



Municipality/Organization: Massachusetts Highway Department

EPA NPDES Permit Number: MA043025

MaDEP Transmittal Number: W-040919

**Annual Report Number
& Reporting Period:** No. 4: April 06-March 07

NPDES Phase II Small MS4 General Permit Annual Report

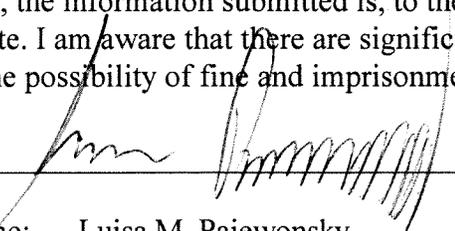
Part I. General Information

Contact Person: Mr. Henry Barbaro **Title:** Supervisor of Wetlands & Water Resources

Telephone #: (617) 973-7419 **Email:** henry.barbaro@mhd.state.ma.us

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, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:  _____

Printed Name: Luisa M. Paiewonsky _____

Title: MassHighway Commissioner _____

Date: 4/27/07 _____



THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION
MASSACHUSETTS HIGHWAY DEPARTMENT

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

LUISA PAIEWONSKY
COMMISSIONER

April 30, 2007

Ann Herrick - CIP
U.S. Environmental Protection Agency - Region 1
1 Congress Street, Suite 1100
Boston, MA 02114-2023

RE: NPDES Phase II Small MS4 General Permit
EPA Permit Number MA043025
MassHighway Permit Year 4 Annual Report

Dear Ms. Herrick,

Please find enclosed the Permit Year 4 Annual Report, signed by Commissioner Luisa Paiewonsky. The annual report summarizes MassHighway activities between April 2006 and March 2007 towards meeting the measurable goals outlined in the NPDES Phase II Notice of Intent (NOI) submitted to your office in July 2003, with the most recent revision on January 3, 2007. Please feel free to contact Mr. Henry Barbaro, Supervisor of Wetlands & Water Resources, at (617) 973-7419 if you have any questions or require further information.

Sincerely,

Gregory H. Prendergast
Director
Environmental Services

Enclosures: NPDES Phase II Small MS4 General Permit Annual Report – Year 4

cc: Fred Civian
Massachusetts Department of Environmental Protection
One Winter Street - 5th Floor
Boston, MA 02108





Part II. Self-Assessment

MassHighway has completed the required self-assessment and has determined that the MS4 is in compliance with all permit conditions. MassHighway submitted a revised NOI to EPA and DEP on January 3, 2007. MassHighway received partial authorization for areas outside of endangered species habitat on January 25, 2007. MassHighway has submitted the letters received from US Fish and Wildlife Services and National Marine Fisheries and is awaiting full authorization under the general permit. The items in Part III of this report reflect the BMPs included in the revised submittal and MassHighway's progress towards implementing the programs.

MassHighway has satisfied the ESA eligibility provision under Criterion D (Small MS4 Permit, Addendum B) with regard to the dwarf wedgemussel in all areas tributary to its habitat in the Connecticut River Basin (See Appendix B for consultation correspondence with U.S. Fish and Wildlife Service). MassHighway has satisfied the eligibility criteria with regard to the short nose sturgeon in all areas tributary to its habitat in the identified portions of the Connecticut and Merrimack River Basins (See Appendix B for consultation correspondence with National Marine Fisheries Service). MassHighway has satisfied the ESA eligibility provisions under Criterion A (Small MS4 Permit, Addendum B) with regard to the dwarf wedgemussel and short nose sturgeon in all areas not tributary to the identified portions of the Connecticut and Merrimack River Basins.

MassHighway has satisfied the eligibility criteria for protection of historic properties by obtaining concurrence from the Massachusetts Historical Commission (MHC) regarding MassHighway's opinion that there are presently no known storm water discharges from its roadways located in urbanized areas and within 500-feet of any historic property identified in MassGIS's historic properties data layer (see Appendix C for correspondence with the MHC).



Part III. Summary of Minimum Control Measures

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
1A	MassHighway Training Assistance Program (MTAP)	MTAP	Continue MTAP Program	Existing program that continues to provide training programs for MassHighway. See BMP 1D-1.	Continue to provide training programs.
1B	Baystate Roads	Baystate Roads	Continue Baystate Roads Program	Existing program that continues to provide training programs for MassHighway. See BMP 1D-2.	Continue to provide training programs.
1C-1	MassHighway Web Site	IT/Environmental	Add Environmental Division web page to web site.	Measurable goal completed in Permit Year 1.	Measurable goal complete.
1C-2	MassHighway Web Site	IT/ Environmental	Solicit public input and publicize storm water related initiatives using web page.	The MassHighway web site includes a link for contacting the Highway Department via email. Emails received are reviewed and directed to the appropriate department.	Measurable goal complete.
1C-3	MassHighway Web Site	IT/ Environmental	Evaluate web page annually and revise as necessary.	The Environmental web page has been reviewed and updated.	Evaluate web page and revise as necessary.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5																																				
1D-1	Storm Water Training Workshop	Environmental/MTAP	Conduct training for MassHighway personnel every two years. Summarize date of meeting, topics covered, and #of attendees in annual report. Also include # of Snow& Ice training classes, and # of “tailgate” meetings.	<p>470 employees were trained through this program this winter. Snow and Ice Training included equipment and operation, roles of personnel, review of materials, environmental impact, MH deicing “tools”, winter scenarios, and reduced salt zones. Trainings were held as follows:</p> <table border="0"> <thead> <tr> <th><u>2006 DATE</u></th> <th><u>Location</u></th> </tr> </thead> <tbody> <tr><td>17-Oct</td><td>District 1</td></tr> <tr><td>18-Oct</td><td>District 2</td></tr> <tr><td>19-Oct</td><td>District 3</td></tr> <tr><td>20-Oct</td><td>Boston</td></tr> <tr><td>24-Oct</td><td>District 5</td></tr> <tr><td>25-Oct</td><td>District 3</td></tr> <tr><td>26-Oct</td><td>District 2</td></tr> <tr><td>27-Oct</td><td>District 4</td></tr> <tr><td>31-Oct</td><td>District 5</td></tr> <tr><td>1-Nov</td><td>District 4</td></tr> <tr><td>2-Nov</td><td>District 3</td></tr> <tr><td>3-Nov</td><td>District 4</td></tr> <tr><td>7-Nov</td><td>District 5</td></tr> <tr><td>15-Nov</td><td>District 4</td></tr> <tr><td>30-Nov</td><td>District 4</td></tr> <tr><td>1-Dec</td><td>Boston</td></tr> <tr><td>18-Dec</td><td>District 4</td></tr> </tbody> </table>	<u>2006 DATE</u>	<u>Location</u>	17-Oct	District 1	18-Oct	District 2	19-Oct	District 3	20-Oct	Boston	24-Oct	District 5	25-Oct	District 3	26-Oct	District 2	27-Oct	District 4	31-Oct	District 5	1-Nov	District 4	2-Nov	District 3	3-Nov	District 4	7-Nov	District 5	15-Nov	District 4	30-Nov	District 4	1-Dec	Boston	18-Dec	District 4	Provide MTAP snow & ice training and additional “tailgate” meetings.
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1D-2	Storm Water Training Workshop	Environmental/ Baystate Roads	Conduct storm water training workshop for municipal DPW personnel every two years. Summarize training programs similarly to above.	<p>Snow and Ice Training was held for each of the 5 districts with 216 total in attendance.</p> <p>11/10/06 – Marlboro 11/17/2006 – Northampton 11/21/06 – Tewksbury 11/08/2006 – Pittsfield 11/28/2006 – Taunton</p> <p>Topics covered included spreader calibration, proper material storage, material chemistry, operational changes designed to reduce the use of salt, sand and liquids.</p> <p>Snow and Ice Tailgate Training held at 10 locations across the Eastern part of Massachusetts in November. 150 people attended in total including MassHighway, Contractors and Local Municipal Agents. Topics covered included impact of operations on the environment and over-application of materials.</p>	Provide training programs.
1E	Educational Seminars for CIM members	Construction Division	Provide educational seminars for CIM members on CGP Permit coverage and environmental compliance in Permit Year 1.	Measurable goal complete in Permit Year 1.	Measurable goal complete.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
1F	MassHighway/ Municipal Tie-In Review Process	Environmental/ Districts	Develop communication mechanism re: MassHighway drainage that discharges to a local MS4. Develop review process for addressing those concerns. Notify other MS4s of process.	<p>MassHighway has developed a Drainage Connection Policy – prohibiting illicit discharges to the MassHighway storm water system. The Policy was issued on June 26, 2006 by the Chief Engineer. A copy of the Policy is included as Appendix E of this document.</p> <p>MassHighway is developing an internal protocol for addressing concerns from municipalities.</p>	MassHighway will complete the internal protocol for addressing concerns from municipalities. This internal protocol will be discussed at the EPA seminars given statewide in May for municipalities, which will include a presentation by MassHighway.
1G	River and Stream Signs	Traffic Operations	Install signs identifying rivers and streams crossed by MassHighway roads.	MassHighway has installed 25 signs identifying river and stream crossings in Permit Year 4. The locations were identified by Mass Riverways Program and installed by MassHighway personnel. A list of the locations is included in Appendix F of this report.	MassHighway will continue to install signs in areas identified by Mass. Riverways Program.
1H	Anti-litter/ Dumping Messages on Variable Message Boards	Operations	Include anti-litter message in the message mix on permanent Variable Message Boards (VMBs).	Anti-litter messages were included in the message mix on permanent Variable Message Boards.	Institute method for tracking anti-litter messages on VMBs. Evaluate effectiveness of quantity and distribution of messages.
1I	Anti-litter/ Dumping Literature at Rest Areas and Visitors Centers	Operations	Distribute anti-litter literature developed by MassHighway at rest areas and visitor centers.	Work has not begun on this BMP.	Work with EOEa to identify appropriate flyers and distribute and rest areas and visitor centers.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
1J	New England DOT Meetings	Environmental	Meet with New England DOTs at least once annually to discuss on-going issues and programs being faced by the DOTs including wetland mitigation, storm water and erosion controls.	The Spring 2006 meeting was held on May 2, 2006 at NH DOT offices in Durham, NH. Representatives from each of the New England DOTs attended. Items discussed at the morning session included Stream Crossing Standards and Culvert Design, update on NPDES Phase II compliance progress, on-going water quality projects by CT DOT and a bridge demolition project by Rhode Island. The afternoon session included a visit to two NH DOT project sites which highlighted context sensitive design and wetland mitigation design.	Meeting scheduled for Fall 2007 in Montpelier, VT.
	Regional Planning Agency Transportation Plans	Environmental	MH will participate in review of regional planning agency Transportation Plans, when applicable	MassHighway worked with the Old Colony Regional Planning Commission on their Transportation Plan. MassHighway was able to give advice and guidance to 12+ communities about NPDES compliance, and to inform them of MassHighway's efforts.	Continue to comment on plans when requested.
	Neponset River Watershed Association	Environmental	Henry Barbaro provided an hour long presentation regarding storm water BMP maintenance.	Led seminar in June 2006. Seminar attended by staff from DPWs, Conservation Commissions and Engineering Departments within the Neponset River watershed.	No additional action anticipated.



2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
2A	Project Related Public Notification and Public Participation Requirements	Environmental	Continue compliance with federal and state public notification and public participation requirements including but not limited to Wetlands Protection Act, Clean Water Act 401 Water Quality Certification, Army Corps of Engineers 404 Permit, and MEPA/NEPA.	MassHighway continues to comply with federal and state public notification and public participation requirements. MassHighway conducted 49 design public hearings in this permit year (see Appendix D).	MassHighway will continue to comply with federal and state public notification and public participation requirements.
2B	Adopt-a-Highway	Adopt-a-Highway	Continue to support program.	MassHighway continues to support this program.	MassHighway will continue to support this program.
2C	Project Clean	Project Clean	Continue to support Project Clean.	MassHighway continues to support this program. During Permit Year 4, MassHighway responded to an estimate 2,000 citizen calls regarding debris pick-up.	MassHighway will continue to support this program.
2D-1	MassHighway Web Site	IT/ Environmental	Post Storm Water Management Plan (SWMP) to web site.	Measurable goal complete. The SWMP/ NOI are posted on the Environmental Section's web page.	When revisions to the SWMP are submitted, they will be posted to web site within 30 days.
2D-2	MassHighway Web Site	IT/ Environmental	Post annual reports to the web site.	Measurable goal complete. Annual reports for Permit Year 1-3 are posted on the Environmental Section's web page.	Permit Year #4's annual report will be posted to the Environmental Division web page for public access within 30 days of submittal to EPA and DEP.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
2E	Complete AASHTO’s Center for Environmental Excellence on “Strategies & Approaches to Complying with NPDES Phase II Survey”	Environmental	Complete survey.	Completed survey in Permit Year 3.	Measurable goal complete.

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
3A	Rest Area Leases	Environmental/ Right-of-Way	Develop electronic drainage requirements language for incorporation in Rest Area lease agreements where rest area is being redeveloped.	Measurable Goal complete in Permit Year 3.	Measurable goal complete.
3B-1	Drainage Inventory	Environmental/ Construction/ Planning/ IT Division	Develop and implement specification for securing drainage information from future construction and redevelopment projects.	Draft of drainage specification has been developed.	Finalize specification and begin to include in contracts.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
3B-2	Drainage Inventory	Environmental/ IT/ Districts	Map drainage discharges within urbanized areas.	Outfall inventory has been completed for urbanized area roads in District 4. Inventory from scanned plans has been completed for UA roads in District 2 and 3.	Complete field inventory for UA roads in District 2 and 3. Complete inventory from scanned plans and field reconnaissance for roads in District 5. Merge outfall inventory from District 1 into database. Provide database to MassHighway GIS department.
3C-1	Drainage Connection Policy	Environmental	Submit Drainage Connection Policy to Chief Engineer and Commissioner for issuance to Department.	Developed Drainage Connection Policy and issued to department. The Policy was issued and posted on June 26, 2006 by the Chief Engineer. A copy of the Policy is included as Appendix E of this document.	No further action required.
3C-2	Drainage Tie-In Standard Operation Procedure (SOP)	Environmental/ Legal	Prepare an internal draft of a revised drainage tie-in SOP. Submit to Chief Engineer.	Internal draft of Drainage Tie-In SOP is being finalized and reviewed by permit engineers.	Finalize Drainage Tie-In SOP. Submit to Chief Engineer for signature and issuance to Department. MassHighway will be finalizing a set of regulations that pertain to the issuance of permits under C.81, S. 21. This will include the rules governing drainage tie-ins.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
3D	Illicit Connection Review	Environmental/ Districts	Review twenty discharges each permit year for potential illicit connections.	MassHighway has been alerted to (by the public, staff members or ENSR during the discharge inventory) twenty-three outfalls which are suspect illicit connections. The table below summarizes the progress on follow up to these potential illicit discharges. Snow melt and wet weather have kept MassHighway’s consultant from performing the dry weather review in the last month.	MassHighway’s consultant will complete the review of the 23 priority outfalls. MassHighway will also issue a Request for Qualifications/ Proposal (RFQ/ RFP) this summer for a contract to review discharges within priority resource areas and TMDL watersheds in the next four years.
3E	Resident Engineer Illicit Connection Training	Construction	Provide training on illicit connection policy, illicit connection identification and protocol for reporting during annual Resident Engineer training seminars. Summarize # of attendees in annual report.	<p>The Illicit Connection training was provided to District construction personnel as part of the regular RE erosion control/stormwater training sessions. In total 176 REs attended training this winter, with additional classes scheduled for early spring as shown below to accommodate those who were unable to attend the initial sessions:</p> <p>District 1 2/28/07 40 attendees District 2 scheduled for 5/2 and 5/3 District 3 3/15/07 36 attendees (second session scheduled for May 07) District 4 9/21/06 24 attendees 18 attendees (third session scheduled for May 07) District 5 2/26/07 58 attendees</p>	If the proposed DEP Stormwater Regulations are promulgated, the additional Standard regarding Illicit Discharges will be reviewed as part of the Regulatory Update portion of the winter training sessions for construction personnel.

9/27/07



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
3F	Maintenance Staff Illicit Connection Training	Environmental	Provide training on illicit connection policy, illicit connection identification and protocol for reporting during annual training seminars for maintenance personnel.	<p>District 1: On 3/1/07 training on the MassHighway Drainage Connection Policy was provided to 51 maintenance personnel by David Abbott. Training included discussion on the relevance of the Drainage Connection Policy and recent possible illicit connections discovered in District 1.</p> <p>District 2: On 11/28/06 and 2/13/07, MassHighway staff provided training on the Drainage Connection Policy to 62 employees.</p> <p>District 3: On 10/31/06, 11/8/06, and 12/14/06, Michael Giando provided training on the MassHighway Drainage Connection Policy to 58 MassHighway staff. Topics covered illicit connection identification and procedures for reporting findings.</p> <p>District 4: On 10/24/06, 10/25/06, 11/2/06, 11/8/06, 11/9/06, and 11/10/06 Ken Leach provided training to 138 MassHighway staff on the MassHighway Illicit Discharge Policy.</p> <p><i>(Continued below)</i></p>	No action required.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
3F cont'd				District 5: On 11/14/06, 11/20/06, 11/21/06, and 12/7/06, Gregory Fulgione provided training to 99 MassHighway staff on the MassHighway Illicit Discharge Policy. Illicit connection detection and procedures for report findings were covered.	

Potential Illicit Discharge Identified in Permit Year 4

Town	Notes	Identification Source	Location	MassHighway Owns Discharge?	Notes
Dracut	Oily sheen present	Drainage Inventory Consultant (ENSR)	Merrimac Ave (Rt. 110) along northern river banks	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Haverhill	White foam present	Drainage Inventory Consultant (ENSR)	Onramp from Rt. 125 onto 495 S	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Billerica	Oily sheen and garbage present	Drainage Inventory Consultant (ENSR)	Boston Rd (3A), if driving northbound, on left hand side	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Rowley	Catch basin with two hoses hooked into it	Drainage Inventory Consultant (ENSR)	Main Street (Rt. 1A) Catch Basin location	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Winchester	2 hoses projecting from pipe	Drainage Inventory Consultant (ENSR)	Cambridge St.(Rt. 3), discharging into upper mystic lake	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.

Town	Notes	Identification Source	Location	MassHighway Owns Discharge?	Notes
Manchester	Culvert with suspected drainage tied in	Drainage Inventory Consultant (ENSR)	Bridge Street (Rt. 127)	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Lenox	Reported oil in wetland from storm water drain.	Larry Salvatore (MHD)	Behind Jiffy Lube on Rt. 7 & 20	--	District 1 (L. Salvatore) addressed issue with MA DEP. Determined to be a release from Jiffy Lube. Oil pumped from system.
Chelsea	Route 1 behind Home Depot, MyRWA Outfall 1342	Mystic River Watershed Assoc.	Constructed wetland, Northern end of HD parking lot	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Revere	Route 1 discharging to Mill Creek, MyRWA Outfall 1338	Mystic River Watershed Assoc.	Off Northeast Expressway (Rt. 1)	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Saugus	Pipes attached to a house	Drainage Inventory Consultant (ENSR)	Salem Turnpike (Rt. 107) at Ballard Street	Y	Will review in field when dry weather conditions are available – scheduled for end of April 2007.
Brookline	Roger requested MH determine if they own. Discharge #566, 567 and 568 per Mr. Frymire	Roger Frymire, email dated 12/27/06	Near Willow Pond	N	Letter documenting that discharges are/ are not owned by MassHighway is in draft form and will be sent to Roger Frymire by end of May 2007.
Watertown	East end of California Street @Rt. 16, Discharge #573 per Mr. Frymire	Roger Frymire, email dated 12/27/06	Outfall of note just to ID ownership	Maybe, the Rt. 16 bridge is classified MH controlled.	Will review in field when dry weather conditions are available – scheduled for end of April 2007. Will summarize results of field review in letter to Roger Frymire.
Newton	Cheesecake Brook, possible tie-ins. Roger requesting MH determine ownership.	Roger Frymire, email dated 12/27/06	Appears to be from MassPike.	N	Letter documenting that discharges are not owned by MassHighway is in draft form and will be sent to Roger Frymire by end of May.



Town	Notes	Identification Source	Location	MassHighway Owns Discharge?	Notes
Lanesboro	Brown stain in ice at discharge and petroleum odor during discharge inventory. No evidence of oil in review of surface runoff leading to discharge.	Larry Salvatore (MHD)	On Route 8, across from D.R. Billings Construction Co.	Y	Review by District 1 and DEP identified no illicit connection.

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4A	MassHighway Department Project Development & Design Guide	Environmental/ Construction/ Projects	Continue to comply with erosion and sediment control requirements indicated in the guide.	All MassHighway projects will continue to be designed in compliance with the erosion and sediment control requirements in the guidebook.	All MassHighway projects will continue to be designed in compliance with the erosion and sediment control requirements in the guidebook.
4B	MA DEP Stormwater Management Policy	Environmental/ Construction/ Projects	Continue to meet criteria in Policy for projects subject to Wetlands Protection Act (WPA).	MassHighway designs continue to comply with the Stormwater Management Policy when projects are subject to the WPA or within urbanized areas.	MassHighway designs will continue to comply with the Stormwater Management Policy when projects are subject to the WPA or within urbanized areas.
4C	NPDES Construction General Permit	Construction	Comply with general permit requirements.	MassHighway will continue to file NOIs for new projects. Contractors will continue to prepare SWPPPs as required by the Special Provision/ Pay Item in all new construction contracts.	MassHighway will continue to file NOIs for new projects. Contractors will continue to prepare SWPPPs as required by the Special Provision/ Pay Item in all new construction contracts.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4D	Other State Environmental Regulations or Policy	Environmental/ Construction/ Projects	MassHighway projects will continue to be designed and constructed in accordance with all applicable state and federal environmental regulations or policy (e.g. Wetlands Protection Act, 404).	The Environmental Division reviews all projects at the 25% design stage to determine what environmental permits are required. The District Environmental Engineer or equivalent District construction staff person attends all pre-construction meetings with the selected contractor to review permit requirements for the project.	The process of design review and pre-construction coordination will continue.
4E	MassHighway Storm Water Handbook	Environmental/ Construction/ Projects	Design projects in urbanized areas in compliance with Handbook	MassHighway requires that all new construction and redevelopment activities undertaken by MassHighway, or by others that are funded in whole or in part by MassHighway, comply with the Handbook.	MassHighway will require that all new construction and redevelopment activities undertaken by MassHighway, or by others that are funded in whole or in part by MassHighway, comply with the Handbook.
4F	Standard Specification for Highway and Bridges	Environmental/ Construction/ Projects	Continue to include erosion and pollution prevention controls in construction contracts.	Inclusion of such controls is standard practice for construction contracts issued by MassHighway.	Such controls will continue to be included in construction contracts issued by MassHighway.
4G	MassHighway Research Needs Program	Environmental/ Construction	Continue support of the NETC research committees. Continue to pursue applicable research projects.	The research committees that MassHighway was participating in have ended.	MassHighway will look for new opportunities to participate in research projects as applicable.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4H	Pre-Construction Meeting Review of NPDES Construction GP requirements	District Environmental Staff/ Construction	District Environmental Staff Review NPDES requirements at the applicable pre-construction meetings. These meetings include outlining the requirements of the Construction General Permit and identify the roles and responsibilities of MassHighway and the Contractor.	MassHighway reviews the NPDES Construction GP requirements with Contractors at the pre-construction meeting.	MassHighway will continue to review the NPDES Construction GP requirements with Contractors at the pre-construction meeting.
4I	Contract Bid Item and Special Provision for Storm Water Pollution Prevention Plans (SWPPPs)	Construction Division/ Contracts	Prepare a Contract Bid Item and Special Provision for inclusion in construction contracts to be advertised for bids which exceed the one-acre disturbance threshold.	Measurable goal complete.	The Bid Item/Special Provision will be reviewed and revised as needed. Consideration will be given to requiring the use of the electronic SWPPP Template recently produced by EPA.
4J	Field Guide on Erosion Prevention and Sediment Control	Construction Division/ Chief Engineer	Prepare field guide and issue to Resident Engineers	State Guide development is 90% complete.	Final completion and circulation for internal approvals will be completed in Permit Year 5, pending Notice to Proceed on additional consultant contract.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4K	Storm Water Pollution Prevention Plan (SWPPP) Guidance Manual for Contractors	Construction Division/ Districts	Prepare a SWPPP Guidance for Contractors document on MassHighway construction projects. Implement use of the document on all appropriate MassHighway projects. Once contractors begin to use the document, it may be revised if necessary to address input received internally and from agencies. Ultimately the document will be converted into a computer program.	Measurable goal complete. Guidance document to SWPPP reviewers has been circulated to Contractors for assistance in preparing documents.	In association with revisions to Bid Item/Special Provision (BMP-4I), language will be added to the Item referencing the EPA publication " <i>Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites (Interim)</i> " published in January 2007 and including the requirement that the SWPPP shall be developed in accordance with the guidance document.
4L-1	Training	Construction Division	Conduct annual Erosion Prevention and Sediment Control Training for MassHighway Construction Personnel.	Resident Engineer (REs) erosion control/ stormwater training sessions were provided this winter. In total 176 REs attended training this winter, with additional classes scheduled for early spring as shown below to accommodate those who were unable to attend the initial sessions: District 1 2/28/07 40 attendees District 2 scheduled for 5/2 and 5/3 District 3 3/15/07 36 attendees (second session scheduled for May 07) District 4 9/21/06 24 attendees 18 attendees (third session scheduled for May 07) District 5 2/26/07 58 attendees	MassHighway will include training on Erosion Prevention and Sediment Control in the annual training seminars given each winter.

9/27/07

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4L-2	Non-Traditional Erosion Control Specifications	Landscaping/ Construction Division	Develop specifications for non-traditional erosion controls and evaluate research being conducted by other state DOTs that can be accepted by MassHighway Research and Materials Section.	Special provisions have been developed for individual case projects using composted wood mulch berms or burlap-wrapped tubes in lieu of haybales for wetland area protection, per request of Town Conservation Commission. Successful project application will help advance to list of erosion and sedimentation control strategies. In addition, MHD has commented to ACOE draft wetland mitigation guidelines recommending use of composted organics as potential organic amendment for wetland soils.	Evaluate application of alternatives on specific construction projects. Seek opportunities for use on other projects.
4M	Erosion and Sediment Control Field Tests	Construction Division/ Districts/ Landscaping	Perform field tests of new erosion and sediment control materials on MassHighway projects. Create and distribute memo internally summarizing materials effectiveness and recommended use.	MassHighway participated in a research proposal on Characterization of Compost for Erosion and Sediment Control. The project involves evaluation of leachate from compost (no biosolids) and was conducted by UMass, under the direction of MA DEP and MHD. Testing was conducted on various types of compost/wood waste to determine what, if any, leachable constituents are generated and at what levels. Study nearing completion, with published results expected by the end of 2007.	Distribute memo regarding findings. Pending results, including DEP evaluation, expanded use of composted wood chip material for field trials or project application on case-by-case basis.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4N	Construction Bulletins	Construction Division	Issue annual construction bulletins to each District regarding storm water issues.	A notice was issued to all District Construction Engineers on 11/22/06 regarding winter stabilization requirements for active construction sites and sites to be shut down for the winter. Topics covered included waste removal (asphalt piles, debris, etc.), esc maintenance, cofferdams and work in water issues, permit expirations, storage of construction vehicles and leak prevention. On 03/30/2007, the District Construction Engineers were notified that all projects should be inspected for winter damage to erosion controls, debris, etc. and esc repaired/maintained in anticipation of spring rainstorms.	A series of Construction bulletins will be developed on topics reflecting esc issues that were common during the past several years, including concrete truck washouts and protection/stabilization of steep slopes.
4O	Solicit Construction Activity Feedback from Public	Construction Division/IT	Maintain MassHighway web site to include contact information for ongoing construction activities. Respond to concerns submitted in a timely manner.	MassHighway maintained their website to include contact information for ongoing construction activities. MH responded to concerns submitted in a timely manner.	MassHighway will continue to maintain their website to include contact information for ongoing construction activities. MH will respond to concerns submitted in a timely manner.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
4P	Construction Runoff Control Enforcement	Construction Division/ Districts	Non-compliance with the CGP and SWPPP as well as non-compliance with any applicable environmental permits will be addressed through the District Construction personnel and District Highway Director and can include monetary penalties where included in contracts and deductions or delays in payment, when warranted.	Quality assurance inspections were completed on active construction projects by the Boston Construction office and by the District Environmental staff.	The annual report will identify the number of notices (if any) of non-compliance received from federal, state and local regulatory agencies and summarize actions taken.
4Q	Standard Practices Memo	Construction Division	MassHighway will prepare and issue a Standard Practices memo to Construction Engineers on the protocol for Illicit Discharge Detection and Elimination during construction projects.	A separate SOP for construction was not developed. The District Construction offices were provide with a memo dated June 16, 2006 regarding the procedures to follow on discovery of any illicit discharges during construction. Winter RE training included discussion of the policy and procedures to follow (BMP 3E). A separate SOP is not warranted	No further action warranted.

5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
5A	MassHighway Storm Water Handbook	Environmental	Secure DEP ratification for MassHighway Storm Water Handbook.	Measurable goal complete.	Measurable goal complete.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
5B	MassHighway Roadway Maintenance Program	Maintenance	Continue to implement MassHighway maintenance program.	MassHighway continues to conduct maintenance on its roadways.	MassHighway will continue to conduct maintenance on its roadways.
5C	Technology Acceptance and Reciprocity Partnership (TARP)	TARP	Continue to participate in TARP program.	MassHighway staff did not participate in these meetings. Instead MassHighway participated in proprietary system sub-committee meetings sponsored by MA DEP as part of the SW Policy update. The meetings included developing protocols for analyzing field and lab tests of the systems. TARP was discussed at these meetings.	No TARP Meetings planned but will continue to work with DEP on the proprietary system sub-committee.
5D	Stormwater Innovative Technology Evaluators (SITEs)	SITEs	Continue to participate in SITEs Committee which evaluates innovative BMPs.	Program has become inactive.	If program begins again, MassHighway will participate.
5E	Highway Runoff Contaminant Model	Env. Div. Consultant	Develop and calibrate contaminant loading model.	Two more USGS sites were added to the sampling network for a total of 12 sites along 8 highways.	Next quarter, water samples will be collected at 7 sites along 4 highways. Continuous records will be collected at all 12 sites. Continue to work on new data set that will be used in the calibration of the Federal Highway model, which is under development and near completion. Model to be completed by December 2008.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
5F-1	BMP Maintenance Manual	Environmental/ Maintenance	Develop BMP Maintenance Manual to be used as a field guide by maintenance personnel.	MassHighway has not begun work on the maintenance manual.	MassHighway will solicit input from district maintenance staff on the format for the manual. MassHighway will develop the maintenance manual by the end of the year.
5F-2	BMP Maintenance Manual	Environmental/ Baystate Roads/ MTAP	Provide training on the BMP Maintenance Manual.	MassHighway has not begun work on the maintenance manual.	No action is proposed regarding training. Training will be provided once the manual is finalized. Estimated 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
5G	Right of Way Parcel Evaluation	Environmental	Develop and implement a program of evaluating parcels which are candidates for disposal by MassHighway for their potential in siting storm water BMPs.	<p>MassHighway has developed and will implement a methodology for evaluating candidate parcels for their storm water management potential. Four parcels were retained for stormwater management during this permit year including:</p> <ol style="list-style-type: none"> 1. Sohier Road in Haverhill – MH determined parcel was desirable for storm water treatment from adjacent roadway (Rt. 128 & Brimbal Ave.) 2. Rte 1 Off Ramp to Rte 128 in Dedham- MH determined that the parcel needed to be retained since it contained drainage swale and CB for MH runoff. 3. Rte 125 Connector in Haverhill – MH determined that the drainage swale portion of the property should remain MH property. 4. Rte 1 & Rte 128 and Rte 1 & elm Street in Dedham – MH determined that the property be retained since it contains drainage structures for MH runoff. 	Continue to implement methodology.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
5H-1	Post Construction Runoff Enforcement-Illicit Discharge Prohibition Policy	Commissioner/ Legal/ Environmental	As part of its SWMP, MassHighway will not allow flows that do not meet NPDES conditions to be added to or remain connected to its drainage system. This approach will be enforced through referrals to the Attorney General.	No illicit discharges were identified this year which required enforcement to remove.	Enforce Illicit Discharge Prohibition Policy.
5H-2	Post Construction Runoff Enforcement- Drainage Tie-In Policy	Commissioner/ Legal/ Environmental/ Districts	Develop permitting process for adjacent properties which would like to tie into MH drainage system. Implement program and summarize actions taken under program in annual report.	Internal draft of Drainage Tie-In SOP is being finalized and reviewed by permit engineers.	Finalize Drainage Tie-In SOP. Submit to Chief Engineer for signature and issuance to Department. MassHighway will be finalizing a set of regulations that pertain to the issuance of permits under C.81, S. 21. This will include the rules governing drainage tie-ins.
5H-3	Post Construction Runoff Enforcement- Offsite Pollution to MH Drainage System	Commissioner/ Legal/ Environmental	Runoff not meeting the NPDES MS4 requirements which is reaching the MH MS4 and is not covered under 5H-1 or 5H-2 may be considered trespassing and referred to the AG’s office by MassHighway counsel at the DHD’s discretion.	No post construction runoff enforcement which met this requirement was necessary during Permit Year 4.	MassHighway will continue to follow these requirements, when necessary.



6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6A-1	Source Control	Project Clean/ Operations	Continue to support Project Clean.	MassHighway continues to support this program.	MassHighway will continue to support this program.
6A-2	Source Control	Adopt-a-Highway/ Operations	Continue to support Adopt-a-Highway program.	MassHighway continues to support this program.	MassHighway will continue to support this program.
6A-3	Source Control	Environmental/ Districts	Continue to support De-icing and Reduced Salt Areas Programs.	<p>MassHighway will continue to support the De-icing and Reduced Salt Areas Programs. Approximately 25% of deicer used in Winter 2007 was derived from alternative technology.</p> <p>8 new salt complaints received as part of Salt Remediation Program for period from 4/06-3/07.</p> <p>The following locations are where well replacements were attempted or connected from the period 4/06-3/07: -Yvon, 239 Otis Road, Blandford; -Hardaker, 999 West Street, Barre; -Hunt, 702 South Main Street, Orange; -Longtine, 3121 Boston Road, Wilbraham;</p> <p><i>(continued below)</i></p>	<p>MassHighway will continue to support the De-icing and Reduced Salt Areas Programs.</p> <p>Pilot-test of corrosion inhibited magnesium chloride along a section of I-95. Continue expanded use of calcium chloride, anti-icing and pre-wetting.</p> <p>Continue data collection at 11 residences. Implement remedial action (water treatment or well replacement) at 2-3 residences and possibly 1 public water supply.</p>

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6A-3 cont'd				<p>-Wildwood Lounge, 64 West Main Street, Upton; -Carozza, 334 Middleton Road, Boxford; -French, 5 Rowley Court, Boxford; -Galarneau (connect), 4 Roberts Road, Boxford; -Shapiro, 3 Titus Lane, Boxford; -Tritt, 29 Roberts Road, Boxford; -Tremblay, 138 Singletary Avenue, Sutton; -Michaud, 29 Woronoco Road, Blandford; -Barnicle (connect), 361 Petersham Road, New Salem; -Erickson (connect), 464 Boston Road, Groton; and -Hibbert (connect), 474 Boston Road, Groton.</p> <p>MassHighway and UMass produced a snow spreader calibration DVD. It is a ten minute video which shows towns how to calibrate their spreaders to reduce salt and sand use. MassHighway distributed it to all MA municipal highway departments, all LTAP centers in the country that get snow and internally.</p>	No activity planned.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6A-4	Source Control	HELP/ Operations	Continue to support Highway Emergency Locator Program (HELP).	MassHighway continues to support this program.	MassHighway will continue to support this program.
6A-5	Source Control	Environmental	Continue development of Vegetation Management Plan (VMP)	<p>2006 Yearly Operational Plan was prepared in March 2006 and delivered to Boston for printing. Three copies of the YOP were delivered to DAR in April of 2006 and the plan was approved in June 2006. Measurable goal complete, except for YOP being posted online.</p> <p>2007 Yearly Operational Plan has been prepared and printed and submitted to Boston IT for online posting – awaiting approval by Commissioner to post on-line.</p>	Receive plan approval from Commissioner for 2007 YOP. Post 2007 YOP on MassHighway web site. Prepare 2008 Yearly Operational Plan in March 2008.
6A-6	Source Control	Planning	Continue to support MassHighway HOV program.	MassHighway continues to support this program	MassHighway will continue to support this program.
6A-7	Source Control	Planning	Continue to support alternative transportation through technical funding and assistance.	MassHighway continues to support this program.	MassHighway will continue to support this program.
6A-8	Source Control	Highway Design	Continue to support highway safety through safety design standards, hazard signage and electronic variable message signs, and rumble strips.	MassHighway continues to support this program.	MassHighway will continue to support this program.
6A-9	Source Control	Environmental	Continue support of Toxics Use Reduction (TURA) program.	MassHighway continues to support this program.	MassHighway will continue to support this program.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6B-1	Employee Training	MTAP/ Baystate Roads	Continue to support MTAP and Baystate Roads program.	MassHighway continues to support these programs. Specific programs sponsored by these programs are discussed in BMP 1D-1 and 1D-2.	MassHighway will continue to support these programs.
6B-2	Employee Training	Environmental	Continue Facility Handbook Training	<p>Trainings were provided in each of the districts this winter. Training included discussion of the following topics:</p> <ul style="list-style-type: none"> • Environmental Compliance Management • Hazardous Materials and Waste Management • Universal Waste Management • Asbestos Containing Material • Solid Waste Management • Roadside Issues • Water Quality • Natural Resources Protection • Record Keeping • Environmental Inspections and Audits • Emergency Response for Hazardous Materials spills • MassHighway Standards Operation Procedures (SOPs) • A review of common compliance issues at MassHighway facilities <p><i>(continued below)</i></p>	MassHighway will again provide annual training to maintenance facility personnel regarding good housekeeping practices and spill prevention in Permit Year 5.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6B-2 cont'd				<p>District 1: On 3/1/07, MH staff provided Environmental Awareness training to 51 maintenance personnel.</p> <p>District 2: On 11/28/06 and 2/13/07, MassHighway staff provided Environmental Awareness Training to 62 District employees.</p> <p>District 3: On 10/31/06, 11/8/06, and 12/14/06, MH staff provided Environmental Awareness Training to 58 MassHighway staff.</p> <p>District 4: On 10/24/06, 10/25/06, 11/2/06, 11/8/06, 11/9/06, and 11/10/06 MH staff provided Environmental Awareness training to 138 MassHighway staff.</p> <p>District 5: On 11/14/06, 11/20/06, 11/21/06, and 12/7/06, training was provided to 99 MassHighway staff on the MassHighway Illicit Discharge Policy. Illicit connection detection and procedures for report findings were covered.</p>	

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6B-3	Employee Training	Highway Operations	Continue Snow and Ice Program Training.	<p>Snow and Ice Training was held for each of the 5 districts for a total of 15 Classes held in October. Topics covered included operations, correct application techniques, environmental impact, and MassHighway Policy.</p> <p>Snow and Ice Tailgate Training held at 10 locations across the Eastern part of Massachusetts in November. 150 people attended in total including MassHighway, Contractors and Local Municipal Agents. Topics covered included impact of operations on the environment and over-application of materials.</p>	MassHighway will again provide annual training on the latest techniques, equipment and material available for snow and ice removal.
6B-4	Employee Training	Highway Operations	Continue equipment and vehicle safety training.	These topics were covered at meetings summarized in BMP 6B-3 above.	MassHighway will again provide annual training on equipment and vehicle safety.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6C-1	Maintenance	Districts	Continue maintenance activities for storm water system.	<p>MassHighway continued to maintain the highway system through catch basin cleaning contracts, street sweeping and regular drainage system maintenance.</p> <p>MassHighway has a resurfacing project currently underway along Route I-190 in the Towns of West Boylston, Sterling and Holden (project no. 602742). This project includes a significant amount of drainage system maintenance and restoration work. There are over 40 detention/water quality basins located within project limits. Areas around all of the basins were cleared and grubbed. At the request of the DCR, maintenance roads were restored to facilitate access to these structures in the event of a hazardous material release.</p> <p>As of January 20, 2007, 2,871 cubic yards of basin sediment and 383 cubic yards of drainage structure sediments were removed and disposed of. Furthermore, over 21,053 linear feet of drainage pipe has been jetted and 29,751 square yards of paved waterways cleaned.</p>	<p>MassHighway will continue to maintain the highway system through catch basin cleaning contracts, street sweeping and regular drainage system maintenance.</p> <p>Complete I-190 project and include summary in annual report.</p>

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6C-2	Maintenance	Districts	Continue maintenance activities and practices discussed in Environmental Facility Handbooks for maintenance/material storage yards.	MassHighway continues to maintain environmental compliance at their maintenance facilities by employing MassHighway’s EMS system and in accordance with each facility’s Environmental Facility Handbook.	MassHighway will continue to maintain environmental compliance at their maintenance facilities by complying with each facility’s Environmental Facility Handbook.
6D	Waste Disposal	Districts	Continue proper waste disposal practices.	MassHighway and its contractors continue to properly dispose of waste.	MassHighway and its contractors will continue to properly dispose of waste.
6E	Good Housekeeping/ Pollution Prevention Program Evaluation	Environmental	Evaluate existing Maintenance Programs to determine additional or revised activities, which would increase effectiveness and usefulness of the programs.	MassHighway is evaluating Maintenance Programs through many of the other BMPs described in this program. The outcome of these programs (e.g. CB Accumulation Study, etc.) and proposed Maintenance Activity Tracking Program proposed for use in watersheds with approved TMDLs will provide additional measures towards good housekeeping and pollution prevention for maintenance.	Review Waste Disposal. Evaluate program to determine if additional storm water BMPs can be integrated.



BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
6-F	Catch Basin Accumulation Project	Environmental/Maintenance/Districts	Collect data for three years on the accumulation of debris for representative areas, and determine if the current inspection and cleaning schedule should be altered for particular areas. The schedule will target areas that are in greatest need of cleaning, with an emphasis on locations with sensitive receiving waters, while corresponding to MassHighway's limited maintenance budgets.	MassHighway began monitoring in October 2006.	MassHighway and its consultant will develop a six month qualitative analysis of the monitoring in May 2007. In November 2007, a Year 1 Data Summary Report will be developed and will review the first year of results.



7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) <<if applicable>>

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
7A	Wetland Protection Act (WPA) Compliance	Environmental	Continue to comply with MESA as required by the WPA.	Continue to comply with MESA as required by the WPA.	Continue to comply with MESA as required by the WPA.
7B	401 Water Quality Certification	Environmental	Continue to comply with MA 401 Water Quality Certification Regulations.	Continue to comply with MA 401 Water Quality Certification Regulations.	Continue to comply with MA 401 Water Quality Certification Regulations.
7C	CE Checklist	Environmental	The checklist includes determining if the site is in an area where there are federally listed endangered species or critical habitat and historic properties.	Complete this checklist at 25% design stage for project that receives federal funds.	Complete this checklist at 25% design stage for project that receives federal funds.
7D	Environmental Site Data Form	Environmental/ Construction	MassHighway has prepared this form to review potential impacts of a project to a variety of resource areas as part of compliance with the NPDES Construction and MS4 general permit. This form includes review of discharges for potential impact to, ORWs, sensitive areas, endangered species and impaired waters, waterbodies with approved TMDLs.	A draft form has been developed and is being reviewed internally.	Finalize form and begin to implement at 25% design stage.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 4	Planned Activities – Permit Year 5
7E	TMDL Recommendation Summary Table Update	Environmental	Update table to Include TMDL reports finalized within the previous year and progress on implementation of any related measurable goals in annual report each year.	See attached table with description of measures to meet TMDL recommendations.	Continue to review draft and new TMDL reports and implement TMDL recommended activities when possible.
7F – 7Q	TMDL Specific Recommendations	See NOI		Comply with TMDL recommendations in attached table.	
8A	Cultural Resources Review	Cultural Resources Department	Review projects for impacts to historic properties at the 25% Design Stage. If a potential impact is found, the Dept. works with the designer and MHC to alter the design to mitigate or prevent adverse effects.	Measurable goal met. There have been no instances during the past year where storm water impacts have adversely affected any National Register-listed or eligible parties.	Continue to review projects for impacts to historic properties at the 25% Design Stage. If a potential impact is found, the Dept. works with the designer and MHC to alter the design to mitigate or prevent adverse effects.



7b. WLA Assessment

Projects within a watershed with an approved TMDL are most likely subject to the Wetlands Protection Act (WPA). MassHighway projects which are subject to the WPA strive to meet the WPA's Stormwater Policy to the greatest extent possible. Meeting the requirements of the Stormwater Policy should provide sufficient water quantity and quality controls to reduce pollutant loading to the impaired waterbodies. The attached table tracks the projects within approved TMDL watersheds and summarizes the controls implemented to meet the TMDL requirements. New design and construction projects which are proposed within a TMDL watershed will incorporate measures to meet the TMDL requirements.

Part IV. Summary of Information Collected and Analyzed

MassHighway did not implement any programs which collect or analyze information during Permit Year 4.

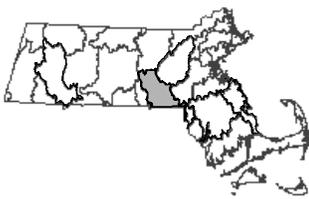
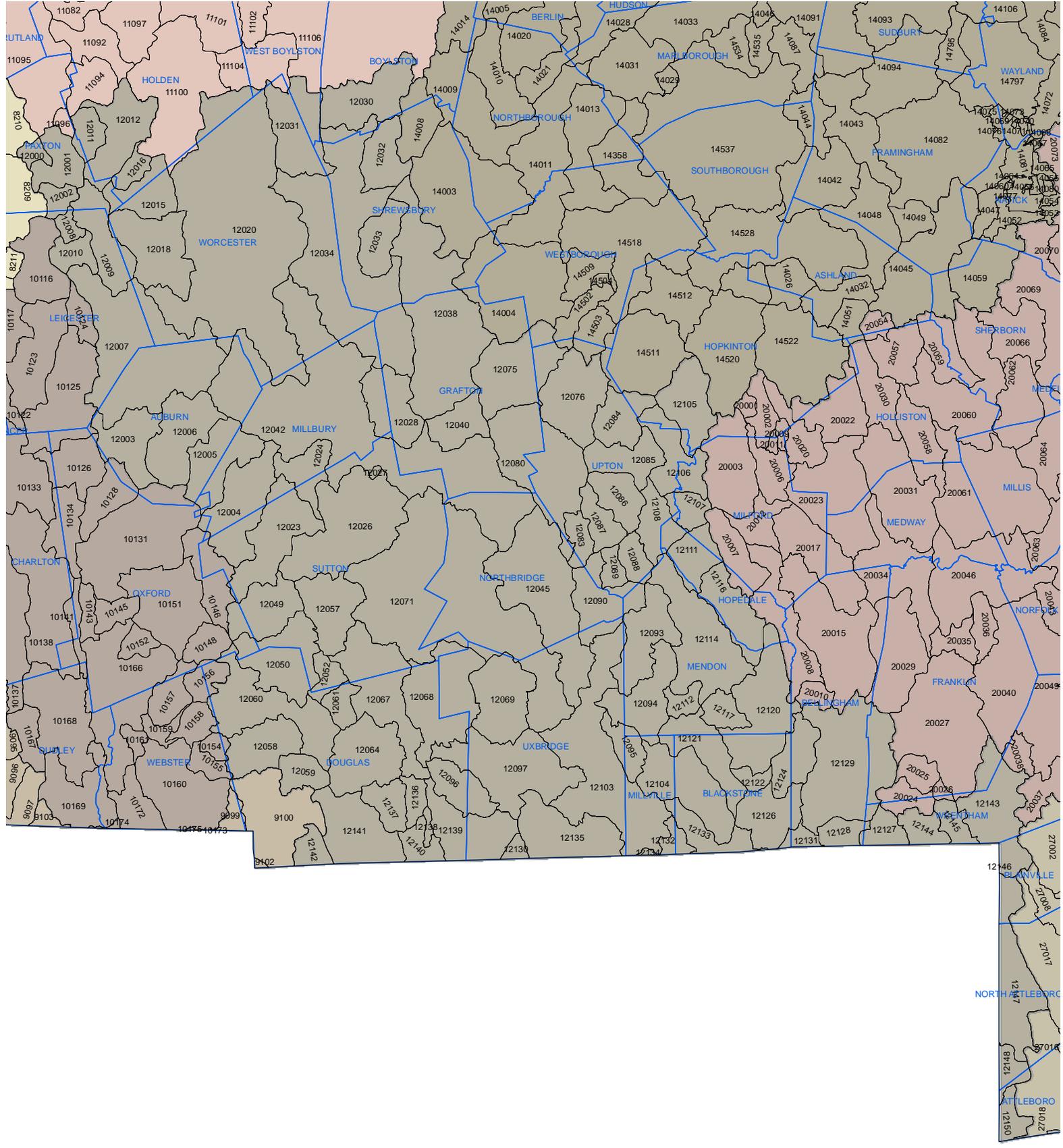
Part V. Program Outputs & Accomplishments (OPTIONAL)

MassHighway's accomplishments during the fourth permit year are summarized in Part 1- 4 of this annual report.



