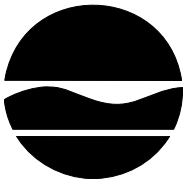


Pathogen Watershed Improvement
Strategies
Guidance Document
Draft

New York State Department of
Environmental Conservation

Division of Water
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Executive Summary

This is a guidance document to facilitate compliance with the Municipal Separate Stormwater Sewer System (MS4) General Permit (GP-0-10-002) for covered entities that have pathogen reduction responsibilities under Section IX of GP-0-10-002 in the Oyster Bay, Peconic, or one of the 27 embayment watersheds for which a Shellfishing Pathogen TMDL was developed.

Most municipalities' within the identified watersheds have been designated as an MS4 requiring Phase II stormwater permit coverage. GP-0-10-002 requires MS4s to develop, implement and enforce a stormwater management program (SWMP) to reduce their discharge of pollutants in accordance with NYS Environmental Conservation Law (ECL) and the Clean Water Act (CWA). MS4s who are also subject to a TMDL have additional responsibilities under GP-0-10-002, specifically compliance with Part III C 2 – Watershed Improvement Strategies and Part IX, Watershed Improvement Strategies (WIS).

To ensure reduction of MS4 discharges to pathogen TMDL waterbodies, Part IX of GP-0-10-002 has enhanced requirements entitled “Minimum Control Measures – Watersheds with Improvement Strategies”. These are additional measures required for compliance with GP-0-10-002. This guidance document will help MS4s develop a five year implementation plan strategy to reduce pathogens that incorporates implementation of basic Minimum Control Measures (MCMs) requirements as well as Watershed Improvement Strategy requirements, including non-structural Best Management Practices (BMPs) to preparation and submittal of a plan and schedule for installation of applicable structural retrofit stormwater management practices

Ultimately, the effectiveness of the pollutant load reductions in meeting water quality standards will be verified by ambient monitoring of the affected waterbody. Where ambient monitoring demonstrates consistent compliance with water quality standards, the covered entity may request that the Department suspend the additional WIS requirements to install stormwater retrofits.

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Figure 2 – Peconic Estuary Pathogen Watersheds

Figure 3 – Shellfish Pathogen TMDL Watersheds

1.0 Introduction

The CWA, Sections 301, 303 and 304, requires states to identify all water bodies in the state that cannot meet applicable water quality standards with existing point source (wastewater treatment plant) effluent limitations alone. The CWA requires states to establish EPA-approvable total maximum daily loads (TMDLs) for these impaired waterbodies which, when implemented, will achieve water quality standards.

The 2002, 2004 and 2006 New York State Section 303(d) list of impaired water bodies identified pathogens as the pollutant of concern for the 2 impaired water bodies of the Oyster Bay Pathogen TMDL, the 25 water bodies of the Peconic Pathogen TMDL and the 27 water bodies in the Shellfishing Pathogens TMDL. These waterbodies are presented in Part IX of GP-0-10-002 and are reproduced in Table 1 of this document. These water bodies and their contributing watersheds are illustrated in Figures 1, 2 and 3 of this document.

GP-0-10-002 requires MS4s to develop, implement and enforce a stormwater management program (SWMP) to reduce the discharge of pollutants from their MS4s in accordance with NYS Environmental Conservation Law and the Clean Water Act. MS4s that discharge to waterbodies for which TMDLs have been developed must meet the requirements specified in GP-0-10-002 Part III C 2 – Special Conditions: Impaired Waters and Part IX C, Watershed Improvement Strategies (WIS) and must reduce the discharge of pollutants from their MS4 to meet the waste load allocation (WLA) specified in the applicable TMDL.

This document provides guidance to regulated MS4s who are required to comply with Part III C – Special Conditions: Impaired Waters and Part IX, Watershed Improvement Strategies (WIS).of GP-0-10-002 (GP-0-10-002) and must reduce the discharge of pollutants from their MS4 to meet the WLA specified in the applicable TMDL.

2.0 State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from MS4s (GP-0-10-002)

The New York State Department of Environmental Conservation NYSDEC SPDES General Permit GP-0-10-002 for the discharge of stormwater from small municipal separate storm sewer systems (MS4) will be effective May 1, 2010. GP-0-10-002 requires MS4s to develop, implement and enforce a SWMP to reduce the discharge of pollutants from their MS4s to the maximum extent practicable (MEP) in order to protect water quality and to satisfy the appropriate water quality requirements of the ECL and CWA. MS4 Operators that discharge to waterbodies for which TMDLs have been developed must meet the requirements specified in GP-0-10-002 Part III C 2 – Special Conditions: Impaired Waters and Part IX, Watershed WIS, and must reduce the discharge of pollutants from their MS4s to meet the waste load allocation (WLA) specified in the applicable TMDL.

GP-0-10-002 and associated guidance can also be found on the NYSNYSDEC website:
<http://www.NYSNYSDEC.ny.gov/chemical/8468.html>

2.1 Coverage Area

Most of the municipalities on Long Island are covered as either automatically or additionally designated (NYSDEC Designation criteria for these areas are described in Part X B of GP-0-10-002) and are required to obtain SPDES permit coverage. The figures presented at the end of this document and in GP-0-10-002 identify the watersheds for the WISs and include the list of municipalities designated under the Phase II stormwater regulations that are required to obtain GP-0-10-002 coverage.

2.2. Compliance

GP-0-10-002 Part V (Program Assessment, Record Keeping, Reporting and Certification Requirements) requires MS4 operators to conduct annual evaluations of their program compliance and submit a report to the NYSNYSDEC.

Task 2.2	NYSDEC
NYSDEC will continue to pursue GP-0-10-002 compliance ensuring that SWMPs are developed and implemented in a manner consistent with the terms and conditions of GP-0-10-002. This includes the required SWMP modifications for MS4s in the affected water bodies, with emphasis on illicit discharge connection elimination (including system mapping), pet waste regulation, septic system inspections, retrofits, green infrastructure and other pathogen reduction activities.	

2.3 Additional Requirements for MS4s in the WIS Water Bodies

To ensure that MS4 pathogen discharge reduction goals are met, Part IX of GP-0-10-002 includes enhanced Minimum Control Measure (MCM) requirements for MS4s that discharge to the affected waterbodies.

To assist with this pathogen reduction effort, Part IX of GP-0-10-002 includes the development of a retrofit plan.

