



Engineering • Construction • Operations

Environmental
Infrastructure
Buildings & Facilities

November 3, 2009

Mr. Victor Alvarez
United States Environmental Protection Agency, Region 1
RPG - NOI Processing
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Subject: **MWRTA Maintenance Garage**
Notice of Intent for Remediation General Permit
37 Waverley Street, Framingham, Massachusetts

Dear Mr. Alvarez:

Watermark Environmental Services, Inc. (Watermark) is pleased to provide supporting documentation for this Notice of Intent (NOI) for Remediation General Permit (RGP) on behalf of Mr. Thomas Battell (Site Owner). This site is currently operated by the MetroWest Regional Transit Authority (MWRTA) as a bus depot and maintenance garage. Site soil and groundwater have been impacted by a historic release of gasoline. This NOI is submitted in order to obtain a permit for the operation of a groundwater recovery and treatment system (GWTS) to be located at 37 Waverley Street, Framingham, Massachusetts (the Site). The GWTS may need to be operated at the Site in order to allow for the removal of petroleum-impacted soil, and collection of soil samples. It may also need to be operated during construction activities associated with installing an oil/water separator at the Site. The removal of contaminated soil will be conducted as a Release Abatement Measure (RAM) under the oversight of a Licensed Site Professional (LSP). A Release Notification Form (RNF) was submitted on November 2, 2009; hence the assignment of a Release Tracking Number (RTN) is pending. A Site Locus is provided as Figure 1. A copy of the NOI form is provided as Attachment 1.

System Design

The groundwater treatment system to be located on the Site will consist of the following components. One or more submersible pumps will collect groundwater from the excavation area. Recovered groundwater will be pumped to a fractionation/weir tank and subsequently through two bag filter units, an iron removal system (if warranted), and two liquid phase granular activated carbon units (plumbed in series) prior to discharge to the Town of Framingham storm water line located in Waverley Street. The storm water line outfalls in Beaver Dam Brook, south of the Site.

A Site Plan showing the location of the groundwater treatment system, the catch basin for the storm water line, and the planned excavation area is provided as Figure 2. A Process and Instrumentation Diagram of the groundwater treatment system is provided as Drawing D-101. The outfall location of the storm water line and surface water bodies adjacent to the outfall location are indicated on the Site Locus, Figure 1.



The estimated average flow rate of treated groundwater from the system to the storm water line is expected to be approximately 25 gallons per minute (gpm). The selected design capacity of the groundwater treatment system is set conservatively higher than the average flow rate at 35 gpm .

Influent Sample Analysis

A groundwater sample was collected at monitoring well MW-1R, located in the area of planned excavation, on October 1, 2009. The sample was submitted to the analytical laboratory, Groundwater Analytical, Inc. of Buzzards Bay, Massachusetts under standard chain of custody protocol for the following analyses:

- VOC via Method 8260B
- EDB via Method 504
- PCBs via Method 608
- SVOCs (low level) via Method 8270 modified
- TPH (GC/FID) via Method 1664
- ICP Analysis for As, Pb, Se, Sb, Cd, Cr, Cu, Fe, Ni, Zn, and Ag via Method 200.7/200.8
- Cold Vapor AA for Mercury via Method 245.1
- Hexavalent Chromium via Method 218.6
- Total Suspended Solids (TSS) via Method 160.2
- Total Residual Chlorine via Method 330.5
- Total Cyanide via Method 335.4

A copy of the laboratory report and chain of custody record is provided as Attachment 2.

Comparison of the concentrations of the detected compounds to the Appendix III of the USEPA's Final Remediation General Permit Under the National Pollutant Discharge Elimination System (NPDES) for Discharges in Massachusetts effluent limitations (<http://www.epa.gov/region1/npdes/remediation/Appendix-III.pdf>, accessed October 28, 2009) indicates that concentrations of benzene, TSS, BTEX, naphthalene, and iron are above the effluent limitations. These compounds will be targeted for removal by the on-site treatment system, and effluent samples will be analyzed for these compounds. Note that although the chlorinated VOCs cis-1,2-dichloroethylene and vinyl chloride were not detected in the sample collected from well MW-1R, they are listed as "believed present" on the NOI Form. These two compounds have been detected in a well on the south western corner of the property at concentrations of 1.1 ug/L and 0.8 ug/L (estimated) respectively. These VOCs are likely associated with a former dry cleaner to the west of the Site. The RAM is not anticipated to be near this well. Construction activities may occur near this well, however, due to the low concentrations, the proposed system will need no modifications to accommodate these compounds.

Receiving Waters Information The receiving water for the treated groundwater discharge is Beaver Dam Brook located approximately 325 feet south of the Site. Beaver Dam Brook flows in an easterly direction and drains into Fisk Pond approximately 1.5 miles east of the Site.

Watermark consulted the online United States Geological Survey (USGS) StreamStats program to determine the 7Q10 flow rate at the discharge location (<http://ma.water.usgs.gov>, accessed October 28, 2009). Data obtained from the online resource indicated that the calculated 7Q10 flow rate for this basin is



0.34 cubic feet per second (cfs). A copy of the StreamStats map and ungauged site report is provided as Attachment 3.

Based upon an estimated maximum flow rate of the discharge from the groundwater treatment system of 35 gpm, the dilution factor was calculated as:

Equation 1: $DF = (Q_d + Q_s)/Q_d$

Where: DF = DilutionFactor
 Q_d = Maximum flow rate of the discharge in cfs
 Q_s = Receiving water 7Q10 flow (cfs), where, 7Q10 = The minimum flow (cfs) for 7 consecutive days with a recurrence interval of 10 years

$$Q_d = 35 \text{ gpm} \times 0.00223 \text{ cfs/gpm} = 0.07805 \text{ cfs}$$

$$DF = (0.07805 + 0.34)/(0.07805)$$

$$DF = 5.35$$

The concentrations of arsenic and iron reported present in the untreated sample (43 and 70,000 micrograms per liter ($\mu\text{g/L}$), respectively) were compared to the column corresponding to a dilution factor of 5.35 (between 5 and 10) in Appendix IV. The discharge limits listed in Appendix IV are 50 $\mu\text{g/L}$ for arsenic and 5,000 $\mu\text{g/L}$ for iron. Therefore iron will be subject to effluent monitoring requirements. As a conservative measure, arsenic will also be monitored since the concentration is close to the Appendix IV value.

Receiving Water Classification

Watermark consulted the Massachusetts Department of Environmental Protection (MassDEP) Division of Water Pollution Control (<http://www.mass.gov/dep/water/laws/tblfig.pdf>) to determine the classification for the receiving waters. Beaver Dam Brook is not listed in 314 CMR 4.00, which outlines the classification of all Massachusetts surface waters. However, Beaver Dam Brook is a tributary to Lake Cochituate Watershed, which in turn is a tributary to the Sudbury River Watershed. Lake Cochituate empties into the Sudbury River just upstream of Saxonville Pond. This portion of the Sudbury River (Fruit Street Bridge to Saxonville Pond mile point 29.1 to 16.2) is classified as a Class B waterway due to warm water and a high quality of water. Therefore, in Watermark's opinion Beaver Dam Brook is a Class B waterway.

Beaver Dam brook empties into Fisk Pond. The Fisk Pond Watershed is classified as a Category 4c watershed. Category 4c watersheds are waters negatively affected by "pollution" such as low flow, habitat alterations, or non-native species infestations that do not require monitoring of total maximum daily loads (TMDLs).

Evaluation of Threatened or Endangered Species or Critical Habitat Located within Receiving Waters

According to Massachusetts Geographic Information Systems (MassGIS) online maps for the Natural Heritage Endangered Species Program (NHESP) (accessed on October 28, 2009), there are no Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife Areas located within a 1/2-mile radius of the proposed discharge area. A copy of the NHESP Map is provided as Attachment 4.

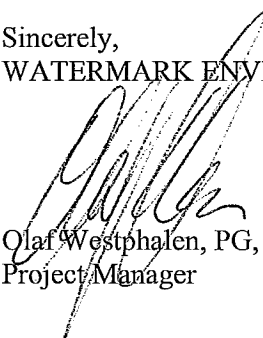


Review of National Register of Historic Places

A listing of all Historic Places within the vicinity of the site was obtained from the online database at www.nr.nps.gov/nrloc1.htm (accessed October 28, 2009). A list of the surrounding historic places is included as Attachment 5. No historic places were located within 0.5 miles of the discharge location.

Copies of this letter and supporting documentation have been forwarded to Mr. Robert Kubit at the Central Regional Office of the MassDEP and to Mr. Julian M. Suso, Town Manger of Framingham, MA. Should you have any questions or concerns regarding the contents of this letter or the NOI for the RGP, please do not hesitate to contact either of the undersigned at (978) 452-9696.

Sincerely,
WATERMARK ENVIRONMENTAL, INC.



Olaf Westphalen, PG, LSP
Project Manager



Evan Barman, PE
Project Engineer

Enclosure: Figure 1 – Site Map
Figure 2 – Map of Strom Drain System
Drawing D-101 – Construction Water Treatment System
Attachment 1 – NOI Form
Attachment 2 – Laboratory Report Package
Attachment 3 – StreamStats Map
Attachment 4 – DEP Priority Resource Map
Attachment 5 – List of Historic Registered Places