Appendix A: Updated Outfall Inventory Table

**Table A: Receiving Waterbodies for MassHighway
Urbanized Area Road Runoff**



Appendix A
Sub-Basin
Identification Maps:
BLACKSTONE

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12001	1.03	Unknown	Kettle Brook Reservoir No. 4	MA51082_2002		
12002	0.06	Unknown	Kettle Brook	MA51-19_2002		
			Kettle Brook Reservoir No. 3	MA51081_2002		
			Kettle Brook Reservoir No. 4	MA51082_2002		
12003	1.78	Unknown	Dark Brook Reservoir	MA51035_2002		
			Tinker Hill Pond	MA51036_2002		
				MA51167_2002		
12005	0.22	Unknown	Pondville Pond	MA51120_2002		
			Ramshorn Brook			
			Stone Brook			
12006	15.45	Unknown	Auburn Pond	MA51004_2002		
			Dark Brook	MA51-16_2002	X	-Cause Unknown
			Eddy Pond	MA51043_2002		
			Pondville Pond	MA51120_2002		
12007	8.49	Unknown	City Pond	MA51021_2002		
			Dark Brook	MA51-16_2002	X	-Cause Unknown
			Kettle Brook	MA51-01_2002	X	-Cause Unknown -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Pathogens
			Kettle Brook Reservoir No. 1			
			Kinnear Brook			
			Leesville Pond	MA51087_2002		
			Lynde Brook			
			Lynde Brook Reservoir	MA51090_2002		
			Smiths Pond	MA51156_2002	X	-Turbidity [5/2/2002-CN070.1]
			Stoneville Pond	MA51160_2002		
			Stoneville Reservoir	MA51161_2002		
			Waite Pond	MA51170_2002	X	-Metals
12009	1.17	Unknown	Lynde Brook			
			Lynde Brook Reservoir	MA51090_2002		
			Southwick Pond	MA51157_2002	X	-Noxious aquatic plants [5/2/2002-CN070.1]
12015	0.15	Unknown	Cook Pond	MA51027_2002		
			Holden Reservoir 2	MA51064_2002		
			Tatnuck Brook	MA51-15_2002	X	-Cause Unknown -(Other habitat alterations*) -Turbidity -(Objectionable deposits*)
12018	1.35	Unknown	Coes Reservoir	MA51024_2002		
			Patch Reservoir	MA51118_2002		
			Smith Pond			
			Tatnuck Brook	MA51-15_2002	X	-Cause Unknown -(Other habitat alterations*) -Turbidity -(Objectionable deposits*)

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12020	40.52	Unknown	Beaver Brook	MA51-07_2002	X	-Cause Unknown -(Other habitat alterations*) -Pathogens -(Objectionable deposits*)
			Bell Pond	MA51009_2002		
			Blackstone River	MA51-03_2002	X	-Unknown toxicity -Priority organics -Metals -Unionized Ammonia -Chlorine -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Suspended solids -Turbidity -(Objectionable deposits*)
			Coes Reservoir	MA51024_2002		
			Crystal Pond			
			Curtis Ponds	MA51032_2002		-Siltation -Noxious aquatic plants [5/2/2002-CN070.1]
			Green Hill Pond	MA51033_2002	X	
			Indian Lake	MA51056_2002	X	-Turbidity [5/2/2002-CN070.1]
				MA51073_2002	X	-Organic enrichment/Low DO [6/28/2002-CN116.0] -Noxious aquatic plants [6/28/2002-CN116.0]
			Kettle Brook	MA51-01_2002	X	-Cause Unknown -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Pathogens
			Middle River	MA51-02_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -pH -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Turbidity -(Objectionable deposits*)
			Salisbury Pond	MA51142_2002	X	-Taste, odor and color -Noxious aquatic plants [6/28/2002-CN114.0] -Turbidity [6/28/2002-CN114.0]
			Unnamed Tributary	MA51-08_2002	X	-Priority organics -Metals -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Oil and grease -Taste, odor and color -Suspended solids -Turbidity -(Objectionable deposits*)
						Weasel Brook
12024	2.14	Unknown	Brierly Pond	MA51010_2002		
			Mayo Pond			
			Shiner Hole			
			Singletary Pond	MA51152_2002		
			Slaughterhouse Pond			

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12026	0.74	Unknown	Aldrich Pond	MA51002_2002	X	-Noxious aquatic plants -(Exotic species*)
			Bond Hollow Swamp			
			Casey Brook			
			Cedar Swamp			
			Clark Reservoir	MA51022_2002		
			Cold Spring Brook			
			Girard Pond	MA51053_2002		
			Marble Pond	MA51093_2002	X	
			Sibley Reservoir	MA51148_2002		
			Spring Brook			
Woodbury Pond	MA51185_2002	X	-Noxious aquatic plants -(Exotic species*)			
12030	0.91	Unknown	Pout Pond	MA51122_2002		
			Sewall Brook			
			Sewall Pond	MA51191_2002		
12031	0.50	Unknown	Spruce Pond			
			City Farm Pond	MA51020_2002	X	-Siltation -Noxious aquatic plants
12032	6.11	Unknown	Great Brook			
			Poor Farm Brook	MA51-17_2002		
12033	3.33	Unknown	Slocum Meadow			
			West Brook			
12034	17.35	Unknown	Meadow Brook			
			Peat Meadow			
			Brooklawn Parkway Pond	MA51195_2002		
			Burncoat Park Pond	MA51012_2002	X	-Noxious aquatic plants -Turbidity
			Flint Pond	MA51050_2002 MA51188_2002		
			Green Hill Pond			
			Hovey Pond	MA51068_2002		
			Jordan Pond	MA51078_2002	X	-Turbidity [5/2/2002-CN070.1]
			Lake Quinsigamond	MA51125_2002		
			Mill Pond	MA51105_2002	X	-Turbidity [5/2/2002-CN070.1]
			Newton Pond	MA51110_2002		
			Poor Farm Brook	MA51-17_2002		
			Quinsigamond River	MA51-09_2002		
Shirley Street Pond	MA51196_2002	X	-Noxious aquatic plants [5/2/2002-CN070.1]			
12038	9.17	Unknown	Axtell Brook			
			Big Bummet Brook			
			Hayes Pond	MA51060_2002	X	-Noxious aquatic plants -(Exotic species*)
			Lake Ripple	MA51135_2002	X	-Noxious aquatic plants -(Exotic species*)
			Pratts Pond	MA51124_2002		
			Quinsigamond River	MA51-09_2002		
			Summet Brook			
Windle Pond	MA51184_2002					
12040	1.45	Unknown	Fisherville Pond	MA51048_2002		
			Quinsigamond River	MA51-09_2002		

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12042	12.37	Unknown	Blackstone River	MA51-03_2002	X	-Unknown toxicity -Priority organics -Metals -Unionized Ammonia -Chlorine -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Suspended solids -Turbidity -(Objectionable deposits*)
				MA51-04_2002	X	-Unknown toxicity -Priority organics -Metals -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
			Broadmeadow Brook			
			Cronin Brook			
			Diversion Channel			
			Dorothy Brook			
			Dorothy Pond	MA51039_2002		
			Fisherville Pond	MA51048_2002		
			Hathaway Pond	MA51059_2002		
			Howe Pond	MA51069_2002		
			Howe Reservoirs	MA51070_2002		
				MA51071_2002	X	-Noxious aquatic plants [5/2/2002-CN070.1]
			Quinsigamond River	MA51-09_2002		
			Riverlin Street Pond	MA51137_2002		
			Slaughterhouse Pond	MA51153_2002		
			Woolshop Pond	MA51186_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12045	3.36	Unknown	Blackstone Canal Blackstone River	MA51-04_2002	X	-Unknown toxicity -Priority organics -Metals -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
				MA51-05_2002	X	-Unknown toxicity -Priority organics -Metals -Nutrients -pH -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
			Ellis Pond Mumford River	MA51-14_2002	X	-Metals -pH -Organic enrichment/Low DO -Pathogens
			Pout Pond Rice City Pond	MA51131_2002	X	-Priority organics -Siltation -Turbidity
			Riverdale Impoundment	MA51136_2002	X	-Priority organics -Turbidity
12057	0.32	Unknown	Dark Brook	MA51034_2002		
			Dark Brook Pond	MA51-13_2002		
			Mumford River Tuckers Pond	MA51169_2002		
12067	0.25	Unknown	Caswell Brook			
			Hunt Pond	MA51072_2002		
			Martin Street Pond	MA51095_2002		
			Mumford River	MA51-13_2002		
			Southwick Brook			
			Stevens Pond Weeks Pond	MA51159_2002		
12068	0.45	Unknown	Gilboa Brook Gilboa Pond	MA51052_2002	X	-Noxious aquatic plants -(Exotic species*)
			Hunt Pond			
			Lackey Pond	MA51083_2002		
			Mumford River	MA51-13_2002 MA51-14_2002	X	-Metals -pH -Organic enrichment/Low DO -Pathogens
12069	0.03	Unknown	Cold Spring Brook			
			Farrell Brook			
			Rivulet Pond	MA51138_2002		

Table A1. Blackstone Basin

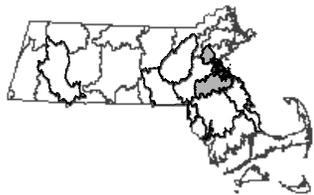
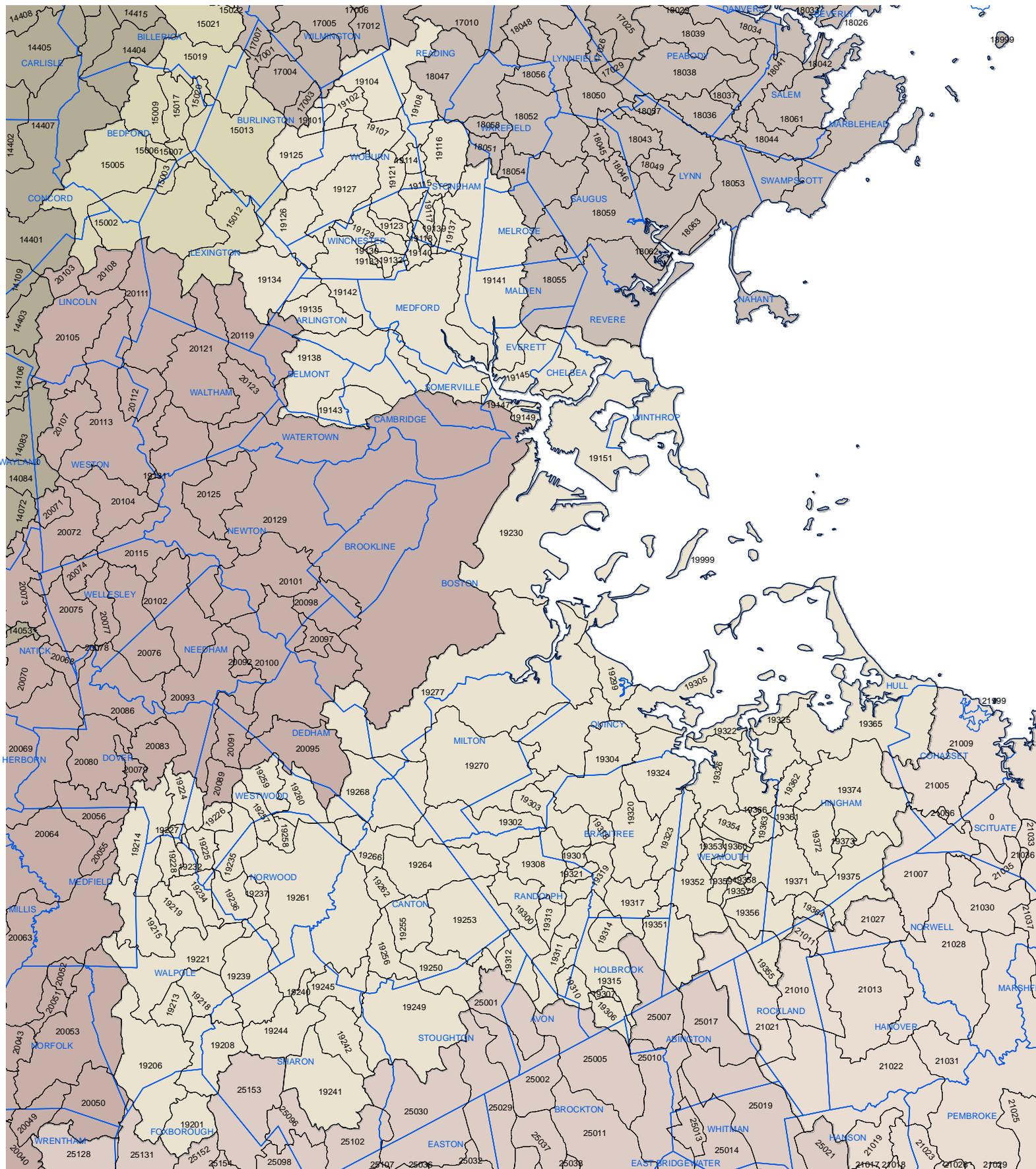
Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12071	4.44	Unknown	Allen Brook	MA51003_2002	X	-Noxious aquatic plants -(Exotic species*)
			Arcade Pond			
			Caprons Pond	MA51014_2002	X	-Noxious aquatic plants -(Exotic species*)
			Carpenter Reservoir	MA51015_2002		
			Fish Pond	MA51047_2002		
			Linwood Pond	MA51088_2002		
			Meadow Pond	MA51193_2002	X	-Noxious aquatic plants -(Exotic species*)
			Mumford River	MA51-14_2002	X	-Metals -pH -Organic enrichment/Low DO -Pathogens
			Purgatory Brook	MA51128_2002		
			Reservoir No. 4			
			Reservoir No. 5			
			Reservoir No. 6	MA51134_2002	X	-Turbidity
			Riley Pond			
			Rivulet Pond	MA51164_2002		
Smith Pond						
Steamburg Brook						
Swans Pond						
Whitin Pond	MA51178_2002					
Whitins Pond	MA51180_2002					
12075	0.75	Unknown	Cider Millpond	MA51019_2002		
12080	2.29	Unknown	Miscoe Brook			
			Baker Pond	MA51019_2002		
			Cider Millpond			
			Lake Wildwood	MA51181_2002	X	-pH -Organic enrichment/Low DO -Pathogens
			Silver Lake	MA51151_2002		
			Warren Brook			
West River	MA51-11_2002	X	-pH -Organic enrichment/Low DO -Pathogens			
				MA51-12_2002	X	-Metals -Nutrients -pH -Organic enrichment/Low DO -Salinity/TDS/chlorides
			Zachary Pond			
12086	0.84	Unknown	Center Brook			
12093	0.37	Unknown	Long Meadow			
			Rock Meadow Brook			
12097	0.01	Unknown	Bazely Pond	MA51008_2002		
			Doctors Pond	MA51194_2002		
			Emerson Brook	MA51067_2002		
			Happy Hollow Brook			
			Houghton Pond			
			Joels Pond	MA51076_2002		
			Lee Pond			
			Lee Reservoir	MA51086_2002		
			Peabody Pond	MA51119_2002		
			Sawmill Pond			
Scadden Brook						

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12103	5.42	Unknown	Blackstone River	MA51-05_2002	X	-Unknown toxicity -Priority organics -Metals -Nutrients -pH -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
			Cedar Swamp Mansfield Pond Pout Pond West River	MA51121_2002 MA51-12_2002	X	-Metals -Nutrients -pH -Organic enrichment/Low DO -Salinity/TDS/chlorides
			West River Pond	MA51177_2002	X	-Noxious aquatic plants -(Exotic species*)
12104	0.30	Unknown	Blackstone River Crane Pond Fox Brook Reilly Pond	MA51030_2002		
12105	1.56	Unknown	Mill River	MA51-10_2002	X	-Priority organics -Metals
			North Pond	MA51112_2002		
12107	0.49	Unknown	Fiske Millpond	MA51049_2002	X	-Noxious aquatic plants -(Exotic species*)
			Little Field Pond Mill Pond Mill River	MA51102_2002 MA51-10_2002	X	-Priority organics -Metals
			Silver Hill Pond	MA51149_2002		
12108	0.22	Unknown	Hopedale Pond Mill River	MA51065_2002 MA51-10_2002	X	-Priority organics -Metals
12111	1.09	Unknown	Hopedale Pond Mill River	MA51065_2002 MA51-10_2002	X	-Priority organics -Metals
12114	0.30	Unknown	Muddy Brook Spring Brook			
12116	0.00	Unknown	Mill River	MA51-10_2002	X	-Priority organics -Metals
			Spindleville Pond	MA51158_2002	X	-Priority organics -Noxious aquatic plants
12120	0.34	Unknown	Duck Pond Fish Pond Mill River	MA51-10_2002	X	-Priority organics -Metals
12126	0.02	Unknown	Harris Pond	MA51058_2002	X	-Noxious aquatic plants -(Exotic species*)
			Mill River	MA51-10_2002	X	-Priority organics -Metals
12129	0.10	Unknown	Arnolds Brook Crystal Lake Curtis Pond Hoag Brook Jenks Reservoir Lakeview Pond Lily Hole Long Pond Peters River	MA51075_2002		
			Silver Lake	MA51150_2002	X	-Metals -Pathogens

Table A1. Blackstone Basin

Sub-basin ID	Mass Highway Road Miles In Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
12132	0.61	Unknown	Blackstone River	MA51-05_2002	X	-Unknown toxicity -Priority organics -Metals -Nutrients -pH -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
				MA51-06_2002	X	-Priority organics -Nutrients -pH -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
12133	1.28	Unknown	Blackstone River	MA51-06_2002	X	-Priority organics -Nutrients -pH -(Flow alteration*) -Pathogens -Taste, odor and color -Suspended solids -Turbidity
12135	0.33	Unknown	Aldrich Brook Bacon Brook Card Machine Brook Ironstone Reservoir	MA51074_2002		
12143	0.46	Unknown	Burnt Swamp Brook			
12147	1.98	Unknown	Abbott Run			
12150	2.59	Unknown	Sweedens Swamp			



Appendix A
Sub-Basin
Identification Maps:
BOSTON HARBOR

Table A2. Boston Harbor Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19102	1.86	15	Halls Brook Middlesex Canal			
19104	9.29	32	Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19107	4.14	31	Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19108	9.44	39	Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19114	2.58	18	Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19115	2.87	5	Whittemore Pond Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19117	0.66	5	Dark Hollow Pond Dixie Pond North Reservoir North Stream			
19121	0.09	0	Aberjona Pond Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19125	10.57	59	Whittemore Pond Cummings Brook Littles Brook			
19126	3.04	22	Shaker Glen Brook			
19127	1.67	11	Fowle Brook Horn Pond Sucker Brook	MA71019_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants

Table A2. Boston Harbor Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19129	0.53	4	Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*)
			Judkins Pond	MA71021_2002	X	-Pathogens -Nutrients -Organic enrichment/Low DO
			Mill Pond	MA71031_2002	X	-Pathogens -Organic enrichment/Low DO
			Wedge Pond	MA71045_2002	X	-Pathogens -Nutrients
			Winter Pond	MA71047_2002	X	-Noxious aquatic plants -Cause Unknown -Nutrients -Noxious aquatic plants -Turbidity
19134	3.55	7	Arlington Reservation Great Meadows Little Pond Mill Brook	MA71-07_2002	X	-(Other habitat alterations*) -Pathogens
19135	0.94	0	Munroe Brook Mill Brook	MA71-07_2002	X	-(Other habitat alterations*) -Pathogens
19137	0.80	1	Dark Hollow Pond Spot Pond			
19138	9.46	36	Alewife Brook	MA71-04_2002	X	-Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color -(Objectionable deposits*)
			Clay Pit Pond	MA71011_2002	X	-Pesticides
			Hills Pond Jerrys Pond Little Pond Spy Pond	MA71018_2002 MA71040_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -(Exotic species*)
19139	2.80	17	Dark Hollow Pond Dixie Pond			
19141	0.39	0	Buckman Pond Doleful Pond EII Pond	MA71014_2002	X	-Nutrients -Pathogens -Suspended solids
			Fellsmere Pond Malden River	MA71-05_2002	X	-Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color -Suspended solids -(Objectionable deposits*)
			Quarter Mile Pond			

Table A2. Boston Harbor Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19142	19.65	145	Aberjona River	MA71-01_2002	X	-Cause Unknown -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*)
			Alewife Brook	MA71-04_2002	X	-Pathogens -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color -(Objectionable deposits*)
			Bellevue Pond	MA71004_2002		
			Brooks Pond			
			Lower Mystic Lake	MA71027_2002	X	-Cause Unknown -Organic enrichment/Low DO -Salinity/TDS/chlorides -(Other habitat alterations*)
			Mill Brook	MA71-07_2002	X	-Pathogens -(Other habitat alterations*)
			Mystic River	MA71-02_2002	X	-Metals -Nutrients -Pathogens
			Quarter Mile Pond			
			Upper Mystic Lake			
			Wellington Marsh Wrights Pond			
19143	0.02	0	Blacks Nook	MA71005_2002	X	-Nutrients -Noxious aquatic plants
			Fresh Pond			
19145	2.61	86	Mystic River	MA71-03_2002	X	-Priority organics -Metals -Unionized Ammonia -Other inorganics -Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color
19147	0.65	15	Mystic River	MA71-03_2002	X	-Priority organics -Metals -Unionized Ammonia -Other inorganics -Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color
19149	0.06	0	Boston Inner Harbor	MA70-02_2002	X	-Priority organics -Pathogens
			Mystic River	MA71-03_2002	X	-Priority organics -Metals -Unionized Ammonia -Other inorganics -Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color

Table A2. Boston Harbor Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19151	19.84	44	Boston Harbor	MA70-01_2002	X	-Priority organics -Pathogens
			Boston Inner Harbor	MA70-02_2002	X	-Priority organics -Pathogens
			Chelsea River	MA71-06_2002	X	-Priority organics -Unionized Ammonia -Organic enrichment/Low DO -Pathogens -Oil and grease -Taste, odor and color -Turbidity -(Objectionable deposits*)
			Lewis Lake Lynn Harbor The Basin Winthrop Bay	MA93-23_2002 MA70-10_2002	X X	-Pathogens -Pathogens
19201	0.14	Unknown	Crackrock Pond	MA73010_2002		
			Neponset Reservoir	MA73034_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
			Neponset River	MA73-01_2002	X	-Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Suspended solids -Noxious aquatic plants -Turbidity
19206	4.97	Unknown	Cedar Swamp Mann Pond Neponset River	MA73-01_2002	X	-Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Suspended solids -Noxious aquatic plants -Turbidity
			Ruckaduck Pond			
19208	0.92	Unknown	Ganawatte Farm Pond	MA73037_2002	X	-Organic enrichment/Low DO -Noxious aquatic plants -Turbidity
19213	1.07	Unknown	School Meadow Brook	MA73-06_2002	X	-Pathogens [6/21/2002-CN121.0]
			Neponset River	MA73-01_2002	X	-Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Suspended solids -Noxious aquatic plants -Turbidity
			School Meadow Brook	MA73-06_2002	X	-Pathogens [6/21/2002-CN121.0]

Table A2. Boston Harbor Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19218	0.01	Unknown	Clark Pond Diamond Pond Memorial Pond	MA73008_2002 MA73012_2002	X	-Noxious aquatic plants -Turbidity
19221	1.48	Unknown	Rainbow Pond Bird Pond Cobbs Pond Mine Brook Neponset River	MA73002_2002 MA73009_2002 MA73-09_2002 MA73-01_2002	X X X X	-Priority organics -Noxious aquatic plants -Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity -(Exotic species*) -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Suspended solids -Noxious aquatic plants -Turbidity
			Plimpton Pond Turner Pond Unnamed Tributary	MA73058_2002 MA73-10_2002		
19230	38.00	40	Boston Harbor Boston Inner Harbor Dorchester Bay Frog Pond Neponset River Pleasure Bay	MA70-01_2002 MA70-02_2002 MA70-03_2002 MA73-04_2002 MA70-11_2002	X X X X X	-Priority organics -Pathogens -Priority organics -Pathogens -Priority organics -Pathogens -Suspended solids -Turbidity -Priority organics -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Turbidity -(Objectionable deposits*) -Priority organics -Pathogens
19234	0.29	Unknown	Bubbling Brook Pettee Pond Unnamed Tributary Willett Pond	MA73-11_2002 MA73-13_2002 MA73-14_2002 MA73062_2002	X X X	-Pathogens [6/21/2002-CN121.0] -Metals
19236	1.22	Unknown	Ellis Pond Germany Brook Hawes Brook Unnamed Tributary	MA73018_2002 MA73-15_2002 MA73-16_2002 MA73-14_2002	X X X	-Nutrients -pH -Pathogens [6/21/2002-CN121.0] -Taste, odor and color -(Objectionable deposits*) -Pathogens [6/21/2002-CN121.0] -Taste, odor and color [6/21/2002-CN121.0] -Objectionable deposits [6/21/2002-CN121.0]

Table A2. Boston Harbor Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19237	0.04	Unknown	Hawes Brook	MA73-16_2002	X	-Pathogens [6/21/2002-CN121.0] -Taste, odor and color [6/21/2002-CN121.0] -Objectionable deposits [6/21/2002-CN121.0]
			Neponset River	MA73-01_2002	X	-Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Suspended solids -Noxious aquatic plants -Turbidity
19239	5.87	Unknown	Traphole Brook	MA73-17_2002	X	-Pathogens [6/21/2002-CN121.0]
19244	0.09	Unknown	Beaver Brook	MA73-19_2002	X	-Cause Unknown -Organic enrichment/Low DO
19249	1.53	Unknown	Bolivar Pond	MA73005_2002	X	-Turbidity -(Exotic species*)
			Brittons Pond			
			Farringtons Pond			
			Muddy Pond			
			Pinewood Pond	MA73039_2002		
			Steep Hill Brook	MA73-18_2002		
			Town Pond	MA73056_2002		
			Unnamed Tributary	MA73-32_2002	X	-Cause Unknown -Nutrients -pH
			Woods Pond	MA73055_2002		
19250	0.98	3	Beaver Meadow Brook	MA73-20_2002	X	-Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0]
			Glen Echo Pond			
19253	3.10	16	Beaver Meadow Brook	MA73-20_2002	X	-Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0]
			Glen Echo Pond	MA73022_2002		
			Muddy Pond			
			Pequid Brook	MA73-22_2002	X	-Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0]
			York Brook			
19255	1.01	5	Pequid Brook	MA73-22_2002	X	-Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0]
			Reservoir Pond	MA73048_2002		
19257	0.09	Unknown	Fisher Meadow			
			Lymans Pond	MA73021_2002		
			Plantingfield Brook	MA73-23_2002		
19258	1.29	Unknown	Plantingfield Brook	MA73-23_2002		
19259	0.14	Unknown	Purgatory Brook	MA73-24_2002	X	-Pathogens [6/21/2002-CN121.0]
19260	7.30	18	Purgatory Brook	MA73-24_2002	X	-Pathogens [6/21/2002-CN121.0]

Table A2. Boston Harbor Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19261	13.60	13	East Branch	MA73-05_2002	X	-Cause Unknown -Metals -Organic enrichment/Low DO -Thermal modifications -(Flow alteration*) -Pathogens [6/21/2002-CN121.0]
			East Branch Neponset River			
			Neponset River	MA73-01_2002	X	-Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Suspended solids -Noxious aquatic plants -Turbidity
				MA73-02_2002	X	-Priority organics -Metals -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Oil and grease -Turbidity -(Objectionable deposits*)
			Plantingfield Brook	MA73-23_2002		
			Purgatory Brook	MA73-24_2002	X	-Pathogens [6/21/2002-CN121.0]
			Traphole Brook	MA73-17_2002	X	-Pathogens [6/21/2002-CN121.0]
			Unnamed Tributary	MA73-33_2002	X	-Nutrients -Pathogens -Taste, odor and color
19264	2.37	22	Duck Pond			
			Ponkapoag Pond	MA73043_2002		
			Ponkapog Brook	MA73-27_2002	X	-Pathogens [6/21/2002-CN121.0]
19266	0.45	2	Neponset River	MA73-02_2002	X	-Priority organics -Metals -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Oil and grease -Turbidity -(Objectionable deposits*)
			Pecunit Brook	MA73-25_2002		
			Ponkapog Brook	MA73-27_2002	X	-Pathogens [6/21/2002-CN121.0]
19268	5.34	37	Hemenway Pond			
			Neponset River	MA73-02_2002	X	-Priority organics -Metals -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Oil and grease -Turbidity -(Objectionable deposits*)
			Sprague Pond	MA73053_2002		

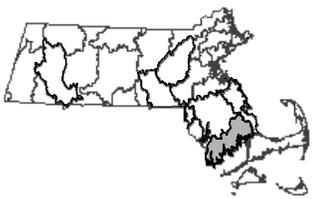
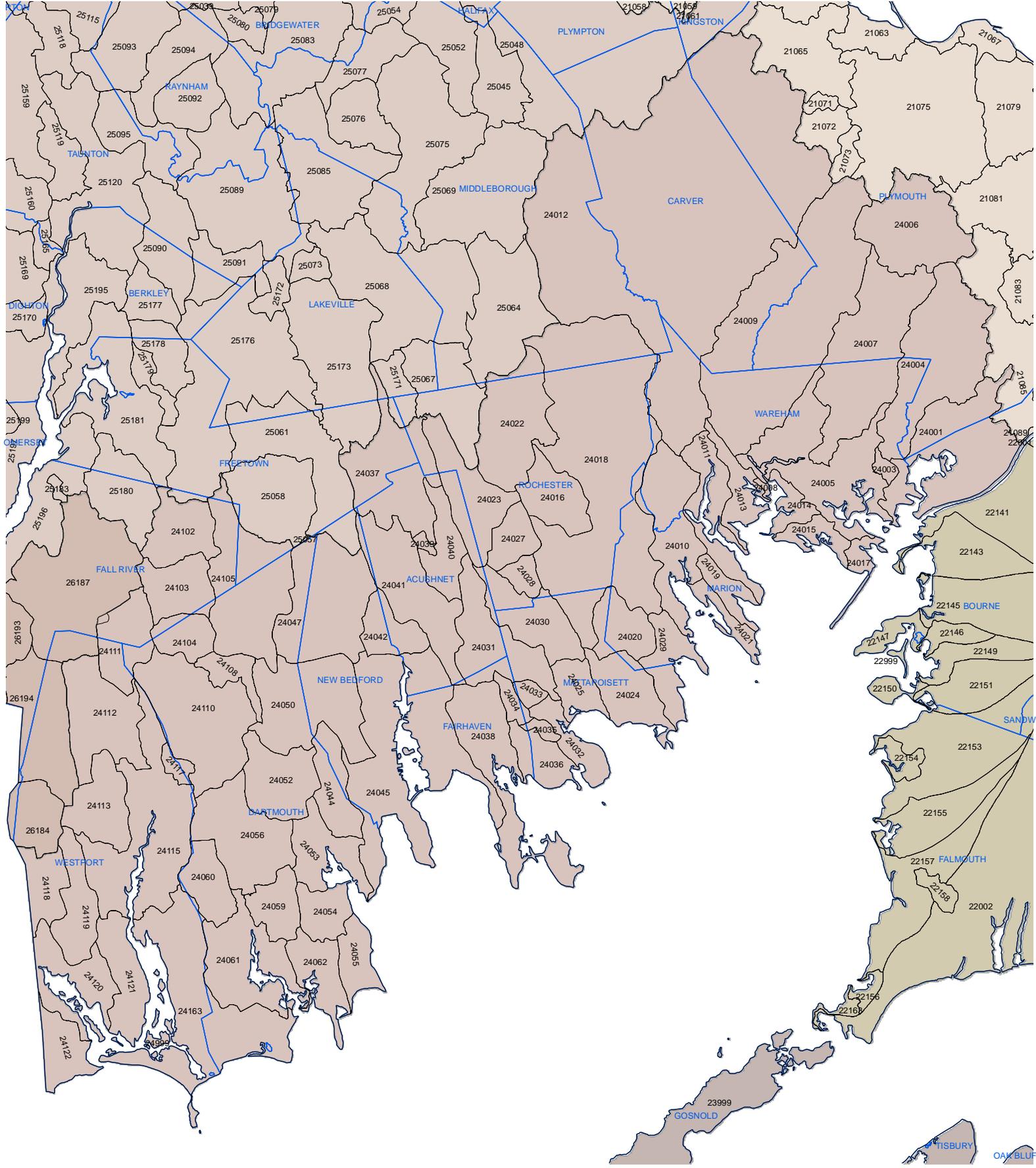
Table A2. Boston Harbor Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment			
19270	3.32	7	Balster Brook	MA73004_2002					
			Blue Hills Reservoir						
			Hemenway Pond						
			Hillside Pond						
			Pine Tree Brook				MA73-29_2002	X	-Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens [6/21/2002-CN121.0]
			Popes Pond				MA73044_2002	X	-Noxious aquatic plants -Turbidity
			Russell Pond				MA73003_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
Trout Brook									
19277	13.96	83	Gulliver Creek	MA73-30_2002	X	-Pathogens [6/21/2002-CN121.0]			
			Mother Brook	MA73-28_2002	X	-Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Pathogens [6/21/2002-CN121.0] -Taste, odor and color			
			Neponset River	MA73-02_2002	X	-Priority organics -Metals -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Oil and grease -Turbidity -(Objectionable deposits*)			
				MA73-03_2002	X	-Priority organics -Metals -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Oil and grease -(Objectionable deposits*)			
				MA73-04_2002	X	-Priority organics -Organic enrichment/Low DO -Pathogens [6/21/2002-CN121.0] -Turbidity -(Objectionable deposits*)			
			Pine Tree Brook	MA73-29_2002	X	-Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens [6/21/2002-CN121.0]			
			Turners Pond	MA73059_2002	X	-Nutrients -Organic enrichment/Low DO -Turbidity			
			Unquity Brook	MA73-26_2002	X	-Nutrients -pH -Siltation -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens [6/21/2002-CN121.0] -(Objectionable deposits*)			

Table A2. Boston Harbor Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19299	0.00	0	Boston Harbor	MA70-01_2002	X	-Priority organics -Pathogens
			Dorchester Bay	MA70-03_2002	X	-Priority organics -Pathogens -Suspended solids -Turbidity
			Furnace Brook	MA74-10_2002	X	-Organic enrichment/Low DO
			Quincy Bay	MA70-04_2002	X	-Priority organics -Pathogens
				MA70-05_2002	X	-Priority organics -Pathogens
19300	1.21	12	Norroy Brook Norroy Pond			
19302	8.19	102	Blue Hill River Hoosicwhisick Pond Houghtons Pond Pakomet Spring	MA74015_2002		
19303	0.67	9	Bouncing Brook Farm River Great Cedar Swamp	MA74-07_2002		
19304	16.03	74	Old Quincy Reservoir Town Brook	MA74017_2002 MA74-09_2002	X	-Cause Unknown -(Other habitat alterations*) -Pathogens
19305	0.08	0	Hingham Bay Quincy Bay	MA70-06_2002 MA70-04_2002	X X	-Pathogens -Priority organics -Pathogens
				MA70-05_2002	X	-Priority organics -Pathogens
			Town Brook	MA74-09_2002	X	-Cause Unknown -(Other habitat alterations*) -Pathogens
			Town River Bay	MA74-15_2002	X	-Organic enrichment/Low DO -Pathogens
			Weymouth Fore River	MA74-14_2002	X	-Pathogens
19306	0.85	Unknown	Trout Brook	MA74-12_2002		
19307	0.14	Unknown	Trout Brook	MA74-12_2002		
19308	1.01	5	Great Pond Norroy Brook Upper Reservoir			
19312	1.25	Unknown	Bear Swamp			
19313	0.97	0	Norroy Pond			
19314	1.08	Unknown	Tumbling Brook			
19315	0.37	Unknown	Cochato River	MA74-06_2002	X	-Pesticides -Organic enrichment/Low DO -Pathogens
			Glovers Brook			
			Ice House Pond	MA74028_2002	X	-Pesticides
			Lake Holbrook	MA74013_2002	X	-Noxious aquatic plants
			Sylvan Lake	MA74021_2002	X	-Pesticides -Priority organics
			Trout Brook	MA74-12_2002		
19318	1.01	2	Sunset Lake	MA74020_2002		

Table A2. Boston Harbor Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19319	0.85	2	Broad Meadow Cochato River	MA74-06_2002	X	-Pesticides -Organic enrichment/Low DO -Pathogens
			Farm River Hollingsworth Pond	MA74-07_2002		
			Monatiquot River	MA74-08_2002	X	-Cause Unknown -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19320	7.94	42	Hollingsworth Pond Monatiquot River	MA74-08_2002	X	-Cause Unknown -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
19322	1.60	2	Hingham Bay	MA70-07_2002	X	-Pathogens
			Weymouth Back River	MA74-13_2002	X	-Pathogens
			Weymouth Fore River	MA74-14_2002	X	-Pathogens
19323	2.41	12	Smelt Brook			
			Weymouth Fore River	MA74-14_2002	X	-Pathogens
19324	1.10	7	Monatiquot River	MA74-08_2002	X	-Cause Unknown -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
			Weymouth Fore River	MA74-14_2002	X	-Pathogens
19325	1.51	Unknown	Hingham Bay	MA70-07_2002	X	-Pathogens
			Hingham Harbor	MA70-08_2002	X	-Pathogens
			Weymouth Back River	MA74-13_2002	X	-Pathogens
19326	0.91	2	Cranberry Pond			
			Fore River Stream			
			Mill Cove Stream			
			Mill Stream			
19352	4.79	16	Weymouth Fore River	MA74-14_2002	X	-Pathogens
			Mill River	MA74-04_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
19353	4.58	27	Mill River	MA74-04_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
			Whortleberry Pond			
19354	0.17	6	Mill River	MA74-04_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
			Old Swamp River	MA74-03_2002	X	-Cause Unknown -Pathogens
			Whitmans Pond	MA74025_2002		
19356	1.61	Unknown	Old Swamp River	MA74-03_2002	X	-Cause Unknown -Pathogens
19357	0.81	0	Old Swamp River	MA74-03_2002	X	-Cause Unknown -Pathogens
19359	1.63	13	Old Swamp River	MA74-03_2002	X	-Cause Unknown -Pathogens
19360	3.03	7	Mill River	MA74-04_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
			Old Swamp River	MA74-03_2002	X	-Cause Unknown -Pathogens
			Whortleberry Pond			

Table A2. Boston Harbor Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19362	0.01	Unknown	Bouve Pond Brewer Pond Fresh River			
19363	0.14	0	Weymouth Back River	MA74-05_2002	X	-Organic enrichment/Low DO -Pathogens
				MA74-13_2002	X	-Pathogens
19364	3.54	Unknown	Accord Pond	MA94002_2002		
19365	7.70	Unknown	Boston Harbor	MA70-01_2002	X	-Priority organics -Pathogens
			Broad Cove Foundry Pond	MA74011_2002	X	-Nutrients -Siltation -Noxious aquatic plants
			Great Swamp			
			Hingham Bay	MA70-07_2002	X	-Pathogens
			Hingham Harbor	MA70-08_2002	X	-Pathogens
			Home Meadows			
			Hull Bay	MA70-09_2002	X	-Pathogens
			Straits Pond			
			Weir River	MA74-02_2002	X	-Nutrients -Pathogens
				MA74-11_2002	X	-Pathogens
19371	7.26	5	Plymouth River			
19375	0.84	Unknown	Accord Brook Accord Pond Hatch Pond Valley Swamp	MA94002_2002		
21028	6.30	36	Furnace Brook	MA74-10_2002	X	-Organic enrichment/Low DO
TOTAL KNOWN:		1219				



Appendix A
Sub-Basin
Identification Maps:
BUZZARDS BAY

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24001	3.68	Unknown	Bourne Pond			
			Buttermilk Bay	MA95-01_2002	X	-Pathogens
			Cape Cod Canal	MA95-14_2002	X	-Pathogens
			Ellis Pond			
			Garland Bog			
			Gibbs Bog			
			Goat Pasture Pond			
			Horse Pond			
			Mare Pond	MA95172_2002		
			Nightingale Pond			
			Nye Bog			
			Onset Bay	MA95-02_2002	X	-Pathogens
			Queen Sewell Pond	MA95180_2002		
Weeks Pond						
24003	0.54	Unknown	Sand Pond	MA95127_2002		
24004	1.69	Unknown	Bartlett Pond			
			Big Rocky Pond	MA95119_2002		
			Big Sandy Pond	MA95011_2002		
			Deer Pond	MA95036_2002		
			Ezekiel Pond	MA95051_2002		
			Grassy Pond			
			Jakes Pond			
			Little Duck Pond			
			Little Rocky Pond	MA95091_2002		
			Little Sandy Pond	MA95092_2002		
			Long Duck Pond	MA95095_2002		
			Mare Pond			
			Morton Pond			
			Red Brook			
			Robbins Bog			
			Wall Pond			
White Island Pond	MA95166_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants			
	MA95173_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -(Exotic species*)			
Whites Pond	MA95168_2002					

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24005	9.22	Unknown	Agawam River	MA95-28_2002	X	-Nutrients -(Other habitat alterations*) -Pathogens -Noxious aquatic plants
				MA95-29_2002		
			Bangs Bog			
			Beaver Dam Pond			
			Black Jonny Pond			
			Broad Marsh			
			Cedar Pond			
			Dicks Pond	MA95038_2002		
			Gibbs Brook			
			Onset Bay	MA95-02_2002	X	
			Rogers Bog			
			Sandy Pond	MA95128_2002		
			Spectacle Pond	MA95142_2002		
			Union Pond	MA95152_2002		
			Wankinco River	MA95-50_2002	X	
			Wareham River	MA95-03_2002	X	
24007	3.58	Unknown	Abner Pond	MA95001_2002		
			Agawam River	MA95-28_2002		
			Branch Maple Springs Brook			
			Cattle Pond			
			Charge Pond			
			Doctors Pond			
			Fawn Pond	MA95053_2002		
			Five Mile Pond	MA95056_2002		
			Glen Charlie Pond	MA95061_2002		
			Grassy Pond			
			Little Fivemile Pond			
			Little Long Pond	MA95089_2002		
			Maple Springs Bog			
			Maple Springs Brook			
			Mill Pond	MA95105_2002		
			New Grassy Pond			

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24009	2.01	Unknown	Barrett Pond	MA95004_2002		
			Bumps Pond			
			Bumpus Bog			
			Carver Bog			
			Charge Pond	MA95025_2002		
			Cherry Pond			
			College Pond	MA95030_2002		
			Doctors Pond			
			East Head Pond	MA95177_2002		
			Fearing Pond	MA95054_2002		
			Fiske Bogs			
			Frogfoot Brook			
			Golden Field Pond			
			Grassy Pond			
			Harlow Brook			
			Hooper Pond			
			Maple Swamp			
			Mosquito Pond			
			New Long Pond	MA95112_2002		
			Parker Mills Pond	MA95115_2002		
			Raccoon Pond			
			Rose Brook			
Round Pond						
Three Cornered Pond	MA95145_2002					
Tihonet Pond	MA95146_2002	X	-Organic enrichment/Low DO			
Torrey Pond						
Walsh Bog						
Wankinco Cranberry Bog						
Wankinco River	MA95-30_2002					
			MA95-50_2002	X	-Pathogens	
24010	5.71	Unknown	Blackmore Pond			
			Blackmore Reservoir	MA95015_2002		
			Cohackett Brook			
			Hammett Cove	MA95-56_2002	X	-Nutrients -Pathogens
			Sippican Harbor	MA95-08_2002	X	-Pathogens
			Sippican River	MA95-06_2002		
			MA95-07_2002	X	-Pathogens	
24011	4.34	Unknown	Beaverdam Creek	MA95-53_2002	X	-Nutrients -Pathogens
			Blackmore Pond			
			Great Swamp			
			Horseshoe Pond			
			Sippican River	MA95-07_2002	X	-Pathogens
			Wareham River	MA95-03_2002	X	-Nutrients -Pathogens
			Weweantic River	MA95-04_2002		
				MA95-05_2002	X	-Nutrients -Pathogens

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24012	3.32	Unknown	Bates Pond	MA95007_2002		
			Beaver Dam Brook			
			Benson Pond Bogs			
			Big West Pond			
			Cedar Pond			
			Cedar Swamp			
			Clear Bottom Pond			
			Clear Pond			
			Crane Brook			
			Crane Brook Bog Pond	MA95033_2002		
			Curlew Pond	MA95034_2002		
			Double Brook			
			Dunham Pond	MA95044_2002		
			East Rocky Gutter Brook			
			Federal Bogs			
			Federal Pond	MA95055_2002		
			Fresh Meadow Pond	MA95174_2002		
			Grady Pond			
			Grassy West Pond			
			Indian Brook			
			Kings Pond	MA95078_2002		
			Little Clear Pond			
			Little Micajah Pond			
			Little West Pond	MA95093_2002		
			Little Widgeon Pond			
			Manters Hole			
			Micajah Pond	MA95102_2002		
			Narragansett Pond			
			Rocky Meadow Brook			
			Rocky Meadow Brook Pond	MA95118_2002		
			Rocky Pond	MA95179_2002		
			Round Hole			
			Sampson Pond	MA95125_2002		
			Smelt Pond			
South Meadow Brook						
South Meadow Brook Pond	MA95139_2002					
South Meadow Pond	MA95140_2002					
Southwest Atwood Bog Pond	MA95141_2002					
Spring Pond						
Tremont Mill Pond	MA95150_2002					
Vaughn Pond	MA95153_2002					
Wenham Pond						
West Rocky Gutter Brook						
Weweantic River	MA95-04_2002					
Widgeon Pond						
24013	2.99	Unknown	Broad Marsh River	MA95-49_2002	X	-Pathogens
			Cedar Island Creek	MA95-52_2002	X	-Pathogens
			Stones Bog			
			Stony Run			
24014	0.24	Unknown	Wareham River	MA95-03_2002	X	-Nutrients -Pathogens
			Black Jonny Pond			
24016	0.24	Unknown	Crooked River	MA95-51_2002	X	-Pathogens
			Wareham River	MA95-03_2002	X	-Nutrients -Pathogens
			Doggett Brook			
			Sherman Brook			

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24018	1.76	Unknown	Bear Swamp Benson Brook East Branch Sippican River Forbes Swamp Haggertys Brook Haskell Swamp Hataway Pond Leonards Pond Marys Pond Mill Pond Sippican River Stewart Bog Towers Swamp West Branch Sippican River	MA95080_2002 MA95100_2002 MA95-06_2002		
24024	0.81	Unknown	Mattapoissett Harbor Pine Island Brook Pine Island Pond	MA95-35_2002	X	-Pathogens
24025	2.67	Unknown	Mattapoissett Harbor	MA95-35_2002	X	-Pathogens
24029	1.62	Unknown	Aucoot Cove Hiller Cove Sippican Harbor	MA95-09_2002 MA95-10_2002 MA95-08_2002	X X X	-Pathogens -Pathogens -Pathogens
24031	0.59	Unknown	Mattapoissett River Tinkham Brook Tinkham Pond	MA95-36_2002 MA95148_2002		
24032	0.91	Unknown	Mattapoissett Harbor Mattapoissett River	MA95-35_2002 MA95-36_2002	X	-Pathogens
24033	0.31	Unknown	Mattapoissett River	MA95-36_2002		
24034	1.15	Unknown	Swift Brook			
24037	3.41	Unknown	Acushnet River Ashley Brook Keene River New Bedford Reservoir Squam Brook	MA95-31_2002 MA95110_2002	X	-Nutrients -Siltation -Organic enrichment/Low DO -Pathogens
24038	7.33	Unknown	Nasketucket River Outer New Bedford Harbor	MA95-63_2002	X	-Priority organics -Nonpriority organics -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
24042	0.23	Unknown	Acushnet River	MA95-32_2002 MA95-33_2002	X X	-Nutrients -Organic enrichment/Low DO -Pathogens -Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
24044	2.93	Unknown	Mill Pond Buttonwood Brook Buttonwood Park Pond	MA95-13_2002 MA95020_2002	X	-Pathogens

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24045	17.91	Unknown	Acushnet River	MA95-33_2002	X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
			Clark Cove	MA95-38_2002	X	-Priority organics -Pathogens
			New Bedford Harbor	MA95-42_2002	X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
			Outer New Bedford Harbor	MA95-63_2002	X	-Priority organics -Nonpriority organics -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
24047	8.22	Unknown	Acushnet Cedar Swamp Black Pond Flag Swamp Hobomock Swamp Paskamanset River Turner Pond	MA95-11_2002 MA95151_2002	X	-Metals -Turbidity
24050	15.91	Unknown	Apponagansett Swamp Paskamansett River	MA95-11_2002		
24052	3.63	Unknown	Paskamanset River	MA95-11_2002		
24108	0.39	Unknown	Colebrook Swamp Shingle Island River	MA95-12_2002		
24110	10.83	Unknown	East Branch Westport River	MA95-40_2002	X	-Pathogens
			Noquochoke Lake	MA95113_2002	X	-Priority organics -Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
				MA95170_2002	X	-Priority organics -Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
				MA95171_2002	X	-Priority organics -Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
			Shingle Island River	MA95-12_2002		
24112	9.64	Unknown	Bread And Cheese Brook			
24115	3.20	Unknown	Allen Creek			
			East Branch Westport River	MA95-40_2002	X	-Pathogens
				MA95-41_2002	X	-Nutrients -Pathogens
			Forge Pond Snell Brook Snell Creek	MA95-44_2002 MA95-45_2002	X	-Pathogens

Table A3. Buzzards Bay Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
24117	1.19	Unknown	East Branch Westport River	MA95-40_2002	X	-Pathogens
			Forge Pond Noquochoke Lake	MA95113_2002	X	-Priority organics -Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
24999	0.35	Unknown	Agawam River	MA95-29_2002	X	-Nutrients -(Other habitat alterations*) -Pathogens -Noxious aquatic plants
			New Bedford Harbor	MA95-42_2002	X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
			Wankinco River	MA95-50_2002	X	-Pathogens
			Wareham River	MA95-03_2002	X	-Nutrients -Pathogens

Table A4. Cape Cod Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22001	69.94	Unknown	Aunt Pattys Pond			
			Barnstable Harbor	MA96-01_2002	X	-Pathogens
			Bennett Pond			
			Black Flats			
			Blackfish Creek			
			Blueberry Pond			
			Boat Cove Creek			
			Boat Meadow Bog			
			Boat Meadow River	MA96-15_2002	X	-Pathogens
			Bound Brook			
			Brickyard Creek			
			Bridge Creek			
			Canoe Pond			
			Cape Cod Canal	MA95-14_2002	X	-Pathogens
			Cedar Pond			
			Chase Garden Creek	MA96-35_2002	X	-Pathogens
			Clapps Pond	MA96035_2002		
			Clapps Round Pond			
			Clays Creek			
			Cliff Pond	MA96039_2002		
			Cobbs Pond			
			Coles Pond			
			Dennis Pond			
			Depot Pond	MA96061_2002		
			Dexter Bog			
			Dook Creek			
			Doughnut Pond			
			Duck Creek	MA96-32_2002	X	-Pathogens
			Duck Harbor			
			Duck Pond			
			Dyer Pond			
			Eel Creek			
			Elbow Pond			
			Flax Pond			
			Freemans Pond			
			Fresh Brook			
			Fund Pond			
			Garretts Pond			
			Grassy Pond			
			Great Marshes			
			Great Pond	MA96114_2002		
				MA96115_2002	X	-Nutrients -Organic enrichment/Low DO
			Great Swamp			
			Greenough Pond			
			Griffiths Pond			
			Gull Pond	MA96123_2002		
			Hallets Millpond			
			Hatchet Creek			
			Herring Pond	MA96133_2002		
			Herring River	MA96-33_2002	X	-Pathogens
				MA96-67_2002	X	-Metals -pH
			Higgins Pond			
			Hinckley Pond			

Table A4. Cape Cod Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22001 continued			Howes Pond			
			Hoxie Pond	MA96146_2002		
			Israel Pond			
			Jemima Pond			
			Keeler Pond			
			Kinnacum Pond			
			Lawrence Pond			
			Little Israel Pond			
			Little Namskaket Creek	MA96-26_2002	X	-Pathogens
			Lone Tree Creek			
			Long Pond	MA96179_2002		
			Lower Mill Pond	MA96188_2002	X	-Nutrients -Noxious aquatic plants -Turbidity
			Maraspin Creek	MA96-06_2002	X	-Pathogens
			Matthews Pond			
			Mill Creek	MA96-37_2002	X	-Pathogens
			Mill Pond			
			Miller Pond			
			Moon Pond			
			Myricks Pond			
			Namskaket Creek	MA96-27_2002	X	-Pathogens
			No Bottom Pond			
			Nye Pond	MA96228_2002		
			Old Harbor Creek			
			Owl Pond			
			Ox Pond			
			Pamet River	MA96-31_2002	X	-Pathogens
			Pasture Pond			
			Perch Pond			
			Pilgrim Lake			
			Pilgrim Spring			
			Pine Pond			
			Provincetown Harbor	MA96-29_2002	X	-Pathogens
			Quivett Creek	MA96-09_2002	X	-Pathogens
			Raccoon Swamp			
			Rock Harbor Creek	MA96-16_2002	X	-Pathogens
			Round Pond			
			Ruth Pond			
			Ryder Pond	MA96268_2002	X	-Nutrients -Organic enrichment/Low DO
			Salls Pond			
			Salt Meadow			
			Sandy Hill Pond			
			Scargo Lake	MA96279_2002		
			Schoolhouse Pond			
			Scorton Creek	MA96-30_2002	X	-Pathogens
			Sesuit Creek	MA96-13_2002	X	-Pathogens
			Shank Painter Pond			
			Shawme Lake			
			Shawme Lake Lower	MA96288_2002		
			Silver Spring Brook			
			Slough Pond			
			Small Pond			
			Smith Pond			

Table A4. Cape Cod Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22002 continued			Cliff Pond	MA96039_2002		
			Coleman Pond			
			Coonamessett Pond			
			Coonamessett River			
			Cornelius Pond			
			Cotuit Bay	MA96-63_2002	X	-Nutrients -Pathogens
			Crooked Pond			
			Crowell Pond			
			Crows Pond	MA96-47_2002	X	-Nutrients
			Crystal Lake	MA96050_2002	X	-Organic enrichment/Low DO
			Dam Pond			
			Deans Pond			
			Deep Pond			
			Deer Pond			
			Depot Pond	MA96061_2002		
			Dinahs Pond			
			Duane Pond			
			Duck Pond			
			Dunns Pond			
			Dutchman'S Creek			
			Eagle Pond			
			Eel Pond			
			Elbow Pond			
			Elishas Pond			
			Emery Pond			
			Falmouth Inner Harbor	MA96-17_2002	X	-Pathogens
			Fawcetts Pond			
			Featherbed Swamp			
			Fish Creek			
			Flashy Pond			
			Flat Pond			
			Flax Pond	MA96090_2002		
			Flintrock Pond			
			Follins Pond			
			Fresh Pond			
			Frog Pond			
			Frost Fish Creek	MA96-49_2002	X	-Nutrients -Pathogens
			Fullers Marsh			
			Goose Pond	MA96106_2002		
			Gould Pond			
			Grassy Nook Pond			
			Grassy Pond			
			Great Harbor	MA96-18_2002	X	-Pathogens
			Great Pond	MA96-54_2002	X	-Nutrients -Pathogens
			Great River	MA96-60_2002	X	-Nutrients
			Green Pond	MA96-55_2002	X	-Nutrients -Pathogens
			Greenland Pond			
			Grews Pond			
			Halfway Pond			
			Halls Creek			
			Hamblin Pond	MA96126_2002	X	-Nutrients -Pathogens
				MA96-58_2002	X	-Metals

