
CHAPTER
FIVE

**PATHOGENS
MANAGEMENT PLAN**

OBJECTIVES

- 1) To minimize health risks due to human consumption of shellfish.
- 2) To promote, to the maximum practicable extent, the social and economic benefits which have been associated with the Peconic Estuary system.
- 3) To maintain the current status of certified (seasonally and year-round) shellfish beds and re-open uncertified beds by eliminating or reducing pathogen (indicator) inputs to the Peconic Estuary System.
- 4) To minimize the closure of bathing beaches in the Peconic Estuary while adequately protecting human health.



MEASURABLE GOALS

The PEP's measurable goals for pathogens include:

- Maintain current level of bottom lands available to shellfish harvesting, with the ultimate aim of re-opening lands currently closed to harvesting (measured through coliform levels and numbers of acres of shellfish beds available to harvest). [See Actions P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-10, P-11, P-12, P-13, P-14, P-15]
- Maintain and improve water quality of the estuary through a reduction of overall stormwater runoff, particularly key areas identified through the Regional Stormwater Runoff Study (measured through the number of stormwater remediation projects implemented). [See Actions P-1, P-2, P-3, P-4, P-12, P-13, P-14]
- Eliminate all vessel waste discharges to the estuary (measured by the adoption/ implementation of a Vessel Waste No Discharge Area in the Peconic Estuary, the number of pump-out facilities and the volume of waste pumped annually). [See Actions P-6, P-7, P-8, P-9]
- Attain a zero discharge of stormwater runoff in new subdivisions (measured by site plans for new developments that achieve this goal and the development of new ordinances and Habitat Protection Overlay Districts). [See Actions P-1, P-2, P-3, P-4]



INTRODUCTION

Pathogens are viruses, bacteria, algae, and protozoans that cause diseases in humans, plants, and other animals. Pathogens that may be found in marine waters in the United States include those causing gastroenteritis, salmonellosis, and hepatitis A. Pathogens can enter marine waters in untreated or partially treated human sewage and in wild and domestic animal waste. Humans may encounter the pathogens through direct contact with or ingestion of contaminated water or by eating raw or partially cooked bivalve shellfish harvested from contaminated waters.

Pathogen loadings to the Peconic Estuary System are of concern because of the potential health risks associated with consumption of contaminated shellfish, health risks associated with direct water contact and/or ingestion, and the economic losses associated with the closure of shellfish beds and beaches.

In order to protect shellfish consumers and beach goers from the human health risks associated with pathogens, the State of New York regularly monitors water quality in the marine waters of New York State and the Suffolk County Department of Health Services (SCDHS) monitors for pathogen indicators at public beaches. When water quality parameters fail to meet the established human health criteria, beaches and shellfish beds are closed.

*The only significant non-human pathogen known in the Peconics is wasting disease in eelgrass, *Zostera marina*, caused by the slime mold, *Labyrinthula zosterae*. This has been a problem in the Peconics in the past and continues to be a concern. This pathogen is discussed further in **Chapter 4**.*

ENVIRONMENTAL CRITERIA

It is difficult to directly measure the concentration of specific pathogens in seawater due to the variable nature of their occurrence. Instead, the potential for the presence of human pathogens in the water is measured using bacterial indicator species. Fecal indicator bacteria originate in the intestines of warm-blooded animals. They are easily measured, and their presence in the water indicates that the wastes of a warm-blooded animal, which may contain pathogens, has entered the water. The most commonly used indicators for human sewage and animal waste are total and fecal coliform bacteria.

Each State adopts an established uniform water quality standard for total and fecal coliforms that indicate the safety of the water for bathing and for consumption of bivalve shellfish. These guidelines are based on U.S. Environmental Protection Agency (EPA) recommendations and guidelines developed by the National Shellfish Sanitation Program. The U.S. Food and Drug Administration (USFDA) evaluates State programs annually to ensure that recommended guidelines are uniformly applied. For the Peconic Estuary, monitoring of bathing beaches is conducted by the SCDHS; monitoring and classification of shellfish growing areas is conducted by the New York State Department of Environmental Conservation (NYSDEC), Division of Fish, Wildlife, and Marine Resources Shellfish Sanitation Unit.