Task 2.3.1	NYSDEC
NYSDEC will provide directly or indirectly technical assistance and outreach to MS4s to assist with SWMP development and implementation. This may be accomplished through funding, partnerships as well as through EPA or other agencies or other groups.	
Task 2.3.2	NYSDEC
NYSDEC will review the required stormwater retrofit plans and give approval based on the predicted ability of the plans to demonstrate the required pathogen reduction. It is required that the plans incorporate measurable goals into the plans that demonstrate what the expected pathogen load reductions will be.	

2.4 Traditional Non-Land Use MS4s and Non-traditional MS4s

Part VIII of GP-0-10-002 addresses the requirements for traditional non-land use MS4s and Non-Traditional MS4s. It is beyond the scope of this document to address the compliance requirements for these MS4's, however, the NYSDEC does encourage that traditional MS4's work with the smaller traditional non-land use entities as well as the non-traditional entities via formal agreement to incorporate these into the larger effort. Doing so will facilitate a coordinated program by, among other things, consolidating services and sharing expertise. NYSDEC promotes the coordination among MS4s by establishing it as a grant priority.

Task 2.4	Local Government
Local governments should identify the traditional non-land use MS4s and the non-traditional MS4s within their jurisdiction and consider working with them to accomplish the goals of the Watershed Improvement Strategy.	

3.0 Pathogen TMDL Development

3.1 TMDL Background

On NYS's 2006 303(d) list NYSDEC listed 71 Class SA water bodies as pathogen-impaired and, therefore, categorically impaired for shellfishing. In 2006, 25 separate embayments and tributaries in the Peconic Bay estuary were included in a TMDL analysis (Battelle, 2006). Of the 46 remaining water bodies, 27 were analyzed in the Shellfish TMDL report (Battelle, 2007). Prior to these, in 2003 pathogen impairments in Oyster Bay and Mill Neck Creek were addressed in a TMDL (Battelle, 2003) for those waters.

The TMDL pathogen reduction requirements is presented in Part IX of GP-0-10-002 and is reproduced here as Table 1. This information is provided to indicate the level of MS4 pathogen reduction required in each of the water bodies to meet water quality for Class SA waters. The

purpose of this guidance document is to propose an approach to address the WIS component of the GP-0-10-002 in the short term (1st five-year cycle)

3.2 Pathogen Load Determination

3.2.1 Oyster Bay & Mill Neck Creek

Oyster Bay & Mill Neck Creek was the first pathogen TMDL developed for shellfishing in New York. It should be noted that Oyster Bay was divided into four management zones so a different analysis was done for each management zone. The pathogen loads from Mill Neck Creek (MNC) and its tributaries were developed using the Storm Water Management Model (SWMM). The pathogen loads from waters of Oyster Bay were developed using the Watershed Treatment Model (WTM) (a version prior to version 3.1 which was used in the 2006 Peconic TMDL and the 2007 Shellfishing TMDL).

Regardless of the model used to determine the pathogen load, the loads were generally distributed as follows:

- Storm Water (approx. 88%)
- Boats/Marinas (approx. 11%)
- Waterfowl/Horses (less than 1%)
- Other Non-Point sources (less than 1%)
- Waste Water Treatment Plants (less than 1%).

We see based on this distribution that stormwater was the major contributing factor to the pathogen load. Since most of the municipalities on Long Island are now designated as MS4's it is reasonable to assume that some portion of the stormwater load discharging to these waters is now going through an MS4 system.

3.2.2 Peconic Estuary and Shellfish/27 Embayments

For the Peconic Estuary and the Shellfish pathogen TMDLs the pathogen load were developed using the Watershed Treatment Model, version 3.1 (WTM). The pathogen loads were developed based on the entire watershed contributing to each affected water body. The pathogen loads were distributed as follows:

- SOURCES**
- POINT SOURCES**
- Sewage Treatment Plant
- RESIDENTIAL/URBAN LAND^{1,2}**
- MS4 Contribution
- Non-MS4 Contribution
- OTHER NONPOINT SOURCES**
- Rural Land
- Forest
- Waterfowl

TOTAL LOAD (Billions)

Water Body (ha)

Billions FC Load/ha/yr

1 - "Urban land" is a combination of residential land, commercial land, industrial land, and roadways

2 - This source includes the load from domestic pets

It should be noted that at the time of the development of the Peconic Estuary Pathogen TMDL, many of the municipalities in the watersheds had not yet been designated as an MS4. Since the completion of these TMDLs, most municipalities within the TMDL watersheds have been additionally designated as MS4s. For the purpose of interpreting the pathogen load reduction requirements for the Peconic TMDL in the additionally designated areas, the NYSDEC assumed that all of the Non-MS4 (Residential/Urban Land) loads that were identified for each affected waterbody in the Peconic TMDL that did not already have a distinct MS4 and Non-MS4 load became an MS4 pathogen load. These pathogen loads need to be re-evaluated to ensure that only the pathogen load from the MS4 is covered under this permit. This will happen during the term of GP-0-10-002.

Task 3.2.	NYSDEC
The NYSDEC will assist MS4s in the evaluation of the urban/residential non-point source loads from the Oyster Bay and Peconic TMDLs to quantify the portion of those pathogen loads that may be attributed to the MS4 load.	

The NYSDEC will work with the MS4s to ensure the pathogen loads attributed to an MS4 are as accurate as possible.

3.3 MS4 Pathogen Loads

3.3.1 Load Sources

As discussed above, the TMDL identified pathogen loads to the affected waterbody from the entire contributing watershed. They did not allocate a pathogen load to each individual MS4 located within the contributing watershed. The NYSDEC suggests that all MS4's within the watershed of an affected waterbody develop a cooperative approach towards meeting pathogen load reductions.

NYSDEC reviewed the TMDLs to identify what sources make up the pathogen load to an MS4 discharging to the affected water bodies and has identified pet waste and residential/urban stormwater runoff as the two key components of the MS4 load in the Peconic and Shellfishing TMDLs. Table 2 presents the relative contributions of pet waste and urban runoff to the pathogen load attributed to a TMDL water body in the Peconic Pathogen TMDL and the Shellfish Pathogen TMDL.

