{Q_d + Q_s}{Q_d}$$

Where,

DF = Dilution Factor

Q_d = Maximum Flow Rate of the Discharge in cubic feet per second (cfs) (1.0 gpm = 0.00223 cfs)

Q_s = Receiving Water 7Q10 Flow (cfs) where,

7Q10 = Minimum Flow (cfs) for 7 Consecutive Days with a Recurrence Interval of 10 Years.

Q_d = 100 gpm = 0.223 cfs

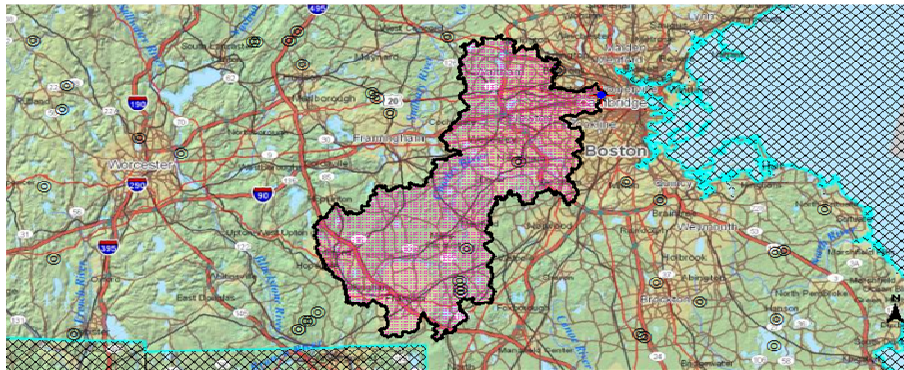
Q_s = 24.6 cfs (M7D10Y on attached USGS Streamstats Ungaged Site Report)

$$\therefore DF = \frac{Q_d + Q_s}{Q_d} = \frac{0.223 + 24.6}{0.223} = 111.3$$



Massachusetts StreamStats

StreamStats Print Page



10 5 0 10 Miles

6/1/2012 8:14:27 AM

Explanation

- ◆ NHDHGage
- ◆ NHDHDam
- ▲ Gaging Station, Continuous Record
- ▲ Low Flow, Partial Record
- ▲ Peak Flow, Partial Record
- ▲ Peak and Low Flow, Partial Record
- ▲ Stage Only
- ▲ Low Flow, Partial Record, Stage
- ▲ Miscellaneous Record
- ▲ Unknown
- ★ GlobalWatershedPoint
- Dendritic Stream Network
- ▭ GlobalWatershed
- ⊗ Excludepoly



Streamstats Ungaged Site Report

Date: Fri Jun 1 2012 08:12:29 Mountain Daylight Time

Site Location: Massachusetts

NAD27 Latitude: 42.3683 (42 22 06)

NAD27 Longitude: -71.1186 (-71 07 07)

NAD83 Latitude: 42.3684 (42 22 06)

NAD83 Longitude: -71.1181 (-71 07 05)

ReachCode: 01090001000111

Measure: 37.77

Drainage Area: 282 mi²

Low Flows Basin Characteristics			
100% Statewide Low Flow (282 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	282 (above max value 149)	1.61	149
Mean Basin Slope from 250K DEM (percent)	2.33	0.32	24.6
Stratified Drift per Stream Length (square mile per mile)	0.23	0	1.29
Massachusetts Region (dimensionless)	0	0	1

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Probability of Perennial Flow Basin Characteristics			
100% Perennial Flow Probability (282 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	282 (above max value 1.99)	0.01	1.99
Percent Underlain By Sand And Gravel (percent)	47.63	0	100
Percent Forest (percent)	42.20	0	100
Massachusetts Region (dimensionless)	0	0	1