The standard utilized for bathing beaches in the Peconic Estuary is based on Section 6-2.15(1) of the New York State Sanitary Code: “the total number of organisms of the coliform group shall not exceed a logarithmic mean of 2400/100 ml for a series of five or more samples in any 30-day period, nor shall 20 percent of total samples during the period exceed 5000/100 ml.” The SCDHS, however, also requests closure of a beach if the fecal coliform level exceeds 400/100 ml, which almost always occurs before the total coliform standard is exceeded.



Shellfish Bed Closures

The NYSDEC Shellfish Sanitation Program classifies shellfish growing areas using two methods: **water quality based closures** and **administrative closures**.

WATER QUALITY based closures are determined when a growing area fails to meet the National Shellfish Sanitation Program (NSSP) criteria for (open) certified shellfish growing areas. There are three categories of water quality based closures: **year-round, conditional, and seasonal closures**.

Year-round closures are areas that do not meet the NSSP criteria for any portion of the year and are closed to shellfish harvesting.

Conditional closures apply to shellfish growing areas that fail to meet the certified criteria following rainfall events. The historic water quality database has documented that conditional areas can be open for shellfish harvesting under a restricted rainfall “trigger amount” during the cold weather months (usually December through April). The “trigger amount” for each conditional area varies and is based on historical water quality data. All conditional areas are evaluated annually prior to the start of the conditional program.

Seasonal closures are used when a shellfish growing area fails to meet the certified criteria for a portion of the year. In general, a majority of the seasonal areas are open for harvesting during the cold weather months (November through April) and are closed for the warm weather months (May through October).

Temporary Emergency Rainfall Closures are put into effect when shellfish growing areas are affected by greater than three (3) inches of rainfall in a continuous thirty-six hour period. The Shellfish Sanitation Program uses these closures to protect public health by temporarily closing the affected areas to shellfish harvesting based on historical water quality data which documents that rainfall events of this magnitude degrade water quality below the acceptable criteria for shellfish harvesting. These temporary closures are rescinded when the laboratory analysis of the samples collected during the closure determine that water quality has returned to certified criteria.

ADMINISTRATIVE closures are used in shellfish growing areas as buffer zones around known potential sources of pathogens such as sewage treatment plant (STP) outfalls, marinas and mooring areas. For example, administrative closures result from the potential for an unpredictable release of pathogens from insufficient treatment at a STP, or from the discharge of untreated waste from marine sanitation devices.

Since the start of the Peconic Estuary Program, several shellfish beds have been upgraded in classification to year-round or seasonally certified for harvesting. Some of these areas include all, or a portion of, East Creek, Fish Cove, North Sea Harbor, Wooley Pond, Accabonac Harbor, Shelter Island Sound near Stirling Basin, and Hashamomuck Pond. These changes came about primarily as a result of increased water quality sampling in these areas, which was done cooperatively between the NYS Shellfish Sanitation Program and East End towns.

Several towns (e.g., Southampton and Southold) have conducted stormwater remediation work to improve water quality by installing catch basins adjacent to shellfish growing areas. It is important to note that only shellfish beds closed due to water quality violations have the potential to be re-opened due to remediation efforts. Administrative closures are mandated on the basis of potential contamination and will not be reduced or eliminated based on remediation efforts.



Shellfish may be harvested for direct human consumption in areas where the median or geometric mean total coliform most probable numbers (MPN) do not exceed 70 per 100 milliliters (70/100 ml) of water with not more than 10 percent of the samples exceeding an MPN value of 230/100 ml (5-tube test) or 330/100 ml (3-tube test), or the fecal coliform median or geometric mean MPN does not exceed 14/100 ml, with not more than 10 percent of the samples exceeding an MPN of 43/100 ml (5-tube test) or 49/100 ml (3-tube test). This determination is based on a minimum of 15 samples collected under adverse pollution conditions. Adverse pollution conditions are defined as the collection of water samples on an ebbing tide within 96 hours of a rainfall event of 0.25 to 3.00 inches in a given 24-hour period. These criteria are defined in the *National Shellfish Sanitation Program (NSSP) Guideline for the Control of Molluscan Shellfish*.