In general, pet waste accounts for roughly 90% of the pathogen load from MS4s in the Shellfish

TMDL, 30 – 60% in the Peconic TMDL and an in determinant amount in the Oyster Bay TMDL. As such the WIS should focus attention on reducing pathogens in runoff through the control of pet waste management.

3.3.1 MS4 Pathogen Loads

The Oyster Bay & Mill Neck Creek Pathogen TMDL took a somewhat different approach and therefore will require its own analysis of what are the actual pathogen loads to be attributed to the MS4s.

NYSDEC recognizes that the task of identifying the pathogen load from a specific MS4 can be challenging for many reasons. As such, the NYSDEC offers the following assistance:

Task 3.3.	NYSDEC
<p>The NYSDEC will:</p> <ul style="list-style-type: none">• Make available the models used in the TMDL• Provide training/guidance in the use of these models• Make relevant GIS data available from the NYSDEC's FTP website: ftp://ftp.dec.state.ny.us/dow/stormdocuments/data/	

For waterbodies where the WTM was used to determine the pathogen load, the NYSDEC is suggesting that the determination of a specific MS4's portion of the load may be established using the relative size of the drainage area of the MS4's sewershed accounting for the distribution of the land use categories in the MS4.

The NYSDEC will work with communities where SWMM was used to determine the most effective way to establish the relative contribution of the MS4 load.

In the event an MS4 or other applicable entity has in the past developed/used a different modeling tool to estimate pathogen loads from an MS4, NYSDEC will review for approval or make recommendations for utilizing of such modeling efforts.

3.4 Regional Stormwater Entity (RSE) Formation

The development of an RSE is defined in GP-0-10-002. Participation in an RSE is voluntary; however the formation of a RSE will enable resource sharing, as well as enhanced funding opportunities among participating MS4s. An RSE creates the flexibility to be able to site retrofits to obtain a better cost-to-pathogen-reduction ratio on a watershed basis.

NYSDEC encourages a watershed based approach to stormwater management and will support municipalities that want to work together to achieve the reduction goals based on a watershed approach.

3.5 Pathogen Load Reductions

The MS4 (or a RSE or some other legally formed stormwater management coalition) is responsible for making the required reductions to achieve the goals of the TMDL. The goal of the TMDL is to achieve the water quality standards in the affected waterbody. This will lead to the affected water body attaining its best use for these Class SA waters which includes supporting shellfishing.

Ultimately, the effectiveness of the pathogen load reductions in meeting water quality standards will be verified by ambient monitoring of the affected waterbody. Where ambient monitoring demonstrates consistent compliance with water quality standards, the MS4 may request that the Department suspend the WIS requirements to install stormwater retrofits. Pathogen impaired waters have the benefit of being regularly sampled for verification of the status of harvesting from a given area.

Task 3.5	NYSDEC
<p>The NYSDEC will work in conjunction with the MS4, or RSE, to develop a five-year pathogen reduction plan, including a retrofit plan. Actions that will reduce the pathogen load from MS4's include non-structural BMPs targeted at source reduction as well as traditional Stormwater Management Practices (SMPs) which include structural retrofits. The retrofit plan will include an evaluation of opportunities for citing retrofits on public property. Additionally, MS4s will be encouraged to achieve reductions through the use of green infrastructure practices.</p>	

To propose effective practices and estimate pathogen load reduction, will require MS4s to take a few initial steps in implementation of their WISs. Steps such as system mapping, identification of the sources of pathogen, prioritization of major pathogen load contribute towards ultimate pathogen load reduction. It is along with source identification that MS4s can approach a reasonable modeling of pathogen load reduction.

Currently it is anticipated that modeling will be used to verify the expected reductions attributed to a retrofit program. The suggested modeling tools for MS4 retrofit evaluation are System for Watershed Treatment Model (WTM), Urban Stormwater Treatment and Analysis Integration (SUSTAIN), and Mapshed with RunQual. The NYSDEC will establish an outline for the computer models assumptions and input variables, and make a determination regarding their acceptability. Consistent use of models will facilitate a more equitable evaluation of proposed pathogen load reductions.

3.5.1 Non-Structural BMP Reductions

3.5.1.1 Source Control

There are many opportunities for controlling sources of pathogen pollution. Pet waste, failing septic systems and illicit discharges are primary pathogen sources throughout the State of New

York. Since controlling the source of pathogens exposed to stormwater is generally more cost effective and reliable than removing pathogens from stormwater by providing treatment, pathogen source control must play an important role in achieving the required reductions.

Task 3.5.1.1	NYSDEC
<p>NYSDEC is promoting a five year pathogen reduction plan including the following:</p> <ul style="list-style-type: none"> • Pet waste management (including the location of pet waste disposal receptacles) • Septic System inspection • Illicit discharge elimination • Nuisance bird population control • Adoption of local Laws (Low Impact Development, Pet waste Control, Wildlife Feeding Prohibition, etc.) <p>The NYSDEC will work with the MS4s to determine the effectiveness of the implementation of a non-structural BMPs and determine what portion of the pathogen load is reduced through that action</p>	

Task 3.5.1.2	NYSDEC
<p>The NYSDEC will work with MS4s to identify non-structural BMPs most applicable to the specific MS4's needs.</p>	

Task 3.5.1.3	MS4
<p>In each MS4 area, SWMPs should emphasize pathogen source control and target areas with potentially high levels of pathogen runoff, high percentages of impervious cover, small lot sizes, and/or compacted soils.</p>	

3.5.1.2 Livestock

Although generally not a prevalent land use in any of the affected waterbody watersheds, agricultural activity including traditionally recognized farm enterprises and smaller “hobby farms”, are also pathogen sources that present viable opportunities for pathogen source reduction. In particular, horse farms and duck farms should be identified and selected for attention because they have a relatively high potential for pathogen laden runoff.

Task3.5.1.2	MS4
MS4s should endeavor, through their program of public outreach and education, to discourage animal access to waterways, as well as the placement of manure piles in the drainage path of waterways.	

3.5.2 Stormwater Retrofits (SMPs) Reductions

3.5.2.1 Green Infrastructure

The green infrastructure approach to stormwater management includes a wide array of practices to manage, treat, and reuse runoff from rain events while maintaining or restoring natural hydrology through infiltration and evapotranspiration. Green infrastructure primarily focuses on practices that reduce the volume of stormwater runoff entering an MS4 sewershed. Reducing the volume of stormwater runoff in an MS4’s sewershed reduces the pathogen load carried by the stormwater. Additionally, reductions in the volume of stormwater carried by an MS4 sewershed could affect the requirements a retrofit plan.