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

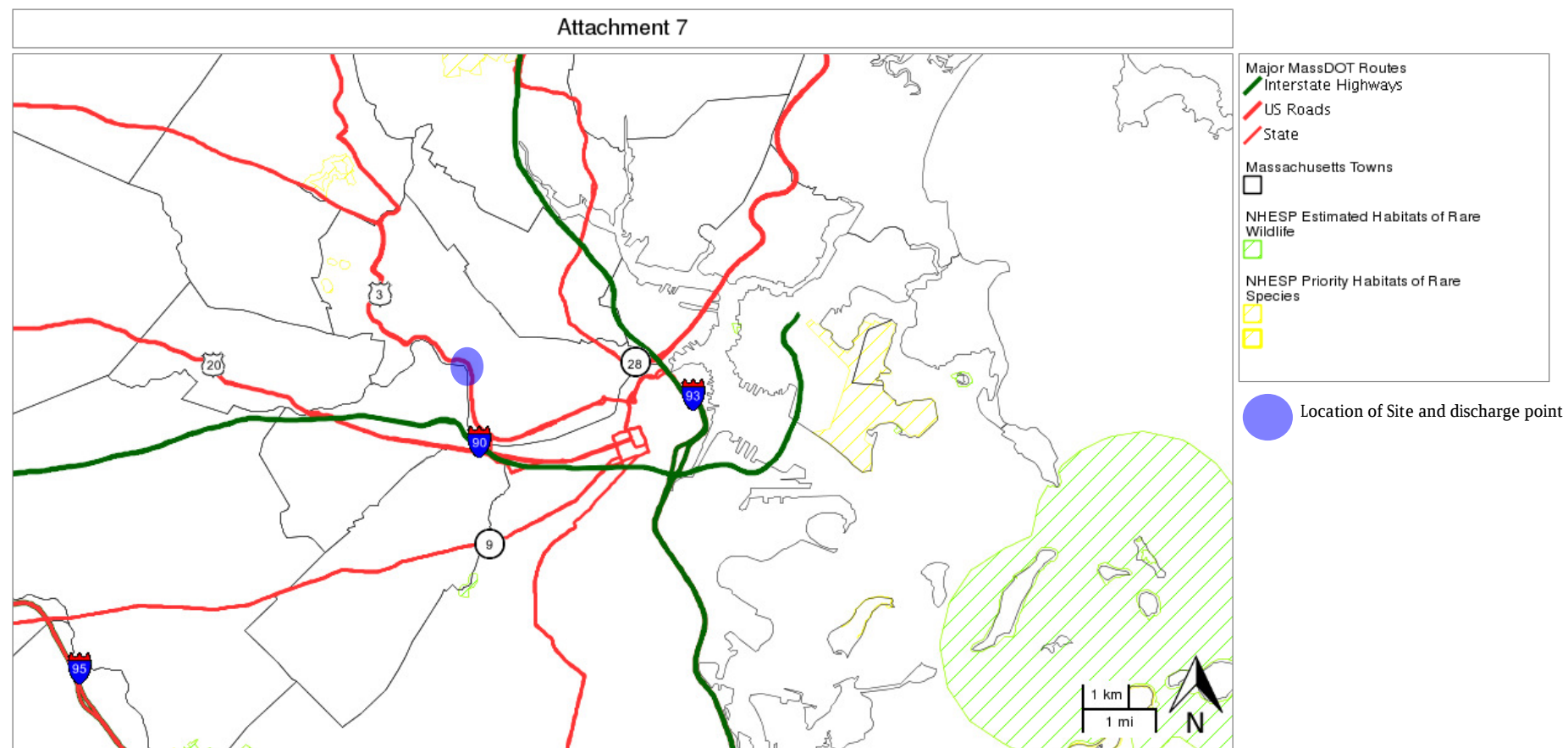
Low Flows Streamflow Statistics					
Statistic	Flow (ft ³ /s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
D50	301				
D60	249				
D70	171				
D75	140				
D80	109				
D85	87.7				
D90	68.3				
D95	46.1				
D98	30.8				
D99	25.6				
M7D2Y	49.4				
AUGD50	94				
M7D10Y	24.6				

The equation for estimating the probability of perennial flow is applicable for most areas of Massachusetts except eastern Buzzards Bay, Cape Cod, and the Island regions. The estimate obtained from the equation assumes natural flow conditions at the site. The equation also is best used for sites with drainage areas between 0.01 to 1.99 mi², as errors beyond for basins beyond these bounds are unknown.

Probability of Perennial Flow Statistics		
Statistic	Value	Standard Error (percent)
PROBPEREN	1	

ATTACHMENT 7

NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM MAP



**Endangered Species and Habitat of Rare Species
Delineation
RGP Permit Application for Old Quincy Residence
Hall Renovation Project
Cambridge, Massachusetts**

Prepared for: Harvard University
by GZA Geoenvironmental, Inc.
Prepared by: AG
Reviewed by: MMS
Date: June 1, 2012

Source: Mass GIS

ATTACHMENT 8
OPERATOR CERTIFICATION



THE COMMONWEALTH OF MASSACHUSETTS
BOARD OF CERTIFICATION
OF OPERATORS OF
WASTEWATER TREATMENT FACILITIES
BE IT KNOWN THAT

Jason Mello

HAS SATISFIED THE BOARD'S QUALIFICATIONS
AS REQUIRED AND IS HEREBY AUTHORIZED TO USE THE TITLE

CERTIFIED OPERATOR GRADE 2-I

AS PROVIDED IN SECTION 66A OF CHAPTER 13 OF THE GENERAL LAWS
ISSUED AND ATTESTED BY SEAL OF THE BOARD OF CERTIFICATION
OF OPERATORS OF WASTEWATER TREATMENT FACILITIES

THIS 30th DAY OF April, 2011

CERTIFICATE NO. 15915

[Signature]
CHAIRMAN
[Signature]
SECRETARY