In January 1997, the NYSDEC Shellfish Sanitation Unit modified its Routine Water Quality Monitoring Program from Adverse Pollution Condition (APC) Sampling to Systematic Random Sampling (SRS). APC focuses sampling efforts exclusively on rainfall events during an ebbing tide. SRS sampling is also done on ebbing tide, but sampling runs are scheduled randomly in advance. Sampling runs are preplanned throughout the year to develop a historic database that includes a mixture of warm and cold weather as well as wet and dry conditions. Because SRS is conducted under various hydrographic conditions (dry conditions and runoff conditions), thirty (30) sets of water quality data are statistically analyzed to determine water quality.

QUALITY/IMPAIRMENTS

Beach Closures

Excessive quantities of coliform bacteria are generally found in areas where the water exchange or flushing is significantly limited and runoff from the surrounding land is high. For a variety of reasons, beaches are typically not situated in areas with these characteristics. Only one bathing beach in the Peconics, which is in such an area, has been closed due to excessive coliform values — the East Hampton town beach on the south end of Lake Montauk. Samples taken in the water just off the beach by the SCDHS have frequently indicated exceedences of the State standard for bathing beaches. Several possible sources of this contamination have been suggested, including waterfowl and other wildlife, as well as overflow from the shallow sanitary systems in the Ditch Plains community south of the Lake. These systems sit on top of a clay lens, which may not allow sufficient filtration of the waste. The Town of East Hampton has obtained funds for a project to remediate this potential source of contamination. Under this project, stormwater runoff will be directed through a series of ditches and freshwater wetlands for filtration before being discharged into the embayment. In order to minimize the possibility of pathogens getting into south Lake Montauk in the future, the Town of East Hampton has constructed public restrooms at the beach, which compost waste material rather than discharging it to a conventional septic system. Over time, it is hoped that this facility will demonstrate the feasibility of using such systems and result in the construction of other such facilities at public locations near bodies of water that are particularly sensitive to pathogen contamination.

Shellfish Bed Closures

Closure of shellfish beds due to pathogens is a problem in the Peconics. In the Peconics, including Gardiners Bay, 121,390 acres of bottom are available for shellfishing. Just over four percent (5,172 acres) are closed to shellfishing. Of these 5,172 acres, 1,960 acres are seasonally certified or open only during the winter, and 3,212 acres are closed year-round.



Although only about four percent of the total bottom area is closed to shellfishing, a much greater percentage of the total productive shellfishing acreage is closed. Based on the NYS Shellfish Sanitation Program estimates, 121,390 acres of bay bottom are technically available for shellfishing. Of these, only 20,880 acres are estimated to be as productive shellfishing areas. Within this productive area, 2,952 acres (14 percent) are closed to shellfishing. These beds are closed because water quality fails to meet the criteria established for certified shellfish growing areas by the NSSP and New York State Regulations.

Most shellfishing in the Peconics is not done in deep waters. In fact, shellfish surveys done by the NYSDEC in 1979–1980 and again through the Peconic Estuary Program in the fall of 1995 have shown that the deep, open waters of the Peconics that were surveyed contain very low numbers of hard clams or any other commercially and recreationally important shellfish species.

An assessment of shellfish growing area classifications in the Peconic Estuary from 1970 to 1995 indicates that, over time, there has been a net increase in shellfish bed closures every year (**Figure 5-1**). The greatest increase in uncertified acreage occurred from 1980 to 1992. The increase in shellfish growing area closures is most likely a result of increased water quality monitoring of the Peconic Estuary following the expansion of the NYSDEC Shellfish Sanitation Program in the late 1980s. During this time, the number of uncertified acres increased by an average of 151 acres per year. However, from 1992 to 1995, the rate of increase decreased to 39 acres per year. The most probable reason for the deceleration in new closures is that many of the shallow, relatively enclosed areas in the Peconic Estuary, which tend to be the most poorly flushed and heavily impacted by pathogens, have already been restricted for shellfish harvesting.

