

**Year 7 Annual Report**  
**Massachusetts Small MS4 General Permit**  
**Reporting Period: July 1, 2024-June 30, 2025**

*\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are to publicly accessible sites\*\**

*Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2024 and June 30, 2025 unless otherwise requested.*

**Part I: Contact Information**

Name of Municipality or Organization:

EPA NPDES Permit Number:

**Primary MS4 Program Manager Contact Information**

Name:  Title:

Street Address Line 1:

Street Address Line 2:

City:  State:  Zip Code:

Email:  Phone Number:

**Stormwater Management Program (SWMP) Information**

SWMP Location (publicly available web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address:

## Part II: Self-Assessment

*First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: <https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state>*

**Impairment(s)**

Bacteria/Pathogens     
  Chloride     
  Nitrogen     
  Phosphorus  
 Solids/ Oil/ Grease (Hydrocarbons)/ Metals

**TMDL(s)**

*In State:*     
  Assabet River Phosphorus     
  Bacteria and Pathogen     
  Cape Cod Nitrogen  
 Charles River Watershed Phosphorus     
  Lake and Pond Phosphorus

*Out of State:*     
  Bacteria/Pathogens     
  Metals     
  Nitrogen     
  Phosphorus

Clear Impairments and TMDLs

*Next, check off all requirements below that have been completed. **By checking each box you are certifying that you have completed that permit requirement fully.** If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 7 Requirements

- Completed catchment investigations associated with Problem Outfalls
- Completed catchment investigations where information gathered on the outfall/interconnection indicated sewer input

Annual Requirements

- Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- Kept records relating to the permit available for 5 years and made available to the public
- The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - This is not applicable because we do not have sanitary sewer
  - This is not applicable because we did not find any new SSOs
  - The updated SSO inventory is attached to the email submission
  - The updated SSO inventory can be found at the following publicly available website:

- Updated system map due in year 10 with information from completed catchment investigations
- Provided training to employees involved in IDDE program within the reporting period
- Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters

- All curbed roadways were swept at least once within the reporting period
- Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Updated inventory of all permittee owned facilities as necessary
- O&M programs for all permittee owned facilities have been completed and updated as necessary
- Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Inspected all permittee owned treatment structures (excluding catch basins)

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Town's Stormwater Resource web page (<https://wilbraham-ma.gov/494/Stormwater-Resource-Center>) provides information to the public. The Town's Stormwater Management Program (SWMP) was last updated in June 2019. Opportunities for public participation in review and implementation of SWMP and complied with State Public Notice requirements was performed in years past.

### **Bacteria/ Pathogens** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

#### Annual Requirements

##### *Public Education and Outreach\**

- Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria
- This is not applicable because there are no septic systems present

*\* Public education messages can be combined with other public education requirements as applicable (see Appendix F and H for more information)*

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Public Education and Outreach performed on behalf of the Town of Wilbraham Department of Public Works by the Pioneer Valley Planning Commission. <https://pvpc.org/program/env/stormwater-management/>

### **Nitrogen** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

#### Annual Requirements

##### *Public Education and Outreach\**

- Distributed an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers
- Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

\* *Public education messages can be combined with other public education requirements as applicable (see Appendix F and H for more information)*

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

*Structural BMPs*

- Installed a structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries. The type of BMP installed is (*e.g. biofiltration*):

The Town has installed a Structural BMP in Permit Year 6 (an infiltration basin behind the police/fire department).

- Any structural BMPs listed in Attachment 3 to Appendix F already existing or installed in the regulated area by the permittee or its agents was tracked and the nitrogen removal by the BMP was estimated consistent with Attachment 3 to Appendix F. The BMP type, total area treated by the BMP, the design storage volume of the BMP, and the estimated nitrogen removed in mass per year by the BMP were documented.

- No BMPs were installed
- The above referenced BMP information is attached to the email submission
- The above referenced BMP information can be found at the following publicly available website:

<https://www.wilbraham-ma.gov/494/Stormwater-Resource-Center>

Total estimated nitrogen removed in lbs/year from the installed BMPs:

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Public Education and Outreach performed by the Pioneer Valley Planning Commission on behalf of the Town of Wilbraham. <https://pvpc.org/program/env/stormwater-management/>. The Town has installed a Structural BMP in Permit Year 6 (an infiltration basin behind the police/fire department).

**Phosphorus** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach\**

- Distributed an annual message in the spring (April/May) encouraging the proper use and disposal of grass clippings and encouraging the proper use of slow-release and phosphorus-free fertilizers
- Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

- Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

*\* Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

*Structural BMPs*

- Installed a structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries. The type of BMP installed is (e.g. *biofiltration*):

The Town has installed a Structural BMP in Permit Year 6 (an infiltration basin behind the police/fire department).

- Any structural BMPs already existing or installed in the regulated area by the permittee or its agents was tracked and the phosphorus removal by the BMP was estimated consistent with Attachment 3 to Appendix F. The BMP type, total area treated by the BMP, the design storage volume of the BMP, and the estimated phosphorus removed in mass per year by the BMP were documented.

- No BMPs were installed
- The above referenced BMP information is attached to the email submission
- The above referenced BMP information can be found at the following publicly available website:

<https://www.wilbraham-ma.gov/494/Stormwater-Resource-Center>

Total estimated phosphorus removed in **lbs/year** from the installed BMPs: 3.25

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Progress is being made to improve infrastructure throughout the Town. Public Education and Outreach performed on behalf of the Town of Wilbraham Department of Public Works by the Pioneer Valley Planning Commission. <https://pvpc.org/program/env/stormwater-management/>. The Town has installed a Structural BMP in Permit Year 6 (an infiltration basin behind the police/fire department).

**Lake and Pond Phosphorus TMDL**

*Below, calculate your current phosphorus export rate by first filling out the individual phosphorus loading components (labeled [A], [B], [C], and [D]) and then computing your current phosphorus export rate using the equation provided.*

Baseline phosphorus export rate from LPCP Area ( <b>lbs/year</b> ) [A]:	15.2
Total phosphorus reduction from all nonstructural controls this reporting period ( <b>lbs/year</b> ) [B]:	0.55
Total phosphorus reduction from all structural controls installed this reporting period and all previous years ( <b>lbs/year</b> ) [C]:	9.66

Phosphorus load increase due to development incurred since baseline loading was calculated in lbs/year [D]:

1.9

Current phosphorus export rate from the LPCP Area in lbs/year [=A-(B+C)+D from above]:

6.89

I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

All municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31.00 pertaining to proper use of fertilizers on turf grasses

Implemented all nonstructural control measures during this reporting period and documented the measures and their phosphorus reduction. The nonstructural control measure information:

- is attached to the email submission
can be found at the following publicly available website:

[Empty text box for website information]

Documented the structural control measures implemented during this reporting period and all previous years, including location, phosphorus reduction in weight/year, and date of last completed maintenance and inspection for each control. The structural control measure information:

- is not applicable; no structural control measures were implemented
is attached to the email submission
can be found at the following publicly available website:

[Empty text box for website information]

The LPCP: (select one of the following options. If you submitted your LPCP in a prior year and have an updated website, please include the website below)

- was submitted with a prior annual report
is attached to the email submission
can be found at the following publicly available website:

[Empty text box for website information]

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

[Empty text box for optional details]

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

[Empty text box for optional self-assessment]



### Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- Yes
- No

If yes, describe below, including any relevant impairments or TMDLs:

### Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

#### MCM1: Public Education

Number of educational messages completed during this reporting period:

Below, report on the educational messages completed during this reporting period. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

**BMP:#1. Think Blue Connecticut River Website**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

A total of 5,060 people visited the Think Blue Connecticut River website during Year 7 and spent an average of 12 seconds on viewing pages on stormwater best practices. Beyond the web analytics reported below on specific messages, there were the following views of the general audience pages on the Think Blue Connecticut River website: Residents views = 69; Businesses and Institutions views = 48; Developers views = 59; Industries views = 29; and Educators views = 39.

Message Date(s):

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

As indicated in previous annual reports, the website was not mentioned in the NOI and SWMP, but it has been central to all messaging in the region, providing additional information and resources on key topics.

**BMP:#2. Proper Management of Pet Waste (during time of licensing)**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience:

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable Goal(s):

Messaging reached 892 people in Stormwater Committee communities with 273 individuals clicking on the "Pledge" button to go to the Pick Up Poop pledge on the Think Blue Connecticut River website.

Analytics for the Think Blue Connecticut River website, indicate that there were another 109 people went to the pet waste landing page on the Think Blue Connecticut River website.

The email and sign went to 20 local Boards of Health, 20 parks and/or recreation departments & 20 Conservation Commissions in the region.

Message Date(s): The social media message ran on Facebook and Instagram for eight days from June 24 to July 1, 2025

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

The NOI/SWMP indicated pet waste messaging only in summer months as PVPC understood that messaging under the Appendixes could be combined. EPA has indicated that additional messaging to dog owners "at time of licensing" is required. Messaging at time of licensing was added, starting in Year 2, along with additional messaging on pet waste during "stay at home" orders with the pandemic (given the increased visibility of associated problems).

To provide additional messaging.

**BMP:#3. Proper Management of Pet Waste (during summer)**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience: residents

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable Goal(s):

Messaging reached 892 people in Stormwater Committee communities with 273 individuals clicking on the "Pledge" button to go to the Pick Up Poop pledge on the Think Blue Connecticut River website.

Analytics for the Think Blue Connecticut River website, indicate that there were another 109 people went to the pet waste landing page on the Think Blue Connecticut River website.

The email and sign went to 20 local Boards of Health, 20 parks and/or recreation departments & 20 Conservation Commissions in the region.

Message Date(s): The social media message ran on Facebook and Instagram for eight days from June 24 to July 1, 2025

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

The NOI/SWMP indicated pet waste messaging only in summer months as PVPC understood that messaging under the Appendixes could be combined. EPA has indicated that additional messaging to dog owners "at time of licensing" is required. Messaging at time of licensing was added, starting in Year 2, along with additional messaging on pet waste during "stay at home" orders with the pandemic (given the increased visibility of associated problems).  
To provide additional messaging.

**BMP:#4. Proper Septic System Care**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience: Residents

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable Goal(s):

The survey and follow-up content went to 20 Boards of Health in the region. Connecticut River Stormwater Committee – Year 7 Annual Report page 14  
Additionally, analytics for the Think Blue Connecticut River website, indicate that there were another 17 people went to the Septic System landing page on the Think Blue Connecticut River website.

Message Date(s): Spring 2025

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

As reported previously, the NOI/SWMP indicated septic system messaging would be done in Year 3 only as MS4 permit language in Appendix H was not entirely clear on the timing of this message. EPA has since indicated that septic system messaging must occur each year. The Connecticut River Stormwater Committee adjusted accordingly, starting in Year 2.

**BMP: #5. Pet waste**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable Goal(s):

Messaging reached 892 people in Stormwater Committee communities with 273 individuals clicking on the "Pledge" button to go to the Pick Up Poop pledge on the Think Blue Connecticut River website.

Analytics for the Think Blue Connecticut River website, indicate that there were another 109 people went to the pet waste landing page on the Think Blue Connecticut River website.

The email and sign went to 20 local Boards of Health, 20 parks and/or recreation departments & 20 Conservation Commissions in the region.

Message Date(s): The social media message ran on Facebook and Instagram for eight days from June 24 to July 1, 2025

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

The NOI/SWMP indicated pet waste messaging only in summer months as PVPC understood that messaging under the Appendixes could be combined. EPA has indicated that additional messaging to dog owners "at time of licensing" is required. Messaging at time of licensing was added, starting in Year 2, along with additional messaging on pet waste during "stay at home" orders with the pandemic (given the increased visibility of associated problems). To provide additional messaging.

**BMP:#6. Importance of Soil Test, Proper Use of Fertilizers, Disposal of Grass Clippings**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience: Residents

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable Goal(s):

The cable access message went to 18 local stations. Analytics for the Think Blue Connecticut River website page on leaf litter, indicate that there were a total of 1416 views on the website landing page with 3 downloads.

Message Date(s): October 11 to 19, 2024

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

not available

**BMP:#7. Importance of Soil Test, Proper Use of Fertilizers, Disposal of Grass Clippings**

Message Description and Distribution Method:

See annual reporting for education and outreach activities, Year 7 at: [www.thinkblueconnecticutriver.org/ms4-communities/](http://www.thinkblueconnecticutriver.org/ms4-communities/)

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable Goal(s):

For the business and commercial audience in Year 7, PVPC issued a letter to reach 147 landscaping and lawn care companies in the region with best practices messaging on disposal of leaf litter and leaf. We also included a survey asking questions related to managing and disposing of leaves from lawns and yards. Signed by the Committee Chair and Co-chair, the letter promoted several key best practices:

- Keep leaves off of driveways and roadways where they can easily wash into storm drains and contribute to higher nutrient flows during the fall season.
- Use a mulching mower. By mulching the leaves into turf areas, you avoid having to rake/blow and bag and you offer a way to manage autumn leaves while providing clients with free fertilizer. Mulched leaves recycle nutrients and reduce the overall need for applied fertilizer, which can help to reduce nutrient loading for local rivers, streams, and lakes.
- Alternatively, if your client has an existing compost pile, you can recommend that they consider allowing you to add leaves to the pile. Leaves provide a critically important element (carbon) to the composting process, making for a more soil enriching product to be used in the next growing season. Be sure compost piles are located away from streams, lakes, or storm drains as these decomposing materials and nutrients could easily reach these water resources.

A survey went out to all 147 landscaping companies in the region asking several questions, including

- Do you ever use a mulching mower to manage leaves on your client’s lawns and yards?
- If you have never used a mulching mower, is there anything that would be helpful in enabling you to mulch leaves into the lawn (e.g. help with purchasing equipment, informative brochure for use with your client on the benefits of mulching leaves)?
- Do you ever add leaves to your client’s composting pile?
- Do you ever take leaves to a nearby farm or other facility that composts leaves
- Do you ever dispose of leaves in another location?
- If yes, please indicate what other location you use to dispose of leaves at:
- Would you like more information on possible locations where land care professionals can dispose of leaves?
- If yes, please provide your company name and best contact for additional information:
- If you did not answer “yes” in Question 7 and would like to be entered into raffle, please provide your name and contact information here

Message Date(s): October 22, 2024

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

not available. Contact PVPC

Add an Educational Message

### MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) during this reporting period:

The Stormwater Management Program (SWMP) is available to the public for review and comment at the Highway Department office and DPW Engineering Office at any time. The SWMP was presented at a public meeting on June 20, 2019 to solicit input from the general public. During this reporting period, the SWMP was not specifically listed as a Warrant Article in the Annual Town Meeting held on May 12, 2025.

Was this opportunity different than what was proposed in your NOI? Yes  No

Describe any other public involvement or participation opportunities conducted during this reporting period:

We note that for construction projects/land disturbance >1-acre, the Town of Wilbraham's Stormwater Management Regulations (11/15/21) provide an opportunity for Public Comment at the Planning Board, Zoning Board, or Conservation Commission public hearings for individual projects.

Reference: <https://wilbraham-ma.gov/DocumentCenter/View/4575/Wilbraham-Stormwater-Regulations---11-15-2021?bidId=>

### MCM3: Illicit Discharge Detection and Elimination (IDDE)

#### Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

This SSO section is NOT applicable because we DO NOT have sanitary sewer

Below, report on the number of SSOs identified in the MS4 system and removed during this reporting period.

Number of SSOs identified:

Number of SSOs removed:

**MS4 System Mapping**

Percent of Phase II map complete:

*Optional:* Provide additional status information regarding your map:

The GIS mapping is updated throughout the year when physical inspections are performed by DPW of new construction or repairs.

**Screening of Outfalls/Interconnections**

*If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.*

- No outfalls were inspected
- The above referenced outfall screening data is attached to the email submission
- The above referenced outfall screening data can be found at the following publicly available website:

*Below, report on the number of outfalls/interconnections screened during this reporting period.*

Number of outfalls screened:

*Below, report on the percent of outfalls/interconnections screened to date.*

Percent of outfalls screened:

*Optional:* Provide additional information regarding your outfall/interconnection screening:

Location: Sunset Rock Road, weather dry and sunny, no precipitation in previous 48 hours.

**Catchment Investigations**

*If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.*

- No catchment investigations were conducted
- The catchment investigation data is attached to the email submission
- The catchment investigation data can be found at the following publicly available website:

*Below, report on the number of catchment investigations completed during this reporting period.*

Number of catchment investigations completed this reporting period:

*Below, report on the percent of catchments investigated to date.*

Percent of total catchments investigated:

*Optional:* Provide any additional information for clarity regarding the catchment investigations below:

**IDDE Progress**

*If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.*

- No illicit discharges were found
- The illicit discharge removal report is attached to the email submission
- The illicit discharge removal report can be found at the following publicly available website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed during this reporting period.*

Number of illicit discharges identified:

Number of illicit discharges removed:

Estimated volume of sewage removed:  gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed since the effective date of the permit (July 1, 2018).*

Total number of illicit discharges identified:

Total number of illicit discharges removed:

*Optional:* Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

**Employee Training**

Describe the frequency and type of employee training conducted **during this reporting period:**

DPW workers who clean catch basins are trained for IDDE. A video presentation is available for guidance. One new Department of Public Works Engineer received NPDES.com stormwater training for MS4 and Construction Site Inspections, as well as self training. Existing GIS Coordinator/Engineer and the DPW Superintendent renewed their 5-year certifications for stormwater inspections through programs offered on NPDES.com.

### MCM4: Construction Site Stormwater Runoff Control

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed during this reporting period.*

Number of site plan reviews completed:

Number of inspections completed:

Number of enforcement actions taken:

*Optional:* Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

Local Stormwater Management Permits are issued by the Town of Wilbraham Department of Public Works for construction projects and other projects where significant earth disturbance is anticipated.

Site Plan Reviews: From 7/1/24 to 12/31/24, 12 stormwater permits were issued for 14 applications (1 cancellation, 1 incomplete application). From 12/31/24 to 6/30/25, 10 stormwater permits were issued for 11 applications (1 application did not meet requirements).

Inspections: From 7/1/24 to 12/31/24, 68 construction site stormwater inspections. From 12/31/24 to 6/30/25, 258 construction site stormwater inspections.

Enforcement Actions: Based on the training provided by EPA Region 1 on August 26, 2025 titled "MS4 Annual Reporting Using the Year 7 Template", as discussed in the Q&A at 14:36 during the training, the EPA considers enforcement actions to be an order with a compliance deadline accompanied by a fine or penalty. From 7/1/24 to 6/30/25, no such enforcement actions with fine/penalties were issued by DPW. Most enforcement by DPW is performed via a direct conversation, email, or phone call with the site property owner or contractor during or shortly following an inspection by DPW. Compliance is typically reached before escalating to a written order, fine or penalty.

### MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

#### As-built Drawings

*Below, report on the number of as-built drawings received during this reporting period.*

Number of as-built drawings received:

*Optional:* Enter any additional information relevant to the submission of as-built drawings:

Final As-built drawings stamped by a professional engineer or licensed surveyor for local stormwater management permits received during this reporting period for the following addresses: 15 Peak Road, 650 Tinkham Road, 14 Wellfleet Drive.

**Street Design and Parking Lots Report**

Below, describe any changes made or planned to be made to local regulations and guidelines based on the report completed in Year 4:

The Town of Wilbraham, Planning Board, Subdivision Regulations were updated and finalized on May 7, 2025. The subdivision regulations included changes to roadway design specification and other features that improve the design stormwater management features in new development.

**Green Infrastructure Report**

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

The Town of Wilbraham's Local Stormwater Management Regulations (11/15/2021) encourage and promote the use of Low Impact Development (LID) or otherwise Green Infrastructure. The performance standard for minor projects disturbing <1-acre (Section 5. C.) and major projects disturbing >1-acre state to use LID techniques where adequate soil, groundwater and topographic conditions allow. These may include but not be limited to reduction in impervious surfaces, disconnection of impervious surfaces, bioretention (rain gardens) and infiltration systems.  
 Reference: <https://wilbraham-ma.gov/DocumentCenter/View/4575/Wilbraham-Stormwater-Regulations---11-15-2021?bidId=>

**Retrofit Properties Inventory**

Below, list remaining permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (must maintain a minimum of 5 sites in inventory until less than 5 sites remain):

Spec Pond  
 Roadside drainage in various locations  
 Town of Wilbraham Town Hall  
 Town of Wilbraham Town Library  
 Memorial School

Below, list all properties that have been modified or retrofitted with BMPs to mitigate impervious area that were inventoried as part of 2.3.6.d of the permit and the type of BMP(s) implemented. Non-MS4 owned properties that have been modified or retrofitted with BMPs to mitigate impervious area may also be listed, but must be indicated as non-MS4.

2025: new stormwater easement granted to Town of Wilbraham on non-MS4 owned property at 1 Ely Rd. where a new retention basin was constructed to receive runoff overflow from Ely Rd. promoting infiltration versus overland runoff.  
 Installed on Cottage Ave 200' of 6" perforated pipe  
 Installed on Springfield St 200' of 6" perforated pipe  
 Installed at Wilbraham Police Station - a drywell and infiltration basin allowing for recharge

<p>Installed on Glendale Road 400' of 6" perforated pipe          Installed at DPW An oil water separator for the truck wash.          Installed a catch basin with a 2' sump in the parking area to catch sedemint.</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### MCM6: Good Housekeeping

#### Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins during this reporting period.*

Number of catch basins inspected:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

*Below, report on the total number of catch basins in the MS4 system.*

Total number of catch basins:

*If applicable:*

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

<p>If a catch basin is 50% full on two consecutive routine inspections, a cleaning schedule will be set up to increase frequency of basin cleaning.</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------

#### Street Sweeping

*Report on street sweeping completed during this reporting period using one of the three metrics below.*

Number of miles cleaned:

Volume of material removed:

Weight of material removed:

#### Stormwater Pollution Prevention Plan (SWPPP)

*Below, report on the number of site inspections for facilities that require a SWPPP completed during this reporting period.*

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

<p> </p>
----------

[Empty rectangular box]

**Additional Information**

**Monitoring or Study Results**

*Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.*

- Not applicable
- The results from additional reports or studies are attached to the email submission
- The results from additional reports or studies can be found at the following publicly available website(s):

[Empty rectangular box for website information]

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

[Empty rectangular box for description of monitoring/studies]

**Additional Information**

Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above.

A permanent drainage easement in favor of DPW was recorded in 2024 on private property at the intersection of Ely Road and Ridge Road. A new stormwater retention basin was constructed in June and July 2025 partially within this new easement and the Town tree belt.

**Year 8**

**Activities Planned for Next Reporting Period**

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 8 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 8 below:

## Part V: Certification of Small MS4 Annual Report 2025

### 40 CFR 144.32(d) 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.

Name:  Title:

Signature:  Date:

*[Signatory may be a duly authorized representative]*



C O N N E C T I C U T R I V E R

*S t o r m w a t e r C o m m i t t e e*

## MS4 Permit Year 7

# Annual Report for Public Education and Outreach

MCM 1 and additional requirements in Appendixes F and H

July 1, 2024 through June 30, 2025

September 18, 2025

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The Connecticut River Stormwater Committee annual report provides a summary of all the work undertaken during the July 1, 2023 to June 30, 2024 reporting period. All of this work is directly applicable to all member communities' EPA annual reporting requirements.

Content has been formatted in a manner consistent with the format of the EPA annual report template for Year 6. Because the Connecticut River Stormwater Committee is a regional partnership program, these sections are written from a "regional" perspective rather than municipality-by-municipality. Additional details of community-specific efforts are reported in each municipality's annual report.

In communication with PVPC, who facilitates the coalition, EPA has endorsed and encouraged a regional Annual Reporting approach whereby Connecticut River Stormwater Committee member communities can satisfy the Public Education and Outreach reporting requirement (within MCM 1 and Appendixes F and H) by referencing the coalition's annual report with a url link in their own annual report.

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## Introduction

### 1. Coalition Purpose and Membership

The Connecticut River Stormwater Committee is an intergovernmental compact of 20 municipalities, the University of Massachusetts-Amherst, and the Pioneer Valley Planning Commission organized to work cooperatively in meeting US EPA Municipal Separate Storm Sewer System Permit (“MS4 Permit”) requirements for stormwater education and outreach. Facilitated and staffed by the Pioneer Valley Planning Commission, the Committee also works together to meet other permit compliance activities where appropriate and needed. Work for the group is funded through annual dues paid by each member and through occasional grants. Member communities are shown in Table 1 below.

**Table 1: Connecticut River Stormwater Committee Member Communities**

Member Community	Committee Representatives and Departments
Agawam	Tracy DeMaio and Mike Albro, Department of Public Works
Belchertown	Linda Leduc, Department of Public Works and Stephanie Sansoucy, Conservation Department
Chicopee	Quinn Lonczak, Department of Public Works
East Longmeadow	Bruce Fenney and Mark Berman, Department of Public Works
Easthampton	Dianne Rossini, Department of Public Works
Granby	Dave Derosiers, Highway Department
Hadley	Scott McCarthy, Department of Public Works, and Nick Cristofari, CEI,
Holyoke	Miira Gates, Department of Public Works
Longmeadow	Tim Keane, Department of Public Works
Ludlow	Jim Goodreau, Department of Public Works
Monson	Toni Uliana, Conservation Department
Northampton	Doug McDonald, Department of Public Works
Palmer	Richard Josephson, Department of Public Works
South Hadley	Melissa LaBonte, Department of Public Works
Southampton	Randall Kemp, Highway Department
Southwick	Randall Brown and Jon Goddard, Department of Public Works
Springfield	Vacant
West Springfield	Connor Knightly, Department of Public Works
Westfield	Joe Kietner, Casey Berube and Noel , Department of Public Works
Wilbraham	Tonya Basch and Dena Grochmal, Department of Public Works
University of Massachusetts - Amherst	Terri Wolejko, Environmental and Hazardous Materials Management Services Department, and Neils LaCour, Campus Planning Department

## 2. Water Quality Considerations in the Region

All Connecticut River Stormwater Committee communities are subject to additional MS4 permit requirements in Appendix F based on waters that are tributaries to the Long Island Sound, which has an approved TMDL for nitrogen.<sup>1</sup> Some member communities are also subject to additional MS4 permit requirements based on the following:

- Lakes and ponds with approved TMDLs for phosphorous (additional requirements within Appendix F of the MS4 permit)
- Waterbodies and their tributaries that are impaired for water quality due to phosphorous (additional requirements within Appendix H of the MS4 permit)
- Waterbodies and their tributaries that are impaired for water quality due to bacteria or pathogens (additional requirements within Appendix H of the MS4 permit)
- Waterbodies and their tributaries that are impaired for water quality due to solids (total suspended solids) (additional requirements within Appendix H of the MS4 permit)

It is important to note that the MS4 permit stipulates that certain additional requirements for public education and outreach messaging in the appendixes can be combined where appropriate. Specifically, Appendix H part I and II as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III.

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<sup>1</sup> TMDL = identifies the Total Maximum Daily Load of nitrogen that can be discharged, in this case to Long Island Sound, without significantly impairing the health of the Sound.

## Annual Report Part II: Self-Assessment

### 1. Education and Outreach on Bacteria/Pathogens

- √ Annual Message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- √ Disseminated educational material to dog owners at time of issuance or renewal of dog license, or other appropriate time
- √ Provided information to owners of septic systems about proper maintenance.

See description of messaging in section 2 below.

### 2. Education and Outreach on Nitrogen and Phosphorous (combined)

- √ Distributed an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers
- √ Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate.
- √ Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

See description of messaging in section 3 below.

## Annual Report Part IV: MCM 1 – Public Education and Outreach

The required general education messages to four audiences under the existing MS4 permit were completed with work in Year 6. As such, this section here describes additional work completed in Year 7, primarily under the continuing annual public education and outreach requirements under Appendixes H and F of the MS4 permit.

### 1. *Think Blue Connecticut River Website*

Message description and distribution method: The *Think Blue Connecticut River* website is at the core of all regional messaging about stormwater. The website at [www.thinkblueconnecticutriver.org](http://www.thinkblueconnecticutriver.org) does the following:

- Covers major areas of messaging about reducing polluted stormwater flows, including lawn and yard care, pet waste management, car care, controlling soil erosion, soaking up the rain, and septic system care
- Addresses the key 4 audiences plus educators
- Serves as the “landing place” for information on nearly all social media messaging

In the past year, PVPC has developed a new logo for the *Think Blue Connecticut River* website as a way to draw greater interest from all audiences in the region. The logo features a river otter, inspired by drone video footage capture of otters in lower Abbey Brook in Chicopee. The river otter will help with future messaging in drawing more powerful connection between the need for clean stormwater to support the lives of these and other important creatures. The core message

being, how we manage our lawns, pet waste, septic systems, etc. has direct impact on the otter and other wildlife dependent on rivers, streams, lakes, and wetlands. Selection of the otter is also based on its qualities as a charismatic megafauna with greater public appeal and thus potential for inducing a response to appeals for cleaning up stormwater. PVPC will be working with the Stormwater Committee in the coming year to consider ways to use the otter to best effect.



Targeted audiences: Residents, business/institutional/commercial, developers, and industrial, and municipalities throughout the region

Responsible Department/Parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable goal(s): A total of 5,060 people visited the *Think Blue Connecticut River* website during Year 7 and spent an average of 12 seconds on viewing pages on stormwater best practices. Beyond the web analytics reported below on specific messages, there were the following views of the general audience pages on the *Think Blue Connecticut River* website:

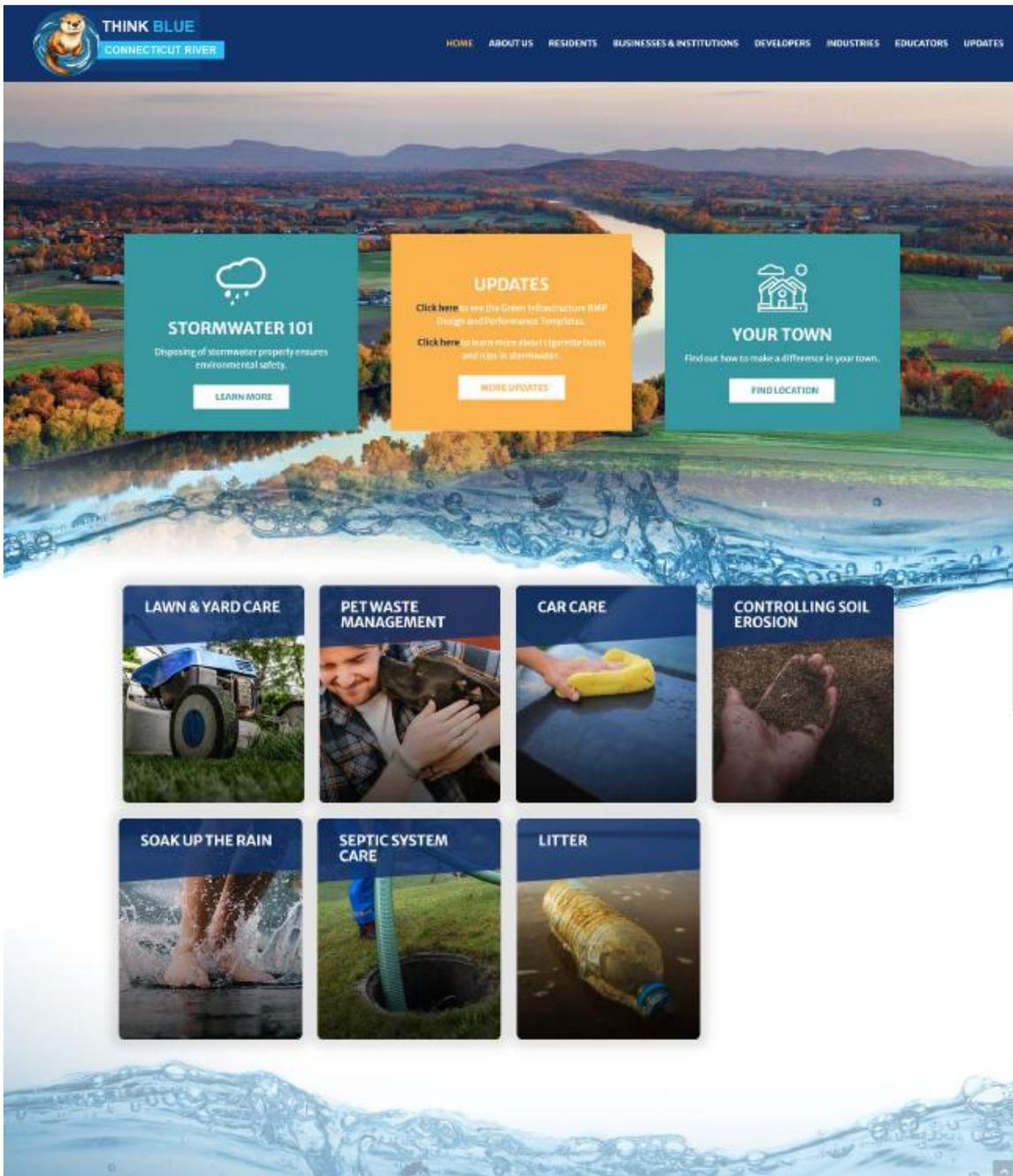
Residents views = 69; Businesses and Institutions views = 48; Developers views = 59; Industries views = 29; and Educators views = 39.