Task3.5.2.1	NYSDEC
<p>The NYSDEC supports the use of green infrastructure practices, as defined in the State Technical Standards, for reducing pathogen loads from MS4’s. Green Infrastructure practices include, but are not limited to:</p> <ul style="list-style-type: none"> • Roof runoff disconnection • Porous pavement • Rain garden • Bioretention • Retrofit of abandoned impervious areas <p>The NYSDEC will work with the MS4s to determine the effectiveness of the adoption of green infrastructure practices and determine what portion of the pathogen load is reduced through those actions.</p>	

3.5.2.2 Traditional SMPs

The current availability of traditional SMPs to remove pathogens is limited. Appropriateness of specific stormwater treatment practices will be determined as further investigation and research is conducted on the effectiveness of traditional SMPs for pathogen removal.

Task3.5.2.2(a)	NYSDEC
The NYSDEC will work, directly or indirectly through funding, partnerships, EPA, other agencies, or other groups, with MS4s to identify SMPs to remove pathogens and will keep the regulated community informed of SMPs the Department approves for pathogen removal	

MS4s identify and place retrofits in their five-year WIS and its pathogen reduction component to meet the required reductions. MS4 may select appropriate practices and establish long term maintenance plans for longevity of retrofit systems.

Task3.5.2.2.(b)	NYSDEC
<p>NYSDEC considers the following to be examples of Traditional SMPs:</p> <ul style="list-style-type: none"> • Infiltration (runoff reduction) • Wet detention ponds • Sand or organic filters 	

Task3.5.2.2(c)	NYSDEC
The NYSDEC will make available, as it becomes available, information on SMPs that are effective for pathogen reductions.	

4.0 Institutional Framework

This five year pathogen reduction plan recognizes that all ongoing watershed protection efforts, (e.g., watershed characterization, restoration, and volunteer or other monitoring) must be identified. Coordination of this process with state agencies, federal agencies, local governments and stakeholders such as the general public, environmental interest groups and representatives from the point and non-point pollution sources will ensure the proposed management alternatives are technically and financially feasible

Citizens play an essential role. They are primarily land owners and their activities generate pathogen pollution (e.g. excessive stormwater runoff, failing septic systems, pet/farm animal waste). Citizen education and outreach efforts are a necessary requirement to fully implement pathogen controls. Citizen acceptance and participation in this plan will be essential to successful pathogen reduction efforts.

Local governments are integral for implementation of pathogen controls. They provide the first line of regulatory oversight by controlling local land use activity and legislating important source control regulations like pet waste management laws and urban stormwater runoff reductions.

Local governments are responsible for developing specific action-oriented SWMP as required by

GP-0-10-002. The actions identified to be implemented in the five-year pathogen reduction plan must be included in the SWMP.

GP-0-10-002 includes requirements for education, outreach and pathogen control from municipal operations. This can be achieved through the illicit discharge identification and mitigation requirements and general action to reduce the volume of stormwater being discharged through an MS4. It also requires that local governments map both their storm sewer configuration and other sources of drainage.

Task 4.0	Local Government
Each local government in the affected waterbody is required to collect basic site specific data for all projects and programs within their jurisdiction that potentially affect pathogen loads and monitor project and program implementation status. Coincident with the annual report for GP-0-10-002 date and reporting period, by June 1 every year, each local government is required to provide the NYSDEC with pathogen reduction project and program information including progress towards implementing the retrofit plan.	

5.0 Implementation Plan Updates

This five year pathogen reduction plan is an intermediary step in the affected water bodies' pathogen reduction process. To account for new information, changing conditions, and to realize the effects of MS4 SWMPs, periodic re-evaluations and revisions are an integral element of this plan. Generally implementation plans provided in the TMDL do not include schedules. Part IX of GP-0-10-002 does impose a schedule of compliance for TMDL waters.

Task 5.0	NYSNYSDEC
The five year pathogen reduction plan will be re-evaluated five years from issuance of GP-0-10-002 (in 2015).	

Ultimately, the effectiveness of the pathogen load reductions in meeting water quality standards will be verified by ambient monitoring of the affected waterbody. Where ambient monitoring demonstrates consistent compliance with water quality standards, the MS4 may request that the Department suspend the WIS requirements to install stormwater retrofits.

6.0 Costs/Funding Sources

The costs associated with this five year pathogen reduction plan will vary. Better cost information will be known when MS4 SWMPs are fully developed and implemented. The

following funding sources may be used to support the five year pathogen reduction plan:

- Water Quality Improvement Projects (WQIP): The Department has not yet scheduled the next call for projects.
- Green Innovation Grant Program (GIGP) is a program that provides low interest rate loans to municipalities to construct sustainable green infrastructure projects. The GIGP is administered by the New York State Environmental Facilities Corporation (www.nysefc.org).
- Stormwater projects are also eligible for assistance under the non-GIGP State Revolving Fund (SRF), including planning activities. The SRF publishes a draft Intended Use Plan in the spring that sets funding criteria for the ensuing federal fiscal year that runs from October 1 to September 30 of the following year.
- EPA/Long Island Sound Study Futures Fund
- New York State Department of State Shared Municipal Services Initiative (SMSI)

Brownfield Opportunity Areas Program (BOAP): NYSDEC's BOAP provides municipalities and community based organizations with assistance to complete area-wide approaches to brownfields redevelopment planning. Through the BOAP, communities will have opportunities to return dormant areas back to productive use and simultaneously restore environmental quality during redevelopment of the sites. The associated Environmental Restoration Program provides grants to municipalities to reimburse up to 90 percent of on-site eligible costs and 100 percent of off-site eligible costs for site investigation and remediation activities.

The NYS Environmental Protection Fund has annual funding cycles. Requests for funding are announced by the NYSNYSDEC and are routinely published in the NYS Environmental Notice Bulletin (<http://www.NYSNYSDEC.ny.gov/enb/enb.html>). Municipalities are encouraged to apply for these competitive grants.