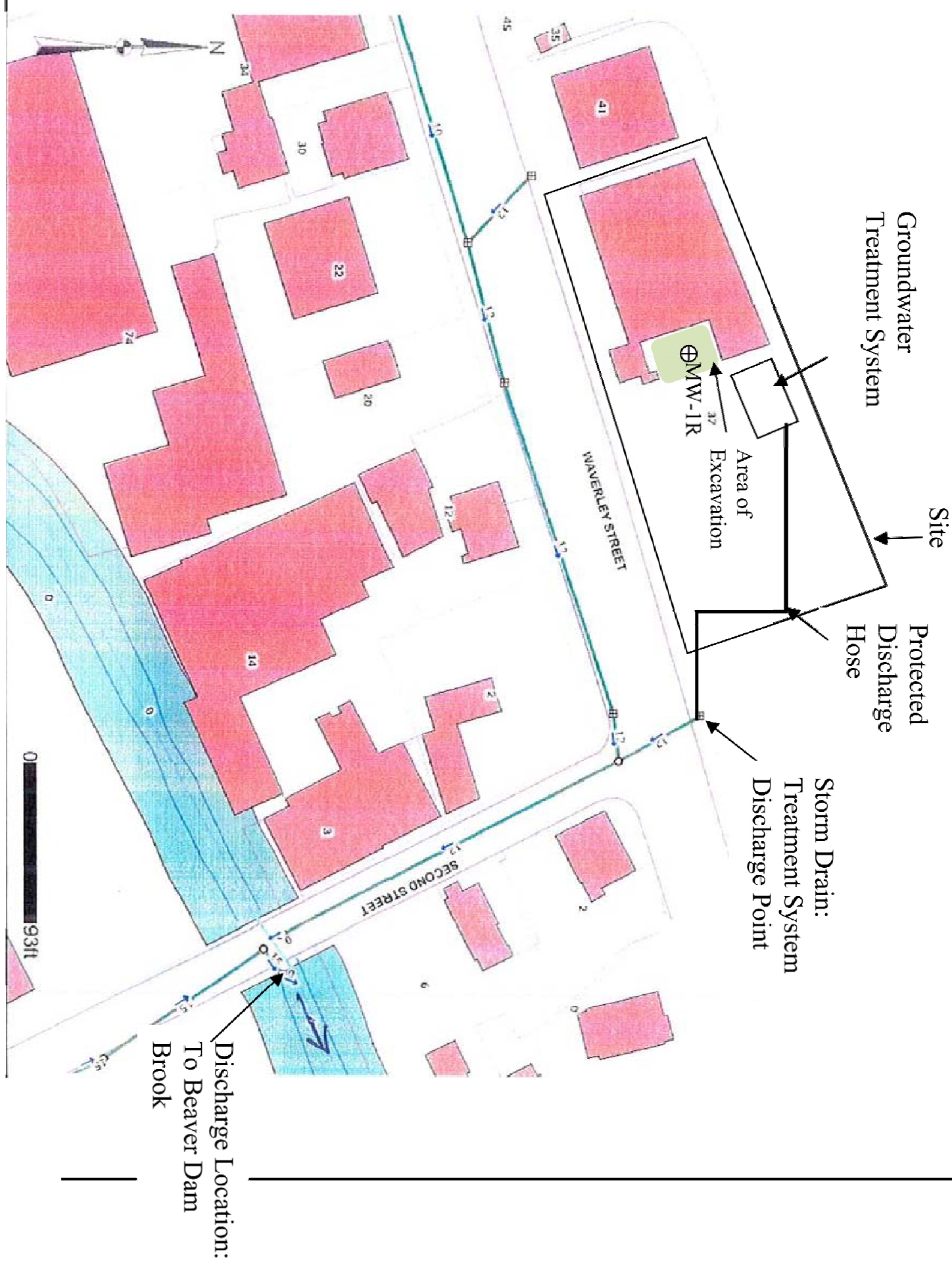
cc: File 09062/WLC0408
Robert Kubit (MassDEP, CERO)
Julian Suso (Town of Framingham)
Thomas Battell

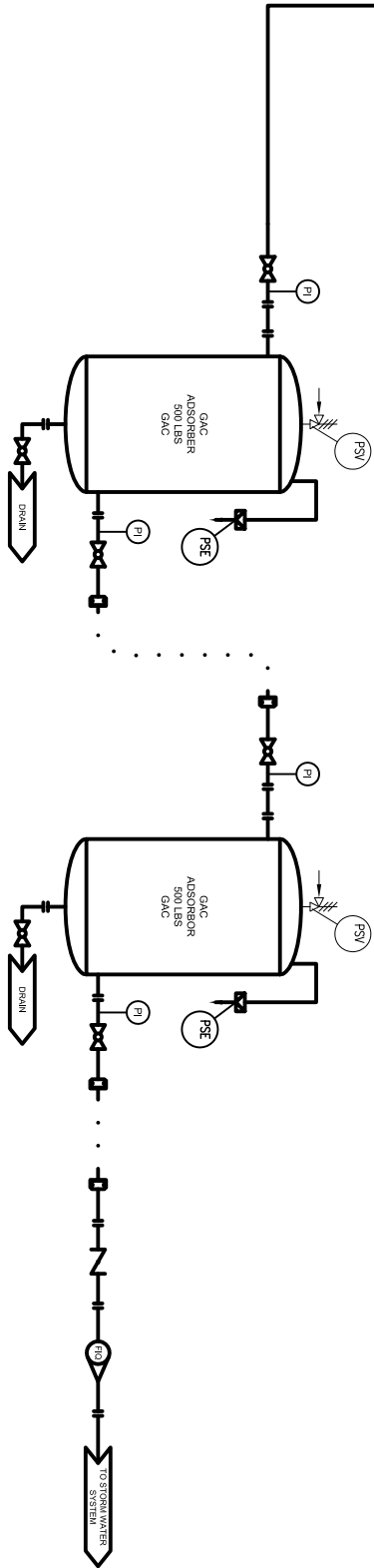
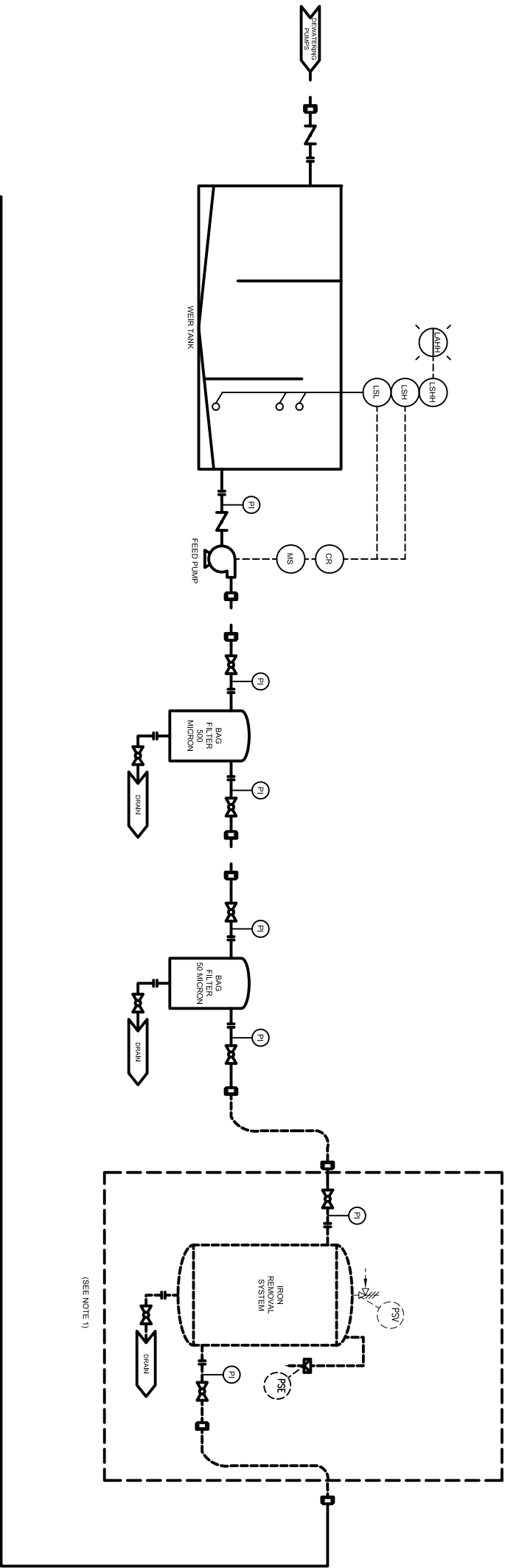
Figures



SITE LOCATION MAP			
WATERMARK ENVIRONMENTAL, INC 175 Cabot Street, Lowell, MA 01854, (978) 452-9696			FIGURE 1
M=-15.61 G=-1.57	37 Waverley Street, Framingham, MA	SCALE: 1:25,000	
	MWRTA Maintenance Garage	DATE: November 2009	

37 Waverley Street Drainage to Beaver Dam Brook





- NOTES:
1. THE IRON REMOVAL SYSTEM WILL BE USED IF NEEDED. THE IRON REMOVAL SYSTEM MAY CONSIST OF AN IRON FILTER, CHEMICAL TREATMENT OR SIMILAR. AN UPDATED DRAWING WILL BE SUBMITTED ONCE THE FINAL IRON REMOVAL SYSTEM IS DETERMINED, IF REQUIRED.
- LEGEND
- PI PRESSURE INDICATOR
 - LAHH LEVEL ALARM HIGH-HIGH
 - LSHH LEVEL SWITCH HIGH-HIGH
 - LSH LEVEL SWITCH HIGH
 - LSL LEVEL SWITCH LOW
 - CR CONTROL RELAY
 - MS MOTOR STARTER
 - PSV PRESSURE SAFETY VALVE (VACUUM BREAKER)
 - PSE PRESSURE SAFETY ELEMENT
 - FIQ FLOW INDICATOR TOTALIZER
 - GAC GRANULAR ACTIVATED CARBON



Watermark

175 Cabot Street • Lowell, MA 01854
Phone: 978.452.9696 • Fax: 978.453.9988

PREPARED FOR: THOMAS BATTELL

MWRTA MAINTENANCE GARAGE

FRAMINGHAM, MA

PROJECT NO: 09062-00

SCALE: NOT TO SCALE

CONSTRUCTION

WATER TREATMENT SYSTEM

D-101

SHEET 1 of 1

Attachment 1

NOI Form

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

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

a) Name of facility/site :		Facility/site address:	
Location of facility/site : longitude:_____ latitude:_____	Facility SIC code(s):4131	Street:	
b) Name of facility/site owner :		Town:	
Email address of owner: tabattell@aol.com		State:	Zip:
Telephone no.of facility/site owner : (774) 248-5705			
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 "yes" or "no" for the following: 1. Has a prior NPDES permit exclusion been granted for the discharge? Yes___ No___, if "yes," number: 2. Has a prior NPDES application (Form 1 & 2C) ever been filed for the discharge? Yes___ No___, if "yes," date and tracking #: 3. Is the discharge a "new discharge" as defined by 40 CFR 122.2? Yes___ No___ 4. For sites in Massachusetts, is the discharge covered under the MA Contingency Plan (MCP) and exempt from state permitting? Yes__ No__			

e) Is site/facility subject to any State permitting or other action which is causing the generation of discharge? Yes___ No___ If “yes,” 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 storm water general permit? Y___ N___, if Y, number: 2. phase I or II construction storm water general permit? Y___ N___, if Y, number: 3. individual NPDES permit? Y___ N___, if Y, number: 4. any other water quality related permit? Y___ N___, if Y, number:
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2. Discharge information. Please provide information about the discharge, (attaching additional sheets as needed) including:

a) Describe the discharge activities for which the owner/applicant is seeking coverage:			
b) Provide the following information about each discharge:	<table border="1"> <tr> <td style="vertical-align: top;">1) Number of discharge points:</td> <td> 2) What is the maximum and average flow rate of discharge (in cubic feet per second, ft³/s)? Max. flow_____ Average flow_____ Is maximum flow a design value? Y___ N___ For average flow, include the units and appropriate notation if this value is a design value or estimate if not available. </td> </tr> </table>	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_____ Average flow_____ Is maximum flow a design value ? Y___ N___ For average flow, include the units and appropriate notation if this value is a design value or estimate if not available.
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_____ Average flow_____ Is maximum flow a design value ? Y___ N___ For average flow, include the units and appropriate notation if this value is a design value or estimate if not available.		
3) Latitude and longitude of each discharge within 100 feet: pt.1:long._____ lat._____; pt.2: long._____ lat._____; pt.3: long._____ lat._____; pt.4:long._____ lat._____; pt.5: long._____ lat._____; pt.6:long._____ lat._____; pt.7: long._____ lat._____; pt.8:long._____ lat._____; etc.			
4) If hydrostatic testing, total volume of the discharge (gals):	5) Is the discharge intermittent_____or seasonal_____? Is discharge ongoing Yes _____ No _____?		
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).			