Table A4. Cape Cod Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22002 continued			Hamblins Brook			
			Harding Beach Pond	MA96-43_2002	X	-Pathogens
			Hawes Run			
			Hawksnest Pond			
			Herring Brook			
			Herring River	MA96-22_2002	X	-Pathogens
			Higgins Pond			
			Hinckleys Pond	MA96140_2002		
			Holly Marsh			
			Horse Pond			
			Horseleech Pond			
			Hyannis Harbor	MA96-05_2002	X	-Pathogens
			Icehouse Pond			
			Jabinettes Pond			
			James Pond			
			Jehu Pond	MA96-59_2002	X	-Nutrients
			Jenkins Pond			
			Jim Pond			
			Johns Pond	MA96157_2002	X	-Metals
			Jones Pond			
			Josephs Pond			
			Joshua Pond			
			Kelleys Pond			
			Kescayo Gansett Pond			
			Kinnacum Pond			
			Labans Pond			
			Lake Elizabeth	MA96080_2002		
			Lamson Pond			
			Lawrence Pond			
			Lewis Bay	MA96-36_2002	X	-Pathogens
			Lewis Pond			
			Lily Pond			
			Little Cliff Pond			
			Little Harbor	MA96-19_2002	X	-Pathogens
			Little Israel Pond			
			Little Mill Pond			
			Little Pond	MA96-56_2002	X	-Nutrients
			Little River	MA96-61_2002	X	-Nutrients -Pathogens
			Little Sandy Pond			
			Littlefields Pond			
			Long Pond	MA96180_2002 MA96183_2002 MA96184_2002	X	-Organic enrichment/Low DO
			Lovells Pond			
			Lovers Lake			
			Lumbert Pond			
			Mares Pond			
			Marstons Mills River			
			Martha Pond			
			Mary Dunnpond			
			Mashpee Pond	MA96194_2002	X	-Metals
			Mashpee River	MA96-24_2002	X	-Nutrients -Pathogens
			Meeting House Pond			
			Micah Pond			
			Middle Pond			

Table A4. Cape Cod Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22002 continued			Mill Creek	MA96-41_2002	X	-Pathogens
			Mill Pond	MA96-52_2002	X	-Nutrients
			Ministers Pond			
			Miss Thachers Pond	MA96258_2002		
			Moll Pond			
			Moody Pond			
			Morse Pond			
			Mud Pond			
			Muddy Creek	MA96-51_2002	X	-Pathogens
			Muddy Pond			
			Mystic Lake			
			Nauset Harbor	MA96-28_2002		
			Neck Pond			
			Nobska Pond			
			North Bay	MA96-66_2002	X	-Nutrients -Pathogens
			North Pond			
			Northeast Pond			
			Northern Simmons Pond			
			Nye Pond			
			Olivers Pond			
			Oyster Pond	MA96-45_2002	X	-Nutrients -Pathogens
				MA96-62_2002	X	-Pathogens
			Oyster Pond River	MA96-46_2002	X	-Nutrients -Pathogens
			Paddocks Pond			
			Parker Pond			
			Parkers River	MA96-38_2002	X	-Pathogens
			Pattys Pond			
			Paw Wah Pond			
			Perch Pond	MA96-53_2002	X	-Pathogens
			Peters Pond	MA96244_2002	X	-Metals
			Phinneys Bay			
			Pilgrim Lake	MA96246_2002		
			Pine Pond			
			Pinlico Pond			
			Plashes Brook			
			Plashes Pond			
			Popes Pond			
			Popponesset Bay	MA96-40_2002	X	-Nutrients
			Popponesset Creek	MA96-39_2002	X	-Pathogens
			Prince Cove	MA96-07_2002	X	-Nutrients -Pathogens
			Quaker Brook			
			Quashnet River	MA96-20_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
			Rafe Pond			
			Randall Pond			
			Red Brook	MA96-25_2002		
			Red Lily Pond	MA96257_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
			Red River			
			Robbins Pond			
			Round Pond			

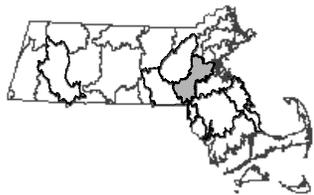
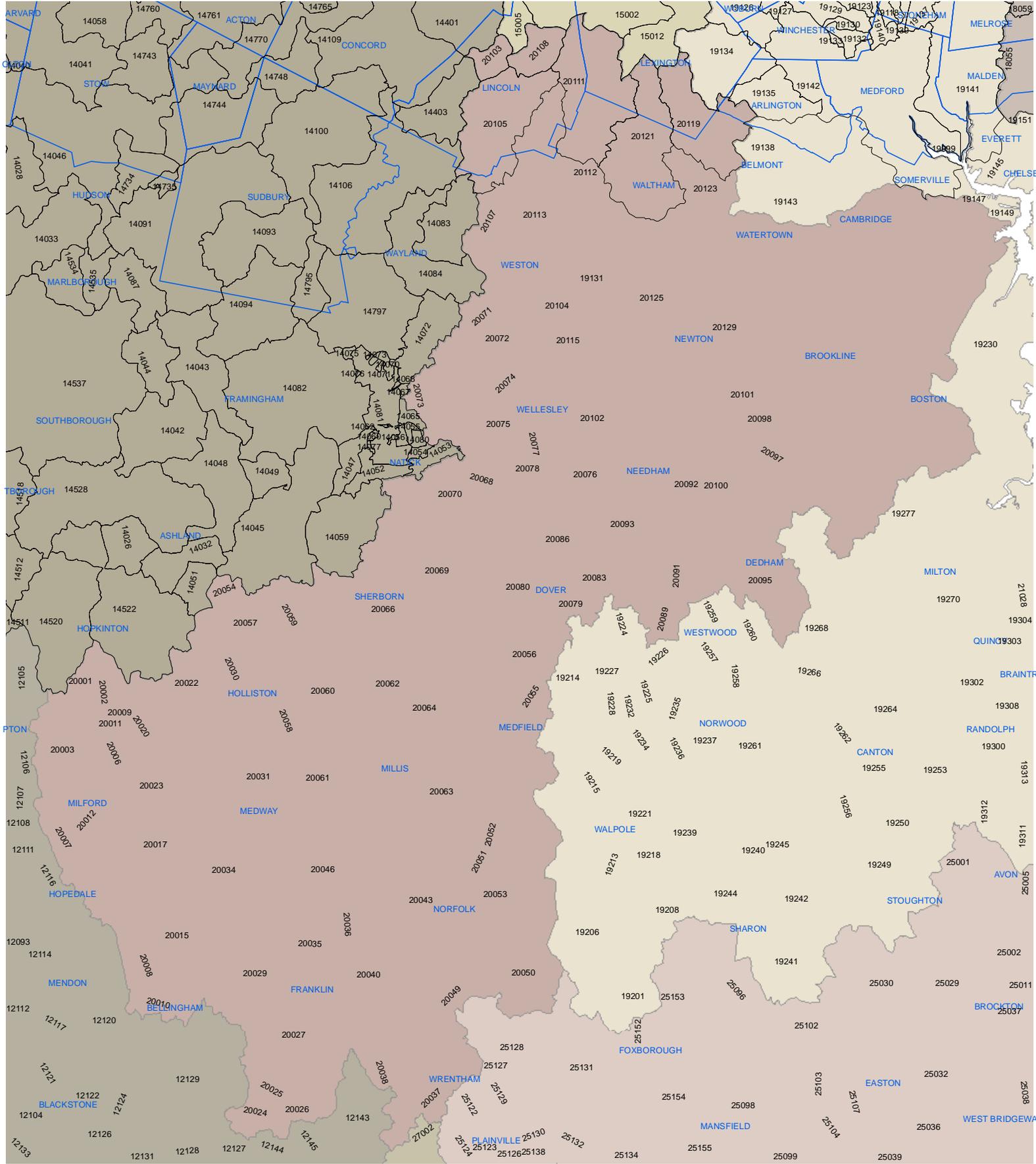
Table A4. Cape Cod Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22002 continued			Run Pond			
			Rushy Marsh Pond			
			Ruth Pond			
			Ryder Cove	MA96-50_2002	X	-Nutrients -Pathogens
			Ryders Pond			
			Sage Lot Pond			
			Salt Pond			
			Sam Pond			
			Sand Pond			
			Santuit Pond	MA96277_2002	X	-Nutrients -Noxious aquatic plants
			Santuit River			
			Saquatucket Harbor	MA96-23_2002	X	-Pathogens
			Sarahs Pond			
			Schoolhouse Pond	MA96281_2002		
			Scudder Bay			
			Seine Pond			
			Seymour Pond			
			Shallow Pond	MA96285_2002		
			Sheep Pond	MA96289_2002	X	-Metals -Organic enrichment/Low DO
			Shivericks Pond			
			Shoal Pond			
			Shoestring Bay	MA96-08_2002	X	-Nutrients -Pathogens
			Shubael Pond	MA96293_2002		
			Siders Pond			
			Simmons Pond			
			Skinequit Pond			
			Slough Pond			
			Smalls Pond			
			Snake Pond	MA96302_2002	X	-Metals
			Sols Pond			
			Southeast Pond			
			Southern Simmons Pond			
			Spectacle Pond			
			Stage Harbor	MA96-11_2002	X	-Nutrients -Pathogens
			Stewarts Creek			
			Stillwater Pond			
			Swan Pond			
			Swan Pond River	MA96-14_2002	X	-Pathogens
			Taylor's Pond	MA96-42_2002	X	-Pathogens
			Tim Pond			
			Town Brook			
			Triangle Pond			
			Uncle Harvey Pond			
			Uncle Israel's Pond			
			Uncle Seth's Pond			
			Uncle Stephans Pond			
			Wakeby Pond	MA96346_2002	X	-Metals
			Walkers Pond			
			Waquoit Bay	MA96-21_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
			Wash Pond			

Table A4. Cape Cod Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22002 continued			Weeks Pond Wequaquet Lake	MA96333_2002	X	-Metals -(Exotic species*)
			West Bay White Pond Williams Pond Witch Pond Woods Cove Wychmere Harbor	MA96-65_2002	X	-Nutrients
22141	2.84	Unknown	Cape Cod Canal Deep Bottom Pond Great Pond Little Halfway Pond Round Swamp	MA95-14_2002	X	-Pathogens
22143	2.31	Unknown	Back River Black River Clay Pond Donnelly Pond Eel Pond Mill Pond Phinneys Harbor	MA95-47_2002 MA95-48_2002 MA95-15_2002	X X X	-Pathogens -Pathogens -Pathogens
22145	0.70	Unknown	Freeman Pond Lily Pond Mill Pond Opening Pond Pocasset River Succunnesett Pond Upper Pond	MA95-16_2002	X	-Pathogens
22146	0.88	Unknown	Flax Pond Lily Pond Red Brook Harbor	MA96087_2002 MA95-18_2002	X	-Pathogens
22149	0.29	Unknown	Lily Pond Bog Red Brook Harbor Red Brook Pond	MA95-18_2002	X	-Pathogens
22151	0.75	Unknown	Beaton Bog Cuffs Pond Long Pond Squeteague Harbor	MA95-55_2002	X	-Nutrients
22153	6.20	Unknown	Cedar Lake Dam Pond Edmunds Pond Fiddlers Cove Flax Pond Herring Brook Megansett Harbor Osborne Pond Squeteague Harbor Trout Pond Wild Harbor Wings Pond	MA96344_2002 MA95-21_2002 MA95-19_2002 MA95-55_2002 MA95-20_2002	X X X	-Pathogens -Pathogens -Nutrients
22155	4.68	Unknown	Crocker Pond Harbor Head Spectacle Pond West Falmouth Harbor	MA95-46_2002 MA95-22_2002	X X	-Pathogens -Nutrients -Pathogens
22156	1.40	Unknown	Quissett Harbor	MA95-25_2002	X	-Pathogens

Table A4. Cape Cod Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
22157	4.77	Unknown	Beach Pond			
			Crooked Pond			
			Deep Pond			
			Flax Pond			
			Flume Pond			
			Fresh Pond			
			Great Sippewisset Creek	MA95-23_2002	X	-Pathogens
			Great Sippewisset Marsh			
			Little Sippewisset Marsh	MA95-24_2002	X	-Pathogens
			Miles Pond			
Quahog Pond						
Spectacle Pond						
22158	0.05	Unknown	Long Pond			



Appendix A
Sub-Basin
Identification Maps:
CHARLES



Table A5. Charles River Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
19131	0.22	2	Unnamed Tributary	MA72-27_2002		
20003	0.94	Unknown	Chaddock Crewes Pond Huckleberry Brook Louisa Lake	MA72068_2002		
20006	1.59	Unknown	Charles River	MA72-01_2002	X	-Nutrients -Pathogens
20008	3.05	Unknown	Box Pond	MA72008_2002	X	-Nutrients -Siltation -Noxious aquatic plants
			Charles River	MA72-02_2002	X	-Metals -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
				MA72-03_2002	X	-Noxious aquatic plants -Cause Unknown -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens
				MA72-04_2002	X	-Noxious aquatic plants -Metals -Pathogens
20015	5.29	Unknown	Beaver Brook Beaver Pond Charles River Curtis Pond	MA72-12_2002 MA72004_2002 MA72-04_2002	X	-Metals -Pathogens
20017	7.14	Unknown	Milford Pond Stall Brook			
20023	1.48	Unknown	Cedar Swamp Hopping Brook			
20027	3.08	Unknown	Beaver Pond Dix Brook Mine Brook Mine Brook Pond Spruce Pond Woodward Swamp	MA72-14_2002 MA72077_2002	X X	-Cause Unknown -(Other habitat alterations*) -Noxious aquatic plants -Turbidity
20029	6.37	Unknown	Curtis Pond Long Pond Mine Brook	MA72-14_2002	X	-Cause Unknown -(Other habitat alterations*)
20030	0.32	Unknown	Chicken Brook Waseeka Sanctuary Pond	MA72155_2002		
20031	1.30	Unknown	Chicken Brook Kirby Swamp Milk Pond			
20034	0.00	Unknown	Charles River Mine Brook	MA72-04_2002 MA72-14_2002	X X	-Metals -Pathogens -Cause Unknown -(Other habitat alterations*)
20037	2.79	Unknown	Desert Brook Lake Pearl Trout Pond	MA72092_2002		

Table A5. Charles River Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
20040	1.12	Unknown	City Mills Pond			
			Comeys Pond			
			Eagle Brook			
			Franklin Reservoir Northeast	MA72095_2002	X	-Noxious aquatic plants -Turbidity
			Franklin Reservoir Southwest	MA72032_2002	X	-Noxious aquatic plants -Turbidity
			Kingsbury Pond			
			Lake Archer	MA72002_2002		
			Lake Pearl	MA72092_2002		
			Mill River	MA72-15_2002		
			Uncas Brook Uncas Pond	MA72122_2002		
20050	2.46	Unknown	Stop River	MA72-09_2002	X	-Cause Unknown -Organic enrichment/Low DO
20053	0.80	Unknown	Bristols Pond			
			Highland Lake	MA72047_2002		
			Mann Pond			
			Stony Brook			
			Stony Brook Lake			
Stop River	MA72-09_2002	X	-Cause Unknown -Organic enrichment/Low DO			
				MA72-10_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
20057	0.98	Unknown	Houghton Pond	MA72050_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
			Jar Brook			
20058	0.21	Unknown	Lake Winthrop	MA72140_2002	X	-Pesticides -Noxious aquatic plants -(Exotic species*)
20060	0.47	Unknown	Bogastow Brook	MA72-16_2002	X	-Pathogens
			Dopping Brook			
			Factory Pond	MA72037_2002	X	-Noxious aquatic plants -(Exotic species*)
			Linden Pond	MA72063_2002	X	-Noxious aquatic plants -Turbidity
			Meadow Brook			

Table A5. Charles River Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment			
20063	0.01	Unknown	Callahan Pond	MA72-05_2002	X	-Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity			
			Charles River						
			Danielson Pond						
			Harlow Pond						
			Holt Pond						
			Horse Brook						
			Maple Swamp						
			Mccarthy Pond						
			Phillips Pond						
			Sewell Brook						
20064	0.03	Unknown	Stop River	MA72-10_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens			
			Walker Pond	MA72126_2002					
			Bogastow Brook	MA72-16_2002	X	-Pathogens			
20064	0.03	Unknown	Bogastow Pond	MA72-05_2002	X	-Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity			
			Charles River						
			North Brook						
			South End Pond				MA72109_2002		
20070	0.42	Unknown	Vine Brook	MA72-05_2002	X	-Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity			
			Charles River						
20072	0.08	Unknown	Davis Brook	MA72085_2002					
			Bogle Brook						
			Nonesuch Pond						
			Pickerel Pond						
20073	2.57	Unknown	Reed Pond	MA72053_2002	X	-(Flow alteration*) -Noxious aquatic plants			
			Jennings Pond						
20075	3.88	9	Mud Pond	MA72053_2002	X	-(Flow alteration*) -Noxious aquatic plants			
			Pickerel Pond						
			Jennings Pond						
			Lake Waban				MA72125_2002		
			Morses Pond				MA72079_2002		
			Paintshop Pond						
Reed Pond									
			Waban Brook	MA72-17_2002					

Table A5. Charles River Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
20076	1.93	3	Abbotts Pond Fuller Brook	MA72-18_2002	X	-Cause Unknown -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Noxious aquatic plants
20077	1.75	3	Fuller Brook	MA72-18_2002	X	-Cause Unknown -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Noxious aquatic plants
20093	2.28	17	Alder Brook	MA72-22_2002	X	-Cause Unknown -Nutrients -Organic enrichment/Low DO
			Charles River	MA72-06_2002	X	-Priority organics -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -Turbidity
				MA72-07_2002	X	-Priority organics -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -Turbidity -(Exotic species*)
			Noannet Pond	MA72084_2002		
			Powissett Brook	MA72-20_2002		
			Powissett Pond			
			Rock Meadow Brook	MA72-21_2002	X	-Pathogens
			Rosemary Lake			
20095	11.11	38	Little Wigwam Pond Lowder Brook Rodman Pond Weld Pond Wigwam Pond	MA72131_2002		
20097	0.02	0	Sawmill Brook	MA72-23_2002	X	-Other inorganics -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -Noxious aquatic plants

Table A5. Charles River Basin

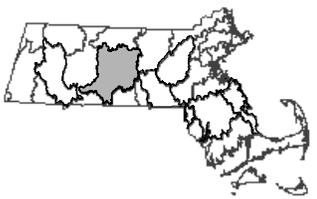
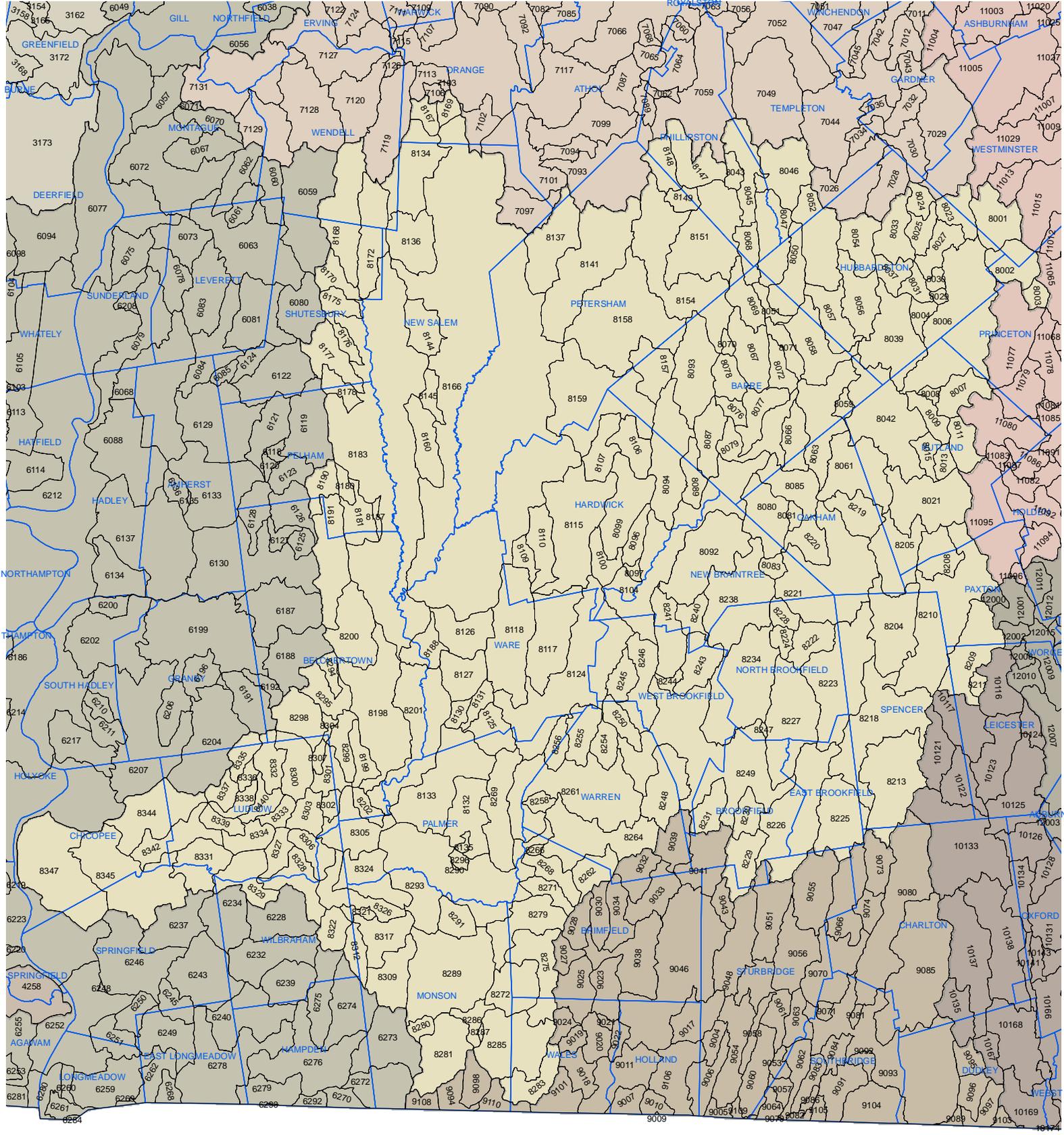
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
20100	10.81	50	Charles River	MA72-07_2002	X	-Priority organics -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -Turbidity -(Exotic species*)
			Cow Island Pond			
			Kendrick Street Pond	MA72055_2002	X	-Turbidity
			Motley Pond			
			Sawmill Brook	MA72-23_2002	X	-Other inorganics -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -Noxious aquatic plants
			Welch Pond			
			Weld Pond	MA72131_2002		
20101	13.04	14	Charles River	MA72-07_2002	X	-Priority organics -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -Turbidity -(Exotic species*)
			Crystal Lake	MA72030_2002		
			Lost Pond			
			New Pond			
			South Meadow Brook	MA72-24_2002	X	-Nutrients -Siltation -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -Turbidity
20102	3.67	11	Longfellow Pond			
			Rosemary Brook	MA72-25_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens -Taste, odor and color -Suspended solids -Turbidity
			Rosemary Lake			
20104	0.94	3	Norumbega Reservoir	MA72086_2002		
				MA72087_2002		
			Seaverns Brook			
			Weston Reservoir	MA72134_2002		
20107	0.70	1	Cherry Brook			
20111	23.02	154	Cambridge Reservoir	MA72014_2002		
			Cambridge Reservoir, Upper Basin	MA72156_2002	X	-Noxious aquatic plants -Turbidity
			Hobbs Brook			
20112	2.31	10	Hobbs Brook			
20113	9.62	100	Dell Brook			
			Stony Brook	MA72-26_2002		
			Stony Brook Reservoir	MA72114_2002		
			Unnamed Tributary	MA72-27_2002		
			Weston Station Pond	MA72135_2002		

Table A5. Charles River Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
20115	22.84	83	Charles River	MA72-07_2002	X	-Priority organics -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants -Turbidity -(Exotic species*)
			Hurd Brook Maple Cove New Pond Rickridge Pond Rosemary Brook	MA72-25_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens -Taste, odor and color -Suspended solids -Turbidity
			Stony Brook Reservoir Unnamed Tributary Wights Pond	MA72-27_2002		
			<hr/>			
20119	9.34	37	Beaver Brook	MA72-28_2002	X	-Cause Unknown -Nutrients -Siltation -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Taste, odor and color -Turbidity
			Duck Pond Mill Pond			
20121	4.14	20	Beaver Brook Chester Brook Hardys Pond	MA72045_2002	X	-Nutrients -Noxious aquatic plants -Turbidity -(Exotic species*)
			Kendall Brook			
20123	0.06	1	Beaver Brook	MA72-28_2002	X	-Cause Unknown -Nutrients -Siltation -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Taste, odor and color -Turbidity
			Clematis Brook Duck Pond			

Table A5. Charles River Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
20129 continued			Muddy River	MA72-11_2002	X	-Priority organics -Metals -Nutrients -Siltation -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Oil and grease -Taste, odor and color
			Sargent Pond			
			Sawins Pond			
			Scarboro Golf Course Pond	MA72107_2002		
			Turtle Pond			
			Unnamed Tributary	MA72-30_2002	X	-Cause Unknown -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -Turbidity
				MA72-31_2002	X	-Priority organics -Metals -(Other habitat alterations*) -Oil and grease -Taste, odor and color
				MA72-32_2002	X	-Pathogens
			Ward Pond			
			Welch Pond			
TOTAL KNOWN:		618				



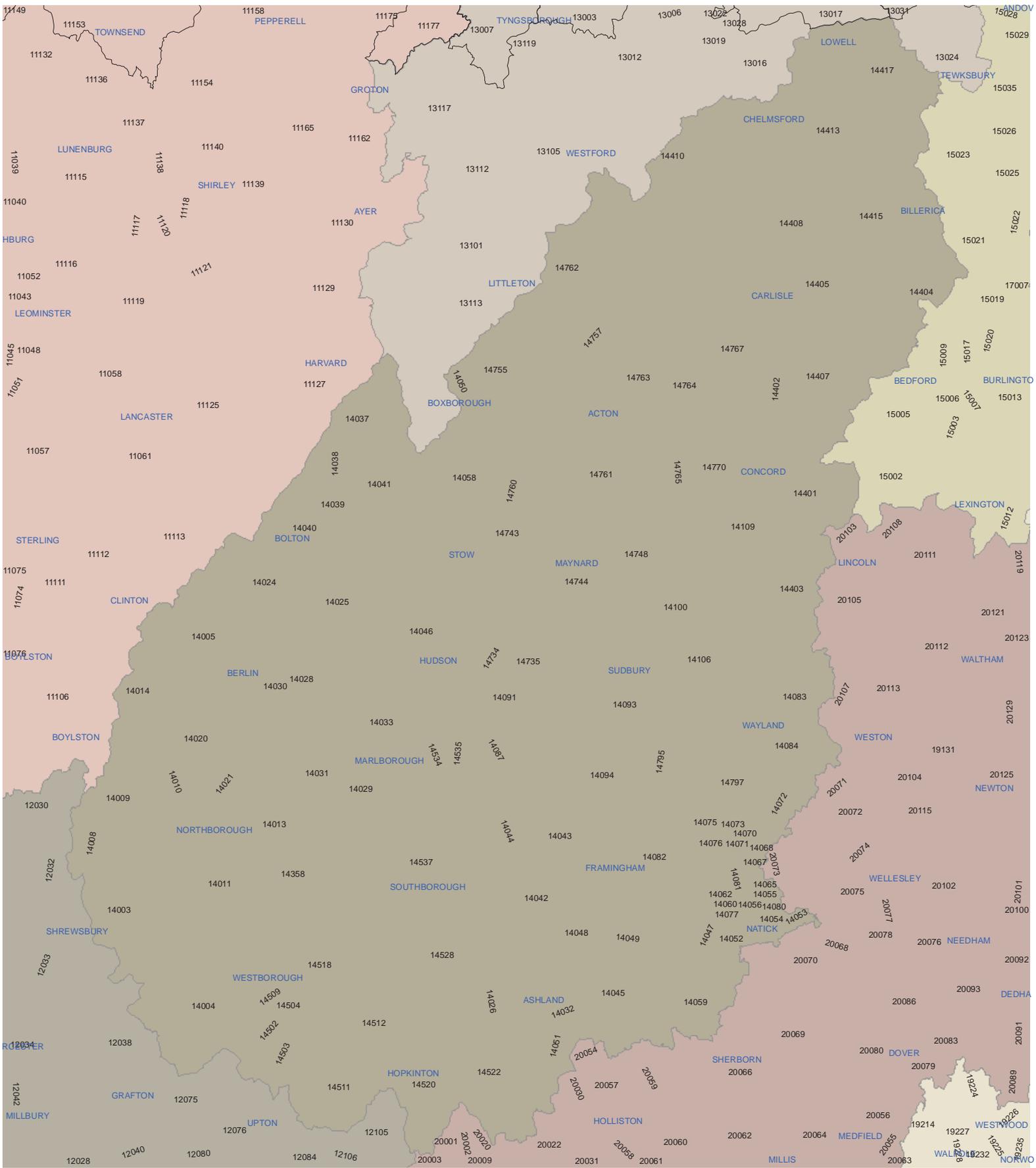
Appendix A
Sub-Basin
Identification Maps:
CHICOPEE

Table A6. Chicopee Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
8011	0.73	Unknown	Moulton Pond	MA36098_2002		
8021	0.18	Unknown	Demond Pond Long Pond	MA36051_2002 MA36082_2002		
8132	1.45	Unknown	Bennett Street Pond Forest Lake Thompson Lake	MA36014_2002 MA36063_2002 MA36154_2002		
8209	0.24	Unknown	Moose Hill Reservoir Shaw Brook Shaw Pond	MA36179_2002 MA36138_2002		
8210	1.32	Unknown	Eames Pond	MA36056_2002	X	-Organic enrichment/Low DO -Noxious aquatic plants
			Moose Hill Reservoir Sugden Reservoir	MA36179_2002 MA36150_2002	X	-Nutrients [4/12/2002-CN118.0] -Organic enrichment/Low DO [4/12/2002-CN118.0] -Turbidity [4/12/2002-CN118.0]
			Thompsons Pond Turkey Hill Brook Turkey Hill Pond	MA36155_2002 MA36157_2002		
8218	0.83	Unknown	Cider Millpond Cranberry River Lake Whittemore Morgan Swamp Sevenmile River	MA36-20_2002 MA36165_2002 MA36-11_2002 MA36-12_2002	X X X X	-Chlorine -Turbidity -Pathogens -Pathogens
8281	0.30	Unknown	Calkins Pond Chicopee Brook Smith Pond	MA36-21_2002		
8286	0.12	Unknown	Conant Brook			
8289	0.48	Unknown	Chicopee Brook Chicopee Brook Pond Paradise Lake	MA36-21_2002 MA36031_2002 MA36116_2002		
8291	0.35	Unknown	Chicopee Brook	MA36-21_2002		
8293	2.29	Unknown	Chicopee Brook Knox Pond Quaboag River	MA36-21_2002 MA36-16_2002 MA36-17_2002	X X	-Pathogens -Taste, odor and color -Pathogens
8324	0.45	Unknown	Calkins Brook Twelvemile Brook	MA36-26_2002		
8326	0.58	Unknown	Calkins Brook Maxwell Brook Twelvemile Brook	MA36-26_2002		
8328	0.77	Unknown	Chicopee River Spectacle Pond	MA36-23_2002 MA36-24_2002 MA36142_2002	X X X	-Pathogens -Pathogens -Noxious aquatic plants [4/12/2002-CN118.0]
8329	1.65	Unknown	Chicopee River Minechoag Pond	MA36-24_2002 MA36093_2002	X X	-Pathogens -Noxious aquatic plants [4/12/2002-CN118.0]

Table A6. Chicopee Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
8331	0.07	Unknown	Chicopee River Dimmock Pond Gamache Pond Murphy Pond Pickerel Pond Wood Pond	MA36-24_2002 MA36053_2002 MA36103_2002	X	-Pathogens
8345	7.55	Unknown	Abbey Brook Chicopee River Cooley Brook Fivemile Pond Fivemile Pond South Lake Lorraine Long Pond Mona Lake	MA36-24_2002 MA36061_2002 MA36182_2002 MA36084_2002 MA36083_2002 MA36094_2002	X X X	-Pathogens -Noxious aquatic plants [4/12/2002-CN118.0] -Noxious aquatic plants [4/12/2002-CN118.0]
8347	12.00	Unknown	Bemis Pond Chicopee River	MA36011_2002 MA36-24_2002 MA36-25_2002	X X X	-Suspended solids -Pathogens -Pathogens



Appendix A
Sub-Basin
Identification Maps:
CONCORD

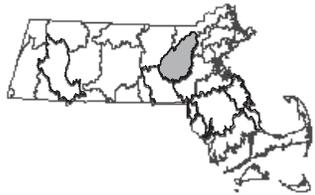


Table A7. Concord Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
14003	11.80	Unknown	Eaton Pond Hop Brook Little Bummet Brook Smith Pond	MA82099_2002		
14004	0.01	Unknown	Assabet River	MA82B-01_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
			Assabet River Reservoir	MA82004_2002	X	-Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
14008	3.61	Unknown	Cushing Swamp Rawson Hill Brook			
14009	3.30	Unknown	Cold Harbor Brook Rocky Pond	MA82095_2002		
14010	0.89	Unknown	Howard Brook			
14011	5.20	Unknown	Assabet River	MA82B-01_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
				MA82B-02_2002	X	-Metals -Nutrients -Organic enrichment/Low DO -Pathogens
				MA82B-03_2002	X	-Nutrients -Pathogens
				MA82B-04_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
			Hocomonco Pond	MA82060_2002	X	-Priority organics -Noxious aquatic plants
			Milham Reservoir Muddy Pond Solomon Pond	MA82077_2002 MA82100_2002		
14013	2.75	Unknown	Assabet River	MA82B-03_2002	X	-Nutrients -Pathogens
			Bartlett Pond Chauncy Lake Crane Swamp Little Chauncy Pond Stirrup Brook	MA82007_2002 MA82017_2002 MA82070_2002		
14014	0.28	Unknown	Clamshell Pond Wrack Meadow	MA82018_2002		
14020	0.06	Unknown	North Brook			
14021	1.81	Unknown	Barefoot Brook North Brook			
14028	3.13	Unknown	Assabet River	MA82B-04_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
			Crystal Spring Gates Pond Gates Pond Brook Hog Swamp Muddy Pond Tripp Pond	MA82047_2002 MA82B-10_2002 MA82107_2002		
14029	1.61	Unknown	Williams Lake	MA82121_2002		

Table A7. Concord Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
14031	4.74	Unknown	Howe Pond Milham Reservoir Millham Brook Millham Brook North Branch	MA82077_2002		
14033	3.71	Unknown	Flagg Swamp Fort Meadow Brook Fort Meadow Reservoir	MA82B-11_2002 MA82042_2002	X	-Nutrients
14037	4.55	Unknown	Elizabeth Brook Horse Meadows			
14041	1.21	Unknown	Elizabeth Brook Hiley Meadows	MA82B-12_2002	X	-Cause Unknown
14042	8.58	Unknown	Foss Reservoir Framingham Reservoir #3 Willow Brook	MA82046_2002		
14043	1.90	Unknown	Birch Meadow Brook			
14044	0.25	Unknown	Framingham Reservoir #3	MA82046_2002		
14045	2.75	Unknown	Gleasons Pond Waushacum Pond	MA82048_2002 MA82112_2002		
14046	0.02	Unknown	Assabet River	MA82B-04_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens
				MA82B-05_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
				MA82B-06_2002	X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Thermal modifications -Taste, odor and color -Suspended solids -Noxious aquatic plants
			Fort Meadow Brook Taylor Brook	MA82B-11_2002 MA82B-08_2002		
14047	0.64	Unknown	Beaver Dam Brook			
14048	1.42	Unknown	Bracket Reservoir Framingham Reservoir #1	MA82044_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)
			Framingham Reservoir #2	MA82045_2002	X	-Metals -Turbidity
			Framingham Reservoir #3 Sudbury River	MA82046_2002 MA82A-02_2002	X	-Metals
14049	0.03	Unknown	Eames Brook	MA82A-13_2002	X	-Cause Unknown -Noxious aquatic plants -(Exotic species*)
			Farm Pond	MA82035_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
14050	1.29	Unknown	Guggins Brook			
14052	1.17	Unknown	Fisk Pond	MA82038_2002		
14054	0.00	Unknown	Lake Cochituate	MA82127_2002	X	-Priority organics -Organic enrichment/Low DO

Table A7. Concord Basin

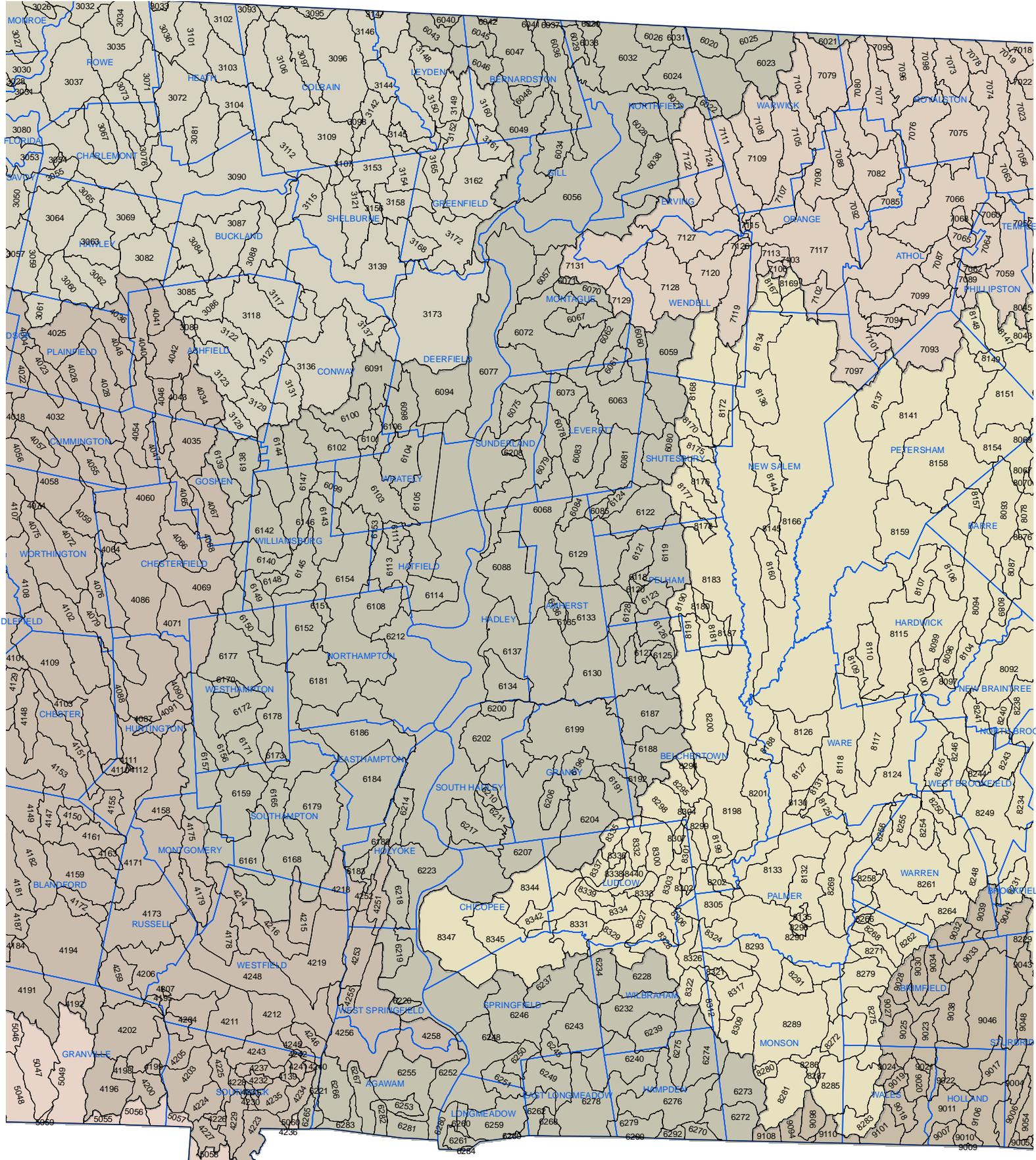
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment	
14081	1.88	Unknown	Lake Cochituate	MA82020_2002	X	-Priority organics -Organic enrichment/Low DO	
				MA82125_2002	X	-Priority organics -Organic enrichment/Low DO	
				MA82126_2002	X	-Priority organics	
				MA82127_2002	X	-Priority organics -Organic enrichment/Low DO	
14082	7.86	Unknown	Eames Brook	MA82A-13_2002	X	-Cause Unknown -Noxious aquatic plants -(Exotic species*)	
				Framingham Reservoir #1	MA82044_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)
			Learned Pond Norton Pond Saxonville Pond		MA82069_2002		
					MA82097_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)
			Sucker Pond Sudbury River	MA82A-02_2002	X	-Metals	
				MA82A-03_2002	X	-Metals	
			14083	0.57	Unknown	Haynard Brook	
14084	1.23	Unknown	Folsom Pond				
			Pine Brook Sudbury River	MA82A-14_2002 MA82A-03_2002	X X	-Cause Unknown -Metals	
14087	0.45	Unknown	Hager Pond	MA82056_2002	X	-Nutrients -Pathogens -Noxious aquatic plants -Turbidity	
				Unnamed Tributary	MA82A-15_2002	X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
			MA82A-16_2002		X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants	
14091	0.29	Unknown	Carding Mill Pond	MA82015_2002	X	-Nutrients -Noxious aquatic plants	
				Crystal Lake Cutting Pond Grist Mill Pond	MA82055_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
			Hop Brook		MA82A-05_2002	X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
					Run Brook Stearns Mill Pond	MA82104_2002	X
			Unnamed Tributary	MA82A-16_2002		X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
				MA82A-17_2002	X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants	
			Willis Lake	MA82122_2002			

Table A7. Concord Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
14093	2.19	Unknown	Blanford Pond Carding Millpond Dudley Brook Hop Brook	MA82A-05_2002	X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
14094	0.57	Unknown	Hop Brook	MA82A-05_2002	X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants
14109	2.92	16	Dugan Brook Fairhaven Bay Goose Pond Kennedys Pond Sudbury River Walden Pond	MA82A-04_2002 MA82109_2002	X X	-Metals -Metals -Organic enrichment/Low DO
14358	0.85	Unknown	Crane Swamp Little Chauncy Pond Little Crane Swamp Wachusett Aqueduct			
14401	2.45	7	Crosby Pond Fairyland Pond Goose Pond Little Goose Pond Mill Brook	MA82A-20_2002		
14404	3.40	0	Mill Brook Nutting Lake	MA82088_2002 MA82124_2002	X X	-Metals -(Exotic species*) -Metals
14407	0.65	0	Assabet River Concord River Great Meadows Great Meadows Pond #3 Mill Brook Sudbury River Yellow Birch Swamp	MA82B-07_2002 MA82A-07_2002 MA82053_2002 MA82A-20_2002 MA82A-04_2002	X X X	-Nutrients -Organic enrichment/Low DO -Pathogens -Metals -Nutrients -Pathogens -Metals
14408	0.86	Unknown	Elm Street Pond Evans Brook Fiske Street Pond Heart Pond Meadow Pond Pond Brook River Meadow Brook Russell Millpond Tophet Swamp Unnamed Tributary	MA82032_2002 MA82037_2002 MA82059_2002 MA82129_2002 MA82096_2002 MA82A-21_2002		
14410	10.41	94	Tadmuck Swamp			
14413	35.61	211	Farley Brook Old Middlessex Canal Putnam Brook River Meadow Brook Russell Millpond	MA82A-10_2002 MA82096_2002	X	-Pathogens

Table A7. Concord Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
14415	2.45	2	Concord River	MA82A-07_2002	X	-Metals -Nutrients -Pathogens
			Winning Pond	MA82123_2002		
14417	10.48	122	Concord River	MA82A-07_2002	X	-Metals -Nutrients -Pathogens
				MA82A-08_2002	X	-Metals -Nutrients
				MA82A-09_2002	X	-Metals -Nutrients -Pathogens
			Meadow Brook			
			River Meadow Brook	MA82A-10_2002	X	-Pathogens
14512	3.03	Unknown	Whitehall Brook	MA82A-11_2002		
14518	6.54	Unknown	Cedar Swamp			
			Piccadilly Brook			
			Rutters Brook			
			Sudbury River	MA82A-01_2002		
				MA82A-02_2002	X	-Metals
			Whitehall Brook	MA82A-11_2002		
14520	3.05	Unknown	Duck Pond			
			Hopkinton Reservoir	MA82061_2002	X	-Organic enrichment/Low DO -(Exotic species*)
			Icehouse Pond			
			Indian Brook	MA82A-12_2002	X	-Cause Unknown
14528	2.18	Unknown	Indian Brook	MA82A-12_2002	X	-Cause Unknown
			Sudbury River	MA82A-02_2002	X	-Metals
14535	0.77	Unknown	Broad Meadow Brook			
			Sudbury Reservoir	MA82106_2002	X	-Metals
14537	10.09	Unknown	Crane Meadow			
			Sudbury Reservoir	MA82106_2002	X	-Metals
			Wachusett Aqueduct			
14743	0.07	Unknown	Elizabeth Brook	MA82B-12_2002	X	-Cause Unknown
			Ministers Pond			
14755	3.12	Unknown	Fort Pond	MA82043_2002		
			Fort Pond Brook	MA82B-13_2002		
			Grassy Pond			
			Grassy Pond Brook			
			Guggins Brook			
			Long Pond	MA82072_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants
14757	0.62	Unknown	Nagog Pond	MA82082_2002		
14760	0.13	Unknown	Heath-Hen Meadow Brook			
			Muddy Brook			
14761	7.61	Unknown	Barkers Pond			
			Coles Brook			
			Fort Pond Brook	MA82B-13_2002		
			Partridge Pond			
			Pratts Brook			
14762	11.72	Unknown	Butter Brook			
			Cobbs Pond			
			Evans Brook			
			Nashoba Brook	MA82B-14_2002		
			Nashua Brook			
			Nonset Brook			
			Vine Brook			

Table A7. Concord Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
14763	4.73	1	Conant Brook Ice House Pond Nagog Brook Nashoba Brook Nashua Brook Wills Hole	MA82066_2002 MA82B-14_2002		
14765	1.07	0	Fort Pond Brook Nashoba Brook Warners Pond	MA82B-13_2002 MA82B-14_2002 MA82110_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)
14770	3.71	6	Assabet River Dakins Brook Second Division Brook Unnamed Tributary Warners Pond	MA82B-06_2002 MA82B-07_2002 MA82B-09_2002 MA82B-16_2002	X X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Thermal modifications -Taste, odor and color -Suspended solids -Noxious aquatic plants -Nutrients -Organic enrichment/Low DO -Pathogens
14795	0.36	Unknown	Hop Brook Wash Brook	MA82A-05_2002 MA82A-06_2002	X X	-Nutrients -Organic enrichment/Low DO -Suspended solids -Noxious aquatic plants -Nutrients -Pathogens -Suspended solids -Noxious aquatic plants
14797	0.24	Unknown	Dudley Pond Heard Pond Norton Pond Pod Meadow Sudbury River Wash Brook	MA82029_2002 MA82058_2002 MA82A-03_2002 MA82A-04_2002 MA82A-06_2002	X X X X X	-Turbidity -(Exotic species*) -Metals -Noxious aquatic plants -(Exotic species*) -Metals -Metals -Nutrients -Pathogens -Suspended solids -Noxious aquatic plants
TOTAL KNOWN:		459				



Appendix A
Sub-Basin
Identification Maps:
CONNECTICUT

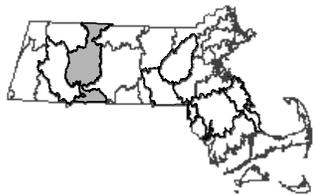
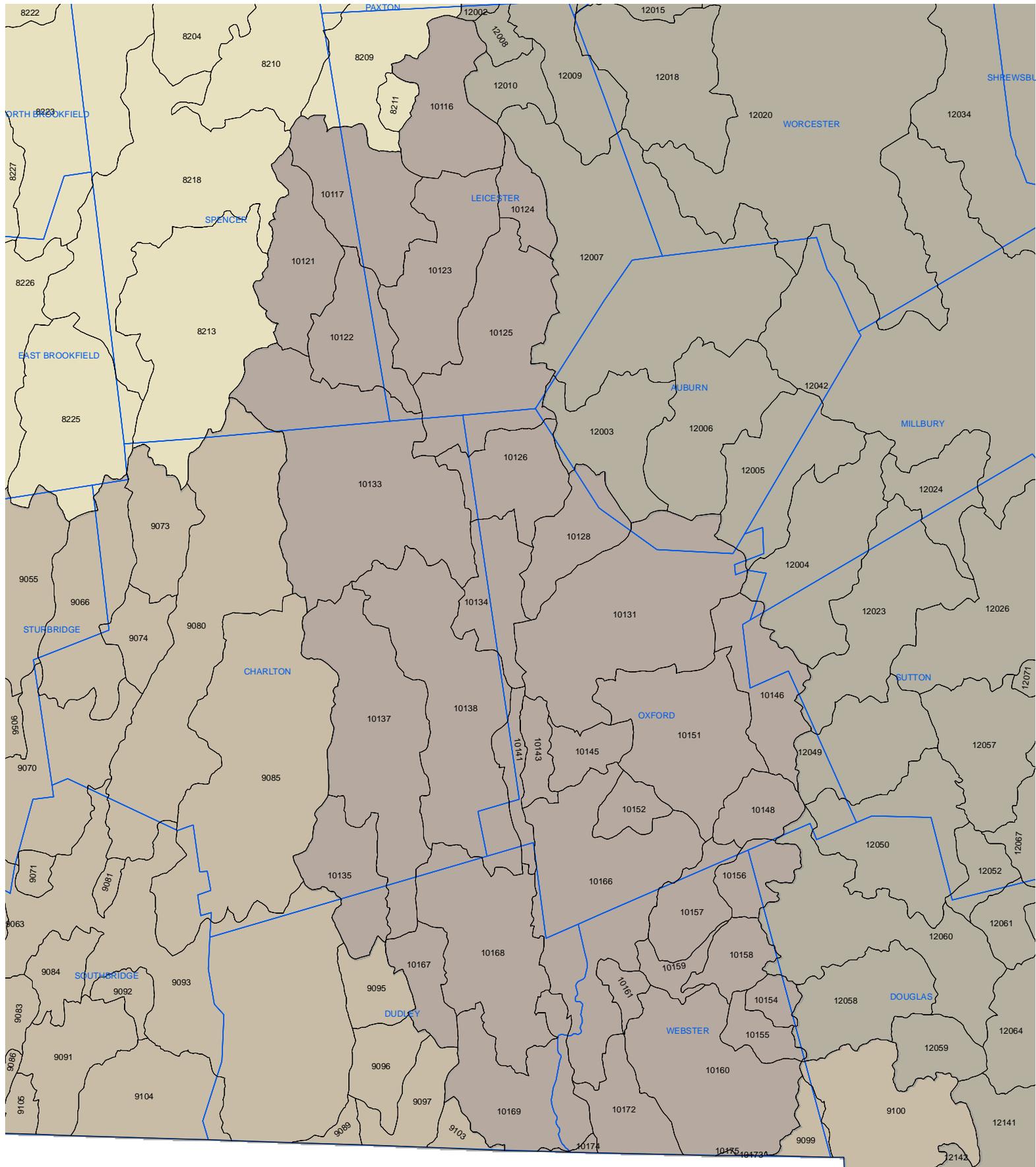