Please note that other funding sources may also be available. Because current funding levels may be insufficient and/or may fluctuate, communities should also consider other means to generate revenue, including the establishment of stormwater drainage districts. It is particularly important to generate continuous revenue for the staff resources that municipalities will likely need to fully develop, implement, maintain and enforce SWMPs.

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TABLES

Table 1

Pollutant Load Reduction and Timetable for Watershed Strategy Areas

Watershed	POC	Enhanced Plan Implementation Deadline	First Retrofit Plan Submission Deadline	% Pollutant Reduction	Pollutant Reduction Deadline
New TMDL	As listed	3 years after obtaining coverage (new permittee) or NYSNYSDEC notification (existing permittee)			
Peconic Bay	Pathogen	05/01/2011		By embayment	
Dering Harbor *	Pathogen	05/01/2013	09/30/2012	10	09/30/2022
Budds Pond*	Pathogen	05/01/2013	09/30/2012	64.5	09/30/2022
Stirling Creek*	Pathogen	05/01/2013	09/30/2012	28	09/30/2022
Town & Jockey Creeks*	Pathogen	05/01/2013	09/30/2012	76	09/30/2022
Goose Creek*	Pathogen	05/01/2013	09/30/2012	71	09/30/2022
Hashamomuck Pond, Zone HP-1*	Pathogen	05/01/2013	09/30/2012	90	09/30/2022
Hashamomuck Pond , Zone HP-2*	Pathogen	05/01/2013	09/30/2012	50	09/30/2022
Richmond Creek*	Pathogen	05/01/2013	09/30/2012	83	09/30/2022
Deep Hole Creek*	Pathogen	05/01/2013	09/30/2012	30	09/30/2022
James Creek*	Pathogen	05/01/2013	09/30/2012	53	09/30/2022
Flanders Bay	Pathogen	05/01/2011	03/09/2011	98	03/09/2021
Reeves Bay	Pathogen	05/01/2011	03/09/2011	97	03/09/2021
Sebonac Creek	Pathogen	05/01/2011	03/09/2011	58	03/09/2021
North Sea Harbor, Zone NSH-1	Pathogen	05/01/2011	03/09/2011	97	03/09/2021
North Sea Harbor, Zone NSH-2	Pathogen	05/01/2011	03/09/2011	62	03/09/2021
North Sea Harbor, Zone NSH-3	Pathogen	05/01/2011	03/09/2011	99	03/09/2021
North Sea Harbor, Zone NSH-5	Pathogen	05/01/2011	03/09/2011	74	03/09/2021
Wooley Pond	Pathogen	05/01/2011	03/09/2011	97	03/09/2021
Noyac Creek, Zone NC-1	Pathogen	05/01/2011	03/09/2011	64	03/09/2021
Sag Harbor, Zone SH-2*	Pathogen	05/01/2013	09/30/2012	50	09/30/2022
Northwest Creek*	Pathogen	05/01/2013	09/30/2012	90	09/30/2022
Acabonac Harbor, Zone AH-2*	Pathogen	05/01/2013	09/30/2012	45	09/30/2022
Acabonac Harbor, Zone AH-3*	Pathogen	05/01/2013	09/30/2012	90	09/30/2022
Acabonac Harbor, Zone AH-4*	Pathogen	05/01/2013	09/30/2012	93	09/30/2022
Acabonac Harbor, Zone AH-5*	Pathogen	05/01/2013	09/30/2012	90	09/30/2022
Montauk Lake, Zone LM-1*	Pathogen	05/01/2013	09/30/2012	53	09/30/2022
Montauk Lake, Zone LM-	Pathogen	05/01/2013	09/30/2012	55	09/30/2022

2*						
Montauk Lake, Zone LM-	Pathogen	05/01/2013	09/30/2012	50		09/30/2022
3*						
Little Sebonac Creek	Pathogen	05/01/2011	03/09/2011	25		03/09/2021
Oyster Bay (Harbor 2)	Pathogen	05/01/2011		20		
Oyster Bay (Harbor 3)	Pathogen	05/01/2011		90		

‘*’ indicates additionally designated area

Pollutant Load Reduction and Timetable for Watershed Strategy Areas

Watershed	POC	Enhanced Plan Implementation Deadline	First Retrofit Plan Submission Deadline	% Pollutant Reduction	Pollutant Reduction Deadline
Hempstead Harbor, north, and tidal tributaries	Pathogen	05/01/2013	09/30/2012	95	09/30/2022
Cold Spring Harbor, and tidal tributaries, Inner	Pathogen	05/01/2013	09/30/2012	95	09/30/2022
Cold Spring Harbor, , Eel Creek	Pathogen	05/01/2013	09/30/2012	90	09/30/2022
Huntington Harbor	Pathogen	05/01/2013	09/30/2012	89	09/30/2022
Centerport Harbor	Pathogen	05/01/2013	09/30/2012	91	09/30/2022
Northport Harbor	Pathogen	05/01/2013	09/30/2012	92	09/30/2022
Stony Brook Harbor and West Meadow Creek, Inner	Pathogen	05/01/2013	09/30/2012	99	09/30/2022
Stony Brook Creek	Pathogen	05/01/2013	09/30/2012	99	09/30/2022
Stony Brook Yacht Club	Pathogen	05/01/2013	09/30/2012	48	09/30/2022
Stony Brook Harbor, Westmeadow Creek	Pathogen	05/01/2013	09/30/2012	99	09/30/2022
Port Jefferson Harbor	Pathogen	05/01/2013	09/30/2010	94	09/30/2022
Conscience Bay	Pathogen	05/01/2013	09/30/2010	99	09/30/2022
Setauket Harbor, Little Bay	Pathogen	05/01/2013	09/30/2012	84	09/30/2022
Setauket Harbor, East Setauket	Pathogen	05/01/2013	09/30/2012	79	09/30/2022
Setauket Harbor, Poquot	Pathogen	05/01/2013	09/30/2012	99.5	09/30/2022
Mt. Sinai Harbor, Crystal Brook	Pathogen	05/01/2013	09/30/2012	88	09/30/2022
Mt. Sinai Harbor, Inner Harbor	Pathogen	05/01/2013	09/30/2012	96	09/30/2022
Mt. Sinai Harbor, Pipe Stave Hollow	Pathogen	05/01/2013	09/30/2012	93	09/30/2022
Mattituck Inlet/Creek, Low, and tidal tributaries	Pathogen	05/01/2013	09/30/2012	64	09/30/2022
Goldsmith Inlet	Pathogen	05/01/2013	09/30/2012	91	09/30/2022
West Harbor, Fishers Island, Head of Pirate Cover	Pathogen	05/01/2013	09/30/2012	0	09/30/2022
West Harbor, Fishers Island, Davloy Cove	Pathogen	05/01/2013	09/30/2012	41	09/30/2022
Georgica Pond, Upper	Pathogen	05/01/2013	09/30/2012	93	09/30/2022
Georgica Pond, Lower	Pathogen	05/01/2013	09/30/2012	93	09/30/2022
Georgica Pond Cove	Pathogen	05/01/2013	09/30/2012	92	09/30/2022
Sagaponack Pond	Pathogen	05/01/2013	09/30/2012	88	09/30/2022
Mecox Bay and tributaries	Pathogen	05/01/2013	09/30/2012	89	09/30/2022
Heady Creek and tributaries	Pathogen	05/01/2013	09/30/2012	88	09/30/2022
Taylor Creek and tributaries	Pathogen	05/01/2013	09/30/2012	52	09/30/2022
Penny Pond	Pathogen	05/01/2013	09/30/2012	31	09/30/2022
Weesuck Creek and tidal tributaries	Pathogen	05/01/2013	09/30/2012	37	09/30/2022
Penniman Creek and tidal	Pathogen	05/01/2013	09/30/2012	32	09/30/2022