3. Contaminant information. In order to complete this section, the applicant will need to take a minimum of one sample of the untreated water and have it analyzed for **all** of the parameters listed in Appendix III. Historical data, (i.e., data taken no more than 2 years prior to the effective date of the permit) may be used if obtained pursuant to: i. Massachusetts' regulations 310 CMR 40.0000, the Massachusetts Contingency Plan ("Chapter 21E"); ii. New Hampshire's Title 50 RSA 485-A: Water Pollution and Waste Disposal or Title 50 RSA 485-C: Groundwater Protection Act; or iii. an EPA permit exclusion letter issued pursuant to 40 CFR 122.3, provided the data was analyzed with test methods that meet the requirements of this permit. Otherwise, a new sample shall be taken and analyzed.

a) Based on the analysis of the sample(s) of the untreated influent, the applicant must check the box of the sub-categories that the potential discharge falls within.

Gasoline Only	VOC Only	Primarily Metals	Urban Fill Sites	Contaminated Sumps	Mixed Contaminants	Aquifer Testing
Fuel Oils (and Other Oils) only	VOC with Other Contaminants	Petroleum with Other Contaminants	Listed Contaminated Sites	Contaminated Dredge Condensates	Hydrostatic Testing of Pipelines/Tanks	Well Development or Rehabilitation

b) Based on the analysis of the untreated influent, the applicant must indicate whether each listed chemical is **believed present** or **believed absent** in the potential discharge. Attach additional sheets as needed.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
1. Total Suspended Solids										
2. Total Residual Chlorine										
3. Total Petroleum Hydrocarbons										
4. Cyanide										
5. Benzene										
6. Toluene										
7. Ethylbenzene										
8. (m,p,o) Xylenes										
9. Total BTEX ⁴										

⁴BTEX = Sum of Benzene, Toluene, Ethylbenzene, total Xylenes.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
10. Ethylene Dibromide ⁵ (1,2- Dibromo-methane)										
11. Methyl-tert-Butyl Ether (MtBE)										
12. tert-Butyl Alcohol (TBA)										
13. tert-Amyl Methyl Ether (TAME)										
14. Naphthalene										
15. Carbon Tetra-chloride										
16. 1,4 Dichlorobenzene										
17. 1,2 Dichlorobenzene										
18. 1,3 Dichlorobenzene										
19. 1,1 Dichloroethane										
20. 1,2 Dichloroethane										
21. 1,1 Dichloroethylene										
22. cis-1,2 Dichloro-ethylene										
23. Dichloromethane (Methylene Chloride)										
24. Tetrachloroethylene										

⁵EDB is a groundwater contaminant at fuel spill and pesticide application sites in New England.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily Value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
25. 1,1,1 Trichloroethane										
26. 1,1,2 Trichloroethane										
27. Trichloroethylene										
28. Vinyl Chloride										
29. Acetone										
30. 1,4 Dioxane										
31. Total Phenols										
32. Pentachlorophenol										
33. Total Phthalates ⁶ (Phthalate esthers)										
34. Bis (2-Ethylhexyl) Phthalate [Di-(ethylhexyl) Phthalate]										
35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)										
a. Benzo(a) Anthracene										
b. Benzo(a) Pyrene										
c. Benzo(b)Fluoranthene										
d. Benzo(k) Fluoranthene										
e. Chrysene										

⁶The sum of individual phthalate compounds.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min- imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
f. Dibenzo(a,h) anthracene										
g. Indeno(1,2,3-cd) Pyrene										
36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)										
h. Acenaphthene										
i. Acenaphthylene										
j. Anthracene										
k. Benzo(ghi) Perylene										
l. Fluoranthene										
m. Fluorene										
n. Naphthalene-										
o. Phenanthrene										
p. Pyrene										
37. Total Polychlorinated Biphenyls (PCBs)										
38. Antimony										
39. Arsenic										
40. Cadmium										
41. Chromium III										
42. Chromium VI										

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min- imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
43. Copper										
44. Lead										
45. Mercury										
46. Nickel										
47. Selenium										
48. Silver										
49. Zinc										
50. Iron										
Other (describe):										

c) For discharges where **metals** are believed present, please fill out the following:

<i>Step 1:</i> Do any of the metals in the influent have a reasonable potential to exceed the effluent limits in Appendix III (i.e., the limits set at zero to five dilutions)? Y____ N____	If yes, which metals?
<i>Step 2:</i> For any metals which have reasonable potential to 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? Metals: _____ DF: _____	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 “Yes,” 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	Dechlorination	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 _____ Maximum flow rate of treatment system _____ Design flow rate of treatment system _____						
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 _____	Within facility__	Storm drain_____	River/brook_____	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: 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? Yes _____ No _____ If yes, for which pollutant(s)? Is there a TMDL? Yes _____ No _____ If yes, for which pollutant(s)?						

6. Receipt of Consultation with Federal Services: Please provide the following information according to requirements of Part I.B.4 and Appendices II and VII.

- a) Are any listed threatened or endangered species, or designated critical habitat, in proximity to the discharge? Yes ☒ No ☐
 Has any consultation with the federal services been completed? Yes ☐ No ☒ or is consultation underway? Yes ☒ No ☐
 What were the results of the consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service (check one):
 a "no jeopardy" opinion? ☐ or written concurrence ☐ on a finding that the discharges are not likely to adversely affect any endangered species or critical habitat?
 b) Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility or site or in proximity to the discharge?
 Yes ☐ No ☒ Have any state or tribal historic preservation officer been consulted in this determination (Massachusetts only)? Yes ☐ No ☒

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:

NAWRTA Maintenance Garage

Operator signature:

Thomas A. DeWitt

Title:

Owner

Date:

11/3/09

Remediation General Permit - Notice of Intent

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Attachment 2

Laboratory Report Package

October 9, 2009

Mr. Olaf Westphalen
Watermark Environmental, Inc.
175 Cabot Street
Lowell, MA 01854

LABORATORY REPORT

Project: **37 Waverly/09062-00**
Lab ID: **128470**
Received: **10-01-09**

Dear Olaf:

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

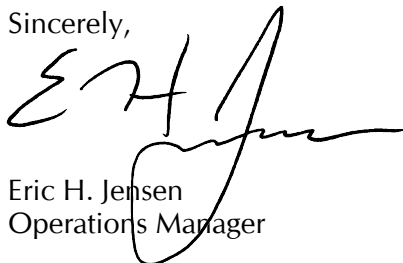
This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of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

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

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

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

Sincerely,



Eric H. Jensen
Operations Manager

EHJ/kh
Enclosures

Sample Receipt Report

Project: **37 Waverly/09062-00**
 Client: **Watermark Environmental, Inc.**
 Lab ID: **128470**

Delivery: **GWA Courier**
 Airbill: **n/a**
 Lab Receipt: **10-01-09**

Temperature: **4.3°C**
 Chain of Custody: **Present**
 Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-1	MW-1R		Aqueous	10/1/09 14:50	EPA 8260B Volatile Organics with Oxygenates			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1239254	40 mL VOA Vial	Proline	BX34662	HCL	R-5885B	09-18-09	n/a	
C1239253	40 mL VOA Vial	Proline	BX34662	HCL	R-5885B	09-18-09	n/a	
C1239252	40 mL VOA Vial	Proline	BX34662	HCL	R-5885B	09-18-09	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-2	MW-1R		Aqueous	10/1/09 14:50	EPA 504.1 EDB			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1171099	40 mL VOA Vial	Proline	BX33782	None	n/a	n/a	n/a	
C1171080	40 mL VOA Vial	Proline	BX33782	None	n/a	n/a	n/a	
C1171075	40 mL VOA Vial	Proline	BX33782	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-3	MW-1R		Aqueous	10/1/09 14:50	EPA 9012A Total Cyanide			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1185537	500 mL Plastic	Proline	BX33920	NaOH	R-5945B	09-25-09	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-4	MW-1R		Aqueous	10/1/09 14:50	EPA 8270C Semivolatile Organics (Low Level)			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1240028	1 L Amber Glass	Proline	BX34777	None	n/a	n/a	n/a	
C1240025	1 L Amber Glass	Proline	BX34777	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-5	MW-1R		Aqueous	10/1/09 14:50	EPA 608 PCBs			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1240034	1 L Amber Glass	Proline	BX34777	None	n/a	n/a	n/a	
C1240031	1 L Amber Glass	Proline	BX34777	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-6	MW-1R		Aqueous	10/1/09 14:50	EPA 1664 Hexane Extractable Material			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1190109	1 L Amber Glass	Scientific Products	BX33057	H2SO4	R-5914A	09-16-09	n/a	
C1190107	1 L Amber Glass	Scientific Products	BX33057	H2SO4	R-5914A	09-16-09	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-7	MW-1R		Aqueous	10/1/09 14:50	SM 4500-Cl G Total Residual Chlorine EPA 7196A Hexavalent Chromium SM 2540 D Total Suspended Solids			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1239630	1 L Plastic	Proline	BX34674	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
128470-8	MW-1R		Aqueous	10/1/09 14:50	EPA 200.7 Ag Cd Cr Cu Fe Ni Se Zn Total EPA 200.8 As Pb Sb Total EPA 245.1 Hg Total			
Con ID	Container	Vendor	QC Lot	Preserv	QC Lot	Prep	Ship	
C1170275	250 mL Plastic	Proline	BX33982	HNO3	R-5913A	09-04-09	n/a	

EPA Method 8260B Volatile Organics by GC/MS

Field ID: **MW-1R**
Project: **37 Waverly/09062-00**
Client: **Watermark Environmental, Inc.**

Laboratory ID: **128470-1**
Sampled: **10-01-09 14:50**
Received: **10-01-09 17:50**
Analyzed: **10-05-09 12:54**
Analyst: **LMG**

Matrix: **Aqueous**
Container: **40 mL VOA Vial**
Preservation: **HCl/ Cool**

QC Batch ID: **VM5-4041-W**
Instrument ID: **MS-5 HP 6890**
Sample Volume: **25 mL**
Dilution Factor: **5**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-01-4	Vinyl Chloride	BRL		ug/L	3
75-35-4	1,1-Dichloroethene	BRL		ug/L	3
67-64-1	Acetone	BRL		ug/L	50
75-09-2	Methylene Chloride	BRL		ug/L	13
1634-04-4	Methyl <i>tert</i> -butyl Ether (MTBE)	13		ug/L	3
75-34-3	1,1-Dichloroethane	BRL		ug/L	3
156-59-2	<i>cis</i> -1,2-Dichloroethene	BRL		ug/L	3
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	3
56-23-5	Carbon Tetrachloride	BRL		ug/L	3
71-43-2	Benzene	70		ug/L	3
107-06-2	1,2-Dichloroethane	BRL		ug/L	3
79-01-6	Trichloroethene	BRL		ug/L	3
123-91-1	1,4-Dioxane	BRL		ug/L	2,500
108-88-3	Toluene	3		ug/L	3
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	3
127-18-4	Tetrachloroethene	BRL		ug/L	3
100-41-4	Ethylbenzene	100		ug/L	3
108-38-3/106-42-3	<i>meta</i> -Xylene and <i>para</i> -Xylene	92		ug/L	3
95-47-6	<i>ortho</i> -Xylene	BRL		ug/L	3
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	3
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	3
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	3
75-65-0	<i>tert</i> -Butyl Alcohol (TBA)	BRL		ug/L	100
994-05-8	<i>tert</i> -Amyl Methyl Ether (TAME)	BRL		ug/L	3

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	9	95 %	70 - 130 %
1,2-Dichloroethane-d ₄	10	9	89 %	70 - 130 %
Toluene-d ₈	10	11	108 %	70 - 130 %
4-Bromofluorobenzene	10	10	101 %	70 - 130 %

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

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

**EPA Method 504.1
EDB and DBCP by GC/ECD**

Field ID:	MW-1R	Matrix:	Aqueous
Project:	37 Waverly/09062-00	Container:	40 mL VOA Vial
Client:	Watermark Environmental, Inc.	Preservation:	Cool
Laboratory ID:	128470-02	QC Batch ID:	PV-0971-E
Sampled:	10-01-09 14:50	Instrument ID:	GC-6 HP 5890
Received:	10-01-09 17:50	Sample Volume:	36 mL
Extracted:	10-07-09 17:00	Final Volume:	2 mL
Analyzed:	10-07-09 23:04	Dilution Factor:	1
Analyst:	AWG		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.01

Method Reference: Methods for the Determination of Organic Compounds in Drinking Water, Supplement III, US EPA, EPA-600/R-95/131 (1995). Method Revision 1.1.