Table A8. Connecticut Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
6114	4.86	Unknown	Mill River	MA34-24_2002		
6137	0.41	Unknown	Fort River Plum Brook	MA34-27_2002		
6154	1.00	Unknown	Beaver Brook Florence Pond Florence Stream Fuller Pond Grass Hill Brook Mill River Nungee Brook Nungee Swamp Potash Brook	MA34-28_2002		
6179	0.09	Unknown	Hackmatack Swamp Manhan River Manhan River South Branch Pomeroy's Meadow Potash Brook Tripple Brook	MA34-11_2002 MA34-12_2002 MA34-16_2002		
6184	0.65	Unknown	Brickyard Brook Broad Brook Lower Mill Pond Nashawannuck Pond Rubber Thread Pond White Brook Wilton Brook	MA34-18_2002 MA34048_2002 MA34057_2002 MA34105_2002 MA34-14_2002 MA34-15_2002	X X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity -Noxious aquatic plants
6186	1.62	Unknown	Bassett Brook Hannum Brook Manhan River	MA34-11_2002		
6188	0.16	Unknown	Lampson Brook Weston Brook	MA34-06_2002 MA34-23_2002	X X	-Unionized Ammonia -Chlorine -Nutrients -Organic enrichment/Low DO -Unionized Ammonia -Chlorine -Nutrients -Organic enrichment/Low DO -Pathogens
6199	0.13	Unknown	Aldrich Lake Bachelor Brook Forge Pond Porter Swamp Weston Brook	MA34002_2002 MA34106_2002 MA34-07_2002 MA34024_2002 MA34-23_2002	X X X	-Noxious aquatic plants [4/12/2002-CN112.0] -Noxious aquatic plants [4/12/2002-CN112.0] -Nutrients -Noxious aquatic plants -(Exotic species*) -Unionized Ammonia -Chlorine -Nutrients -Organic enrichment/Low DO -Pathogens
6202	0.86	Unknown	Bachelor Brook Elmer Brook Pitchawam Swamp	MA34-07_2002		
6206	0.33	Unknown	Muddy Brook			

Table A8. Connecticut Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
6207	2.36	Unknown	Lower Pond	MA34049_2002	X	-Noxious aquatic plants -(Exotic species*)
			Pitchawam Swamp			
			Slabbery Pond			
			Snows Pond			
			Stony Brook	MA34-19_2002		
			Upper Pond	MA34095_2002		-(Exotic species*)
6210	0.36	Unknown	Stony Brook	MA34-19_2002		
6211	1.12	Unknown	Leaping Well Brook			
			Leaping Well Reservoir	MA34040_2002	X	-Noxious aquatic plants
			Stony Brook	MA34-19_2002		
6212	18.04	Unknown	Bachelor Brook	MA34-07_2002		
			Conn River Brook			
			Connecticut River	MA34-04_2002	X	-Priority organics -Pathogens
				MA34-05_2002	X	-Priority organics -Pathogens -Suspended solids
			Cow Bridge Brook			
			Danks Pond	MA34019_2002		
			Dry Brook			
			Fort River	MA34-27_2002		
			Great Pond			
			Greene Swamp			
			Hulberts Pond	MA34036_2002		-(Flow alteration*)
			Lake Bray	MA34013_2002		-(Exotic species*)
			Lake Warner	MA34098_2002		-Nutrients [4/12/2002-CN112.0] -Organic enrichment/Low DO [4/12/2002-CN112.0] -Noxious aquatic plants [4/12/2002-CN112.0] -Turbidity [4/12/2002-CN112.0] -(Exotic species*)
			Log Pond Cove	MA34124_2002	X	-Priority organics -(Exotic species*)
			Manhan River	MA34-11_2002		
			Mill River	MA34-24_2002		
				MA34-28_2002		
			Mill River Diversion	MA34-32_2002		
			Mohawk Brook			
			Neds Ditch			
			Oxbow	MA34066_2002	X	-Turbidity
			Rocky Hill Pond			
			Russell Cove			
			Serendipity Stream			
			Stony Brook	MA34-19_2002		
			Sugarloaf Brook			
			Superstition Stream			
			Unnamed Tributary	MA34-31_2002		
			White Brook			
6214	0.21	Unknown	Superstition Stream			
			Whiting Street Reservoir	MA34101_2002		-(Exotic species*)
6217	5.45	Unknown	Buttery Brook			
			Taylor Pond			
6218	4.56	Unknown	Clear Pond			
			Tannery Brook			
6219	3.68	Unknown	Goldine Brook			
			Schoolhouse Brook			

Table A8. Connecticut Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
6220	0.19	Unknown	Piper Brook			
6223	61.05	Unknown	1St Level Canal 2Nd Level Canal Connecticut River	MA34-05_2002	X	-Priority organics -Pathogens -Suspended solids
			Mountain Lake	MA34055_2002	X	-Noxious aquatic plants -Turbidity
			Slabbery Pond Upper Van Horn Park Pond	MA34128_2002	X	-Nutrients -Noxious aquatic plants -Turbidity
			Van Horn Reservoir			
6228	0.47	Unknown	Cedar Swamp Nine Mile Pond	MA34127_2002		
6234	0.63	Unknown	North Branch Mill River			
6237	0.01	Unknown	Loon Pond	MA34045_2002	X	-Nutrients [4/12/2002-CN112.0] -Noxious aquatic plants [4/12/2002-CN112.0]
			North Branch Mill River			
6246	1.16	Unknown	Dan Baker Cove Island Pond Lake Lookout	MA34044_2002	X	-Noxious aquatic plants -Turbidity
			Mill River Noonan Cove	MA34-29_2002 MA34058_2002	X	-Noxious aquatic plants -Turbidity
			Venture Pond	MA34096_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity
			Watershops Pond	MA34099_2002	X	-Noxious aquatic plants -Turbidity
6252	17.97	Unknown	Connecticut River	MA34-05_2002	X	-Priority organics -Pathogens -Suspended solids
			Cooley Brook Mill River Wheel Meadow Brook	MA34-20_2002 MA34-29_2002		
6255	12.86	Unknown	Silver Lake Three Mile Brook	MA34084_2002		
6260	2.57	Unknown	Longmeadow Brook	MA34-21_2002		
6261	1.51	Unknown	Raspberry Brook	MA34-22_2002		
6267	0.12	Unknown	Philo Brook Taylor Pond			
6280	0.62	Unknown	Connecticut River	MA34-05_2002	X	-Priority organics -Pathogens -Suspended solids
			Longmeadow Brook Raspberry Brook	MA34-21_2002 MA34-22_2002		
6281	0.00	Unknown	Fourmile Brook Worthington Brook			



Appendix A
Sub-Basin
Identification Maps:
FRENCH

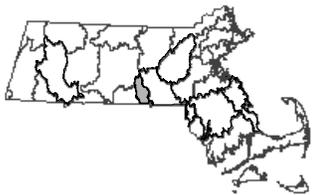
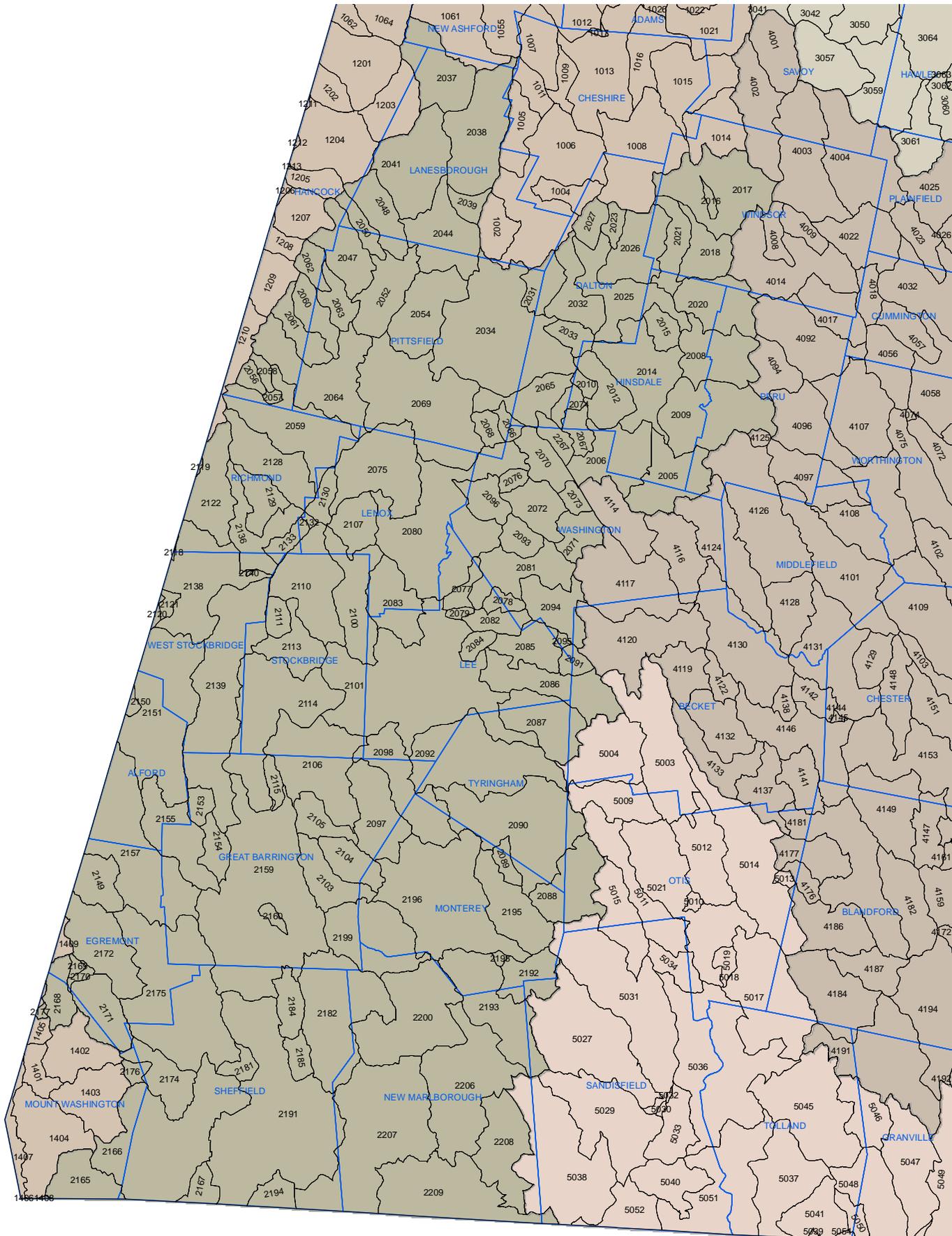


Table A9. French Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
10117	1.38	Unknown	Burncoat Brook Burncoat Pond Cedar Meadow Pond	MA42-07_2002 MA42007_2002 MA42009_2002		
10123	0.86	Unknown	Ballard Hill Pond Bartons Brook Bouchard Pond Burncoat Brook Dutton Pond Greenville Pond Greenville Pond West Town Meadow Brook	MA42069_2002 MA42-08_2002 MA42003_2002 MA42-07_2002 MA42015_2002 MA42023_2002 MA42022_2002 MA42-01_2002 MA42-02_2002	X X	-Nutrients [7/12/2002-CN110.0] -Noxious aquatic plants [7/12/2002-CN110.0] -Turbidity [7/12/2002-CN110.0]
10124	0.16	Unknown	Henshaw Pond	MA42025_2002		
10125	0.01	Unknown	French River Great Cedar Swamp Greenville Pond Grindstone Brook Rochdale Pond	MA42-03_2002 MA42023_2002 MA42048_2002	X X X	-Metals -Turbidity [7/12/2002-CN110.0] -Nutrients [7/12/2002-CN110.0] -Organic enrichment/Low DO [7/12/2002-CN110.0] -Noxious aquatic plants [7/12/2002-CN110.0]
10126	0.26	Unknown	French River Texas Pond	MA42-03_2002 MA42058_2002	X X	-Metals -Metals -Noxious aquatic plants [7/12/2002-CN110.0]
10128	2.49	Unknown	French River Thayers Pond	MA42-03_2002 MA42-04_2002 MA42059_2002	X X	-Metals -Metals -Nutrients -Turbidity
10131	8.27	Unknown	Carbuncle Pond Cedar Swamp Chimney Pond French River Stumpy Pond Thayers Pond Unnamed Tributary Wellington Brook	MA42008_2002 MA42-04_2002 MA42059_2002 MA42-12_2002 MA42-11_2002	X	-Metals -Nutrients -Turbidity
10133	0.01	Unknown	Hammond Pond Hultered Pond Jones Pond Little Nugget Lake Little River Pikes Pond Snow Pond Tucker Pond Wee Laddie Pond	MA42072_2002 MA42030_2002 MA42032_2002 MA42-09_2002 MA42044_2002 MA42054_2002 MA42065_2002	X X X	-Noxious aquatic plants [7/12/2002-CN110.0] -Metals -Turbidity [7/12/2002-CN110.0]
10137	0.08	Unknown	Dodge Pond Granite Reservoir Hultered Pond Shepherd Pond South Charlton Reservoir	MA42019_2002 MA42051_2002	X	-Noxious aquatic plants [7/12/2002-CN110.0]

Table A9. French Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
10151	4.23	Unknown	Eames Pond Lowes Pond Mckinstry Pond	MA42034_2002 MA42035_2002	X X	-Noxious aquatic plants [7/12/2002-CN110.0] -Noxious aquatic plants [7/12/2002-CN110.0]
10152	2.16	Unknown	Lowes Brook			
10159	1.54	Unknown	Club Pond Webster Lake	MA42064_2002		
10160	7.23	Unknown	Bates Cove Cedar Swamp Lake Chaubunagungamaug Middle Pond Mill Brook Narrows North Pond Pout Pond Reid Smith Cove South Pond Sucker Brook Cove Webster Lake Winter Cove	MA42-10_2002 MA42064_2002		
10161	0.32	Unknown	Mill Brook	MA42-10_2002		
10166	7.17	Unknown	French River Mill Brook	MA42-04_2002 MA42-05_2002 MA42-10_2002	X	-Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -(Objectionable deposits*)
10168	0.32	Unknown	French River Hayden Pond Larner Pond Low Pond Merino Pond Mosquito Pond New Pond Peter Pond Pierpoint Meadow Pond Wallis Pond	MA42-05_2002 MA42024_2002 MA42068_2002 MA42033_2002 MA42036_2002 MA42060_2002 MA42037_2002 MA42042_2002 MA42043_2002 MA42062_2002	X X X X X	-Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -(Objectionable deposits*) -Noxious aquatic plants [7/12/2002-CN110.0] -Noxious aquatic plants [7/12/2002-CN110.0] -Nutrients [7/12/2002-CN110.0] -Organic enrichment/Low DO [7/12/2002-CN110.0] -Organic enrichment/Low DO [7/12/2002-CN110.0] -Noxious aquatic plants [7/12/2002-CN110.0]
10169	2.35	Unknown	Conant Pond French River Packard Pond Potash Brook	MA42-05_2002 MA42-06_2002 MA42040_2002	X X	-Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -(Objectionable deposits*) -Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -Turbidity -(Objectionable deposits*)



Appendix A
Sub-Basin
Identification Maps:
HOUSATONIC

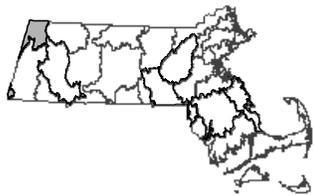
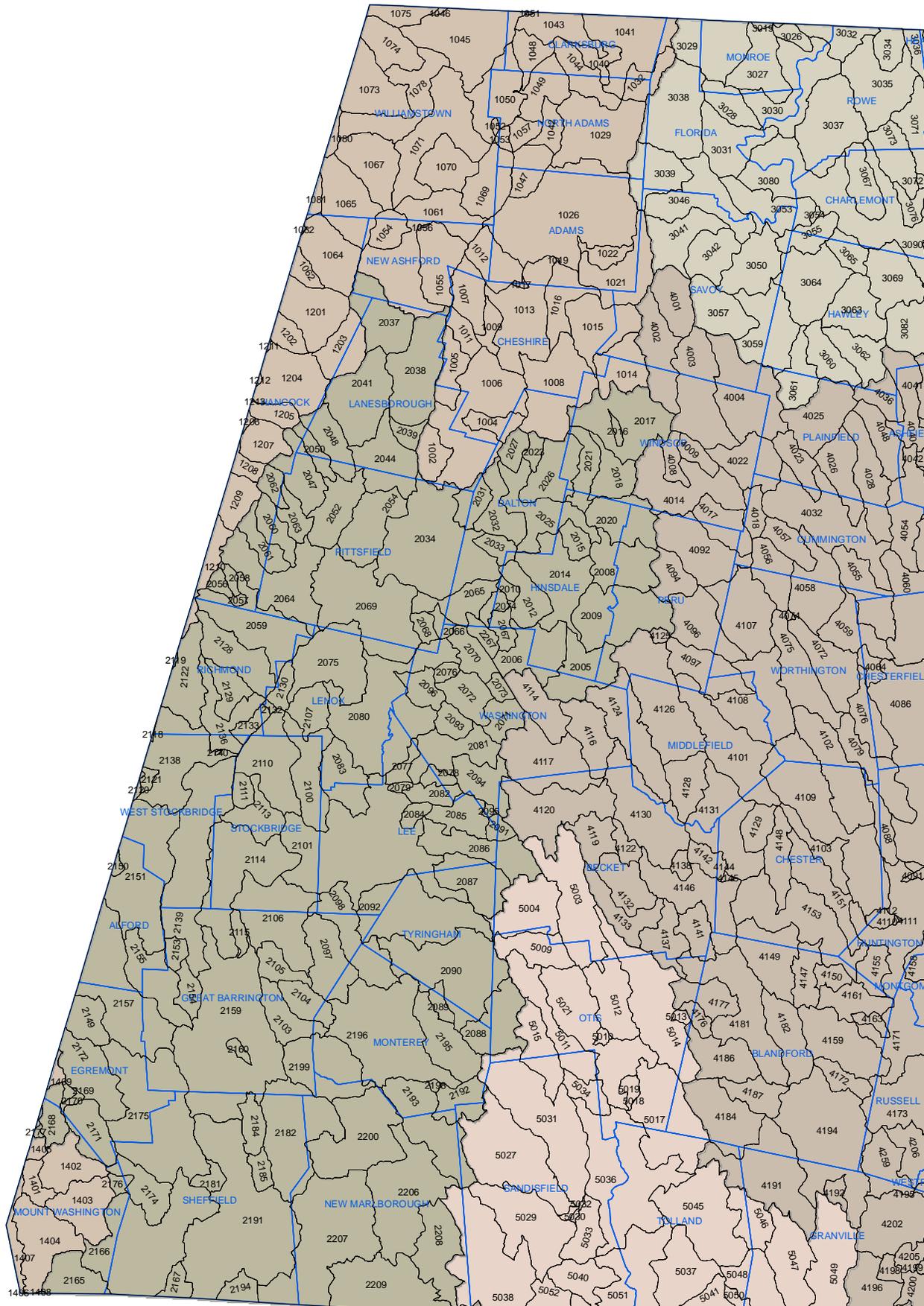


Table A10. Housatonic Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
2014	0.67	Unknown	East Branch Housatonic River Frisell Brook	MA21-01_2002	X	-Priority organics
2025	0.77	Unknown	Anthony Brook Center Pond Cleveland Brook East Branch Housatonic River Egypt Reservoir Wahconah Falls Brook	MA21-10_2002 MA21016_2002 MA21-08_2002 MA21-01_2002 MA21-11_2002	X X X	-Priority organics -Priority organics
2026	0.64	Unknown	Little Egypt Reservoir Wahconah Falls Brook Weston Brook Windsor Reservoir	MA21-11_2002		
2031	0.77	Unknown	East Branch Housatonic River	MA21-02_2002	X	-Cause Unknown -Unknown toxicity -Priority organics -Pathogens
2032	1.93	Unknown	Center Pond East Branch Housatonic River Walker Brook	MA21016_2002 MA21-01_2002 MA21-02_2002	X X X	-Priority organics -Priority organics -Cause Unknown -Unknown toxicity -Priority organics -Pathogens
2034	5.59	Unknown	Barton Brook Brattle Brook East Branch Housatonic River Goodrich Pond Silver Lake Unkamet Brook	MA21-02_2002 MA21042_2002	X	-Cause Unknown -Unknown toxicity -Priority organics -Pathogens
2039	0.76	Unknown	Town Brook			
2044	1.13	Unknown	Pontoosuc Lake Town Brook	MA21083_2002	X	-Metals -(Exotic species*)
2054	0.10	Unknown	Pecks Pond Pontoosuc Lake West Branch Housatonic River	MA21083_2002 MA21-18_2002	X X	-Metals -(Exotic species*) -Priority organics -Siltation -(Other habitat alterations*) -Pathogens
2064	1.28	Unknown	Cranberry Pond Jacoby Brook Mud Pond Shaker Brook Smith Brook Southwest Branch Housatonic River Twin Pond	MA21-17_2002	X	-Cause Unknown -Siltation -(Other habitat alterations*)

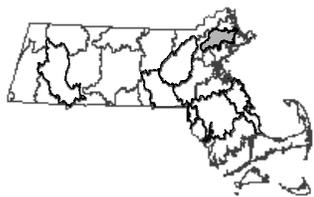
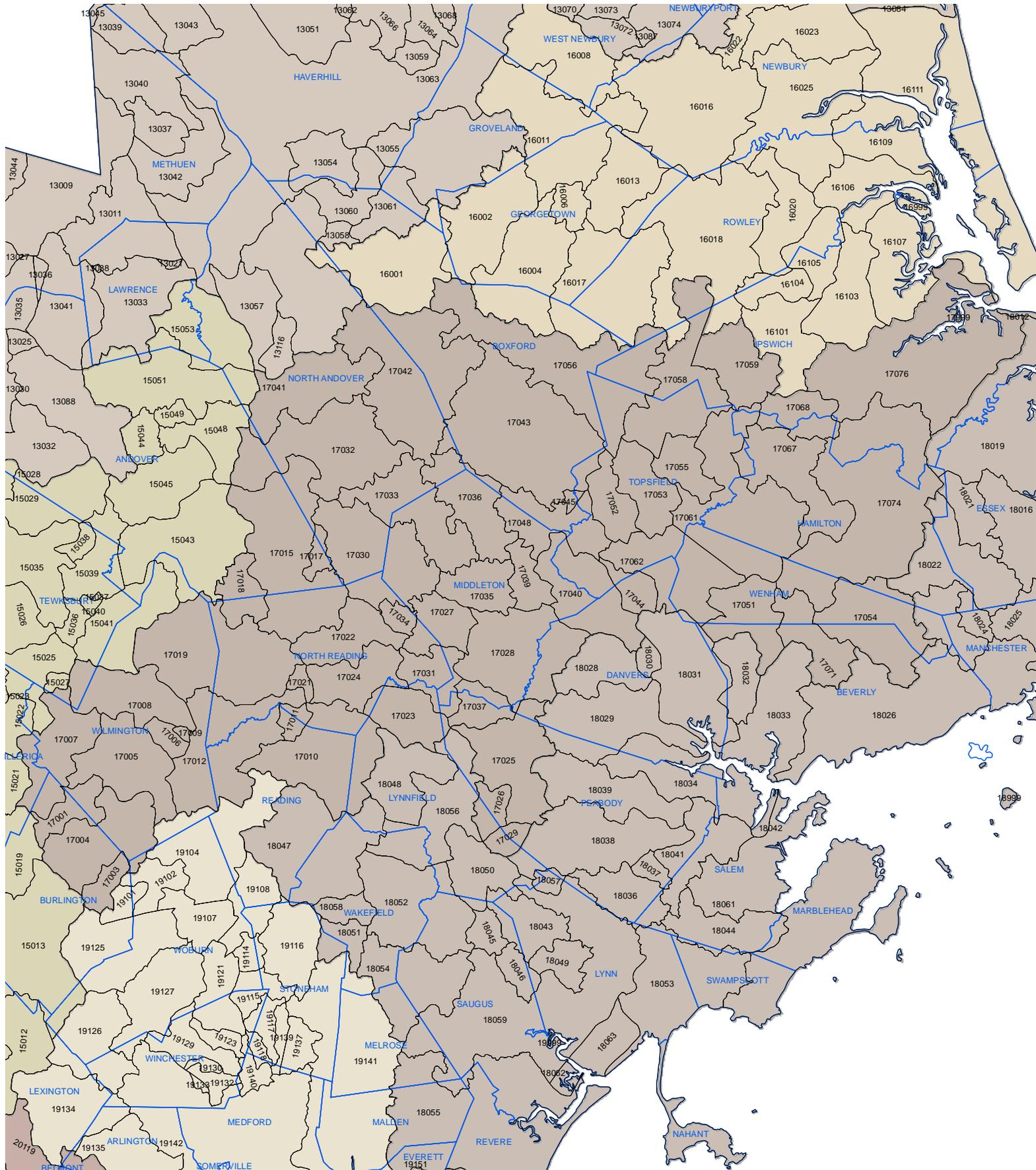
Table A10. Housatonic Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment		
2069	2.70	Unknown	East Branch Housatonic River	MA21-02_2002	X	-Cause Unknown -Unknown toxicity		
			Housatonic River	MA21-04_2002	X	-Priority organics -Pathogens		
			Maloy Brook Morewood Lake Sackett Brook					
			Southwest Branch Housatonic River	MA21-17_2002	X	-Cause Unknown -Siltation -(Other habitat alterations*)		
			West Branch Housatonic River	MA21-18_2002	X	-Priority organics -Siltation -(Other habitat alterations*) -Pathogens		
2075	1.34	Unknown	Yokun Brook					



Appendix A
Sub-Basin
Identification Maps:
HUDSON

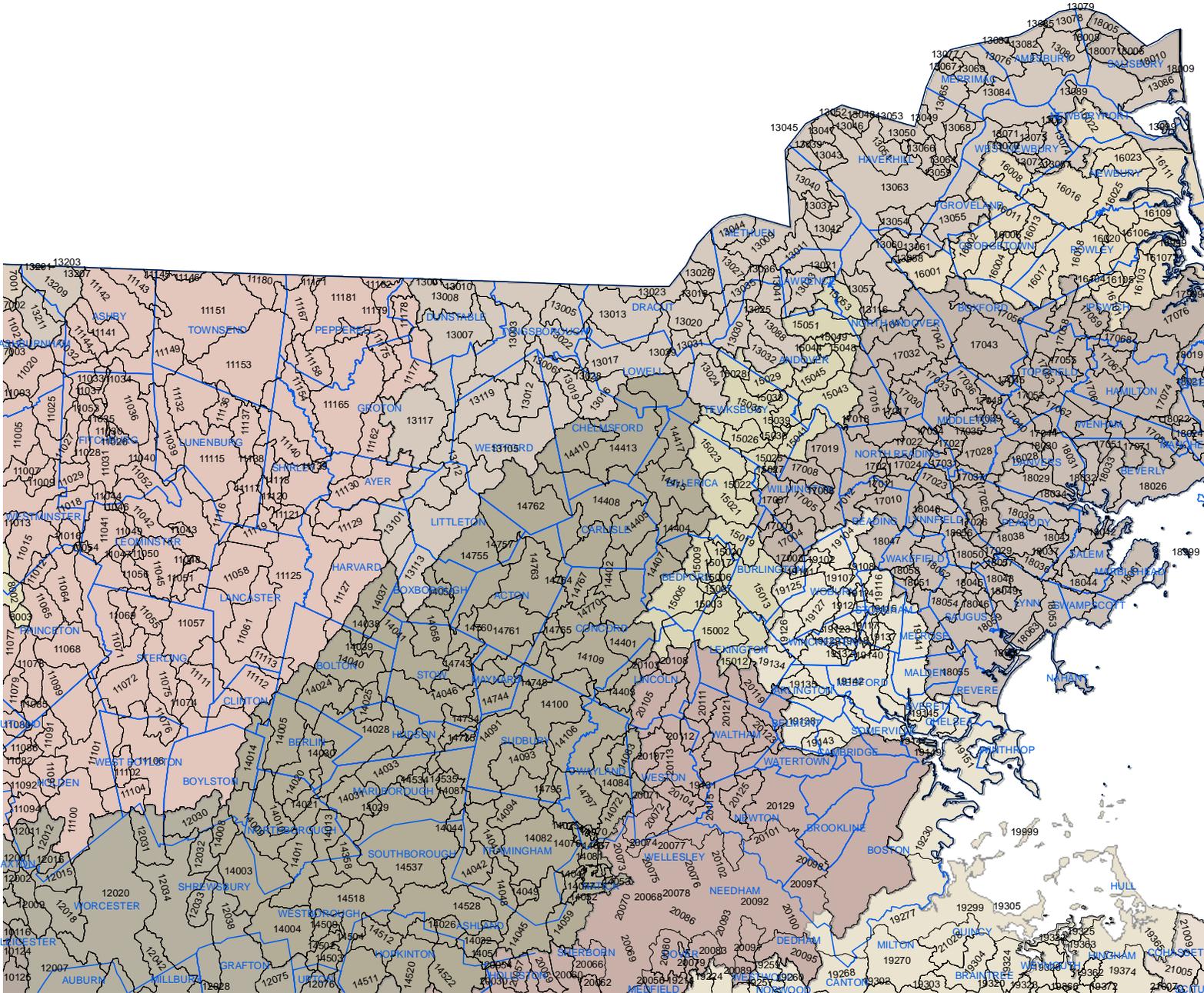
Table A11. Hudson Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
1004	0.00	Unknown	Gore Brook Gore Pond			
1006	2.38	Unknown	Berkshire Pond Cheshire Reservoir	MA11001_2002 MA11002_2002	X	-Nutrients -Noxious aquatic plants -Turbidity -(Exotic species*)
				MA11018_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
			Collins Brook Hoosic River	MA11019_2002 MA11-03_2002	X	-Cause Unknown -(Other habitat alterations*) -Pathogens



Appendix A
Sub-Basin
Identification Maps:
IPSWICH

Table A12. Ipswich Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
17004	1.62	0	Maple Meadow Brook Mill Pond Sawmill Brook	MA92-04_2002 MA92041_2002	X	-Metals
17005	2.06	6	Ipswich River Maple Meadow Brook	MA92-04_2002		
17007	0.46	4	Lubber Pond East Lubber Pond West Lubbers Brook Mud Pond	MA92035_2002 MA92036_2002 MA92-05_2002		
17008	2.48	14	Lubbers Brook Mud Pond Silver Lake	MA92-05_2002 MA92059_2002		
17010	0.87	3	Bear Meadow Brook Cedar Swamp	MA92-07_2002		
17012	8.45	36	Bear Meadow Brook Ipswich River	MA92-07_2002 MA92-06_2002	X	-Nutrients -(Flow alteration*)
17015	1.24	17	Bear Pond Brackett Pond Bradford Pond Collins Pond Field Pond Frye Pond Skug River	MA92004_2002 MA92005_2002 MA92010_2002 MA92019_2002 MA92023_2002	X X X	-Turbidity -Noxious aquatic plants -Turbidity -Noxious aquatic plants
17018	4.26	30	Martins Pond	MA92038_2002	X	-Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
17019	11.50	70	Martins Brook Martins Pond	MA92-08_2002 MA92038_2002	X X	-Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Metals -Noxious aquatic plants -Turbidity -(Exotic species*)
17024	0.01	1	Ipswich River Unnamed Tributary Wills Brook	MA92-06_2002 MA92-09_2002 MA92-10_2002	X X	-Nutrients -(Flow alteration*) -Organic enrichment/Low DO -Pathogens
17025	2.54	10	Crystal Pond Devils Dishfull Pond Elginwood Pond Norris Brook Pierces Pond	MA92013_2002 MA92015_2002 MA92017_2002 MA92-11_2002 MA92048_2002	X X X	-Noxious aquatic plants -Noxious aquatic plants -Turbidity -Organic enrichment/Low DO -Suspended solids -Turbidity
17028	4.32	17	Ipswich River Norris Brook Unnamed Tributary	MA92-06_2002 MA92-11_2002 MA92-12_2002	X X X	-Nutrients -(Flow alteration*) -Organic enrichment/Low DO -Suspended solids -Turbidity -Pathogens
17029	1.72	3	Suntaug Lake	MA92065_2002		
17032	3.55	24	Boston Brook Farnum Street Pond	MA92-13_2002 MA92018_2002		

Table A12. Ipswich Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
17040	5.21	43	Nichols Brook Orne Swamp	MA92-25_2002		
17041	2.17	8	Mosquito Brook			
17043	4.62	79	Crooked Pond Fish Brook Howes Pond Kimballs Pond Towne Pond	MA92-14_2002 MA92026_2002 MA92068_2002		
17051	2.18	3	Cedar Pond Wenham Lake	MA92073_2002		
17053	0.95	4	Ipswich River	MA92-06_2002	X	-Nutrients -(Flow alteration*)
17055	0.58	1	Hassocky Meadow Mile Brook Pintail Pond Rockery Pond	MA92-16_2002		
17056	3.95	53	Fourmile Pond Hood Pond Lowe Pond Lower Four Mile Pond Pye Brook Spofford Pond Stevens Pond	MA92022_2002 MA92025_2002 MA92034_2002 MA92032_2002 MA92060_2002 MA92062_2002	X X	-Metals -Metals -(Exotic species*)
17058	2.28	2	Howlett Brook Mile Brook	MA92-17_2002 MA92-16_2002	X	-Pathogens
17061	0.00	1	Bunker Meadows Gravelly Brook Hassocky Meadow Howlett Brook Idlewild Brook Ipswich River Mile Brook Muddy Pond Pleasant Pond Salem Beverly Waterway Canal Wenham Swamp	MA92-18_2002 MA92-17_2002 MA92-24_2002 MA92-06_2002 MA92-15_2002 MA92-16_2002 MA92049_2002	X X X	-Pathogens -Nutrients -(Flow alteration*) -Organic enrichment/Low DO -(Flow alteration*)
17071	2.37	16	Beaver Pond Miles River Norwood Pond	MA92002_2002 MA92-03_2002	X	-Organic enrichment/Low DO -Pathogens
17074	1.50	3	Cutler Pond Long Causeway Brook Miles River	MA92-20_2002 MA92-03_2002	X	-Organic enrichment/Low DO -Pathogens
17076	1.72	4	Ipswich River Kimball Brook Labor In Vain Creek Miles River Ranfoul Pond Unnamed Tributary	MA92-02_2002 MA92-15_2002 MA92-21_2002 MA92-22_2002 MA92-03_2002 MA92-23_2002	X X X X X	-Pathogens -Organic enrichment/Low DO -(Flow alteration*) -Organic enrichment/Low DO -Pathogens -Organic enrichment/Low DO -Pathogens -Organic enrichment/Low DO -Pathogens
TOTAL:		452				



Appendix A
Sub-Basin
Identification Maps:
MERRIMACK

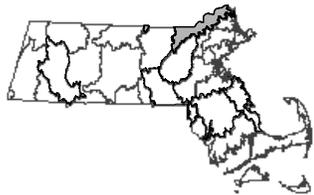


Table A13. Merrimack Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
13006	5.31	2	Deep Brook	MA84A-21_2002	X	-Unknown toxicity -Siltation -Organic enrichment/Low DO -Pathogens
13009	14.15	69	Mystic Pond Peat Meadow Spicket River	MA84A-10_2002	X	-Cause Unknown -Metals -Nutrients -(Other habitat alterations*) -Pathogens -(Objectionable deposits*)
13011	2.69	6	Searles Pond Spicket River	MA84A-10_2002	X	-Cause Unknown -Metals -Nutrients -(Other habitat alterations*) -Pathogens -(Objectionable deposits*)
13013	1.02	Unknown	Beaver Brook	MA84A-11_2002	X	-Cause Unknown -(Other habitat alterations*) -Pathogens -Oil and grease -Turbidity -(Objectionable deposits*)
			Double Brook Long Pond	MA84032_2002	X	-Metals -Noxious aquatic plants
			Peppermint Brook			
13016	6.38	5	Black Brook	MA84A-17_2002	X	-Unknown toxicity -Siltation -Pathogens -Turbidity
13017	9.49	36	Black Brook	MA84A-17_2002	X	-Unknown toxicity -Siltation -Pathogens -Turbidity
			Claypit Brook Concord River Eastern Canal Hamilton Canal Merrimack River	MA84A-01_2002	X	-Metals -Pathogens
				MA84A-02_2002	X	-Metals -Nutrients -(Flow alteration*) -Pathogens
			Northern Canal Pawtucket Canal Spruce Swamp Western Canal			
13018	0.09	0	Trout Brook	MA84A-13_2002		

Table A13. Merrimack Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment	
13019	4.29	5	Newfield Pond	MA84046_2002	X	-Metals -Organic enrichment/Low DO -Noxious aquatic plants -(Exotic species*)	
			Stony Brook	MA84B-04_2002	X	-Cause Unknown -Nutrients -pH -Organic enrichment/Low DO -Pathogens	
13020	0.90	9	Richardson Brook	MA84A-12_2002			
			Trout Brook	MA84A-13_2002			
13022	7.37	31	Deep Brook	MA84A-21_2002	X	-Unknown toxicity -Siltation -Organic enrichment/Low DO -Pathogens	
			Lawrence Brook	MA84A-20_2002			
			Limit Brook				
			Locust Pond	MA84031_2002	X	-Metals	
			Merrimack River	MA84A-01_2002	X	-Metals -Pathogens	
			Uptons Pond	MA84075_2002			
13024	7.68	91	Trull Brook	MA84A-14_2002			
13027	1.41	3	Bartlett Brook				
			Cedar Pond				
			Peters Pond				
13028	0.32	0	Merrimack River	MA84A-01_2002	X	-Metals -Pathogens	
			Stony Brook	MA84B-04_2002	X	-Cause Unknown -Nutrients -pH -Organic enrichment/Low DO -Pathogens	
13030	1.18	3	Merrimack River	MA84A-03_2002	X	-Priority organics -Metals -Nutrients -Pathogens	
13031	2.60	15	Merrimack River	MA84A-02_2002	X	-Metals -Nutrients -(Flow alteration*) -Pathogens	
				MA84A-03_2002	X	-Priority organics -Metals -Nutrients -Pathogens	
			Richardson Brook	MA84A-12_2002			
			Trull Brook	MA84A-14_2002			
13032	3.96	33	Haggets Pond	MA84022_2002	X	-Metals	

Table A13. Merrimack Basin

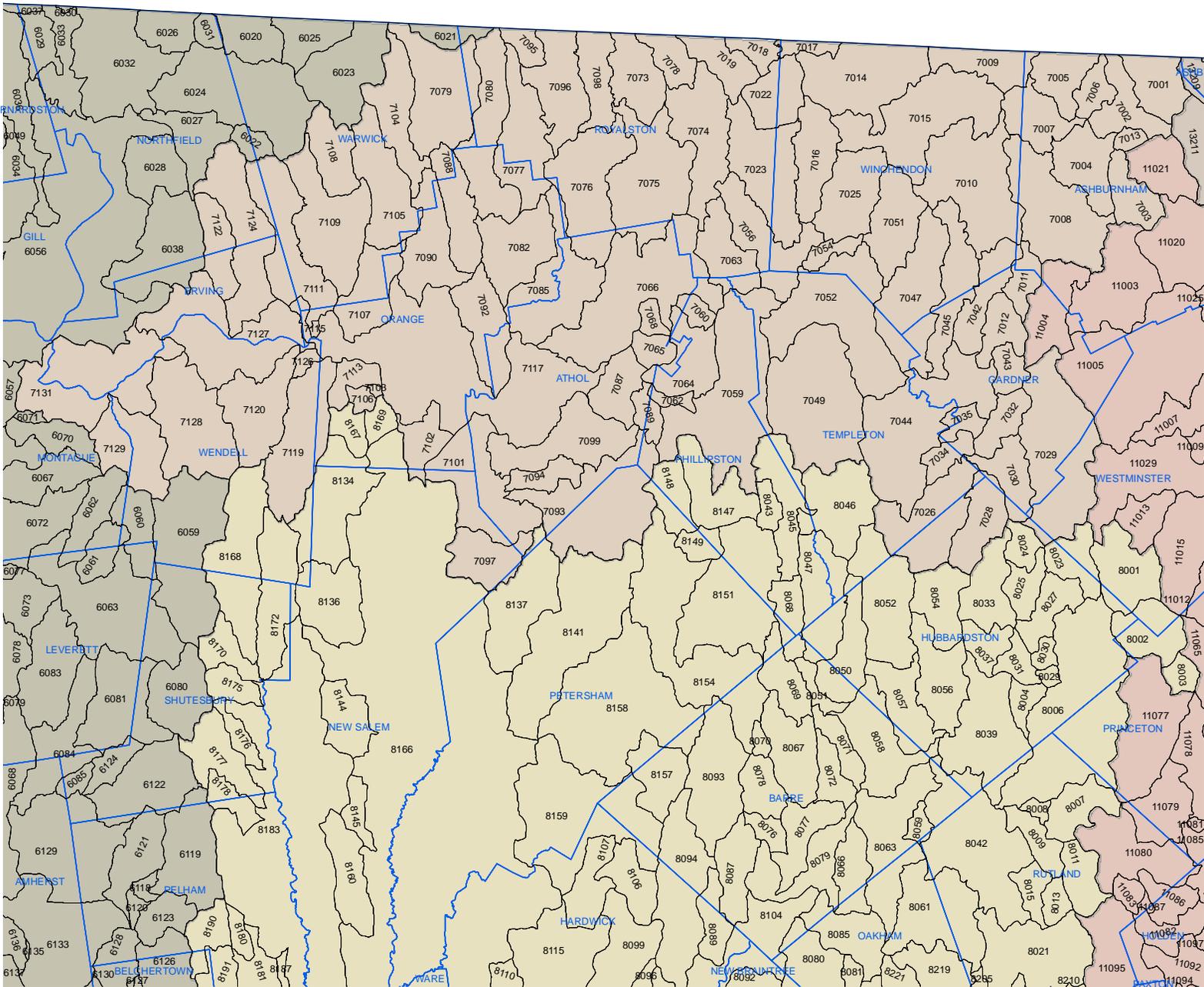
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
13033	0.84	2	Merrimack River	MA84A-03_2002	X	-Priority organics -Metals -Nutrients -Pathogens
				MA84A-04_2002	X	-Priority organics -Nutrients -Pathogens
			Spicket River	MA84A-10_2002	X	-Cause Unknown -Metals -Nutrients -(Other habitat alterations*) -Pathogens -(Objectionable deposits*)
13035	4.50	15	Griffin Brook Merrimack River	MA84A-03_2002	X	-Priority organics -Metals -Nutrients -Pathogens
			Mill Pond			
13036	2.30	9	Merrimack River	MA84A-03_2002	X	-Priority organics -Metals -Nutrients -Pathogens
13041	6.21	39	Merrimack River	MA84A-03_2002	X	-Priority organics -Metals -Nutrients -Pathogens
13042	7.43	32	Bare Meadow Brook	MA84A-18_2002	X	-Siltation -Organic enrichment/Low DO -Pathogens -Turbidity
			Hills Pond			
13050	7.25	85	Frye Pond Snows Brook			
13051	2.74	42	Little River	MA84A-09_2002	X	-(Other habitat alterations*) -Pathogens
13057	1.10	6	Stevens Pond Sutton Pond	MA84064_2002	X	-Metals
13063	0.69	6	Lake Cochichewick	MA84008_2002	X	-Metals
13065	1.84	7	East Meadow River Neal Pond			
13066	0.05	0	Kenoza Lake	MA84028_2002	X	-Metals
13068	0.20	6	Millvale Reservoir	MA84041_2002	X	-Metals
13069	0.03	0	Cobbler Brook	MA84A-22_2002	X	-Cause Unknown -Unknown toxicity
13071	0.30	2	Mill Pond	MA84039_2002		
13076	0.56	2	Black River Lake Attitash Powwow River	MA84002_2002 MA84A-28_2002	X X	-Metals -Pathogens -Suspended solids -Noxious aquatic plants -Turbidity
			Sargent Mill Pond Tuxbury Pond			

Table A13. Merrimack Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment		
13080	7.23	132	Back River	MA84A-16_2002	X	-Siltation -Pathogens -Turbidity		
			Lake Gardner					
			Pow Wow River					
			Powwow River	MA84A-08_2002	X	-Pathogens		
				MA84A-25_2002	X	-Pathogens -Suspended solids -Noxious aquatic plants -Turbidity		
13084	30.15	188	Back River					
			Bailey Pond	MA84003_2002				
			Boggy Meadows					
			Cobbler Brook	MA84A-22_2002	X	-Cause Unknown -Unknown toxicity		
			Goodwin Creek					
			Indian River					
			Merrimack River	MA84A-05_2002	X	-Priority organics -Unionized Ammonia -Pathogens		
				MA84A-06_2002	X	-Priority organics -Pathogens		
				MA84A-26_2002	X	-Pathogens		
			Plum Island River	MA84A-27_2002	X	-Pathogens		
			Plumbush Creek					
Powwow River	MA84A-08_2002	X	-Pathogens					
Presbus Creek								
Town Creek								
13086	0.75	0	Allen Creek					
			Black Rock Creek					
			Merrimack River	MA84A-06_2002	X	-Priority organics -Pathogens		
			Middle Creek					
13088	11.11	86	Fish Brook					
			Haggets Pond	MA84022_2002	X	-Metals		
13090	36.52	337	Bare Meadow Brook	MA84A-18_2002	X	-Siltation -Organic enrichment/Low DO -Pathogens -Turbidity		
			Creek Brook					
			Lake Saltonstall	MA84059_2002	X	-Metals		
			Little River	MA84A-09_2002	X	-(Other habitat alterations*) -Pathogens		
			Merrimack River	MA84A-04_2002	X	-Priority organics -Nutrients -Pathogens		
				MA84A-05_2002	X	-Priority organics -Unionized Ammonia -Pathogens		
						Sutton Pond		
13101	1.22	Unknown	Bennetts Brook					
			Black Pond					
			Forge Pond	MA84015_2002				
			Gibson Brook					
			New Estate Swamp					
			Spectacle Pond	MA84089_2002	X	-Organic enrichment/Low DO -Noxious aquatic plants -(Exotic species*)		

Table A13. Merrimack Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
13105	5.01	Unknown	Bootwell Brook Cold Spring Brook Grass Pond Reed Brook Stony Brook	MA84B-03_2002	X	-Cause Unknown -pH -Organic enrichment/Low DO -Pathogens
				MA84B-04_2002	X	-Cause Unknown -Nutrients -pH -Organic enrichment/Low DO -Pathogens
			Tadmuck Brook			
13112	0.80	Unknown	Forge Pond Springy Pond Stony Brook	MA84015_2002		
				MA84B-03_2002	X	-Cause Unknown -pH -Organic enrichment/Low DO -Pathogens -Turbidity
13113	11.03	Unknown	Beaver Brook	MA84B-02_2002	X	-Nutrients -pH -Organic enrichment/Low DO -Pathogens -Suspended solids
				MA84B-05_2002		
			Black Pond Forge Pond Mill Pond	MA84015_2002		
				MA84038_2002	X	-Noxious aquatic plants
				MA84081_2002	X	-Noxious aquatic plants
			Muddy Brook Unnamed Tributary	MA84B-01_2002	X	-Nutrients -pH -Organic enrichment/Low DO -Pathogens -Suspended solids
			Wolf Swamp			
13117	0.40	Unknown	Bradaocook Pond Burnt Meadow Pond Burnt Meadow Swamp Duck Pond Knops Pond/Lost Lake Martins Pond Brook	MA84084_2002		
				MA84A-19_2002	X	-Siltation -Organic enrichment/Low DO -Turbidity
			Springy Pond Whitney Pond			
TOTAL KNOWN:		1304				



Appendix A
Sub-Basin
Identification Maps:
MILLERS

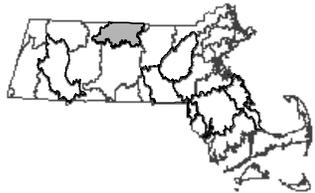
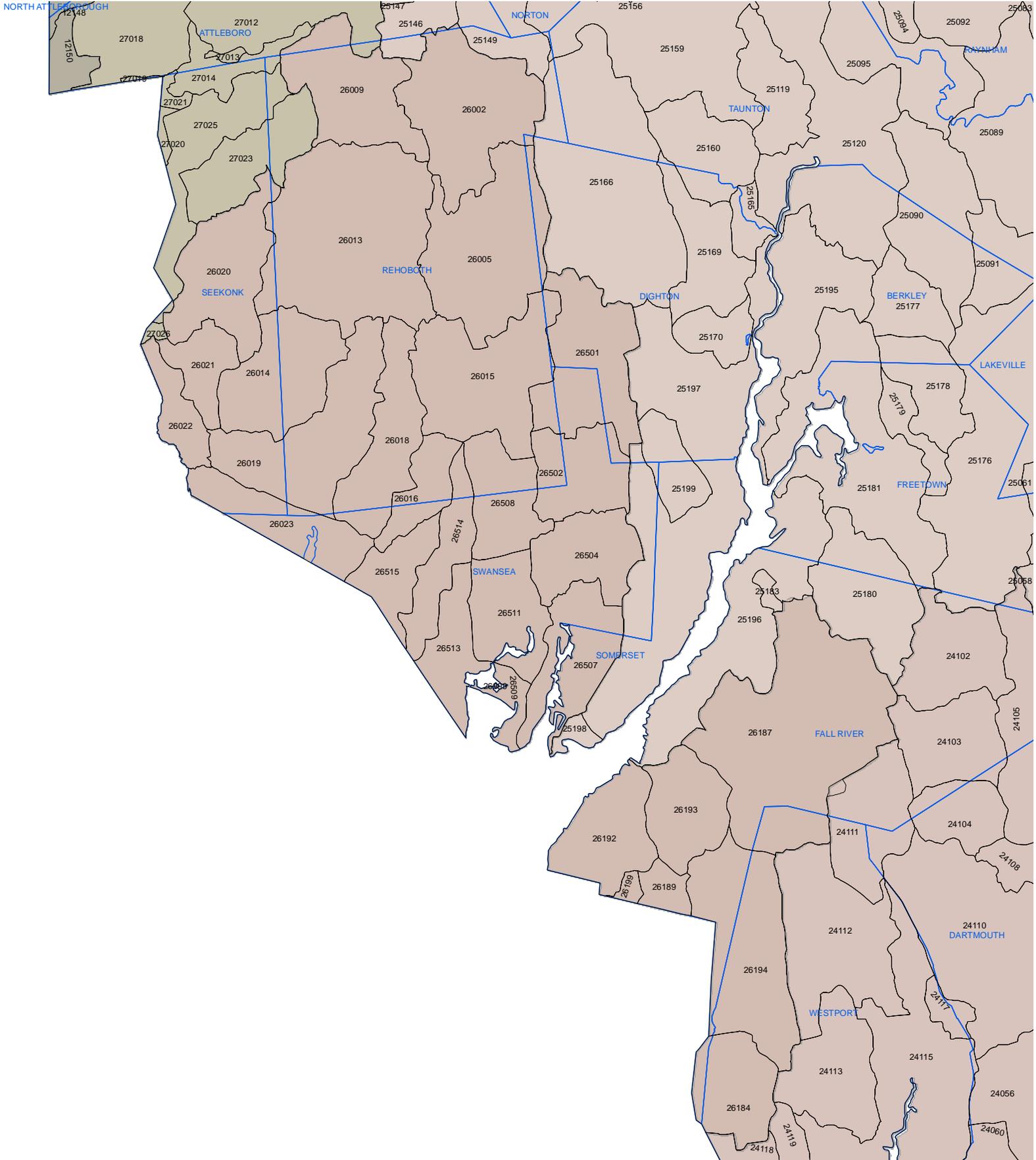