Message dates: July 1, 2024 through June 30, 2025

Message completed for: Appendix F requirements  Appendix H requirements

Was message different than what proposed in your NOI/SWMP? Yes  No

If yes, describe why the change was made: As indicated in previous annual reports, the website was not mentioned in the NOI and SWMP, but it has been central to all messaging in the region, providing additional information and resources on key topics.



*Above is an image of the updated home page for the Think Blue Connecticut River website.*

## 2. Messages related to bacteria and pathogens

### Proper management of pet waste

Message description and distribution method: Pet waste messaging in Year 7 occurred at time of licensing and during the summer months and was based on the message: “Think picking up Spike’s poop is gross? Try swimming in it.” In part, the aim of messaging has been to drive people to the pet waste pick up pledge on the *Think Blue Connecticut River* website.

#### *At time of licensing*

Messaging included a slide for use by local cable access television stations in English and Spanish, and an e-mail message to municipal clerks/dog officers providing materials for use in the licensing process.

The cable access message was simplified based on feedback from cable tv stations on a Year 5 fall leaf litter messages. This message in Year 7 on pet waste also focused specifically on communicating that pet waste *should be put in a trash bin*. Public works officials on the Connecticut River Stormwater Committee had stressed the importance of this point because they are frequently finding bagged pet waste in catch basins.

Materials provided to municipal clerks and licensing officers was based on a survey done in Year 3 about what might be the most effective methods for messaging through their licensing process.

**If you care about clean water...**

then properly dispose of your pup's poop. Put it in the trash bin.

The Connecticut River Stormwater Committee

## Si te importa el agua limpia...

desecha correctamente  
la caca de tu perrito.  
Ponla en la basura.



The Connecticut River Stormwater Committee  
(El Comité de Aguas Pluviales del Río Connecticut)

*The above message in English and Spanish was provided to 18 local cable access television stations in the region.*



**THINK PICKING UP  
SPIKE'S POOP  
IS GROSS?**

**TRY SWIMMING IN IT.**

**THINK AGAIN.  
THINK BLUE.**

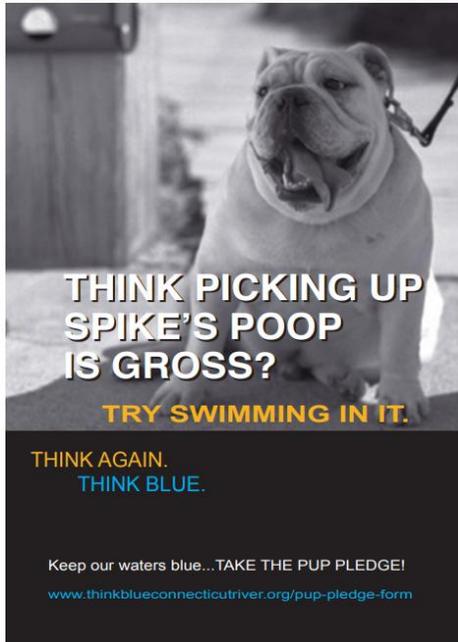
Did you know that there are about 47,000 dogs in the Pioneer Valley, and that together, they produce about 17.5 tons of animal waste a day?

Dog waste does not act as an effective fertilizer. Stormwater runoff can wash dog waste into ponds, lakes, streams and drinking water supplies, causing outbreaks of *E. coli* and other bacteria harmful to both people and wildlife. It can contaminate parks, athletic fields and places where children play.

We all need to pick up and properly dispose of our pet's waste in the trash can. Join all the dog owners in your neighborhood who are showing they care and take the PUP (Pick up Poop) Pledge at:

[www.thinkblueconnecticutriver.org/pup-pledge-form/](http://www.thinkblueconnecticutriver.org/pup-pledge-form/)

*PVPC provided the above electronic message to be placed on municipal dog licensing web pages in member communities.*



**JOIN PIONEER VALLEY DOG OWNERS BY TAKING THE PUP (PICK UP POOP) PLEDGE!**

Here in the Valley, we have about 47,000 dogs that together produce more than 17.5 tons of waste per day. Dog poop left on the ground — or thrown down a storm drain— washes with the next rainfall straight to our rivers and lakes. The cumulative impacts of improper waste disposal make our local waters unsafe. Show that you care and take the PUP Pledge to help keep our waters BLUE.

**TAKE THE PUP (Pick Up Poop) PLEDGE!**



SCAN ME

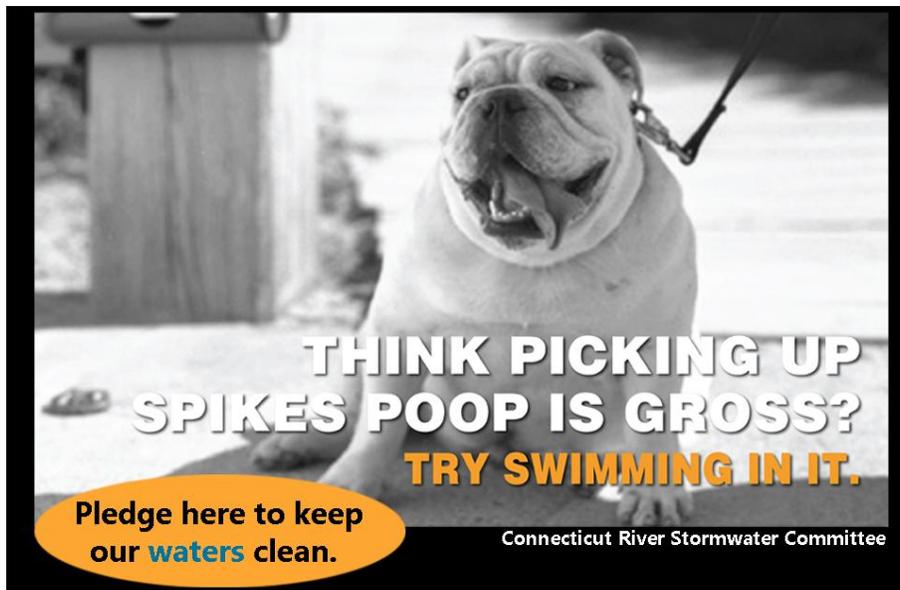
Follow the web link, or scan the QR code to access the pledge.

[www.thinkblueconnecticutriver.org/pup-pledge-form](http://www.thinkblueconnecticutriver.org/pup-pledge-form)

*Messaging was slightly modified as shown above to also serve members communities as a postcard for distribution with dog licenses.*

**Summer**

Paid placement social media messages on Facebook and Instagram at the start of the summer swimming season targeted people in Connecticut Stormwater Committee zip codes who had identifiers that match “pets at home” and “dog walking.”



*Above is the paid social media message that ran on Facebook and Instagram. The pledge button links to the pledge form on the Think Blue Connecticut River website.*

As this message in Year 7 on pet waste also focused specifically on communicating that pet waste *should be put in a trash bin*. We also sent the following email and sign to local BOH, parks departments & Conservation Commission to post in the Town's parks and open space areas and included information on installing signage, kiosks and pet waste stations.

Good morning,

Dog waste in your parks or conservation property got you down? The Connecticut River Stormwater Committee has some great resources for your use.

Your municipality is a member of this group, a regional coalition that works together to meet EPA and MassDEP requirements to message for water quality improvements. Your member representative is cc'd on this message so that you might collaborate and stay in touch about use of these pet waste pick up reminder materials.

Please see attached for your use:

- a design template for a humorous 12x18" sign
- quotes for sign production and sign hardware within the region
- an example kiosk used recently by City of Holyoke (if you are interested in setting up a pet waste station)

Most people just need a reminder that leaving their dog's waste in the park or on a conservation property is not acceptable. With some prompting and a dose of humor that reminds them that there is no poop fairy, people ought to be more conscientious about proper disposal of dog waste. Not only will this help you in better care for your property, but it will also prevent the harmful bacteria in pet waste from flowing with rainfall to local rivers and streams.

there is no  
**POOP FAIRY!**



per local ordinance

**SCOOP YOUR POOP**

**Grab it - Bag it - Toss it**  
(in the trash)

**Keep our local waters clean**  
**ThinkBlueConnecticutRiver.org**

Measurable goal(s):

*During time of licensing*

The cable access message in English and Spanish went to 18 local stations.

*Summer*

Messaging reached 892 people in Stormwater Committee communities with 273 individuals clicking on the “Pledge” button to go to the Pick Up Poop pledge on the *Think Blue Connecticut River* website.

Analytics for the *Think Blue Connecticut River* website, indicate that there were another 109 people went to the pet waste landing page on the *Think Blue Connecticut River* website.

The email and sign went to 20 local Boards of Health, 20 parks and/or recreation departments & 20 Conservation Commissions in the region.

Message dates:

The social media message ran on Facebook and Instagram for eight days from June 24 to July 1, 2025.

Message completed for: Appendix F requirements ✓ Appendix H requirements ✓

Was message different than what proposed in your NOI/SWMP? Yes ✓ No

The NOI/SWMP indicated pet waste messaging only in summer months as PVPC understood that messaging under the Appendixes could be combined. EPA has indicated that additional messaging to dog owners “at time of licensing” is required. Messaging at time of licensing was added, starting in Year 2, along with additional messaging on pet waste during “stay at home” orders with the pandemic (given the increased visibility of associated problems).

If yes, describe why the change was made: To provide additional messaging.

## **Proper septic system care**

Message description and distribution method: Recognizing that Boards of Health are the primary point of contact on septic systems for residents, the Stormwater Committee worked this year toward better understanding and enabling them in this role. A survey went out to all Boards of Health, asking several questions, including

- Whether they are in possession of a list of septic system owners in Town from Board of Assessors.
- Whether issuing a direct mail letter to septic system owners makes sense
- When approving septic plans, does the BOH make a practice of providing three-page EPA flyer on septic system care?
- If yes, can BOH track this?
- If no, willing to begin this practice?

Based on the survey responses, Boards of Health received several messaging items for their use shown below.



**BE  
SEPTIC  
SAVVY**  
HELP KEEP OUR WATERWAYS CLEAN

Proactive septic maintenance can save you money and help protect the health of your family, community, and environment. Make sure to evaluate your tank every 1-3 years and pump when solids reach 1/3 of tank volume. For more tips, visit: <https://thinkblueconnecticutriver.org/septic-system-care/>

Website / social media element were provided for Board of Health use.

### Do Your Part, Be SepticSmart: The Do's and Don'ts of Your Septic System

Learn these simple steps to protect your home, health, environment and property value:

**Protect It and Inspect It:**

**Do:**

- Have your system inspected (in general) every three years by a licensed contractor and have the tank pumped, when necessary, generally every three to five years.

**Think at the Sink:**

**Don't:**

- Pour cooking grease or oil down the sink or toilet.
- Rinse coffee grounds into the sink.
- Pour household chemicals down the sink or flush them.

**Do:**

- Eliminate or limit the use of a garbage disposal.
- Properly dispose of coffee grounds & food.
- Put grease in a container to harden before discarding in the trash.

**Don't Overload the Commode:**

**Don't:**

- Flush non-degradable products or chemicals, such as feminine hygiene products, condoms, dental floss, diapers, cigarette butts, cat litter, paper towels, pharmaceuticals.

**Do:**

- Dispose of these items in the trash can!

**Shield Your Field:**

**Don't:**

- Park or drive on your drainfield. The weight can damage the drain lines.
- Plant trees or shrubs too close to your drainfield; roots can grow into your system and clog it.

**Do:**

- Consult a septic service professional to advise you of the proper distance for planting trees and shrubs, depending on your septic tank location.

**Don't Strain Your Drain:**

**Don't:**

- Concentrate your water use by using your dishwasher, shower, washing machine, and toilet at the same time. All that extra water can really strain your septic system.

**Do:**

- Stagger the use of water-generating appliances. This can be helpful especially if your system has not been pumped in a long time.
- Become more **water efficient** by fixing plumbing leaks and consider installing bathroom and kitchen faucet aerators and water-efficient products.

For more SepticSmart tips, visit: [www.epa.gov/septicmart](http://www.epa.gov/septicmart)

EPA 832-R-13-002 • September 2013

### Ponga de su parte: conozca SepticSmart: Lo que sí puede hacer y lo que no puede hacer para su sistema séptico

Siga estos pasos sencillos para proteger su casa, su salud, el medio ambiente y el valor de su propiedad.

**Protéjalo e inspecciónelo:**

**Si:**

- Contrate a un contratista licenciado para que inspeccione el sistema séptico en su totalidad cada tres años y bombee el tanque (si es necesario) generalmente cada 3-5 años.

**Piense en el fregadero:**

**No:**

- Eche grasa para cocinar por el fregadero o el inodoro.
- Eche restos de café por el fregadero.
- Eche productos químicos de uso casero por el fregadero o el inodoro.

**Si:**

- Elimine o limite el uso del triturador de desperdicios.
- Desheche correctamente los restos de café y de comida.
- Antes de tirar la grasa en la basura, pídele a que se solidifique en un recipiente.

**No sobrecargue el inodoro:**

**No:**

- Eche en el inodoro productos no degradables, como productos de higiene femenina preservativos, hilo dental, pañales, colillas de cigarrillos, arena sanitaria para gatos, toallas de papel, medicamentos.

**Si:**

- Desheche estos artículos en la basura!

**Proteja el área:**

**No:**

- Se estacione ni conduzca por el área de drenaje. El peso puede dañar la tubería.
- Siempre arbustos de arboles demasiado cerca del área de drenaje: las raíces pueden crecer sobre el sistema y obstruirlo.

**Si:**

- Consulte con un profesional de servicios sépticos para que le diga cuál es la distancia correcta para plantar árboles y arbustos, dependiendo de la ubicación del tanque séptico.

**No ponga a prueba su drenaje:**

**No:**

- Concentre el uso de agua usando el lavaplatos, la ducha, la lavadora y el inodoro al mismo tiempo. Toda esa agua extra puede sobrecargar el sistema séptico.

**Si:**

- Use los aparatos que usan agua a distintos horas. Esto puede ser muy útil si el sistema no se ha bombeado por mucho tiempo.
- Use el agua con más eficiencia: repare cualquier fuga y considere instalar aireadores para grifos en el baño y la cocina y productos eficaces para el consumo del agua.

Para obtener una lista completa de recomendaciones SepticSmart, visite [www.epa.gov/septicmart](http://www.epa.gov/septicmart)

EPA 832-R-13-002 • Agosto 2013

EPA flyers were provided for Board of Health use.

**DRAFT – Letter for local boards of health to send to residents with septic systems**

*Print on muni/organizational letterhead*

June \_\_, 2025

Hello,

your muni name is subject to more stringent federal and state stormwater permit requirements. Along with 23 other communities here in the Pioneer Valley, we must find ways to reduce contaminated flows to local rivers, streams, and lakes.

Our records indicate that your household relies on a septic system for disposal of sanitary sewage. Your septic system is designed to treat wastewater from your home before it filters into the soil and replenishes the groundwater that feeds local lakes, rivers, and, in many cases, drinking water supply wells.

Pumping your septic tank is critical to ensuring that it properly treats waste. Accumulated solids at the bottom of your tank can prevent the system from doing its job. If your septic system is not in good working order, it can also flood and cause sewage backup into your yard or home. While you can imagine how harmful raw sewage could be to your property, you may not be thinking about the harm a faulty septic system can cause to drinking water and local waterways. MassDEP recommends the following strategies for ensuring a healthy septic system:

- Inspect your system at least once every 3 years. A reputable, permitted septage hauler can advise you on the frequency of pumping needed for your particular household. For homes with garbage disposals, pumping once a year is recommended.
- Limit the use of your kitchen sink garbage disposal and flush only human waste down your toilets. This will keep your system working optimally and reduce the overall frequency of maintenance.
- Properly dispose of hazardous or toxic substances, such as medicines, household chemicals, solvents, etc. These substances are not treated by your septic system and contaminate groundwater.
- Avoid driving over, parking on, or doing construction over your system and tank as this can impact proper function of your system.
- Conserve water to reduce the amount of liquid your system must process and thereby extend its lifespan.

You can find more information on maintaining septic systems at the state website at: <https://www.mass.gov/guides/caring-for-your-septic-system>. The Connecticut River Stormwater Committee, of which your muni name is a member also has some helpful information at: <https://thinkblueconnecticutriver.org/septic-system-care/>

As a resident of your muni name, your commitment to proper maintenance and upkeep of your septic system helps us achieve and maintain water quality standards.

Thank you,

*Letter above was provided for Board of Health use.*

Targeted audience: Residents

Responsible department/parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable goal(s): The survey and follow-up content went to 20 Boards of Health in the region.

Additionally, analytics for the *Think Blue Connecticut River* website, indicate that there were another 17 people went to the Septic System landing page on the *Think Blue Connecticut River* website.

Message dates: Spring 2025.

Message completed for: Appendix F requirements Appendix H requirements ✓

Was message different than what proposed in your NOI/SWMP? Yes ✓ No

If yes, describe why the change was made: As reported previously, the NOI/SWMP indicated septic system messaging would be done in Year 3 only as MS4 permit language in Appendix H was not entirely clear on the timing of this message. EPA has since indicated that septic system messaging must occur each year. The Connecticut River Stormwater Committee adjusted accordingly, starting in Year 2.

### **3. Messages related to phosphorus and nitrogen**

#### **Disposal of grass clippings and proper use of slow-release fertilizers**

##### *Residential audience*

For the Stormwater Committee, PVPC worked with UMass Cooperative Extension to improve outreach content for Think Blue and UMass web pages to simplify the process of soil testing, interpreting results, and then acting on those results. For its part, PVPC revised elements on the Think Blue website related to lawn care including:

- Soil test information, noting that 95% of soil tests showing that already way overblown on nutrients – clear pattern
- References to good field guide resource(s)

Once these updates were made, PVPC worked with the Stormwater Committee social media consultant on social media campaign with a slightly revised lead message: “Know what your lawn needs.”

Targeted audience: Residential and business/institutions/commercial facilities owners

Responsible department/parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable goal(s): Analytics for the *Think Blue Connecticut River* website page on lawn care, indicate that there were a total of 1917 views on the website landing page with 4 downloads.

Message dates: May 7<sup>th</sup> to 14<sup>th</sup>

Message completed for: Appendix F requirements ✓ Appendix H Requirements ✓

Was message different than what proposed in your NOI/SWMP? Yes No ✓

If yes, describe why the change was made: N/A



*Above is the post that ran on social media and had 2,237 clicks to Learn More, which directly links people to content on the Connecticut River Think Blue website specific to lawn care.*

### ***Business and commercial audience***

For the business audience, PVPC had planned to do an op-ed piece in the Business West magazine featuring a local business following best practices, but we were unable to locate a company willing to work with us on a letter to the editor. We made significant outreach efforts with repeated emails and calls to follow up with over ten local businesses but were never returned and we were unsuccessful.

### **Proper management of pet waste**

Summer messaging was combined with annual messaging requirements for bacteria and pathogens. See description in section 2 above.

### **Proper disposal of leaf litter**

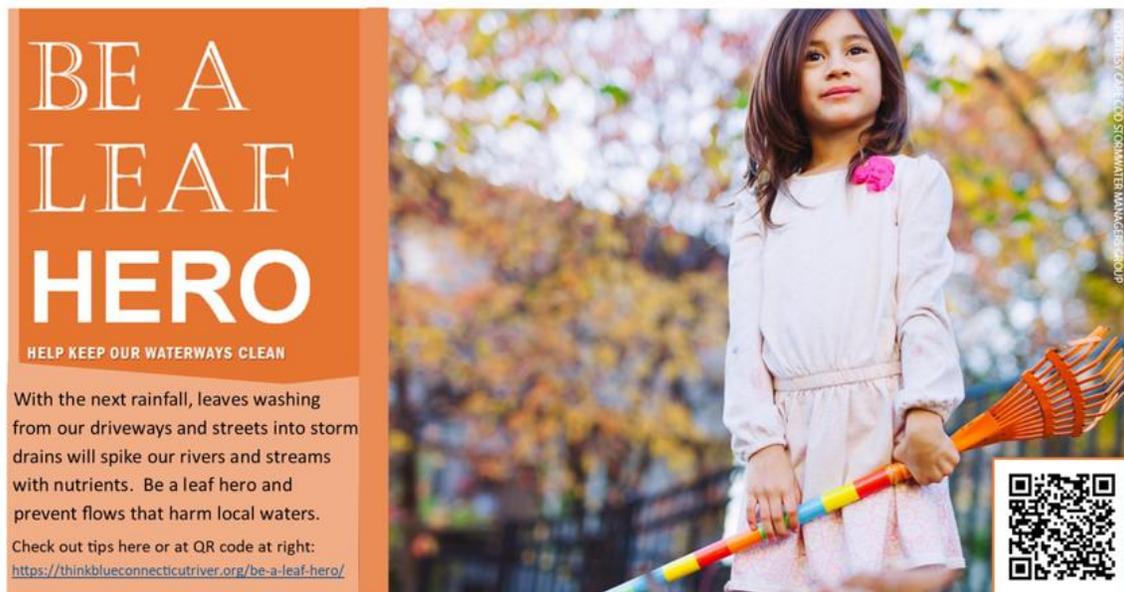
### ***Residential audience***

For Year 7, PVPC worked with the *Be a Leaf Hero* social media posts developed by the Cape Cod Commission, already customized by PVPC for the Connecticut River Stormwater Committee. Messaging to the residential audience included the following:

- Slides displayed by local cable access television stations
- A flyer for posting on member webpages

Both messaging elements included a “call to action,” providing a link to a series of tips and more in-depth content on the *Think Blue Connecticut River* website. The flyer included a link to locations for proper disposal of leaves and yard waste in each community. See website page at: <https://thinkblueconnecticutriver.org/be-a-leaf-hero/>. The content seeks to promote better practices with leaf litter and build understanding about potential contamination of stormwater with leaf litter.

Given the election season this fall, however, there was no related social media messaging. In past election seasons, there has been heightened security around social media and the work to get through barriers to post has been extremely time consuming. With the U.S. presidential election this fall, it is anticipated that these issues will only be compounded.



*Above is the slide provided to cable access television stations in the region.*

CLEAN WATER  
BEGINS WITH YOU



## KEEP FALLEN LEAVES OUT OF STREETS

Leaves raked or blown into streets will leach nutrients into stormwater runoff and contribute to pollution in our local waterways. Leaf litter can also plug storm drains and increase flooding issues.

Better options:

- Mulch leaves in place with your lawnmower to put valuable nutrients back into the soil
- Gather leaves and other "yard waste" into a compost pile and let overwinter and decompose for use as fertilizer next growing season

- Dispose of your leaves locally.

Find out where at :

<https://thinkblueconnecticutriver.org/wp-content/uploads/2022/10/Muni-disposal-resources-Leaves-updated-10-16-22.pdf>



# BE A LEAF HERO

For more tips and information visit:

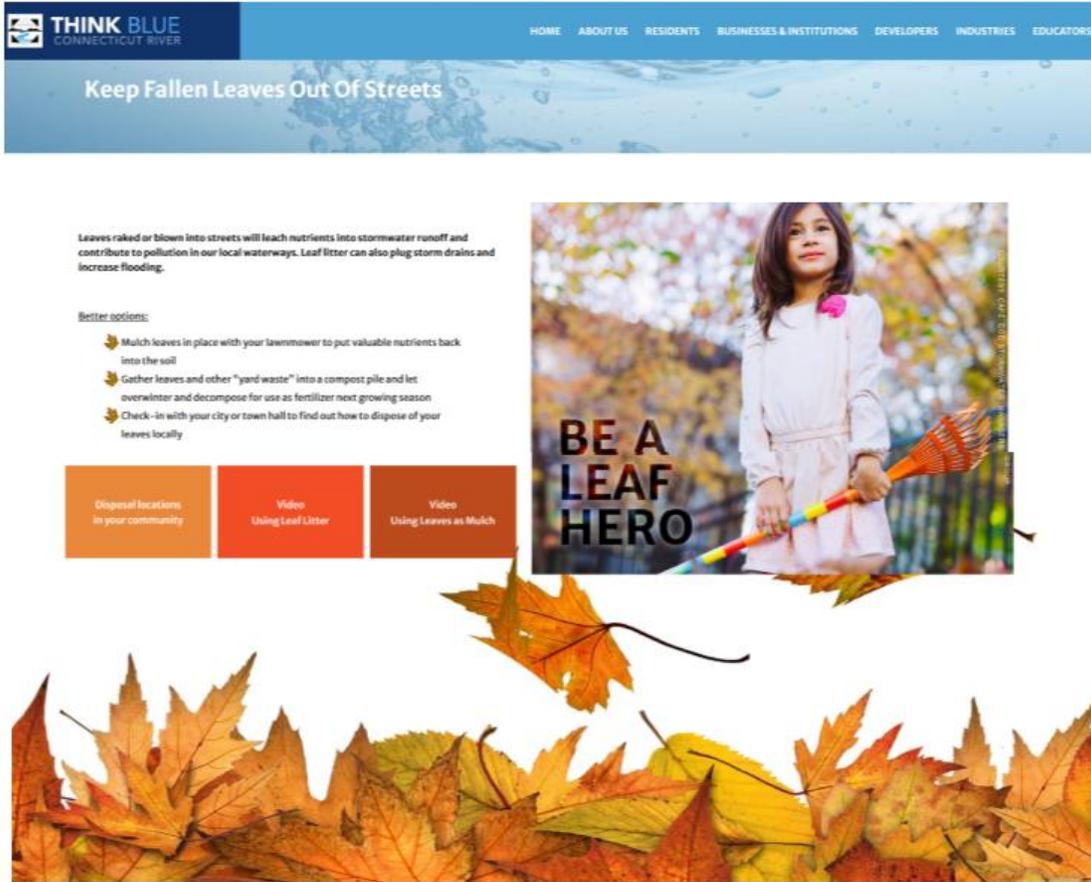
[www.thinkblueconnecticutriver.org/be-a-leaf-hero](http://www.thinkblueconnecticutriver.org/be-a-leaf-hero)

ADAPTED COURTESY CAPE COD STORMWATER MANAGERS GROUP

### What is Stormwater Pollution?

It's the toxic mix of bacteria, chemicals, metals, nutrients and other contaminants that washes over pavement and other impervious surfaces and flows down storm drains to our waterways.

*This flyer, which includes a link to a list of locations for proper disposal of leaves, was provided for members to post on municipal websites.*



*Above is the Think Blue Connecticut River website landing page on leaf litter, where social media clicks take the audience to additional information, including a list of disposal locations in Stormwater Committee communities and two instructional videos.*

Targeted audience: Residents

Responsible department/parties: PVPC staff and Connecticut River Stormwater Committee members

Measurable goal(s): The cable access message went to 18 local stations. Analytics for the *Think Blue Connecticut River* website page on leaf litter, indicate that there were a total of 1416 views on the website landing page with 3 downloads.

Message dates: October 11 to 29, 2024

Message completed for: Appendix F requirements Appendix H requirements ✓

Was message different than what proposed in your NOI/SWMP? Yes ✓ No

If yes, describe why the change was made: N/A

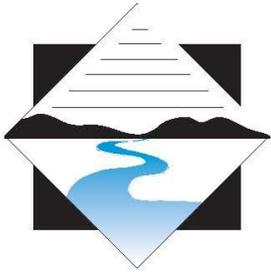
## *Business and commercial audience*

For the business and commercial audience in Year 7, PVPC issued a letter to reach 147 landscaping and lawn care companies in the region with best practices messaging on disposal of leaf litter and leaf. We also included a survey asking questions related to managing and disposing of leaves from lawns and yards. Signed by the Committee Chair and Co-chair, the letter promoted several key best practices:

- Keep leaves off of driveways and roadways where they can easily wash into storm drains and contribute to higher nutrient flows during the fall season.
- Use a mulching mower. By mulching the leaves into turf areas, you avoid having to rake/blow and bag and you offer a way to manage autumn leaves while providing clients with free fertilizer. Mulched leaves recycle nutrients and reduce the overall need for applied fertilizer, which can help to reduce nutrient loading for local rivers, streams, and lakes.
- Alternatively, if your client has an existing compost pile, you can recommend that they consider allowing you to add leaves to the pile. Leaves provide a critically important element (carbon) to the composting process, making for a more soil enriching product to be used in the next growing season. Be sure compost piles are located away from streams, lakes, or storm drains as these decomposing materials and nutrients could easily reach these water resources.

A survey went out to all 147 landscaping companies in the region asking several questions, including

- Do you ever use a mulching mower to manage leaves on your client's lawns and yards?
- If you have never used a mulching mower, is there anything that would be helpful in enabling you to mulch leaves into the lawn (e.g. help with purchasing equipment, informative brochure for use with your client on the benefits of mulching leaves)?
- Do you ever add leaves to your client's composting pile?
- Do you ever take leaves to a nearby farm or other facility that composts leaves
- Do you ever dispose of leaves in another location?
- If yes, please indicate what other location you use to dispose of leaves at:
- Would you like more information on possible locations where land care professionals can dispose of leaves?
- If yes, please provide your company name and best contact for additional information:
- If you did not answer "yes" in Question 7 and would like to be entered into raffle, please provide your name and contact information here:



# C O N N E C T I C U T R I V E R

## S t o r m w a t e r C o m m i t t e e

October 22, 2024

- Town of Agawam**
- Town of Belchertown**
- City of Chicopee**
- Town of East Longmeadow**
- City of Easthampton**
- Town of Granby**
- Town of Hadley**
- City of Holyoke**
- Town of Longmeadow**
- Town of Ludlow**
- City of Northampton**
- Town of Palmer**
- Town of South Hadley**
- Town of Southampton**
- Town of Southwick**
- City of Springfield**
- Town of West Springfield**
- City of Westfield**
- Town of Wilbraham**
- University of Massachusetts**
- Pioneer Valley Planning Commission**

Hello Professional Landscaper:

As you may know, many communities here in the Pioneer Valley are subject to more stringent federal stormwater requirements. This permit requires communities to reduce contaminated storm flows to local rivers, streams, and lakes. Under the Clean Water Act, we have made important strides toward fishable and swimmable waters, but we still have some distance to go.