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

Inorganic Chemistry

Field ID: **MW-1R**
 Project: **37 Waverly/09062-00**
 Client: **Watermark Environmental, Inc.**

Matrix: **Aqueous**
 Received: **10-01-09 17:50**

Lab ID: **128470-03** Sampled: **10-01-09 14:50** Container: **500 mL Plastic** Preservation: **NaOH/Cool**

Analyte	Result	Units	RL	DF	Volume	Analyzed	QC Batch	Method	Inst	Analyst
Cyanide, Total	BRL	mg/L	0.01	1	50 mL	10-08-09 12:12	TCN-1523-W	EPA 9012A	1	JR

Lab ID: **128470-06** Sampled: **10-01-09 14:50** Container: **1 L Amber Glass** Preservation: **H2SO4/Cool**

Analyte	Result	Units	RL	DF	Volume	Analyzed	QC Batch	Method	Inst	Analyst
Total Petroleum Hydrocarbons	BRL	mg/L	5	1	980 mL	10-03-09 08:00	HO-0476-W	EPA 1664	3	JR

Lab ID: **128470-07** Sampled: **10-01-09 14:50** Container: **1 L Plastic** Preservation: **Cool**

Analyte	Result	Units	RL	DF	Volume	Analyzed	QC Batch	Method	Inst	Analyst
Solids, Total Suspended	320	mg/L	5	3	200 mL	10-02-09 08:55	TSS-1683-W	SM 2540 D	3	JR
Chlorine, Total Residual	BRL	mg/L	0.02	1	5 mL	10-01-09 08:00	TRC-0811-W	SM 4500-Cl G	2	DEB
Chromium, Hexavalent	BRL	mg/L	0.01	1	5 mL	10-02-09 10:00	HC-0168-W	EPA 7196A	2	JK

Method Reference: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

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

RL Reporting Limit.

DF Dilution Factor.

1 Instrument ID: Lachat 8000 Autoanalyzer

2 Instrument ID: Thermo Electron Genesys 20

3 Instrument ID: Mettler AT 200 Balance

**EPA Method 8270C
Semivolatile Organics by GC/MS (Part 1)**

Field ID: **MW-1R**
 Project: **37 Waverly/09062-00**
 Client: **Watermark Environmental, Inc.**
 Laboratory ID: **128470-04**
 Sampled: **10-01-09 14:50**
 Received: **10-01-09 17:50**
 Extracted: **10-02-09 13:30**
 Analyzed: **10-05-09 16:02**
 Analyst: **MJB**

Matrix: **Aqueous**
 Container: **1 L Amber Glass**
 Preservation: **Cool**
 QC Batch ID: **SV-2429-F**
 Instrument ID: **MS-3 HP 5890**
 Sample Volume: **850 mL**
 Final Volume: **1 mL**
 Dilution Factor: **1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
108-95-2	Phenol	BRL		ug/L	6
95-57-8	2-Chlorophenol	BRL		ug/L	6
95-48-7	2-Methylphenol	BRL		ug/L	6
108-39-4/106-44-5	3 and 4-Methylphenol *	BRL		ug/L	6
88-75-5	2-Nitrophenol	BRL		ug/L	6
105-67-9	2,4-Dimethylphenol	BRL		ug/L	6
120-83-2	2,4-Dichlorophenol	BRL		ug/L	6
59-50-7	4-Chloro-3-methylphenol	BRL		ug/L	6
88-06-2	2,4,6-Trichlorophenol	BRL		ug/L	6
95-95-4	2,4,5-Trichlorophenol	BRL		ug/L	6
131-11-3	Dimethyl phthalate	BRL		ug/L	6
51-28-5	2,4-Dinitrophenol	BRL		ug/L	6
84-66-2	Diethyl phthalate	BRL		ug/L	6
534-52-1	4,6-Dinitro-2-methylphenol	BRL		ug/L	6
84-74-2	Di-n-butyl phthalate	BRL		ug/L	6
85-68-7	Butyl benzyl phthalate	BRL		ug/L	6
117-81-7	Bis(2-ethylhexyl) phthalate	BRL		ug/L	6

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	24	11	46 %	15 - 110 %
Phenol-d5	24	9	38 %	15 - 110 %
Nitrobenzene-d5	12	9	72 %	30 - 130 %
2-Fluorobiphenyl	12	8	65 %	30 - 130 %
2,4,6-Tribromophenol	24	18	79 %	15 - 110 %
Terphenyl-d14	12	8	70 %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
 Sample extraction performed by EPA Method 3510C.

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

* Analyzed as 4-Methylphenol.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◇ Analyzed as Azobenzene.

EPA Method 8270C Semivolatile Organics by GC/MS-SIM (Part 2)

Field ID: **MW-1R**
Project: **37 Waverly/09062-00**
Client: **Watermark Environmental, Inc.**

Laboratory ID: **128470-04**
Sampled: **10-01-09 14:50**
Received: **10-01-09 17:50**
Extracted: **10-02-09 13:30**
Analyzed: **10-05-09 22:55**
Analyst: **MJB**

Matrix: **Aqueous**
Container: **1 L Amber Glass**
Preservation: **Cool**

QC Batch ID: **EP-2429-F**
Instrument ID: **MS-6 HP 6890**
Sample Volume: **850 mL**
Final Volume: **1 mL**
Dilution Factor: **1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	4.3		ug/L	0.6
91-57-6	2-Methylnaphthalene	2.2		ug/L	0.6
208-96-8	Acenaphthylene	BRL		ug/L	0.6
83-32-9	Acenaphthene	BRL		ug/L	0.6
86-73-7	Fluorene	BRL		ug/L	0.6
85-01-8	Phenanthrene	BRL		ug/L	0.6
120-12-7	Anthracene	BRL		ug/L	0.6
206-44-0	Fluoranthene	BRL		ug/L	0.6
129-00-0	Pyrene	BRL		ug/L	0.6
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1
87-86-5	Pentachlorophenol	BRL		ug/L	1.0

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	24	10	43 %	15 - 110 %
Phenol-d5	24	7.7	33 %	15 - 110 %
Nitrobenzene-d5	12	6.7	57 %	30 - 130 %
2-Fluorobiphenyl	12	7.1	60 %	30 - 130 %
2,4,6-Tribromophenol	24	18	77 %	15 - 110 %
Terphenyl-d14	12	7.0	60 %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Sample extraction performed by EPA Method 3510C.

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

**EPA Method 608
Polychlorinated Biphenyls (PCBs) by GC/ECD**

Field ID: **MW-1R**
 Project: **37 Waverly/09062-00**
 Client: **Watermark Environmental, Inc.**
 Laboratory ID: **128470-05**
 Sampled: **10-01-09 14:50**
 Received: **10-01-09 17:50**
 Extracted: **10-05-09 08:00**
 Cleaned Up: **10-05-09 13:00**
 Analyzed: **10-06-09 13:54**
 Analyst: **AWG**

Matrix: **Aqueous**
 Container: **1 L Amber Glass**
 Preservation: **Cool**
 QC Batch ID: **PB-2542-F**
 Instrument ID: **GC-11 Agilent 6890**
 Sample Weight: **890 mL**
 Final Volume: **10 mL**
 Dilution Factor: **1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/L	0.5
11104-28-2	Aroclor 1221	BRL		ug/L	0.5
11141-16-5	Aroclor 1232	BRL		ug/L	0.5
53469-21-9	Aroclor 1242	BRL		ug/L	0.5
12672-29-6	Aroclor 1248	BRL		ug/L	0.5
11097-69-1	Aroclor 1254	BRL		ug/L	0.5
11096-82-5	Aroclor 1260	BRL		ug/L	0.5

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro- <i>m</i> -xylene	0.22	0.18	81 %	30 - 150 %
Column	Decachlorobiphenyl	0.22	0.16	70 %	30 - 150 %
Second	Tetrachloro- <i>m</i> -xylene	0.22	0.18	82 %	30 - 150 %
Column	Decachlorobiphenyl	0.22	0.16	70 %	30 - 150 %

Method Reference: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, US EPA, 40 C.F.R. 136, Appendix A, (1986).
 Sample extraction performed by EPA Method 3510C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

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

Trace Metals

Field ID: **MW-1R**
Project: **37 Waverly/09062-00**
Client: **Watermark Environmental, Inc.**

Matrix: **Aqueous**
Container: **250 mL Plastic**
Preservation: **HNO₃ / Cool**
Preserved: **10-01-09 14:50**

Laboratory ID: **128470-8**
Sampled: **10-01-09 14:50**
Received: **10-01-09 17:50**

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 200.8 ¹	MB-3882-W	EPA 200.8	10-06-09 00:00	50 mL	ICPMS-1 ELAN 9000	MP
EPA 200.7 ²	MB-3882-W	EPA 200.7	10-06-09 00:00	50 mL	ICP-1 PE 3000	MP
EPA 245.1 ³	MP-2230-W	EPA 245.1	10-02-09 09:30	25 mL	CVAA-1 PE FIMS	MFP

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-36-0	Antimony, Total	BRL		mg/L	0.05	1	10-07-09 18:13	EPA 200.8 ¹
7440-38-2	Arsenic, Total	0.043		mg/L	0.005	1	10-07-09 18:13	EPA 200.8 ¹
7440-43-9	Cadmium, Total	BRL		mg/L	0.05	1	10-07-09 18:12	EPA 200.7 ²
7440-47-3	Chromium, Total	BRL		mg/L	0.01	1	10-07-09 18:12	EPA 200.7 ²
7440-50-8	Copper, Total	BRL		mg/L	0.005	1	10-07-09 18:12	EPA 200.7 ²
7439-89-6	Iron, Total	70		mg/L	0.1	1	10-07-09 18:12	EPA 200.7 ²
7439-92-1	Lead, Total	BRL		mg/L	0.04	1	10-07-09 18:13	EPA 200.8 ¹
7439-97-6	Mercury, Total	BRL		mg/L	0.0002	1	10-02-09 21:15	EPA 245.1 ³
7440-02-0	Nickel, Total	BRL		mg/L	0.01	1	10-07-09 18:12	EPA 200.7 ²
7782-49-2	Selenium, Total	BRL		mg/L	0.05	1	10-07-09 18:13	EPA 200.8 ¹
7440-22-4	Silver, Total	BRL		mg/L	0.01	1	10-07-09 18:12	EPA 200.7 ²
7440-66-6	Zinc, Total	BRL		mg/L	0.01	1	10-07-09 18:12	EPA 200.7 ²

Method Reference: Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised (1983), and Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA-600/R-94-111, (1994), and 40 C.F.R. 136, Appendix C (1990).