Table A14. Millers Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
7029	7.47	Unknown	Dunn Pond	MA35021_2002		
			Foster Brook			
			Greenwood Pond	MA35025_2002		
			Mahoney Brook			
			Minott Pond	MA35046_2002		
			Minott Pond South	MA35045_2002		
			Quag Pond			
			Upper Reservoir	MA35091_2002	X	-Metals
Wrights Reservoir	MA35104_2002					
7030	0.01	Unknown	Baker Brook			
			Bents Pond	MA35007_2002	X	-Noxious aquatic plants -Turbidity
			Otter River	MA35-06_2002		
Ramsdall Pond	MA35062_2002					
7034	0.29	Unknown	Otter River	MA35-06_2002		
			Snake Pond			
7035	0.96	Unknown	Kendall Pond	MA35034_2002		
			Otter River	MA35-06_2002		
				MA35-07_2002	X	-Nutrients -Organic enrichment/Low DO -(Other habitat alterations*)
7044	2.63	Unknown	East Templeton Pond	MA35022_2002		
			Greenwood Pond	MA35026_2002		
			Otter River	MA35-07_2002	X	-Nutrients -Organic enrichment/Low DO -(Other habitat alterations*)
			Parker Pond	MA35056_2002		
			Partridgeville Pond	MA35057_2002		
			Perley Brook			
			Ridgley Pond			
			Wilder Brook			
7045	0.36	Unknown	Bailey Brook			
			Hilchey Pond	MA35029_2002	X	-Turbidity
7047	1.42	Unknown	Mellen Pond			
			Otter River	MA35-07_2002	X	-Nutrients -Organic enrichment/Low DO -(Other habitat alterations*)
				MA35-08_2002	X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Salinity/TDS/chlorides -(Other habitat alterations*) -Pathogens
7049	0.04	Unknown	Bourn-Hadley Pond	MA35008_2002		
			Brazell Pond	MA35010_2002		
			Crow Hill Brook			
			Day Millpond			
			Trout Brook			

Table A14. Millers Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
7052	1.90	Unknown	Beaman Brook Beaman Pond Depot Pond Hansel Pond Mud Pond Norcross Hill Brook Otter River	MA35018_2002 MA35-08_2002	X	-Priority organics -Metals -Nutrients -Organic enrichment/Low DO -Salinity/TDS/chlorides -(Other habitat alterations*) -Pathogens
			Stoddard Pond	MA35083_2002		



Appendix A
Sub-Basin
Identification Maps:
NARRAGANSETT BAY



Table A15. Narraganset Bay Basin

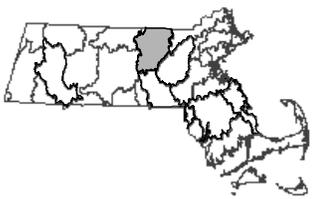
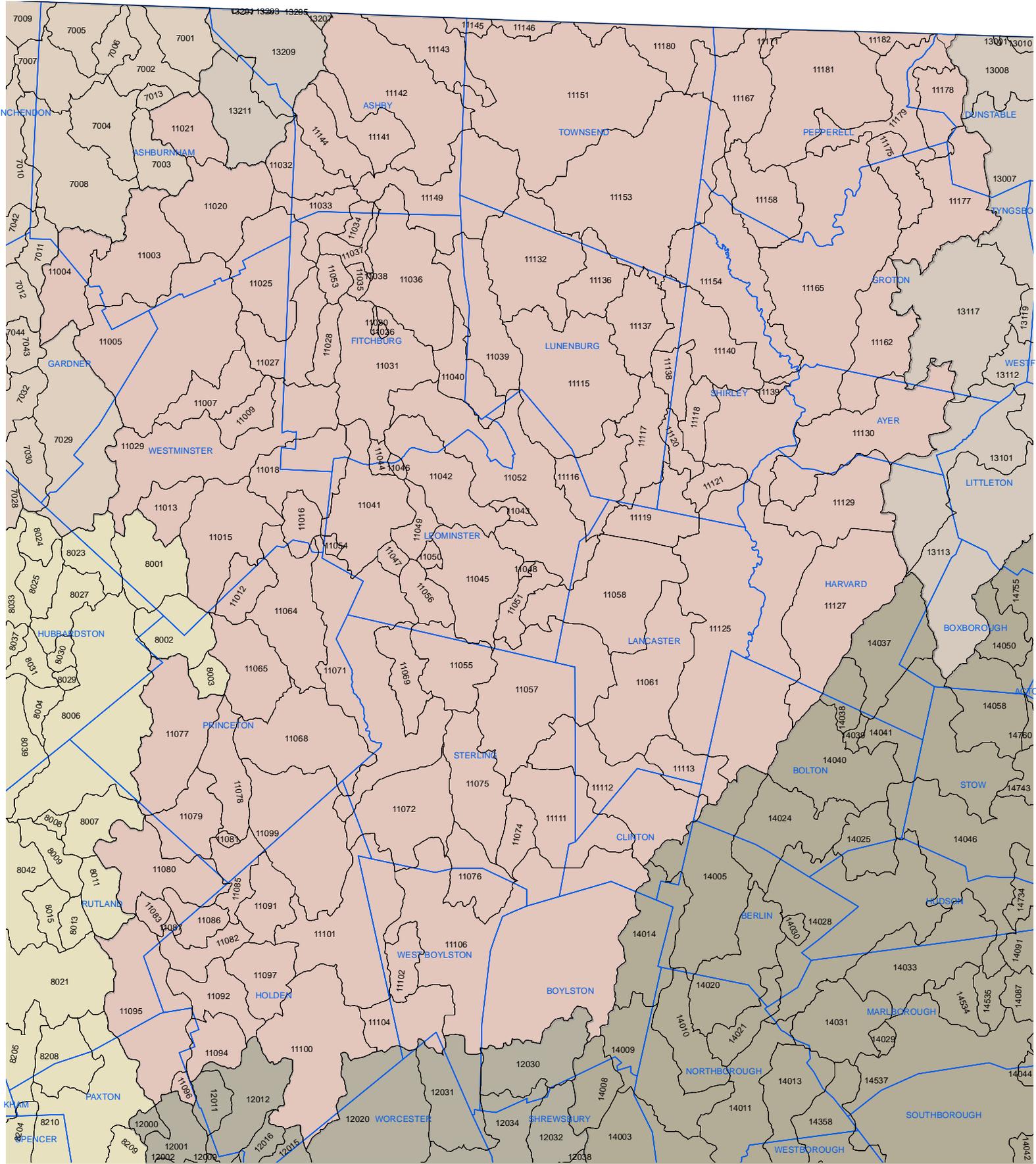
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
26013	1.08	Unknown	Carpenter Brook Folleys Brook Palmer River	MA53-04_2002	X	-Nutrients -(Flow alteration*) -Pathogens
			Perryville Pond Rumneymarsh Brook Sabin Pond West Branch Wolf Plain Brook			
26014	0.06	Unknown	Clear Run Brook Palmer River	MA53-04_2002	X	-Nutrients -(Flow alteration*) -Pathogens
			Shad Factory Pond	MA53-05_2002	X	-Pathogens
26016	0.00	Unknown	Rocky Run			
26018	1.31	Unknown	Oak Swamp Oak Swamp Brook Rocky Run			
26019	1.40	Unknown	Palmer River	MA53-03_2002	X	-Pathogens
			Shad Factory Pond Tory Creek	MA53-05_2002	X	-Pathogens
26020	0.66	Unknown	Runnins River	MA53-01_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Oil and grease -(Objectionable deposits*)
26021	0.82	Unknown	Old Grist Mill Pond Runnins River	MA53-01_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Oil and grease -(Objectionable deposits*)
26022	8.81	Unknown	Burrs Pond Runnins River	MA53001_2002	X	-Metals
				MA53-01_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Oil and grease -(Objectionable deposits*)

Table A15. Narraganset Bay Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
26023	1.63	Unknown	Palmer River	MA53-03_2002	X	-Pathogens
			Runnins River	MA53-01_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Oil and grease -(Objectionable deposits*)
			Warren River Pond	MA53-06_2002	X	-Pathogens
26187	9.72	Unknown	King Philip Spring	MA61004_2002	X	-Metals
			North Watuppa Lake			
			North Watuppa Pond			
			Pond Swamp			
			Queen Gutter Brook			
The Narrows						
26189	4.50	Unknown	South Watuppa Pond	MA61006_2002		
			Sucker Brook			
26192	2.82	Unknown	Cook Pond	MA61001_2002	X	-Cause Unknown -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Thermal modifications -Pathogens
			Mount Hope Bay	MA61-06_2002		
			Quequechan River	MA61-05_2002		
			Taunton River	MA62-04_2002		
26193	11.97	Unknown	Quequechan River	MA61-05_2002		
			South Watuppa Pond	MA61006_2002		
26194	4.44	Unknown	South Watuppa Pond	MA61006_2002		
26507	6.58	Unknown	Lee River	MA61-01_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
				MA61-02_2002	X	-Pathogens -Taste, odor and color -Noxious aquatic plants -(Objectionable deposits*)
26509	0.34	Unknown	Cedar Cove	MA61-04_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
			Cole River			
			Lee River			
			Mount Hope Bay	MA61-07_2002	X	-Cause Unknown -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Thermal modifications -Pathogens

Table A15. Narraganset Bay Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
26511	8.42	Unknown	Cole River	MA61-03_2002 MA61-04_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
			Milford Pond			
26513	2.04	Unknown	Cole River	MA61-04_2002	X	-Nutrients -Organic enrichment/Low DO -Pathogens
			Mount Hope Bay	MA61-07_2002	X	-Cause Unknown -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Thermal modifications -Pathogens
26514	0.58	Unknown	Kickamuit River Warren Reservoir	MA61-08_2002	X	-Pathogens
26515	0.40	Unknown	Birch Swamp Heath Brook Kickamuit River	MA61-08_2002	X	-Pathogens



Appendix A
Sub-Basin
Identification Maps:
NASHUA



Table A16. Nashua Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
11005	3.11	Unknown	Crocker Pond Muddy Pond Whitman River Whitmanville Reservoir	MA81025_2002 MA81-11_2002 MA81109_2002		
11018	8.31	Unknown	Flag Brook North Nashua River Rice Meadow Pond Sawmill Pond Wymans Brook	MA81-10_2002 MA81118_2002		
11029	6.11	Unknown	Burnt Millpond Cedar Swamp Flag Brook North Nashua River Partridge Pond Phillips Brook Round Meadow Pond Snows Millpond Tophet Swamp Whitman River	MA81-10_2002 MA81-01_2002 MA81098_2002 MA81-12_2002 MA81114_2002 MA81127_2002 MA81-11_2002	X X	-Cause Unknown -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
11031	0.38	Unknown	Nichols Pond North Nashua River Overlook Reservoir Sand Brook Sheldon Pond	MA81-01_2002 MA81-02_2002	X X	-Cause Unknown -(Other habitat alterations*) -Pathogens -Cause Unknown -Unknown toxicity -Pathogens -Taste, odor and color -(Objectionable deposits*)
11036	1.18	Unknown	Falulah Brook Greenes Pond Putnam Pond Saima Pond			
11039	0.92	Unknown	Paige Pond Pearl Hill Brook			
11040	0.60	Unknown	Baker Brook			
11041	0.46	Unknown	Notown Reservoir	MA81092_2002		
11042	3.02	Unknown	Distributing Reservoir Goodfellow Brook Mirror Lake Monoosnuc Brook Pierce Pond Rockwell Pond	MA81084_2002 MA81-13_2002 MA81101_2002 MA81112_2002		
11044	1.24	Unknown	Notown Reservoir	MA81092_2002		
11045	0.81	Unknown	Barrett Pond Fall Brook Fall Brook Reservoir Lake Samoset Morse Reservoir	MA81162_2002 MA81-14_2002 MA81038_2002 MA81116_2002		
11046	0.25	Unknown	Monoosnuc Brook	MA81-13_2002		

Table A16. Nashua Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
11048	0.00	Unknown	Fall Brook	MA81-14_2002		
11051	1.39	Unknown	Fall Brook	MA81-14_2002		
11052	17.36	Unknown	Baker Brook			
			Fall Brook	MA81-14_2002		
			Monoosnuc Brook	MA81-13_2002		
			North Nashua River	MA81-02_2002	X	-Cause Unknown -Unknown toxicity -Pathogens -Taste, odor and color -(Objectionable deposits*)
				MA81-03_2002	X	-Cause Unknown -Unknown toxicity -Pathogens -Taste, odor and color
				MA81-04_2002	X	-Turbidity -Cause Unknown -Pathogens -Taste, odor and color
			White Pond	MA81155_2002		-Turbidity
11057	0.49	Unknown	Bartlett Pond Pratts Pond Wekepeke Brook			
11058	1.47	Unknown	Little Spectacle Pond Mcgovern Brook Nashua River North Nashua River	MA81-04_2002	X	-Cause Unknown -Pathogens -Taste, odor and color -Turbidity
			Oak Hill Pond Spectacle Brook Spectacle Pond	MA81132_2002		
11072	2.92	Unknown	Houghton Brook Scanlon Brook Stillwater River	MA81-31_2002		
11075	0.58	Unknown	Connelly Brook Tannery Brook The Quag West Waushacum Pond	MA81170_2002 MA81153_2002		
11092	0.43	Unknown	Asnebumskit Brook Eagle Lake Kendall Reservoir Pine Hill Reservoir Stump Pond	MA81034_2002 MA81062_2002 MA81102_2002 MA81171_2002		
11095	0.25	Unknown	Asnebumskit Pond Bumbo Brook Pine Hill Reservoir Streeter Pond Worcester Brook	MA81002_2002 MA81102_2002 MA81136_2002		
11097	0.87	Unknown	Asnebumskit Brook Warren Tannery Brook			
11100	3.18	Unknown	Bryant Pond Chaffin Pond Chaffins Brook Dawson Pond Poor Farm Brook Unionville Pond Unnamed Tributary	MA81017_2002 MA81-33_2002 MA81028_2002 MA81143_2002 MA81-35_2002	X X	-Cause Unknown -Cause Unknown -Organic enrichment/Low DO

Table A16. Nashua Basin

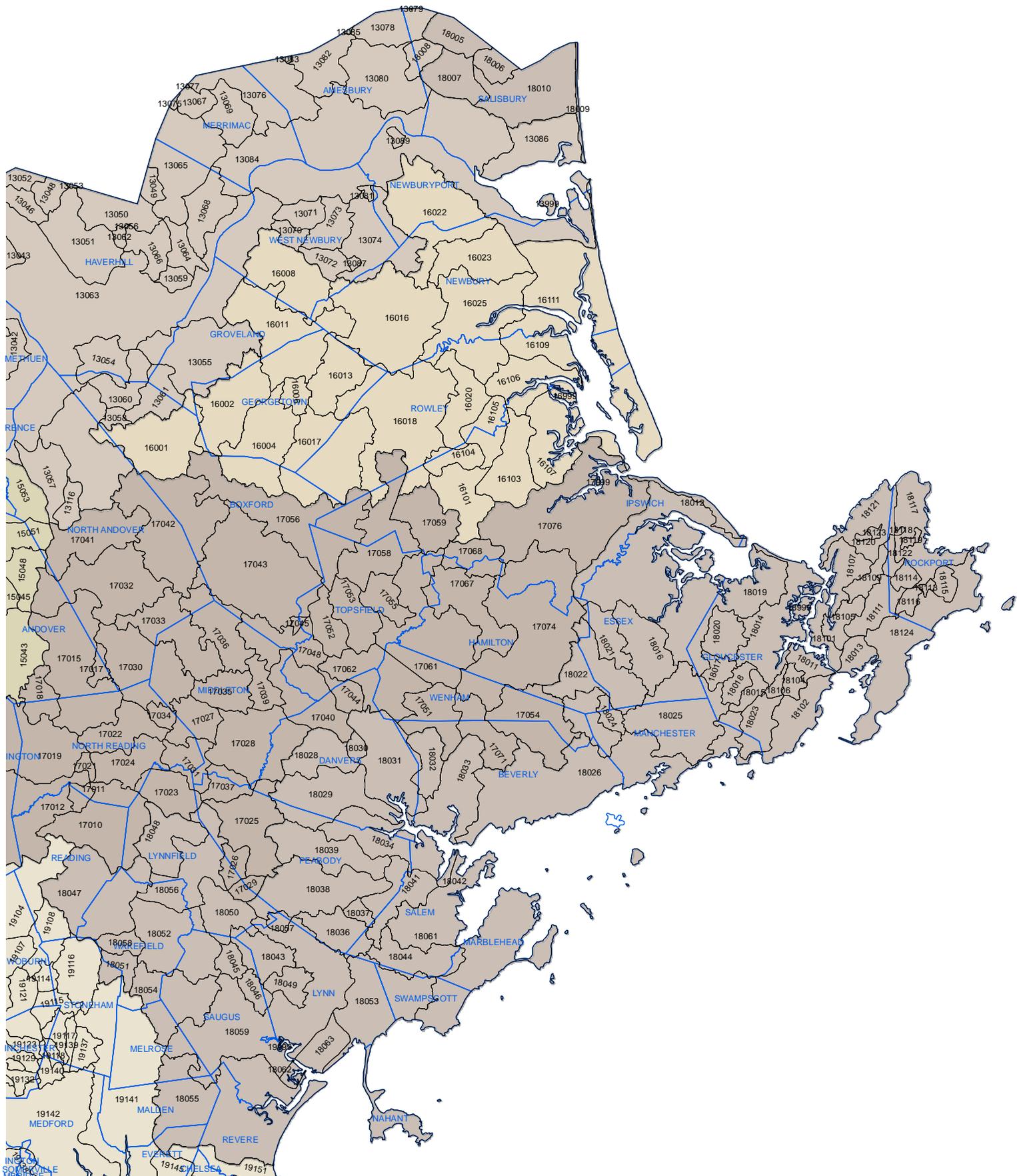
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
11104	5.14	Unknown	Gates Brook	MA81-24_2002	X	-Cause Unknown -Pathogens
			Scarletts Brook	MA81-25_2002	X	-Pathogens
11106	4.53	Unknown	Carrolls Pond			
			Carville Basin			
			French Brook			
			Gates Brook	MA81-24_2002	X	-Cause Unknown -Pathogens
			Gates Cove			
			Hastings Cove			
			Lily Pond			
			Malagasco Brook	MA81-29_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
			Malden Brook	MA81-27_2002		
			Muddy Brook	MA81-28_2002	X	-Cause Unknown
			Pine Swamp			
			Prescott Cove			
			Quinapoxet River	MA81-32_2002		
			Scotland Swamp			
			South Bay			
			Stillwater Basin			
			Stillwater River	MA81-31_2002		
			Boylston Brook	MA81-34_2002	X	-Cause Unknown
			Wachusett Reservoir	MA81147_2002	X	-Metals
11111	0.03	Unknown	Coachlace Pond	MA81019_2002		
			Fitch Pond			
			Mossy Pond			
			South Meadow Brook			
			South Meadow Pond	MA81129_2002 MA81165_2002		
11112	0.65	Unknown	Goodridge Brook	MA81065_2002		
			Lancaster Millpond	MA81-08_2002	X	-Cause Unknown -Unknown toxicity -Pathogens
			Nashua River	MA81-09_2002	X	-Cause Unknown -Nutrients -Pathogens -(Objectionable deposits*)
			Wachusett Reservoir	MA81147_2002	X	-Metals
11115	2.25	Unknown	Catacoonamug Brook			
			Dead Pond			
			Lake Whalom	MA81154_2002		
			Massapoag Pond	MA81080_2002		
			Turkey Hill Pond			
			White Rabbit Swamp			
11116	0.24	Unknown	Easter Brook			
			Lake Shirley	MA81122_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)

Table A16. Nashua Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment	
11125	0.84	Unknown	Catacoonamug Brook	MA81-16_2002			
			Cranberry Pond				
			Nashua River	MA81-05_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Pathogens -Taste, odor and color -Turbidity	
				MA81-09_2002	X	-Cause Unknown -Nutrients -Pathogens -(Objectionable deposits*)	
			North Nashua River	MA81-04_2002	X	-Cause Unknown -Pathogens -Taste, odor and color -Turbidity	
			Slate Rock Pond				
			Still River	MA81-15_2002			
11129	0.01	Unknown	Bowers Brook				
			Cold Spring Brook				
			Little Mirror Lake				
			Mirror Lake	MA81085_2002	X	-Metals	
			Robbins Pond				
11130	1.69	Unknown	Balch Pond				
			Flannagan Pond	MA81044_2002			
			Grove Pond	MA81053_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)	
			Long Pond	MA81073_2002			
			Nonacoicus Brook	MA81-17_2002			
			Plow Shop Pond	MA81103_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)	
			Robbins Pond	MA81111_2002			
			Sandy Pond	MA81117_2002			
			Willow Brook				
11132	0.00	Unknown	Hickory Hills Lake	MA81031_2002	X	-Metals	
			Mulpus Brook	MA81-22_2002			
11137	1.30	Unknown	Flurcum Swamp				
			Lane Pond				
			Mulpus Brook	MA81-22_2002			
			Perrins Pond				
			White Rabbit Swamp				
11139	0.79	Unknown	Mulpus Brook	MA81-22_2002			
11140	0.06	Unknown	Mulpus Brook	MA81-22_2002			
			Perrins Pond				
11151	2.72	Unknown	Ash Swamp				
			Bayberry Hill Brook				
			Dead Swamp				
			Pearl Hill Brook				
			Squannacook River	MA81-18_2002			
			Walker Brook				
			Walker Pond				
			Wolf Swamp				
11153	2.20	Unknown	Bixby Brook				
			Bixby Reservoir	MA81010_2002			
			Graves Pond				
			Harbor Pond	MA81054_2002			
			Squannacook River	MA81-18_2002			
			Trout Brook				
			Witch Brook				

Table A16. Nashua Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
11154	0.35	Unknown	Flat Pond Nashua River	MA81-05_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Pathogens -Taste, odor and color -Turbidity
				MA81-06_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity
			Pumpkin Brook Squannacook River	MA81-18_2002 MA81-19_2002	X	-Cause Unknown
			Trap Swamp Brook			
11158	0.10	Unknown	Bancroft Brook Robinson Brook			
11162	0.21	Unknown	Cady Pond Groton School Pond James Brook	MA81-20_2002		
11165	2.76	Unknown	Dead River James Brook	MA81-20_2002		
				MA81-22_2002		
			Mulpus Brook Nashua River	MA81-05_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Pathogens -Taste, odor and color -Turbidity
				MA81-06_2002	X	-Cause Unknown -Metals -Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity
				MA81-07_2002	X	-Cause Unknown -Nutrients -Pathogens -Turbidity
			Nod Brook Nonacoicus Brook Pepperell Pond	MA81-17_2002 MA81167_2002	X	-Metals -Nutrients -Noxious aquatic plants -Turbidity -(Exotic species*)
				Spruce Swamp Walker Brook Wrangling Brook		



Appendix A
Sub-Basin
Identification Maps:
NORTH COASTAL

Table A17. North Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
18007	6.67	107	Meader Brook Smallpox Brook			
18010	4.15	35	Blackwater River Great Meadows Little River			
18011	1.60	0	Annisquam River Fernwood Lake Lower Banjo Pond Upper Banjo Pond	MA93-12_2002 MA93022_2002 MA93080_2002	X X	-Pathogens -Noxious aquatic plants -Turbidity
18013	0.21	0	Gloucester Harbor	MA93-18_2002	X	-Pathogens
18014	3.29	14	Annisquam River Sleepy Hollow Pond	MA93-12_2002	X	-Pathogens
18016	0.15	0	Alewife Brook Essex River	MA93-11_2002	X	-Pathogens
18019	0.65	2	Castle Neck River Ebben Creek Essex Bay Essex River Farm Creek Lufkin Creek Sleepy Hollow Pond Soginese Creek	MA93-16_2002 MA93-11_2002	X X	-Pathogens -Pathogens
18023	1.16	0	Clark Pond Lily Pond West Pond			
18025	3.30	17	Bayberry Swamp Beaverdam Swamp Cat Brook Cedar Swamp Dexter Pond Millets Swamp Sawmill Brook	MA93-29_2002	X	-pH -Siltation -Pathogens
18026	0.14	2	Coy Pond Gravelly Pond Round Pond	MA93016_2002 MA93028_2002 MA93063_2002	X	-Noxious aquatic plants -Turbidity
18027	8.93	44	Beverly Harbor Cat Brook Chubb Creek Curtis Brook Lily Pond Mackerel River Manchester Harbor Plum Brook Salem Sound	MA93-20_2002 MA93-29_2002 MA93-19_2002 MA93-25_2002	X X X X	-Pathogens -pH -Siltation -Pathogens -Pathogens
18028	9.86	41	Beaver Brook	MA93-37_2002	X	-Organic enrichment/Low DO -Pathogens

Table A17. North Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
18029	14.09	38	Beaver Brook	MA93-37_2002	X	-Organic enrichment/Low DO -Pathogens
			Crane Brook	MA93-02_2002	X	-Unionized Ammonia -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Suspended solids -Turbidity
			Crane River	MA93-38_2002	X	-Pathogens -Turbidity
			Mill Pond	MA93-41_2002	X	-Pathogens
			Porter River	MA93-04_2002	X	-Siltation -Pathogens -Noxious aquatic plants -Turbidity
18031	4.50	3	Frost Fish Brook	MA93-36_2002	X	-Pathogens
			Porter River	MA93-04_2002	X	-Siltation -Pathogens -Noxious aquatic plants -Turbidity
18032	1.40	7	Bass River	MA93-07_2002		
18033	5.38	22	Bass River	MA93-07_2002		-Pathogens
				MA93-08_2002	X	
			Beverly Harbor	MA93-20_2002	X	-Pathogens
			Danvers River	MA93-09_2002	X	-Pathogens
18034	8.90	19	Shoe Pond	MA93068_2002	X	-Turbidity
			Danvers River	MA93-09_2002	X	-Pathogens
			North River	MA93-42_2002	X	-Unionized Ammonia -Organic enrichment/Low DO -Pathogens
18038	19.90	101	Waters River	MA93-01_2002	X	-(Other habitat alterations*) -Pathogens
			Cedar Pond Craig Pond Goldthwait Brook	MA93013_2002		
18039	10.70	46	Little Elder Pond Pierces Pond	MA93-05_2002	X	-Cause Unknown -Unknown toxicity -Unionized Ammonia -Nutrients -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Noxious aquatic plants
			Proctor Brook	MA93-39_2002	X	-Cause Unknown -Nutrients -Siltation -(Other habitat alterations*) -Pathogens

Table A17. North Coastal Basin

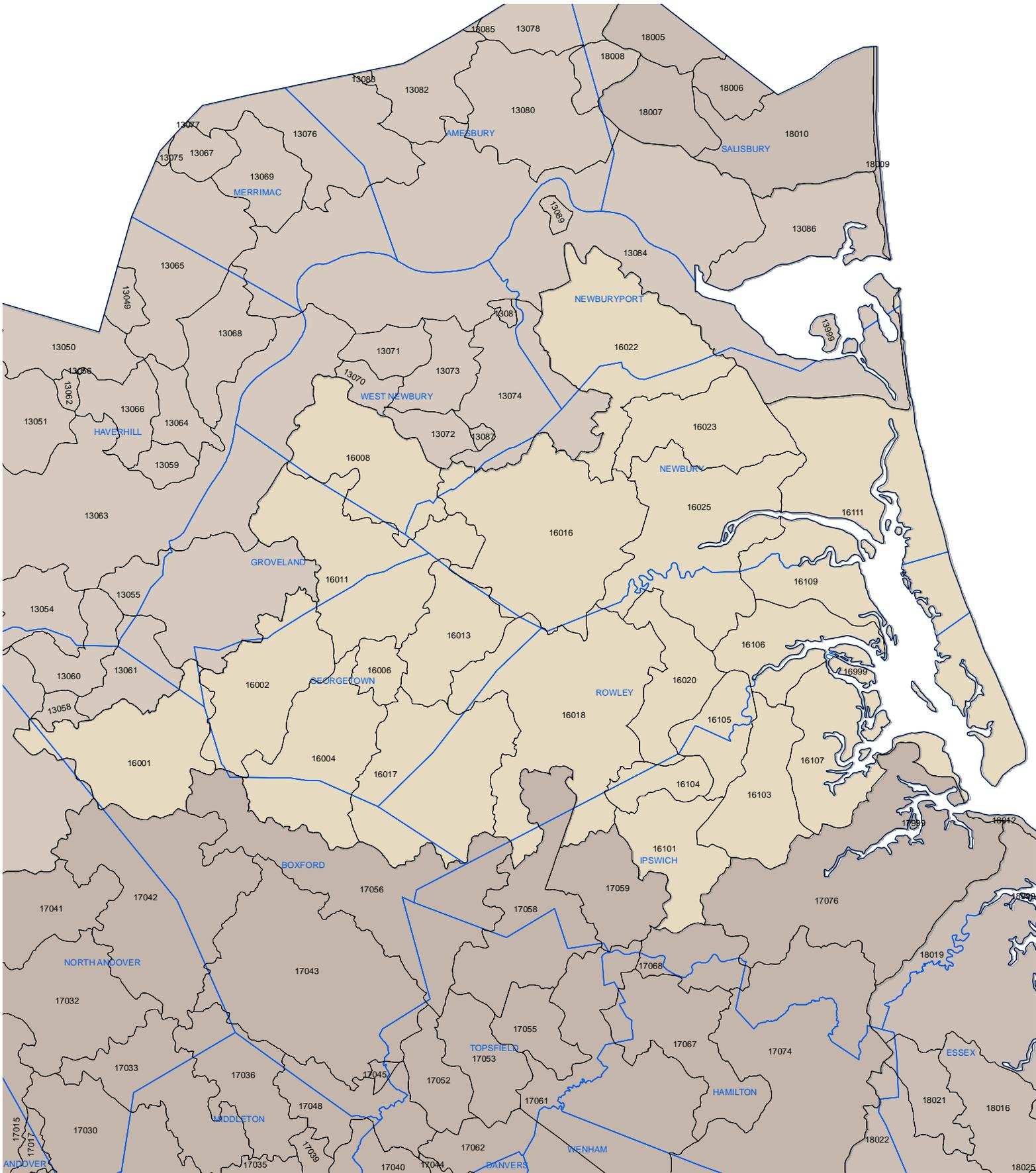
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
18041	0.25	1	Meadow Pond	MA93-42_2002	X	-Unionized Ammonia -Organic enrichment/Low DO -Pathogens
			North River			
			Proctor Brook			
			Strongwater Brook	MA93-40_2002	X	-Pathogens
18042	0.09	1	Danvers River	MA93-09_2002	X	-Pathogens
			North River	MA93-42_2002	X	-Unionized Ammonia -Organic enrichment/Low DO -Pathogens
18043	0.20	4	Walden Pond	MA93084_2002		
18044	2.75	5	Forest River	MA93-10_2002	X	-Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens
			Salem Harbor Thompsons Meadow			
18045	2.87	4	Hawkes Brook	MA93-32_2002	X	-Pathogens
				MA93-33_2002	X	-Pathogens
			Hawkes Pond	MA93032_2002	X	-Turbidity
			Walden Pond	MA93084_2002		
18047	13.65	78	Lake Quannapowitt	MA93060_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
			Saugus River	MA93-34_2002	X	-Nutrients -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
18050	7.21	26	Hawkes Brook	MA93-32_2002	X	-Pathogens
			Hawkes Pond	MA93032_2002	X	-Turbidity
18051	0.01	0	Crystal Lake	MA93018_2002		
18052	1.23	9	Hawkes Brook	MA93-33_2002	X	-Pathogens
			Lower Pond	MA93044_2002		
			Mill River	MA93-31_2002	X	-Organic enrichment/Low DO -Pathogens -Suspended solids -Turbidity
			Saugus River	MA93-34_2002	X	-Nutrients -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
				MA93-35_2002	X	-Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens
			Upper Pond	MA93083_2002		

Table A17. North Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
18053	2.23	8	Bear Pond Dorothy Cove Floating Bridge Pond	MA93024_2002	X	-Nutrients -Noxious aquatic plants -Turbidity
			Foster Pond Frog Pond Goldfish Pond Lynn Harbor Nahant Bay Reed Cove	MA93-23_2002 MA93-24_2002	X X	-Pathogens -Pathogens
18054	1.21	7	Crystal Pond Brook Griswold Pond Nihan Pond Spring Pond	MA93029_2002 MA93072_2002		
18055	20.65	81	Lynn Harbor Pines River Rumney Marsh Saugus River	MA93-23_2002 MA93-15_2002 MA93-14_2002	X X X	-Pathogens -Pathogens -Thermal modifications -(Flow alteration*) -Pathogens -Oil and grease
			Swains Pond Towners Pond			
18056	3.20	13	Pillings Pond Reedy Meadow Saugus River	MA93056_2002 MA93-34_2002	X X	-Noxious aquatic plants -Turbidity -Nutrients -(Flow alteration*) -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
18057	0.75	3	Nells Pond			
18059	13.50	62	Breeds Pond Cedar Brook Fiske Brook Flax Pond	MA93006_2002 MA93023_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
			Lily Mere Nells Pond Nihan Pond Penny Brook Prankers Pond Saugus River	MA93-14_2002 MA93-35_2002	X X	-Thermal modifications -(Flow alteration*) -Pathogens -Oil and grease -Organic enrichment/Low DO -(Flow alteration*) -(Other habitat alterations*) -Pathogens
			Shute Brook Sluice Pond Stevens Pond	MA93071_2002		

Table A17. North Coastal Basin

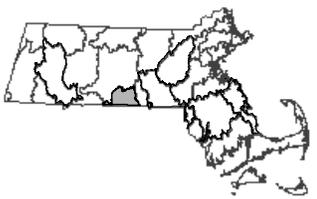
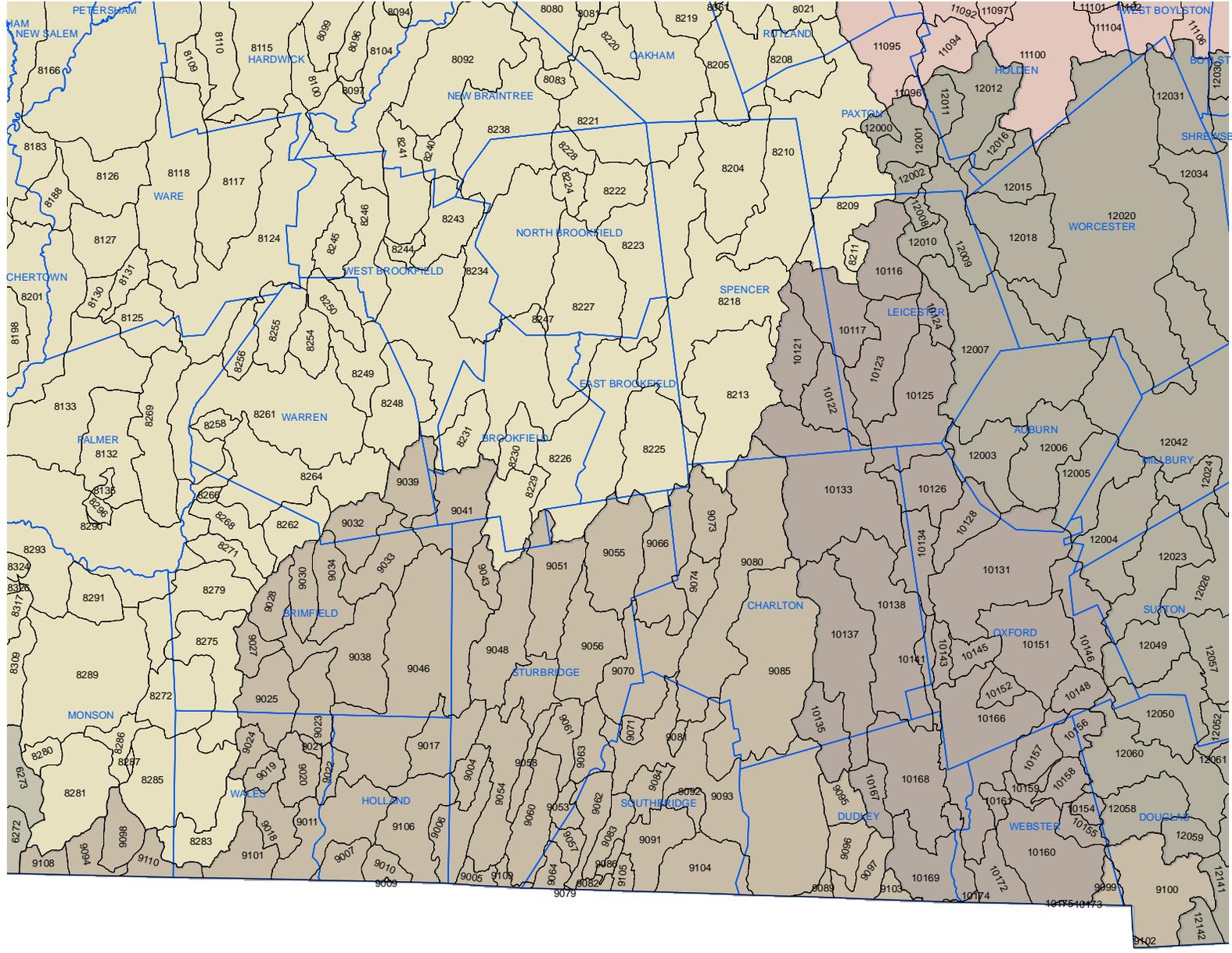
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
18061	1.85	2	Beverly Harbor	MA93-20_2002	X	-Pathogens
			Black Joe Pond			
			Flag Pond			
			Marblehead Harbor	MA93-22_2002	X	-Pathogens
			Nahant Bay	MA93-24_2002	X	-Pathogens
			Oliver Pond			
			Palmer Pond			
			Reds Pond			
			Salem Harbor	MA93-21_2002	X	-Pathogens
Salem Sound	MA93-25_2002	X	-Pathogens			
Ware Pond						
18062	0.73	5	Saugus River	MA93-14_2002	X	-Thermal modifications -(Flow alteration*) -Pathogens -Oil and grease
18063	0.32	0	Lynn Harbor	MA93-23_2002	X	-Pathogens
			Saugus River	MA93-14_2002	X	-Thermal modifications -(Flow alteration*) -Pathogens -Oil and grease
18101	1.63	7	Annisquam River	MA93-12_2002	X	-Pathogens
			Mill River	MA93-28_2002	X	-Pathogens
18102	2.14	2	Buswell Pond	MA93009_2002		
			Gloucester Harbor	MA93-18_2002	X	-Pathogens
			West Pond	MA93089_2002	X	-Nutrients -Noxious aquatic plants
18105	1.01	3	Goose Cove Reservoir	MA93093_2002		
			Mill Pond	MA93050_2002		
			Strangman Pond	MA93076_2002	X	-Noxious aquatic plants -Turbidity
			Unnamed Tributary	MA93-27_2002		
18106	0.09	0	Fernwood Lake	MA93022_2002		
			Wallace Pond	MA93085_2002		
18107	0.01	0	Annisquam River	MA93-12_2002	X	-Pathogens
			Duck Pond			
			Goose Cove Reservoir	MA93093_2002		
			Langsford Pond			
18111	1.54	2	Mill River	MA93-28_2002	X	-Pathogens
			Alewife Brook	MA93-26_2002		
			Babson Reservoir	MA93001_2002		
			Strangman Pond			
18114	0.51	0	Unnamed Tributary	MA93-27_2002		
			Loop Pond			
18116	0.15	0	Cape Pond	MA93011_2002	X	-Turbidity
18117	0.17	0	Oregon Pond			
			Quarry Reservoir	MA93053_2002		
			Rockport Harbor	MA93-17_2002	X	-Pathogens
18119	0.01	0	Quarry Reservoir	MA93053_2002		
18121	0.03	0	Annisquam River	MA93-12_2002	X	-Pathogens
			Beaver Swamp			
			Lily Pond			
			Orchard Swamp			
18124	1.36	4	Camborne Pond			
			Days Pond	MA93092_2002		
			Gloucester Harbor	MA93-18_2002	X	-Pathogens
			Loblolly Cove			
			Niles Pond	MA93052_2002		
TOTAL:		825				



Appendix A
Sub-Basin
Identification Maps:
PARKER



Table A18. Parker Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
16008	0.07	0	Ash Swamp Beaver Brook Little Crane Pond	MA91007_2002		
16011	0.85	0	Beaver Brook Crane Pond Parker River	MA91004_2002 MA91-01_2002	X	-Metals -(Flow alteration*)
16013	0.58	10	Jackman Brook Parker River Wheeler Brook	MA91-07_2002 MA91-01_2002	X	-Metals -(Flow alteration*)
16016	0.66	1	Cart Creek Parker River	MA91-01_2002 MA91-02_2002	X X	-Metals -(Flow alteration*) -Pathogens
16017	0.44	4	Lower Mill Pond Mill River Muddy Brook Upper Mill Pond	MA91008_2002 MA91-08_2002 MA91015_2002	X X	-Noxious aquatic plants -(Exotic species*) -Cause Unknown
16018	0.76	1	Bachelor Brook Great Swamp Brook Hawk Meadow Lower Mill Pond Mill River Upper Millpond Wilson Pond	MA91-08_2002 MA91017_2002	X	-Cause Unknown
16020	0.73	1	Central Street Pond Ox Pasture Brook	MA91003_2002 MA91-10_2002		
16022	7.07	50	Little River State Street Pond	MA91-11_2002 MA91014_2002	X	-Pathogens
16023	0.10	2	Little River Quills Pond	MA91-11_2002 MA91011_2002	X	-Pathogens
16103	0.27	0	Egypt River Muddy Run Rowley River	MA91-14_2002 MA91-05_2002	X X	-Pathogens -Pathogens
16105	0.59	3	Bull Brook Bull Brook Reservoir Egypt River Rowley River	MA91002_2002 MA91-13_2002 MA91-14_2002 MA91-05_2002	 X X	 -Pathogens -Pathogens
16106	0.77	0	Club Head Creek Rowley River Sand Creek West Creek	MA91-05_2002	X	-Pathogens
TOTAL:		72				

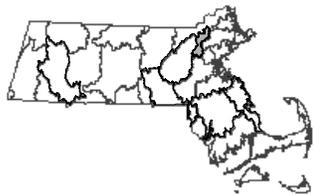
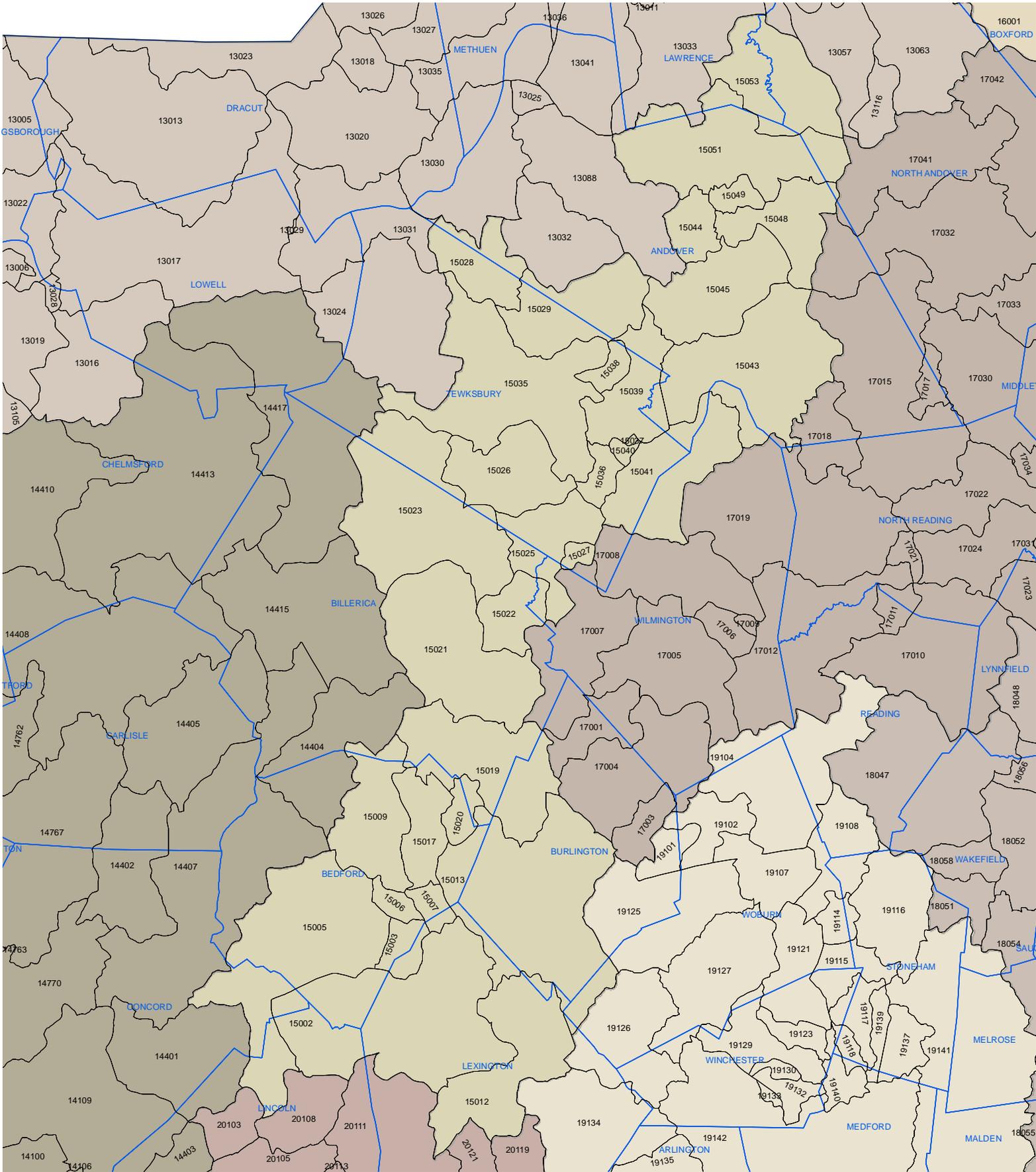


Appendix A
Sub-Basin
Identification Maps:
QUINEBAUG



Table A19. Quinebaug Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
9048	1.01	Unknown	Quinebaug River	MA41-01_2002	X	-Metals -Pathogens
9051	0.37	Unknown	Cedar Pond New Boston Road Pond	MA41008_2002 MA41035_2002		
9056	0.91	Unknown	Hobbs Brook Pistol Pond Walker Pond	MA41057_2002 MA41052_2002	X	-Noxious aquatic plants
9061	2.76	Unknown	Quinebaug River	MA41-01_2002 MA41-02_2002	X	-Metals -Pathogens
9063	0.48	Unknown	Quinebaug River	MA41-02_2002		
9071	0.12	Unknown	Quinebaug River	MA41-02_2002		
9080	1.37	Unknown	Cady Brook	MA41-05_2002	X	-(Flow alteration*) -Pathogens
				MA41-06_2002	X	-Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Taste, odor and color
			Glen Echo Lake Lambs Pond Prindle Lake Railroad Pond	MA41017_2002 MA41043_2002 MA41058_2002	X	-Organic enrichment/Low DO
9081	0.09	Unknown	Cady Brook	MA41-06_2002	X	-Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Taste, odor and color
			Carpenter Pond			
9085	0.51	Unknown	Dresser Hill Pond Mcintyre Pond Wabash Pond	MA42014_2002 MA41031_2002	X	-Turbidity [7/12/2002-CN110.0]
9089	0.24	Unknown	Quinebaug River	MA41-04_2002	X	-Pathogens
9093	3.48	Unknown	Blood Pond Cady Brook	MA41-06_2002	X	-Nutrients -Organic enrichment/Low DO -(Flow alteration*) -Taste, odor and color
			Carpenter Pond Quinebaug River	MA41-02_2002 MA41-03_2002	X	-Nutrients -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Taste, odor and color -(Objectionable deposits*)
				MA41-04_2002	X	-Pathogens
				MA41-09_2002	X	-Organic enrichment/Low DO -(Other habitat alterations*) -Turbidity -(Objectionable deposits*)
			Sylvestri Pond	MA41049_2002		
9097	0.67	Unknown	Conant Pond Wielock Pond	MA41056_2002	X	-Turbidity



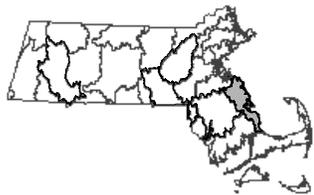
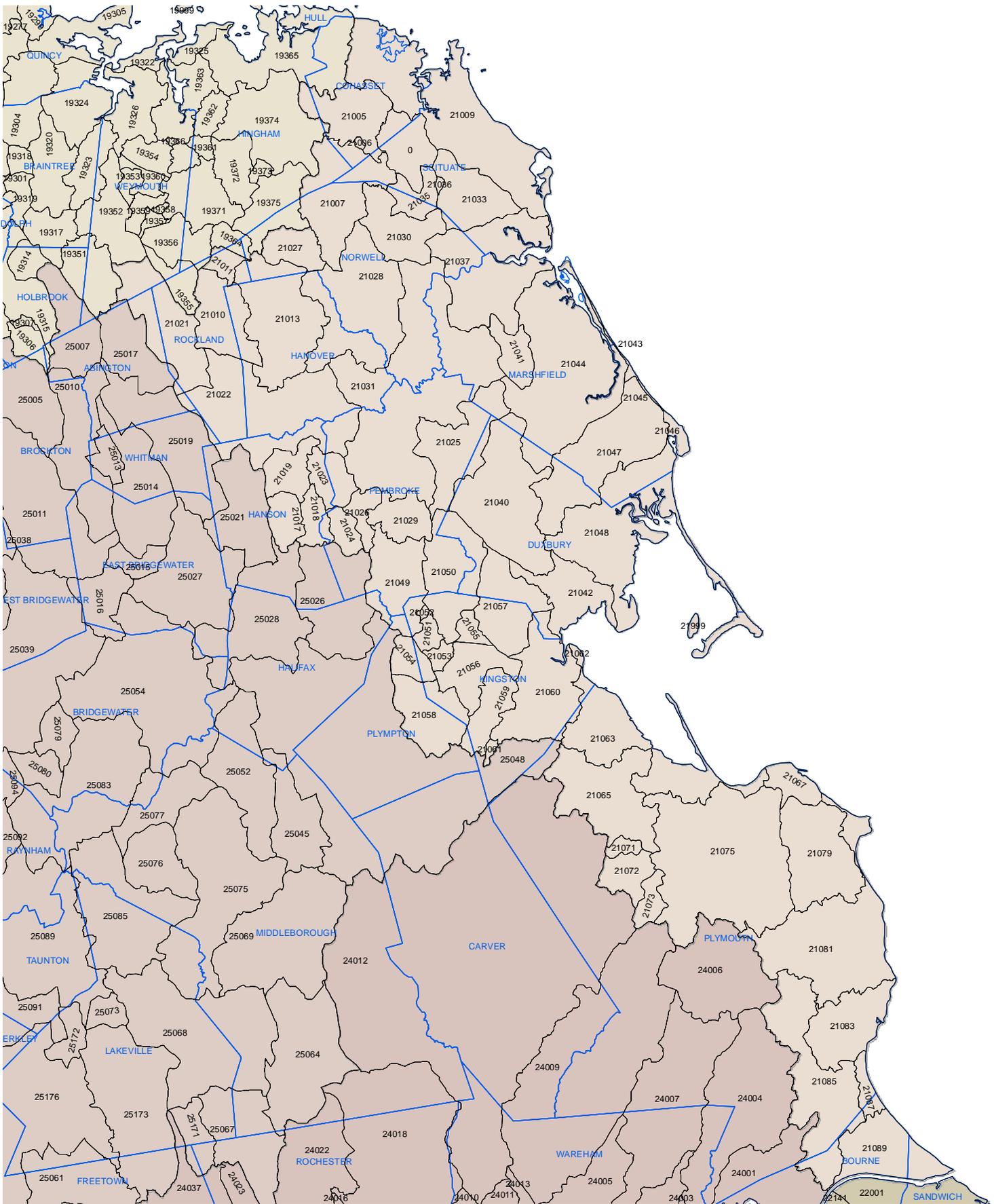
Appendix A
Sub-Basin
Identification Maps:
SHAWSHEEN