### Why should you care as a professional landscaper?

Many lawn care practices contribute directly to storm flows that are especially high in nutrients. The improper use and disposal of fertilizers, leaves, and grass clippings add nutrients like nitrogen and phosphorous into storm flows, which then directly enter our local rivers & stream. As a lawn care professional, you can do your part to help by learning more about best lawn care practices. These are changes to common practice and will involve the cooperation of your client as well. To that end, our group has posted information for property owners on better management practices. See: [www.thinkblueconnecticutriver.org/be-a-leaf-hero/](http://www.thinkblueconnecticutriver.org/be-a-leaf-hero/)

### For your work this fall, you might start by considering the following:

- **Keep leaves off of driveways** and roadways where they can easily wash into storm drains and contribute to higher nutrient flows during the fall season.
- **Use a mulching mower.** By mulching the leaves into the lawn, you avoid having to rake/blow and bag and you offer a way to manage autumn leaves while providing your client with free fertilizer. Mulched leaves put nutrients back into the ground and reduce the overall need for more soluble fertilizer products, which present greater problems for our local waterways.
- Alternatively, if your client has an existing **compost** pile, you can recommend they consider allowing you to add leaves to the pile. Leaves provide a critically important element (carbon) to the composting process, making for a more soil enriching product to be used in the next growing season. *Be sure compost piles are located away from streams, lakes, or storm drains as these decomposing materials and nutrients could easily leach to these water resources.*

### Thank you for considering these better lawn care practices for leaf litter!!!

In an effort to better serve you we are conducting a brief survey to determine how local landscapers dispose of leaf litter. Surveys will be open until November 30, 2024, and anyone who participates in the survey will be entered into a raffle for a \$100 Lowes or Home Depot Gift Card! Please use the QR code or the following link for the survey: <https://www.surveymonkey.com/r/fall2024leaf>



Patty Gambarini, from Pioneer Valley Planning Commission, would be happy to hear from you about any thoughts on improving leaf litter practice in the region. Please contact her at: [pgambarini@pvpc.org](mailto:pgambarini@pvpc.org)

Sincerely,

Joseph Kietner, Committee Chairman  
Stormwater Coordinator, City of Westfield

Randal Brown, Committee Vice Chair  
Public Works Director, Town of Southwick

*Above is the letter sent to 147 landscaping companies in the region.*



Town of Wilbraham, Massachusetts

# **LAKE & POND PHOSPHORUS CONTROL PLAN (LPCP)**

For Spectacle Pond Watershed  
Phosphorus TMDL

February 2025

**Tighe&Bond**

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Attachment B	Spectacle Pond Watershed-Based Plan
Attachment C	Methodology for Phosphorus Load Calculations
Attachment D	EPA BATT: Phosphorus Removal Estimate Calculations for Town & Private BMPs
Attachment E	EPA Guidance: Using a Self-Certification Process to Streamline Operation & Maintenance (O&M) of Private Stormwater Controls
Attachment F	Excerpt from Municipal Facilities and Activities Inventory and Operations & Maintenance Plan: Structural BMP Inspections & Maintenance Standard Operating Procedure

# Section 1

## Overview of Spectacle Pond's Water Quality Concerns

The 2016 National Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts ("MS4 Permit" or "the Permit") took effect on July 1, 2018. The Permit was subsequently modified on December 7, 2020; modifications took effect on January 6, 2021. The MS4 Permit conditions the operation, regulation, and management of MS4s in subject Massachusetts communities. Terms and conditions include requirements across six Minimum Control Measures (MCMs), and water quality-based effluent limitations (WQBEL), including requirements for waterbodies with approved Total Maximum Daily Loads (TMDLs) and other water quality-limited waterbodies.

A TMDL (a.k.a. "pollution budget") for phosphorus was developed and approved in January 2002 for select waterbodies (lakes and ponds) in the Chicopee watershed, including Spectacle Pond<sup>1</sup>. Phosphorus is a nutrient that, when present at high levels in natural waterbodies, can cause overgrowth of aquatic plants, increased harmful algal blooms, decreased light in a waterbody, and decreased levels of dissolved oxygen, thereby impairing designated uses (aquatic life, fish consumption, primary and secondary contact, and aesthetics) per the Commonwealth's Surface Water Quality Standards (314 CMR 4.00). Phosphorus is a common pollutant in stormwater, with sources including leaf litter, pet waste, road salt, fertilizer, and atmospheric deposition. A variety of structural (infiltration and treatment structures) and non-structural (such as street sweeping and catch basin cleaning) Best Management Practices (BMPs) can be effective at reducing phosphorus loads from stormwater.

Per the TMDL, the lakes and ponds included "were listed on the state "303d" list for a variety of pollutants and stressors including low dissolved oxygen, turbidity, nutrients, and overabundance of nuisance aquatic plants. All of the pollutants and stressors are indicators of nutrient enriched systems, better known as the process of eutrophication. In freshwater systems the primary nutrient known to accelerate eutrophication is phosphorus. Therefore, in order to prevent further degradation in water quality and to ensure that each lake meets state water quality standards, the TMDL establishes a phosphorus limit for each lake and outlines corrective actions to achieve that goal."

Since approval of the TMDL in January 2002, iterations of the Integrated List of Waters have consistently listed Spectacle Pond as being impaired by noxious aquatic plants (2008 Integrated List) and eutrophication biological indicators (added in 2010 Integrated List). The Massachusetts Final 2016 Integrated List of Waters was approved in 2019 and did not add any new impairments. The Massachusetts Final 2018/2020 (approved in February 2022) and 2022 Integrated Lists of Waters (approved in May 2023) also did not add any new impairments. Excerpts from the 2014, 2016, 2018/2020, and 2022 Integrated List of Waters are enclosed (see **Attachment A**).

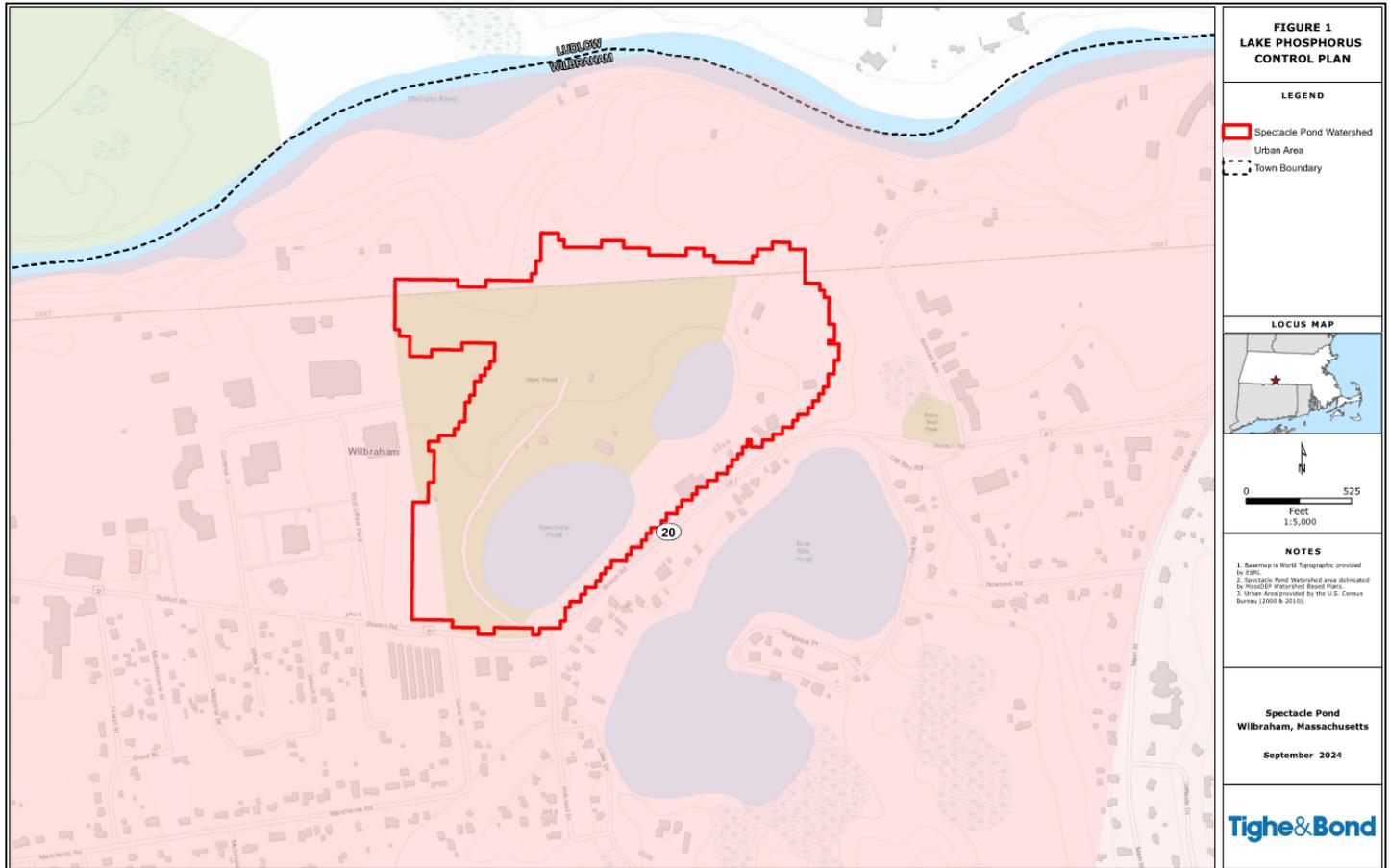
A portion of the Town of Wilbraham's MS4 discharges to Spectacle Pond. As specified in the Permit's Appendix F, Part A.II, the Town's discharges to Spectacle Pond and its tributaries are subject to the Permit requirements to address phosphorus impairments through the development and implementation of a Lake and Pond Phosphorus Control Plan (LPCP).

---

<sup>1</sup> Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes (TMDL Report Number: MA36025), <https://www.mass.gov/doc/final-tmdls-of-phosphorus-for-selected-chicopee-basin-lakes/download>

Spectacle Pond occupies approximately 9 acres in Wilbraham. The pond is located north of Boston Road and northwest of Nine Mile Pond. The pond is fed by an unnamed wetland as well as sheet flow from the surrounding area (which is primarily developed open space, forest, and impervious). The total watershed of Spectacle Pond is approximately 64 acres.

**Figure 1** shows the location of Spectacle Pond, the approximate watershed, and Wilbraham’s MS4 urbanized areas.



**Figure 1** Spectacle Pond Watershed

A Watershed-Based Plan for Spectacle Pond is enclosed (see **Attachment B**), which was prepared using the Massachusetts Watershed-Based Plan toolkit, provides additional background information about the watershed and water quality concerns.

## Section 2

# EPA's Lake & Pond Phosphorus Reduction Requirements

To address the required phosphorus reduction of 45% in Spectacle Pond, the Permit requires Wilbraham to develop a written LPCP and fully implement all control measures as soon as possible, but no later than June 30, 2033 (15 years from effective date of the Permit). The LPCP is comprised of the following elements, which are included in this report:

- Scope of the "LPCP Area"
- Legal analysis
- Calculations for Baseline Phosphorus Load, Phosphorus Reduction Requirement, and Allowable Phosphorus Load
- Descriptions of non-structural and structural controls
- Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs
- Cost and funding source assessment
- Implementation Schedule
- Performance Evaluation

The Permit assumes phosphorus will first be addressed with non-structural controls (street sweeping, catch basin cleaning, and enhanced leaf litter pickup), assessing performance of those controls, and then adding structural controls and assessing performance over the remaining years through 2033.

### 2.1 LPCP Scope (LPCP Area)

An element of the LPCP requires the Town to determine the scope of implementation for the LPCP. An excerpt from the Permit for this is as follows:

*The Permittee shall indicate the area in which the Permittee plans to implement the LPCP, this area is known as the "LPCP Area". The Permittee must choose one of the following: 1) to implement its LPCP in the entire area within its jurisdiction discharging to the impaired waterbody (for a municipality this would be the municipal boundary) or 2) to implement its LPCP in only the urbanized area portion of its jurisdiction discharging to the impaired waterbody. If the Permittee chooses to implement the LPCP in its entire jurisdiction discharging to the impaired waterbody, the Permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and nonstructural controls on discharges that occur both inside and outside the urbanized area. If the Permittee chooses to implement the LPCP in its urbanized area only discharging to the impaired waterbody, the Permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur within the urbanized area only.*

The Spectacle Pond watershed is fully within Wilbraham's town boundaries and its Urbanized Area (i.e., the area regulated by the Permit). Thus, the Town will implement its LPCP within this entire area.

---

## Section 3 LPCP “Legal Analysis” Requirements

In accordance with Appendix F, as part of developing and implementing an LPCP designed to reduce the amount of phosphorus in stormwater discharges from the MS4 to Spectacle Pond and its tributaries, Wilbraham must conduct an analysis of local legal authority that may be necessary to effectively implement the entire LPCP (termed by EPA as a “legal analysis”). A description of the Legal Analysis, as stated in the Permit, reads as follows:

*The Permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances and describes any changes to these regulatory mechanisms that may be necessary to effectively implement the LPCP. This may include the creation or amendment of financial and regulatory authorities. The Permittee shall adopt necessary regulatory changes by the end of the Permit term.*

Tighe & Bond has prepared the LPCP Legal Analysis to identify existing regulatory mechanisms available to the Town such as bylaws and regulations and any changes to regulatory mechanisms that may be necessary to effectively implement the entire LPCP. The following includes an analysis of available non-structural, structural, and semi-structural phosphorus reduction actions; current legal authority of the Town to implement those actions on both public and private property; and future changes that would be required to fully implement the LPCP. This analysis also considers the potential use of a Stormwater Utility or Enterprise Fund that could include a credit system for private properties, as well as the potential for EPA taking Residual Designation Authority (RDA) over private properties.

### 3.1 Legal Authority to Implement LPCP on Public Property

#### Current Authority

The Town of Wilbraham has authority to undertake all structural and non-structural controls on public property. Public property consists of Town owned or operated parcels including parking lots, as well as municipal roadways and the right of way. Wilbraham can complete street sweeping, catch basin cleaning, and although not currently implemented, an enhanced Organic Waste and Leaf Litter Collection program, both now and in the future. Wilbraham has authority to install structural or semi-structural BMPs on Town-owned lands.

#### Changes Needed

There are no legal changes necessary to implement the LPCP on public property. However, requiring all public new and redevelopment projects to implement structural BMPs that improve water quality, beyond those required by current local code, requires buy-in from municipal officials and planning for these efforts in capital and operational budgets.

## 3.2 Legal Authority to Implement LPCP on Private Property

### Current Authority

#### Local Code:

- Stormwater Management By-Law: The Town's Stormwater Management By-Law<sup>2</sup> outlines the following thresholds for projects requiring a Local Stormwater Management Permit through the Wilbraham Department of Public Works:
  1. Any proposed development disturbing an area of less than 1 acre;
  2. Subdivisions and construction activities of any kind disturbing an area equal to or greater than 1 acre; and
  3. Development or redevelopment involving multiple separate activities in discontinuous locations or on different schedules if the activities are part of a larger common plan of development that all together disturbs an area equal to or greater than 1 acre.

As outlined in the associated Regulations<sup>3</sup>, stormwater management systems installed on new development and redevelopment sites must meet total phosphorus removal standards as outlined in the Permit. Additionally, the Regulations require applicants to implement structural and non-structural stormwater BMPs that are optimized to remove the pollutant(s) responsible for nearby waterbody impairments or TMDLs, which includes this Spectacle Pond phosphorus TMDL.

- Title V: Title V applies to subsurface sewage disposal systems (septic systems) of 10,000 gallons per day or less that must conform to 310 CMR 15.00. This includes private residential properties in Wilbraham. Implementation of the Town's Title V code and providing educational materials about proper maintenance to septic system owners can help reduce phosphorus loadings to local waters via leaching or failing systems.

#### Non-Structural BMPs:

- Catch Basin Cleaning: Wilbraham has no authority to clean catch basins on private individual properties. This could be required as an ongoing condition through an O&M Plan required by the Wilbraham Department of Public Works.
- Enhanced Sweeping: Wilbraham has no authority to physically sweep on private individual properties. Similar to catch basin cleaning, this could be required as an ongoing condition through an O&M Plan required by the Wilbraham Department of Public Works.
- Enhanced Organic Waste and Leaf Litter Collection Program: Wilbraham has no authority to require this work on private property; further, the Town has no control over the method of disposal on private individual properties. In order to meet the Organic Waste and Leaf Litter Collection program requirements in Appendix F, the private entities must gather and remove all landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots at least once per week during the period of September 1 to December 1 of each year.

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<sup>2</sup> The Town's Stormwater Management By-Law is Article VI, Section 634 of the General By-Laws, revised 4/28/2021.

<sup>3</sup> The Wilbraham Stormwater Regulations include additional requirements and were last amended 2021.

**Semi-Structural BMPs<sup>4</sup>:** There is limited opportunity to require semi-structural BMPs through current code.

**Structural BMPs<sup>5</sup>:** Structural BMPs on private properties can only be required through issuance of a local Permit that requires structural BMPs as part of Permit conditions and/or O&M Plan. **Currently, it is impossible under local code for the Town to require a completed project to retrofit the drainage system to add structural BMPs on private property.**

### Changes Needed

To fully implement the LPCP on private property, there would need to be significant changes to local and/or state and federal Permitting. Note that the Spectacle Pond watershed area covers only a portion of Wilbraham, as shown in **Figure 1**. The requirements of the LPCP are only applicable in the area covered by the watershed.

Some changes to consider include:

1. Changes to roadway width, parking, and other requirements in local codes that result in creation of impervious cover. Additional recommendations related to impervious cover provisions in local code are outlined in the *Town of Wilbraham – Local Code Assessment* memorandum completed in September 2022.
2. Development of a rain barrel program.
3. Developing a Stormwater Utility or Enterprise Fund and incentivizing private sites to take their own actions through a credit system.
4. Politically, it will be very challenging if not impossible to require private properties to retrofit a site without an activity that triggers local Permitting. EPA Region 1 has been petitioned to take Residual Designation Authority (RDA)<sup>6</sup> of various watersheds. Wilbraham can consider supporting an RDA petition, if desired, however, elected officials and decision makers should carefully consider balancing Town needs with the economics of private landowners.

---

<sup>4</sup> Semi-structural BMPs include impervious area disconnection through storage (e.g., rain barrels, cisterns, etc.), impervious area disconnection, conversion of impervious area to permeable pervious area, and soil amendments to enhance permeability of pervious areas

<sup>5</sup> Structural BMPs include infiltration trench, infiltration basin or other surface infiltration practice, bio-filtration practice, gravel wetland system, porous pavement, wet pond or wet detention basin, dry pond or detention basin, dry water quality swale/grass swale

<sup>6</sup> EPA and the authorized states regulate stormwater discharges from regulated MS4s, industrial activities, and construction sites under section 402(p) of the Clean Water Act. These stormwater discharges require NPDES Permits. In addition, EPA can use its "residual designation" authority under 40 CFR 122.26(a)(9)(i)(C) and (D) to require NPDES Permits for other stormwater discharges or category of discharges on a case-by-case basis when it determines that:

- the discharges contribute to a violation of water quality standards,
- the discharges are a significant contributor of pollutant to federally protected surface waters, or
- controls are needed for the discharge based on wasteload allocations that are part of TMDLs that address the pollutant(s) of concern.

## Section 4 Phosphorus Loadings

The next element of the LPCP includes determining a baseline phosphorus loading and phosphorus reduction requirement within the watershed. The methodology for this analysis is included in **Attachment C**. An excerpt from the Permit for this phase is as follows:

*Permittees shall calculate their numerical Allowable Phosphorus Load and Phosphorus Reduction Requirement in mass/yr by first estimating their Baseline Phosphorus Load in mass/yr from its LPCP Area consistent with the methodology in Attachment 1 to Appendix F, the baseline shall only be estimated using land use phosphorus export coefficients in Attachment 1 to Appendix F and not account for phosphorus reductions resulting from implemented structural BMPs completed to date. Table F-6 contains the percent phosphorus reduction required from urban stormwater consistent with the TMDL of each impaired waterbody. The Permittee shall apply the applicable required percent reduction in Table F-6 to the calculated Baseline Phosphorus Load to obtain the Permittee specific Allowable Phosphorus Load. The Allowable Phosphorus Load shall then be subtracted from the Baseline Phosphorus Load to obtain the Permittee specific Phosphorus Reduction Requirement in mass/yr.*

The **Baseline Phosphorus Load** is a measure of the annual phosphorus load discharging in stormwater from the impervious and pervious areas within the MS4 area in each watershed subject to the LPCP. Watersheds that are more densely developed and have more impervious cover will yield a higher total pollution potential (e.g., a commercial property will have a higher phosphorus loading than forested land). The calculation uses phosphorus loading rates prescribed by EPA for each land use type within the watershed. The sum of loading rates for all land use categories in the watershed is the total Baseline Phosphorus Load for the watershed.

The Phosphorus Pounds Reduction, also referred to as the **Phosphorus Reduction Requirement**, represents the required reduction in annual phosphorus load in stormwater to meet the water quality goals for the impaired watershed. This is calculated by multiplying the Baseline Phosphorus Load by the Required Percent Reduction for the watershed (45% reduction for the Spectacle Pond watershed). This yields the Phosphorus Pounds Reduction.

The **Allowable Phosphorus Load** is the amount of phosphorus allowed in stormwater within the impaired watershed annually. It is calculated by subtracting the Phosphorus Reduction Requirement from the Baseline Phosphorus Load.

**Table 1** includes a summary of the Baseline Phosphorus, Phosphorus Reduction Requirement, and Allowable Phosphorus Load for the Spectacle Pond watershed.

**Table 1** Required Reduction of Phosphorus from Stormwater

<b>Waterbody</b>	<b>Watershed Area in Wilbraham &amp; its MS4 (acres)</b>	<b>Baseline Phosphorus Load (lbs/yr)</b>	<b>Phosphorus Reduction Requirement P<sub>RR</sub> (lbs/yr)</b>	<b>Allowable Phosphorus Load P<sub>allow</sub> (lbs/yr)</b>
Spectacle Pond	64	15.2	6.83	8.35

Notes:

- The Baseline Phosphorus Load was calculated using the MassGIS land use category database from 2005.
- The watershed area for Spectacle Pond was determined using StreamStats from USGS and differs slightly from the area provided in the enclosed Watershed-Based Plan.

## 4.1 Non-Structural Controls

The LPCP requires the Town to determine what types of non-structural stormwater control measures can be implemented to achieve the phosphorus reduction requirement of 6.83 lbs/year within the LPCP Area. An excerpt from the Permit for this phase is as follows:

*The Permittee shall describe the non-structural stormwater control measures to be implemented to support the achievement of the milestones in Table F-7. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation.*

Non-structural controls include street sweeping, catch basin cleaning, and enhanced leaf litter pickup. The Town is currently implementing all three of these non-structural BMPs, which can qualify for phosphorus reduction credits.

The **street sweeping credit** is calculated using Equation 2-1 from Attachment 2 to Appendix F of the Permit, as follows:

$$\text{Phosphorus Credit} = IA_{\text{swept}} \times \text{PLER}_{\text{IC-land use}} \times \text{PRF}_{\text{sweeping}} \times \text{AF}$$

Where:

$IA_{\text{swept}}$  = Area of impervious surface that is swept (acres)

$\text{PLER}_{\text{IC-land use}}$  = Phosphorus load export rate for impervious cover and specified land use (lb/acre/yr)

$\text{PRF}_{\text{sweeping}}$  = Phosphorus reduction factor for sweeping based on sweeper type and frequency

AF = Annual frequency for sweeping. Note, as stated in Attachment 2 to Appendix F, "for full credit for monthly and weekly frequency, sweeping must be conducted year round. Otherwise, the credit should be adjusted proportionally based on the duration of the sweeping season (using AF factor)." Wilbraham sweeps 2x per year, thus the AF factor used was (2/12).

The **catch basin cleaning credit** is calculated using Equation 2-3 from Attachment 2 to Appendix F of the Permit, as follows:

$$\text{Phosphorus Credit} = IA_{\text{CB}} \times \text{PLER}_{\text{IC-land use}} \times \text{PRF}_{\text{CB}}$$

Where:

$IA_{\text{CB}}$  = Impervious drainage area to catch basins (acres)

$\text{PLER}_{\text{IC-land use}}$  = Phosphorus load export rate for impervious cover and specified land use (lb/acre/yr)

$\text{PRF}_{\text{CB}}$  = Phosphorus reduction factor for sweeping based on sweeper type and frequency. Note, Attachment 2 to Appendix F gives the  $\text{PRF}_{\text{CB}}$  for catch basin cleaning as 0.02.

The **leaf litter program credit** is calculated using Equation 2-5 from Attachment 2 to Appendix F of the Permit, as follows:

$$\text{Leaf Litter Credit} = IA_{\text{leaf litter}} \times \text{PLER}_{\text{IC-land use}} \times 0.05$$

Where:

$IA_{\text{leaf litter}}$  = Impervious area (acres) subject to enhanced organic waste and leaf litter collection program

$\text{PLER}_{\text{IC-land use}}$  = Phosphorus load export rate for impervious cover and specified land use (lb/acre/yr)

$\text{PRF}_{\text{sweeping}}$  = Phosphorus reduction factor for sweeping based on sweeper type and frequency

AF = 5% nutrient reduction factor for organic waste and leaf litter collection program

**Table 2** presents these phosphorus reduction credits.

**Table 2** Current Non-Structural Control Summary

<b>Non-Structural BMP</b>	<b>Average Annual Acres Managed</b>	<b>Average Annual Phosphorus-Reduction (lb/yr)</b>	<b>Implementation Level (frequency, sweeper type)</b>
<b>Town</b> <sup>1</sup>			
Street Sweeping	2.70	0.01	2x per year, mechanical broom
Catch Basin Cleaning	3.05	0.12	1x per year
Leaf Litter Program	2.70	0.26	Weekly effort Sept 1 – Dec 1
<b>TOTAL P<sub>NSred</sub></b>	-	<b>0.39</b>	-
<b>Private</b> <sup>2</sup>			
Street Sweeping	2.11	0.01	2x per year, mechanical broom
Catch Basin Cleaning	3.93	0.15	1x per year
Leaf Litter Program	N/A	N/A	N/A
<b>TOTAL P<sub>NSred</sub></b>	-	<b>0.16</b>	-

<sup>1</sup> Town Data Assumptions:

- 2016 MassGIS Land Use data layer was used.
- Street Sweeping - The nutrient reduction efficiency factor for sweeping impervious areas was assumed as the 2x/year frequency with a mechanical broom.
- Catch Basin Cleaning – Metropolitan Area Planning Council (MAPC) method for catchment delineations were used to develop catchment areas on an individual catch basin basis.
- Leaf Litter Program – The Town performs regular gathering, removal and disposal of landscaping wastes, organic debris, and leaf litter from impervious surfaces in the watershed.
- The Average Annual Acres Managed noted includes town-owned streets/parking areas within the LPCP area, excluding private parking lots because they are not maintained by the Town.

<sup>2</sup> Private Data Assumptions:

- 2016 MassGIS Land Use data layer was used.
- Street Sweeping - The nutrient reduction efficiency factor for sweeping impervious areas was assumed as the 2x/year frequency with a mechanical broom.
- It is unknown whether the private properties have a leaf litter collection program, so no credits were evaluated.
- Catch Basin Cleaning – Metropolitan Area Planning Council (MAPC) method for catchment delineations were used to develop catchment areas on an individual catch basin basis.
- The Town will confirm proper catch basin & street sweeping procedures are followed on private lots within the watershed. The phosphorus credit from private entities is included here for planning purposes.

At this time, the financial and staffing resources to enhance non-structural controls are not available. The Town will further evaluate the feasibility of increasing these efforts in subsequent years.

## 4.2 Structural Controls

### 4.2.1 Planned Structural Controls

The LPCP also requires the Town to determine what types of structural stormwater control measures can be implemented to achieve the phosphorus reduction requirement of 6.83 lbs/year within the LPCP Area and develop a priority ranking for locations within the LPCP Area where the controls can be implemented. An excerpt from the Permit for this phase is as follows:

*The Permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices. The ranking shall be developed through the use of available screening and monitoring results collected during the Permit term either by the Permittee or another entity and the mapping required pursuant to part 2.3.4.6 of the Permit. The Permittee shall also include in this prioritization a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The Permittee shall coordinate this activity with the requirements of part 2.3.6.8.b of the Permit. A description and the result of this priority ranking shall be included in the LPCP. The Permittee shall describe the structural stormwater control measures necessary to support achievement of the milestones in Table F-7. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in the LPCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.*

As described in Section 9.1 of this report, the Town is on track to meet its reduction requirements due to existing non-structural and structural control measures. Therefore, the following section outlines structural stormwater controls that have been implemented within the LPCP Area for municipal and private BMPs.

### 4.2.2 Existing Town-owned BMPs

An assessment was completed to estimate total phosphorus removal for the existing municipal BMP that has been installed within the LPCP Area since the Permit effective date. This assessment utilized EPA's BMP Accounting and Tracking Tool (BATT). BATT uses BMP type, storage volume, catchment area, hydrologic soil group (HSG) and infiltration rate to estimate total phosphorus reduction by the BMP. Available design plans were provided by the Town and were used to estimate BMP storage volume. The catchment area of the BMP was estimated using the catch basin catchment delineations discussed in **Table 2**, as well as the 2016 MassGIS Land Use data layer. Natural Resources Conservation Service (NRCS) Soils Layer was referenced for HSG on the BMP site; however, the location was not assigned a value. Therefore, according to Permit Appendix F Attachment 1, an HSG was assumed to be "C" and Rawls Rate was used for the infiltration rate (0.27 in/hr for HSG C soils). This calculation is summarized in **Table 3** and included in **Attachment D**.

**Table 3** Existing BMP Estimated Phosphorus Load Reductions

Location	BMP	Estimated TP Removal (lb/yr)
Spectacle Pond Public Area	Detention Basin	3.25
<b>Total</b>		<b>3.25 lb/yr</b>

In order to take credit for the estimated **3.25 lb/yr** from the existing municipal BMP, the Town must certify in Annual Reports that the BMP is performing up to design specifications and is

properly maintained and inspected according to manufacturer design or specifications. The Permit provides certification statement language as follows:

*I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.*

#### 4.2.3 Existing Privately-owned BMPs

Phosphorus load reductions from private structural BMPs can be used to offset the phosphorus loading in the LPCP Area if O&M of the private BMPs is certified by the private owners. Using EPA's BATT, estimated total phosphorus removal was calculated for the existing private BMP that has been installed within the LPCP Area since the Permit effective date, shown in **Table 4** and included in **Attachment D**. Available design plans were provided by the Town and were used to estimate BMP storage volume. The catchment area of the BMP was estimated using the catch basin catchment delineations discussed in **Table 2**, as well as the 2016 MassGIS Land Use data layer. NRCS Soils Layer was referenced for HSG on the BMP site; however, the location was not assigned a value. Therefore, according to Permit Appendix F Attachment 1, an HSG was assumed to be "C" and Rawls Rate was used for the infiltration rate (0.27 in/hr for HSG C soils).