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

Project Narrative

Project: **37 Waverly/09062-00**
Client: **Watermark Environmental, Inc.**

Lab ID: **128470**
Received: **10-01-09 17:50**

A. Documentation and Client Communication

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

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

B. Method Modifications, Non-Conformances and Observations

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

- 1 . EPA 8260B Note: Samples 128470-1. Sample were diluted prior to analysis. Dilution was required due to observed foaming characteristics of sample. Sample foaming interferes with purge and trap sample concentration.
- 2 . EPA 8270C Non-conformance: Laboratroy control sample (LCS) had analyte Pentachlorophenol with an RPD above recommended recovery limits for QC batch SV-2426-F.

Quality Assurance/Quality Control

A. Program Overview

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

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

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

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

B. Definitions

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

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

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

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

Quality Control Report Laboratory Control Sample

Category: **Inorganic Chemistry**
Matrix: **Aqueous**

Analyte	Units	Spiked	Measured	Recovery	QC Limits	Analyzed	QC Batch	Method	Inst	Analyst
Solids, Total Suspended	mg/L	80	72	91 %	80 - 120 %	10-02-09 08:55	TSS-1683-W	SM 2540 D	2	JR
Chlorine, Total Residual	mg/L	0.05	0.05	92 %	80 - 120 %	10-01-09 08:00	TRC-0811-W	SM 4500-Cl G	1	DEB
Chromium, Hexavalent	mg/L	0.1	0.1	102 %	80 - 120 %	10-02-09 10:00	HC-0168-W	EPA 7196A	1	JK
Oil and Grease, Total	mg/L	40	36	91 %	78 - 114 %	10-03-09 08:00	HO-0476-W	EPA 1664	2	JR

Method Reference: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

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

- 1 Instrument ID: Thermo Electron Genesys 20
- 2 Instrument ID: Mettler AT 200 Balance

**Quality Control Report
Method Blank**Category: **Inorganic Chemistry**Matrix: **Aqueous**

Analyte	Result	Units	RL	Analyzed	QC Batch	Method	Inst	Analyst
Solids, Total Suspended	BRL	mg/L	2	10-02-09 08:55	TSS-1683-W	SM 2540 D	3	JR
Chlorine, Total Residual	BRL	mg/L	0.02	10-01-09 08:00	TRC-0811-W	SM 4500-Cl G	2	DEB
Chromium, Hexavalent	BRL	mg/L	0.01	10-02-09 10:00	HC-0168-W	EPA 7196A	2	JK
Oil and Grease, Total	BRL	mg/L	5	10-03-09 08:00	HO-0476-W	EPA 1664	3	JR
Cyanide, Total	BRL	mg/L	0.01	10-08-09 09:15	TCN-1523-W	EPA 9012A	1	JR

Method Reference: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

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

RL Reporting Limit.

1 Instrument ID: Lachat 8000 Autoanalyzer

2 Instrument ID: Thermo Electron Genesys 20

3 Instrument ID: Mettler AT 200 Balance

Laboratory Control Samples

Category: **Inorganics**

Matrix: **Aqueous**

Units: **mg/L**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 9012A	TCN-1523-W	EPA 9012A	10/8/2009 9:15	10/8/2009 12:04	Lachat 8000 Autoanalyzer JR	
LCS D	EPA 9012A	TCN-1523-W	EPA 9012A	10/8/2009 9:15	10/8/2009 12:05	Lachat 8000 Autoanalyzer JR	

Analyte	LCS			LCS Duplicate				QC Limits		Method
	Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
Cyanide, Total	0.45	0.43	96%	0.45	0.43	96%	1 %	80-120%	20 %	EPA 9012A

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised (1983), and
Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA-600/R-94-111,
(1994), and 40 C.F.R. 136, Appendix C (1990).

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

Quality Control Report Laboratory Control Sample

Category: **EPA Method 608 PCBs**
 QC Batch ID: **PB-2542-F**
 Matrix: **Aqueous**
 Units: **ug/L**

Instrument ID: **GC-11 Agilent 6890**
 Extracted: **10-05-09 08:00**
 Cleaned Up: **10-05-09 13:00**
 Analyzed: **10-06-09 11:57**
 Analyst: **AWG**

CAS Number	Analyte	Spiked	Measured		Recovery		QC Limits
			1st Column	2nd Column	1st Column	2nd Column	
12674-11-2	Aroclor 1016	5.0	4.7	4.3	94 %	87 %	40 - 140 %
11096-82-5	Aroclor 1260	5.0	3.5	3.3	70 %	65 %	40 - 140 %
QC Surrogate Compound		Spiked	Measured		Recovery		QC Limits
Tetrachloro- <i>m</i> -xylene		0.20	0.16	0.16	81 %	81 %	30 - 150 %
Decachlorobiphenyl		0.20	0.20	0.21	102 %	103 %	30 - 150 %

Method Reference: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, US EPA, 40 C.F.R. 136, Appendix A, (1986).
 Sample extraction performed by EPA Method 3510C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

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

Quality Control Report Method Blank

Category: **EPA Method 608 PCBs**
QC Batch ID: **PB-2542-F**
Matrix: **Aqueous**

Instrument ID: **GC-11 Agilent 6890**
Extracted: **10-05-09 08:00**
Cleaned Up: **10-05-09 13:00**
Analyzed: **10-06-09 11:09**
Analyst: **AWG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/L	0.2
11104-28-2	Aroclor 1221	BRL		ug/L	0.2
11141-16-5	Aroclor 1232	BRL		ug/L	0.2
53469-21-9	Aroclor 1242	BRL		ug/L	0.2
12672-29-6	Aroclor 1248	BRL		ug/L	0.2
11097-69-1	Aroclor 1254	BRL		ug/L	0.2
11096-82-5	Aroclor 1260	BRL		ug/L	0.2
QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro- <i>m</i> -xylene	0.20	0.16	80 %	30 - 150 %
	Decachlorobiphenyl	0.20	0.20	98 %	30 - 150 %
Second Column	Tetrachloro- <i>m</i> -xylene	0.20	0.16	79 %	30 - 150 %
	Decachlorobiphenyl	0.20	0.19	95 %	30 - 150 %

Method Reference: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, US EPA, 40 C.F.R. 136, Appendix A, (1986). Sample extraction performed by EPA Method 3510C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

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

**Quality Control Report
Laboratory Control Sample**

Category: **EPA Method 504.1**
QC Batch ID: **PV-0971-E**
Matrix: **Aqueous**
Units: **ug/L**

Instrument ID: **GC-6 HP 5890**
Extracted: **10-07-09 10:45**
Analyzed: **10-07-09 21:02**
Analyst: **AWG**

CAS Number	Analyte	Spiked	Measured		Recovery		QC Limits
			1st Column	2nd Column	1st Column	2nd Column	
106-93-4	1,2-Dibromoethane (EDB)	0.20	0.19	0.20	96 %	99 %	70 - 130 %

Method Reference: Methods for the Determination of Organic Compounds in Drinking Water, Supplement III, US EPA, EPA-600/R-95/131 (1995). Method Revision 1.1.

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

**Quality Control Report
Method Blank**

Category: **EPA Method 504.1**
QC Batch ID: **PV-0971-E**
Matrix: **Aqueous**

Instrument ID: **GC-6 HP 5890**
Extracted: **10-07-09 10:45**
Analyzed: **10-07-09 22:33**
Analyst: **AWG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.01

Method Reference: Methods for the Determination of Organic Compounds in Drinking Water, Supplement III, US EPA, EPA-600/R-95/131 (1995). Method Revision 1.1.

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

Quality Control Report Laboratory Control Samples

Category: **Metals**
Matrix: **Aqueous**
Units: **mg/L**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 6010B	MB-3882-WL	EPA 3010A	10-06-09 00:00	10-07-09 18:00	ICP-1 PE3000XL	MFP
LCS	EPA 6020A	MB-3882-WL	EPA 3010A	10-06-09 00:00	10-07-09 18:00	ICPMS-1 ELAN 9000	MFP
LCS	EPA 7470A	MP-2230-WL	EPA 7470A	10-02-09 09:30	10-02-09 19:51	CVAA-1 PE FIMS	MFP
LCSD	EPA 6010B	MB-3882-WL	EPA 3010A	10-06-09 00:00	10-07-09 17:41	ICP-1 PE3000XL	MFP
LCSD	EPA 6020A	MB-3882-WL	EPA 3010A	10-06-09 00:00	10-07-09 17:41	ICPMS-1 ELAN 9000	MFP
LCSD	EPA 7470A	MP-2230-WL	EPA 7470A	10-02-09 09:30	10-02-09 19:54	CVAA-1 PE FIMS	MFP

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits		Method
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
7440-36-0	Antimony	5.0	4.6	93%	5.0	4.8	96%	2 %	80-120 %	20 %	EPA 6020A
7440-38-2	Arsenic	5.0	4.5	89%	5.0	4.6	92%	2 %	80-120 %	20 %	EPA 6020A
7440-43-9	Cadmium	1.0	1.0	101%	1.0	0.96	96%	3 %	80-120 %	20 %	EPA 6010B
7440-47-3	Chromium	1.0	0.97	97%	1.0	0.94	94%	2 %	80-120 %	20 %	EPA 6010B
7440-50-8	Copper	1.0	0.95	95%	1.0	0.97	97%	1 %	80-120 %	20 %	EPA 6010B
7439-89-6	Iron	5.0	5.0	100%	5.0	4.9	98%	1 %	80-120 %	20 %	EPA 6010B
7439-92-1	Lead	5.0	4.8	96%	5.0	4.9	98%	1 %	80-120 %	20 %	EPA 6020A
7439-97-6	Mercury	0.0010	0.0010	103%	0.0010	0.0011	108%	2 %	80-120 %	20 %	EPA 7470A
7440-02-0	Nickel	1.0	1.0	103%	1.0	1.0	100%	1 %	80-120 %	20 %	EPA 6010B
7782-49-2	Selenium	5.0	4.7	93%	5.0	4.9	97%	2 %	80-120 %	20 %	EPA 6020A
7440-22-4	Silver	0.50	0.52	104%	0.50	0.51	102%	1 %	80-120 %	20 %	EPA 6010B
7440-66-6	Zinc	1.0	0.97	97%	1.0	0.94	94%	2 %	80-120 %	20 %	EPA 6010B