Table A20. Shawsheen Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
15002	13.56	52	Kiln Brook	MA83-10_2002	X	-Pathogens [9/12/2002-CN122.0]
			Shawsheen River	MA83-08_2002	X	-Other habitat alterations -Pathogens [9/12/2002-CN122.0]
			Trophet Swamp			
15003	0.86	2	Shawsheen River	MA83-01_2002	X	-Unknown toxicity -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
				MA83-08_2002	X	-Other habitat alterations -Pathogens [9/12/2002-CN122.0]
15005	1.57	11	Elm Brook	MA83-05_2002	X	-Pathogens [9/12/2002-CN122.0] -Turbidity
			White Cedar Swamp			
15006	0.03	0	Elm Brook	MA83-05_2002	X	-Pathogens [9/12/2002-CN122.0] -Turbidity
			Shawsheen River	MA83-01_2002	X	-Unknown toxicity -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
15009	1.20	0	Fawn Lake	MA83004_2002		
			Shawsheen River	MA83-01_2002	X	-Unknown toxicity -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
15012	1.29	2	Spring Brook	MA83-14_2002	X	-Pathogens [9/12/2002-CN122.0]
			Butterfield Pond	MA83003_2002	X	-Noxious aquatic plants -Turbidity
15013	16.01	51	Vine Brook	MA83-06_2002	X	-Pathogens [9/12/2002-CN122.0]
			Butterfield Pond			
15017	4.23	0	Long Meadow Brook	MA83-11_2002	X	-Pathogens [9/12/2002-CN122.0]
			Sandy Brook	MA83-13_2002	X	-Pathogens [9/12/2002-CN122.0]
			Vine Brook	MA83-06_2002	X	-Pathogens [9/12/2002-CN122.0]
15019	1.87	6	Shawsheen River	MA83-01_2002	X	-Unknown toxicity -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
				MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
			Spring Brook	MA83-14_2002	X	-Pathogens [9/12/2002-CN122.0]
			Vine Brook	MA83-06_2002	X	-Pathogens [9/12/2002-CN122.0]
15021	2.31	12	Shawsheen River	MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
			Jones Brook			
15022	0.00	0	Webb Brook			
			Shawsheen River	MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]

Table A20. Shawsheen Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
15023	0.06	0	Content Brook	MA83-09_2002	X	-Pathogens [9/12/2002-CN122.0]
			Long Pond	MA83010_2002	X	-Nutrients -Noxious aquatic plants
			Pond Street Pond Richardson Pond	MA83021_2002 MA83020_2002		
15025	0.82	5	Content Brook	MA83-09_2002	X	-Pathogens [9/12/2002-CN122.0]
			Shawsheen River	MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
15026	1.51	6	Heath Brook			
15028	4.15	23	Ames Pond	MA83001_2002	X	-Metals
			Meadow Brook	MA83-12_2002	X	-Pathogens [9/12/2002-CN122.0]
15029	3.20	13	Meadow Brook	MA83-12_2002	X	-Pathogens [9/12/2002-CN122.0]
			Pinnacle Brook Unnamed Tributary	MA83-15_2002	X	-Pathogens [9/12/2002-CN122.0]
15035	1.65	5	Great Swamp			
			Meadow Brook	MA83-12_2002	X	-Pathogens [9/12/2002-CN122.0]
			Round Pond Strong Water Brook	MA83018_2002 MA83-07_2002	X	-Pathogens [9/12/2002-CN122.0]
15039	4.51	20	Shawsheen River	MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
			Unnamed Tributary	MA83-15_2002	X	-Pathogens [9/12/2002-CN122.0]
15043	2.88	11	Fosters Pond	MA83005_2002	X	-Metals -(Exotic species*)
			Lowell Junction Pond	MA83011_2002	X	-Metals -Noxious aquatic plants -(Exotic species*)
			Shawsheen River	MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
			Unnamed Tributary	MA83-16_2002	X	-Pathogens [9/12/2002-CN122.0]
15048	1.47	8	Rabbit Pond	MA83015_2002	X	-Turbidity
			Rogers Brook	MA83-04_2002	X	-Pathogens [9/12/2002-CN122.0] -Turbidity
			Shawsheen River	MA83-02_2002	X	-Unknown toxicity -Metals -Organic enrichment/Low DO -Pathogens [9/12/2002-CN122.0]
				MA83-03_2002	X	-Unknown toxicity -Pathogens [9/12/2002-CN122.0]
15049	0.02	0	Rogers Brook	MA83-04_2002	X	-Pathogens [9/12/2002-CN122.0] -Turbidity
			Shawsheen River	MA83-03_2002	X	-Unknown toxicity -Pathogens [9/12/2002-CN122.0]
15051	12.18	45	Gravel Pit Pond	MA83007_2002		
			Hussey Brook Hussey Brook Pond	MA83008_2002 MA83008_2002		
			Hussey Pond	MA83009_2002	X	-Noxious aquatic plants
			Shawsheen River	MA83-03_2002	X	-Unknown toxicity -Pathogens [9/12/2002-CN122.0]
15053	10.28	86	Shawsheen River	MA83-03_2002	X	-Unknown toxicity -Pathogens [9/12/2002-CN122.0]
TOTAL:		358				



Appendix A
Sub-Basin
Identification Maps:
SOUTH COASTAL

Table A21. South Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
21005	1.02	Unknown	Aaron River Bound Brook Herring Brook Lily Pond	MA94-18_2002		
21010	0.57	Unknown	Ben Mann Brook Cushing Brook Drinkwater River	MA94-21_2002	X	-Metals
21013	4.95	Unknown	Drinkwater River Hackett Pond Hell Swamp Longwater Brook Peg Swamp Pine Island Swamp Shinglemill Brook Shinglemill Pond	MA94-21_2002	X	-Metals
21021	2.27	1	French Stream Studleys Pond	MA94-03_2002 MA94151_2002	X	-Unknown toxicity -Nutrients -Organic enrichment/Low DO -Pathogens
21022	1.84	Unknown	Beech Hill Swamp Drinkwater River Factory Pond Forge Pond French Stream Indian Head River Torrey Branch Trout Pond Wampum Swamp	MA94-21_2002 MA94175_2002 MA94037_2002 MA94-03_2002 MA94-04_2002 MA94-22_2002	X X X X X	-Metals -Metals -Noxious aquatic plants -Turbidity -(Exotic species*) -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Pathogens -Metals -Nutrients -Organic enrichment/Low DO
21025	2.45	Unknown	Arnold School Pond Keene Pond Mc Farland Brook Pudding Brook Randall Pond Reservoir	MA94004_2002 MA94127_2002		
21027	1.28	Unknown	Hatch Pond Jacobs Pond	MA94077_2002		
21028	6.30	36	Hoop Pole Swamp Mill Pond Mollys Brook Old Pond Meadows Peterson Pond Third Herring Brook Wildcat Brook Wildcat Creek			

Table A21. South Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
21031	6.88	Unknown	Copeland Tannery Brook Hatch Pond Herring Brook Howard Pond Indian Head River Little Pudding Brook Magoun Pond Mine Brook Mounce Pond No Bottom Pond North River Oakman Pond Robinson Creek Second Herring Brook Swamp Brook	MA94-22_2002 MA94-05_2002	X	-Pathogens
21033	2.43	Unknown	First Herring Brook Old Oaken Bucket Pond Satsuit Meadow Tack Factory Pond	MA94113_2002 MA94152_2002	X	-Noxious aquatic plants -Turbidity
21037	2.68	Unknown	Bares Brook Branch Creek Cove Brook Hanna Eames Brook Herring River Lewis Pond Macomers Creek North River North River Marsh Old Oaken Bucket Pond Stony Brook Torrey Pond Wales Pond	MA94-07_2002 MA94-05_2002 MA94-06_2002 MA94113_2002	X X X X	-Pathogens -Pathogens -Pathogens -Noxious aquatic plants -Turbidity
21038	1.93	Unknown	Bound Brook The Gulf	MA94-18_2002 MA94-19_2002		
21040	6.10	Unknown	Keene Pond Lorings Bogs Pond Lovings Bogs Philips Brook Pine Lake Round Pond South River South River Pond South River Reservoir	MA94079_2002 MA94089_2002 MA94120_2002 MA94131_2002 MA94-08_2002 MA94148_2002		
21041	1.79	Unknown	Furnace Brook			
21042	2.78	Unknown	Duxbury Bay Island Creek Pond Mill Pond Round Pond	MA94-15_2002 MA94073_2002 MA94101_2002	X	-Pathogens

Table A21. South Coastal Basin

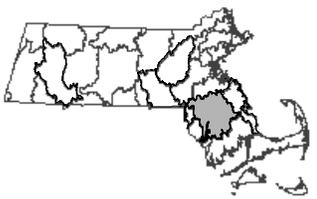
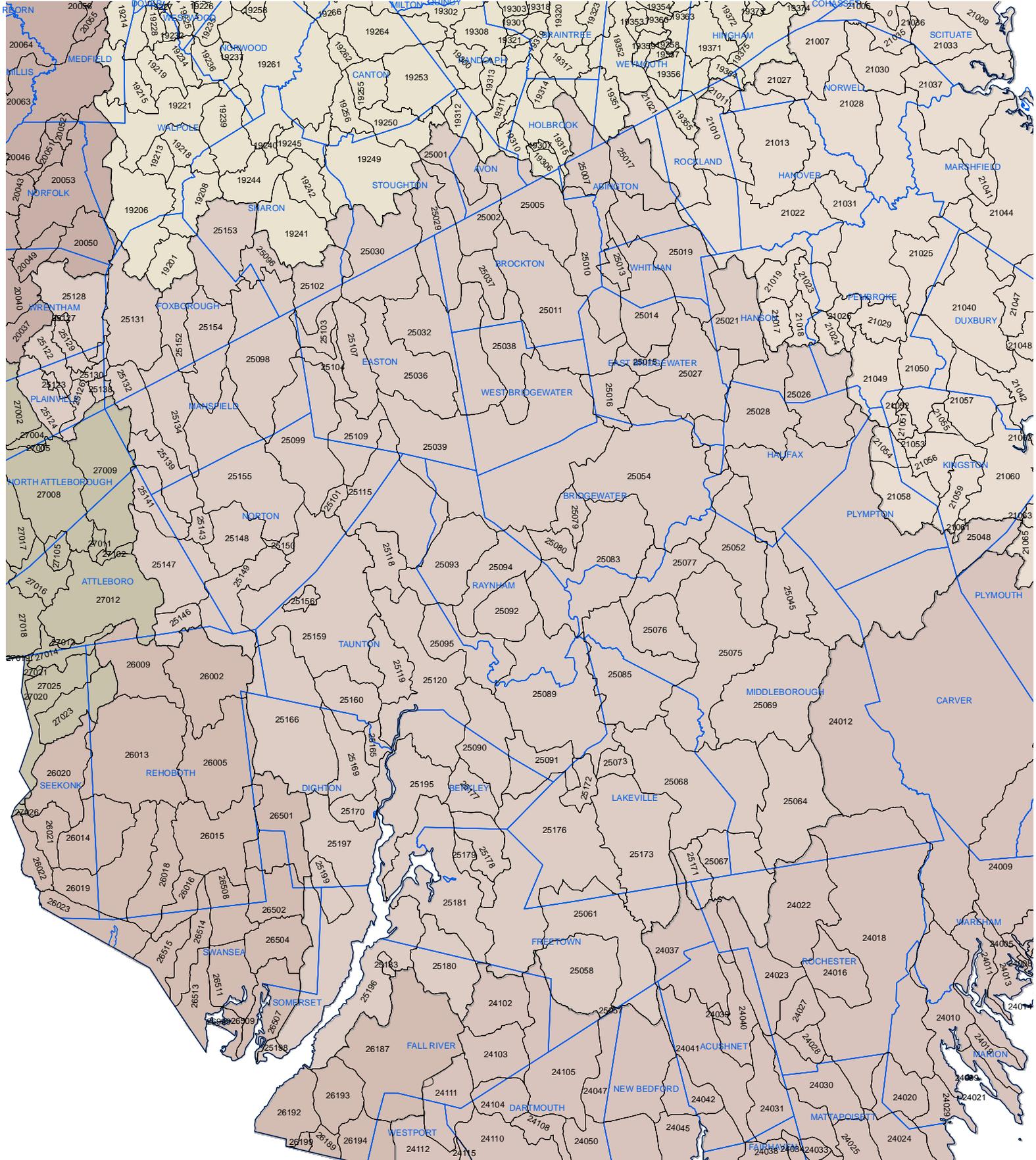
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
21044	3.35	Unknown	Branch Creek			
			Broad Creek			
			Chandlers Pond			
			Furnace Brook			
			Furnace Pond			
			Lewis Pond			
			Littles Creek			
			North River	MA94-06_2002	X	-Pathogens
			Parsons Pond			
			South River	MA94-08_2002		
			MA94-09_2002	X	-Pathogens	
			Wales Pond			
21047	2.66	Unknown	Bass Creek			
			Black Mountain Pond	MA94009_2002		
			Green Harbor Marsh			
			Green Harbor River	MA94-10_2002		
			Wharf Creek			
			Winslow Cemetary Pond	MA94172_2002		
			Wright Pond	MA94174_2002		
			Wright Reservoir			
21048	2.05	Unknown	Allens Pond			
			Cut River			
			Duck Hill River			
			Duxbury Bay	MA94-15_2002	X	-Pathogens
			Duxbury Marsh			
			Governor Winslow House Pond	MA94047_2002		
			Green Harbor	MA94-11_2002	X	-Pathogens
			North Hill Marsh			
			North Hill Marsh Pond	MA94109_2002		
Pine Point River						
			Plymouth Bay	MA94-17_2002	X	-Pathogens
21050	0.57	Unknown	Lower Chandler Pond	MA94091_2002		
			Pembroke Street South Pond	MA94117_2002		
			Pine Brook			
			Reeds Millpond	MA94126_2002		
			Upper Chandler Pond	MA94165_2002		
			West Chandler Pond	MA94170_2002		
21056	0.01	Unknown	Crossman Pond	MA94032_2002	X	-Noxious aquatic plants
			Fountainhead Brook			
			Jones River	MA94-12_2002		
				MA94-13_2002		
			MA94-14_2002	X	-Pathogens	
21057	6.18	Unknown	Bassett Brook			
			Blackwater Pond			
			Bracketts Pond			
			Dead Swamp			
			Halls Brook			
			Lower Chandler Pond			
			Pine Street Pond	MA94121_2002		
21059	0.51	Unknown	Crossman Pond			
			Furnace Brook			
			Granny Pond			
			Indian Pond	MA94072_2002		
			Russell Pond	MA94133_2002		
			Soules Pond			

Table A21. South Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
21060	10.58	Unknown	Foundry Pond	MA94038_2002	X	-Turbidity
			Goose Pond			
			Great Mink Hole			
			Jones River	MA94-14_2002	X	-Pathogens
			Little Mink Hole			
			Little Smelt Pond			
			Lucas Pond			
			Pratt Pond			
			Rocky Pond			
			Smelt Brook			
			Smelt Pond	MA94184_2002		
			Wolf Pond			
			21063	12.65	Unknown	Arms House Pond
Duxbury Bay	MA94-15_2002	X				-Pathogens
Eel River	MA94-23_2002					
Foundry Pond						
Hedges Pond						
Leach Pond						
Little Smelt Pond						
No Bottom Pond						
Plymouth Bay	MA94-17_2002	X				-Pathogens
Plymouth Harbor	MA94-16_2002	X				-Pathogens
Spooner Pond						
Stone Pond						
21065	2.35	Unknown	Arms House Pond			
			Billington Sea	MA94007_2002	X	-Noxious aquatic plants -Turbidity
			Briggs Reservoir	MA94020_2002		
			Cooks Pond	MA94027_2002		
			Goose Pond			
			Harlow Pond			
			Little Muddy Pond			
			Little Pond	MA94182_2002		
			Lout Pond	MA94090_2002		
			No Bottom Pond			
			North Triangle Pond	MA94110_2002		
			South Triangle Pond	MA94149_2002		
			Town Brook			
			Trask Pond			
Triangle Pond						
21075	3.51	Unknown	Crooked Pond			
			Eel River	MA94-23_2002		
			Forge Pond	MA94036_2002		
			Gunners Exchange Pond	MA94055_2002		
			Hallfield Pond			
			Hooper Pond			
			Howland Pond			
			Hoyts Pond	MA94070_2002		
			Island Pond	MA94076_2002		
			Negro Pond			
			Russell Millpond	MA94132_2002	X	-Noxious aquatic plants
			South Triangle Pond			
			Turtle Pond			

Table A21. South Coastal Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
21079	2.81	Unknown	Bartlett Pond	MA94005_2002		
			Beaver Dam Brook			
			Beaver Dam Pond	MA94006_2002		
			Fresh Pond	MA94040_2002		
			Long Island Pond	MA94088_2002		
			Rabbit Pond			
			Warner Pond			
21081	3.00	Unknown	Black Pond			
			Briggs Reservoir	MA94019_2002		
			Clam Pudding Pond			
			Cotton Pond			
			Dugway Pond			
			Ellis Bog			
			Hathaway Pond			
			Indian Brook			
			Island Pond	MA94075_2002		
			Lilly Pond			
			Morey Hole	MA94102_2002		
			Rocky Pond			
			Savery Grassy Pond			
			Scokes Pond			
Shallow Pond	MA94140_2002					
Ship Pond	MA94142_2002					
			Tays Bog			
21083	1.80	Unknown	Black Jimmy Pond	MA94008_2002		
			Black Pond			
			Center Hill Pond			
			Hedges Bog			
			Hedges Pond	MA94065_2002		
			Salt Pond			
			Savery Pond	MA94136_2002		
21085	6.13	Unknown	Black Pond			
			Bloody Pond	MA94015_2002		
			Elbow Pond	MA94035_2002		
			Foundry Pond			
			Grassy Pond			
			Great Herring Pond	MA94050_2002	X	-Metals
			Hathaway Pond			
			Island Pond	MA94074_2002		
			Little Herring Pond	MA94082_2002		
			Pickerel Pond			
			Triangle Pond	MA94160_2002		
21089	6.70	Unknown	Black Pond			
			Cape Cod Canal	MA95-14_2002	X	-Pathogens
			Foundry Pond			
			Long Swamp			
TOTAL KNOWN:		37				



Appendix A
Sub-Basin
Identification Maps:
TAUNTON

Table A22. Taunton Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25001	3.88	Unknown	Brockton Reservoir Waldo Lake	MA62023_2002 MA62201_2002		
25002	10.63	Unknown	Cross Pond Ellis Brett Pond Lovett Brook Lower Porter Pond Thirtyacre Pond Upper Porter Pond Waldo Lake	MA62052_2002 MA62111_2002 MA62190_2002 MA62200_2002 MA62201_2002		
25005	4.82	Unknown	Cary Brook Searles Brook Trout Brook Upper Porter Pond	MA62-07_2002	X	-Siltation -Organic enrichment/Low DO -Pathogens
25007	0.25	2	Beaver Brook Cleveland Pond Cushing Pond	MA62042_2002 MA62056_2002		
25010	1.55	Unknown	Beaver Brook Cleveland Pond Hunts Pond Jones Pond	MA62-09_2002 MA62042_2002		
25011	1.51	Unknown	Beaver Brook Cross Pond Edson Brook Ellis Brett Pond Jones Pond Lower Porter Pond Matfield River Salisbury Brook Salisbury Plain River Thirtyacre Pond Trout Brook Upper Porter Pond	MA62-09_2002 MA62052_2002 MA62-32_2002 MA62-08_2002 MA62-05_2002 MA62-06_2002 MA62-07_2002	X X X X X X	-Pathogens -Siltation -Pathogens -Siltation -(Other habitat alterations*) -Pathogens -Suspended solids -Cause Unknown -Pathogens -Siltation -Organic enrichment/Low DO -Pathogens
25014	4.78	Unknown	Hunts Pond Meadow Brook			
25015	0.58	Unknown	Forge Pond			
25016	1.76	Unknown	Matfield River	MA62-32_2002	X	-Pathogens
25017	2.82	Unknown	Island Grove Pond Shumatuscacant River	MA62094_2002 MA62-33_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
25019	2.00	Unknown	Bear Meadow Hobart Pond Poor Meadow Brook Shumatuscacant River	MA62090_2002 MA62-33_2002	X	-Turbidity -(Exotic species*)

Table A22. Taunton Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25027	0.01	Unknown	Black Brook Poor Meadow Brook Satucket River	MA62-34_2002 MA62-10_2002		
25029	2.47	Unknown	Dorchester Brook French Pond Gibney Pond Monte Pond			
25030	1.96	Unknown	Ames Long Pond Dry Pond Farrington Pond Flyaway Pond Longwater Pond Picker Pond Queset Brook Shovelshop Pond Whitman Brook	MA62001_2002 MA73040_2002 MA62109_2002 MA62-21_2002 MA62172_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
25032	16.42	Unknown	Ames Pond Coweset Brook Dean Pond Hockomock River Longwater Pond Morse Pond Queset Brook	MA62-22_2002 MA62-35_2002 MA62-21_2002		
25036	1.56	Unknown	Black Brook Little Cedar Swamp	MA62106_2002		
25037	2.37	Unknown	West Meadow Brook			
25039	5.50	Unknown	Black Brook Hockomock River Hockomock Swamp Howard Brook Lake Nippenicket Nunkets Pond Town River Willow Brook	MA62-35_2002 MA62131_2002 MA62-11_2002 MA62-12_2002		
25045	0.56	Unknown	Raven Brook			
25048	0.48	Unknown	Annasnapett Brook Bonney Pond Cedar Swamp Colchester Brook Cooper Pond Doten Brook Fuller Street Pond Granny Pond Johns Pond Little Cedar Swamp Lyon Pond Muddy Pond Muddy Pond Brook North Center Street Pond Palmer Mill Brook Peterson Swamp Ricketts Pond Savery Pond Trickle Pond Turkey Swamp Whetstone Brook Winnetuxet River	MA62046_2002 MA95058_2002 MA62096_2002 MA62125_2002 MA94104_2002 MA62132_2002 MA62167_2002		

Table A22. Taunton Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25054	1.68	Unknown	Beaver Brook Blood Pond Carver Pond Matfield River Satucket River South Brook Spring Brook Taunton River Town River Winnetuxet River	MA62033_2002 MA62-32_2002 MA62-10_2002 MA62-01_2002 MA62-12_2002 MA62-13_2002 MA62-24_2002	X	-Pathogens
25061	4.06	Unknown	Bolton Cedar Swamp East Freetown Pond Fall Brook Sassaquin Pond	MA62063_2002 MA95129_2002		
25064	2.72	Unknown	Black Brook Millers Neck Brook			
25068	2.01	Unknown	Assawompset Pond Bates Brook Cranberry Pond Loon Pond Nemasket River Owl Swamp Pocksha Pond Sampsons Cove Tamett Brook The Reservoir	MA62003_2002 MA62-25_2002 MA62145_2002 MA62189_2002		
25069	2.08	Unknown	Fall Brook Shaving Brook Shorts Brook Stony Brook Tispaquin Pond Woods Brook Woods Pond	MA62220_2002	X	-Turbidity -(Exotic species*)
25075	6.73	Unknown	Beaver Dam Brook Beaverdam Swamp Fall Brook Meetinghouse Swamp Nemasket River	MA62-25_2002 MA62-26_2002		
25076	2.03	Unknown	Joses Meadow Purchade Brook			
25083	1.48	Unknown	Bassett Brook Ice Pond Otis Pratt Brook Sawmill Brook Taunton River	MA62-36_2002 MA62-01_2002		
25085	7.98	Unknown	Clear Pond Dunham Pond Nevertouch Pond Pogouy Brook Poquoy Pond Puddingshear Brook Thatchers Pond The Reservoir	MA62147_2002		

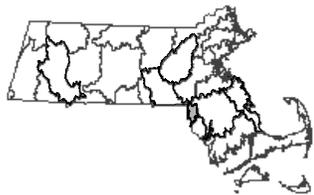
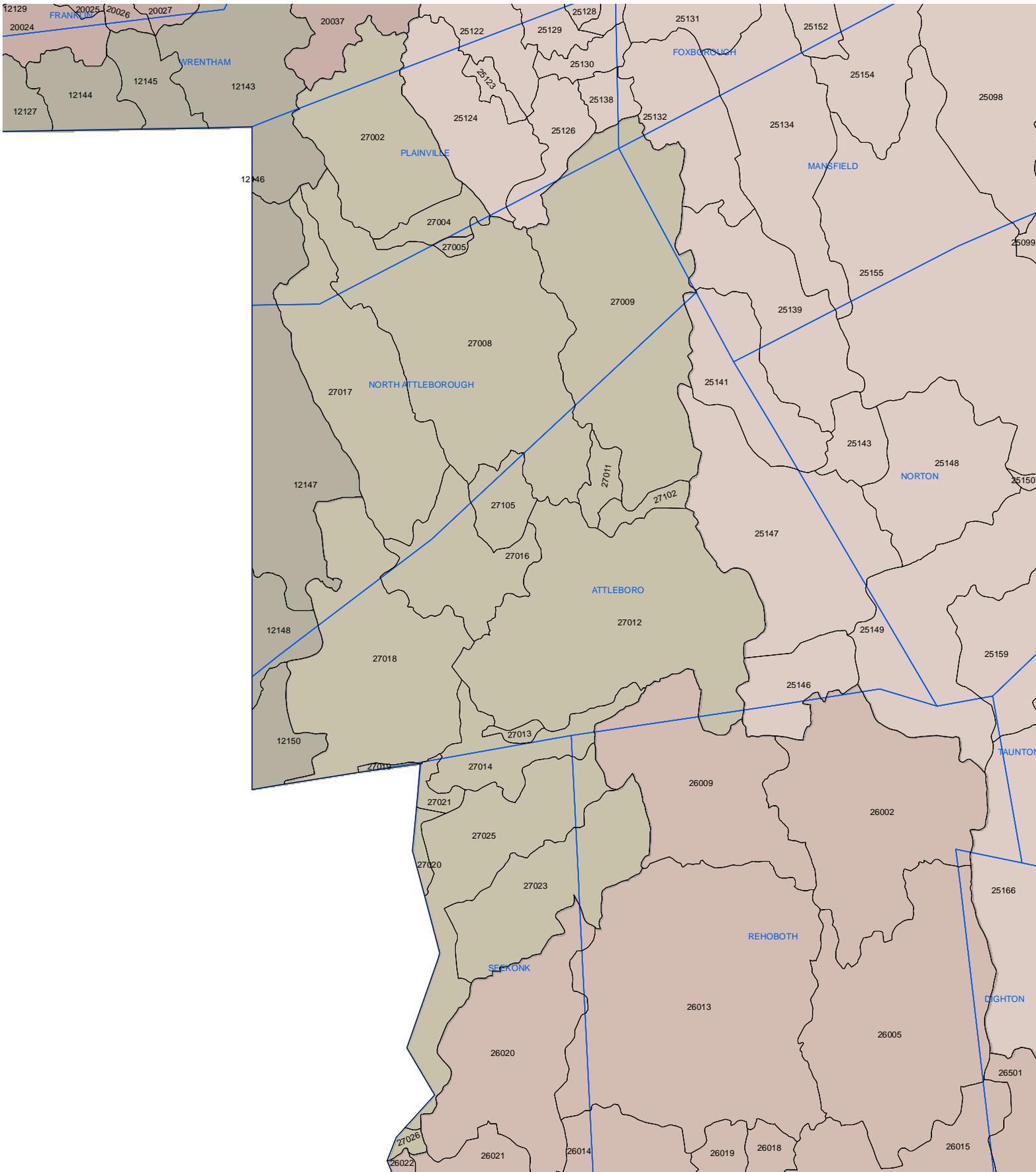
Table A22. Taunton Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25089	0.57	Unknown	Big Bearhole Pond	MA62011_2002	X	-Organic enrichment/Low DO -Noxious aquatic plants -(Exotic species*)
			Cain Pond	MA62030_2002	X	-Organic enrichment/Low DO -Turbidity
			Deep Pond			
			Furnace Brook			
			Furnace Pond			
			Kings Pond			
			Lake Rico	MA62148_2002		
			Little Bearhole Pond			
			Middle Pond	MA62115_2002		
			Richmond Pond	MA62159_2002		
			Taunton River	MA62-01_2002		
			Thatchers Pond			
			Thompson Brook			
25090	13.26	Unknown	Barstows Pond			
			Cotley River			
25091	5.91	Unknown	Cotley River			
25092	1.94	Unknown	Dam Lot Brook			
			Johnson Pond			
25093	3.54	Unknown	Dead Swamp			
			Pine Swamp			
			Pine Swamp Brook			
			Prospect Hill Pond	MA62149_2002		
25094	3.79	Unknown	Forge River	MA62-37_2002		
			Gushee Pond	MA62084_2002		
			Hewitt Pond	MA62088_2002		
			Johnson Pond	MA62097_2002		
			Kings Pond	MA62101_2002		
			Titicut Swamp			
			Tracy Pond			
25095	5.25	Unknown	Cotley River			
			Forge River	MA62-37_2002		
			Taunton River	MA62-01_2002		
				MA62-02_2002	X	-Pathogens
25099	7.34	Unknown	Canoe River	MA62-27_2002		
25115	2.10	Unknown	Black Pond			
			Canoe River	MA62-27_2002		
			Hockomock Swamp			
			Lake Sabbatia	MA62166_2002		
			Mulberry Meadow Brook	MA62-31_2002		
			Snake River	MA62-28_2002		
			Winnecunnet Pond	MA62213_2002		
25118	0.02	Unknown	Lake Sabbatia	MA62166_2002		
			Mill River	MA62-29_2002		
			Watson Pond	MA62205_2002	X	-Nutrients -Organic enrichment/Low DO -Noxious aquatic plants -Turbidity -(Exotic species*)
			Whittenton Impoundment	MA62228_2002		
25119	0.01	Unknown	Cobb Brook			
			Crapo Bog			
25120	1.24	Unknown	Mill River	MA62-29_2002		
			Taunton River	MA62-02_2002	X	-Pathogens
25122	0.32	Unknown	Hawthorne Brook			
			Trout Pond			
25124	1.05	Unknown	Turnpike Lake	MA62198_2002		

Table A22. Taunton Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25128	2.57	Unknown	Cracker Pond Crocker Pond Meadow Brook Rabbly Hill Pond Route One Pond, West Thurston Street Pond	MA62051_2002 MA62165_2002 MA62192_2002		
25131	2.44	Unknown	Carpenter Pond Cocasset Brook Cocasset Lake Furnace Lake Governor Meadow Sunset Lake Wading River	MA62032_2002 MA62043_2002 MA62076_2002 MA62184_2002	X	-Turbidity
25132	2.80	Unknown	Blakes Pond Robinson Pond Wading River Witch Pond Swamp	MA62221_2002 MA62163_2002 MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25134	4.19	Unknown	Hodges Brook			
25139	0.01	Unknown	Sweets Pond Wading River	MA62185_2002 MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25141	0.34	Unknown	Wading River	MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25143	0.41	Unknown	Wading River	MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25147	1.42	Unknown	Chartley Brook Chartley Pond Coopers Pond	MA62038_2002		
25148	1.22	Unknown	Barrowsville Pond Wading River	MA62007_2002 MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25150	0.04	Unknown	Wading River	MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25152	10.58	Unknown	Hersey Pond Robinson Brook	MA62-14_2002		
25153	4.61	Unknown	Billings Brook Gavins Pond Mcavoy Pond Rumford River Vandys Pond Wolomolopoag Pond	MA62077_2002 MA62112_2002 MA62-15_2002 MA62216_2002	X	-Pesticides -Organic enrichment/Low DO -Pathogens
25154	6.89	Unknown	Cabot Pond Fulton Pond Glue Factory Pond Hodges Pond Robinson Brook Rumford River	MA62029_2002 MA62075_2002 MA62091_2002 MA62-14_2002 MA62-15_2002	X X X X	-Pesticides -Pesticides -Pesticides -Pesticides -Organic enrichment/Low DO -Pathogens

Table A22. Taunton Basin						
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25155	9.64	Unknown	Norton Reservoir	MA62134_2002	X	-Pesticides -Nutrients -Noxious aquatic plants -Turbidity -(Exotic species*)
			Rumford River	MA62-15_2002	X	-Pesticides -Organic enrichment/Low DO -Pathogens
			Threemile River	MA62-16_2002	X	-Pathogens
			Wading River	MA62-17_2002	X	-Cause Unknown -Organic enrichment/Low DO -Pathogens
25159	3.73	Unknown	Fall Brook			
			Meadow Brook			
			Meadow Brook Pond	MA62113_2002		
			Oakland Pond	MA62136_2002		
			Threemile River	MA62-16_2002	X	-Pathogens
25160	0.13	Unknown	Three Mile River Impoundment	MA62231_2002		
25165	0.53	Unknown	Threemile River	MA62-16_2002	X	-Pathogens
25166	0.40	Unknown	Maple Swamp			
			Segreganset River	MA62-18_2002		
			Segreganset River Ponds	MA62169_2002	X	-Noxious aquatic plants -Turbidity
25170	0.68	Unknown	Cedar Swamp			
			Segreganset River	MA62-18_2002		
25173	2.40	Unknown	Fall Brook			
			Hathaway Brook			
			Long Pond	MA62108_2002		
			Mill Pond			
25176	3.19	Unknown	Mullein Hill Chapel Pond	MA62127_2002		
25177	3.83	Unknown	Cedar Swamp			
			Holloway Brook			
25178	0.20	Unknown	Quaker Brook			
25180	0.05	Unknown	Assonet River	MA62-19_2002		
			Forge Pond	MA62072_2002		
			Quaker Brook			
25181	2.01	Unknown	Mill Brook			
			Rattlesnake Brook			
25181	2.01	Unknown	Assonet River	MA62-19_2002		
				MA62-20_2002	X	-Pathogens
			Shepherds Cove			
			Taunton River	MA62-03_2002	X	-Organic enrichment/Low DO -Pathogens
25196	14.74	Unknown	Terry Brook			
			Mount Hope Bay	MA61-06_2002	X	-Cause Unknown -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Thermal modifications -Pathogens
			Quequechan River	MA61-05_2002		
			Steep Brook			
			Taunton River	MA62-03_2002	X	-Organic enrichment/Low DO -Pathogens
				MA62-04_2002	X	-Organic enrichment/Low DO -Pathogens

Table A22. Taunton Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
25197	8.32	Unknown	Broad Cove	MA62022_2002		
			Buffington Brook			
			Labor In Vain Brook			
			Mount Hope Bay	MA61-06_2002	X	-Cause Unknown -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Thermal modifications -Pathogens
			Muddy Cove Brook	MA62-23_2002		
			Muddy Cove Brook Pond	MA62124_2002	X	-Noxious aquatic plants -Turbidity
			Segreganset River	MA62-18_2002		
			Somerset Reservoir	MA62174_2002	X	-Metals
			Taunton River	MA62-02_2002	X	-Pathogens
				MA62-03_2002	X	-Organic enrichment/Low DO -Pathogens
	MA62-04_2002	X	-Organic enrichment/Low DO -Pathogens			
25198	1.35	Unknown	Mount Hope Bay	MA61-06_2002	X	-Cause Unknown -Unknown toxicity -Nutrients -Organic enrichment/Low DO -Thermal modifications -Pathogens
TOTAL KNOWN:		2				



Appendix A
Sub-Basin
Identification Maps:
TEN MILE



Table A23. Ten Mile Basin

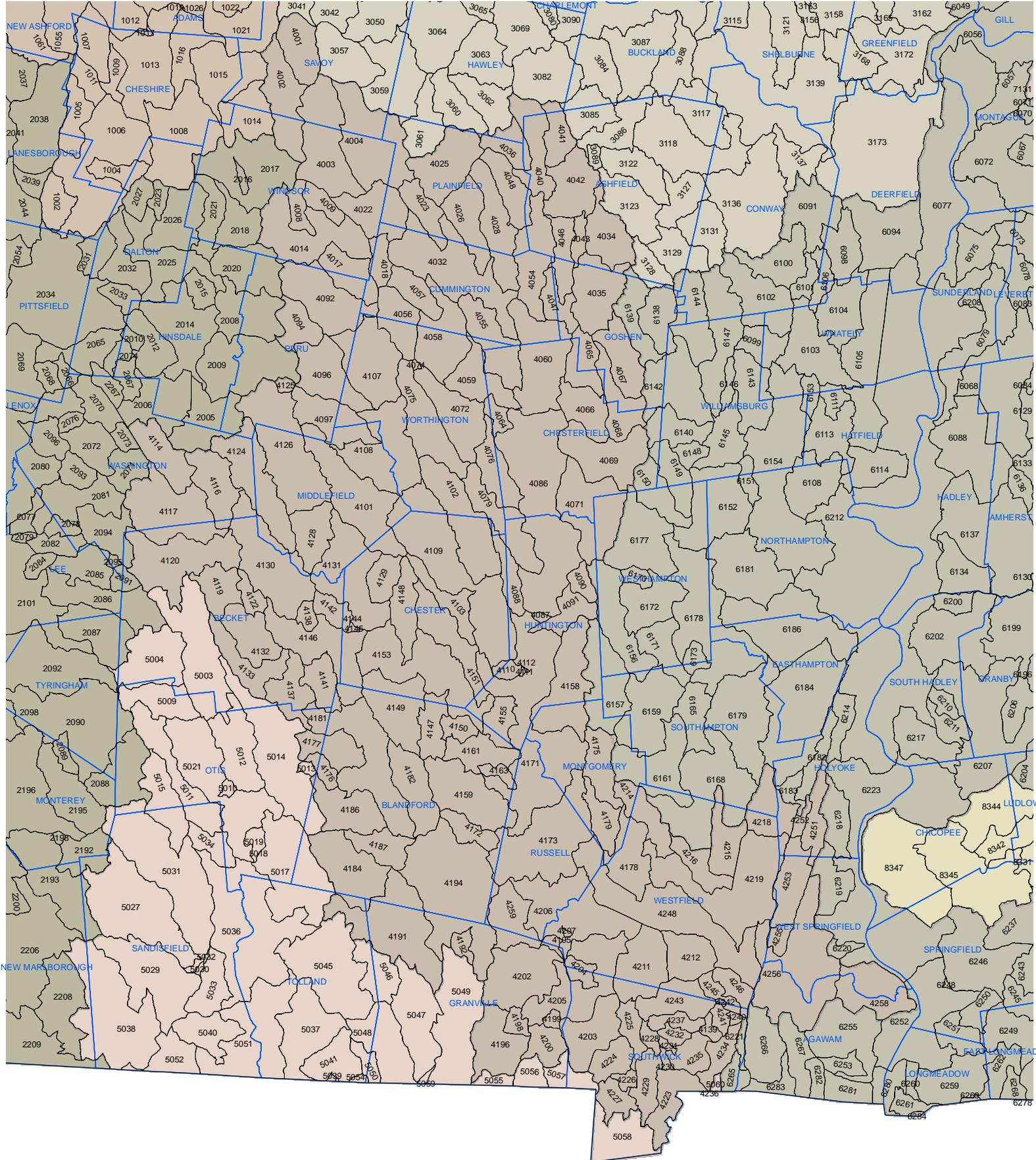
Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
27004	0.58	Unknown	Plainville Pond	MA52-02_2002	X	-Cause Unknown -Metals -Nutrients -Siltation -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
			Ten Mile River			
			Wetherells Pond			
			Whiting Pond	MA52042_2002		
27005	0.49	Unknown	Ten Mile River	MA52-02_2002	X	-Cause Unknown -Metals -Nutrients -Siltation -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
			Whiting Pond			
27008	8.33	Unknown	Falls Pond	MA52013_2002	X	-Nutrients -Noxious aquatic plants -Turbidity
				MA52014_2002		
			Farmers Pond	MA52015_2002	X	-Nutrients -Noxious aquatic plants
			Manchester Pond Reservoir	MA52026_2002		
			Mechanics Pond	MA52027_2002	X	-Nutrients -Pathogens -Noxious aquatic plants
			Peck Pond			
			Scotts Brook	MA52-09_2002	X	-(Flow alteration*)
			Ten Mile River	MA52-02_2002	X	-Cause Unknown -Metals -Nutrients -Siltation -(Other habitat alterations*) -Pathogens -Noxious aquatic plants -Turbidity
				MA52-03_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants
				Whiting Pond	MA52042_2002	

Table A23. Ten Mile Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment			
27009	10.39	Unknown	Black Pond						
			Bungay River	MA52-06_2002					
			Greenwood Lake	MA52017_2002					
			Mechanics Pond	MA52027_2002	X	-Nutrients -Pathogens -Noxious aquatic plants			
			Plain Street Pond	MA52032_2002	X	-Noxious aquatic plants -(Exotic species*)			
			Witch Pond						
			Witch Pond Swamp						
27012	0.43	Unknown	Dodgeville Pond	MA52011_2002	X	-Nutrients -Pathogens -Noxious aquatic plants -Turbidity			
			Hebronville Pond	MA52020_2002	X	-Noxious aquatic plants			
			Mechanics Pond	MA52027_2002	X	-Nutrients -Pathogens -Noxious aquatic plants			
			Speedway Brook	MA52-05_2002	X	-Cause Unknown -Metals -Nutrients -Siltation -Organic enrichment/Low DO -(Other habitat alterations*) -Pathogens -Turbidity			
			Ten Mile River	MA52-03_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants			
						Thacher Brook			
						Ten Mile River	MA52-03_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants
27013	0.02	Unknown	Ten Mile River	MA52-03_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants			
27014	0.00	Unknown	Ten Mile River	MA52-03_2002	X	-Cause Unknown -Unknown toxicity -Metals -Nutrients -Organic enrichment/Low DO -Pathogens -Noxious aquatic plants			
27016	6.49	Unknown	Fourmile Brook	MA52-10_2002					
			Luther Reservoir	MA52025_2002	X	-Turbidity			
			Orrs Pond	MA52029_2002					
			Sevenmile River	MA52-07_2002	X	-Organic enrichment/Low DO -(Flow alteration*) -Pathogens			
			Todds Pond						

Table A23. Ten Mile Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
27017	7.01	Unknown	Hoppin Hill Reservoir	MA52021_2002		
			Scotts Brook	MA52-09_2002	X	-(Flow alteration*)
			Sevenmile River	MA52-07_2002	X	-Organic enrichment/Low DO -(Flow alteration*) -Pathogens
27018	13.97	Unknown	Lake Como	MA52010_2002	X	-Noxious aquatic plants -Turbidity -(Exotic species*)
			Orrs Pond	MA52029_2002		
			Sevenmile River	MA52-07_2002	X	-Organic enrichment/Low DO -(Flow alteration*) -Pathogens
			Sweedens Swamp	MA52-08_2002	X	-Pathogens
27105	2.17	Unknown	Fourmile Brook	MA52-10_2002		
			Manchester Pond			
			Manchester Pond Reservoir	MA52026_2002		



Appendix A
Sub-Basin
Identification Maps:
WESTFIELD

Table A24. Westfield Basin

Sub-basin ID	Mass Highway Road Miles in Urbanized Area	Number of Known Outfalls	Receiving Waterbody	Water Body Segment ID Code	Impaired - Category 4a or 5	Impairment
4173	0.92	Unknown	Pond Brook Potash Brook Russell Pond Westfield River	MA32-22_2002 MA32061_2002 MA32-05_2002		
4211	0.01	Unknown	Ashley Brook Jacks Brook Little River	MA32-08_2002		
4212	0.10	Unknown	Little River	MA32-08_2002		
4215	1.25	Unknown	Arm Brook			
4216	0.72	Unknown	Arm Brook			
4219	0.16	Unknown	Barry Brook Buck Pond Fuller Reservation Pond Horse Pond Pond Brook Powdermill Brook Sandy Brook Snake Pond	MA32012_2002 MA32043_2002 MA32-24_2002 MA32-09_2002	X	-Siltation -Pathogens -Suspended solids -Turbidity
4223	0.02	Unknown	Congamond Lakes Goose Pond Great Brook	MA32021_2002 MA32022_2002 MA32023_2002 MA32-25_2002		
4229	0.76	Unknown	Great Brook	MA32-25_2002		
4230	0.06	Unknown	Great Brook	MA32-25_2002		
4243	0.00	Unknown	Kellog Brook Slab Brook			
4246	0.01	Unknown	Great Brook	MA32-25_2002		
4248	6.03	Unknown	Great Brook Little River Moose Meadow Brook Powdermill Brook Westfield River Westfield River Brook	MA32-25_2002 MA32-08_2002 MA32-23_2002 MA32-09_2002 MA32-05_2002 MA32-06_2002	X	-Siltation -Pathogens -Suspended solids -Turbidity
4256	2.93	Unknown	Block Brook Miller Brook Paucatuck Brook Trask Brook Westfield River White Brook	MA32-27_2002 MA32-29_2002 MA32-06_2002 MA32-07_2002 MA32-28_2002		
4258	4.67	Unknown	Westfield Brook Westfield River	MA32-07_2002		



Appendix B: Endangered Species Correspondence



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

MAR 19 2007

John Blundo
Massachusetts Highway Department
10 Park Plaza
Boston, Massachusetts 02116-3969

Attn: Henry Barbaro

Dear Mr. Blundo,

This is in response to your letter dated February 12, 2007 regarding an application by the Massachusetts Highway Department (MassHighway) for coverage under the National Pollutant Discharge Elimination System General Permit for Discharges from Small Municipal Separate Storm Water Systems (MS4 permit) administered by the US Environmental Protection Agency (EPA). EPA has granted MassHighway partial authorization to discharge storm water under this permit with the exception of the Merrimack and Connecticut River mega-basins. In order for MassHighway to obtain coverage for the remaining roadways (i.e., those in the Merrimack and Connecticut River watersheds), MassHighway must demonstrate to EPA that storm water runoff from these roads will have no effect on threatened and/or endangered species listed by NOAA's National Marine Fisheries Service (NMFS).

As you know, populations of shortnose sturgeon (*Acipenser brevirostrum*) occur in the Connecticut River from the Turners Falls Dam to the mouth of the River in Connecticut and in the Merrimack River from the mouth of the River to the Lawrence Dam. Several MassHighway roads exist in the Merrimack and Connecticut River watersheds and storm water runoff from these roads has the potential to enter either of these rivers.

MassHighway has used the Impervious Cover Model to demonstrate that storm water runoff from MassHighway roads in the Merrimack and Connecticut River watersheds constitute less than one percent of the total discharge volume of these rivers and less than one percent of the possible total contaminant loading. This model assumes that all pavement runoff is captured and discharged directly into the Rivers, while in reality most runoff is filtered through the ground and a minimal amount of runoff is likely directly discharged to either River. As such, MassHighway has determined that storm water runoff from these roads has no effect on the water quality of the mainstem Merrimack and/or Connecticut Rivers. Additionally, MassHighway has an extensive storm water management program and employs many Best Management Practices to reduce the pollutant load of any storm water runoff from MassHighway roads.



The information provided by MassHighway supports the conclusion that storm water runoff from MassHighway roads within the Merrimack and Connecticut River watersheds will not affect water quality in either river in a way that will cause effects to shortnose sturgeon. As such, the inclusion of these roadways in EPA's MS4 permit will not affect any species listed by NMFS. Should project plans change or new information become available that changes the basis for this determination, further coordination with NMFS should be pursued. Should you have any questions about these comments, please contact Julie Crocker at (978) 281-9300 ext. 6530 or by e-mail (Julie.Crocker@noaa.gov).

Sincerely,



Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

Cc: Boelke, F/NER4



THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION
MASSACHUSETTS HIGHWAY DEPARTMENT

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

LUISA PAIEWONSKY
COMMISSIONER

February 12, 2007

Mary A. Colligan
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: MassHighway NPDES Permit – Discharges to Shortnose Sturgeon Habitat

Dear Ms. Colligan:

The Massachusetts Highway Department (MassHighway) has received your letter dated August 21, 2006, requesting additional information to help determine whether discharges from MassHighway outfalls have the potential to adversely affect shortnose sturgeon within the Connecticut and Merrimack Rivers. In response to your request, we have prepared an estimate of the average annual runoff and pollutant load from MassHighway roads in the Connecticut and Merrimack River basins.

Using a state-of-the-art model (the Impervious Cover Model), MassHighway has determined that the portion of MassHighway highways in both the Connecticut and Merrimack mega-basin watersheds constitute less than one percent of the total discharge volume, as well as contaminant loading; even if it is assumed that all the pavement runoff is captured and discharged directly into the Rivers. We believe that this model, and the programs included in the attached Notice of Intent, illustrates that the shortnose sturgeon habitat is not being adversely impacted by MassHighway roads. We are attaching a copy of the current Notice of Intent (submitted to EPA and DEP) to provide you with more detail on the existing and proposed programs that are being implemented under the NPDES program

MassHighway currently has partial authorization to discharge storm water under the NPDES General Permit for MS4s (outside of the Merrimack and Connecticut mega-basins). However, MassHighway will not be issued full authorization from EPA until the National Marine Fisheries Service finds that MassHighway's storm water discharges do not adversely affect the shortnose sturgeon. Therefore, we appreciate your timely response to this submittal.

If you have any concerns or comments regarding this letter, please feel free to contact Henry Barbaro at (617) 973-7419.

Sincerely,

A handwritten signature in black ink, appearing to read "John Blundo".

John, Blundo, P.E.
Chief Engineer

Enclosure: Attachment A – Analysis of MassHighway Storm Water Discharges
Attachment B - NPDES Notice of Intent (12/13/06)

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds

MassHighway used the Impervious Cover Model (ICM) to perform a rough estimate of the average annual storm water volume and pollutant loading based on impervious cover associated with MassHighway roads and the land uses in the watershed.

1.0 Impervious Cover Model Overview

The Center of Watershed Protection's Impervious Cover Model (Schueler, 2003) provides a simple method for estimating storm water runoff volumes and pollutant loads based on impervious cover in the watershed. The method uses the five following steps:

Watershed Delineation including delineation of each sub-watershed in an area of interest and development of a GIS data-layer.

Impervious Cover Mapping including development of land cover and/or impervious cover GIS data-layers.

Impervious Cover Determination for overall watershed impervious cover magnitude and percentage of watershed area.

Estimation of Annual Storm Water Runoff Volume based on watershed impervious cover.

Estimation of Average Annual Pollutant Loads using annual runoff volume and event mean pollutant concentration for selected pollutants.

The equations used to estimate annual storm water runoff and pollutant load are shown in Figure 1.

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds (continued)

Figure 1: “Simple Method”

Step 1 – Calculate Runoff Volume Coefficient

$R_v = \text{Runoff Volume Coefficient} = 0.05 + 0.9I_a$, where

I_a = Impervious fraction (from GIS analysis)

Step 2 – Calculate Annual Runoff Volume

$R = \text{Annual runoff (acre*ft)} = P * P_j * R_v * A$, where

P = Annual rainfall (ft)

P_j = Fraction of rainfall events producing runoff = 0.9

A = Watershed area (acres)

Step 3 – Calculate Annual Pollutant Load

$L = \text{Annual pollutant load (lbs)} = R * C * U * A$, where

C = Pollutant concentration in stormwater, EMC (mg/l) from literature

U = Unit conversion factor = 0.226

A = Area (acres).

2.0 Impervious Cover

To calculate watershed impervious cover, the Massachusetts portion of the Merrimack and Connecticut River megabasins were digitally intersected with the Massachusetts land cover layer, and the area of each land use category calculated. Watershed impervious percentage was then calculated based on the assumed impervious percentages for each land use as shown in Table 1. The assumed percentage of impervious cover for each land use was derived using recommended percentages from TR-55, Urban Hydrology for Small Watersheds (USDA, 1986).

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds (continued)

Table 1: Estimated Percent Impervious Cover by Land Cover

Land Use	Estimated Percent Impervious Cover
Commercial-Industrial-Transportation	79%
Dense Residential Developed	65%
High Intensity Residential	65%
Highways/Runways	75%
Low Intensity Residential	25%
Sparse Residential Developed	20%
Urban/Industrial	72%
Other	0%

The MassHighway road area within each watershed was calculated using the surface width (travel lane) and shoulder width (left and right) values provided in the MassHighway road shapefiles available on MassGIS assuming 100% of this area is impervious cover, as shown in Table 2.