**Table 4** Existing BMP Estimated Phosphorus Load Reductions

Location	BMP	Estimated TP Removal (lb/yr)
Post Office Park	Infiltration Basin	6.41
<b>Total</b>		<b>6.41 lb/yr</b>

In order to take credit for the estimated **6.41 lb/yr** from the existing privately-owned BMP, annual certification is required to confirm that proper O&M was followed. The Town may utilize EPA's guidance document, *Using a Self-Certification Process to Streamline Operation & Maintenance (O&M) of Private Stormwater Controls*, provided in **Attachment E** to aid in this process.

#### 4.2.4 Conclusion

Considering the estimated phosphorus reduction removal for the existing town-owned BMP (estimated in **Table 3**), and assuming proper O&M certification, the Town currently achieves approximately **3.25 lb/yr** of phosphorus removal from Town structural BMPs.

Assuming the private sites with BMPs complete required O&M and provide the Town with proper certification, up to **6.41 lb/yr** of phosphorus removal within the LPCP Area could be achieved (estimated in **Table 4**). However, this can only be considered once the certification statement is provided to the Town.

Per the Permit's Equation 2 in Appendix F Part A.II, Section 2, the yearly phosphorus reduction from implemented structural controls ( $P_{Sred}$ ) for existing Town and private BMPs is estimated to be **9.66 lb/yr**, pending private entity BMP O&M certification.

## Section 5 Operation & Maintenance Program

The LPCP requires the Town to describe the O&M Program for structural control measures being claimed for the phosphorus reduction. An excerpt from the Permit for this phase is as follows:

*The Permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit. This includes BMPs implemented to date as well as BMPs to be implemented. The Operation and Maintenance Program shall become part of the LPCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.*

Town BMPs should be inspected following the BMP Standard Operating Procedure (SOP) included in Wilbraham's Operation & Maintenance Plan as part of their Good Housekeeping Program, which is included in **Attachment F**. The SOP includes inspection and maintenance requirements for various BMP types.

Private BMPs must be maintained in accordance with the Town's Stormwater Regulations, and the specific site's O&M Plan. As required by the Bylaw regulations<sup>7</sup>, each Local Stormwater Management Permit shall include an O&M Plan "designed to ensure that water quality standards are met in all seasons and throughout the life of the system."

Additionally, the Town has worked to reduce phosphorus loading into Spectacle Pond in other ways as well. The LPCP Area is a recreational area with field/turf, pavilion and public bathhouses. The public bathhouses (that originally used septic systems) are connected to the public sewer system. Since 2014, the Town's Recreation Department has not used fertilizers that contain phosphorus.

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<sup>7</sup> See Section 10 of the Stormwater Regulations for O&M Plan requirements. URL: <https://www.wilbraham-ma.gov/DocumentCenter/View/4575/Wilbraham-Stormwater-Regulations---11-15-2021?bidId=>

## Section 6 LPCP Funding Source Assessment

The Town must also assess possible funding sources that may be used to implement the LPCP. The Permit states:

*The Permittee shall describe known and anticipated funding mechanisms (e.g. general funding, enterprise funding, stormwater utilities) that will be used to fund PCP implementation. The Permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.*

Recommended potential funding sources include:

- Property Taxes/General Fund, including the DPW operational budget and capital projects as needed
- Grants/Loans (e.g., MassDEP State Revolving Fund)
- Stormwater Permit/Connection Fee(s)
- Stormwater Enterprise Fund with an impervious area-based fee structure.

Another component of the LPCP requires that the cost and anticipated funding for implementing the LPCP be estimated. An excerpt from the Permit for this phase is as follows:

*The Permittee shall estimate the cost for implementing its LPCP and describe known and anticipated funding mechanisms. The Permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.*

As described in Section 9.1 of this report, the Town is on track to meet its reduction requirements due to existing non-structural and structural control measures. However, if circumstances were to change, the following is the estimated cost for implementing the LPCP:

**Table 5** Estimated LPCP Implementation Cost <sup>1,2</sup>

Number	Task	Estimated Cost <sup>3</sup>
1A	Coordination with Private Entities <sup>4</sup>	In-house
1B	Annual performance evaluation	\$4,000
2	Design, Permit, and bid a BMP retrofit project <sup>5</sup>	\$30,000
3	Construct a BMP retrofit project <sup>5</sup>	\$25,000 - \$50,000

<sup>1</sup> This table was completed in Permit Year 7 in accordance with the LPCP requirements. Future updates or revisions may be completed by the Town for implementation but are not necessarily reflected herein.

<sup>2</sup> Costs presented herein exclude current operating budgets for DPW staff, equipment, etc. This should be evaluated as part of the overall LPCP implementation cost.

<sup>3</sup> Estimated costs are subject to change based on further development of the LPCP and during design and construction of structural controls.

<sup>4</sup> The Town should work with private entities in upcoming Permit Years to obtain proper O&M certification to stay on track to meet the Year 13 and 15 phosphorus reduction goals. See Section 9 for more information.

<sup>5</sup> Depending on the outcome of Task 1A, more than one BMP retrofit project may be required to meet the phosphorus reduction goal. The plan will be established after Task 1 has been completed and refined LPCP costs are known.

The Town currently funds MS4 program compliance through the General Fund for stormwater program compliance, including sweeping, catch basin cleaning, and planning. The Town anticipates funding the LPCP through a mix of grants, loans, and the General Fund (including DPW operational budget and capital projects) for work on public and Town property. Through implementation of the *Stormwater Management By-Law*, some of the onus of phosphorus reduction and water quality improvements shifts to private developers or property owners. If installation of a municipal structural BMP(s) is required, the Town intends to increase the annual Highway Department operating budget to account for the cost increase and pursue potential grant opportunities or donations. If required, a capital project could be added to the annual town budget, to be funded by the General Fund.

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## Section 7 Implementation Schedule

The development of an initial schedule for the implementation of the BMPs identified in this LPCP is required as well, as the Permit states:

*An initial schedule for implementing the BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the LPCP, and all non-structural BMPs shall be fully implemented within six years of the Permit effective date. Where planned structural BMP retrofits or major drainage infrastructure projects are expected to take additional time to construct, the Permittee shall within four years of the effective date of the Permit have a schedule for completion of construction consistent with the reduction requirements in Table F-7. The Permittee shall complete the implementation of its LPCP as soon as possible or at a minimum in accordance with the milestones set forth in Table F-7. The implementation schedule shall be updated as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the Permit effective date.*

The Permit assumes phosphorus will first be addressed with non-structural controls, assessing performance of those controls, and then adding structural controls and assessing performance over the remaining years through 2033. The initial implementation schedule for Wilbraham's LPCP is summarized in **Table 6**.

Note that performance evaluations are required each year. An excerpt describing these evaluations from the Permit is as follows:

*The Permittee shall evaluate the effectiveness of the LPCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the Permit. Phosphorus reductions shall be calculated consistent with Attachment 2 (nonstructural BMP performance), Attachment 3 (structural BMP performance) and Attachment 1 (reductions through land use change), to Appendix F for all BMPs implemented to date. Phosphorus load increases resulting from development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in units of mass/yr shall be added or subtracted from the calculated Baseline Phosphorus Load to estimate the yearly phosphorous export rate from the LPCP Area in mass/yr. The Permittee shall also include all information required in part II.2 of this Appendix in each performance evaluation.*

Table 6 Initial Implementation Schedule

Planned Date <sup>1</sup>	Task	Status
Permit Year 7 (FY2025)	<ul style="list-style-type: none"> <li>Performance Evaluation: Evaluate level of phosphorus loading based on municipal and private BMP phosphorus reductions estimated in Permit Year 7, plan for what remains to meet the phosphorus load reduction requirement (i.e., installation of additional structural BMPs).</li> </ul>	<ul style="list-style-type: none"> <li>Complete. See Section 9.1.</li> </ul>
Permit Year 8 (FY2026)	<ul style="list-style-type: none"> <li>Performance Evaluation</li> <li>Demonstrate: <math>P_{exp} \leq P_{allow} + (P_{RR} \times 0.80)</math>; where <math>P_{exp}</math> is the current total phosphorus export rate, <math>P_{allow}</math> is the Allowable Phosphorus Load, <math>P_{RR}</math> is the Phosphorus Reduction Requirement</li> </ul>	To be completed in Permit Year 8.
Permit Year 9 (FY2027)	<ul style="list-style-type: none"> <li>Performance Evaluation</li> </ul>	To be completed in Permit Year 9.
Permit Year 10 (FY2028)	<ul style="list-style-type: none"> <li>Performance Evaluation and update LPCP</li> <li>Demonstrate: <math>P_{exp} \leq P_{allow} + (P_{RR} \times 0.60)</math>; where <math>P_{exp}</math> is the current total phosphorus export rate, <math>P_{allow}</math> is the Allowable Phosphorus Load, <math>P_{RR}</math> is the Phosphorus Reduction Requirement. OR demonstrate a reduction of <math>P_{exp}</math> by 30 kg/yr (whichever is greater, unless full <math>P_{RR}</math> has been met).</li> <li>Implementation of structural controls (construction of BMP retrofit project) (<i>if required</i>).</li> </ul>	To be completed in Permit Year 10.
Permit Year 11/12 (FY2029/2030)	<ul style="list-style-type: none"> <li>Performance Evaluation</li> </ul>	To be completed in Permit Year 11/12.
Permit Year 13 (FY2031)	<ul style="list-style-type: none"> <li>Performance Evaluation</li> <li>Demonstrate: <math>P_{exp} \leq P_{allow} + (P_{RR} \times 0.30)</math>; where <math>P_{exp}</math> is the current total phosphorus export rate, <math>P_{allow}</math> is the Allowable Phosphorus Load, <math>P_{RR}</math> is the Phosphorus Reduction Requirement.</li> <li>Design and Permitting for BMP retrofit (<i>if required</i>).</li> </ul>	To be completed in Permit Year 13.
Permit Year 14 (FY2032)	<ul style="list-style-type: none"> <li>Performance Evaluation</li> </ul>	To be completed in Permit Year 14.
Permit Year 15 (FY2033)	<ul style="list-style-type: none"> <li>Performance Evaluation</li> <li>Demonstrate: <math>P_{exp} \leq P_{allow}</math>; where <math>P_{exp}</math> is the current total phosphorus export rate, <math>P_{allow}</math> is the Allowable Phosphorus Load.</li> <li>Implementation of structural controls (construction of BMP retrofit project) (<i>if required</i>).</li> </ul>	To be completed in Permit Year 15.

<sup>1</sup> Note that schedules presented herein are subject to change based on further development of the LPCP and available funding for design and construction of structural controls.

## Section 8 Annual Reporting

Starting in Permit Year 5, the following will be included in each annual report submitted by the Town to EPA and MassDEP, as stated in Appendix F, Part A.II.2 of the Permit:

- a. *All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr ( $P_{NSred}$ ) calculated consistent with Attachment 2 to Appendix F*
- b. *Structural controls implemented during the reporting year and all previous years including:*
  - a. *Location information of structural BMPs (GPS coordinates or street address)*
  - b. *Phosphorus reduction from all structural BMPs implemented to date in mass/yr ( $P_{Sred}$ ) calculated consistent with Attachment 3 to Appendix F*
  - c. *Date of last completed maintenance for each structural control*
- c. *Phosphorus load increases due to development over the previous reporting period and incurred to date ( $P_{DEVinc}$ ) calculated consistent with Attachment 1 to Appendix F*
- d. *Estimated yearly phosphorus export rate ( $P_{exp}$ ) from the LPCP Area calculated using Equation 2 [see Permit for equation]. Equation 2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with applicable phosphorus reduction milestones.*
- e. *Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:*

*I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.*
- f. *Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses (see <http://www.mass.gov/courts/docs/lawlib/300-399cmr/330cmr31.pdf>).*

## **Section 9 Performance Evaluations**

Starting in Permit Year 6, the Town must annually evaluate the level of phosphorus loading based on Town and private BMP phosphorus load reductions and discuss the plan for what remains to meet the phosphorus load reduction requirement. An excerpt from the Permit for this phase is as follows:

*The Permittee shall evaluate the effectiveness of the LPCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the Permit.*

## 9.1 Permit Year 7 Performance Evaluation

**Table 7** provides a summary of the Performance Evaluation that assesses Wilbraham's LPCP progress through Permit Year 7.

**Table 7** Permit Year 7 Performance Evaluation Summary

Parameter	Estimated Phosphorus Removal (lb/yr)
Baseline (as presented in Table 1)	15.2
Allowable (as presented in Table 1)	8.3
Calculations to Update to Current Conditions	
Changes in P-Load Since Baseline ( $P_{DEVinc}$ ) (Addresses changes to Impervious Cover since 2005 Baseline by using the 2016 MassGIS Land Use data)	+1.9
Current P-Load ( $P_{exp}$ ) = Baseline +/- Impacts = 16.6 + 12.4	17.1
Updated Phosphorus Reduction Required to Meet Allowable Load ( $P_{RR}$ ) = $P_{exp} - P_{allow} = 17.1 - 8.3$	8.8
Current P-Export Rate: Year 8 Milestone (lb/yr) $P_{exp} \leq P_{allow} + (P_{RR} \times 0.80)$ $P_{exp} \leq 8.3 + (8.8 \times 0.80)$	$P_{exp} \leq 15.4$
Current P-Export Rate: Year 10 Milestone (lb/yr) $P_{exp} \leq P_{allow} + (P_{RR} \times 0.60)$ $P_{exp} \leq 8.3 + (8.8 \times 0.60)$	$P_{exp} \leq 13.6$
Current P-Export Rate: Year 13 Milestone (lb/yr) $P_{exp} \leq P_{allow} + (P_{RR} \times 0.30)$ $P_{exp} \leq 8.3 + (8.8 \times 0.30)$	$P_{exp} \leq 11.0$
Current P-Export Rate: Year 15 Milestone (lb/yr) $P_{exp} \leq P_{allow}$ $P_{exp} \leq 9.2$	$P_{exp} \leq 8.3$
Non-Structural Phosphorus Credits for Permit Year 7	
Total Reduction from Town Non-Structural BMPs	0.39
Total Reduction from Private Non-Structural BMPs <sup>1</sup>	0.16
Structural Phosphorus Credits for Permit Year 7	
Total Reduction from Town Structural BMPs	3.25
Total Reduction from Private Structural BMPs <sup>1</sup>	6.41
Permit Year 7 Evaluation	
<b>Permit Year 7 P-Export Rate (<math>P_{exp}</math>)</b> $P_{exp} = \text{Current P-Load} - (\text{Total non-structural} + \text{structural credits})$	<b>6.89</b>
<b>Remaining Phosphorus Reduction Requirement</b> (Updated Phosphorus Reduction Requirement to Meet Allowable Load - Total Reductions) <sup>1</sup>	<b>-1.45</b>

<sup>1</sup> The Town will work with private entities to ensure proper O&M certification of BMPs. In addition, they will confirm proper catch basin & street sweeping procedures are followed on private lots within the watershed. The phosphorus credit from private entities is included here for planning purposes.

Based on this year's evaluation, Wilbraham is on track to meet each Permit Year 8 and 10 milestones of 20% and 40% progress, respectively. To stay on track, the Town will work with private entities to obtain proper O&M certification. This will ensure the Town meets Permit Year 13 and 15 milestones.

Please note that it is possible that EPA refines the crediting for nonstructural and structural BMPs in future iterations of the Permit. Thus, these phosphorus reduction credits are subject to change.

**Attachment A**  
**Excerpts from Integrated Lists of Waters**

# Massachusetts Year 2014 Integrated List of Waters

*Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*



CN 450.1

**Commonwealth of Massachusetts**  
**Executive Office of Energy and Environmental Affairs**  
Matthew A. Beaton, Secretary  
**Massachusetts Department of Environmental Protection**  
Martin Suuberg, Commissioner  
**Bureau of Water Resources**  
Douglas E. Fine, Assistant Commissioner

## Massachusetts Category 4a Waters "TMDL is completed"

NAME	SEGMENT ID	DESCRIPTION	SIZE	UNITS	POLLUTANTS ADDRESSED BY TMDL	EPA TMDL NUMBER
Uncas Pond	MA72122	Franklin	17.3	ACRES	(Non-Native Aquatic Plants*)	
					Oxygen, Dissolved	40319
Unnamed Tributary	MA72-32	Locally known as Sawins Brook - emerges east of Elm Street, Watertown to confluence with the Charles River, Watertown (sections culverted).	0.539	MILES	Escherichia coli	32382
<b>Chicopee</b>						
Lake Lashaway	MA36079	North Brookfield/East Brookfield	274	ACRES	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Long Pond	MA36083	Springfield	14	ACRES	Nutrient/Eutrophication Biological Indicators	722
Minechoag Pond	MA36093	Ludlow	21	ACRES	Nutrient/Eutrophication Biological Indicators	3629
Mona Lake	MA36094	Springfield	11	ACRES	Nutrient/Eutrophication Biological Indicators	3630
Pottapaug Pond	MA36125	Petersham/Hardwick	568	ACRES	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Quabbin Reservoir	MA36129	Petersham/Pelham/Ware/Hardwick/Shutesbury/Belchertown/New Salem	24012	ACRES	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Quacumquasit Pond	MA36131	Brookfield/East Brookfield/Sturbridge	223	ACRES	(Eurasian Water Milfoil, Myriophyllum spicatum*)	
					(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Spectacle Pond	MA36142	Wilbraham	9	ACRES	Nutrient/Eutrophication Biological Indicators	3631
Sugden Reservoir	MA36150	Spencer	85	ACRES	Nutrient/Eutrophication Biological Indicators	3633
Wickaboag Pond	MA36166	West Brookfield	315	ACRES	Aquatic Plants (Macrophytes)	1332
					Turbidity	1332
<b>Concord (SuAsCo)</b>						
Ashland Reservoir	MA82003	Ashland	167.961	ACRES	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	42396
Boons Pond	MA82011	Stow/Hudson	173.442	ACRES	(Non-Native Aquatic Plants*)	
					Excess Algal Growth	2353
					Mercury in Fish Tissue	33880
Nutting Lake	MA82124	[West Basin] Billerica	51.408	ACRES	Mercury in Fish Tissue	33880
Sudbury Reservoir	MA82106	Southborough/Marlborough	1177.986	ACRES	Mercury in Fish Tissue	33880
Walden Pond	MA82109	Concord	62.946	ACRES	Mercury in Fish Tissue	33880



# Massachusetts Year 2016 Integrated List of Waters

*Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act*



MASSACHUSETTS  
DEPARTMENT  
OF  
ENVIRONMENTAL  
PROTECTION

CN 470.1

**Commonwealth of Massachusetts**  
**Executive Office of Energy and Environmental Affairs**  
Kathleen A. Theoharides, Secretary  
**Massachusetts Department of Environmental Protection**  
Martin Suuberg, Commissioner  
**Bureau of Water Resources**  
Kathleen Baskin, Assistant Commissioner

## Category 4a waters listed alphabetically by major watershed "TMDL is completed"

Water Body	Segment ID	Description	Size	Units	Pollutants Addressed By TMDL	EPA TMDL No.
Rosemary Brook	MA72-25	Headwaters, outlet Rosemary Lake, Needham to mouth at confluence with the Charles River, Wellesley.	3.30	Miles	Dissolved Oxygen	40317
					Phosphorus, Total	40317
South Meadow Brook	MA72-24	From emergence west of Parker Street, Newton to mouth at confluence with the Charles River, Newton (three culverted portions totaling approximately 2870 feet (0.54mile)).	1.70	Miles	(Bottom Deposits*)	
					(Debris*)	
					(Physical substrate habitat alterations*)	
					(Trash*)	
					Dissolved Oxygen	40317
					Escherichia Coli (E. Coli)	32377
					Phosphorus, Total	40317
Turbidity	40317					
Uncas Pond	MA72122	Franklin.	17.00	Acres	(Non-Native Aquatic Plants*)	
					Dissolved Oxygen	40319
Unnamed Tributary	MA72-32	Locally known as "Sawins Brook" - emerges east of Elm Street, Watertown to mouth at confluence with the Charles River, Watertown (one culverted portion approximately 360 feet (0.07mile)).	0.50	Miles	Escherichia Coli (E. Coli)	32382
<b>Chicopee</b>						
Lake Lashaway	MA36079	North Brookfield/East Brookfield.	274.00	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Long Pond	MA36083	Springfield.	14.00	Acres	Nutrient/Eutrophication Biological Indicators	722
Minechoag Pond	MA36093	Ludlow.	21.00	Acres	Nutrient/Eutrophication Biological Indicators	3629
Mona Lake	MA36094	Springfield.	11.00	Acres	Nutrient/Eutrophication Biological Indicators	3630
Pottapaug Pond	MA36125	Petersham/Hardwick.	568.00	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Quabbin Reservoir	MA36129	Petersham/Pelham/Ware/Hardwick/Shutesbury/Belchertown /New Salem.	24012	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Quacumquasit Pond	MA36131	Brookfield/East Brookfield/Sturbridge.	223.00	Acres	(Eurasian Water Milfoil, Myriophyllum spicatum*)	
					(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	33880
Spectacle Pond	MA36142	Wilbraham.	9.00	Acres	Nutrient/Eutrophication Biological Indicators	3631
Sugden Reservoir	MA36150	Spencer.	85.00	Acres	Nutrient/Eutrophication Biological Indicators	3633
Wickaboag Pond	MA36166	West Brookfield.	316.00	Acres	Turbidity	1332
<b>Concord (SuAsCo)</b>						
Ashland Reservoir	MA82003	Ashland.	168.00	Acres	(Non-Native Aquatic Plants*)	
					Mercury in Fish Tissue	42396



# Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle



MASSACHUSETTS  
DEPARTMENT  
OF  
ENVIRONMENTAL  
PROTECTION

*CN 505.1*

**Commonwealth of Massachusetts**  
**Executive Office of Energy and Environmental Affairs**  
Kathleen A. Theoharides, Secretary  
**Massachusetts Department of Environmental Protection**  
Martin Suuberg, Commissioner  
**Bureau of Water Resources**  
Kathleen Baskin, Assistant Commissioner

**Category 4a waters listed alphabetically by major watershed  
"TMDL is completed"**

<b>Waterbody</b>	<b>AU_ID</b>	<b>Description</b>	<b>Size</b>	<b>Units</b>	<b>Impairment</b>	<b>ATTAINS Action ID</b>
Minechoag Pond	MA36093	Ludlow.	21.00	Acres	Nutrient/Eutrophication Biological Indicators	3629
Mona Lake	MA36094	Springfield.	11.00	Acres	Nutrient/Eutrophication Biological Indicators	3630
Pottapaug Pond	MA36125	Petersham/Hardwick.	568.00	Acres	(Non-Native Aquatic Plants*) Mercury in Fish Tissue	33880
Quabbin Reservoir	MA36129	Petersham/Pelham/Ware/Hardwick/Shutesbury/Belchertown/Ne w Salem.	24,010.0 0	Acres	(Non-Native Aquatic Plants*) Mercury in Fish Tissue	33880
Quacumquasit Pond	MA36131	Brookfield/East Brookfield/Sturbridge. (also known as South Pond)	223.00	Acres	(Eurasian Water Milfoil, Myriophyllum Spicatum*) (Fanwort*) (Non-Native Aquatic Plants*) Mercury in Fish Tissue	33880
Spectacle Pond	MA36142	Wilbraham.	9.00	Acres	Nutrient/Eutrophication Biological Indicators	3631
Sugden Reservoir	MA36150	Spencer.	85.00	Acres	Nutrient/Eutrophication Biological Indicators	3633
Wickaboag Pond	MA36166	West Brookfield.	316.00	Acres	Turbidity	1332
<b>Concord (SuAsCo)</b>						
Ashland Reservoir	MA82003	Ashland.	168.00	Acres	(Non-Native Aquatic Plants*) Mercury in Fish Tissue	42396
Boons Pond	MA82011	Stow/Hudson.	174.00	Acres	(Fanwort*) (Non-Native Aquatic Plants*) Algae Mercury in Fish Tissue	2353 33880
Nutting Lake	MA82124	[West Basin] Billerica.	51.00	Acres	Mercury in Fish Tissue	33880
Sudbury Reservoir	MA82106	Southborough/Marlborough.	1,181.00	Acres	(Eurasian Water Milfoil, Myriophyllum Spicatum*) (Water Chestnut*) Mercury in Fish Tissue	33880
Walden Pond	MA82109	Concord.	63.00	Acres	Mercury in Fish Tissue	33880
Warners Pond	MA82110	Concord.	59.00	Acres	(Water Chestnut*) Mercury in Fish Tissue	33880
<b>Connecticut</b>						
Lake Warner	MA34098	Hadley.	65.00	Acres	(Fanwort*) (Water Chestnut*) Algae Dissolved Oxygen Phosphorus, Total	651 651 651



# Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle



*CN 568.1*

**Commonwealth of Massachusetts**  
**Executive Office of Energy and Environmental Affairs**  
Rebecca L. Tepper, Secretary  
**Massachusetts Department of Environmental Protection**  
Bonnie Heiple, Commissioner  
**Bureau of Water Resources**  
Kathleen M. Baskin, Assistant Commissioner



**Category 4a waters listed alphabetically by major watershed  
"TMDL is completed"**

Waterbody	AU_ID	Description	Size	Units	Impairment	ATTAINS Action ID
Quabbin Reservoir	MA36129	Petersham/Pelham/Ware/Hardwick/Shutesbury/Belchertown/New Salem.	24,010.00	Acres	(Non-Native Aquatic Plants*) Mercury in Fish Tissue	33880
Quacumquasit Pond	MA36131	Brookfield/East Brookfield/Sturbridge. (also known as South Pond)	223.00	Acres	(Eurasian Water Milfoil, Myriophyllum Spicatum*) (Fanwort*) (Non-Native Aquatic Plants*) Mercury in Fish Tissue	33880
Spectacle Pond	MA36142	Wilbraham.	9.00	Acres	Nutrient/Eutrophication Biological Indicators	3631
Sugden Reservoir	MA36150	Spencer.	85.00	Acres	Nutrient/Eutrophication Biological Indicators	3633
Wickaboag Pond	MA36166	West Brookfield.	316.00	Acres	Turbidity	1332
<b>Concord (SuAsCo)</b>						
Ashland Reservoir	MA82003	Ashland.	168.00	Acres	(Non-Native Aquatic Plants*) Mercury in Fish Tissue	42396
Boons Pond	MA82011	Stow/Hudson.	174.00	Acres	(Fanwort*) (Non-Native Aquatic Plants*) Algae	2353
Nutting Lake	MA82124	[West Basin] Billerica.	51.00	Acres	Mercury in Fish Tissue	33880
Sudbury Reservoir	MA82106	Southborough/Marlborough.	1,181.00	Acres	(Eurasian Water Milfoil, Myriophyllum Spicatum*) (Water Chestnut*) Mercury in Fish Tissue	33880
Walden Pond	MA82109	Concord.	63.00	Acres	Mercury in Fish Tissue	33880
Warners Pond	MA82110	Concord.	59.00	Acres	(Water Chestnut*) Mercury in Fish Tissue	33880
<b>Connecticut</b>						
Lake Warner	MA34098	Hadley.	65.00	Acres	(Fanwort*) (Water Chestnut*) Algae Dissolved Oxygen Phosphorus, Total Turbidity	651
Lake Wyola	MA34103	Shutesbury.	124.00	Acres	Nutrient/Eutrophication Biological Indicators Phosphorus, Total	653
Leverett Pond	MA34042	Leverett.	91.00	Acres	(Eurasian Water Milfoil, Myriophyllum Spicatum*) (Non-Native Aquatic Plants*) Nutrient/Eutrophication Biological Indicators	675
<b>Deerfield</b>						
Ashfield Pond	MA33001	Ashfield.	38.00	Acres	(Water Chestnut*)	



**Attachment B**  
**Spectacle Pond Watershed-Based Plan**



# WATERSHED-BASED PLAN

## Spectacle Pond

---

September 10, 2024



Tighe & Bond





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## Introduction

### What is a Watershed-Based Plan?

#### Purpose & Need

The purpose of a Massachusetts Watershed-Based Plan (WBP) is to organize information about Massachusetts' watersheds and present the information in a format that will enhance the development and implementation of projects that will restore water quality and beneficial uses in the Commonwealth. The Massachusetts WBP follows the United States Environmental Protection Agency's (EPA's) recommended format for "nine-element" watershed plans, as described below.

All states are required to develop WBPs, but not all states have taken the same approach. Most states develop WBPs only for selected watersheds. Massachusetts Department of Environmental Protection's (MassDEP's) approach has been to develop a tool to support statewide development of WBPs so **that good projects in all areas of the state may be eligible for federal watershed implementation grant funds** under [Section 319 of the Clean Water Act](#).

EPA guidelines promote the use of Section 319 funding for developing and implementing WBPs. WBPs are required for all projects implemented with Section 319 funds and are recommended for all watershed projects, whether they are designed to protect unimpaired waters, restore impaired waters, or both.

### **Watershed-Based Plan Outline**

This WBP includes nine elements (a through i) in accordance with EPA Guidelines:

- a) An **identification of the causes and sources** or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this WBP and to achieve any other watershed goals identified in the WBP, as discussed in item (b) immediately below.
- b) An **estimate of the load reductions** expected for the management measures described under paragraph (c) below, recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time.
- c) A **description of the nonpoint source (NPS) management measures** needed to achieve the load reductions estimated under paragraph (b) above as well as to achieve other watershed goals identified in this WBP and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.
- d) An **estimate of the amounts of technical and financial assistance needed**, associated costs, and/or the sources and authorities that will be relied upon, to implement this plan. As sources of funding, States should consider the use of their Section 319 programs, State Revolving Funds, United States Department of Agriculture's (USDA's) Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant federal, state, local, and private funds that may be available to assist in implementing this plan.
- e) An **information/education component** that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.
- f) A **schedule for implementing the NPS management measures** identified in this plan that is reasonably expeditious.
- g) A description of **interim, measurable milestones** for determining whether NPS management measures or other control actions are being implemented.
- h) A set of **criteria to determine if loading reductions are being achieved** over time and substantial progress is being made toward attaining water quality standards and, if not, the criteria for determining whether this WBP needs to be revised or, if a NPS total maximum daily load (TMDL) has been established, whether the TMDL needs to be revised.
- i) A **monitoring component** to evaluate the effectiveness of the implementation efforts over time measured against the criteria established under item (h) immediately above.

## Data Sources

This WBP was developed using the framework and data sources provided by MassDEP's [WBP Tool](#).

## Element A: Identify Causes of Impairment & Pollution Sources

**Element A:** Identify the causes and sources or groups of similar sources that need to be controlled to achieve the necessary pollutant load reductions estimated in the watershed based plan (WBP).