tributaries					
Ogden Pond	Pathogen	05/01/2013	09/30/2012	28	09/30/2022
Quantuck Bay	Pathogen	05/01/2013	09/30/2012	91	09/30/2022
Quantuck Canal/Moneybogue Bay	Pathogen	05/01/2013	09/30/2012	62	09/30/2022
Seatuck Cove	Pathogen	05/01/2013	09/30/2012	94	09/30/2022
Harts Cove	Pathogen	05/01/2013	09/30/2012	12	09/30/2022
Narrow Bay	Pathogen	05/01/2013	09/30/2012	16	09/30/2022
Bellport Bay, Beaver Dam Creek	Pathogen	05/01/2013	09/30/2012	94	09/30/2022
Bellport Bay, West Cove	Pathogen	05/01/2013	09/30/2012	94	09/30/2022
Patchogue Bay, Swan River	Pathogen	05/01/2013	09/30/2012	90	09/30/2022
Patchogue Bay, Mud Creek	Pathogen	05/01/2013	09/30/2012	71	09/30/2022

Table 2

TMDL	Waterbody	Pet Waste Load billion FC/yr	Urban Runoff Load billion FC/yr	Total MS4 Load billion FC/yr	Pet Waste % of MS4 Load	MS4 WLA/Assumed MS4 WLA billion FC/yr	Required % reduction	Remaining load if reduce pet waste by 75% billion FC/yr	% reduction achieved
Shellfish Pathogen TMDLs for 27 303(d)-listed Waters, September 2007	Bellport--Beaverdam	2,583,850	338,120	2,921,970	88%	175,318	94%	984,083	66%
	Bellport--West Cove	27,421,603	2,737,633	30,159,236	91%	1,809,554	94%	9,593,033	68%
	Cold Spring Harbor--Eel	111,427	15,785	127,212	88%	12,721	90%	43,641	66%
	Cold Spring Harbor--Inner	13,184,150	828,512	14,012,663	94%	700,633	95%	4,124,550	71%
	Conscience Bay(1)	7,909,229	569,346	8,478,575	93%	84,786	99%	2,546,654	70%
	Georgica Pond--Georgica Cove	1,217,290	91,637	1,308,926	93%	104,714	92%	395,959	70%
	Georgica Pond--Lower	170,294	6,541	176,835	96%	12,378	93%	49,115	72%
	Georgica Pond--Upper	559,238	198,994	758,232	74%	53,076	93%	338,804	55%
	Goldsmiths Inlet	401,558	23,987	425,546	94%	38,299	91%	124,377	71%
	Harts Cove	830,448	74,770	905,218	92%	796,592	12%	282,382	69%
	Heady Creek	1,667,203	144,817	1,812,020	92%	217,443	88%	561,617	69%
	Hempstead Harbor	24,246,979	1,819,718	26,066,697	93%	1,303,335	95%	7,881,463	70%
	Huntington Harbor	13,695,034	780,905	14,475,938	95%	1,592,353	89%	4,204,663	71%
	Centerport Harbor--Inner	3,864,211	199,036	4,063,247	95%	365,692	91%	1,165,089	71%
	Mattituck Creek	2,663,741	167,221	2,830,962	94%	1,019,046	64%	833,156	71%
	Mecox Bay	6,042,298	541,062	6,583,359	92%	724,169	89%	2,051,636	69%
	Mt. Sinai Harbor--Crystal	2,478,730	140,712	2,619,442	95%	314,333	88%	760,395	71%
	Mt. Sinai Harbor--Inner	1,597,824	78,910	1,676,734	95%	67,069	96%	478,366	71%
	Mt. Sinai--Pipe Stave	979,718	48,995	1,028,714	95%	72,010	93%	293,925	71%
	Narrow Bay	7,547,616	558,739	8,106,355	93%	6,809,338	16%	2,445,643	70%
	Northport Harbor	7,019,914	348,702	7,368,615	95%	589,489	92%	2,103,680	71%
	Ogden Pond	504,576	23,879	528,455	95%	380,488	28%	150,023	72%
	Patchogue-mud creek	4,288,896	435,526	4,724,422	91%	1,370,082	71%	1,507,750	68%
	Patchogue--Swan	11,521,152	968,711	12,489,863	92%	1,248,986	90%	3,848,999	69%
	Penniman	435,197	25,620	460,817	94%	313,356	32%	134,420	71%
	Penny Pond	901,930	22,305	924,234	98%	637,722	31%	247,787	73%
	Port Jefferson (1)	4,503,341	218,639	4,721,980	95%	283,319	94%	1,344,474	72%
	Quantuck Creek	1,156,320	404,625	1,560,945	74%	140,485	91%	693,705	56%
	Quantuck-Moneybogues	914,544	44,004	958,548	95%	364,248	62%	272,640	72%
	Sagaponack	2,133,936	139,226	2,273,162	94%	272,780	88%	672,710	70%
	Seatuck Cove	3,588,797	384,345	3,973,142	90%	238,389	94%	1,281,544	68%
	Setauket--East	3,561,466	225,589	3,787,055	94%	795,282	79%	1,115,955	71%