Table 2: Impervious Cover by Mega-Basin

Watershed	Watershed Area (acres)	Impervious Cover (acres)	Impervious Percentage (%)
MA Portion of Merrimack River Mega-Basin	766,800	86,700	11
MH Roads in Merrimack Mega-Basin	970	970	100
MA Portion of Connecticut River*	1,741,200	65,000	4
MH Roads In Connecticut Watershed*	650	650	100

3.0 Storm Water Volume Analysis

In assessing the potential impact of stormwater runoff from MassHighway roads to these rivers, the average annual storm water contribution from MassHighway roads in the Merrimack and Connecticut River megabasins was estimated using the Simple Method described above. Land use values within each of the watersheds within Massachusetts were obtained from MassGIS data. Table 3 summarizes this analysis.

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds (continued)

Table 3: Estimated Average Annual Storm Water Volume

		Area (sq. mi.)	Area (acres)	Avg. Annual Precip. (inches)	Avg. Annual SW Runoff (inches)	Avg. Annual SW Volume (acre-ft)	SW Volume from MH Roads (%)
Merrimack River	MassHighway Roads	1.5	969	45.8	39.2	3,200	--
	MA Portion of Watershed	1,198	766,800	45.8	6.3	403,000	0.8%
	Overall Watershed	5,010	3,206,400				
Connecticut River	MassHighway Roads	1.0	654	45.5	38.9	2,200	--
	MA Portion of Watershed	2,721	1,741,200	45.5	3.4	494,000	0.4%
	Overall Watershed	11,000	7,040,000				

- Merrimack River watershed areas were obtained from Merrimack River Watershed Council web site (www.merrimack.org)
- Connecticut River watershed areas were obtained from Connecticut River Watershed Council web site (www.ctriver.org)
- MassHighway road areas were obtained from MassHighway GIS shapefiles and include all MassHighway roads within the watershed regardless of whether they are within urbanized area zones. Each area was calculated from the surface width plus the shoulder widths to determine an overall impervious width, multiplied by the length.
- Average annual precipitation was obtained from WorldClimate.com. Lawrence station was used for Merrimack River and Springfield station for the Connecticut River. Average annual runoff values were obtained from Water Atlas of the United States published by Water Information Center in 1973.
- MA portion of watershed includes only the portion of the watershed within Massachusetts.
- Connecticut mega-basin includes Connecticut, Chicopee, Westfield and Millers rivers.
- Merrimack mega-basin includes Merrimack, Nashua, Concord and Shawsheen rivers.

Although this analysis is a rough estimate, it indicates the order of magnitude of MassHighway’s storm water runoff volume relative to the total runoff experienced from each watershed. The analysis only includes storm water runoff and does not account for groundwater base flow or point source discharges within the river which provides further dilution of the storm water from MassHighway roads. The analysis indicates that the estimated storm water runoff from MassHighway roads is a very small fraction of the storm water volume received by the rivers each year.

4.0 Pollutant Load Analysis

The average annual pollutant loading from MassHighway roads versus the loading from the other land uses in each of the watersheds was estimated using the Simple Method. The method uses EMC to determine the pollutant loading per acre of watershed.

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds (continued)

4.1 Event Mean Concentrations (EMC)

EMCs represent the average concentration of the pollutant during an entire stormwater runoff event. EMCs are empirically derived from large stormwater data sets compiled by the Nationwide Urban Runoff Program, the US. Geological Survey, and the EPA NDPEs Phase I stormwater program (Schueler, 2003). EMC estimates were selected because they are based on field data collected from thousands of storm events. However, these estimates are based on nationwide data, so they do not account for regional variation in soil types, climate, and other factors. Thus, EMCs applied to Massachusetts watersheds should be considered to be screening-level estimates. EMC values are provided in the Impacts of Impervious Cover document (Schueler, 2003) for a variety of constituents including:

- TSS
- Total P
- Soluble P
- Total N
- TKN
- Chromium
- Nitrite & Nitrate
- Copper
- Lead
- Zinc
- Cadmium

4.2 Assumptions and Limitations

Watershed impervious cover/EMC can be employed to estimate annual pollutant loading. This method includes the following limitations and limiting assumptions:

- This method does not account for point source pollutant loadings.
- EMCs will provide reasonable accuracy over long time periods (i.e., annual loads), but since concentrations vary significantly from storm to storm, this method should not be used for calculating loads for individual storm events. The event mean concentrations are based on countrywide data and do not account for regional variation in soil types, climate and other factors.
- This method does not account for in-stream water quality processes.
- This method does not account for existing water quality BMPs or natural treatment prior to reaching the river. This is especially prevalent in the MassHighway road pollutant loadings since the model estimates the pollutant loading as if the impervious acreage is directly discharged to the river.

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds (continued)

4.3 Watershed Specific Pollutant Load Summary

Table 4 shows the estimated annual loads calculated using the Simple Method for the Merrimack River megabasin within Massachusetts versus the annual load from MassHighway roads. The Merrimack mega-basin includes the sub-watersheds for the Merrimack, Nashua, Concord and Shawsheen rivers.

Table 4: Estimated Annual Loads – Merrimack River Mega-Basin

Constituent	Event Mean Concentrations	Estimated Annual Load		
		MA Portion of Watershed	MH Roads	MH Contribution vs. MA watershed (%)
Sediments				
TSS (lbs)	78.4	84,962,300	672,400	0.8
Nutrients				
Total P (lbs)	0.32	346,800	2,750	0.8
Soluble P (lbs)	0.13	140,900	1,120	0.8
Total N (lbs)	2.39	2,590,000	20,500	0.8
TKN (lbs)	1.73	1,874,800	14,850	0.8
Nitrite & Nitrate (lbs)	0.66	715,200	5,650	0.8
Metals				
Copper (lbs)	0.0134	14,500	115	0.8
Lead (lbs)	0.0675	73,150	580	0.8
Zinc (lbs)	0.162	175,600	1,390	0.8
Cadmium (lbs)	0.0007	760	6	0.8
Chromium (lbs)	0.004	4,340	34	0.8

Table 5 shows the estimated annual loads calculated using the Simple Method for the Connecticut River megabasin within Massachusetts, based on the relevant pollutants for this type of impairment. The Connecticut River mega-basin includes the sub-watersheds for the Connecticut, Chicopee, Westfield, and Millers rivers.

Attachment A. Analysis of MassHighway Storm Water Discharges within the Connecticut and Merrimack River Watersheds (continued)

Table 5: Estimated Annual Loads – Connecticut River in MA

Constituent	Event Mean Concentrations	Estimated Annual Load		
		MA Portion of Watershed	MH Roads	MH Contribution vs. MA watershed (%)
Sediments				
TSS (lbs)	78.4	105,620,300	450,700	0.4
Nutrients				
Total P (lbs)	0.32	431,100	1,840	0.4
Soluble P (lbs)	0.13	175,100	750	0.4
Total N (lbs)	2.39	3,219,800	13,740	0.4
TKN (lbs)	1.73	2,330,700	9,950	0.4
Nitrite & Nitrate (lbs)	0.66	889,200	3,800	0.4
Metals				
Copper (lbs)	0.0134	18,000	80	0.4
Lead (lbs)	0.0675	91,000	390	0.4
Zinc (lbs)	0.162	218,200	930	0.4
Cadmium (lbs)	0.0007	950	4	0.4
Chromium (lbs)	0.004	5,400	23	0.4

4.4 Unaccounted for Treatment Factors

This analysis does not account for the many water quality treatment BMPs that mitigate the pollutant loading from MassHighway roads or the fact that a significant portion of the MassHighway roads do not directly discharge to receiving waters. A significant percentage of the storm water conveyance system along the linear roads is comprised of country drainage (i.e. overland flow and swales). Runoff from these roads typically infiltrates into the ground as it travels long distances in vegetated swales or over vegetated buffers. Only a small fraction of this runoff from these roads (e.g., I-91 within the Connecticut River Basin) ever reaches a receiving tributary.

Furthermore, MassHighway’s Notice of Intent (NOI), submitted as part of applying for coverage under the NPDES Phase II MS4 General Permit, includes many programs which will provide treatment or source controls for the roads discharging to the Connecticut and Merrimack Rivers.

Attachment B - NPDES Notice of Intent (12/13/06)



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Watershed Management
BRP WM 08A NPDES Stormwater General Permit
Notice of Intent for Discharges from Small Municipal Separate
Storm Sewer Systems (MS4s)

W040919
 Transmittal Number

MAR043025
 Facility ID (if known)

A. Instructions

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Submission of this Notice of Intent constitutes notice that the entity named at item B1. of this form intends to be authorized by the DEP General Permit issued jointly with EPA for stormwater discharges from the small municipal separate storm sewer system (MS4), in the location identified at item B2. of this form. Submission of the Notice of Intent also constitutes notice that the party identified at item B1. has read, understands and meets the eligibility conditions of Part I.B. of the NPDES Small MS4 General Permit, agrees to comply with all applicable terms and conditions of the NPDES Small MS4 General Permit, and understands that continued authorization to discharge is contingent on maintaining eligibility for coverage. **In order to be granted coverage, all information required on BRP WM 08A, including the Stormwater Management Program Summary and Time Frames form, must be completed. Please read the permit and make sure you comply with all requirements, including the requirement to develop and implement a stormwater management program.**

B. Applicant Information

1. Small MS4 Operator/Owner Information:

MassHighway Department – Environmental Section
 Name
 10 Park Plaza Room 4260
 Mailing Address
 Boston MA
 City/Town State
 (617) 973-7419 Henry.Barbaro@mhd.state.ma.us
 Telephone Number Email (if available)

2. Municipality Name

MassHighway Department
 City/Town

3. Legal Status:

Federal City/Town State Tribal Private

Other public entity: _____
 Specify Public Entity

4. Other regulated MS4(s) within municipal boundaries:

Since MassHighway's properties are statewide, MassHighway's MS4 system is within municipal boundaries which may include regulated MS4s. A discharge inventory of the system within the urbanized area will be performed during this permit term and will include information on any discharges that flow to other regulated MS4s. This information will be summarized in annual reports submitted to EPA and DEP.



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B. Applicant Information (cont.)

5. Based on the instructions provided in Part I of the NPDES Small MS4 General Permit, have the eligibility criteria for "listed species" and critical habitat been met?

yes pending no

MassHighway has satisfied the ESA eligibility provision under Criterion D (Small MS4 Permit, Addendum B) with regard to the dwarf wedgemussel in all areas tributary to its habitat in the Connecticut River Basin (See Appendix B for consultation correspondence with U.S. Fish and Wildlife Service). MassHighway has not yet satisfied the eligibility criteria with regard to the short nose sturgeon in all areas tributary to its habitat in the identified portions of the Connecticut and Merrimack River Basins. However, MassHighway is currently consulting with National Marine Fisheries Services (NMFS) (see Appendix B) to facilitate a determination. MassHighway has satisfied the ESA eligibility provisions under Criterion A (Small MS4 Permit, Addendum B) with regard to the dwarf wedgemussel and short nose sturgeon in all areas not tributary to the identified portions of the Connecticut and Merrimack River Basins.

6. Based on the instructions provided in Part I of the NPDES Small MS4 General Permit, have the eligibility criteria for protection of historic properties been met?

yes pending no

MassHighway has satisfied the eligibility criteria for protection of historic properties by obtaining concurrence from the Massachusetts Historical Commission (MHC) regarding MassHighway's opinion that there are presently no known storm water discharges from its roadways located in urbanized areas and within 500-feet of any historic property identified in MassGIS's historic properties datalayer (see Appendix C for correspondence with the MHC).

Note:
 Section C may be duplicated to accommodate a larger list of receiving waters

C. Names of (Presently Known) Receiving Waters

Receiving Water:	No. of Outfalls	Listed as Impaired?	Impairment
See Appendix A Name _____	_____ Number	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____ Specify

Since MassHighway has not completed a drainage outfall inventory outside of the Lower Charles River area, MassHighway has instead summarized in Table A (Appendix A) the miles of urbanized area roadway within a receiving waterbody's watershed. The table and associated figures indicate the MassHighway urbanized area road miles within each of the major watersheds in Massachusetts. The information is then broken down further to summarize the data by sub-basin including the number of outfalls (if known), MassHighway urbanized area road miles, the water bodies within the sub-basin, if the waterbodies are impaired, and the impairment. As MassHighway completes an inventory of the outfalls in a certain district, we will update Table A to include the number of outfalls identified in each sub-basin. The updated table will be included in future SWMP submittal and annual reports.



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D. Stormwater Management Program Summary

1. Public Education:

1A

BMP ID #

MassHighway Training
Assistance Program (MTAP)

Specify Best Management Practice

MTAP

Responsible Dept./Person Name

Continue MTAP Program

Specify Measurable Goal

1B

BMP ID #

Baystate Roads

Specify Best Management Practice

Baystate Roads

Responsible Dept./Person Name

Continue Baystate Roads Program

Specify Measurable Goal

1C-1

BMP ID #

MassHighway Website

Specify Best Management Practice

IT/Environmental

Responsible Dept./Person Name

Environmental Division web page
added to web site.

Specify Measurable Goal

1C-2

BMP ID #

MassHighway Website

Specify Best Management Practice

IT/Environmental

Responsible Dept./Person Name

The MassHighway website includes a
link for contacting the Highway
Department via email. Emails
received are reviewed and directed to
the appropriate department.

Specify Measurable Goal

1C-3

BMP ID #

MassHighway Website

Specify Best Management Practice

IT/Environmental

Responsible Dept./Person Name

Web page is evaluated annually and
revised as necessary.

Specify Measurable Goal

1D-1

BMP ID #

Storm Water Training

Specify Best Management Practice

Environmental/ MTAP

Responsible Dept./Person Name

Conduct training for MassHighway
personnel every two years.

Specify Measurable Goal

1D-2

BMP ID #

Storm Water Training

Specify Best Management Practice

Environmental/ Baystate Roads

Responsible Dept./Person Name

Conduct training for municipal DPW
personnel every two years.

Specify Measurable Goal

1E

BMP ID #

Educational Seminars for CIM
members

Specify Best Management Practice

Construction Division

Responsible Dept./Person Name

MH provided educational seminars for
CIM members on CGP Permit
coverage and environmental
compliance in Permit Year 1.

Specify Measurable Goal



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Facility ID (if known)

1F

BMP ID #

MassHighway/ Municipal Tie-
In Review Process

Specify Best Management Practice

Environmental/ Districts

Responsible Dept./Person Name

Develop communication mechanism re: MassHighway drainage that discharges to a local MS4. Develop review process for addressing those concerns. Notify other MS4s of process.

Specify Measurable Goal

1G

BMP ID #

River and Stream Signs

Specify Best Management Practice

Traffic Operations

Responsible Dept./Person Name

MH installs signs identifying rivers and streams crossed by MassHighway Roads.

Specify Measurable Goal

1H

BMP ID #

Anti-litter/ Dumping Messages
on Variable Message Boards

Specify Best Management Practice

Operations

Responsible Dept./Person Name

Include anti-litter message in the message mix on permanent Variable Message Boards.

Specify Measurable Goal

1I

BMP ID #

Anti-litter/ Dumping Literature
at Rest Areas and Visitors
Centers

Specify Best Management Practice

Operations

Responsible Dept./Person Name

Distribute anti-litter/ dumping literature developed by MassHighway at rest areas and visitor centers.

Specify Measurable Goal

1J

BMP ID #

New England DOT Meetings

Specify Best Management Practice

Environmental

Responsible Dept./Person Name

Staff members from the New England DOTs meet at least annually to discuss on-going issues and programs being faced by the DOT's including wetland mitigation, storm water and erosion controls. Meet at least annually.

Specify Measurable Goal

3E

BMP ID #

Resident Engineer Illicit
Connection Training

Specify Best Management Practice

Construction

Responsible Dept./Person Name

In 2007, provide training on illicit connection policy, illicit connection identification and protocol for reporting during annual Resident Engineer training seminars.

Specify Measurable Goal

3F

BMP ID #

Maintenance Staff Illicit
Connection Training

Specify Best Management Practice

Environmental

Responsible Dept./Person Name

In 2007, provide training on illicit connection policy, illicit connection identification and protocol for reporting during annual training seminars for maintenance personnel.

Specify Measurable Goal



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<u>4H</u> BMP ID # <u>NPDES Phase II Notice</u> Specify Best Management Practice	<u>Construction Division</u> Responsible Dept./Person Name	Develop and distribute a Notice from the MassHighway Chief Engineer to all pre-qualified Construction Contractors. <u>Specify Measurable Goal</u>
<u>4L-1</u> BMP ID # <u>Training</u> Specify Best Management Practice	<u>Construction</u> Responsible Dept./Person Name	Conduct annual Erosion Prevention and Sediment Control Training for Construction Personnel. <u>Specify Measurable Goal</u>
<u>4M</u> BMP ID # <u>Erosion and Sediment Control Field Tests</u> Specify Best Management Practice	<u>Construction Division/ Districts/ Landscaping</u> Responsible Dept./Person Name	Perform field tests of new E&S materials on MassHighway projects. Create and distribute internal memo summarizing materials effectiveness and recommended use. <u>Specify Measurable Goal</u>
<u>4N</u> BMP ID # <u>Construction Bulletins</u> Specify Best Management Practice	<u>Construction Division</u> Responsible Dept./Person Name	Issue annual construction bulletins to each District regarding storm water issues. <u>Specify Measurable Goal</u>

2. Public Participation:

<u>2A</u> BMP ID # <u>Project Related Public Notification and Public Participation Requirements</u> Specify Best Management Practice	<u>Environmental</u> Responsible Dept./Person Name	Continue compliance with federal and state public notification and public participation requirements <u>Specify Measurable Goal</u>
<u>2B</u> BMP ID # <u>Adopt-a-Highway</u> Specify Best Management Practice	<u>Adopt-a-Highway</u> Responsible Dept./Person Name	<u>Continue to support program.</u> <u>Specify Measurable Goal</u>
<u>2C</u> BMP ID # <u>Project Clean</u> Specify Best Management Practice	<u>Project Clean</u> Responsible Dept./Person Name	<u>Continue to support Project Clean.</u> <u>Specify Measurable Goal</u>
<u>2D-1</u> BMP ID # <u>MassHighway Web Site</u> Specify Best Management Practice	<u>IT/Environmental</u> Responsible Dept./Person Name	MH posts the most recent copy of the Storm Water Management Plan on the Environmental Section web page. <u>Specify Measurable Goal</u>



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2D-2

BMP ID #

MassHighway Web Site
 Specify Best Management Practice

IT/Environmental
 Responsible Dept./Person Name

MH post each year's annual reports to the Environmental Section webpage.
 Specify Measurable Goal

2E

BMP ID #

Complete AASHTO's Center for Environmental Excellence on "Strategies & Approaches to Complying with NPDES Phase II survey
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

MH completed this survey in Permit Year 3.
 Specify Measurable Goal

4O

BMP ID #

Solicit Construction Activity Feedback from Public
 Specify Best Management Practice

Construction Division/ IT
 Responsible Dept./Person Name

Maintain Construction Division web page to include contact information for ongoing construction activities. Respond to concerns submitted in a timely manner.
 Specify Measurable Goal

3. Illicit Discharge Detection and Elimination:

3A

BMP ID #

Rest Area Leases
 Specify Best Management Practice

Environmental/ Right-of-Way
 Responsible Dept./Person Name

Submission of drainage information is a standard condition on all new MassHighway Rest Area Leases.
 Specify Measurable Goal

3B-1

BMP ID #

Drainage Inventory
 Specify Best Management Practice

Environmental/ Construction/ Planning/ IT Division
 Responsible Dept./Person Name

Develop drainage Inventory Spec and include in future construction and redevelopment projects. Spec to include submittal of as-built info on all drainage related activities
 Specify Measurable Goal

3B-2

BMP ID #

Drainage Inventory
 Specify Best Management Practice

Environmental/ Districts/ IT
 Responsible Dept./Person Name

Complete field program mapping of drainage outfalls within urbanized areas and develop maps. Include summary of progress in each year's annual report.
 Specify Measurable Goal

3C-1

BMP ID #

Illicit Drainage Connection Policy
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

Illicit Drainage Connection Policy was issued June 26, 2006. Issue letter to all Resident Engineers discussing the Policy.
 Specify Measurable Goal



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3C-2

BMP ID #

Drainage Tie-In SOP
 Specify Best Management Practice

Environmental/ Legal
 Responsible Dept./Person Name

Prepare an internal draft of a revised Drainage Tie-in SOP . Submit to Chief Engineer. The Policy will address discharges from non-MassHighway properties to the MassHighway MS4 system including existing development and construction sites. The Policy will include procedures for receipt and consideration of information submitted by the public.
 Specify Measurable Goal

3D

BMP ID #

Illicit Connection Review
 Specify Best Management Practice

Environmental/ Districts
 Responsible Dept./Person Name

Review twenty discharges each year for potential illicit connections and summarize outcome in each year's annual report..
 Specify Measurable Goal

3E

BMP ID #

Resident Engineer Illicit Connection Training
 Specify Best Management Practice

Construction
 Responsible Dept./Person Name

In 2007, provide training on illicit connection policy, illicit connection identification and protocol for reporting during annual Resident Engineer training seminars.
 Specify Measurable Goal

3F

BMP ID #

Maintenance Staff Illicit Connection Training
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

In 2007, provide training on illicit connection policy, illicit connection identification and protocol for reporting during annual training seminars for maintenance personnel.
 Specify Measurable Goal

4Q

BMP ID #

Standard Practices Memo
 Specify Best Management Practice

Construction
 Responsible Dept./Person Name

Prepare and issue a Standard Practices memo to Construction Engineers on the protocol for Illicit Discharge Detection and Elimination during construction projects. The SOP will describe accepted method for identifying such discharges in the field and will provide the Prohibition Policy for addressing such discharges.
 Specify Measurable Goal

1H

BMP ID #

Anti-litter/ Dumping Messages on Variable Message Boards
 Specify Best Management Practice

Operations
 Responsible Dept./Person Name

Include anti-litter message in the message mix on permanent Variable Message Boards.
 Specify Measurable Goal



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 Facility ID (if known)

1I

BMP ID #

Anti-litter/ Dumping Literature
 at Rest Areas and Visitors
 Centers

Specify Best Management Practice

Operations

Responsible Dept./Person Name

Distribute anti-litter/ dumping literature
 developed by MassHighway at rest
 areas and visitor centers.

Specify Measurable Goal

4. Construction Site Runoff Control:

4A

BMP ID #

MassHighway Department
 Project Development & Design
 Guide

Specify Best Management Practice

Environmental/ Construction/
 Projects

Responsible Dept./Person Name

Continue to comply with erosion and
 sediment control requirements
 indicated in design guide.

Specify Measurable Goal

4B

BMP ID #

MA DEP Stormwater
 Management Policy

Specify Best Management Practice

Environmental/ Construction/
 Projects

Responsible Dept./Person Name

Continue to meet criteria in Policy for
 projects subject to Wetlands
 Protection Act.

Specify Measurable Goal

4C

BMP ID #

NPDES Construction General
 Permit

Specify Best Management Practice

Construction

Responsible Dept./Person Name

MassHighway and the Contractors file
 NOIs for new projects. A Special
 Provision/ Pay Item is included in all
 new construction contracts to cover
 the preparation of the SWPPP by the
 Contractor. District Environmental and
 Construction offices verify that the
 General Permit item is included when
 the contract is awarded. For any
 projects which have not included the
 item but trigger the one acre threshold,
 an Extra Work Order is processed to
 produce the SWPPP.

Specify Measurable Goal

4D

BMP ID #

Other state environmental
 regulations or policy

Specify Best Management Practice

Environmental/ Construction/
 Projects

Responsible Dept./Person Name

Continue compliance with other state
 environmental regulations and
 policies.

Specify Measurable Goal

4E

BMP ID #

MassHighway Storm Water
 Handbook

Specify Best Management Practice

Environmental/ Construction/
 Projects

Responsible Dept./Person Name

MassHighway requires that all new
 construction and redevelopment
 activities undertaken by MassHighway,
 or by others that are funded in whole
 or in part by MassHighway, comply
 with the Handbook

Specify Measurable Goal



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Transmittal Number

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Facility ID (if known)

4F

BMP ID #

Standard Specification for
Highway and Bridges
Specify Best Management Practice

Environmental/ Construction/
Projects
Responsible Dept./Person Name

Inclusion of erosion and pollution
prevention controls is standard
practice for construction contracts
issued by MassHighway
Specify Measurable Goal

4G

BMP ID #

MassHighway Research Need
Program
Specify Best Management Practice

Environmental/ Construction
Responsible Dept./Person Name

MassHighway continues to support
this program and be an active
member on two research committees:

1. Measuring Pollutant Removal
Efficiencies of Stormwater
Treatment Units
 2. Wood Fiber Attenuation of
Roadway Runoff
- Specify Measurable Goal

4H

BMP ID #

Pre-Construction Meeting Review
of NPDES requirements
Specify Best Management Practice

District Environmental Staff
Responsible Dept./Person Name

District Environmental Staff review
NPDES requirements at the applicable
pre-construction meetings. These
meetings outline the requirements of
the Construction General Permit and
identify the roles and responsibilities of
MassHighway and the Contractor..
Specify Measurable Goal

4I

BMP ID #

Contract Bid Item and Special
Provision for SWPPPs
Specify Best Management Practice

Construction Division/
Contracts
Responsible Dept./Person Name

A Special Provision/ Pay Item is
included in all new construction
contracts to cover the preparation of
the SWPPP by the Contractor. District
Environmental and Construction
offices verify that the General Permit
item is included when the contract is
awarded. For any projects which have
not included the item but trigger the
one acre threshold, an Extra Work
Order is processed to produce the
SWPPP.
Specify Measurable Goal

4J

BMP ID #

Field Guide on Erosion
Prevention and Sediment
Control
Specify Best Management Practice

Construction Division/ Chief
Engineer
Responsible Dept./Person Name

Finalize field guide. Issue to Resident
Engineers.
Specify Measurable Goal



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4K

BMP ID #

Storm Water Pollution
Prevention Plan (SWPPP)
Guidance Manual for
Contractors

Specify Best Management Practice

Construction Division

Responsible Dept./Person Name

SWPPP Guidance for Contractors
document completed and in use by
Contractors on MassHighway projects.
Specify Measurable Goal

4L-1

BMP ID #

Training

Specify Best Management Practice

Construction Division

Responsible Dept./Person Name

Conduct annual Erosion Prevention
and Sediment Control Training for
Construction Personnel.
Specify Measurable Goal

4L-2

BMP ID #

Non-Traditional Erosion Control
Specifications

Specify Best Management Practice

Landscaping/ Construction

Responsible Dept./Person Name

Develop specifications for non-
traditional erosion controls. Evaluate
research being conducted by other
state DOT's that can be accepted by
MassHighway Research and Materials
Section. As new technologies/
techniques are developed, they will be
tested and, if accepted, a spec will be
developed.

Specify Measurable Goal

4M

BMP ID #

Erosion and Sediment Control
Field Tests

Specify Best Management Practice

Construction Division/ Districts/
Landscaping

Responsible Dept./Person Name

Perform field tests of new E&S
materials on MassHighway projects.
Create and distribute internal memo
summarizing materials effectiveness
and recommended use. As new
products are developed, MH will field
test and provide internal memo.

Specify Measurable Goal

4N

BMP ID #

Construction Bulletins

Specify Best Management Practice

Construction Division

Responsible Dept./Person Name

Issue annual construction bulletins to
each District regarding storm water
issues.

Specify Measurable Goal

4O

BMP ID #

Solicit Construction Activity
Feedback from Public

Specify Best Management Practice

Construction Division/ IT

Responsible Dept./Person Name

Maintain MassHighway web site to
include contact information for on-
going construction activities. Respond
to concerns submitted in a timely
manner.

Specify Measurable Goal



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Watershed Management
BRP WM 08A NPDES Stormwater General Permit
Notice of Intent for Discharges from Small Municipal Separate
Storm Sewer Systems (MS4s)

W040919
 Transmittal Number

MAR043025
 Facility ID (if known)

4P

BMP ID #

Construction Runoff Control Enforcement

Specify Best Management Practice

Construction Division/ Districts
 Responsible Dept./Person Name

If, in the judgment of the Engineer, the surface area of erodible earth material exposed has the potential for causing water pollution, the Engineer shall direct the Contractor to cease the applicable operations until satisfactory temporary or permanent erosion control measures are taken. In the event of conflict between these requirements and pollution control laws, rules or regulations of other federal, State or local agencies, the more restrictive laws, rules or regulations shall apply. MassHighway Contract Standard Provisions address payment for work under a contract. No such payment shall be made when, in the Engineer's judgment, the work is not proceeding in accordance with the provisions of the Contract. These provisions have been successfully enforced with respect to lack of contractor response to erosion control issues.

Specify Measurable Goal

4Q

BMP ID #

Standard Practices Memo

Specify Best Management Practice

Construction Division

Responsible Dept./Person Name

Prepare and issue a Standard Practices memo to Construction Engineers on the protocol for Illicit Discharge Detection and Elimination during construction projects. The SOP will describe accepted method for identifying such discharges in the field and will provide the Prohibition Policy for addressing such discharges.

Specify Measurable Goal

1E

BMP ID #

Educational Seminars for CIM members

Specify Best Management Practice

Construction Division

Responsible Dept./Person Name

Provide educational seminars for CIM members on CGP Permit coverage and environmental compliance.

Specify Measurable Goal

2A

BMP ID #

Project Related Public Notification and Public Participation Requirements

Specify Best Management Practice

Environmental

Responsible Dept./Person Name

Continue compliance with federal and state public notification and public participation requirements

Specify Measurable Goal



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Watershed Management
BRP WM 08A NPDES Stormwater General Permit
Notice of Intent for Discharges from Small Municipal Separate
Storm Sewer Systems (MS4s)

W040919
 Transmittal Number

MAR043025
 Facility ID (if known)

5. Post Construction Runoff Control:

<p><u>5A</u> BMP ID # MassHighway Stormwater Handbook Specify Best Management Practice</p>	<p><u>Environmental</u> Responsible Dept./Person Name</p>	<p>MassHighway has recently secured DEP ratification for MassHighway Storm Water Handbook. Specify Measurable Goal</p>
<p><u>5B</u> BMP ID # MassHighway Maintenance Program Specify Best Management Practice</p>	<p><u>Maintenance</u> Responsible Dept./Person Name</p>	<p>Continue to implement MassHighway maintenance program. Specify Measurable Goal</p>
<p><u>5C</u> BMP ID # Technology Acceptance and Reciprocity Partnership (TARP) Specify Best Management Practice</p>	<p><u>TARP</u> Responsible Dept./Person Name</p>	<p>Continue to participate in TARP program. Specify Measurable Goal</p>
<p><u>5D</u> BMP ID # Stormwater Innovative Technology Evaluators (SITES) Specify Best Management Practice</p>	<p><u>SITES</u> Responsible Dept./Person Name</p>	<p>Continue to participate in Committee. Specify Measurable Goal</p>
<p><u>5E</u> BMP ID # Highway Runoff Contaminant Model Specify Best Management Practice</p>	<p><u>Env. Div. Consultant</u> Responsible Dept./Person Name</p>	<p>Develop and calibrate model. Specify Measurable Goal</p>
<p><u>5F-1</u> BMP ID # BMP Maintenance Manual Specify Best Management Practice</p>	<p><u>Environmental/ Maintenance</u> Responsible Dept./Person Name</p>	<p>Develop manual. Specify Measurable Goal</p>
<p><u>5F-2</u> BMP ID # BMP Maintenance Manual Specify Best Management Practice</p>	<p><u>Environmental/ Baystate Roads/ MTAP</u> Responsible Dept./Person Name</p>	<p>Provide training on manual. Specify Measurable Goal</p>
<p><u>5G</u> BMP ID # Right of Way Parcel Evaluation Specify Best Management Practice</p>	<p><u>Environmental</u> Responsible Dept./Person Name</p>	<p>MassHighway developed a methodology for evaluating parcels which are candidates for disposal for their storm water management potential. Specify Measurable Goal</p>



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Watershed Management

W040919
 Transmittal Number

BRP WM 08A NPDES Stormwater General Permit
Notice of Intent for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)

MAR043025
 Facility ID (if known)

5H-1

BMP ID #

Post Construction Runoff Enforcement – Illicit Discharge Prohibition Policy

Specify Best Management Practice

Commissioner/ Legal/ Environmental

Responsible Dept./Person Name

On June 26, 2006, Policy Directive No. P-06-002 was adopted to clarify how MassHighway should treat unauthorized connections to its drainage systems. Under this policy, no unauthorized connections are allowed unless a permit has been. As part of its SWMP MassHighway will not allow flows that do not meet NPDES conditions to be added to or remain connected to its drainage system. This approach will be enforced through referrals to the Attorney General.

Specify Measurable Goal

5H-2

BMP ID #

Post Construction Runoff Enforcement – Drainage Tie-In Policy

Specify Best Management Practice

Commissioner/ Legal/ Environmental/ Districts

Responsible Dept./Person Name

As discussed in BMP 3C-2, MassHighway will prepare a permitting process for adjacent parcels which want to tie-in to the MassHighway drainage system. The permitting process will require the permittee to demonstrate that the water discharged to MassHighway's MS4 will meet the MA Stormwater Policy and the NPDES General Permit requirements.

Specify Measurable Goal

5H-3

BMP ID #

Post Construction Runoff Enforcement – Offsite Pollution to MH Drainage System

Specify Best Management Practice

Commissioner/ Legal/ Environmental

Responsible Dept./Person Name

Runoff not meeting the NPDES MS4 requirements which is reaching the MH MS4 and is not covered under 5H-1 or 5H-2 may be considered trespassing and referred to the AG's office by MassHighway counsel at the DHD's discretion.

Specify Measurable Goal

3B-1

BMP ID #

Drainage Inventory

Specify Best Management Practice

Environmental/ Construction/ Planning/ IT Division

Responsible Dept./Person Name

Develop drainage Inventory Spec and include in future construction and redevelopment projects. Spec to include submittal of as-built info on all drainage related activities.

Specify Measurable Goal

4A

BMP ID #

MassHighway Department Project Development & Design Guide

Specify Best Management Practice

Environmental/ Construction/ Projects

Responsible Dept./Person Name

Continue to comply with erosion and sediment control requirements indicated in design guide.

Specify Measurable Goal



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 Bureau of Resource Protection - Watershed Management
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Storm Sewer Systems (MS4s)

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MAR043025
 Facility ID (if known)

<u>4E</u> BMP ID #	<u>Environmental/ Construction/ Projects</u> Responsible Dept./Person Name	<u>Design projects in urbanized areas in compliance with Handbook.</u> Specify Measurable Goal
<u>MassHighway Storm Water Handbook</u> Specify Best Management Practice		

6. Municipal Good Housekeeping:

<u>6A-1</u> BMP ID #	<u>Project Clean</u> Responsible Dept./Person Name	<u>Continue to support Project Clean.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-2</u> BMP ID #	<u>Adopt-a-Highway</u> Responsible Dept./Person Name	<u>Continue to support Adopt-a-Highway program.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-3</u> BMP ID #	<u>Environmental/ Districts</u> Responsible Dept./Person Name	<u>Continue to support Deicing and Reduced Salt Areas Programs.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-4</u> BMP ID #	<u>HELP</u> Responsible Dept./Person Name	<u>Continue to support Highway Emergency Locator Program (HELP).</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-5</u> BMP ID #	<u>Environmental</u> Responsible Dept./Person Name	<u>Continue development of Vegetation Management Plan.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-6</u> BMP ID #	<u>Planning</u> Responsible Dept./Person Name	<u>Continue to support MassHighway HOV program.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-7</u> BMP ID #	<u>Planning</u> Responsible Dept./Person Name	<u>Continue to support alternative transportation through technical funding and assistance.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		

<u>6A-8</u> BMP ID #	<u>Highway Design</u> Responsible Dept./Person Name	<u>Continue to support highway safety through safety design standards, hazard signage and electronic variable message signs, and rumble strips.</u> Specify Measurable Goal
<u>Source Control</u> Specify Best Management Practice		



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<u>6A-9</u> BMP ID # <u>Source Control</u> Specify Best Management Practice	<u>Environmental</u> Responsible Dept./Person Name	<u>Continue support of Toxics Use Reduction (TURA) program.</u> Specify Measurable Goal
<u>6B-1</u> BMP ID # <u>Employee Training</u> Specify Best Management Practice	<u>MTAP/ Baystate Roads</u> Responsible Dept./Person Name	<u>Continue to support MTAP and Baystate Roads program.</u> Specify Measurable Goal
<u>6B-2</u> BMP ID # <u>Employee Training</u> Specify Best Management Practice	<u>Environmental</u> Responsible Dept./Person Name	<u>Continue Facility Handbook Training.</u> Specify Measurable Goal
<u>6B-3</u> BMP ID # <u>Employee Training</u> Specify Best Management Practice	<u>Highway Operations</u> Responsible Dept./Person Name	<u>Continue Snow and Ice Program Training.</u> Specify Measurable Goal
<u>6B-4</u> BMP ID # <u>Employee Training</u> Specify Best Management Practice	<u>Highway Operations</u> Responsible Dept./Person Name	<u>Continue Equipment and Vehicle Safety Training</u> Specify Measurable Goal
<u>6C-1</u> BMP ID # <u>Maintenance</u> Specify Best Management Practice	<u>Districts</u> Responsible Dept./Person Name	<u>Continue maintenance activities for storm water system.</u> Specify Measurable Goal
<u>6C-2</u> BMP ID # <u>Maintenance</u> Specify Best Management Practice	<u>Districts</u> Responsible Dept./Person Name	<u>Continue maintenance activities and practices discussed in Environmental Facility Handbooks for maintenance/ material storage yards.</u> Specify Measurable Goal
<u>6D</u> BMP ID # <u>Waste Disposal</u> Specify Best Management Practice	<u>Districts</u> Responsible Dept./Person Name	<u>Continue proper waste disposal practices for wastes removed from drainage structures and storm water BMPs during maintenance.</u> Specify Measurable Goal
<u>6E</u> BMP ID # <u>Good Housekeeping/ Pollution Prevention Program Evaluation</u> Specify Best Management Practice	<u>Environmental</u> Responsible Dept./Person Name	<u>Evaluate existing Good Housekeeping/ Pollution Prevention Programs to determine additional or revised activities that would increase effectiveness and usefulness of the programs.</u> Specify Measurable Goal



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6F
 BMP ID #
Catch Basin Accumulation Project
 Specify Best Management Practice

Environmental/ Maintenance/ Districts
 Responsible Dept./Person Name

Collect data for three years on the accumulation of debris for representative areas, and determine if the current inspection and cleaning schedule should be altered for particular areas. The schedule will target areas that are in greatest need of cleaning, with an emphasis on locations with sensitive receiving waters, while corresponding to MassHighway's limited maintenance budgets.

Specify Measurable Goal

7. BMPs for Meeting TMDL:

7A
 BMP ID #
Wetland Protection Act (WPA) Compliance
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

Continue to comply with MESA as required by the WPA.

Specify Measurable Goal

7B
 BMP ID #
401 Water Quality Certification
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

Continue to comply with MA 401 Water Quality Certification regulations.

Specify Measurable Goal

7C
 BMP ID #
CE Checklist
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

Complete this checklist at 25% design stage if project receives federal funds.

Specify Measurable Goal

7D
 BMP ID #
Environmental Site Data Form
 Specify Best Management Practice

Environmental/ Construction
 Responsible Dept./Person Name

Develop form and instructions. Designers to submit at 25% Design. Contractors to submit as part of Construction SWPPP.

Specify Measurable Goal

7E
 BMP ID #
TMDL Recommendation Summary Table Update
 Specify Best Management Practice

Environmental
 Responsible Dept./Person Name

Update table to include TMDL reports finalized within the previous year and progress on implementation of any related measurable goals in annual report each year.

Specify Measurable Goal



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Storm Sewer Systems (MS4s)

W040919
Transmittal Number

MAR043025
Facility ID (if known)

7F

BMP ID #

Rt 28 Roadway Drainage –
Frost Fish Creek

Specify Best Management Practice

District/ Planning

Responsible Dept./Person Name

As part of the next Route 28 reconstruction project, the Massachusetts Highway Department will work with the Town to mitigate the Route 28 roadway drainage in the immediate area by installing practicable best management structures, or operational practices, as warranted by the magnitude of contaminant loading to Frost Fish Creek.

Specify Measurable Goal

7G

BMP ID #

Rt 28 Roadway Drainage –
Muddy Creek

Specify Best Management Practice

District/ Planning

Responsible Dept./Person Name

As part of the next Route 28 reconstruction project, the Massachusetts Highway Department will determine the Route 28 roadway drainage area discharging to Muddy Creek and install practicable best management structures, or operational practices, as warranted by the magnitude of contaminant loading to Muddy Creek.

Specify Measurable Goal

7H

BMP ID #

Chicopee Basin Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal

7I

BMP ID #

Connecticut Basin Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal



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Transmittal Number

MAR043025
Facility ID (if known)

7J

BMP ID #

French Basin Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal

7K

BMP ID #

Indian Lake Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal

7L

BMP ID #

Leesville Pond Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal

7M

BMP ID #

Miller River Basin Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal

7N

BMP ID #

Northern Blackstone Impaired
Waterbodies TMDL

Specify Best Management Practice

Environmental/ Planning/
District

Responsible Dept./Person Name

MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.

Specify Measurable Goal



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 Facility ID (if known)

<u>7O</u> BMP ID # <u>Salisbury Pond Impaired</u> <u>Waterbody TMDL</u> Specify Best Management Practice	<u>Environmental/ Planning/</u> <u>District</u> Responsible Dept./Person Name	MassHighway has committed to DEP in its January 23, 2002 letter that streets will be swept at least once a year (usually in spring) and more often if necessary. All sumped drainage structures will be inspected and cleaned if necessary, twice a year and more often if necessary. MassHighway will inspect/ clean drainage outlet locations where sediment build-up is evident. MassHighway will inspect and repair damaged and/ or clogged drainage conveyances. <u>Specify Measurable Goal</u>
<u>7P</u> BMP ID # <u>Lake Quinsigamond and Flint</u> <u>Pond Impaired Waterbodies</u> <u>TMDL</u> Specify Best Management Practice	<u>District 3</u> Responsible Dept./Person Name	MassHighway District 3 will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. <u>Specify Measurable Goal</u>
<u>7Q</u> BMP ID # <u>Neponset River Impaired</u> <u>Waterbodies TMDL</u> Specify Best Management Practice	<u>Environmental/ Planning/</u> <u>District</u> Responsible Dept./Person Name	MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. <u>Specify Measurable Goal</u>
<u>8A</u> BMP ID # <u>Cultural Resources Review</u> Specify Best Management Practice	<u>Cultural Resources</u> <u>Department</u> Responsible Dept./Person Name	Review all projects for impacts to historic properties at the 25% Design stage. If a potential impact is found, the Department works with the designer (MassHighway or consultant) and Massachusetts Historical Commission to alter the design to mitigate or prevent adverse effects. <u>Specify Measurable Goal</u>
<u>3B-1</u> BMP ID # <u>Drainage Inventory</u> Specify Best Management Practice	<u>Environmental/ Construction/</u> <u>Planning/ IT Division</u> Responsible Dept./Person Name	Develop Drainage Inventory Spec and include in future construction, and redevelopment projects. <u>Specify Measurable Goal</u>



Massachusetts Department of Environmental Protection
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MAR043025
 Facility ID (if known)

3B-2

BMP ID #

Drainage Inventory
 Specify Best Management Practice

Environmental/ Districts/ IT
Division
 Responsible Dept./Person Name

Complete mapping of outfalls from plans and field program. Develop maps showing outfalls. Include summary of progress in each year's annual report.
Specify Measurable Goal

4B

BMP ID #

MA DEP Stormwater
Management Policy
 Specify Best Management Practice

Environmental/ Construction/
Projects
 Responsible Dept./Person Name

Continue to meet criteria in Policy for project subject to Wetland Protection Act.
Specify Measurable Goal

5E

BMP ID #

Highway Runoff Contaminant
Model
 Specify Best Management Practice

Environmental Division
Consultant
 Responsible Dept./Person Name

Develop and calibrate model.
Specify Measurable Goal

E. 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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Ms. Luisa M. Paiewonsky, MassHighway Commissioner
 Printed Name

 Signature

 Date



Mitt Romney
Governor

Kerry Healey
Lt. Governor

John Cogliano
Secretary

Luisa Paiewonsky
Commissioner



MASSACHUSETTS
EXECUTIVE OFFICE
OF TRANSPORTATION

August 16, 2006

Julie Crocker
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office (NERO)
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: MassHighway NPDES MS4 Permit Outfall Within Short Nose Sturgeon Habitat

Dear Ms. Crocker:

The National Pollutant Elimination System (NPDES) General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) requires that permit applicant review the potential impact of drainage system outfalls on federal threatened and endangered species habitat. We are writing to request your review of MassHighway urbanized area roads within the Connecticut River watershed. The main stem of the Connecticut River and select tributaries have been identified as potential habitat for short-nose sturgeon according to Addendum A of the NPDES General Permit.

MassHighway has submitted an application for coverage under this MS4 permit to EPA and is awaiting authorization. In the Storm Water Management Plan (SWMP) prepared as part of the submittal, MassHighway stated that they would review urbanized area roads with National Marine Fisheries Service (NMFS) to determine if known storm water outfalls from their roadways are potentially having an adverse impact to short-nose sturgeon habitat. Outfalls are eligible for coverage under this permit if the discharges or discharge related activities are not likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA.

MassHighway has begun to inventory stormwater outfalls along these roads but, due to the large number of urbanized area road miles owned by MassHighway, will not complete the statewide inventory until the end of the permit term (March 2008). Therefore, we have included with this memo a detailed map with MassHighway roads within areas classified as "urbanized" by the Census Bureau and the Connecticut River watershed and the Merrimack River watershed below the Lawrence Dam. We ask that you review the figures and let us know if there are any specific outfalls that are adversely impacting the short-nose sturgeon. If MassHighway can provide additional information for help in the review, please feel free to contact me at (617) 973-7419, or in writing to 10 Park Plaza, Room 4260, Boston, MA 02116.

Sincerely,

Henry L. Barbaro
Supervisor
Wetlands & Water Resources

Attachment: MassHighway Roads...Sturgeon Habitat (three figures)

MASS HIGHWAY ROADS IN URBANIZED AREAS AND IN SHORTNOSE STURGEON HABITAT



LOCUS MAP



Legend

- Town Boundary
- MH Roads
- Merrimac River
- Watershed to Merrimac River
- MH Roads in UA Intersecting the Watershed

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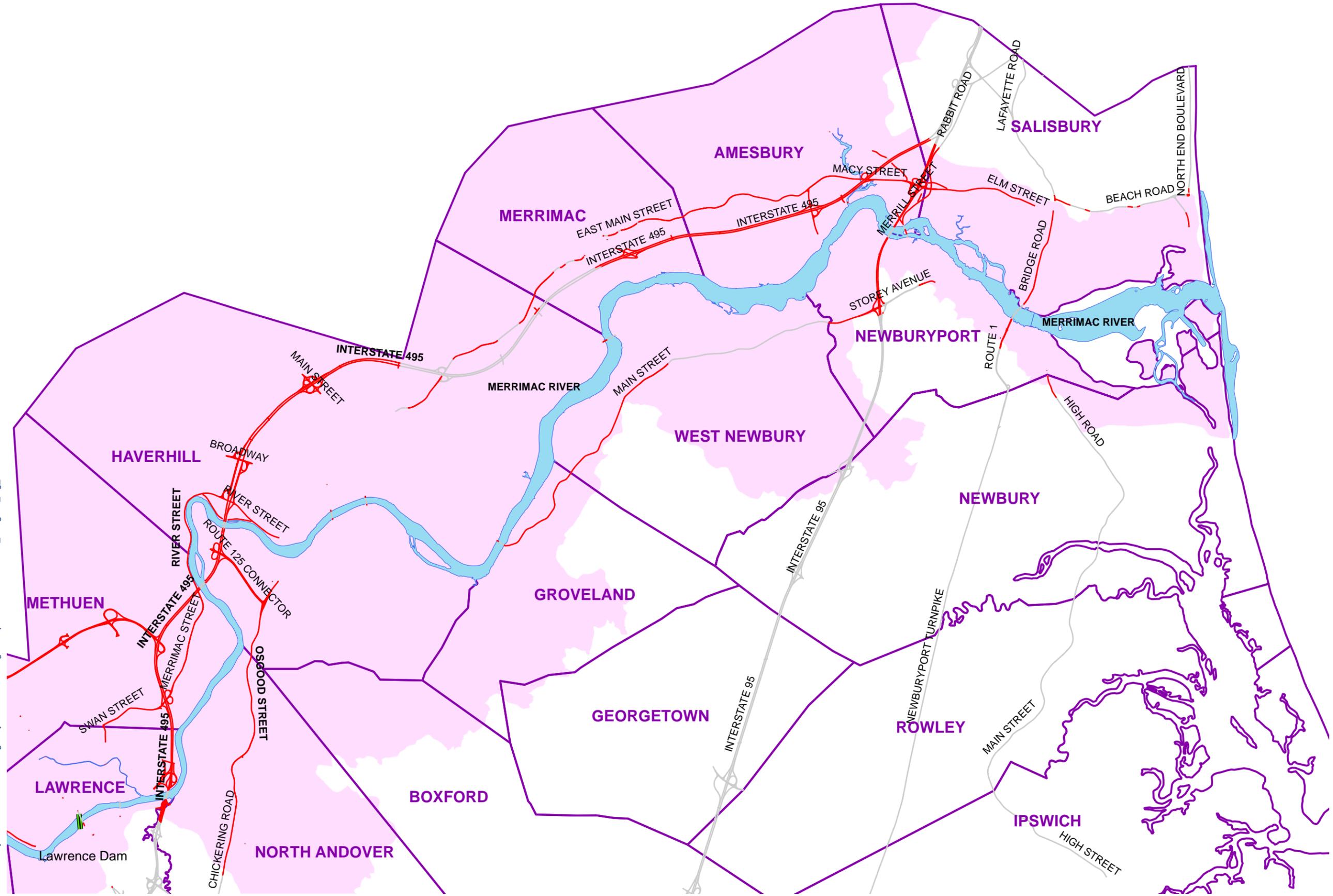
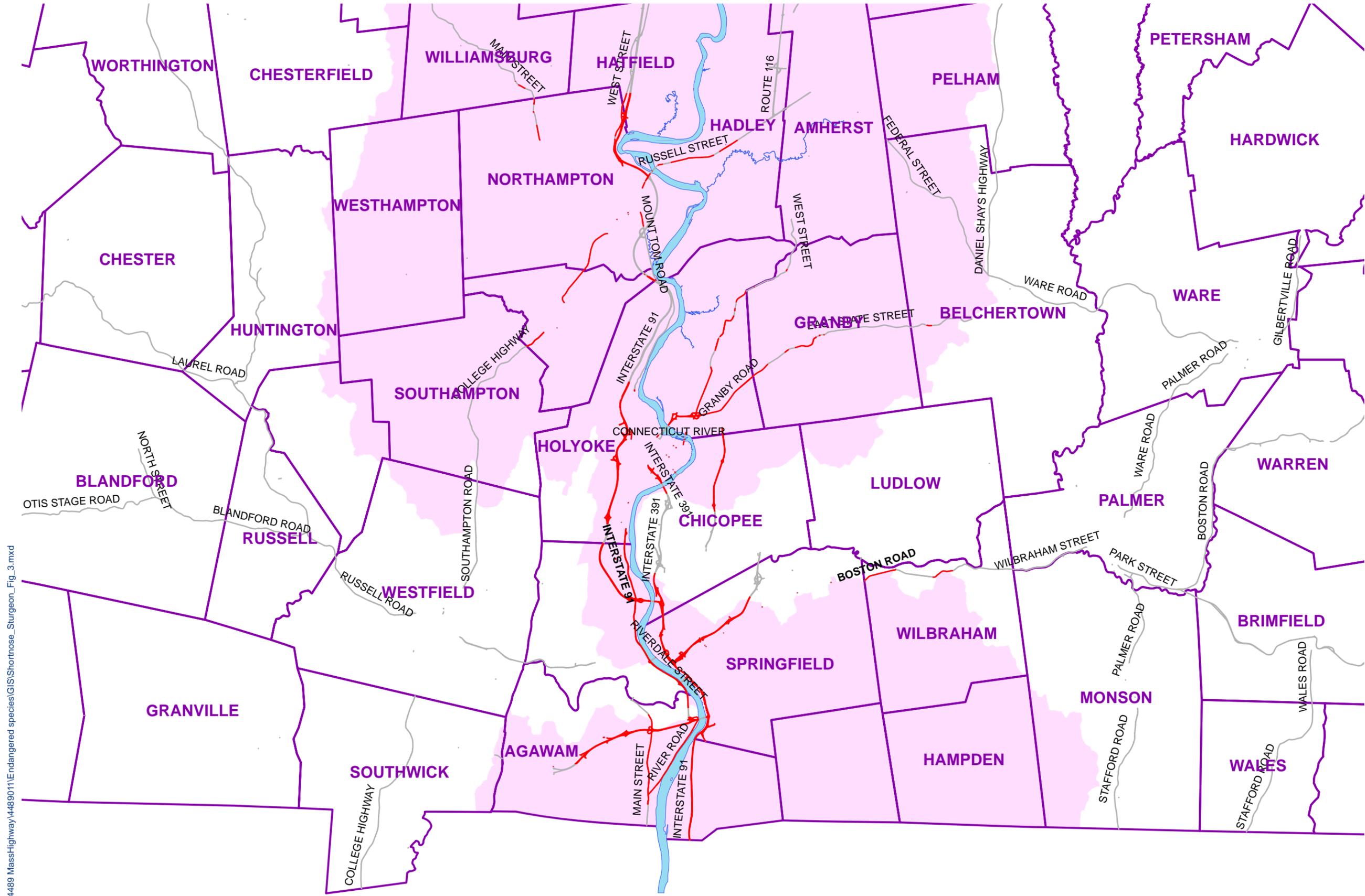


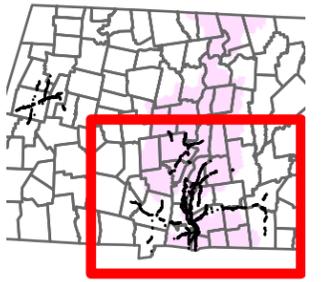
Figure 1



MASS HIGHWAY ROADS IN URBANIZED AREAS AND IN SHORTNOSE STURGEON HABITAT



LOCUS MAP



- Legend
- Town Boundary
 - MH Roads
 - Connecticut River
 - Watershed to Connecticut River
 - MH Roads in UA Intersecting the Watershed

Figure 3

J:\ESP\Projects\PO40\4489 MassHighway\44890111\Endangered species\GIS\Shortnose_Sturgeon_Fig_3.mxd



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

Henry L. Barbaro
Wetlands and Water Resources
Massachusetts Highway Department
10 Park Plaza, Room 4260
Boston, Massachusetts 02116

AUG 21 2006

Dear Mr. Barbaro,

This is in response to your letter dated August 16, 2006 regarding an application by MassHighway for coverage under the National Pollutant Discharge Elimination System (NPDES) permit program for urbanized area road drainage system outfalls. In order to be eligible for coverage under this permit, MassHighway must demonstrate to the US Environmental Protection Agency that the discharges are not adversely affecting any species listed as threatened or endangered under the jurisdiction of NOAA's National Marine Fisheries Service.