### General Watershed Information

**Table A-1: General Watershed Information**

General Watershed Information	
<b>Watershed Name (Assessment Unit ID):</b>	Spectacle Pond (MA36142)
<b>Major Basin:</b>	CHICOPEE
<b>Watershed Area (within MA):</b>	62.9 (ac)
<b>Water Body Size:</b>	9 (ac)

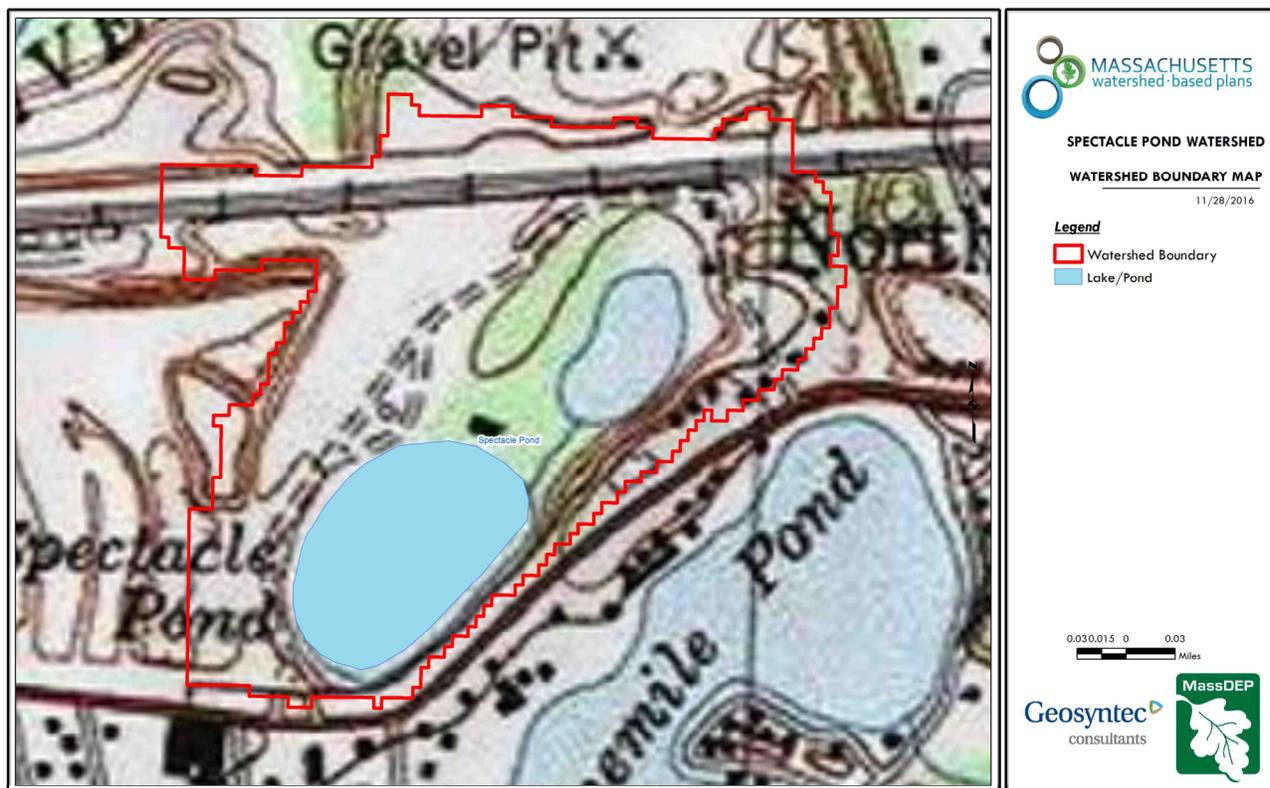


Figure A-1: Watershed Boundary Map (MassGIS, 1999; MassGIS, 2001; USGS, 2016)

### MassDEP Water Quality Assessment Report and TMDL Review

The following reports are available:

- [Chicopee River Watershed 2003 Water Quality Assessment Report](#)
- [Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes](#)

The section below summarizes the findings of any available Water Quality Assessment Report and/or TMDL that relate to water quality and water quality impairments. Select excerpts from these documents relating to the water quality in the watershed are included below (note: relevant information is included directly from these documents for informational purposes and has not been modified).

Chicopee River Watershed 2003 Water Quality Assessment Report (MA36142 - Spectacle Pond )
<p>Aquatic Life Use Biology</p> <p>An unconfirmed species of Myriophyllum is present in Spectacle Pond. Whether or not it is non-native needs to be determined.</p> <p>The Aquatic Life Use is not assessed for Spectacle Pond. However, this use is identified with an "Alert Status" because of the potential infestation of a non-native form of Myriophyllum.</p>

#### Primary and Secondary Contact Recreation Uses

There are two beaches along the shoreline of Spectacle Pond: Spectacle Pond Camp and Spectacle Pond Beach. Currently there is uncertainty associated with the accurate reporting of freshwater beach closure information to the Massachusetts DPH, which is required as part of the Beaches Bill. Therefore, no Primary Contact Recreational Use assessments (either support or impairment) decisions are being made using Beaches Bill data for this waterbody.

No recent quality-assured data are available for Spectacle Pond. All designated uses are not assessed.

#### Report Recommendations:

Consult and follow recommendations in Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes (MassDEP 2002).

Confirm species of *Myriophyllum* when flowering heads are present.

#### Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes (MA36142 - Spectacle Pond)

No detailed study of the nutrient sources within the watersheds has been conducted to date. Thus, nutrient sources were estimated based on land use modeling within the DEP's NPSLAKE model as discussed below. The NPSLAKE model was designed to estimate watershed loading rates of phosphorus to lakes. A review of other models including the use of mean values from Reckhow et al., (1980) or the MassGIS data viewer tool appeared to overestimate loads to lakes. The phosphorus loading estimates from the NPSLAKE model are used with estimates of water runoff and these are used as inputs into a water quality model of Reckhow (1979) which is included as part of the NPSLAKE model output. A brief description of the NPSLAKE model and data inputs is given here. MassGIS digital maps of land use within the watershed were used to calculate areas of landuse within three major types: Forest, rural and urban landuse. This model takes the area in hectares of land use within each of three categories and applies an export coefficient to each to predict the annual external loading of phosphorus to the lake from the watershed. Because much of the landuse data is based on old (1985) aerial photographs, the current landuses within the watershed may be different today. This can be important in the development of the TMDL because different landuses can result in different phosphorus loadings to the waterbody in question. For many rural areas, landuse changes often result in conversion of open or agricultural lands to low density housing, in which case, the export coefficients of the NPSLAKE model are the same and no change in loading is predicted to occur. However, in cases where development changes forests to residential areas or rural landuses to urban landuses, phosphorus loadings are predicted to increase. In some cases, loadings are predicted to decrease if additional agricultural land is abandoned and forest regrowth occurs. To account for this uncertainty in landuse changes, a conservative target is chosen (see below). In addition, the MassGIS landuse maps are scheduled to be updated with current aerial photos and the TMDL can be modified as additional information is obtained.

Other phosphorus sources, such as septic system inputs of phosphorus, are estimated from an export coefficient multiplied by the number of homes within 100 meters of the lake. Point sources are estimated manually based on discharge information and site specific information for uptake and storage. No point sources are present in watersheds of the lakes addressed in this report. Other sources such as atmospheric deposition to lakes was determined to be small and not significant in the NPSLAKE model, perhaps because lakes tend to be sinks rather than sources of phosphorus. For similar reasons, wetlands were also not considered to be significant sources of phosphorus. Other, non-landuse sources of phosphorus such as inputs from waterfowl were not included, but can be added as additional information becomes available. If large numbers of waterfowl are using the lake the total phosphorus budget may be an underestimate, and control measures should be considered.

Internal sources (recycling) of phosphorus are not included because they are not considered as part of the net external load to the lake, but rather a seasonal recycling of phosphorus already present in the lake. In cases where this internal source is large it may result in surface concentrations higher than predicted from landuse loading models and may contribute to water quality violations during the critical summer period. As additional monitoring data become available, these lakes will be assessed for internal contributions and possibly control of these sources by alum or other means. The major sources according to the land use analysis are shown for the lake in the following table (originally Table 2 of "Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes" report, 2002).

Table . Spectacle Pond (West) MA36142.

Total Estimated Nonpoint Source Pollution loads based on GIS Landuse

Watershed Area=	10.1 Ha (0.0 mi <sup>2</sup> )
Average Annual Water Load =	61612.3 m <sup>3</sup> /yr (0.1 cfs)
Average Runoff=	61.0 cm/yr (24.0 in/yr)
Lake area=	3.4 Ha. (8.5ac)
Areal water loading to lake: q=	1.8 m/yr.
Homes with septic systems within 100m of lake.=	0.0
Other P inputs =	0.0 kg/yr

Estimate of annual Nonpoint Source Pollution Loads by land use

Land use	Area Ha (%)	P Load kg/yr (%)	N Load kg/yr	TSS Load kg/yr
<b>Forest category</b>				
Forest:	3.3 (32.6)	0.4 (2.5)	8.2	79.0
<b>Rural category</b>				
Agriculture:	0.0 (0.0)	0.0 (0.0)	0.0	0.0
Open land:	1.0 (10.2)	0.3 (1.8)	5.3	15.4
Residential Low:	0.0 (0.0)	0.0 (0.0)	0.0	0.0
<b>Urban category</b>				
Residential High:	0.4 (4.2)	5.2 (30.6)	2.3	196.9
Comm - Ind:	0.9 (8.9)	10.9 (65.0)	8.9	608.3
<b>Other Landuses</b>				
Water:	4.5 (44.2)	0.0 (0.0)	0.0	0.0
Wetlands:	0.0 (0.0)	0.0 (0.0)	0.0	0.0
Subtotal	10.1	16.8	24.8	899.6
Other P inputs:	NA	0.0 (0.0)		
0.0 Septics:	NA	0.0 (0.0)		
<b>Total</b>	<b>10.1 (100.0)</b>	<b>16.8(100)</b>	<b>24.8</b>	<b>899.6</b>

Summary of Lake Total Phosphorus Modeling Results

Areal P loading L= 0.5 g/m<sup>2</sup>/yr.  
 Reckhow (1979) model predicts lake TP = L/(11.6+1.2q)\*1000 = 35.6 ppb.  
 Predicted transparency = 1.3 meters.

If all land were forested, P export would be 0.7 kg/yr  
 And the forested condition lake TP would be 1.6 ppb.

The NPSLAKE model assumes land uses are accurately represented by the MassGIS digital maps and that land use has not changed appreciably since the maps were compiled in 1985. The predicted loading is based on the equation:

$$P \text{ Loading (kg/yr)} = 0.5 * \text{septics} + 0.13 * \text{forest ha} + 0.3 * \text{rural ha} + 14 * (\text{urban ha})^{0.5}$$

The coefficients of the model are based on a combination of values estimated with the aid of multiple regression on a Massachusetts data set and of typical values reported in previous diagnostic/feasibility studies in Massachusetts.

All coefficients fall within the range of values reported in other studies. The overall standard error of the model is approximately 172 kg/yr. If no data is available for internal loading a rough estimate of the magnitude of this sources can be

estimated from the Reckhow model (see below) by substitution of the in-lake concentration for TP. The difference in predicted loadings from this approach and the landuse approach is the best estimate of internal loading.

The NPSLAKE model also generates predictions of estimated yearly average water runoff to the lake based on total watershed area and runoff maps of Massachusetts. Other estimates of nitrogen and total suspended solid (TSS) loading rates are estimates based on Reckhow et al.(1980) and EPA (1983) respectively, and are provided here for informational and comparison purposes only.

Because of the general nature of the landuse loading approach, natural background is included in land use based export coefficients. Natural background can be estimated based on the forest export coefficient of 0.13 kg/ha/yr multiplied by the hectares of the watershed assuming the watershed to be entirely forested. Without site specific information regarding soil phosphorus and natural erosion rates the accuracy of this estimate would be uncertain and would add little value to the analysis.

Reckhow, K.H. 1979. Uncertainty Analysis Applied to Vollenweider’s Phosphorus Loading Criteria. J. Water Poll. Control Fed. 51(8):2123-2128.

Reckhow, K.H., M.N. Beaulac, J.T. Simpson. 1980. Modeling Phosphorus Loading and Lake Response Under Uncertainty: A Manual and Compilation of Export Coefficients. U.S.E.P.A. Washington DC. EPA 440/5-80-011.

EPA. 1983. Results of the Nationwide Urban Runoff Program. Volume 1, Final Report. Water Planning Division U.S.E.P.A. Washington DC. NTIS #PB84-185552.

Historical and current Technical Memoranda (TM) produced by the MassDEP Watershed Planning Program are available here: [Water Quality Technical Memoranda | Mass.gov](#) and are organized by major watersheds in Massachusetts. Most of these TMs present the water chemistry and biological sampling results of WPP monitoring surveys. The TMs pertaining primarily to biological information (e.g., benthic macroinvertebrates, periphyton, fish populations) contain biological data and metrics that are currently not reported elsewhere. The data contained in the water quality TMs are also provided on the “Data” page ([Water Quality Monitoring Program Data | Mass.gov](#)). Many of these TMs have helped inform Clean Water Act 305(b) assessment and 303(d) listing decisions.

### Water Quality Impairments

Known water quality impairments, as documented in the Massachusetts Department of Environmental Protection (MassDEP) 2018/2020 Massachusetts Integrated List of Waters (MassDEP, 2021), are listed below. Impairment categories from the Integrated List are as follows:

**Table A-2: 2018/2020 MA Integrated List of Waters Categories**

Integrated List Category	Description
1	Unimpaired and not threatened for all designated uses.
2	Unimpaired for some uses and not assessed for others.
3	Insufficient information to make assessments for any uses.

4	Impaired or threatened for one or more uses, but not requiring calculation of a Total Maximum Daily Load (TMDL), including: 4a: TMDL is completed 4b: Impairment controlled by alternative pollution control requirements 4c: Impairment not caused by a pollutant - TMDL not required
5	Impaired or threatened for one or more uses and requiring preparation of a TMDL.

**Table A-3: Water Quality Impairments (MassDEP 2021)**

Assessment Unit ID	Waterbody	Integrated List Category	Designated Use	Impairment Cause	Impairment Source
MA36142	Spectacle Pond	4A	Aesthetic	Nutrient/eutrophication Biological Indicators	Commercial Districts (shopping/office Complexes)
MA36142	Spectacle Pond	4A	Aesthetic	Nutrient/eutrophication Biological Indicators	Discharges From Municipal Separate Storm Sewer Systems (ms4)
MA36142	Spectacle Pond	4A	Aesthetic	Nutrient/eutrophication Biological Indicators	Rural (residential Areas)
MA36142	Spectacle Pond	4A	Primary Contact Recreation	Nutrient/eutrophication Biological Indicators	Commercial Districts (shopping/office Complexes)
MA36142	Spectacle Pond	4A	Primary Contact Recreation	Nutrient/eutrophication Biological Indicators	Discharges From Municipal Separate Storm Sewer Systems (ms4)
MA36142	Spectacle Pond	4A	Primary Contact Recreation	Nutrient/eutrophication Biological Indicators	Rural (residential Areas)
MA36142	Spectacle Pond	4A	Secondary Contact Recreation	Nutrient/eutrophication Biological Indicators	Commercial Districts (shopping/office Complexes)
MA36142	Spectacle Pond	4A	Secondary Contact Recreation	Nutrient/eutrophication Biological Indicators	Discharges From Municipal Separate Storm Sewer Systems (ms4)
MA36142	Spectacle Pond	4A	Secondary Contact Recreation	Nutrient/eutrophication Biological Indicators	Rural (residential Areas)

### Water Quality Goals

Water quality goals may be established for a variety of purposes, including the following:

- a.) For **water bodies with known impairments**, a [Total Maximum Daily Load](#) (TMDL) is established by MassDEP and the United States Environmental Protection Agency (USEPA) as the maximum amount of the target pollutant that the waterbody can receive and still safely meet water quality standards. If the waterbody has a TMDL for total phosphorus (TP) or total nitrogen (TN), or total suspended solids (TSS), that information is provided below and included as a water quality goal.

b.) For **water bodies without a TMDL for total phosphorus (TP)**, a default water quality goal for TP is based on target concentrations established in the [Quality Criteria for Water](#) (USEPA, 1986) (also known as the “Gold Book”). The Gold Book states that TP should not exceed 50 ug/L in any stream at the point where it enters any lake or reservoir, nor 25 ug/L within a lake or reservoir. For the purposes of developing WBPs, MassDEP has adopted 50 ug/L as the TP target for all streams at their downstream discharge point, regardless of which type of water body the stream discharges to.

c.) [Massachusetts Surface Water Quality Standards](#) (314 CMR 4.00, 2013) prescribe the minimum water quality criteria required to sustain a waterbody’s designated uses. Spectacle Pond is a Class 'B' waterbody. The water quality goal for fecal coliform bacteria is based on the Massachusetts Surface Water Quality Standards.

**Table A-4: Surface Water Quality Classification by Assessment Unit**

Assessment Unit ID	Waterbody	Class
MA36142	Spectacle Pond	B

d.) **Other water quality goals set by the community** (e.g., protection of high quality waters, in-lake phosphorus concentration goal to reduce recurrence of cyanobacteria blooms, etc.).

**Table A-5: Water Quality Goals**

Pollutant	Goal	Source
<b>Total Phosphorus (TP)</b>	Total phosphorus should not exceed: --50 ug/L in any stream --25 ug/L within any lake or reservoir	<a href="#">Quality Criteria for Water (USEPA, 1986)</a>
<b>Bacteria</b>	<p><b><u>Class B Standards</u></b></p> <ul style="list-style-type: none"> <li>Public Bathing Beaches: For E. coli, geometric mean of 5 most recent samples shall not exceed 126 colonies/ 100 ml and no single sample during the bathing season shall exceed 235 colonies/100 ml. For enterococci, geometric mean of 5 most recent samples shall not exceed 33 colonies/100 ml and no single sample during bathing season shall exceed 61 colonies/100 ml;</li> <li>Other Waters and Non-bathing Season at Bathing Beaches: For E. coli, geometric mean of samples from most recent 6 months shall not exceed 126 colonies/100 ml (typically based on min. 5 samples) and no single sample shall exceed 235 colonies/100 ml. For enterococci, geometric mean of samples from most recent 6 months shall not</li> </ul>	<a href="#">Massachusetts Surface Water Quality Standards (314 CMR 4.00, 2013)</a>

	exceed 33 colonies/100 ml, and no single sample shall exceed 61 colonies/100 ml.	
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*Note: There may be more than one water quality goal for bacteria due to different Massachusetts Surface Water Quality Standards Classes for different Assessment Units within the watershed.*

### Land Use and Impervious Cover Information

Land use information and impervious cover is presented in the tables and figures below. Land use source data is from 2005 and was obtained from MassGIS (2009b).

### Watershed Land Uses

**Table A-6: Watershed Land Uses**

Land Use	Area (acres)	% of Watershed
Agriculture	0	0
Commercial	2.52	4
Forest	24.66	39.2
High Density Residential	0	0
Highway	1.78	2.8
Industrial	2.22	3.5
Low Density Residential	1.21	1.9
Medium Density Residential	0	0
Open Land	16.37	26
Water	14.13	22.5

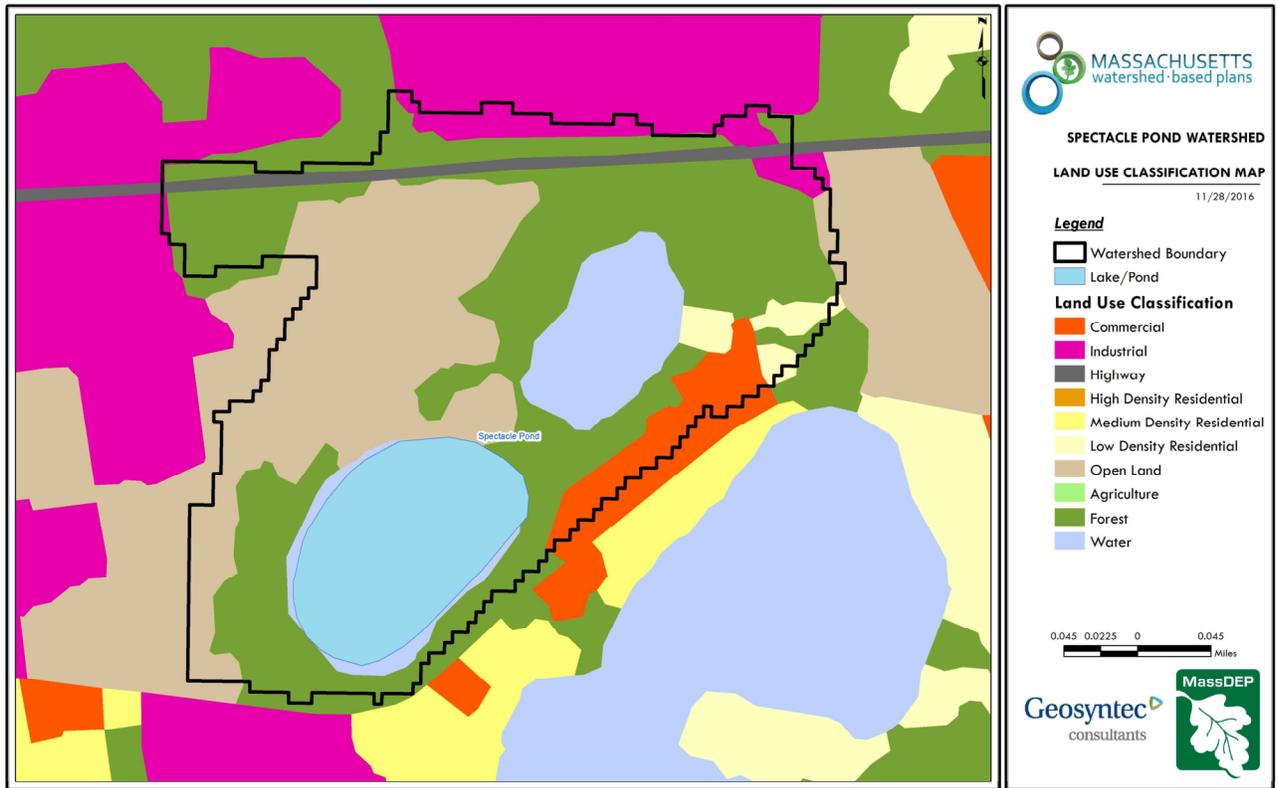


Figure A-2: Watershed Land Use Map (MassGIS, 2009b; MassGIS, 1999; MassGIS, 2001; USGS, 2016)

### Watershed Impervious Cover

There is a strong link between impervious land cover and stream water quality. Impervious cover includes land surfaces that prevent the infiltration of water into the ground, such as paved roads and parking lots, roofs, basketball courts, etc.

**Impervious areas that are directly connected (DCIA)** to receiving waters (via storm sewers, gutters, or other impervious drainage pathways) produce higher runoff volumes and transport stormwater pollutants with greater efficiency than disconnected impervious cover areas which are surrounded by vegetated, pervious land. Runoff volumes from disconnected impervious cover areas are reduced as stormwater infiltrates when it flows across adjacent pervious surfaces.

An estimate of DCIA for the watershed was calculated based on the Sutherland equations. USEPA provides guidance (USEPA, 2010) on the use of the Sutherland equations to predict relative levels of connection and disconnection based on the type of stormwater infrastructure within the **total impervious area (TIA)** of a watershed. Within each subwatershed, the total area of each land use were summed and used to calculate the percent TIA.

**Table A-7: TIA and DCIA Values for the Watershed**

	Estimated TIA (%)	Estimated DCIA (%)
Spectacle Pond	15.7	14.5

The relationship between TIA and water quality can generally be categorized as shown in **Table A-8** (Schueler et al. 2009):

**Table A-8: Relationship between Total Impervious Area (TIA) and water quality (Schueler et al. 2009)**

% Watershed Impervious Cover	Stream Water Quality
0-10%	Typically high quality, and typified by stable channels, excellent habitat structure, good to excellent water quality, and diverse communities of both fish and aquatic insects.
11-25%	These streams show clear signs of degradation. Elevated storm flows begin to alter stream geometry, with evident erosion and channel widening. Stream banks become unstable, and physical stream habitat is degraded. Stream water quality shifts into the fair/good category during both storms and dry weather periods. Stream biodiversity declines to fair levels, with most sensitive fish and aquatic insects disappearing from the stream.
26-60%	These streams typically no longer support a diverse stream community. The stream channel becomes highly unstable, and many stream reaches experience severe widening, downcutting, and streambank erosion. Pool and riffle structure needed to sustain fish is diminished or eliminated and the substrate can no longer provide habitat for aquatic insects, or spawning areas for fish. Biological quality is typically poor, dominated by pollution tolerant insects and fish. Water quality is consistently rated as fair to poor, and water recreation is often no longer possible due to the presence of high bacteria levels.
>60%	These streams are typical of “urban drainage”, with most ecological functions greatly impaired or absent, and the stream channel primarily functioning as a conveyance for stormwater flows.

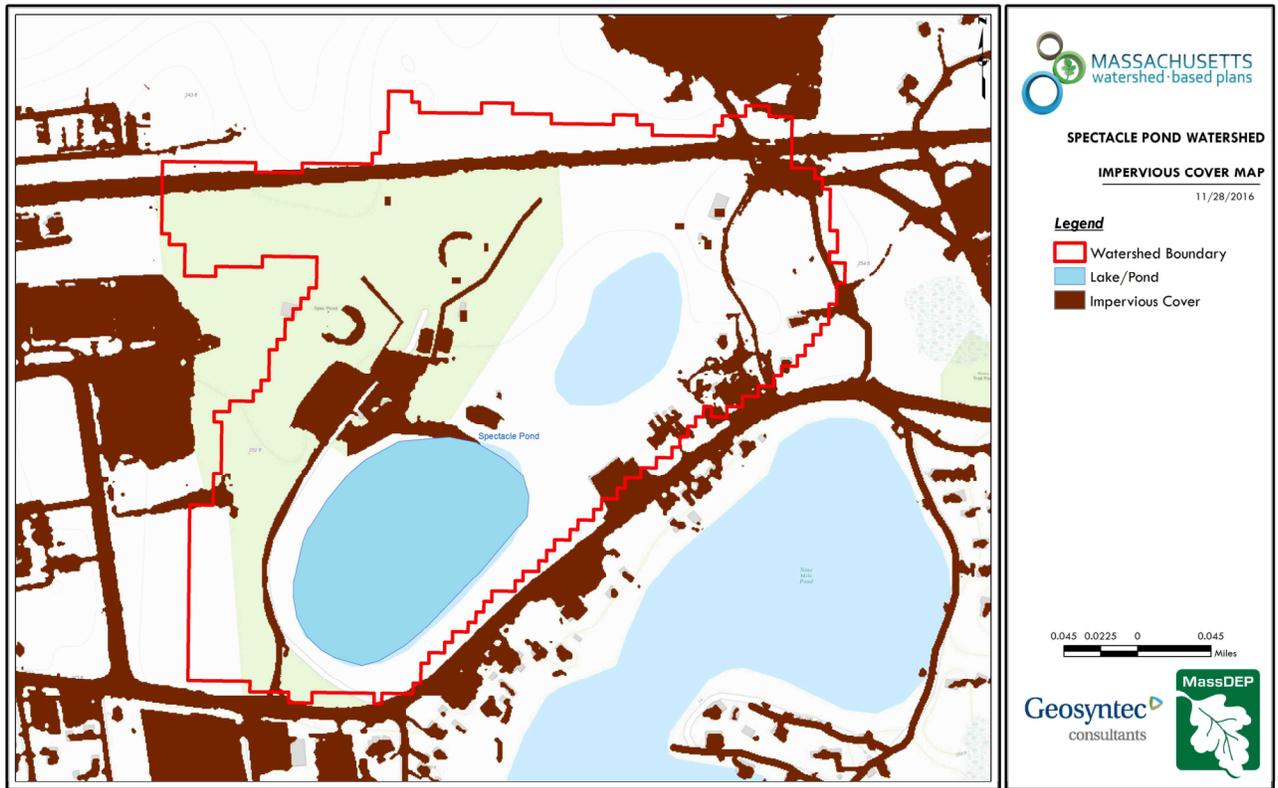


Figure A-3: Watershed Impervious Surface Map (MassGIS, 2009b; MassGIS, 1999; MassGIS, 2001; USGS, 2016)

### Pollutant Loading

Geographic Information Systems (GIS) was used for the pollutant loading analysis. The land use data (MassGIS, 2009b) was intersected with impervious cover data (MassGIS, 2009a) and United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soils data (USDA NRCS and MassGIS, 2012) to create a combined land use/land cover grid. The grid was used to sum the total area of each unique land use/land cover type.

The amount of DCIA was estimated using the Sutherland equations as described above and any reduction in impervious area due to disconnection (i.e., the area difference between TIA and DCIA) was assigned to the pervious D soil category for that land use to simulate that some infiltration will likely occur after runoff from disconnected impervious surfaces passes over pervious surfaces.

Pollutant loading for key nonpoint source pollutants in the watershed was estimated by multiplying each land use/cover type area by its pollutant load export rate (PLER) as follows:

$$L_n = A_n * P_n$$

Where  $L_n$  = Loading of land use/cover type n (lb/yr);  $A_n$  = area of land use/cover type n (acres);  
 $P_n$  = pollutant load export rate of land use/cover type n (lb/acre/yr)

The PLERs are an estimate of the annual total pollutant load exported via stormwater from a given unit area of a particular land cover type. The PLER values for TN, TP and TSS were obtained from USEPA (USEPA, 2020; UNHSC, 2018, Tetra Tech, 2015) (see values provided in Appendix A). **Table A-9** presents the estimated land-use based TN, TP and TSS pollutant loading in the watershed.

**Table A-9: Estimated Pollutant Loading for Key Nonpoint Source Pollutants**

Land Use Type	Pollutant Loading <sup>1</sup>		
	Total Phosphorus (TP) (lbs/yr)	Total Nitrogen (TN) (lbs/yr)	Total Suspended Solids (TSS) (tons/yr)
Agriculture	0	0	0.00
Commercial	2	17	0.21
Forest	5	32	1.57
High Density Residential	0	0	0.00
Highway	2	18	1.19
Industrial	1	11	0.14
Low Density Residential	0	5	0.06
Medium Density Residential	0	0	0.00
Open Land	10	86	1.68
<b>TOTAL</b>	21	168	4.85
<sup>1</sup> These estimates do not consider loads from point sources or septic systems.			

## Element B: Determine Pollutant Load Reductions Needed to Achieve Water Quality Goals

### Element B of your WBP should:

Determine the pollutant load reductions needed to achieve the water quality goals established in Element A. The water quality goals should incorporate Total Maximum Daily Load (TMDL) goals, when applicable. For impaired water bodies, a TMDL establishes pollutant loading limits as needed to attain water quality standards.



### Estimated Pollutant Loads

**Table B-1** lists estimated pollutant loads for the following primary nonpoint source (NPS) pollutants: total phosphorus (TP), total nitrogen (TN), total suspended solids (TSS). These estimated loads are based on the pollutant loading analysis presented in Section 4 of Element A.