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

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

Quality Control Report Method Blank

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

<u>Analysis Method</u>	<u>QC Batch ID</u>	<u>Prep Method</u>	<u>Prepared</u>	<u>Sample Volume</u>	<u>Instrument ID</u>	<u>Analyst</u>
EPA 6010B	MB-3882-WB	EPA 3010A	10-06-09 00:00	50 mL	ICP-1 PE3000XL	MFP
EPA 6020A	MB-3882-WB	EPA 3010A	10-06-09 00:00	50 mL	ICPMS-1 ELAN 9000	MFP
EPA 7470A	MP-2230-WB	EPA 7470A	10-02-09 09:30	25 mL	CVAA-1 PE FIMS	MFP

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-36-0	Antimony		BRL	mg/L	0.05	1	10-07-09 18:00	EPA 6020A
7440-38-2	Arsenic		BRL	mg/L	0.005	1	10-07-09 18:00	EPA 6020A
7440-43-9	Cadmium		BRL	mg/L	0.05	1	10-07-09 17:31	EPA 6010B
7440-47-3	Chromium		BRL	mg/L	0.01	1	10-07-09 17:31	EPA 6010B
7440-50-8	Copper		BRL	mg/L	0.005	1	10-07-09 17:31	EPA 6010B
7439-89-6	Iron		BRL	mg/L	0.1	1	10-07-09 17:31	EPA 6010B
7439-92-1	Lead		BRL	mg/L	0.04	1	10-07-09 18:00	EPA 6020A
7439-97-6	Mercury		BRL	mg/L	0.0002	1	10-02-09 19:51	EPA 7470A
7440-02-0	Nickel		BRL	mg/L	0.01	1	10-07-09 17:31	EPA 6010B
7782-49-2	Selenium		BRL	mg/L	0.05	1	10-07-09 18:00	EPA 6020A
7440-22-4	Silver		BRL	mg/L	0.01	1	10-07-09 17:31	EPA 6010B
7440-66-6	Zinc		BRL	mg/L	0.01	1	10-07-09 17:31	EPA 6010B

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

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

Quality Control Report Laboratory Control Samples

Category:	EPA Method 8260B	LCS	Instrument ID:	MS-5 HP 6890	LCSD	Instrument ID:	MS-5 HP 6890
QC Batch ID:	VM5-4041-W		Analyzed:	10-05-09 07:20		Analyzed:	10-05-09 08:01
Matrix:	Aqueous		Analyst:	LMG		Analyst:	LMG
Units:	ug/L						

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
75-01-4	Vinyl Chloride	10	9.7	97 %	10	9.6	96 %	2 %	70 - 130 %	25%
75-35-4	1,1-Dichloroethene	10	11	115 %	10	9.9	99 %	14 %	70 - 130 %	25%
67-64-1	Acetone	20	18	90 %	20	19	96 %	6 %	70 - 130 %	25%
75-09-2	Methylene Chloride	10	9.8	98 %	10	9.2	92 %	6 %	70 - 130 %	25%
1634-04-4	Methyl tert-butyl Ether (MTBE)	10	11	110 %	10	11	108 %	2 %	70 - 130 %	25%
75-34-3	1,1-Dichloroethane	10	11	112 %	10	11	112 %	1 %	70 - 130 %	25%
156-59-2	cis- 1,2-Dichloroethene	10	11	112 %	10	11	112 %	0 %	70 - 130 %	25%
71-55-6	1,1,1-Trichloroethane	10	11	107 %	10	10	104 %	2 %	70 - 130 %	25%
56-23-5	Carbon Tetrachloride	10	11	107 %	10	10	104 %	3 %	70 - 130 %	25%
71-43-2	Benzene	10	11	111 %	10	11	111 %	0 %	70 - 130 %	25%
107-06-2	1,2-Dichloroethane	10	11	114 %	10	11	114 %	1 %	70 - 130 %	25%
79-01-6	Trichloroethene	10	10	103 %	10	10	103 %	1 %	70 - 130 %	25%
123-91-1	1,4-Dioxane	200	170	87 %	200	190	95 %	9 %	70 - 130 %	25%
108-88-3	Toluene	10	11	109 %	10	11	109 %	0 %	70 - 130 %	25%
79-00-5	1,1,2-Trichloroethane	10	11	105 %	10	10	103 %	2 %	70 - 130 %	25%
127-18-4	Tetrachloroethene	10	10	102 %	10	10	101 %	0 %	70 - 130 %	25%
100-41-4	Ethylbenzene	10	11	108 %	10	11	105 %	3 %	70 - 130 %	25%
108-38-3/106-42-3	meta- Xylene and para- Xylene	20	22	108 %	20	21	106 %	2 %	70 - 130 %	25%
95-47-6	ortho- Xylene	10	11	108 %	10	11	106 %	2 %	70 - 130 %	25%
541-73-1	1,3-Dichlorobenzene	10	10	104 %	10	10	105 %	0 %	70 - 130 %	25%
106-46-7	1,4-Dichlorobenzene	10	10	101 %	10	10	103 %	1 %	70 - 130 %	25%
95-50-1	1,2-Dichlorobenzene	10	10	102 %	10	10	102 %	0 %	70 - 130 %	25%
75-65-0	tert -Butyl Alcohol (TBA)	200	190	93 %	200	180	91 %	2 %	70 - 130 %	25%
994-05-8	tert -Amyl Methyl Ether (TAME)	10	9.7	97 %	10	9.6	96 %	2 %	70 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	9	93 %	10	10	96 %	70 - 130 %
1,2-Dichloroethane-d ₄	10	9	91 %	10	9	91 %	70 - 130 %
Toluene-d ₈	10	10	97 %	10	10	101 %	70 - 130 %
4-Bromofluorobenzene	10	10	96 %	10	10	99 %	70 - 130 %

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

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

Quality Control Report Method Blank

Category: **EPA Method 8260B**
QC Batch ID: **VM5-4041-W**
Matrix: **Aqueous**

Instrument ID: **MS-5 HP 6890**
Analyzed: **10-05-09 08:41**
Analyst: **LMG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
67-64-1	Acetone	BRL		ug/L	10
75-09-2	Methylene Chloride	BRL		ug/L	3
1634-04-4	Methyl tert-butyl Ether (MTBE)	BRL		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
156-59-2	cis-1,2-Dichloroethene	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
108-88-3	Toluene	BRL		ug/L	0.5
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
100-41-4	Ethylbenzene	BRL		ug/L	0.5
108-38-3/106-42-3	meta-Xylene and para-Xylene	BRL		ug/L	0.5
95-47-6	ortho-Xylene	BRL		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
75-65-0	tert-Butyl Alcohol (TBA)	BRL		ug/L	20
994-05-8	tert-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	10	100 %	70 - 130 %
1,2-Dichloroethane-d ₄	10	10	96 %	70 - 130 %
Toluene-d ₈	10	10	102 %	70 - 130 %
4-Bromofluorobenzene	10	9	94 %	70 - 130 %

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

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

Quality Control Report Laboratory Control Samples

Category:	EPA 8270C (Part 2)	LCS	Instrument ID:	MS-6 HP 6890	LCSD	Instrument ID:	MS-6 HP 6890
QC Batch ID:	SV-2429-F	Extracted:	10-02-09 13:30	Extracted:	10-02-09 13:30		
Matrix:	Aqueous	Analyzed:	10-05-09 20:14	Analyzed:	10-05-09 20:54		
Units:	ug/L	Analyst:	MJB	Analyst:	MJB		

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	5.0	3.0	60 %	5.0	3.0	60 %	1 %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	5.0	3.2	64 %	5.0	3.1	63 %	2 %	40 - 140 %	25%
208-96-8	Acenaphthylene	5.0	3.3	66 %	5.0	3.2	65 %	2 %	40 - 140 %	25%
83-32-9	Acenaphthene	5.0	3.2	64 %	5.0	3.0	60 %	6 %	40 - 140 %	25%
86-73-7	Fluorene	5.0	3.4	68 %	5.0	3.2	64 %	6 %	40 - 140 %	25%
85-01-8	Phenanthrene	5.0	3.3	67 %	5.0	3.2	64 %	4 %	40 - 140 %	25%
120-12-7	Anthracene	5.0	3.6	72 %	5.0	3.6	73 %	1 %	40 - 140 %	25%
206-44-0	Fluoranthene	5.0	3.4	69 %	5.0	3.4	68 %	2 %	40 - 140 %	25%
129-00-0	Pyrene	5.0	3.6	71 %	5.0	3.4	68 %	4 %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	5.0	3.8	76 %	5.0	3.6	72 %	6 %	40 - 140 %	25%
218-01-9	Chrysene	5.0	3.7	73 %	5.0	3.5	71 %	3 %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	5.0	4.0	80 %	5.0	3.9	78 %	3 %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	5.0	3.9	78 %	5.0	3.8	76 %	3 %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	5.0	4.2	85 %	5.0	4.2	83 %	2 %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	5.0	4.0	80 %	5.0	3.9	78 %	3 %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	5.0	4.0	80 %	5.0	3.8	77 %	4 %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	5.0	3.9	78 %	5.0	3.7	75 %	4 %	40 - 140 %	25%
87-86-5	Pentachlorophenol	5.0	2.9	58 %	5.0	2.1	43 %	31 % q	30 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2-Fluorophenol	20	9.0	45 %	20	9.3	46 %		15 - 110 %
Phenol-d5	20	8.1	41 %	20	7.9	40 %		15 - 110 %
Nitrobenzene-d5	10	6.5	65 %	10	6.8	68 %		30 - 130 %
2-Fluorobiphenyl	10	6.4	64 %	10	6.4	64 %		30 - 130 %
2,4,6-Tribromophenol	20	16	82 %	20	16	82 %		15 - 110 %
Terphenyl-d14	10	6.5	65 %	10	6.3	63 %		30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C.

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

q Recovery outside recommended limits.

**Quality Control Report
Method Blank**

Category: **EPA Method 8270C (Part 2)**
QC Batch ID: **SV-2429-F**
Matrix: **Aqueous**

Instrument ID: **MS-6 HP 6890**
Extracted: **10-02-09 13:30**
Analyzed: **10-05-09 21:34**
Analyst: **MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1
87-86-5	Pentachlorophenol	BRL		ug/L	1.0

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	20	9.3	47 %	15 - 110 %
Phenol-d5	20	8.2	41 %	15 - 110 %
Nitrobenzene-d5	10	6.6	66 %	30 - 130 %
2-Fluorobiphenyl	10	6.8	68 %	30 - 130 %
2,4,6-Tribromophenol	20	14	71 %	15 - 110 %
Terphenyl-d14	10	6.0	60 %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Sample extraction performed by EPA Method 3510C.