Included with your letter were maps detailing the location of roads within urbanized areas in the Connecticut River and Merrimack River watersheds. Populations of the endangered shortnose sturgeon (*Acipenser brevirostrum*) occur in the mainstem of both rivers. Your letter requested that NMFS review the maps and indicate which outfalls may be adversely impacting shortnose sturgeon in these rivers. In order to determine whether discharges from any of these outfalls have the potential to adversely affect this species NMFS will need the following information:

- exact location of the discharge and distance from the mainstem river;
- volume of water discharged from the outfall;
- components of the discharge, including known concentrations of any pollutants; and,
- any mitigation measures in place at the outfall.

Without this information it is difficult to determine if any given outfall has the potential to adversely affect shortnose sturgeon in the Connecticut or Merrimack River. Should you have any questions regarding this correspondence, please contact Julie Crocker of my staff at (978)281-9300 x6530 or by e-mail (Julie.Crocker@noaa.gov).

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

File Code: Sec 7 EPA R1 Masshighway MS4 coverage
PCTS: T/NER/2006/04049





United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

September 20, 2006

Henry Barbaro
Mass Highway
10 Park Plaza, Room 4260
Boston, MA 02116

Dear Mr. Barbaro:

This responds to your recent correspondence requesting information regarding adverse impacts to dwarf wedgemussels at stormwater outfalls along urbanized area roads owned by Mass Highway within the Connecticut River watershed area.

Based on information currently available to us, no dwarf wedgemussels are known to occur in close proximity to the urbanized roads referenced above. However, there is an historic record for dwarf wedgemussel in the Mill River Diversion, downstream of Easthampton Road. The reason for the lack of persistence of the dwarf wedgemussel at this site is unknown.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Michael J. Amaral
Endangered Species Specialist
New England Field Office



Mitt Romney
Governor

Kerry Healey
Lt. Governor

John Cogliano
Secretary

Luisa Paiewonsky
Commissioner



August 16, 2006

Michael J. Amaral
Endangered Species Specialist
U.S. Fish and Wildlife Service
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087

Subject: MassHighway NPDES MS4 Permit Outfall Within Dwarf Wedge Mussel Habitat

Dear Mr. Amaral:

The National Pollutant Elimination System (NPDES) General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) requires that permit applicant review the potential impact of drainage system outfalls on federal threatened and endangered species habitat. We are writing to request your review of MassHighway urbanized area roads within the Connecticut River watershed. The main stem of the Connecticut River and select tributaries have been identified as potential habitat for the dwarf wedge mussel according to Addendum A of the NPDES General Permit.

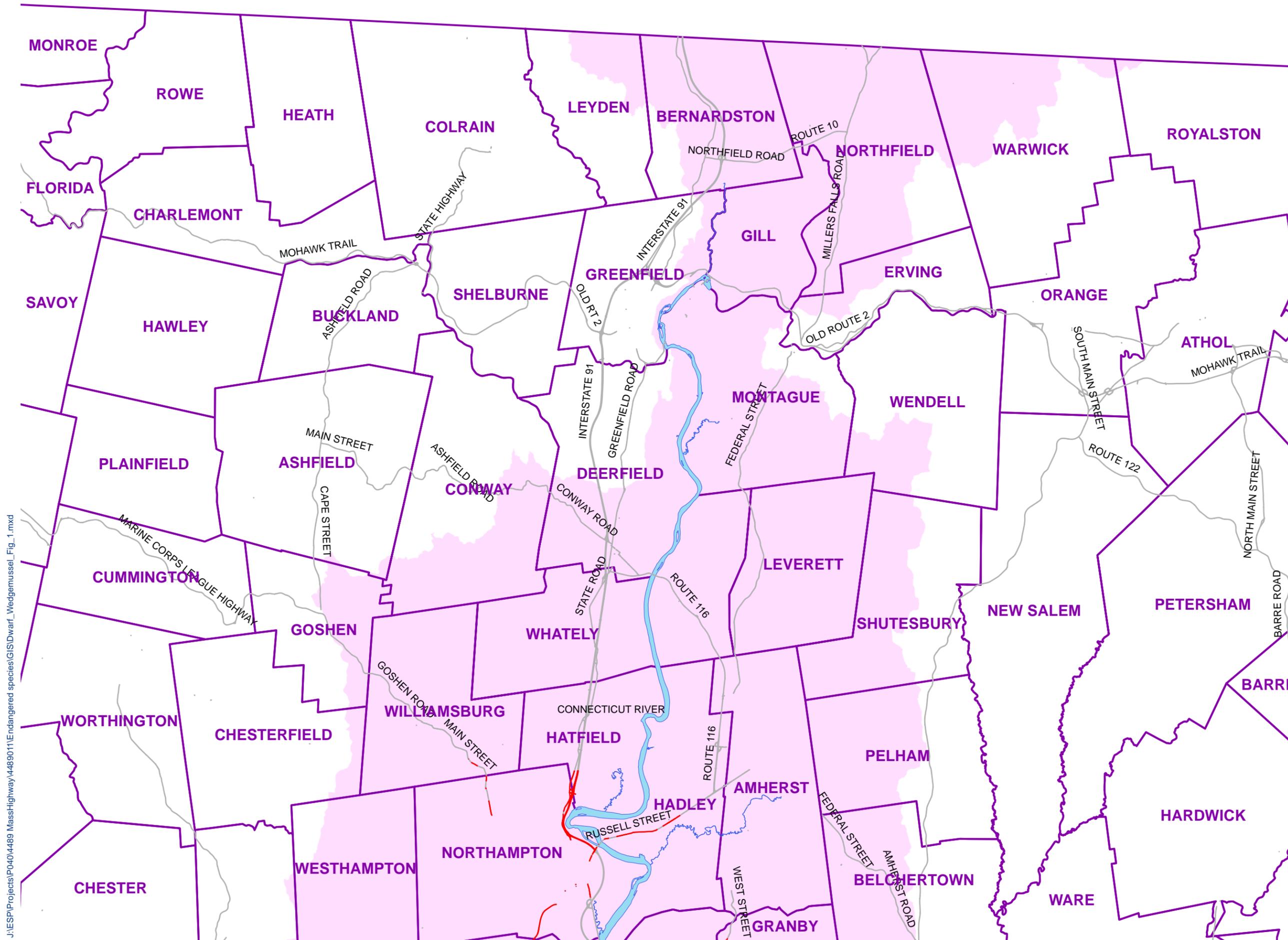
MassHighway has submitted an application for coverage under this MS4 permit to EPA and is awaiting authorization. In the Storm Water Management Plan (SWMP) prepared as part of the submittal, MassHighway stated that they would review urbanized area roads with United States Fish and Wildlife Service (USFWS) to determine if storm water outfalls from their roadways are potentially having an adverse impact to dwarf wedge mussel habitat. Outfalls are eligible for coverage under this permit if the discharges or discharge related activities are not likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA.

MassHighway has begun to inventory stormwater outfalls along these roads but, due to the large number of urbanized area road miles owned by MassHighway, will not complete the statewide inventory until the end of the permit term (March 2008). Therefore, we have included with this memo a detailed map with MassHighway roads within areas classified as "urbanized" by the Census Bureau and the Connecticut River watershed. We ask that you review the figures and let us know if there are any specific outfalls that are adversely impacting the dwarf wedge mussel. If MassHighway can provide additional information for help in the review, please feel free to contact me at (617) 973-7419, or in writing to 10 Park Plaza, Room 4260, Boston, MA 02116.

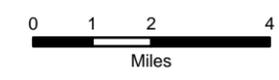
Sincerely,

Henry L. Barbaro
Supervisor
Wetlands & Water Resources

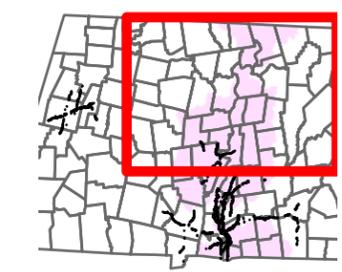
Attachments: MassHighway Roads...Mussel Habitat (two figures)



MASS HIGHWAY ROADS IN URBANIZED AREAS AND IN DWARF WEDGEMUSSEL HABITAT



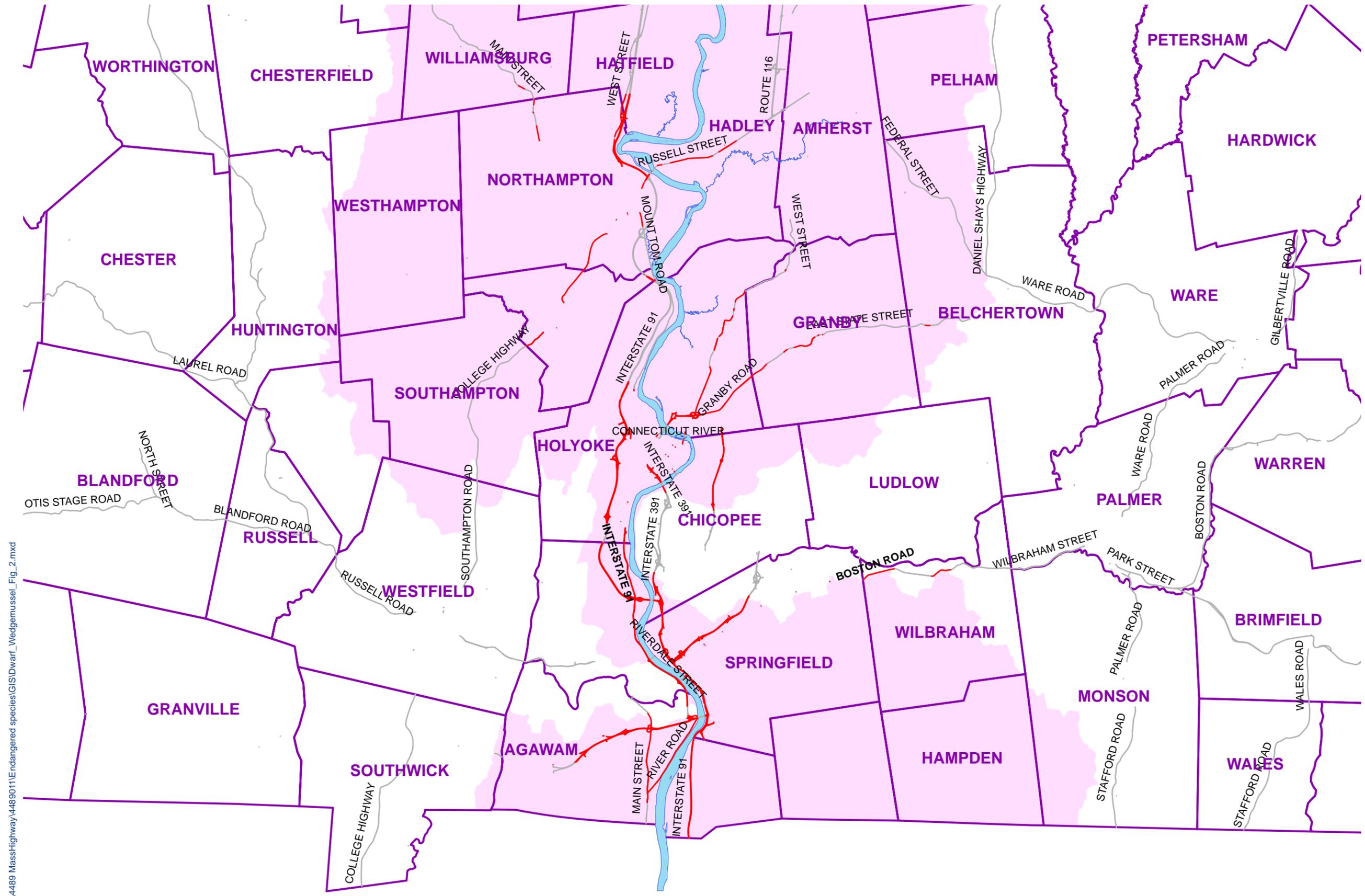
LOCUS MAP



- Legend
- Town Boundary
 - MH Roads
 - Connecticut River
 - Watershed to Connecticut River
 - MH Roads in UA Intersecting the Watershed

Figure 1

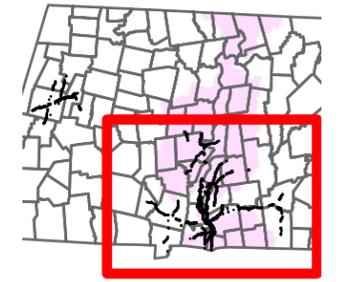
J:\ESP\Projects\PO40\4489 MassHighway\44890111\Endangered species\GIS\Dwarf_Wedgemussel_Fig_1.mxd



MASS HIGHWAY ROADS IN URBANIZED AREAS AND IN DWARF WEDGEMUSSEL HABITAT



LOCUS MAP



- Legend
- Town Boundary
 - MH Roads
 - Connecticut River
 - Watershed to Connecticut River
 - MH Roads in UA Intersecting the Watershed

Figure 2

J:\ESP\Projects\PO40\4489 MassHighway\44890111\Endangered species\GIS\Dwarf_Wedgemussel_Fig_2.mxd



Appendix C: Historic Properties Correspondence



Mitt Romney
Governor

Kerry Healey
Lt. Governor

John Cogliano
Secretary

Luisa Paiewonsky
Commissioner



MASSACHUSETTS
EXECUTIVE OFFICE
OF TRANSPORTATION

August 16, 2006

Brona Simon
Deputy State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314

RECEIVED

AUG 18 2006

MASS. HIST. COMM

Subject: MassHighway NPDES MS4 Permit Roads Near Historic Properties/ Districts

38693

Dear Ms. Simon:

The NPDES General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) requires that permit applicants review the potential impact of drainage system outfalls on properties listed or eligible to be listed in the National Register of Historic Places.

MassHighway has submitted an application for coverage under this permit to EPA and is awaiting authorization. In the Storm Water Management Plan (SWMP) prepared as part of the submittal, MassHighway agreed to review urbanized area roads owned by MassHighway for any currently known adverse effects on historic properties caused by storm water discharges from MassHighway-owned roadways. Discharges, or implementation of a storm water management program, which adversely affects properties listed or eligible to be listed on the National Register of Historic Places would eliminate such discharges or programs for coverage under the MS4 General Permit.

MassHighway has begun to inventory existing storm water outfalls along these roads but, due to the large number of urbanized area road miles owned by MassHighway, will not complete the statewide inventory until the end of the permit term (March 2008). Therefore, we have included with this memo a CD which contains detailed maps, by town, of MassHighway roads within areas classified as "urbanized" by the Census Bureau, overlaid with the historic properties datalayer provided by MassGIS (Massachusetts Office of Geographic and Environmental Information). The detailed maps show all MassHighway roads in urbanized areas that are located within 500 feet of any historic property identified by MassGIS.

To the best recollection of MassHighway's senior Cultural Resources Unit staff (20+ years) storm water discharge from a MassHighway roadway has never been identified as having an adverse effect on a property listed, or eligible for listing, in the National Register. If you or your staff could review the enclosed CD and confirm MassHighway's opinion that there are, at present, no known storm water discharges from the shown MassHighway roadways causing adverse effects on historic properties, it would be greatly appreciated. If we can provide additional information for help in the review, please feel free to contact me at (617) 973-7419, or in writing to 10 Park Plaza, Room 4260, Boston, MA 02116.

Sincerely,

Henry L. Barbaro

Henry L. Barbaro
Supervisor
Wetlands & Water Resources

CONCURRENCE: *Brona Simon*

10/3/06
BRONA SIMON
DEPUTY STATE HISTORIC
PRESERVATION OFFICER
MASSACHUSETTS
HISTORICAL COMMISSION

XC: Greg Prendergast, MTHD

Attachment: Historical Resources and MassHighway Roads (CD)



Mitt Romney
Governor

Kerry Healey
Lieutenant Governor

John Cogliano
Secretary

Lisa Paley-Wonsky
Commissioner



August 16, 2006

Brona Simon
Deputy State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314

Subject: MassHighway NPDES MS4 Permit Roads Near Historic Properties/ Districts

Dear Ms. Simon:

The NPDES General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) requires that permit applicants review the potential impact of drainage system outfalls on properties listed or eligible to be listed in the National Register of Historic Places.

MassHighway has submitted an application for coverage under this permit to EPA and is awaiting authorization. In the Storm Water Management Plan (SWMP) prepared as part of the submittal, MassHighway agreed to review urbanized area roads owned by MassHighway for any currently known adverse effects on historic properties caused by storm water discharges from MassHighway-owned roadways. Discharges, or implementation of a storm water management program, which adversely affects properties listed or eligible to be listed on the National Register of Historic Places would eliminate such discharges or programs for coverage under the MS4 General Permit.

MassHighway has begun to inventory existing storm water outfalls along these roads but, due to the large number of urbanized area road miles owned by MassHighway, will not complete the statewide inventory until the end of the permit term (March 2008). Therefore, we have included with this memo a CD which contains detailed maps, by town, of MassHighway roads within areas classified as "urbanized" by the Census Bureau, overlaid with the historic properties datalayer provided by MassGIS (Massachusetts Office of Geographic and Environmental Information). The detailed maps show all MassHighway roads in urbanized areas that are located within 500 feet of any historic property identified by MassGIS.

To the best recollection of MassHighway's senior Cultural Resources Unit staff (20+ years) storm water discharge from a MassHighway roadway has never been identified as having an adverse effect on a property listed, or eligible for listing, in the National Register. If you or your staff could review the enclosed CD and confirm MassHighway's opinion that there are, at present, no known storm water discharges from the shown MassHighway roadways causing adverse effects on historic properties, it would be greatly appreciated. If we can provide additional information for help in the review, please feel free to contact me at (617) 973-7419, or in writing to 10 Park Plaza, Room 4260, Boston, MA 02116.

Sincerely,

Henry L. Barbaro
Supervisor
Wetlands & Water Resources

Attachment: Historical Resources and MassHighway Roads (CD)



Appendix D: Design Public Hearings Table



List of public hearings posted on the MHD web site from 4/1/2006 to 3/31/2007

City/Town	Date	Description
April 2006		
Orleans	4/5/2006	A Design Public Hearing was held by MassHighway to discuss the proposed traffic intersection improvement project at Route 28 (South Orleans Road), Finlay Road and Pond Road in Orleans, MA.
Framingham	4/6/2006	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of the Fountain Street Bridge over MBTA/CSX Railroad in Framingham, MA.
Pittsfield	4/10/2006	A Design Public Hearing was held by MassHighway to discuss the proposed roadway reconstruction and traffic signal improvement project on Route 20 (West Housatonic Street) from Britton Street to South Merriam Street in Pittsfield, MA.
Pittsfield	4/24/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Carriage Way (Trail) construction at the Hancock Shaker Village in Hancock- Pittsfield, MA.
May 2006		
Springfield	5/10/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Corridor Improvements of State Street in Springfield, MA.
Westminster	5/11/2006	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of Bridge No. W-28-019, at Depot Road over Round Meadow Brook in Westminster, MA.
Lowell	5/18/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Bridge Replacement Project at the Lowell Connector Eastbound and Westbound over Plain Street in the City of Lowell.
Falmouth	5/23/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Shining Sea Bikeway - Phase III project in Falmouth, MA.



West Bridgewater	5/23/2006	A Design Public Hearing was held by MassHighway to discuss the proposed South Street over the Town River bridge replacement project in West Bridgewater, MA.
Boston	5/24/2006	A Public Information Meeting was held by MassHighway to discuss the proposed transportation improvement project on Cambridge Street over the Charles River in the City of Boston.
June 2006		
Chicopee	6/5/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Center Street roadway reconstruction project in the City of Chicopee.
Lexington	6/13/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Signal Upgrade and Intersection Improvement Project at Route 2A (Marrett Road) and Waltham Street in Lexington, MA.
Hampden	6/15/2006	A Design Public Hearing was held by MassHighway to discuss the proposed project to replace the Chapin Road Bridge over the Scantic River in Hampden, MA.
Andover	6/20/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Traffic Signals Improvement Project for the Intersection of Route 125 at Salem Street and Stinson Road, Andover, MA.
Westfield	6/20/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Columbia Greenway Rail Trail project in the City of Westfield, MA.
Ware	6/26/2006	A Design Public Hearing was held by MassHighway to discuss the proposed rehabilitation of the historic Gilbertville timber covered bridge which carries Bridge Street across the Ware River between the Towns of Hardwick and Ware, MA.
Leominster	6/27/2006	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of Bridge No. L-8-14 which carries Whitney Street over the Monoosnoc Brook in Leominster, MA.
Egremont	6/28/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Route 41 (Mountain Road) over the Karner Brook bridge replacement project in the Town of Egremont.
Taunton	6/28/2006	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of Bridge No. T-1-21 which carries Bay Street over the Mill River in Taunton, MA.
Otis	6/29/2006	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of Bridge No. O-05-005, at Reservoir Road over the West Branch of the Farmington River in Otis, MA.



July 2006		
Attleboro	7/10/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Route 152 /North Main Street Traffic Improvement Project in Attleboro, MA.
Worcester	7/13/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Traffic Improvements along Southbridge Street at the intersections of Cambridge Street and Riverside Avenue in the City of Worcester, MA.
Marlborough	7/20/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Boundary Street bridge replacement project in the City of Marlborough, MA.
August 2006		
Northampton	8/2/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Earle Street Reconstruction project in Northampton, MA.
September 2006		
Hingham	9/6/2006	A Design Public Hearing was held by MassHighway to discuss the proposed reconstruction of Route 228, from Queen Anne's Comer to Merrymount Road in Hingham, MA.
South Yarmouth	9/14/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Packet Landing project located in the Town of Yarmouth bordered by Bridge Street (Route 28), Pleasant Street, Allen Street, Water Street and the Bass River.
Buzzard's Bay	9/27/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Median Installation and Safety Improvements on Route 6 (Scenic Highway) project in Bourne, MA.
Danvers	9/28/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Roadway Reconstruction on a Section of Collins Street from Sylvan Street to the Intersection at Center and Holten Streets in Danvers, MA.



November 2006		
Gardner	11/9/2006	A Design Public Hearing was held by MassHighway to discuss the replacement of Winter Street bridge over Baker Brook, in the City of Gardner.
Fitchburg	11/13/2006	A Design Public Hearing was held by the Massachusetts Highway Department to discuss the proposed North Street Phase III and Pearl Street reconstruction project in Fitchburg, Massachusetts.
North Reading	11/15/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Main Street bridge over the Ipswich River project located at the North Reading and Reading town line.
Conway	11/16/2006	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of three bridges located on North Poland Road over Poland Brook and Poland Road over the South River in the Town of Conway.
Brockton	11/29/2006	A Design Public Hearing was held by MassHighway to discuss the proposed reconstruction of the intersection of Route 27 (Pleasant Street) at Belair and Moraine Streets in Brockton, MA.
Braintree	11/30/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Reconstruction of Union Street in Braintree, MA.
Gardner	11/30/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Pleasant Street bridge over the B&M railroad line located in the City of Gardner, MA.
December 2006		
Boston	12/5/2006	A Design Public Hearing was held by MassHighway to discuss the proposed bridge replacement of Bridge No. B-16-217 which carries American Legion Highway over Morton Street (Route 203) in Boston, MA.
Raynham	12/13/2006	A Design Public Hearing was held by MassHighway to discuss the proposed signalization of the Route I-495 ramps at Route 138.
Mansfield	12/14/2006	A Design Public Hearing was held by MassHighway to discuss the proposed roadway rehabilitation of the Chauncy Street (Route 106) Underpass under the MBTA/Amtrak Railroad Bridge in Mansfield, MA.
Melrose	12/14/2006	A Design Public Hearing was held by MassHighway to discuss the proposed Lebanon Street Improvements project in Melrose, MA.



January 2007		
Townsend	1/17/2007	A Design Public Hearing was held by MassHighway to discuss the proposed project to replace the Vinton Pond Road Bridge over the Pearl Hill Brook in Townsend, MA.
February 2007		
Spencer	2/6/2007	A Design Public Hearing was held by MassHighway to discuss the proposed Reconstruction of Maple St. (Rte. 31 Phase 1) from just south of Bemis St. to Main St. in the Town of Spencer, MA.
Hudson	2/7/2007	A Design Public Hearing was held by MassHighway to discuss the replacement of Houghton Street bridge over the Assabet River in the town of Hudson.
Springfield	2/7/2007	A Design Public Hearing was held by MassHighway to discuss the proposed Roosevelt Avenue, Page Boulevard and Bay Street (Memorial Industrial Park II) Traffic Improvements project in Springfield, MA.
Palmer	2/22/2007	A Design Public Hearing was held by MassHighway to discuss the proposed replacement of the bridge that carries State Street over the Ware River in Palmer, MA.
Brockton	2/28/2007	A Design Public Hearing was held by MassHighway to discuss the proposed Roadway and Intersection Reconstruction of Route 27, Pleasant Street at West Street and Westgate Drive in Brockton, MA.



March 2007		
Brockton	3/7/2007	A Design Public Hearing was held by MassHighway to discuss the proposed traffic improvements at Route 28 (Main Street) at Plain Street and Keith Avenue, in Brockton, MA.
Danvers	3/8/2007	A Design Public Hearing was held by MassHighway to discuss the proposed improvements at Liberty Street, in Danvers, MA.
Newburyport	3/21/2007	A Design Public Hearing was held by MassHighway to discuss the proposed Clipper City Rail Trail -Phase I from Parker Street to the Merrimack River in Newburyport, MA.
North Adams	3/28/2007	A Design Public Hearing was held by MassHighway to discuss the proposed Bridge Rehabilitation Contract in the City of North Adams, Massachusetts. This contract is for Bridge No. N-14-018, Route 8 over the B&M Railroad and Hoosic River.



Appendix E: Drainage Connection Policy



Policy # P-06-002
Date: 06/26/2006

POLICY DIRECTIVE


COMMISSIONER

**Massachusetts Highway Department
Drainage Connection Policy**

The purpose of this policy is to comply with state and federal statutes and regulations relating to storm water discharges including the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) General Permit. Therefore, effective immediately, MassHighway prohibits the connection of unauthorized and/or illicit discharges to the State highway drainage system and requires the disconnection, or permitting, of all such existing connections. The NPDES MS4 General Permit requires the permittee to "develop, implement, and enforce a program to detect and eliminate illicit discharges."

Unauthorized discharges to MassHighway's storm drain system include any discharges or tie-ins that have not been issued a drainage access tie-in permit.

An illicit connection is a "direct or indirect discharge to the [MassHighway] storm drain system that is not composed entirely of storm water. Illicit discharges include, without limitation, sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously authorized, permitted, or approved before the effective date of the NPDES Phase II program (May 1, 2003). The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit (municipal general permit for MS4 or discharge of only storm water from industrial activity covered under 40 CFR 122.26(b)(14)(i)-(xi)), or a Surface Water Discharge Permit (discharge of treated effluent water from industrial activity) or resulting from fire fighting activities." It shall be the property owner's responsibility to prove that any existing or proposed tie-in is in compliance with NPDES.

All drainage connections require a MassHighway drainage tie-in permit, except for the discharges listed at the end of this policy. If an illicit or unauthorized connection is identified, then the District Highway Director shall notify the landowner in writing that they are in violation of Chapter 81, Section 21 of Massachusetts General Laws and may be in possible noncompliance with NPDES requirements. A copy of the letter shall be forwarded to MassHighway's Environmental Section and the Executive Office of Transportation's Office of the General Counsel. It shall be the responsibility of the landowner to apply for a MassHighway tie-in permit, or propose a schedule for the removal of the discharge. If the landowner does not act within 90 days of the date of notification, or sooner if the discharge poses an imminent health threat, then MassHighway will pursue legal action with the Attorney General's office. MassHighway also may construe the connection as a form of trespass and consequently remove the connection.

Distribution: X

Please Post:

Do Not Post: X

Non storm water discharges that are not regulated under NPDES MS4 General Permit, and do not require a Mass highway drainage tie-in permit, include the following, provided that the source is not a significant contributor of pollutants as determined by the District Highway Director:

- Discharge or flow resulting from fire fighting activities;
- Springs;
- Natural flow from riparian habitats and wetlands; or
- Application of water for street sweeping or construction-related dust control



Appendix F: River and Stream Signs Installed in Permit Year 4



River and Stream Crossing Signs Installed by MassHighway during Permit Year 4

Road	River	Town
Route 2A bridge	Nashua River	Ayer/ Shirley
Route 183 bridge	Larrywaug Brook	Stockbridge
Route 24 bridge	Town River	Bridgewater/ West Bridgewater
Route 2 (“French King”) Bridge	Connecticut River	Gill/ Wendell
U. S. Route 1 bridge	Neponset River	Norwood
Route 110 bridge	Powow River	Amesbury
Routes 122/32 bridge	East Branch Swift River	Petersham
Route 122 bridge	Prince River	Barre
Route 122 bridge	Ware River	Barre
U.S. Route 7 bridge	Broad Brook	Williamstown
U.S. Route 7 bridge	Hubbard Brook	Sheffield
U.S. Route 7 bridge	Green River	Great Barrington
Route 3 bridge	North River	the Norwell/Marshfield
Route 113 bridge	Artichoke River	West Newbury/Newburyport
Route 63 Bridge	Sawmill River	Montague
Route 123 bridge	Ten Mile River	Attleboro
Route 140 bridge	Rumford River	Norton
Route 140 bridge	Wading River	Norton
Bay Street bridge	Mill River	Taunton
Route 44 bridge	Nemasket River	Middleborough
Route 3A bridge	Town Brook	Plymouth
Route 20 bridge	Assabet River	Northborough
Route 135 bridge	Assabet River	Northborough/Westborough
Route 28 bridge	Neponset River	Boston/Milton
Route 56 bridge	French River	Oxford



Appendix G: TMDL Review Table

Summary of MA TMDL Reports and Recommendations Which Pertain to MassHighway

Overall Basin	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding MassHighway?	If yes, what are the recommendations?	How is MassHighway currently meeting these recommendations or how does MassHighway plan to meet them in the future?
Cape Cod	Frost Fish Creek	Bacteria	Yes	Yes	The Massachusetts Highway Department should determine the Route 28 roadway drainage discharging to Muddy Creek and install best management structures and/or operational practices to the maximum extent practicable with a goal of meeting the water quality standard for bacteria in SA waters. Given this is a waterway with an approved TMDL, the MHD must meet the requirements of EPA's NPDES General Permit for Stormwater Discharges from small MS4s (Phase II), Part i D(1-4), as it pertains to approved TMDLs." MassDEP has not deferred to the Route 28 reconstruction project since we do not have any information about the extent or the time schedule for it. MassDEP also suggests that the MassHighway Dept. work with the Town of Chatham to work out a reasonable schedule for these activities.	Because of funding constraints and the condition of the existing roadway, there is no plan to resurface Route 28 within the boundaries of Muddy or Frost Fish Creeks within the next 5 years. District 5 personnel has met with the Town of Chatham and identified their concerns, and some measures may be taken to reduce and/or treat runoff to the creeks if time and funding permits. The District hopes to implement these measure within the next 2 years prior to resurfacing.
Cape Cod	Muddy Creek	Bacteria	Yes	Yes	The Massachusetts Highway Department should determine the Route 28 roadway drainage discharging to Muddy Creek and install best management structures and/or operational practices to the maximum extent practicable with a goal of meeting the water quality standard for bacteria in SA waters. Given this is a waterway with an approved TMDL, the MHD must meet the requirements of EPA's NPDES General Permit for Stormwater Discharges from small MS4s (Phase II), Part i D(1-4), as it pertains to approved TMDLs." MassDEP has not deferred to the Route 28 reconstruction project since we do not have any information about the extent or the time schedule for it. MassDEP also suggests that the MassHighway Dept. work with the Town of Chatham to work out a reasonable schedule for these activities.	Because of funding constraints and the condition of the existing roadway, there is no plan to resurface Route 28 within the boundaries of Muddy or Frost Fish Creeks within the next 5 years. District 5 personnel has met with the Town of Chatham and identified their concerns, and some measures may be taken to reduce and/or treat runoff to the creeks if time and funding permits. The District hopes to implement these measure within the next 2 years prior to resurfacing.

Summary of MA TMDL Reports and Recommendations Which Pertain to MassHighway

Overall Basin	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding MassHighway?	If yes, what are the recommendations?	How is MassHighway currently meeting these recommendations or how does MassHighway plan to meet them in the future?
Chicopee Basin	Browning Pond, Oakham Long Pond, Springfield Sugden Reservoir, Spencer Mona Lake, Springfield	Phosphorus	Yes	No	--	--
	Minechoag Pond, Ludlow Spectacle Pond, Wilbraham Wickaboag Pond, West Brookfield	Phosphorus	Yes	Yes	TMDL suggests MassHighway should regulate road sanding, salting, regular sweeping, and installation of BMPs for these three ponds.	MassHighway regulates road sanding and salting through its Snow and Ice Program and the procedures approved in the GEIR. Roads are swept on an annual basis after winter deicing applications. MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. MassHighway believes that the most cost-effective approach to improving stormwater quality is to focus on source control measures, rather than end-of-pipe BMPs. Two important examples include reducing winter road sand application rates, and stabilizing shoulder areas that erode onto road surfaces. Source reduction measures are described in this NPDES Stormwater Management Plan.
Connecticut Basin	Aldrich Lake East, Granby Aldrich Lake West, Granby Leverett Pond, Leverett Lake Wyola, Shutesbury	Phosphorus	Yes	No	--	--
	Loon Pond, Springfield Lake Warner, Hadley	Phosphorus	Yes	Yes	TMDL suggests MassHighway and towns should develop Storm Water Management Plans for Phase II NPDES and initiate additional BMPs in critical areas. MassHighway should regulate road sanding, salting, regular sweeping, and installation of BMPs for these two ponds. TMDL mentions that Rt. 20 is within the watershed of the Loon Pond and Rt. 47 is within the watershed of Lake Warner.	MassHighway has received authorization from EPA to discharge storm water under the general permit for Loon Pond area. Lake Warner, Hadley is outside of urbanized area and is therefore not subject to the general permit. MassHighway regulates road sanding and salting through its Snow and Ice Program and the procedures approved in the GEIR. Roads are swept on an annual basis after winter deicing applications. MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. MassHighway believes that the most cost-effective approach to improving stormwater quality is to focus on source control measures, rather than end-of-pipe BMPs. Two important examples include reducing winter road sand application rates, and stabilizing shoulder areas that erode onto road surfaces. Source reduction measures are described in this NPDES Stormwater Management Plan.

Summary of MA TMDL Reports and Recommendations Which Pertain to MassHighway

Overall Basin	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding MassHighway?	If yes, what are the recommendations?	How is MassHighway currently meeting these recommendations or how does MassHighway plan to meet them in the future?
French Basin	<p>Buffumville Lake, Charlton Cedar Meadow Pond, Leicester</p> <p>Dresser Hill Pond, Charlton Dutton Pond, Leicester Gore Pond, Charlton/Dudley Granite Reservoir, Charlton Greenville Pond, Leicester Hudson Pond, Oxford Jones Pond, Charlton/Spencer</p> <p>Larner Pond, Dudley Lowes Pond, Oxford McKinstry Pond, Oxford Mosquito (Tobins) Pond, Dudley New Pond, Dudley Peter Pond, Dudley Pierpoint Meadow Pond, Dudley/Charlton Pikes Pond, Charlton Robinson Pond, Oxford Rochdale Pond, Leicester Shepherd Pond, Dudley Texas Pond, Oxford Wallis Pond, Dudley</p>	Phosphorus	Yes	Yes	<p>TMDL suggests:</p> <ol style="list-style-type: none"> MassHighway conduct loading study and develop methodology to calculate loadings from highways. MassHighway and local towns should initiate twice yearly sweeping and catch basin inspection and cleaning program along MassHighway I-395, and other roadways. MS4s should install additional BMPs as needed to address pollutant loadings identified above. MassHighway and the towns of Charlton, Leicester and Oxford should prepare Storm Water Management Plans for Phase II. (implementation activity specific to these impaired waterbodies) 	<p>USGS is currently performing a loading study for MassHighway.</p> <p>MassHighway has proposed a catchbasin inspection and maintenance record system in its SWMP (BMP 6C-4). MassHighway has very limited maintenance budgets and staff, therefore we feel that the cost-effectiveness, and necessity of cleaning catch basins twice per year should be closely evaluated rather than arbitrarily set. Consequently, MH has begun a CB Accumulation Study (BMP 6C-3) to review the accumulation trends in catchbasins. The study includes review of accumulation data in five different roadway and winter deicing areas for three years. Upon completion of the review, MH will update that Catch Basin Cleaning SOP, if determined necessary, and implement the SOP.</p> <p>MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. MassHighway believes that the most cost-effective approach to improving stormwater quality is to focus on source control measures, rather than end-of-pipe BMPs. Two important examples include reducing winter road sand application rates, and stabilizing shoulder areas that erode onto road surfaces. Source reduction measures are described in this NPDES Stormwater Management Plan.</p> <p>MassHighway has received partial authorization to discharge under the general permit (authorized for those discharges outside of endangered species habitat) and expects to receive full authorization in the near future since favorable responses have been received from both USFWS and NMFS.</p>

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French Basin (cont'd)					5. MassHighway should regulate road sanding, salting, regular sweeping, and installation of BMPs (implementation activity specific to these impaired waterbodies).	MassHighway regulates road sanding and salting through its Snow and Ice Program and the procedures approved in the GEIR. Roads are swept on an annual basis after winter deicing applications. MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. MassHighway believes that the most cost-effective approach to improving stormwater quality is to focus on source control measures, rather than end-of-pipe BMPs. Two important examples include reducing winter road sand application rates, and stabilizing shoulder areas that erode onto road surfaces. Source reduction measures are described in this NPDES Stormwater Management Plan.
Indian Lake	Indian Lake, Worcester	Phosphorus	Yes	Yes	TMDL suggests that MassHighway and town or city Dept. Public Works should reduce impervious surfaces, institute increased street sweeping and catch basin cleaning; install detention basins, etc. It was noted at the public meeting that MassHighway will be required to comply with a new Phase II Stormwater discharge permit. In addition, the Regional DEP office in Worcester has submitted a written request to the Regional office of MassHighway to give the roads in the Mill Brook drainage area (including parts of Indian Lake Watershed) priority for increased Best Management Practices such as sweeping and catchbasin cleaning.	MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. MassHighway believes that the most cost-effective approach to improving stormwater quality is to focus on source control measures, rather than end-of-pipe BMPs. Two important examples include reducing winter road sand application rates, and stabilizing shoulder areas that erode onto road surfaces. Source reduction measures are described in this NPDES Stormwater Management Plan. see above
Lake Boon (Boons Pond)	Lake Boon, Hudson/ Stow	Phosphorus	Yes	No	--	--
Lake Quinsigamond and Flint Pond	Flint Pond, Grafton/Worcester/ Shrewsbury Lake Quinsigamond, Worcester/ Shrewsbury	Phosphorus	Yes	Yes	1. MassHighway should begin the Storm Water Management Plans required under Phase II to reduce discharge of pollutants to the "maximum extent practicable".	MassHighway has received authorization from EPA to discharge storm water under the general permit for discharges in this watershed.

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Lake Quinsigamond and Flint Pond (cont'd)					<p>2. MassHighway will also be required to apply for the EPA Phase II General Stormwater NPDES Permit by March 10 of 2003.</p> <p>3. The regional office of MassHighway has offered to target high priority watersheds in the region of higher frequency of BMPs and maintenance.</p> <p>4. Visually inspect the roads monthly and sweep as needed. At a minimum, roads must be swept at least twice a year as soon after snowmelt as possible or by April 1st of each year and again in the fall.</p> <p>5. Inspect catch basins at least twice a year and any other settling or detention basins once a year to measure depth of solids. If solids are one half or more of design volume for solids, then completely remove all solids.</p> <p>6. Inspect and maintain all structural components of stormwater system on a yearly basis.</p> <p>7. Develop methodology to calculate loadings from highways.</p> <p>8. Conduct pilot project to assess loadings and test BMPs on highways</p> <p>9. Initiate twice yearly sweeping and catch basin inspection and cleaning program along I-290 and other roadways. Install additional BMPs as needed to address pollutant loadings identified above.</p>	<p>MassHighway District 3 will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue. District 3 has agreed to increased maintenance schedule within this watershed.</p> <p>In a letter written to DEP and dated June 19, 2002, District 3 committed to an increased schedule of inspection of catch basins every six months, with cleaning as determined necessary in inspections, and annual sweeping of roads in this watershed. Also, MH has begun a CB Accumulation Study (BMP 6C-3) to review the accumulation trends in catchbasins. The study includes review of accumulation data in five different roadway and winter deicing areas for three years. Upon completion of the review, MH will update that Catch Basin Cleaning SOP, if determined necessary, and implement the SOP.</p> <p>See response above (#4) regarding maintenance schedule commitments. The letter committed to inspection and cleaning, if necessary of all sumped drainage structures twice a year and more often if necessary; inspection/ cleaning of drainage outlet locations where sediment build up is evident; and inspection and repair of damaged and/or clogged drainage conveyances.</p> <p>See response above (#5).</p> <p>USGS is currently performing a loading study for MassHighway.</p> <p>USGS is currently performing a loading study for MassHighway.</p> <p>See response above (#4) regarding CBs. MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.</p>

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Leesville Pond	Leesville Pond, Auburn/ Worcester	Phosphorus	Yes	Yes	<p>TMDL suggests that:</p> <ol style="list-style-type: none"> 1. MassHighway should conduct loading study and develop methodology to calculate loadings from highways. 2. MassHighway and towns of Auburn, Leicester, Paxton, and Millbury and City of Worcester should initiate twice yearly sweeping and catch basin inspection and cleaning program along I-290 and other roadways and install additional BMPs as needed to address pollutants loadings identified above. 3. MassHighway and towns of Auburn, Leicester, Paxton, and Millbury should prepare Storm Water Management Plan for Phase II. 4. MassHighway and town or city Dept of Public Works should reduce impervious surfaces, institute street sweeping program, catch basin cleaning, install detention basin etc. 	<p>USGS is currently performing a loading study for MassHighway. The loading study is scheduled to be completed by the end of the permit term.</p> <p>MassHighway District 3 has committed to an increased schedule of inspection of catch basins every six months, with cleaning as determined necessary in inspections, and annual sweeping of roads in this watershed. Also, MH has begun a CB Accumulation Study (BMP 6C-3) to review the accumulation trends in catchbasins. The study includes review of accumulation data in five different roadway and winter deicing areas for three years. Upon completion of the review, MH will update that Catch Basin Cleaning SOP, if determined necessary, and implement the SOP. District 3 has committed to inspection and cleaning, if necessary, of all sumped drainage structures twice a year and more often if necessary; inspection/ cleaning of drainage outlet locations where sediment build up is evident; and inspection and repair of damaged and/or clogged drainage conveyances. MassHighway will review projects within this watershed for opportunities to include additional BMPs within proposed projects if MassHighway determines they will help address the pollutant loading issue.</p> <p>MassHighway has received partial authorization to discharge under the general permit (authorized for those discharges outside of endangered species habitat) and expects to receive full authorization in the near future since favorable responses have been received from both USFWS and NMFS.</p> <p>see above measures</p>
Miller River Basin	Bents Pond Bourn-Hadley Pond Brazell Pond Lake Ellis Greenwood Pond	Phosphorus	Yes	Yes	<p>TMDL suggests that MassHighway should better manage road sanding, salting, regular sweeping, and installation of BMPs (specific to these impaired waterbodies).</p>	<p>MH has begun a CB Accumulation Study (BMP 6C-3) to review the accumulation trends in catchbasins. The study includes review of accumulation data in five different roadway and winter deicing areas for three years. Upon completion of the review, MH will update that Catch Basin Cleaning SOP, if determined necessary, and implement the SOP.</p>

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Miller River Basin (cont'd)	Lake Monomonac					
	Ramsdall Pond					
	Reservoir No. 1					
	Wallace Pond					
	Whitney Pond					
	Beaver Flowage Pond	Phosphorus	Yes	No	--	--
	Cowee Pond					
	Davenport Pond					
	Lake Denison					
	Depot Pond					
	Hilchey Pond					
	Lower Naukeag Lake					
	Minott Pond South					
	Minott Pond					
	Parker Pond					
	Reservoir No. 2					
	Riceville Pond					
South Athol Pond						
Stoddard Pond						
Ward Pond						
Whites Mill Pond						
Wrights Reservoir						
Neponset River Basin	Beaver Meadow Brook	Bacteria	Yes	Yes	Regulated municipalities should prepare Storm Water Management Plans for Phase II.	MassHighway has received partial authorization to discharge under the general permit (authorized for those discharges outside of endangered species habitat) and expects to receive full authorization in the near future since favorable responses have been received from both USFWS and NMFS.
	East Branch, Outlet Forge Pond					
	Germany Brook					
	Gulliver Creek					
	Hawes Brook					
	Massapoag Brook					
	Mill Brook					
	Mine Brook					
	Mother Brook					
	Neponset River					
	Pequid Brook					
	Pine Tree Brook					
	Ponkapoag Brook					
	Purgatory Brook					
School Meadow Brook						

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Neponset River Basin (cont'd)	Traphole Brook Unquity Brook					
Northern Blackstone	Auburn Pond, Auburn Curtis Pond North, Worcester Curtis Pond South, Worcester Dorothy Pond, Millbury Eddy Pond, Auburn Pondville Pond, Auburn Smiths Pond, Leicester Southwick Pond, Leicester Stoneville Pond, Auburn	Phosphorus	Yes	Yes	TMDL suggests that MassHighway should regulate road sanding, salting, regular sweeping, and installation of BMPs (for these impaired waterbodies).	MassHighway regulates road sanding and salting through its Snow and Ice Program and the procedures approved in the GEIR. Roads are swept on an annual basis after winter deicing applications. MassHighway District 3 recently completed roadway reconstruction project located in the City of Worcester on Airport Drive. Runoff from this area enters waterways south of Smith Pond and north of Curtis Pond, in the City of Worcester. This project included a significant amount of drainage infrastructure work including three detention ponds (42,200 sq. ft. total area); 30 deep sump CBs with hoods; 1,500 linear feet of stone line drainage swales; and 1,000 linear feet of grass lined drainage swales.
	Brierly Pond, Millbury Green Hill Pond, Worcester Howe Reservoir, Millbury Jordan Pond, Shrewsbury Mill Pond, Shrewsbury Newton Pond, Shrewsbury Shirley Street Pond, Shrewsbury	Phosphorus	Yes	No	--	--
Salisbury Pond	Salisbury Pond, Worcester	Phosphorus	Yes	Yes	TMDL indicates that: 1. MassHighway should develop methodology to calculate loadings from highways and conduct pilot projects to assess loadings and test BMPs on highways. 2. MassHighway and town or city Dept. Public Works should reduce impervious surfaces, institute more frequent street sweeping and catch basin cleaning, install detention basins, dredge and maintain storm water detention basins, etc.	USGS is currently performing a loading study for MassHighway. The loading study is scheduled to be completed by the end of the permit term. MassHighway has committed to DEP in its January 23, 2002 letter that streets will be swept at least once a year (usually in spring) and more often if necessary. All sumped drainage structure will be inspected and cleaned, if necessary, twice a year and more often if necessary. MassHighway will inspect/ clean drainage outlet locations where sediment build-up is evident. MassHighway will inspect and repair damaged and/ or clogged drainage conveyances.

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Salisbury Pond (cont'd)					3. MassHighway will also be required to apply for the EPA Phase II General Stormwater NPDES Permit by March 10 of 2003.	MassHighway has received partial authorization to discharge under the general permit (authorized for those discharges outside of endangered species habitat) and expects to receive full authorization in the near future since favorable responses have been received from both USFWS and NMFS.
Shawsheen River Basin	Shawsheen River	Bacteria	Yes	No	--	
		Stormwater	Yes	No	--	
Little Harbor	Little Harbor, Cohasset	Fecal Coliform	No	--	--	
Assabet River	Assabet River	Phosphorus	Yes	No	--	--
Chatham Embayments (Stage Harbor, Sulphur Springs,	Stage Harbor includes: Oyster Pond Oyster Pond River Stage Harbor Mill Pond Sulphur Spring includes: Harding Beach Pond Bucks Creek Taylors Pond includes: Taylors Pond Bassing Harbor includes: Crows Pond Ryder Cove Frost Fish Creek Muddy Creek includes: Muddy Creek Peters River	Total Nitrogen	Yes	No	--	--
Popponeset Bay	Mashpee River	Nitrogen	Yes	No	--	--
	Shoestring Bay Popponeset Bay					
Bare Hill Pond	Bare Hill Pond	Nuisance Aquatic Plants Phosphorus	Yes	No	--	--