### Water Quality Goals

Water quality goals for primary NPS pollutants are listed in **Table B-1** based on the following:

- TMDL water quality goals (if a TMDL exists for the water body);
- For all water bodies, including impaired waters that have a pathogen TMDL, the water quality goal for bacteria is based on the [Massachusetts Surface Water Quality Standards](#) (314 CMR 4.00, 2013) that apply to the Water Class of the selected water body.
- If the water body does not have a TMDL for TP, a default target TP concentrations is provided which is based on guidance provided by the USEPA in [Quality Criteria for Water \(1986\)](#), also known as the “Gold Book”. Because there are no similar default water quality goals for TN and TSS, goals for these pollutants are provided in **Table B-1** only if a TMDL exists or alternate goal(s) have been optionally established by the WBP author.
- According to the USEPA Gold Book, total phosphorus should not exceed 50 ug/L in any stream at the point where it enters any lake or reservoir. The water quality loading goal was estimated by multiplying this target maximum phosphorus concentration (50 ug/L) by the estimated annual watershed discharge for the selected water body. To estimate the annual watershed discharge, the mean flow was used, which was estimated based on United States Geological Survey (USGS) “Runoff Depth” estimates for Massachusetts (Cohen and Randall, 1998). Cohen and Randall (1998) provide statewide estimates of annual Precipitation (P), Evapotranspiration (ET), and Runoff (R) depths for the northeastern U.S. According to their method, Runoff Depth (R) is defined as all water reaching a discharge point (including surface and groundwater), and is calculated by:

$$P - ET = R$$

A mean Runoff Depth R was determined for the watershed by calculating the average value of R within the watershed boundary. This method includes the following assumptions/limitations:

- a. For lakes and ponds, the estimate of annual TP loading is averaged across the entire watershed. However, a given lake or reservoir may have multiple tributary streams, and each stream may drain land with vastly different characteristics. For example, one tributary may drain a highly developed residential area, while a second tributary may drain primarily forested and undeveloped land. In this case, one tributary may exhibit much higher phosphorus concentrations than the average of all streams in the selected watershed.
- b. The estimated existing loading value only accounts for phosphorus due to stormwater runoff. Other sources of phosphorus may be relevant, particularly phosphorus from on-site wastewater treatment (septic systems) within close proximity to receiving waters. Phosphorus does not typically travel far within an aquifer, but in watersheds that are primarily unsewered, septic systems and other similar groundwater-related sources may contribute a significant load of phosphorus that is not captured in this analysis. As such, it is important to consider the estimated TP loading as "the expected TP loading from stormwater sources."
- c. If the calculated water quality goal is higher than the existing estimated total load; the water quality goal is automatically set equal to the existing estimated total load.

**Table B-1: Pollutant Load Reductions Needed**

Pollutant	Existing Estimated Total Load	Water Quality Goal	Required Load Reduction
<b>Total Phosphorus</b>	See TMDL information below	See TMDL information below	See TMDL information below
<b>Total Nitrogen</b>	168 lbs/yr		
<b>Total Suspended Solids</b>	5 ton/yr		
<b>Bacteria</b>	<i>MSWQS for bacteria are concentration standards (e.g., colonies of fecal coliform bacteria per 100 ml), which are difficult to predict based on estimated annual loading.</i>	<p><b>Class B. <u>Class B Standards</u></b></p> <ul style="list-style-type: none"> <li>• Public Bathing Beaches: For E. coli, geometric mean of 5 most recent samples shall not exceed 126 colonies/ 100 ml and no single sample during the bathing season shall exceed 235 colonies/100 ml. For enterococci, geometric mean of 5 most recent samples shall not exceed 33 colonies/100 ml and no single sample during bathing season shall exceed 61 colonies/100 ml;</li> <li>• Other Waters and Non-bathing</li> </ul>	

		<p>Season at Bathing Beaches: For E. coli, geometric mean of samples from most recent 6 months shall not exceed 126 colonies/100 ml (typically based on min. 5 samples) and no single sample shall exceed 235 colonies/100 ml. For enterococci, geometric mean of samples from most recent 6 months shall not exceed 33 colonies/100 ml, and no single sample shall exceed 61 colonies/100 ml.</p>	
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### TMDL Pollutant Load Criteria

<b>Total Phosphorus (MA36142)</b>						
<b>TMDL Analysis</b>						
<p>Identification of Target: There is no loading capacity per se for nuisance aquatic plants. As the term implies, TMDLs are often expressed as maximum daily loads. However, as specified in 40 CFR 130.2(l), TMDLs may be expressed in other terms when appropriate. For these cases, the TMDLs are expressed in terms of allowable annual loadings of phosphorus because the growth of phytoplankton and macrophytes responds to changes in annual rather than daily loadings of nutrients. The target in-lake total phosphorus concentration chosen is based on consideration of the typical concentrations expected in lakes in the region. The phosphorus ecoregion map of Griffith et al. (1994) is based on spring/fall concentrations, while the phosphorus ecoregion map of Rohm et al., (1995) is based on summer concentrations. The following table (originally Table 3 of "Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes" report, 2002) shows the ecoregion expected TP concentrations for both spring and summer, and the target TP that was chosen for each lake. The TP predicted by the NPSLAKE model and the surface TP concentrations are also shown for comparison. Note that according to the Carlson Trophic State analysis (Carlson,1977) a lake should have total phosphorus concentrations of no more than 40 ppb to meet the 4-foot transparency requirement for swimming beaches in Massachusetts. The target should be set lower than this to allow for a margin of safety. The lower phosphorus concentrations will lessen the chance of nuisance algal blooms, which may occur as macrophyte biomass is reduced by direct controls. In the case of Browning Pond the target is the same as the current predicted total phosphorus concentration and thus no reduction in loading is required.</p>						
WBID	Lake Name	TP (ppb) range in Griffith ecoregion	TP (ppb) range in Rohm ecoregion	NPSLAKE Predicted TP (ppb)	Surface TP data (ppb)	STP
MA36025	Browning Pond	15-19	10-14	15	20	1
MA36083	Long Pond	25-50	>50	73	210	3
MA36093	Minechoag Pond	25-50	>50	62	40	3
MA36094	Mona Lake	25-50	>50	77	130	3
MA36142	Spectacle Pond	25-50	>50	35	20	2
MA36150	Sugden Reservoir	15-19	10-14	24	60	1
MA36166	Wickaboag Pond	15-19	10-14	22	50	1

Shallow nutrient rich sediments offer an ideal habitat for natural growth of aquatic macrophytes, which provide habitat for fish and wildlife and as such complete elimination of macrophytes is neither possible nor desired. In many cases, the proliferation of aquatic macrophytes in the pond is a natural condition resulting from nutrient rich riparian soils being flooded when streams and lakes were dammed for hydropower. Thus reducing the supply of external phosphorus may not meet the goals of the TMDL without additional management in the lake as discussed below.

### **Loading Capacity**

Modeling Assumptions, Key Input, Calibration and Validation:

There are no numeric models available to predict the growth of rooted aquatic macrophytes as a function of nutrient loading estimates, therefore the control of nuisance aquatic plants is based on best professional judgment. However, as previously stated, the goal of the TMDL is to prevent future eutrophication from occurring, thus the nutrient loading still needs to be controlled. To control eutrophication, the Carlson Trophic State Index (TSI) (Carlson,1977) predicts a lake should have total phosphorus concentrations of about 40 ppb to meet the 4-foot transparency requirement for swimming beaches in Massachusetts and targets are set lower than this. Due to the lack of data on mean depth and other parameters, a simple water quality model was used to link watershed phosphorus loading to in-lake total phosphorus concentration targets. Based on the NPSLAKE model phosphorus loading output and predicted water runoff volumes, an estimated in-lake total phosphorus (TP) concentration was derived based on the Reckhow (1979) model:

$$TP=L/(11.6+1.2*q)*1000$$

where TP= the predicted average total phosphorus concentration (mg/l) in the lake.

L= Phosphorus loading in g/m<sup>2</sup>/yr (the total loading in grams divided by lake area in meters).

q= The areal water loading in m/yr from total water runoff in m<sup>3</sup>/yr divided by lake area in m<sup>2</sup>.

Similarly, by setting the TP to the target total phosphorus concentration, a target load was estimated by solving the equation above. As noted in Mattson and Isaac (1999) the Reckhow (1979) model was developed on similar, north temperate lakes and most Massachusetts lakes will fall within the range of phosphorus loading and hydrology of the calibration data set. Additional assumptions, and details of calibration and validation are given in Reckhow (1979).

### **Wasteload Allocations, Load Allocations and Margin of Safety**

For most lakes, point source wasteload allocation is zero since no point sources have been identified. The margin of safety is set by establishing a target that is below that expected to meet the 4-foot swimming standard (about 40 ppb). Thus, the TMDL is the same as the target load allocation to nonpoint sources as indicated in the right side of the following table (originally Table 4 of "Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes" report, 2002). Loading allocations are based on the NPSLAKE landuse modeled phosphorus budget. Note that some lakes have surface TP concentrations that are larger than those predicted by the NPSLAKE model. It is difficult to determine the cause of the discrepancy because only one data point was available for each lake and that one sample may not be representative of the lake. If further sampling confirms a discrepancy in these lakes, internal sources of phosphorus, such as the sediments, may also be a contributing source of phosphorus to the surface waters and should be considered for further evaluation and control. Spectacle Pond is a seepage lake with a very small watershed and thus the NPSLAKE model prediction for loading is probably too high as indicated by the over prediction of lake phosphorus concentrations. As a further effort to protect this trout pond the target TP concentration was set lower (to 20 ppb) than that indicated by the ecoregion maps (25-50 ppb).

Table 4a. Browning Pond MA36025 TMDL Load Allocation.

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	121	121
Agriculture	33	33
Open Land	9	9
Residential (Low den.)	14	14
Residential (High den.)	0	0
Comm. Indust.	13	13
Septic System	10	10
Other	0.0	0.0
<b>Total Inputs</b>	<b>200</b>	<b>200</b>

Table . Long Pond MA36083 TMDL Load Allocation.

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	4	4
Agriculture	0	0
Open Land	6	2
Residential (Low den.)	0	0
Residential (High den.)	133	53
Comm. Indust.	20	8
Septic System	0	0
Other	0	0
<b>Total Inputs</b>	<b>163</b>	<b>68</b>

Table . Minechoag Pond MA36093 TMDL Load Allocation.

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	2	2
Agriculture	0	0
Open Land	6	3
Residential (Low den.)	1	1
Residential (High den.)	98	46
Comm. Indust.	2	1
Septic System	0	0
Other	0	0
<b>Total Inputs</b>	<b>110</b>	<b>53</b>

Table . Mona Lake MA36094 TMDL Load Allocation.

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	1	1
Agriculture	0	0
Open Land	0	0
Residential (Low den.)	0	0
Residential (High den.)	46	18
Comm. Indust.	0	0
Septic System	0	0
Other	0	0
<b>Total Inputs</b>	<b>47</b>	<b>19</b>

Table . Spectacle Pond MA36142 TMDL Load Allocation.

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	0.4	0.4
Agriculture	0	0
Open Land	0.3	0.3
Residential (Low den.)	0	0
Residential (High den.)	5.2	3
Comm. Indust.	10.9	5
Septic System	0	0
Other	0	0
<b>Total Inputs</b>	<b>16.8</b>	<b>8.7</b>

**Table Sugden Reservoir MA36150 TMDL Load Allocation.**

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	142	142
Agriculture	66	25
Open Land	6	2
Residential (Low den.)	19	7
Residential (High den.)	59	22
Comm. Indust.	20	8
Septic System	59	23
Other	0	0
<b>Total Inputs</b>	<b>372</b>	<b>230</b>

**Table Wickaboag Pond MA36166 TMDL Load Allocation.**

<i>Source</i>	<i>Current TP Loading (kg/yr)</i>	<i>Target TP Load Allocation (kg/yr)</i>
Forest	373	373
Agriculture	317	167
Open Land	44	23
Residential (Low den.)	35	18
Residential (High den.)	136	72
Comm. Indust.	22	11
Septic System	123	65
Other	0	0
<b>Total Inputs</b>	<b>1049</b>	<b>729</b>

Phosphorus loading allocations for each landuse category are shown (in most cases rounded to the nearest kg/yr) in the table above. No reduction in forest loading is targeted, because other than logging operations, which are relatively rare and are required by the DEM to use BMPs as part of their logging operations, this source is unlikely to be significantly reduced by additional BMPs. The remaining load reductions are allocated as a proportional phosphorus loading reduction.

The TMDL is the sum of the wasteload allocations (WLA) from point sources (e.g., sewage treatment plants) plus load allocations (LA) from nonpoint sources (e.g., landuse sources) plus a margin of safety (MOS). Thus, the TMDL can be written as:

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

Seasonality: As the term implies, TMDLs are often expressed as maximum daily loads. However, as specified in 40 CFR 130.2(l), TMDLs may be expressed in other terms when appropriate. For this case, the TMDL is expressed in terms of allowable annual loadings of phosphorus. Although critical conditions occur during the summer season when weed growth is more likely to interfere with uses, water quality in many lakes is generally not sensitive to daily or short term loading, but is more a function of loadings that occur over longer periods of time (e.g. annually).

Therefore, seasonal variation is taken into account with the estimation of annual loads. In addition, evaluating the effectiveness of nonpoint source controls can be more easily accomplished on an annual basis rather than a daily basis.

For most lakes, it is appropriate and justifiable to express a nutrient TMDL in terms of allowable annual loadings.

The annual load should inherently account for seasonal variations by being protective of the most sensitive time of year. The most sensitive time of year in most lakes occurs during summer, when the frequency and occurrence of nuisance algal blooms and macrophyte growth are usually greatest. Therefore, because these phosphorus TMDLs were established to be protective of the most environmentally sensitive period (i.e., the summer season), it will also be protective of water quality during all other seasons. Additionally, the targeted reduction in annual phosphorus load to the ponds will result in the application of phosphorus controls that also address seasonal variation. For example, certain control practices such as stabilizing eroding drainage ways or maintaining septic systems will be in place throughout the year while others will be in effect during the times the sources are active (e.g., application of lawn fertilizer).

Carlson, R.E. 1977. A Trophic State Index for Lakes. *Limnol. Oceanogr.* 22(2):361-369.

Griffith, G.E., J.M. Omernik, S.M. Pierson, and C.W. Kiilsgaard. 1994. Massachusetts Ecological Regions Project. USEPA Corvallis. Massachusetts DEP, DWM Publication No. 17587-74-70-6/94-D.E.P.

Mattson, M.D. and R.A. Isaac. 1999. Calibration of Phosphorus Export coefficients for Total Maximum Daily Loads of Massachusetts Lakes. *Lake and Reservoir Man.* 15(3):209-219.

Reckhow, K.H. 1979. Uncertainty Analysis Applied to Vollenweider's Phosphorus Loading Criteria. *J. Water Poll. Control Fed.* 51(8):2123-2128.

Rohm, C.M., J.M. Omernik, and C.W. Kiilsgaard. 1995. Regional Patterns of Total Phosphorus in Lakes of the Northeastern United States. *Lake and Reservoir Man.* 11(1): 1-14.

*Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes*

## Element C: Describe management measures that will be implemented to achieve water quality goals

**Element C:** A description of the nonpoint source management measures needed to achieve the pollutant load reductions presented in Element B, and a description of the critical areas where those measures will be needed to implement this plan.



### BMP Hotspot Map:

The following GIS-based analysis was performed within the watershed to identify high priority parcels for best management practice (BMP) (also referred to as management measure) implementation:

- Each parcel within the watershed was evaluated based on ten different criteria accounting for the parcel ownership, social value, and implementation feasibility (See **Table C-1** for more detail below);
- Each criterion was then given a score from 0 to 5 to represent the priority for BMP implementation based on a metric corresponding to the criterion (e.g., a score of 0 would represent lowest priority for BMP implementation whereas a score of 5 would represent highest priority for BMP implementation);
- A multiplier was also assigned to each criterion, which reflected the weighted importance of the criterion (e.g., a criterion with a multiplier of 3 had greater weight on the overall prioritization of the parcel than a criterion with a multiplier of 1); and
- The weighted scores for all the criteria were then summed for each parcel to calculate a total BMP priority score.

**Table C-1** presents the criteria, indicator type, metrics, scores, and multipliers that were used for this analysis. Parcels with total scores above 60 are recommended for further investigation for BMP implementation suitability. **Figure C-1** presents the resulting BMP Hotspot Map for the watershed. The following link includes a Microsoft Excel file with information for all parcels that have a score above 60: [hotspot spreadsheet](#).

This analysis solely evaluated individual parcels for BMP implementation suitability and likelihood for the measures to perform effectively within the parcel's features. This analysis does not quantify the pollutant loading to these parcels from the parcel's upstream catchment. When further evaluating a parcel's BMP implementation suitability and cost-effectiveness of BMP implementation, the existing pollutant loading from the parcel's upstream catchment and potential pollutant load reduction from BMP implementation should be evaluated.

GIS data used for the BMP Hotspot Map analysis included:

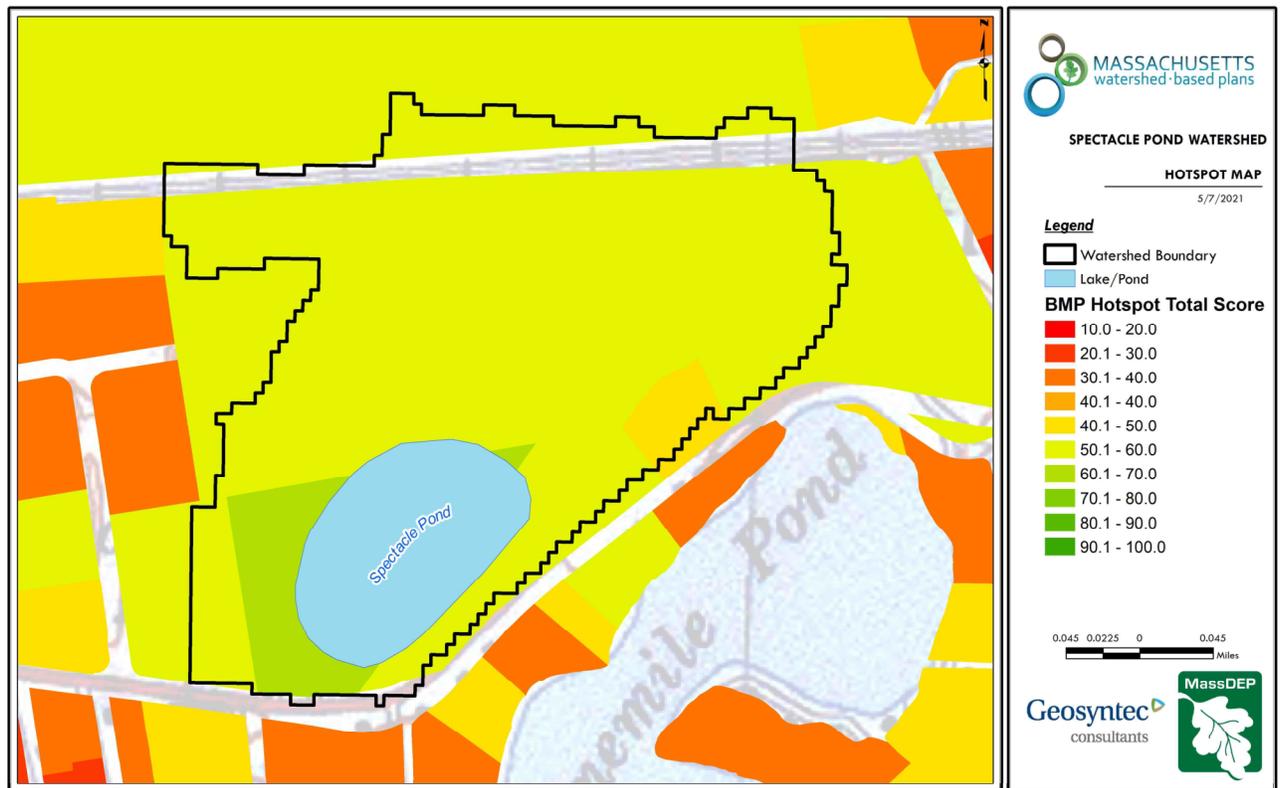
- MassGIS (2015a);
- MassGIS (2015b);
- MassGIS (2017a);
- MassGIS (2017b);
- MassGIS (2020);
- MA Department of Revenue Division of Local Services (2016);

- MassGIS (2005);
- ArcGIS (2020);
- MassGIS (2009b);
- MassGIS (2012); and
- ArcGIS (2020b).

**Table C-1: Matrix for BMP Hotspot Map GIS-based Analysis**

Criteria	Indicator Type	METRICS																Multiplier	Maximum Potential Score												
		Yes or No?		Hydrologic Soil Group				Land Use Type						Water Table Depth		Parcel Area				Parcel Average Slope											
		Yes	No	A or A/D	B or B/D	C or C/D	D	Low and Medium Density Residential	High Density Residential	Commercial	Industrial	Highway	Agriculture	Forest	Open Land	Water	101-200 cm			62-100 cm	31-61 cm	0-30 cm	Greater than 2 acres	Between 1-2 acres	Less than 1 acre	Less than 2%	Between 2% and 15%	Greater than 15%	Less than 50%	Between 51% and 100%	
Is the parcel a school, fire station, police station, town hall or library?	Ownership	5	0																											2	10
Is the parcel's use code in the 900 series (i.e. public property or university)?	Ownership	5	0																											2	10
Is parcel fully or partially in an Environmental Justice Area?	Social	5	0																											2	10
Most favorable Hydrologic Soil Group within Parcel	Implementation Feasibility			5	3	0	0																							2	10
Most favorable Land Use in Parcel	Implementation Feasibility						1	2	4	2	4	5	1	4	X <sup>1</sup>															3	15
Most favorable Water Table Depth (deepest in Parcel)	Implementation Feasibility															5	4	3	0											2	10
Parcel Area	Implementation Feasibility																			5	4	1								3	15
Parcel Average Slope	Implementation Feasibility																						3	5	1					1	5
Percent Impervious Area in Parcel	Implementation Feasibility																									5	2.5			1	5
Within 100 ft buffer of receiving water (stream or lake/pond)?	Implementation Feasibility	5	2																											2	10

Note 1: X denotes that parcel is excluded



**Figure C-1: BMP Hotspot Map (MassGIS (2015a), MassGIS (2015b), MassGIS (2017a), MassGIS (2017b), MassGIS (2020), MA Department of Revenue Division of Local Services (2016), MassGIS (2005), ArcGIS (2020), MassGIS (2009b), MassGIS (2012), ArcGIS (2020b))**

*Ctrl + Click on the map to view a full sized image in your web browser.*

### Proposed Management Measures:

**Table C-2** presents the proposed management measures as well as the estimated pollutant load reductions and costs. The planning level cost estimates and pollutant load reduction estimates and estimates of BMP footprint were based off information obtained in the following sources and were also adjusted to 2016 values using the Consumer Price Index (CPI) (United States Bureau of Labor Statistics, 2016):

- Geosyntec Consultants, Inc. (2014);
- Geosyntec Consultants, Inc. (2015);
- King and Hagen (2011);
- Leisenring, et al. (2014);
- King and Hagen (2011);
- MassDEP (2016a);
- MassDEP (2016b);
- University of Massachusetts, Amherst (2004);
- USEPA (2020);
- UNHSC (2018);
- Tetra Tech, Inc. (2015)

The water quality target concentration(s) is presented under Element A of this plan. To achieve this target concentration, the annual loading must be reduced to the amount described in Element B. Element C of this plan describes the various management measures that will be implemented to achieve this targeted load reduction. The evaluation criteria and monitoring program described below will be used to measure the effectiveness of the proposed management measures (described in Element C) in improving the water quality of Spectacle Pond.

## References

- 314 CMR 4.00 (2013). "[Division of Water Pollution Control, Massachusetts Surface Water Quality Standards](#)"
- ArcGIS (2020a). "[USA Soils Hydrologic Group](#)" Imagery Layer
- ArcGIS (2020b). "[USA Soils Water Table Depth](#)" Imagery Layer
- Cohen, A. J.; Randall, A.D. (1998). "[Mean annual runoff, precipitation, and evapotranspiration in the glaciated northeastern United States, 1951-80.](#)" Prepared for United States Geological Survey, Reston VA.
- Geosyntec Consultants, Inc. (2014). "*Least Cost Mix of BMPs Analysis, Evaluation of Stormwater Standards Contract No. EP-C-08-002, Task Order 2010-12.*" Prepared for Jesse W. Pritts, Task Order Manager, U.S. Environmental Protection Agency
- Geosyntec Consultants, Inc. (2015). "*Appendix B: Pollutant Load Modeling Report, Water Integration for the Squamscott-Exeter (WISE) River Watershed.*"
- King, D. and Hagan, P. (2011). "*Costs of Stormwater Management Practices in Maryland Counties.*" University of Maryland Center for Environmental Science Chesapeake Biological Laboratory. October 11, 2011.
- Leisenring, M., Clary, J., and Hobson, P. (2014). "*International Stormwater Best Management Practices (BMP) Database Pollutant Category Statistical Summary Report: Solids, Bacteria, Nutrients and Metals.*" Geosyntec Consultants, Inc. and Wright Water Engineers, Inc. December 2014.
- MA Department of Revenue Division of Local Services (2016). "[Property Type Classification Codes, Non-arm's Length Codes and Sales Report Spreadsheet Specifications](#)" June 2016
- MassDEP (2012). "[Massachusetts Year 2012 Integrated List of Waters Final Listing of Massachusetts' Waters Pursuant to Sections 305\(b\), 314 and 303\(d\) of the Clean Water Act](#)"
- MassDEP (2016a). "[Massachusetts Clean Water Toolkit](#)"
- MassDEP (2016b). "[Massachusetts Stormwater Handbook, Vol. 2, Ch. 2, Stormwater Best Management Practices](#)"
- MassDEP (2021). "[Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle](#)" November 2021.
- MassGIS (1999). "[Networked Hydro Centerlines](#)" Shapefile
- MassGIS (2001). "[USGS Topographic Quadrangle Images](#)" Image
- MassGIS (2005). "[Elevation \(Topographic\) Data \(2005\)](#)" Digital Elevation Model
- MassGIS (2007). "[Drainage Sub-basins](#)" Shapefile

MassGIS (2009a). "[Impervious Surface](#)" Image

MassGIS (2009b). "[Land Use \(2005\)](#)" Shapefile

MassGIS (2012). "[2010 U.S. Census Environmental Justice Populations](#)" Shapefile

MassGIS (2013). "[MassDEP 2012 Integrated List of Waters \(305\(b\)/303\(d\)\)](#)" Shapefile

MassGIS (2015a). "[Fire Stations](#)" Shapefile

MassGIS (2015b). "[Police Stations](#)" Shapefile

MassGIS (2017a). "[Town and City Halls](#)" Layer

MassGIS (2017b). "[Libraries](#)" Layer

MassGIS (2020). "[Massachusetts Schools \(Pre-K through High School\)](#)" Datalayer

MassGIS (2021). "[Standardized Assessors' Parcels](#)" Mapping Data Set

Schueler, T.R., Fraley-McNeal, L, and K. Capiella (2009). "*Is impervious cover still important? Review of recent research*" Journal of Hydrologic Engineering 14 (4): 309-315.

Tetra Tech, Inc. (2015). "*Update of long-term runoff time series for various land uses in New England.*" Memorandum in Opti-Tool zip package. 20 November 2015. Available at: Opti-Tool: EPA Region 1's Stormwater Management Optimization Tool | US EPA

United States Bureau of Labor Statistics (2016). "[Consumer Price Index](#)"

United States Geological Survey (2016). "*National Hydrography Dataset, High Resolution Shapefile*"

University of Massachusetts, Amherst (2004). "*Stormwater Technologies Clearinghouse*"

University of New Hampshire Stormwater Center (UNHSC) (2018). "*Stormwater Control Measure Nomographs with pollutant removal and design cost estimates.*" Available at: Stormwater Tools in New England | US EPA.

USDA NRCS and MassGIS (2012). "[NRCS SSURGO-Certified Soils](#)" Shapefile

USEPA (1986). "*Quality Criteria for Water (Gold Book)*" EPA 440/5-86-001. Office of Water, Regulations and Standards. Washington, D.C.

USEPA. (2010). "*EPA's Methodology to Calculate Baseline Estimates of Impervious Area (IA) and Directly Connected Impervious Area (DCIA) for Massachusetts Communities.*"

USEPA. (2020). "General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (as modified); Appendix F – Requirements for MA Small MS4s Subject to Approved TMDLs." 7 December 2020.

## Water Quality Assessment Reports

["Chicopee River Watershed 2003 Water Quality Assessment Report"](#)

## TMDL

["Total Maximum Daily Loads of Phosphorus for Selected Chicopee Basin Lakes"](#)

## Appendices

**Appendix A – Pollutant Load Export Rates (PLERs)**

Land Use & Cover <sup>1</sup>	PLERs (lb/acre/year)		
	(TP)	(TSS)	(TN)
AGRICULTURE, HSG A	0.45	7.14	2.6
AGRICULTURE, HSG B	0.45	29.4	2.6
AGRICULTURE, HSG C	0.45	59.8	2.6
AGRICULTURE, HSG D	0.45	91	2.6
AGRICULTURE, IMPERVIOUS	1.52	650	11.3
COMMERCIAL, HSG A	0.03	7.14	0.3
COMMERCIAL, HSG B	0.12	29.4	1.2
COMMERCIAL, HSG C	0.21	59.8	2.4
COMMERCIAL, HSG D	0.37	91	3.7
COMMERCIAL, IMPERVIOUS	1.78	377	15.1
FOREST, HSG A	0.12	7.14	0.5
FOREST, HSG B	0.12	29.4	0.5
FOREST, HSG C	0.12	59.8	0.5
FOREST, HSG D	0.12	91	0.5
FOREST, HSG IMPERVIOUS	1.52	650	11.3
HIGH DENSITY RESIDENTIAL, HSG A	0.03	7.14	0.3
HIGH DENSITY RESIDENTIAL, HSG B	0.12	29.4	1.2
HIGH DENSITY RESIDENTIAL, HSG C	0.21	59.8	2.4
HIGH DENSITY RESIDENTIAL, HSG D	0.37	91	3.7
HIGH DENSITY RESIDENTIAL, IMPERVIOUS	2.32	439	14.1
HIGHWAY, HSG A	0.03	7.14	0.3
HIGHWAY, HSG B	0.12	29.4	1.2
HIGHWAY, HSG C	0.21	59.8	2.4
HIGHWAY, HSG D	0.37	91	3.7
HIGHWAY, IMPERVIOUS	1.34	1,480	10.5
INDUSTRIAL, HSG A	0.03	7.14	0.3
INDUSTRIAL, HSG B	0.12	29.4	1.2

INDUSTRIAL, HSG C	0.21	59.8	2.4
INDUSTRIAL, HSG D	0.37	91	3.7
INDUSTRIAL, IMPERVIOUS	1.78	377	15.1
LOW DENSITY RESIDENTIAL, HSG A	0.03	7.14	0.3
LOW DENSITY RESIDENTIAL, HSG B	0.12	29.4	1.2
LOW DENSITY RESIDENTIAL, HSG C	0.21	59.8	2.4
LOW DENSITY RESIDENTIAL, HSG D	0.37	91	3.7
LOW DENSITY RESIDENTIAL, IMPERVIOUS	1.52	439	14.1
MEDIUM DENSITY RESIDENTIAL, HSG A	0.03	7.14	0.3
MEDIUM DENSITY RESIDENTIAL, HSG B	0.12	29.4	1.2
MEDIUM DENSITY RESIDENTIAL, HSG C	0.21	59.8	2.4
MEDIUM DENSITY RESIDENTIAL, HSG D	0.37	91	3.7
MEDIUM DENSITY RESIDENTIAL, IMPERVIOUS	1.96	439	14.1
OPEN LAND, HSG A	0.03	7.14	0.3
OPEN LAND, HSG B	0.12	29.4	1.2
OPEN LAND, HSG C	0.21	59.8	2.4
OPEN LAND, HSG D	0.37	91	3.7
OPEN LAND, IMPERVIOUS	1.52	650	11.3
<sup>1</sup> HSG = Hydrologic Soil Group			

**Attachment C**  
**Methodology for Phosphorus Load**  
**Calculations**

## Methodology for Phosphorus Load Calculations

This appendix explains the methodology used to calculate phosphorus loading within the Spectacle Pond watershed. All actions described were performed in ArcGIS Pro 3.1.1 and Microsoft Excel.