	Setauket--Little Bay	353,203	18,258	371,461	95%	59,434	84%	106,558	71%
	Setauket--Poquott	790,502	39,845	830,347	95%	4,152	99%	237,470	71%
	Smith Creek	3,210,365	133,013	3,343,377	96%	935,604	100%	935,604	72%
	Stony Brook Yacht Club	611,798	27,615	639,413	96%	332,495	48%	180,564	72%
	Stony Brook--Inner	597,082	80,880	677,961	88%	6,780	99%	230,150	66%
	Stony Brook--SB Creek	1,883,750	120,743	2,004,493	94%	20,045	99%	591,680	70%
	Taylor Creek	735,840	28,558	764,398	96%	366,911	52%	212,518	72%
	Tuthill Cove	2,604,874	67,734	2,672,608	97%	100%	100%	718,953	73%
Weesuck Creek	1,652,486	151,889	1,804,375	92%	1,136,756	37%	565,010	69%	
West Harbor--Darby Cove	18,922	938	19,859	95%	11,717	41%	5,668	71%	
West Harbor--Pirates Cove	39,946	1,594	41,540	96%	41,540	0%	11,581	72%	
West Meadow Creek	3,069,504	162,046	3,231,550	95%	32,315	99%	929,422	71%	
Peconic Estuary Pathogen TMDL, 2006	Dering Harbor*	18,732	28,990	47722	39%	45,558	5%	33,673	29%
	Budds Pond*	3,784	10,480	14264	27%	5,356	62%	11,426	20%
	Stirling Creek*	30,842	18,023	48865	63%	35,751	27%	25,734	47%
	Town & Jockey Creeks *	37465	43,333	80798	46%	19,921	75%	52,699	35%
	Goose Creek*	49,858	43,269	93127	54%	27,788	70%	55,734	40%
	Hashamomuck Pond 1*	16,556	23,682	40238	41%	4,153	90%	27,821	31%
	Hashamomuck Pond 2*	11,637	25,358	36995	31%	21,520	42%	28,267	24%
	Richmond Creek*	10,028	11,987	22015	46%	4,317	80%	14,494	34%
	Deep Hole Creek*	20,341	14,476	34817	58%	24,830	29%	19,561	44%
	James Creek*	21,760	15,903	37663	58%	18,046	52%	21,343	43%
	Flanders Bay**		520,751	520751	0%	24,787	95%	520,751	0%
	Reeves Bay**		120,351	120351	0%	3,925	97%	120,351	0%
	Sebonac Creek**		11,541	11541	0%	4,842	58%	11,541	0%
	North Sea Harbor - 1**		32,580	32580	0%	831	97%	32,580	0%
	North Sea Harbor - 2**		23,923	23923	0%	9,014	62%	23,923	0%
	North Sea Harbor - 3**		15,943	15943	0%	4,110	74%	15,943	0%
	North Sea Harbor - 5**		16,713	16713	0%	4,274	74%	16,713	0%
	Wooley Pond**		30,745	30745	0%	993	97%	30,745	0%
	Noyac Creek - 1**		14,150	14150	0%	5,070	64%	14,150	0%
	Sag Harbor - 2**		10,547	10547	0%	5,250	50%	10,547	0%
	Norhtwest Creek*	10543	26,145	36688	29%	4,177	89%	28,781	22%
	Acabonac harbor - 2*	19868	23,757	43625	46%	25,600	41%	28,724	34%
	Acabonac harbor - 3*	4257	11,934	16191	26%	1,647	90%	12,998	20%
Acabonac harbor - 4*	4541	11,621	16162	28%	1,253	92%	12,756	21%	
Acabonac harbor - 5*	7569	5,458	13027	58%	1,295	90%	7,350	44%	
Montauk Lake - 1*	35194	63,745	98939	36%	47,977	52%	72,544	27%	
Montauk Lake - 2*	851	31,061	31912	3%	15,148	53%	31,274	2%	
Montauk Lake - 3*	121571	239,507	361078	34%	187,710	48%	269,900	25%	
Little Sebonic Creek		22,397	22397	0%	6,779	70%	22,397	0%	

(1) These waterbodies were not included in the list of waterbodies in part IX of the MS4 Permit

*For the purpose of interoperating the load reduction requirements for the Peconic TMDL in the additionally designated areas, the DEC assumed that all of the Non-MS4 (Residential/Urban Land) loads that were identified for each affected waterbody in the Peconic TMDL that did not have a distinct MS4 and Non-MS4 load became an MS4 load "Residential/Urban Land" Load converted to an MS4 load in this MS4 permit

** These waterbodies had both an MS4 load as well as a Non-MS4 load as part of their "Residential/Urban Land" load
As such, there is no way to attribute the pet waste load between the two loads.