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

Quality Control Report Laboratory Control Samples

Category:	EPA 8270C (Part 1)	LCS	Instrument ID:	MS-3 HP 5890	LCSD	Instrument ID:	MS-3 HP 5890
QC Batch ID:	SV-2429-F	Extracted:	10-02-09 13:30	Extracted:	10-02-09 13:30	Analyzed:	10-05-09 13:16
Matrix:	Aqueous	Analyzed:	10-05-09 12:35	Analyzed:	10-05-09 13:16	Analyst:	MJB
Units:	ug/L	Analyst:	MJB	Analyst:	MJB		

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
108-95-2	Phenol	50	20	40 %	50	21	42 %	3 %	30 - 130 %	25%
95-57-8	2-Chlorophenol	50	31	63 %	50	32	63 %	0 %	30 - 130 %	25%
95-48-7	2-Methylphenol	50	34	69 %	50	34	69 %	0 %	30 - 130 %	25%
106-44-5	4-Methylphenol	50	27	54 %	50	28	57 %	5 %	30 - 130 %	25%
88-75-5	2-Nitrophenol	50	35	71 %	50	36	71 %	1 %	30 - 130 %	25%
105-67-9	2,4-Dimethylphenol	50	35	71 %	50	39	78 %	10 %	30 - 130 %	25%
120-83-2	2,4-Dichlorophenol	50	34	68 %	50	37	74 %	9 %	30 - 130 %	25%
59-50-7	4-Chloro-3-methylphenol	50	37	74 %	50	41	82 %	10 %	30 - 130 %	25%
88-06-2	2,4,6-Trichlorophenol	50	35	70 %	50	37	74 %	5 %	30 - 130 %	25%
95-95-4	2,4,5-Trichlorophenol	50	35	69 %	50	39	79 %	12 %	30 - 130 %	25%
131-11-3	Dimethyl phthalate	50	41	83 %	50	45	90 %	9 %	40 - 140 %	25%
51-28-5	2,4-Dinitrophenol	50	36	72 %	50	36	72 %	1 %	30 - 130 %	25%
84-66-2	Diethyl phthalate	50	42	85 %	50	44	89 %	5 %	40 - 140 %	25%
534-52-1	4,6-Dinitro-2-methylphenol	50	37	73 %	50	41	82 %	11 %	30 - 130 %	25%
84-74-2	Di-n-butyl phthalate	50	45	90 %	50	48	96 %	6 %	40 - 140 %	25%
85-68-7	Butyl benzyl phthalate	50	46	92 %	50	48	95 %	4 %	40 - 140 %	25%
117-81-7	Bis(2-ethylhexyl) phthalate	50	44	89 %	50	47	94 %	6 %	40 - 140 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2-Fluorophenol	20	8.9	45 %	20	8.7	44 %		15 - 110 %
Phenol-d5	20	7.4	37 %	20	7.8	39 %		15 - 110 %
Nitrobenzene-d5	10	6.8	68 %	10	6.8	68 %		30 - 130 %
2-Fluorobiphenyl	10	6.6	66 %	10	7.0	70 %		30 - 130 %
2,4,6-Tribromophenol	20	14	72 %	20	16	81 %		15 - 110 %
Terphenyl-d14	10	6.8	68 %	10	7.4	74 %		30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C.

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

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◇ Analyzed as Azobenzene.

Quality Control Report Method Blank

Category: **EPA Method 8270C (Part 1)**
 QC Batch ID: **SV-2429-F**
 Matrix: **Aqueous**

Instrument ID: **MS-3 HP 5890**
 Extracted: **10-02-09 13:30**
 Analyzed: **10-05-09 13:57**
 Analyst: **MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
108-95-2	Phenol	BRL		ug/L	5
95-57-8	2-Chlorophenol	BRL		ug/L	5
95-48-7	2-Methylphenol	BRL		ug/L	5
108-39-4/106-44-5	3 and 4-Methylphenol *	BRL		ug/L	5
88-75-5	2-Nitrophenol	BRL		ug/L	5
105-67-9	2,4-Dimethylphenol	BRL		ug/L	5
120-83-2	2,4-Dichlorophenol	BRL		ug/L	5
59-50-7	4-Chloro-3-methylphenol	BRL		ug/L	5
88-06-2	2,4,6-Trichlorophenol	BRL		ug/L	5
95-95-4	2,4,5-Trichlorophenol	BRL		ug/L	5
131-11-3	Dimethyl phthalate	BRL		ug/L	5
51-28-5	2,4-Dinitrophenol	BRL		ug/L	5
84-66-2	Diethyl phthalate	BRL		ug/L	5
534-52-1	4,6-Dinitro-2-methylphenol	BRL		ug/L	5
84-74-2	Di- <i>n</i> -butyl phthalate	BRL		ug/L	5
85-68-7	Butyl benzyl phthalate	BRL		ug/L	5
117-81-7	Bis(2-ethylhexyl) phthalate	BRL		ug/L	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	20	9	46 %	15 - 110 %
Phenol-d5	20	8	39 %	15 - 110 %
Nitrobenzene-d5	10	8	76 %	30 - 130 %
2-Fluorobiphenyl	10	7	68 %	30 - 130 %
2,4,6-Tribromophenol	20	14	72 %	15 - 110 %
Terphenyl-d14	10	7	73 %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
 Sample extraction performed by EPA Method 3510C.

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

* Analyzed as 4-Methylphenol.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◇ Analyzed as Azobenzene.

Certifications and Approvals

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

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

CONNECTICUT

Department of Health Services, PH-0586

Potable Water, Wastewater, Solid Waste and Soil

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

MASSACHUSETTS

Department of Environmental Protection, M-MA-103

Potable Water and Non-Potable Water

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

Department of Labor,

Asbestos Analytical Services, Class A

Division of Occupational Safety, AA000195

http://www.mass.gov/dos/forms/la-rpt_list_aa.pdf

NEW HAMPSHIRE

Department of Environmental Services, 202708

Potable Water, Non-Potable Water, Solid and Chemical Materials

<http://www4.egov.nh.gov/DES/NHELAP>

NEW YORK

Department of Health, 11754

Potable Water, Non-Potable Water, Solid and Hazardous Waste

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

RHODE ISLAND

Department of Health,

Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry

Division of Laboratories, LAO00054

<http://www.health.ri.gov/labs/outofstatelabs.pdf>

U.S. DEPARTMENT OF AGRICULTURE

USDA, Soil Permit, S-53921

Foreign soil import permit

VERMONT

Department of Health, VT-87643

Potable Water

http://healthvermont.gov/enviro/ph_lab/water_test.aspx#cert

Certifications and Approvals

MASSACHUSETTS
Department of Environmental Protection, M-MA-103

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

Potable Water (Drinking Water)		Non-Potable Water (Wastewater)	
Analyte	Method	Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1	Ammonia-N	Lachat 10-107-06-1-B
1,2-Dibromoethane	EPA 504.1	Antimony	EPA 200.7
Alkalinity, Total	SM 2320-B	Antimony	EPA 200.8
Antimony	EPA 200.8	Antimony	EPA 200.9
Antimony	EPA 200.9	Arsenic	EPA 200.7
Arsenic	EPA 200.8	Arsenic	EPA 200.8
Arsenic	EPA 200.9	Arsenic	EPA 200.9
Barium	EPA 200.7	Beryllium	EPA 200.7
Barium	EPA 200.8	Beryllium	EPA 200.8
Beryllium	EPA 200.7	Beta-BHC	EPA 608
Beryllium	EPA 200.8	Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7	Cadmium	EPA 200.7
Cadmium	EPA 200.8	Cadmium	EPA 200.8
Calcium	EPA 200.7	Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G	Chemical Oxygen Demand	SM 5220-D
Chromium	EPA 200.7	Chlordane	EPA 608
Copper	EPA 200.7	Chloride	EPA 300.0
Copper	EPA 200.8	Chlorine, Total Residual	SM 4500-CL-G
Cyanide, Total	Lachat 10-204-00-1-A	Chromium	EPA 200.7
E. Coli (Treatment and Distribution)	EC-MUG SM 9221-F	Chromium	EPA 200.8
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223	Cobalt	EPA 200.7
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G	Cobalt	EPA 200.8
Fecal Coliform (Source Water)	MF SM 9222-D	Copper	EPA 200.7
Fluoride	EPA 300.0	Copper	EPA 200.8
Fluoride	SM 4500-F-C	Copper	EPA 200.9
Heterotrophic Plate Count	SM 9215-B	Cyanide, Total	Lachat 10-204-00-1-A
Lead	EPA 200.8	DDD	EPA 608
Lead	EPA 200.9	DDE	EPA 608
Mercury	EPA 245.1	DDT	EPA 608
Nickel	EPA 200.7	Delta-BHC	EPA 608
Nickel	EPA 200.8	Dieldrin	EPA 608
Nitrate-N	EPA 300.0	Endosulfan I	EPA 608
Nitrate-N	Lachat 10-107-04-1-C	Endosulfan II	EPA 608
Nitrite-N	EPA 300.0	Endosulfan Sulfate	EPA 608
Nitrite-N	Lachat 10-107-04-1-C	Endrin	EPA 608
pH	SM 4500-H-B	Endrin Aldehyde	EPA 608
Selenium	EPA 200.8	Fluoride	EPA 300.0
Selenium	EPA 200.9	Gamma-BHC	EPA 608
Silver	EPA 200.7	Hardness (CaCO ₃), Total	EPA 200.7
Silver	EPA 200.8	Hardness (CaCO ₃), Total	SM 2340-B
Sodium	EPA 200.7	Heptachlor	EPA 608
Sulfate	EPA 300.0	Heptachlor Epoxide	EPA 608
Thallium	EPA 200.8	Iron	EPA 200.7
Thallium	EPA 200.9	Kjeldahl-N	Lachat 10-107-06-02-D
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223	Lead	EPA 200.7
Total Coliform (Treatment and Distribution)	MF SM 9222-B	Lead	EPA 200.9
Total Dissolved Solids	SM 2540-C	Magnesium	EPA 200.7
Trihalomethanes	EPA 524.2	Manganese	EPA 200.7
Turbidity	SM 2130-B	Manganese	EPA 200.8
Volatile Organic Compounds	EPA 524.2	Mercury	EPA 245.1
		Molybdenum	EPA 200.7
		Molybdenum	EPA 200.8
		Nickel	EPA 200.7
		Nickel	EPA 200.8
		Nickel	EPA 200.9
		Nitrate-N	EPA 300.0
		Nitrate-N	Lachat 10-107-04-1-C
		Non-Filterable Residue	SM 2540-D
		Oil and Grease	EPA 1664
Non-Potable Water (Wastewater)			
Analyte	Method		
Aldrin	EPA 608		
Alkalinity, Total	Lachat 10-303-31-1-A		
Alpha-BHC	EPA 608		
Aluminum	EPA 200.7		
Aluminum	EPA 200.8		

Certifications and Approvals

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

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

Non-Potable Water (Wastewater)

Analyte	Method
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.8
Selenium	EPA 200.9
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
SVOC-Acid Extractables	EPA 625
SVOC-Base/Neutral Extractables	EPA 625
Thallium	EPA 200.7
Thallium	EPA 200.8
Thallium	EPA 200.9
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Toxaphene	EPA 608
Vanadium	EPA 200.7
Vanadium	EPA 200.8
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7
Zinc	EPA 200.8