The methodology is based on the following resources:

- Attachment 1 to Appendix F of the MS4 General Permit, *Method to Calculate Baseline Phosphorus Load (Baseline,  $P_{base}$ ), Phosphorus Reduction Requirements and Phosphorus load increases due to development ( $P_{DEVinc}$ )*, URL: <https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-f-attach-1-2016-ma-sms4-gp-mod.pdf>
- Supplemental information from MassDEP, *2016 Massachusetts Small MS4 Permit Pollutant Loading Export Rates applies to the 2016 Massachusetts Land Use/Land Cover GIS Dataset*, URL: <https://www.mass.gov/doc/land-use-land-cover-guidance-updated-2016/download>

The analysis included the four GIS shapefiles shown in **Table C-1**.

**TABLE C-1** Shapefiles Used in Analysis

Layer	Use	Origin
Watershed Drainage Area Delineation	Area of interest for phosphorus loading analysis	StreamStats, USGS
2005 Land Use	Land use classifications; Impervious area calculations	MassGIS
2016 Land Use/Land Cover	Land use and cover classifications; Impervious area calculations	MassGIS
Subsurface Geology (SSURGO_Soils) <i>Last updated 12/15/23</i>	Soil hydrologic groups	NRCS Soils Layer

Using the data sources above, the following key analyses were calculated:

- **Spectacle Pond Watershed Area**
- **Baseline Phosphorus Load:** Following the procedure outlined in Attachment 1 to Appendix F of the MS4 General Permit, the 2005 baseline phosphorus load was determined using land use categories and composite phosphorus export rates (PLERs). The steps outlined in the Permit provided instructions to calculate the baseline load, phosphorus reduction requirement, and subsequently an allowable phosphorus load for the watershed.
- **Updated Phosphorus Load ( $P_{base} + P_{DEVinc}$ ):** The watershed's current phosphorus export rate, as referenced in equation 2 in Appendix F, was calculated for the watershed based on current conditions. The updated phosphorus load was calculated using the 2016 Land Use/Land Cover dataset, MassDEP's supplemental report (*2016 Massachusetts Small MS4 Permit Pollutant Loading Export Rates applies to the 2016 Massachusetts Land Use/Land Cover GIS Dataset*), NRCS SSURGO\_Soils and the watershed drainage area.

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### **Baseline Phosphorus Load Calculations**

The baseline loading was determined by calculating the areas of each land use within the Spectacle Pond watershed. The GIS and Microsoft Excel steps taken are as follows:

1. Clip the "2005 Land Use" shapefile with the watershed area.
2. Dissolve the new layer by *Land Use Category*.
3. Add a new field to the dissolved layer and calculate area in acres.
4. Export attribute table to excel.
5. In excel, export rates were assigned for each *Land Use Category* based on Table 1-1 in Attachment 1 to Appendix F of the MS4 General Permit.
6. Areas were summed to provide the baseline phosphorus load (lb/yr).

### **Updated Phosphorus Load Calculations**

The updated phosphorus loading was determined by calculating the areas of each land use/cover soil combinations within the watershed. The GIS and excel steps taken are as follows:

1. Clip the "2016 Land Use/Land Cover" shapefile with the watershed area.
2. Clip the "SSURGO Soils" shapefile with the watershed area.
3. Intersect the "2016 Land Use/Land Cover" shapefile with the "SSURGO Soils" shapefile to create a new layer called "SSURGO\_Soils\_ClipIntersect\_2016".
4. Create a new field called *Land Use Soil Category*.
5. Populate *LandUseCat* field using field calculator to equal the *Generalized Use Name* from "2016 Land Use/Land Cover" shapefile.
6. Populate the *Land Use Soil Category* field to equal the *LandUseCat* field plus the string "TIA" if the land cover was impervious.
7. Populate the *Land Use Soil Category* field to equal the *LandUseCat* field plus the string "PERV" plus the intersecting soil hydrologic group if the land cover was not impervious.
8. Dissolve the new layer by *Land Use Soil Category*.
9. Add a new field to the dissolved layer and calculate the area of each *Land Use Soil Category* in acres.
10. Each area per land use group was input into a spreadsheet developed by Brown and Caldwell (yellow cells were filled in, the orange cells were EPA-provided values, and purple cells automatically calculated based on inputs). This provided the updated phosphorus load (lb/yr). See **Figure C-1**.

FIGURE C-1 Updated Phosphorus Loading Calculation in Excel

Phosphorus Land Use Group	Total Area (ac)	Impervious Area (ac)	Percent Impervious	Directly Connected Impervious Area					Pervious Area Phosphorus Load														Disconnected Impervious Area			Total Avg Annual Phosphorus Load (lb/yr)									
				Sutherland Coeffs		Percent Directly Connected Impervious Area (%)	Directly Connected Impervious Area (ac)	Phosphorus Loading Export Rate (lb/ac/yr)	Avg Annual Phosphorus Export Load (lb/yr)	Perv HSG Area (ac)							Phosphorus Export Loading Rate (lb/ac/yr)							Avg Annual Phosphorus Export Load (lb/yr)							Disconnected Impervious Area (ac)	Composite Phosphorus Export Loading Rate (lb/ac/yr)	Avg Annual Phosphorus Load (lb/yr)		
				A	B					A	B	C	C/D	D	Unk	Total	A	B	C	C/D	D	Unk	Total	A	B		C	C/D	D	Unk				Total	
Commercial	25.8	6.8	26.27%	0.4	1.2	20.2%	5.2	1.78	9.3	0.5						18.5	19.0	0.03	0.12	0.21	0.21	0.37	0.21	0.0	-	-	-	-	-	3.9	3.9	1.6	0.2	0.3	13.5
Industrial	1.6	0.0	0.00%	0.4	1.2	0.0%	0.0	1.78	-						1.6	1.6	0.03	0.12	0.21	0.21	0.37	0.21	-	-	-	-	-	-	0.3	0.3	-	0.2	-	0.3	
Highway	2.90	0.1	3.46%	0.1	1.5	0.6%	0.0	1.95	0.0	0.006					2.8	2.8	0.03	0.12	0.21	0.21	0.37	0.21	0.0	-	-	-	-	-	0.6	0.6	0.1	0.2	0.0	0.6	
Forest	15.9	0.0	0.00%	0.01	2	0.0%	0.0	1.52	-	1.1					14.9	15.9	0.13	0.13	0.13	0.13	0.13	0.13	0.1	-	-	-	-	-	1.9	2.1	-	0.1	-	2.1	
Open land	2.6	0.1	4.02%	0.1	1.5	0.8%	0.0	1.52	0.0	0.044					2.45	2.50	0.03	0.12	0.21	0.21	0.37	0.21	0.0	-	-	-	-	0.5	0.5	0.1	0.2	0.0	0.6		
Agriculture			0.00%	0.01	2	0.0%	0.0	1.52	-						-	-	0.45	0.45	0.45	0.45	0.45	0.45	0.45	-	-	-	-	-	-	-	-	-	-	-	
Subtotal	48.8	7.0	14%			11%	5.2		9.3	1.6	-	-	-	-	40.2	41.8								0.2	-	-	-	-	7.3	7.4	1.7		0.4	17.1	
Water	15.2																																		
Total	64.0																																		

Fill in these cells

EPA-provided values (Source: EPA Memorandum, Authored by: Mark Voorhees, Dated: 1/14/2014, Entitled: Overview of Methodology to Calculate Baseline Stormwater Phosphorus Loads and Phosphorus Load Reduction Requirements for Charles River)

Calculated values

NOTES:

- This spreadsheet was developed by Brown and Caldwell to calculate baseline phosphorus loads in accordance with the methodology used in the Massachusetts Small MS4 General Permit. EPA documented the baseline phosphorus load calculations in the EPA Memorandum authored by Mark Voorhees and dated 1/14/2014.
- Only edit the yellow cells.
- Brown and Caldwell is providing this spreadsheet as a courtesy to third parties. Brown and Caldwell makes no guarantees or warranties about its accuracy. You are responsible for verifying all calculations. If you identify any issues, please contact Matt Davis (see contact info below)
- This spreadsheet is valid only for calculating baseline phosphorus loads. The calculation of current loads is performed using a different methodology and phosphorus export loading rates.
- For a detailed discussion of how baseline phosphorus loads are calculated, please watch the recorded video from the Charles River Watershed Association Phosphorus Control Planning Workshop #1 that was held on 3/8/2022.
- Please contact Matt Davis at Brown and Caldwell if you have any questions. Email: mdavis@brwncald.com.

**Attachment D**  
**EPA BATT: Phosphorus Removal Estimate**  
**Calculations for Town & Private BMPs**

**Wilbraham Spectacle Pond  
EPA BATT: Phosphorus Removal Estimate Calculations**

BMP Location	Type	BMP Storage Volume <sup>a</sup> (ft <sup>3</sup> )	Infiltration Rate (in/hr) <sup>b</sup>	Hydrologic Soil Group <sup>b</sup>	Catchment Areas <sup>c</sup>				Phosphorus Load Removal (lbs/yr)
					Open Land - Pervious (acres)	Forest - Pervious (acres)	Open Land - Impervious (acres)	Total Area (acres)	
<b>Town</b>									
Spectacle Pond Detention Basin	Detention Basin	29,100	0.27	C	14.58	1.46	13.12	29.16	3.25
<b>Private</b>									
Post Office Park	Retention/Infiltration Basin	83,600	0.27	C	0.50	0.00	4.54	5.04	6.41

Notes:

- a. "Storage Volume" estimated from design plans using Conic Method for Reservoir Volumes per USACE HEC-1.
- b. Value unavailable from USDA NRCS Web Soil Survey (<https://websoilsurvey.nrcs.usda.gov/app/>). Per Attachment 1 of Appendix F of the MS4 General Permit, assume HSG C for phosphorus load export rate. Infiltration rate also assumed based on Rawls Rate.
- c. Catchment areas estimated based on MassGIS 2016 Land Cover Land Use layer as well as MassGIS contour layers.

**Attachment E**  
**EPA Guidance: Using a Self-Certification**  
**Process to Streamline Operation &**  
**Maintenance (O&M) of Private Stormwater**  
**Controls**

# Using a Self-Certification Process to Streamline Operation & Maintenance (O&M) of Private Stormwater Controls

## Purpose and Background

Ongoing maintenance of stormwater controls is essential for those controls to perform as intended to achieve water quality and water quantity benefits. Under the NPDES MS4 Stormwater General Permit for Massachusetts (MS4 Permit), municipalities intending to obtain credit for the phosphorus reductions achieved by stormwater controls (per Appendix F of the MS4 Permit) must ensure that ongoing maintenance is being performed. In accordance with Standard 9 of the Massachusetts Stormwater Handbook<sup>1</sup>, municipalities routinely require that applicants for stormwater, wetlands, subdivision, site plan review and special permits provide a stormwater operations and maintenance plan (O&M) in their applications. However, many municipalities find it challenging to ensure ongoing maintenance of stormwater controls occurs after a project is built by an applicant. One solution to this challenge is to require property owners annually self-certify they are inspecting and maintaining their controls. An O&M self-certification process as proposed herein would provide a reporting process that can fold directly into the municipality's MS4 Annual Report and allow the municipality to focus inspections on auditing just a small proportion of the systems each year. Read on to learn how Stormwater O&M self-certification works.

O&M self-certification emerged as an interest and a need during the [Mystic Stormwater Collaborative Project](#), which includes the communities of Cambridge, Lexington, Reading, and Watertown, and technical partners such as the Mystic River Watershed Association, University of New Hampshire Stormwater Center, and the U.S. Environmental Protection Agency (EPA). While the four participating communities understand the importance of conducting regular O&M on stormwater management controls, they expressed interest in new ways to address the challenges associated with ensuring O&M on smaller projects within existing regulatory frameworks and available resources.

## Model O&M Self-Certification Form

The O&M self-certification form should be simple and easy to complete by a property owner or their agent. A template form that communities can start with is provided in Appendix A.

The minimum information to be collected on a self-certification form should include:

- Name and contact information of owner
- Name and contact information of operator, if applicable
- Address/location of stormwater control
- Type of stormwater control
- Date of last inspection or maintenance for each control
- Certification statement

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<sup>1</sup> The Massachusetts Stormwater Handbook is currently being updated. Requirements for the individual stormwater standards may change.

- Signature of owner or operator
- Date attesting to the certification statement
- Reference of the O&M Plan or guidance being followed

Many property owners may be unfamiliar with or unaware of their stormwater controls and maintenance responsibilities. Typically, a stormwater O&M Plan is approved as part of the permitting process for an improvement on their property.

Some projects that fall below a particular municipal permit threshold are often not required to develop a stormwater O&M Plan. For these properties, it may be helpful to append to the self-certification form a menu list of common small-scale stormwater control practices (e.g., dry wells, rain gardens, bio swales, and permeable pavers) along with O&M best practices. This will help serve as a reminder to such owners and their agents (e.g., operators) of the recommended O&M for their specific control(s). An O&M Plan approved through a municipal permit process should always take precedent over the maintenance best practices highlighted in an appendix to the form.

**Making Stormwater O&M Plans Readily Available:**

Most property owners will not be well versed in stormwater controls and may not be aware that the stormwater controls approved on their site require ongoing maintenance. A municipality can help by ensuring that O&M plans approved through a permitting process are complete, include a map or figure identifying each control, and are attached to the permit when it is issued to the property owner. *(Note: Permits should be issued to property owners and linked to specific parcels, even if the applicant filing the permit application is an agent.)*

Depending on the municipality's MS4 regulatory requirements and capacity for data collection, the form could include more specific operational information for the stormwater controls, such as:

- Permit number, so the municipality could track the form back to the original permit.
- A field to indicate whether the stormwater control ties into the MS4.
- Comment box for the owner/operator to describe specific maintenance performed or problems encountered since the last inspection.

Municipalities could require applicants of larger projects, which would be required to submit an O&M Plan with their permit application, to also customize and submit an O&M self-certification form as part of their permit application. The approved customized form could then be used by the owner for years to come.

## Regulatory Framework

For this self-certification process to succeed, property owners with stormwater controls must be legally required to submit the stormwater O&M self-certification form each year. This requirement should be embedded into the municipal permitting process either as a standard condition that is attached to the permit approval or found in regulations in the bylaw/ordinance or regulations. This approach will differ among municipalities depending on the existing permit structure for stormwater controls. Regardless of which permitting authority is responsible, the same form should be used and supplemented as needed with any other conditions that may be required by the issuing authority. The permit that includes the ongoing reporting requirement should be issued for a given property and should run with the property.

**New Controls:** Moving forward, owners/operators of all permitted stormwater controls should be required to submit an annual form certifying completion of the ongoing stormwater O&M Plan approved in their permit.

**Existing Controls:** Permits for prior permitted stormwater controls should be reviewed to determine if O&M was required and if annual reporting can be required. If O&M was required, the municipality can explore whether and how to include those properties in the self-certification process.

O&M self-certification may be beneficial to municipalities for small, medium, and large projects alike. Larger projects often manage O&M of stormwater controls well since they tend to have better access to resources (e.g., funding, engineers, site managers or operators). However, a municipality may find it useful to require larger projects to self-certify if the community has a significant number of these larger projects to oversee, and limited resources for inspections and enforcement. Smaller projects, on the other hand, may not be as well-informed to properly manage stormwater controls, but self-certification can provide an important educational service to the owners, even if there is no or limited follow-up and enforcement on small projects. Municipalities may find the best use of their resources to target the medium projects, like multi-family housing and mid-size commercial properties.

**Consistency in Stormwater Standards Across Permits:** If stormwater management controls are evaluated in multiple permit processes (e.g., Stormwater Management Permit, Wetlands Order of Conditions, Site Plan Review, Subdivision Approval, Drainage Connection Permit), those processes should be made consistent so that a given development project and its stormwater controls are held to a uniform set of stormwater standards, including a stormwater O&M Plan.

## Submission Frequency

Stormwater O&M self-certification forms should be collected from property owners on an annual basis. Maintaining one uniform submittal schedule, regardless of the installation date or permit issuance date for a given stormwater control, helps to simplify the process for both the property owners/operators and the municipality. The due date for self-certification forms should be selected to provide sufficient time for the municipality to review and compile the results and include them in the municipal MS4 Annual Report.

## Submission Process

Completed forms should be directed to a single department or individual to log the responses. The municipality can create a specific email address to receive completed forms, and allow paper copies to be mailed or hand delivered if desired. A municipality that has an online database system in place could create a mechanism for uploading completed forms or ideally an option for completing the form online (there could be a link to a town data base, where the user only has access to his/her submittal field). In the early years, the number of reporting forms collected each year may be minimal. However, over time, it will increase. For this reason, an automated process is recommended.

## Auditing and Enforcement

The crux of the self-certification process is auditing. An auditing process involves the municipality performing a small percentage of stormwater inspections each year and is essential to ensuring the credibility of the self-certification reporting. Municipal staff must be authorized through the individual permitting processes or the stormwater ordinance/bylaw to perform inspections and enforce the approved O&M Plan on the applicable properties.

**Credible Enforcement Mechanism:**  
Credible enforcement is necessary to ensure MS4 permit holders can obtain phosphorus reduction credit for stormwater controls.

Such authorization for enforcement may currently be provided to different departments, boards, or commissions depending on the permits issued for a given project. It could be beneficial to streamline the auditing and enforcement powers through just one department, such as Engineering, Public Works, or Health, so that the system can be more easily monitored. Many

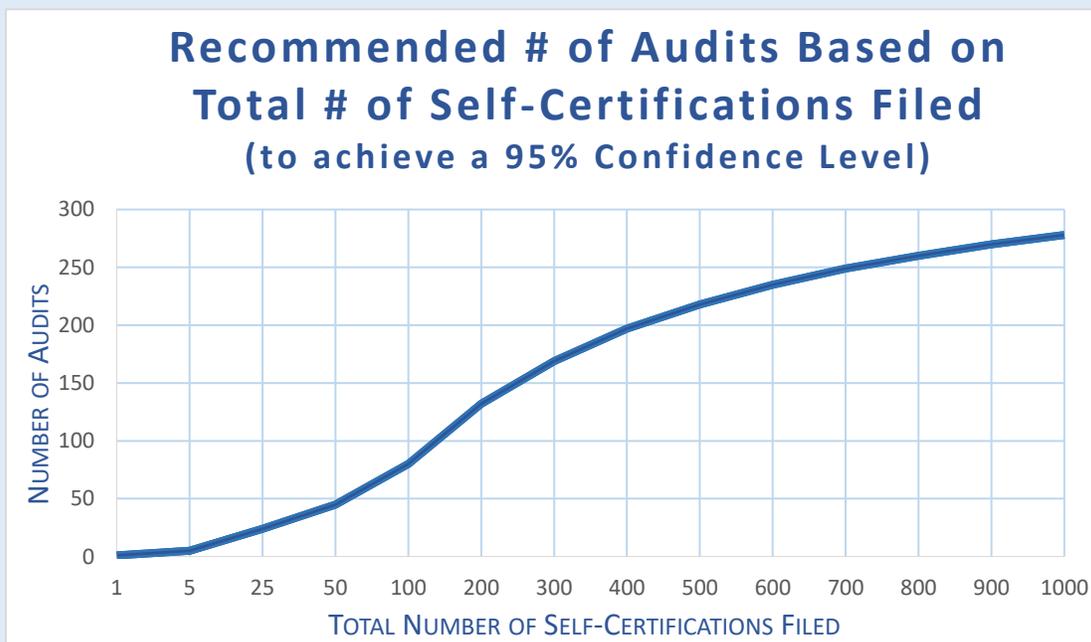
bylaws/ordinances or regulations include a provision by which a board or commission or other permitting entity can designate an agent to perform some of the duties, including enforcement. Review your code for this type of authorization and consider coordinating with other permitting entities to designate one consistent enforcement agent for all stormwater controls.

Although O&M self-certification may be required on projects of variety of sizes, the municipality should focus enforcement resources on medium and large projects. Including small projects in the self-certification process serves as a great educational tool; however, enforcing these types of projects may be prohibitively burdensome for the municipality.

A properly designed audit program will allow a municipality to maintain confidence that individual self-certified stormwater controls are in fact being maintained. In addition, the MS4 permit requires municipalities to certify that all stormwater controls they are claiming pollution credit for are working and maintained as designed. An important mechanism to ensure that the municipality can make that claim with confidence is a statistically significant auditing program. The community may want to perform a statistical analysis to determine the percentage of audits that should be done each year to ensure general compliance with O&M across all self-certified sites. The box below provides some simple tips for developing an audit to consider for developing an audit program, including some guidance on selecting the number of annual audits to perform based on the total number of controls in the program. The goal is to perform the audits over the course of a 5 year permit cycle.

### Tips for Developing an Audit Program:

1. Select the number of audits to perform to ensure with a 95% confidence level that the audited systems will be representative of the total population. If your municipality has fewer than 50 certifications, all of the systems should be audited over the 5-year cycle. As the number of certifications increases, the relative number that needs to be audited decreases.



2. Randomly select the systems to audit (e.g., select every 5<sup>th</sup> certification in your database).
3. Notify property owners of audits electronically, to let them know when it will be, how long it will take, and to offer to change to a more convenient time if owners want to be present.
4. Develop an audit checklist that mirrors the self-certification standards, so the audit report can be used as an example for self-certification.
5. Communicate the results to the property owner, with a timeline to address deficiencies and a reporting requirement or re-auditing protocol, depending on seriousness of non-compliance
6. At end of the annual or 5-year audit period, tabulate audit data to identify common maintenance issues for further action or revised guidance as needed to improve compliance.

### Useful Tool: Permitting Database

A permitting database, from a basic internal Excel file to a GIS database to an online cloud-based system, can be an exceptionally useful tool for communities working to track stormwater controls. A database can help multiple departments within a municipality monitor and participate in the permit approval process, and can serve as an organizational tool to log all permits issued to an individual parcel over time. Important data to track over the long term include permit issuances, parcel ID and up-to-date contact information for parcel owners.

Some communities have instituted an online database to coordinate and track permit applications, reviews, and approvals among municipal departments. The permit information is typically linked to individual parcels allowing a community to track all permits and additional relevant information on a parcel-by-parcel basis. In addition, a permitting database enables the municipality to run reports, compile records, generate electronic communications, and trigger certain reviews or audits on a designated schedule or frequency. In addition, an online permitting database with a public-facing interface can allow permittees to submit documentation to their record, such as an annual stormwater O&M self-certification form. Communities using an online permitting database, such as Viewpoint Cloud, may find it easy to develop and require electronic submission of the O&M self-certification form. Filing these forms electronically will help provide easy access to the forms and critical information required for annual reporting to comply with the MS4 Permit requirements.

#### Common Online Permitting Platforms:

Viewpoint Cloud (<https://www.viewpointcloud.com/>). Used in Cambridge and Lexington, MA.

CitizenServe (<https://www.citizenserve.com/>). Used in Lawrence, MA.

CityView (<https://www.municipalsoftware.com/>).

Govpilot (<https://www.govpilot.com/>).

*Note: Listing of permit database platforms in this document is for informational purposes only, and does not represent an endorsement by the authors or EPA.*

#### Documenting and Tracking Prior Existing Stormwater Controls

Communities may lack records on the existence and location of small stormwater controls, particularly because stormwater controls could have been approved through one of several different permit processes (e.g., Wetlands Order of Conditions, Site Plan Review, Stormwater Permit, Building Permit). While it would be ideal to know where every stormwater control is located throughout the municipality, a community may only be interested or able to document the type and location of stormwater controls approved and installed in recent years. The MS4 Permit only allows phosphorus control credit for practices if an inspection is performed and any necessary maintenance is performed to bring the system into working order. Therefore, the process of folding these prior existing stormwater controls into the reporting process is useful for the overall health of the watershed in which they are located, but need not be prioritized over tracking and maintenance of new practices.

#### Communicating with Property Owners

It is best practice to issue reminders to owners/operators to conduct O&M as part of completing the self-certification form. Reminders could be easiest sent via the online permitting database, if applicable. Communities that do not have an online database could send annual reminders to permittees through regular mail and include reminders in other general municipal communications such as social media, town website, or utility billing. Educational materials that are used to promote O&M to smaller projects should be careful to not include a punitive tone if the municipality does not intend to audit and enforce O&M self-certification for small projects.

Ensuring continuity of O&M practices through property transfer can be challenging. Property transfer is a time when information about municipal requirements for the property, such as O&M self-certification, can get lost. While some municipalities require the transfer of property with larger stormwater controls

to renew an O&M plan, it is more difficult to track for small and medium projects. Municipalities can work with the water department to notify the stormwater authority when there is a change in water meter ownership. Other mechanisms may be readily available to the community if an online database is utilized. Municipalities may choose to adopt a bylaw to ensure continuity.

Under the MS4 Permit, municipalities are required to implement an education and outreach program for their community, including residents, businesses, and institutions, which comprise the targeted audience for O&M self-certification. Communities can use this opportunity to circulate a fact sheet on the importance of on-site stormwater management and conducting regular O&M.

Appendix A: Template O&M Self-Certification Form

**Stormwater Control Operation and Maintenance  
Annual Self-Certification Form  
Calendar Year: \_\_\_\_\_**

<b><u>Owner (required)</u></b>	<b><u>Operator (if applicable)</u></b>
Name:	Name:
Phone:	Phone:
Email address:	Email address:
Street Address of Stormwater Control Location:	
Name and Date of Operations and Maintenance Plan:	
<p>(Note: If your property received or was a part of property that received any of the permits listed on the back of this form since 2020, your permit included a Stormwater O&amp;M Plan that you should be following. Please see the back of this form for more information.)</p>	

Name/ Type of Stormwater Control	Description and Date of Maintenance performed since July 1 of last year

<p><b><u>Certification Statement</u></b>  I understand that I own a stormwater control practice or practices on my property and I understand that I need to perform regular and ongoing maintenance of that/those practice(s) to ensure performance and functionality, and to protect the water resources in my community. I certify that I have performed the approved maintenance for my stormwater control practice(s) for this year.</p> <p>Signature of Owner or Operator: _____</p> <p>Date: _____</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

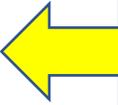
Note: The Town/City performs maintenance audits each year on a small percentage of stormwater controls. You may be contacted by the Department of Public Works for this purpose.

## Stormwater Control Operation and Maintenance Annual Self-Certification Form ADDENDUM

(This addendum is intended to serve as a reference for property owners in completing the Annual Self-Certification Form. It should be edited by each municipality to meet its own needs)

These are the types of land development or land alteration permits that may include Stormwater O&M Plans for your stormwater practices:

- Stormwater Management Permit
- Wetlands Order of Conditions
- Site Plan Review
- Subdivision Approval
- Drainage Connection Permit



This list of permits should be adjusted by each individual municipality according to its own permit practices.

Our records show that you received a **[permit type]** on **[date]**. Please contact the **[appropriate department]** at **[municipality name]** Town Offices for help in locating the appropriate Stormwater O&M Plan for your property.



If a database is used to track permits and communicate with permittees, a statement like this could be included on each individual self-certification reporting form that is generated for each permitted property.

## Appendix B. Maintenance Needs for Common Small Stormwater Controls for Small Projects

The information summarized below is for stormwater controls that have no approved Operations and Maintenance (O&M) Plan associated with it. Approved O&M Plans take precedent over the information provided below.

Stormwater Controls	Maintenance Summary
<b>Bioretention</b>	<p><b>Regularly:</b> Inspect your bioretention practice, remove trash and debris, pull weeds, and repair any erosion gullies.</p> <p><b>Early Spring and Fall:</b> Mow grassy areas of the practice and prune your plants, remove dead vegetation and replace if needed, and replenish mulch in the bed as needed.</p> <p><b>If the practice is slow to drain:</b> you may need to aerate the top layer of soil or remove fine sediment that may have accumulated. Check the underdrain system through the cleanout to make sure there isn't standing water in the pipe.</p>
<b>Dry Well</b>	<p><b>Early Spring and Fall:</b> inspect the downspout connection to the dry well to be sure it is properly connected and clear of debris. For open downspouts, remove debris and sediment buildup in the upper gravel layer.</p> <p><b>If system appears clogged:</b> If excessive ponding or gully erosion is observed, and/or the system does not drain within three days, your dry well is not functioning properly. Check the drainage connection and gravel for clogging. Remove and replace all stone if needed, or possibly the entire drywell structure if crushed or otherwise damaged beyond repair.</p>
<b>Infiltration Trench</b>	<p><b>Early Spring and Fall, and after major storms:</b> Inspect the system surface for damage and remove accumulated debris and sediment from the upper layer of gravel. Check the underdrain system through the cleanout to make sure there isn't standing water in the pipe, if the practice has an underdrain system.</p> <p><b>Annually:</b> Inspect system and remove sediments, trash and debris from sediment removal (pretreatment) systems when ½ of the storage volume is full of sediment.</p> <p><b>If the trench is not draining:</b> remove and replace the top layer of stone and filter fabric. If ponding continues, gravel layers and pipes may need to be replaced but this usually does not occur until years of use with proper maintenance.</p>
<b>Permeable Pavers</b>	<p><b>Monthly:</b> Remove debris and trash and sweep away sediment buildup that can clog the system over time.</p> <p><b>Early Spring and Fall:</b> Mow and seed the grass in the pavers. Add sand or gravel to stone pavers to replace any lost material.</p> <p><b>Winter:</b> Attach rollers to the bottoms of snowplows to prevent snagging, or perform snow removal with a snowblower or shovel.</p> <p><b>After any major storms:</b> Check that paver system is draining. If it is not, remove and wash gravel in joints, and remove any plant growth that was not originally planted. Refer to manufacturer's instructions for pressure washing or vacuuming.</p>

Stormwater Controls	Maintenance Summary
<b>Planters</b>	<p><b>Early Spring:</b> Inspect the planter and replace any dead or damaged plants, missing gravel, damaged infrastructure and repair any damage to the planter, especially to address leakage.</p> <p><b>As needed:</b> remove debris, trash and sediment that accumulates in the planter.</p>
<b>Porous Pavement</b>	<p><b>Routinely:</b> Remove trash and debris (particularly leaves) from the surface.</p> <p><b>Start of each season:</b> Vacuum sweep (you will need to contract this service, as this requires special equipment)</p> <p><b>Annually:</b> Inspect the surface for deterioration and crumbling and take note of any surface ponding. Repair/replace when needed.</p> <p><b>Note:</b> Do not use sand on porous pavement for winter snow management. Porous pavement helps to significantly reduce standing water, which reduces icing and the need for sand or salt. Sand will clog the system. Salt can be used sparingly in most areas.</p>
<b>Rain Garden</b>	<p><b>Regularly:</b> Inspect your rain garden and remove trash and debris, pull weeds, and repair any erosion gullies.</p> <p><b>Early Spring and Fall:</b> Mow or prune your plants, remove dead vegetation and replace if needed, and mulch the bed.</p> <p><b>If the rain garden is slow to drain:</b> you may need to aerate the top layer of soil or remove fine sediment that may have accumulated.</p>
<b>Water Quality Swale</b>	<p><b>Spring and fall:</b> Mow the swale and remove any accumulated trash and debris.</p> <p><b>Annually:</b> inspect for accumulated sediment and/or erosion; remove sediment and repair gullies as needed.</p> <p><b>If draining poorly:</b> roto-till the bottom of the swale to improve aeration and reseed as needed.</p>

<sup>1</sup> Some stormwater controls, including underground storage, are more advanced or more difficult to access than others and need an experienced operator to routinely inspect and conduct maintenance.