FIGURES

Figure 1
Oyster Bay & Mill Neck Creek Pathogen Watersheds

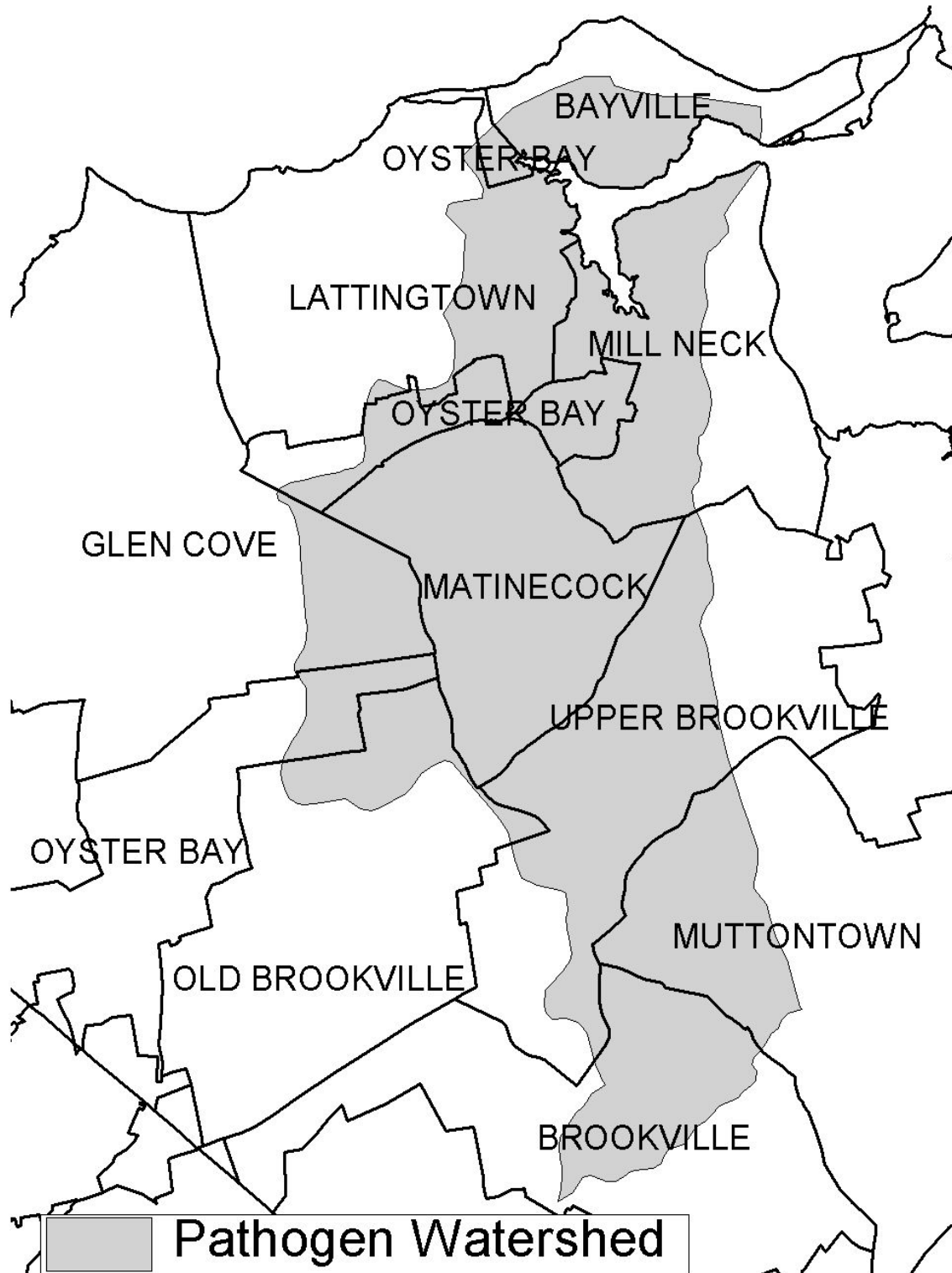


Figure 2
Peconic Estuary Pathogen Watersheds

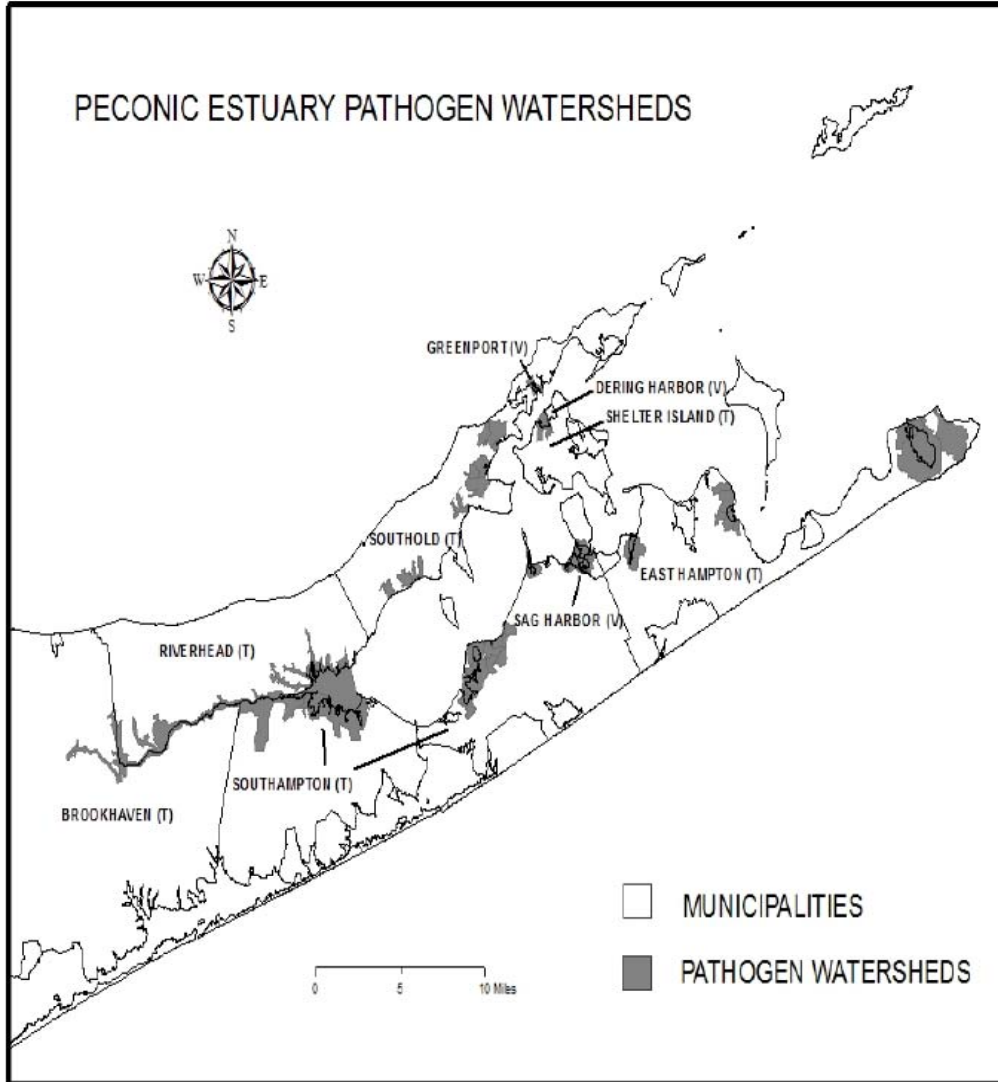


Figure 3
Shellfish Pathogen TMDL (27 Embayments)