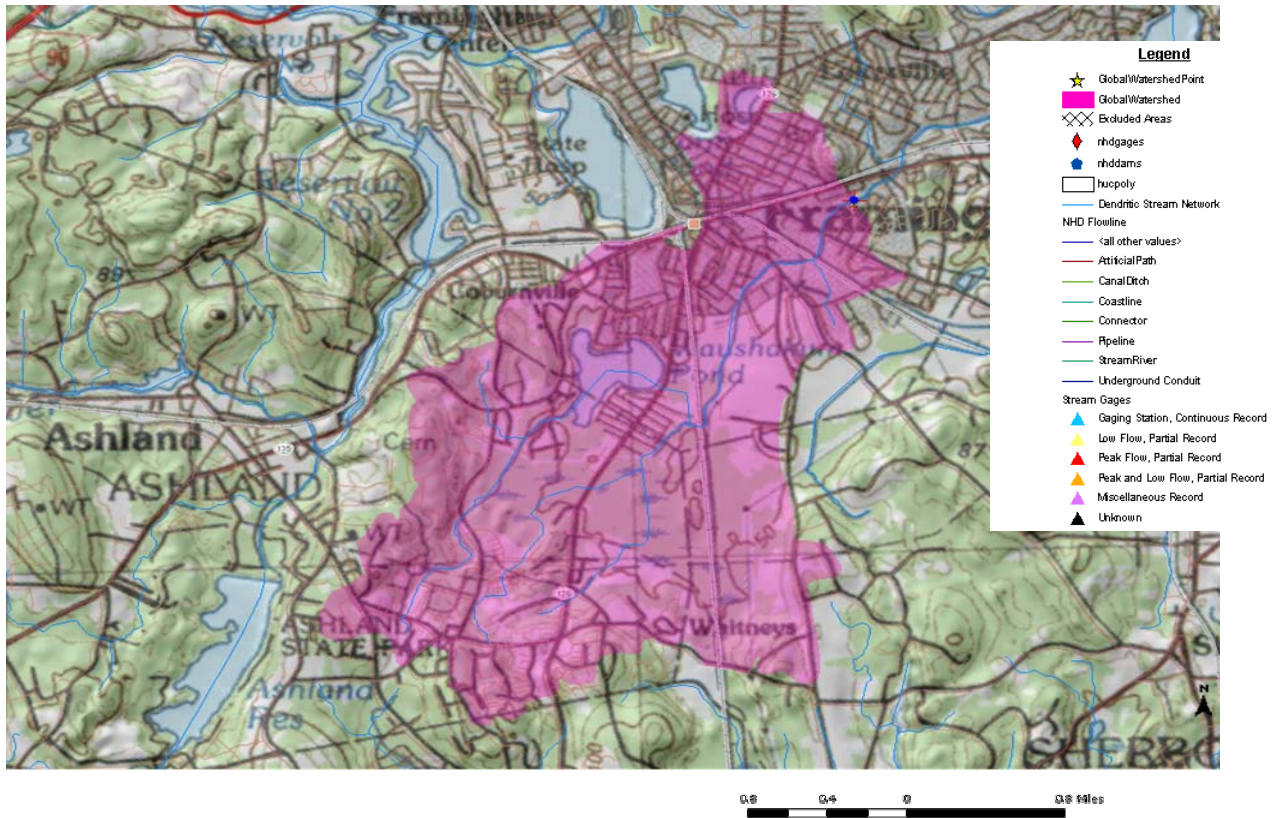
Attachment 3
StreamStats Map



Massachusetts StreamStats

StreamStats Print Page

37 Waverly Street, Framingham, MA



10/28/2009 7:44:43 AM



Streamstats Ungaged Site Report

Date: Wed Oct 28 2009 07:13:13 Mountain Daylight Time

Site Location: Massachusetts

NAD83 Latitude: 42.2784 (42 16 42)

NAD83 Longitude: -71.4021 (-71 24 07)

NAD27 Latitude: 42.2783 (42 16 41)

NAD27 Longitude: -71.4026 (-71 24 09)

ReachCode: 01070005000219

Measure: 47.05

Drainage Area: 5.52 mi²

Low Flows Basin Characteristics			
100% Statewide Low Flow (5.52 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	5.52	1.61	149
Mean Basin Slope from 250K DEM (percent)	1.85	0.32	24.6
Stratified Drift per Stream Length (square mile per mile)	0.38	0	1.29
Massachusetts Region (dimensionless)	0	0	1

Probability of Perennial Flow Basin Characteristics			
100% Perennial Flow Probability (5.52 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	5.52 (above max value 1.99)	0.01	1.99
Percent Underlain By Sand And Gravel (percent)	60.29	0	100
Percent Forest (percent)	34.87	0	100
Massachusetts Region (dimensionless)	0	0	1

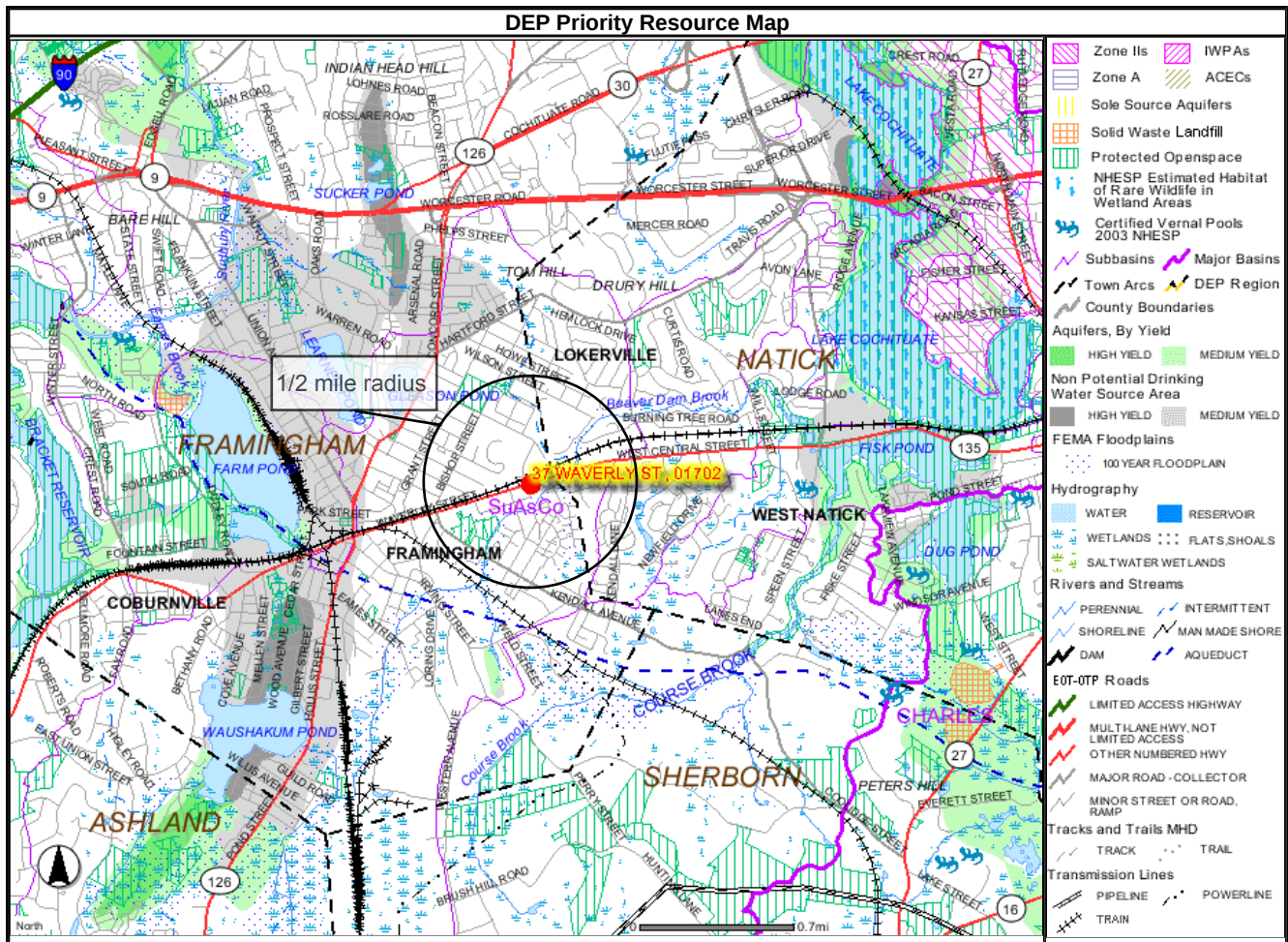
Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Low Flows Streamflow Statistics					
Statistic	Flow (ft ³ /s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
D50	5.45	18		2.76	10.7
D60	4.19	20		1.5	11.6
D70	2.91	24		1.19	7.04
D75	2.35	26		0.98	5.52
D80	2.1	28		0.92	4.7
D85	1.56	32		0.63	3.83
D90	1.29	37		0.52	3.13
D95	0.74	46		0.25	2.12
D98	0.48	60		0.14	1.54
D99	0.36	65		0.0996	1.21
M7D2Y	0.75	49		0.25	2.19
AUGD50	1.71	33		0.66	4.3
M7D10Y	0.34	71		0.089	1.22

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	0.99	

Attachment 4
DEP Priority Resource Map



Attachment 5

List of Historic Registered Places



Index by State and City

National Register Information System

10/29/2009 10:46:44

No filter

Include filter in navigation

Row	STATE	COUNTY	RESOURCE NAME	ADDRESS	CITY	LISTED	MULTIPLE
1	MA	Middlesex	Concord Square Historic District	Park, Concord, and Kendall Sts., and Union Ave.	Framingham	1983-03-10	
2	MA	Middlesex	Ellis, Moses, House	283 Pleasant St.	Framingham	1983-11-29	
3	MA	Middlesex	First Baptist Church	1013 Worcester Rd.	Framingham	1980-04-09	
4	MA	Middlesex	Framingham Centre Common Historic District	Roughly centered on Framingham Centre Common, between MA 9 and I-90	Framingham	1990-10-25	
5	MA	Middlesex	Framingham Railroad Station	417 Waverly St.	Framingham	1975-01-17	
6	MA	Middlesex	Framingham Reservoir No. 1 Dam and Gatehouse	E end of Framingham Reservoir No. 1, off Winter St. N of Long Ave.	Framingham	1990-01-18	Water Supply System of Metropolitan Boston MPS
7	MA	Middlesex	Framingham Reservoir No. 2 Dam and Gatehouse	Between Framingham Reservoirs Nos. 1 and 2, W of jct. of Winter and Fountain Sts.	Framingham	1990-01-18	Water Supply System of Metropolitan Boston MPS
8	MA	Middlesex	Framingham Reservoir No. 3 Dam and Gatehouse	SE end of Framingham Reservoir No. 3, off MA 9/30	Framingham	1990-01-18	Water Supply System of Metropolitan Boston MPS
9	MA	Middlesex	Gibbs, Paul, House	1147 Edmands Rd.	Framingham	1983-03-10	
10	MA	Middlesex	Irving Square Historic District	Irving Square, Waverly, South, Columbia, Irving, Gordon and Hollis Sts.	Framingham	1982-11-30	

Page 1