**Attachment F**  
**Excerpt from Municipal Facilities and**  
**Activities Inventory and Operations &**  
**Maintenance Plan: Structural BMP**  
**Inspections & Maintenance Standard**  
**Operating Procedure**

**STANDARD OPERATING PROCEDURE 5: STRUCTURAL STORMWATER BEST MANAGEMENT PRACTICES INSPECTIONS AND MAINTENANCE  
TOWN OF WILBRAHAM DEPARTMENT OF PUBLIC WORKS**



**DESCRIPTION:** Procedures for inspecting and maintaining common types of constructed stormwater best management practices (BMPs) used on Wilbraham town property. Constructed BMPs are permanent site features designed to treat stormwater before infiltrating it to the subsurface or discharging it to a surface water body.

This Standard Operating Procedure (SOP) is based on the Massachusetts Stormwater Handbook and is not intended to replace that document. This SOP is also not intended to replace the Stormwater BMP Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act, Order of Conditions. Inspection forms for each BMP are attached.

**TARGETED CONSTITUENTS:**

- Sediment
- Nutrients
- Trash
- Invasive species

**EXTENDED DRY DETENTION BASINS:**

*Description*

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and to reduce local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

*Inspection & Maintenance*

Annual inspection of Town-owned extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include: erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately.

*Maintenance Schedule*

Activity	Time of Year	Frequency
Inspect basins	Spring or Fall	Every four years
Examine outlet structure for clogging or high outflow release velocities	Spring and Fall	Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Annually
Remove trash and debris	Spring	Annually
Remove sediment from basin	Year round	As Necessary

**STANDARD OPERATING PROCEDURE 5: STRUCTURAL STORMWATER BEST  
MANAGEMENT PRACTICES INSPECTIONS AND MAINTENANCE  
TOWN OF WILBRAHAM DEPARTMENT OF PUBLIC WORKS**



**INFILTRATION BASINS**

*Description*

Infiltration basins are designed to contain stormwater quantity and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site, however high failure rates often occur due to improper siting, inadequate pretreatment, poor design and lack of maintenance.

*Inspection & Maintenance*

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction or low spots.

Inspections should include:

- signs of differential settlement
- cracking
- erosion
- leakage in the embankments
- tree growth on the embankments
- rip-rap condition
- sediment accumulation
- turf health

*Maintenance Schedule*

Activity	Time of Year	Frequency
Preventative maintenance	Spring through Fall	Every four years
Inspection	Spring through Fall	After every major storm for the first 3 months after construction completion. Every four years thereafter.
Mow/rake buffer area, side slopes and basin bottom	Spring through Fall	Every four years
Remove trash, debris and organic matter	Spring through Fall	Every four years

**STANDARD OPERATING PROCEDURE 5: STRUCTURAL STORMWATER BEST  
MANAGEMENT PRACTICES INSPECTIONS AND MAINTENANCE  
TOWN OF WILBRAHAM DEPARTMENT OF PUBLIC WORKS**



**INFILTRATION SUBSTRUCTURES**

*Description*

Subsurface structures are underground systems that capture runoff, and gradually infiltrate it into the groundwater through rock and gravel. There are a number of underground infiltration systems that can be installed to enhance groundwater recharge. The most common types include pre-cast concrete or plastic pits, chambers (manufactured pipes), perforated pipes, and galleys.

*Inspection & Maintenance*

Because subsurface structures are installed underground, they are extremely difficult to maintain. Remove any debris that might clog the system. Include mosquito controls in the Operation and Maintenance Plan.

*Maintenance Schedule*

Activity	Time of Year	Frequency
Remove trash and debris that may clog the substructures	N/A	Each Inspection
Inspect Inlets of Substructures	Spring, Fall, and Summer	Annually
Ensure mosquito controls are effective	N/A	Each Inspection

**DRY WELLS/LEACHING CATCH BASINS**

*Description*

Dry wells are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. Dry wells provide groundwater recharge and can reduce the size and cost required of downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

*Inspection & Maintenance*

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24- and 48-hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop in water level (inches) by the time elapsed (hours).

*Maintenance Schedule*

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Every four years thereafter.

**TRAINING**

Employees are trained once per year on this procedure and the proper operation of stormwater BMPs. Employees are also trained on stormwater pollution prevention, spill and response, and illicit discharge detection and elimination procedures.

If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

**STANDARD OPERATING PROCEDURE 5: STRUCTURAL STORMWATER BEST  
MANAGEMENT PRACTICES INSPECTIONS AND MAINTENANCE  
TOWN OF WILBRAHAM DEPARTMENT OF PUBLIC WORKS**



**RECORD KEEPING**

1. Records are kept at the *Public Works Office* at *240 Springfield Street* in *Wilbraham, MA*.
2. Records shall include an inventory of municipally-owned stormwater treatment BMPs and inspection forms.

**REVISING THE SOP**

These procedures are reviewed and updated as needed.



**INSPECTION OF INFILTRATION SUBSTRUCTURES**

**General Information**

BMP Description	Infiltration Substructure		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

**Specific Information**

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for trash and debris that may clog the substructure	As Needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Inspect inlet of substructure	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Ensure effectiveness of mosquito control method	As Needed		



## INSPECTION OF EXTENDED DRY DETENTION BASINS

**Inspections should be conducted bi-annually, and during and after major storm events.**

### General Information

BMP Description	Extended Dry Detention Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

### Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Examine outlet structure for clogging or high outflow release velocities	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Mow upper stage, side slopes, embankment and emergency spillway	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove trash and debris	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove sediment from basin	As needed	Yes <input type="checkbox"/> No <input type="checkbox"/>	



### INSPECTION OF DRY WELLS

**Regular inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.**

**General Information**

BMP Description	Dry Well		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			
Describe condition of dry well at time of inspection			

After a major storm event, the water depth in the observation well should be measured at 24 and 48 hour intervals and the clearance rate calculated.



### INSPECTION OF INFILTRATION BASINS

**Inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.**

#### General Information

BMP Description	Infiltration Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			
Describe condition of wet basin at time of inspection			

#### Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Preventative maintenance	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Mow/rake buffer area, side slopes and basin bottom	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Remove trash, debris and organic matter	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Inspect and clean pretreatment devices	Annually	Yes <input type="checkbox"/> No <input type="checkbox"/>	



### INSPECTION OF OTHER BMPs

#### General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Describe the weather conditions at time of inspection			

#### Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input type="checkbox"/>	





June 27, 2025

Mark O'Malley  
Town Of Wilbraham DPW  
240 Springfield Street  
Wilbraham, MA 01095

Project Location: Wilbraham, MA  
Client Job Number:  
Project Number: [none]  
Laboratory Work Order Number: 25F1011

Enclosed are results of analyses for samples as received by the laboratory on June 12, 2025. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kristi L. Gosselin  
Project Manager

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Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Town Of Wilbraham DPW  
240 Springfield Street  
Wilbraham, MA 01095  
ATTN: Mark O'Malley

REPORT DATE: 6/27/2025

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 25F1011

The results of analyses performed on the following samples submitted to Pace Analytical Services, LLC - East Longmeadow, Ma, are found in this report.

PROJECT LOCATION: Wilbraham, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
Outfall	25F1011-01	Storm Water		EPA 350.1, Rev.2.0 (1993)	MA M-CT007/CT PH-0618/NY11301
				SM 2510B-2011	
				SM 5540C	MA M-CT007/CT PH-0618/NY11301
CB-2145	25F1011-02	Storm Water		SM 9223B - Colilert	
				SM 9223B - Colilert 18	
				EPA 350.1, Rev.2.0 (1993)	MA M-CT007/CT PH-0618/NY11301
CB-2146	25F1011-03	Storm Water		SM 2510B-2011	
				SM 5540C	MA M-CT007/CT PH-0618/NY11301
				SM 9223B - Colilert	
				SM 9223B - Colilert 18	



Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

#### CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to Pace Analytical Services, LLC - East Longmeadow, Ma, for testing. I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa A. Worthington", written over a light gray rectangular background.

Lisa A. Worthington  
Technical Representative



Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Wilbraham, MA

Sample Description:

Work Order: 25F1011

Date Received: 6/12/2025

Sampled: 6/12/2025 14:45

Field Sample #: Outfall

Sample ID: 25F1011-01

Sample Matrix: Storm Water

Conventional Chemistry Parameters by EPA/PHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Coliform, Fecal	2400	1.0	MPN/100 mL	1		SM 9223B - Colilert 18	6/12/25	6/12/25 17:45	JF
Specific conductance @13.3°C	220	2.0	µmhos/cm	1		SM 2510B-2011	6/19/25	6/19/25 9:42	AGR
E. Coli	1400	1.0	MPN/100 mL	1		SM 9223B - Colilert	6/12/25	6/12/25 17:40	JF

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Wilbraham, MA

Sample Description:

Work Order: 25F1011

Date Received: 6/12/2025

Field Sample #: CB-2145

Sampled: 6/12/2025 15:40

Sample ID: 25F1011-02

Sample Matrix: Storm Water

**Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)**

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Coliform, Fecal	410	1.0	MPN/100 mL	1		SM 9223B - Colilert 18	6/12/25	6/12/25 17:45	JF
Specific conductance @12.8°C	160	2.0	µmhos/cm	1		SM 2510B-2011	6/19/25	6/19/25 9:42	AGR
E. Coli	80	1.0	MPN/100 mL	1		SM 9223B - Colilert	6/12/25	6/12/25 17:40	JF



Pace Analytical Services, LLC - East Longmeadow, Ma

39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

Project Location: Wilbraham, MA

Sample Description:

Work Order: 25F1011

Date Received: 6/12/2025

Sampled: 6/12/2025 15:15

Field Sample #: CB-2146

Sample ID: 25F1011-03

Sample Matrix: Storm Water

Conventional Chemistry Parameters by EPA/PHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Coliform, Fecal	>2419.6	1.0	MPN/100 mL	1		SM 9223B - Colilert 18	6/12/25	6/12/25 17:45	JF
Specific conductance @13.6°C	230	2.0	µmhos/cm	1		SM 2510B-2011	6/19/25	6/19/25 9:42	AGR
E. Coli	>2419.6	1.0	MPN/100 mL	1		SM 9223B - Colilert	6/12/25	6/12/25 17:40	JF

**Sample Extraction Data**

**SM 2510B-2011**

Lab Number [Field ID]	Batch	Initial [mL]	Date
25F1011-01 [Outfall]	B407734	100	06/19/25
25F1011-02 [CB-2145]	B407734	100	06/19/25
25F1011-03 [CB-2146]	B407734	100	06/19/25

**SM 9223B - Colilert**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
25F1011-01 [Outfall]	B407258	100	100	06/12/25
25F1011-02 [CB-2145]	B407258	100	100	06/12/25
25F1011-03 [CB-2146]	B407258	100	100	06/12/25

**SM 9223B - Colilert 18**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
25F1011-01 [Outfall]	B407257	100	100	06/12/25
25F1011-02 [CB-2145]	B407257	100	100	06/12/25
25F1011-03 [CB-2146]	B407257	100	100	06/12/25



39 Spruce Street \* East Longmeadow, MA 01028 \* FAX 413/525-6405 \* TEL. 413/525-2332

**QUALITY CONTROL**

**Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B407257 - SM 9223B - Colilert 18</b>										
<b>Blank (B407257-BLK1)</b> Prepared & Analyzed: 06/12/25										
Coliform, Fecal	ND	1.0	MPN/100 mL							
<b>Blank (B407257-BLK2)</b> Prepared & Analyzed: 06/12/25										
Coliform, Fecal	ND	1.0	MPN/100 mL							
<b>Batch B407258 - SM 9223B - Colilert</b>										
<b>Blank (B407258-BLK1)</b> Prepared & Analyzed: 06/12/25										
Coliform, Total	ND	1.0	MPN/100 mL							
E. Coli	ND	1.0	MPN/100 mL							
<b>Blank (B407258-BLK2)</b> Prepared & Analyzed: 06/12/25										
Coliform, Total	ND	1.0	MPN/100 mL							
E. Coli	ND	1.0	MPN/100 mL							
<b>Batch B407734 - SM 2510B-2011</b>										
<b>Blank (B407734-BLK1)</b> Prepared & Analyzed: 06/19/25										
Specific conductance	ND	2.0	µmhos/cm							
<b>LCS (B407734-BS1)</b> Prepared & Analyzed: 06/19/25										
Specific conductance	360	2.0	µmhos/cm	317.0		112	90-115			

**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

No results have been blank subtracted unless specified in the case narrative section.

**CERTIFICATIONS**

**Certified Analyses included in this Report**

Analyte	Certifications
<b>SM 2510B-2011 in Water</b>	
Specific conductance	CT,MA,NH,NY,RI,NC,ME,VA
<b>SM 9223B - Colilert in Water</b>	
E. Coli	MA,CT,RI
<b>SM 9223B - Colilert 18 in Water</b>	
Coliform, Fecal	MA,CT,RI,ME

Pace Analytical Services, LLC - East Longmeadow, Ma, operates under the following certifications and accreditations:

Code	Description	Number	Expires
MA	Massachusetts DEP	M-MA100	06/30/2025
CT	Connecticut Department of Public Health	PH-0821	12/31/2026
NY	New York State Department of Health	10899 NELAP	04/1/2026
NH	New Hampshire Environmental Lab	2516 NELAP	02/5/2026
RI	Rhode Island Department of Health	LAO00373	12/30/2025
NC	North Carolina Div. of Water Quality	652	12/31/2025
NJ	New Jersey DEP	MA007 NELAP	06/30/2026
ME	State of Maine	MA00100	06/9/2027
VA	Commonwealth of Virginia	460217	12/14/2025

2571011 RF

ANALYSIS REQUESTED

7-Day  10-Day  15-Day  Field Filtered   
 PFAS 10-Day (std)  Due Date:  Lab to Filter   
 1-Day  3-Day  Field Filtered   
 2-Day  4-Day  Lab to Filter   
 Format: PDF  EXCEL  Data Delivery  
 Other: SOXHLET  PCB ONLY   
 CLP Like Data Pkg Required:  Ma.gov   
 Email To: MonaLexp@wiltonham.com NON SOXHLET   
 Fax To:

Requested Turnaround Time	Dissolved Metals Samples	Orthophosphate Samples	Other
7-Day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10-Day	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15-Day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field Filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab to Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Beginning Date/Time	Ending Date/Time	Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE
6/12/25 1445	Grab	0	U	4				
6/12/25 1540	Grab	0	U	4				
6/12/25 1515	Grab	0	U	4				

1 Matrix Codes:  
 GW = Ground Water  
 WW = Waste Water  
 DW = Drinking Water  
 A = Air  
 S = Soil  
 SL = Sludge  
 SOL = Solid  
 O = Other (please define) Storm Water

2 Preservation Codes:  
 I = Iced  
 H = HCL  
 M = Methanol  
 N = Nitric Acid  
 S = Sulfuric Acid  
 B = Sodium Bisulfate  
 X = Sodium Hydroxide  
 T = Sodium Thiosulfate  
 O = Other (please define)

Relinquished by (signature)	Date/Time	Received by (signature)	Date/Time
<i>[Signature]</i>	6/12/25 1630	<i>[Signature]</i>	6/12/25 1630
<i>[Signature]</i>	6/12/25 1630	<i>[Signature]</i>	6/12/25 1630

Client Comments: Direct from sampling

Detection Limit Requirements	Special Requirements
MA: <u>Mass DEP</u>	MA MCP Required <input type="checkbox"/>
CT: <u>Surface Water Standards</u>	MCP Certification Form Required <input type="checkbox"/>
	CT RCP Required <input type="checkbox"/>
	RCP Certification Form Required <input type="checkbox"/>
	MA State DW Required <input type="checkbox"/>

Project Entity:  Government  Municipality  WRTA  Chromatogram  
 Federal  City  21 J  School  MBTA  AHA-LAP, LLC

Project Name: Wiltonham MA  
 Project Location: Sunset Rock Rd.  
 Project Number: 168  
 Project Manager: Mark O'Malley - DPW  
 Pace Quote Name/Number: Mark O'Malley - DPW  
 Invoice Recipient: Town of Wiltonham  
 Sampled By: Mark O'Malley

Company Name: Town of Wiltonham  
 Address: 240 Springfield St, Wiltonham, MA  
 Phone: 413-214-1867  
 Project Name: Wiltonham MA  
 Project Location: Sunset Rock Rd.  
 Project Number: 168  
 Project Manager: Mark O'Malley - DPW  
 Pace Quote Name/Number: Mark O'Malley - DPW  
 Invoice Recipient: Town of Wiltonham  
 Sampled By: Mark O'Malley

Comments: MA State DW Required

Disclaimer: Pace Analytical is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Pace Analytical values your partnership on each project and will try to assist with missing information, but will not be held accountable.

	DC#_Title: ENV-FRM-ELON-0001 v08_Sample Receiving Checklist
	Effective Date: 06/11/2024

### Log In Back-Sheet

Client Town of Wilbraham  
 Project Wilbraham Water Department  
 MCP/RCP Required no  
 Deliverable Package Requirement none  
 Location Sunset Rock Rd., Wilbraham, MA  
 PWSID# (When Applicable) n/a  
 Arrival Method:  
 Courier  Fed Ex  Walk In  Other   
 Received By / Date / Time Mem 6/12/25 1630  
 Back-Sheet By / Date / Time Mem 6/12/25 1645  
 Temperature Method Gun # 4  
 WV samples: Yes (see note \*) / No (follow normal procedure)  
 Temp < 6° C Actual Temperature 16.8  
 Rush Samples: Yes / No Notify No  
 Short Hold: Yes / No Notify Yes WC team

Log In Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False statement will be brought to the attention of the Client - True or False

	True	False
Received on Ice	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Received in Cooler	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Custody Seal: DATE TIME	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COC Relinquished	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples Labels Agree	<input checked="" type="checkbox"/>	<input type="checkbox"/>
All Samples in Good Condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples Received within Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is there enough Volume	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Proper Media/Container Used	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Splitting Samples Required	<input type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Trip Blanks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lab to Filters	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COC Legible	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC Included: (Check all included)		
Client <input checked="" type="checkbox"/>	Analysis <input checked="" type="checkbox"/>	Sampler Name <input checked="" type="checkbox"/>
Project <input checked="" type="checkbox"/>	IDs <input checked="" type="checkbox"/>	Collection Date/Time <input checked="" type="checkbox"/>
All Samples Proper pH:	N/A <input type="checkbox"/>	<input type="checkbox"/>

**Notes regarding Samples/COC outside of SOP:**

\* Temp direct from sample (cooler used, samples still warm from field)

**Additional Container Notes**

\*Note: West Virginia requires all samples to have their temperature taken. Note any outliers.





Tuesday, June 17, 2025

Attn: Rebecca Faust  
Con-Test  
39 Spruce Street  
East Longmeadow, MA 01028

Project ID: 25F1011  
SDG ID: GCT51156  
Sample ID#s: CT51156 - CT51158

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #M-CT007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Sample Id Cross Reference

June 17, 2025

SDG I.D.: GCT51156

Project ID: 25F1011

---

Client Id	Lab Id	Matrix	Col Date
25F1011-01	CT51156	WATER	06/12/25 14:45
25F1011-02	CT51157	WATER	06/12/25 15:40
25F1011-03	CT51158	WATER	06/12/25 15:15



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102

**Analysis Report**

June 17, 2025

FOR: Attn: Rebecca Faust  
Con-Test  
39 Spruce Street  
East Longmeadow, MA 01028

Sample Information

Matrix: WATER  
Location Code: CON-TEST  
Rush Request: Standard  
P.O.#:

Custody Information

Collected by:  
Received by: SR1  
Analyzed by: see "By" below

Date

06/12/25  
06/13/25

Time

14:45  
11:34

Laboratory Data

SDG ID: GCT51156  
Phoenix ID: CT51156

Project ID: 25F1011  
Client ID: 25F1011-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
MBAS	0.13	0.05	mg/L	1	06/13/25 22:59	KL1	SM5540 C-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

The LAS standard used for the MBAS analysis has a molecular weight of 326.5 g/mol.  
If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.  
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

**Phyllis Shiller, Laboratory Director**

**June 17, 2025**

**Reviewed and Released by: Anil Makol, Project Manager**



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102

# Analysis Report

June 17, 2025

FOR: Attn: Rebecca Faust  
 Con-Test  
 39 Spruce Street  
 East Longmeadow, MA 01028

Sample Information

Matrix: WATER  
 Location Code: CON-TEST  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: SR1  
 Analyzed by: see "By" below

Date

06/12/25  
 06/13/25

Time

15:40  
 11:34

## Laboratory Data

SDG ID: GCT51156  
 Phoenix ID: CT51157

Project ID: 25F1011  
 Client ID: 25F1011-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
MBAS	< 0.05	0.05	mg/L	1	06/13/25 23:00	KL1	SM5540 C-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

The LAS standard used for the MBAS analysis has a molecular weight of 326.5 g/mol.  
 If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.  
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**Phyllis Shiller, Laboratory Director**

**June 17, 2025**

**Reviewed and Released by: Anil Makol, Project Manager**



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102

# Analysis Report

June 17, 2025

FOR: Attn: Rebecca Faust  
 Con-Test  
 39 Spruce Street  
 East Longmeadow, MA 01028

Sample Information

Matrix: WATER  
 Location Code: CON-TEST  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: SR1  
 Analyzed by: see "By" below

Date

06/12/25  
 06/13/25

Time

15:15  
 11:34

## Laboratory Data

SDG ID: GCT51156  
 Phoenix ID: CT51158

Project ID: 25F1011  
 Client ID: 25F1011-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
MBAS	0.26	0.05	mg/L	1	06/13/25 23:00	KL1	SM5540 C-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

The LAS standard used for the MBAS analysis has a molecular weight of 326.5 g/mol.  
 If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.  
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**Phyllis Shiller, Laboratory Director**

**June 17, 2025**

**Reviewed and Released by: Anil Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102

# QA/QC Report

June 17, 2025

## QA/QC Data

SDG I.D.: GCT51156

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 789053 (mg/L), QC Sample No: CT51157 (CT51156, CT51157, CT51158)													
MBAS	BRL	0.05	<0.05	<0.05	NC	92.1			95.3			85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference
- (ISO) - Isotope Dilution

  
 Phyllis Shiller, Laboratory Director  
 June 17, 2025

Tuesday, June 17, 2025

Criteria: None

State: MA

# Sample Criteria Exceedances Report

## GCT51156 - CON-TEST

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----------------	-------------------

\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## Analysis Comments

June 17, 2025

SDG I.D.: GCT51156

---

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

**SUBCONTRACT CHAIN OF CUSTODY**

**Pace New England**

**25F1011**

*WCTice 7.0*

**SENDING LABORATORY:**

Pace New England  
 39 Spruce Street  
 East Longmeadow, MA 01028  
 Phone: 413.525.2332  
 Fax: 413.525.6405  
 Project Manager: Rebecca Faust

**RECEIVING LABORATORY:**

Phoenix Laboratory  
 587 Middle Turnpike East  
 Manchester, CT 06040  
 Phone : (860) 645-1102  
 Fax: (860) 645-0823

Project Location: Massachusetts

Analysis	Sample Name	Due	Expires	Comments
	<i>51156</i>			
<b>Sample ID: 25F1011-01</b>	<b>Outfall</b>	<b>Water</b>	<b>Sampled: 06/12/25 14:45</b>	
S-Surfactants		06/23/25 14:00	06/14/25 14:45	
<i>Containers Supplied:</i>				
1 L plastic Unpreserved (f)				
	<i>51157</i>			
<b>Sample ID: 25F1011-02</b>	<b>CB-2145</b>	<b>Water</b>	<b>Sampled: 06/12/25 15:40</b>	
S-Surfactants		06/23/25 14:00	06/14/25 15:40	
<i>Containers Supplied:</i>				
1 L plastic Unpreserved (f)				
	<i>51158</i>			
<b>Sample ID: 25F1011-03</b>	<b>CB-2146</b>	<b>Water</b>	<b>Sampled: 06/12/25 15:15</b>	
S-Surfactants		06/23/25 14:00	06/14/25 15:15	
<i>Containers Supplied:</i>				
1 L plastic Unpreserved (f)				

<i>[Signature]</i>	<i>6/13/25</i>	<i>11:30</i>	<i>Don Acua</i>	<i>6-13-25</i>	<i>10:30</i>
Released By	Date		Received By	Date	
<i>Don Acua</i>	<i>6-13-25</i>	<i>11:15</i>	<i>[Signature]</i>	<i>06/13/25</i>	<i>11:34</i>
Released By	Date		Received By	Date	



Friday, June 27, 2025

Attn: Kristi Gosselin  
Pace Analytical Laboratory  
39 Spruce Street  
East Longmeadow, MA 01028

Project ID: 25F1011  
SDG ID: GCT60161  
Sample ID#s: CT60161 - CT60163

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #M-CT007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Sample Id Cross Reference

June 27, 2025

SDG I.D.: GCT60161

Project ID: 25F1011

---

Client Id	Lab Id	Matrix	Col Date
25F1011-01	CT60161	WATER	06/12/25 14:45
25F1011-02	CT60162	WATER	06/12/25 15:40
25F1011-03	CT60163	WATER	06/12/25 15:15



## Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102

# Analysis Report

June 27, 2025

FOR: Attn: Kristi Gosselin  
Pace Analytical Laboratory  
39 Spruce Street  
East Longmeadow, MA 01028

### Sample Information

Matrix: WATER  
Location Code: CON-TEST  
Rush Request: 24 Hour  
P.O.#:

### Custody Information

Collected by:  
Received by: SR1  
Analyzed by: see "By" below

### Date

06/12/25  
06/25/25

### Time

14:45  
14:45

## Laboratory Data

SDG ID: GCT60161  
Phoenix ID: CT60161

Project ID: 25F1011  
Client ID: 25F1011-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	1.62	0.10	mg/L	2	06/26/25	KDB	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

### Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

June 27, 2025

Reviewed and Released by: Anil Makol, Project Manager



## Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102

# Analysis Report

June 27, 2025

FOR: Attn: Kristi Gosselin  
Pace Analytical Laboratory  
39 Spruce Street  
East Longmeadow, MA 01028

### Sample Information

Matrix: WATER  
Location Code: CON-TEST  
Rush Request: 24 Hour  
P.O.#:

### Custody Information

Collected by:  
Received by: SR1  
Analyzed by: see "By" below

### Date

06/12/25  
06/25/25

### Time

15:40  
14:45

## Laboratory Data

SDG ID: GCT60161  
Phoenix ID: CT60162

Project ID: 25F1011  
Client ID: 25F1011-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.10	0.10	mg/L	2	06/26/25	KDB	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

### Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

June 27, 2025

Reviewed and Released by: Anil Makol, Project Manager



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102

**Analysis Report**

June 27, 2025

FOR: Attn: Kristi Gosselin  
Pace Analytical Laboratory  
39 Spruce Street  
East Longmeadow, MA 01028

Sample Information

Matrix: WATER  
Location Code: CON-TEST  
Rush Request: 24 Hour  
P.O.#:

Custody Information

Collected by:  
Received by: SR1  
Analyzed by: see "By" below

Date

06/12/25  
06/25/25

Time

15:15  
14:45

Laboratory Data

SDG ID: GCT60161  
Phoenix ID: CT60163

Project ID: 25F1011  
Client ID: 25F1011-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	2.88	0.10	mg/L	2	06/26/25	KDB	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

**Phyllis Shiller, Laboratory Director**

**June 27, 2025**

**Reviewed and Released by: Anil Makol, Project Manager**



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102

## QA/QC Report

June 27, 2025

### QA/QC Data

SDG I.D.: GCT60161

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 790731 (mg/L), QC Sample No: CT57635 (CT60161, CT60162, CT60163)													
Ammonia as Nitrogen	BRL	0.05	1.30	1.42	8.80	94.6			96.5			90 - 110	20

Comment:

TKN is reported as Organic Nitrogen in the Blank, LCS, DUP and MS.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference
- (ISO) - Isotope Dilution

Phyllis Shiller, Laboratory Director  
June 27, 2025

Friday, June 27, 2025

Criteria: None

State: MA

# Sample Criteria Exceedances Report

## GCT60161 - CON-TEST

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
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\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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## Analysis Comments

June 27, 2025

SDG I.D.: GCT60161

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The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

**SUBCONTRACT CHAIN OF CUSTODY**

Pace New England  
25F1011

CWI 4.0

**SENDING LABORATORY:**

Pace New England  
39 Spruce Street  
East Longmeadow, MA 01028  
Phone: 413.525.2332  
Fax: 413.525.6405  
Project Manager: Kristi L. Gosselin

**RECEIVING LABORATORY:**

Phoenix Laboratory  
587 Middle Turnpike East  
Manchester, CT 06040  
Phone : (860) 645-1102  
Fax: (860) 645-0823

Project Location: Massachusetts

Analysis	Sample Name	Due	Expires	Comments
Sample ID: 25F1011-01	Outfall <sup>60161</sup> <u>09C</u>	Water	Sampled: 06/12/25 14:45	
<del>S. Substrate</del>		06/26/25 14:00	06/14/25 14:45	
Ammonia-N by Gallery		06/26/25 14:00	07/10/25 14:45	Rush
Containers Supplied: <del>1 L plastic Unpreserved</del> (1 250 mL plastic + H2SO4 (				
Sample ID: 25F1011-02	CB-2145 <sup>60162</sup> <u>09C</u>	Water	Sampled: 06/12/25 15:40	
<del>S. Substrate</del>		06/26/25 14:00	06/14/25 15:40	
Ammonia-N by Gallery		06/26/25 14:00	07/10/25 15:40	Rush
Containers Supplied: <del>1 L plastic Unpreserved</del> (1 250 mL plastic + H2SO4 (				
Sample ID: 25F1011-03	CB-2146 <sup>60163</sup> <u>09C</u>	Water	Sampled: 06/12/25 15:15	
<del>S. Substrate</del>		06/26/25 14:00	06/14/25 15:15	
Ammonia-N by Gallery		06/26/25 14:00	07/10/25 15:15	Rush
Containers Supplied: <del>1 L plastic Unpreserved</del> (1 250 mL plastic + H2SO4 (				

*[Signature]*  
Released By

6-25-25  
Date

*[Signature]*  
Received By

6-25-25 12:15  
Date

*[Signature]*  
Released By

6-25-25 14:10  
Date

*[Signature]*  
Received By

6-25-25 2:12  
Date  
6-25-25 14:45  
Page 1 of 1