At present, the percentage of “productive” shellfish beds closed in the Peconics is relatively low in comparison to other bodies of water in the New York marine district. For example, in the early 1990s, 75 percent of the productive beds in New York waters of the Long Island Sound were restricted to shellfish harvesting (year-round and seasonal); currently, 100 percent of the bottom in the New York-New Jersey Harbor core area is closed to the direct harvesting of shellfish, although transplants are permitted out of this area (see the PEP *Pathogens Characterization Report* for more details on the transplant program).

Without further action to reduce pathogen loading to the estuary, additional shellfish beds in the Peconics may be closed to harvesting each year.

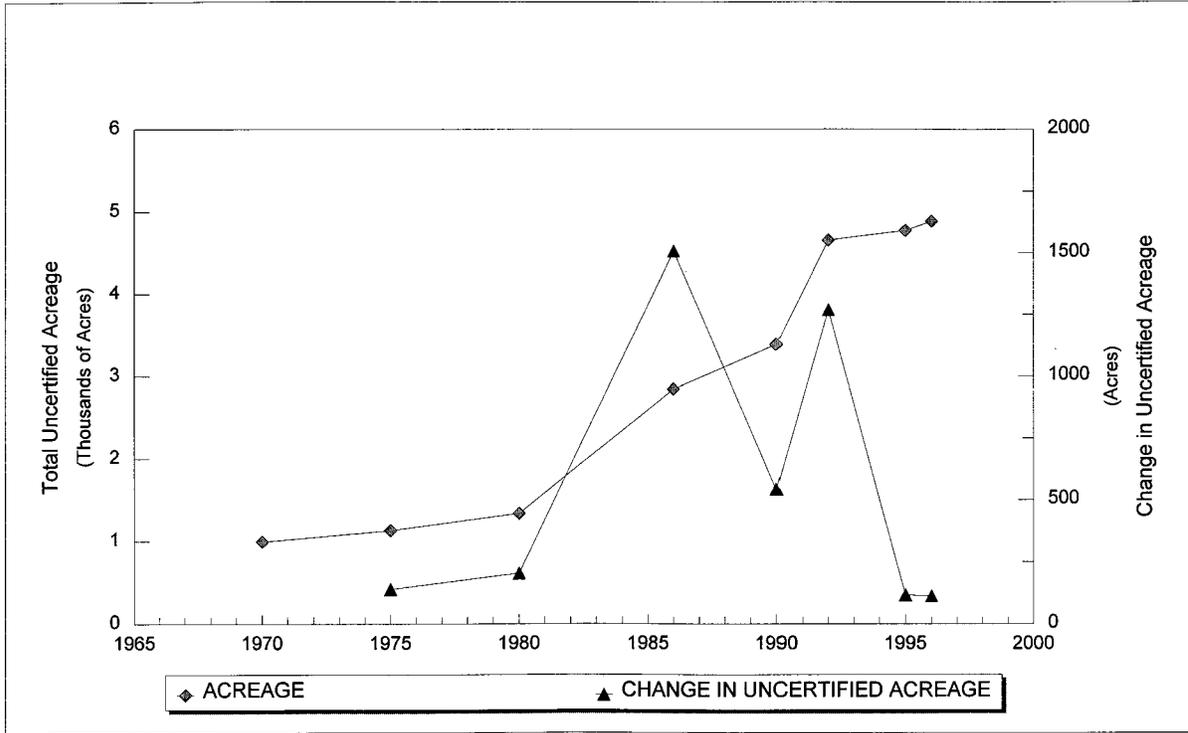


Figure 5-1. Uncertified Shellfish Growing Area Acreage in the Peconic Estuary System, 1970-1996.

Harmful Algal Blooms

Paralytic Shellfish Poisoning

Paralytic shellfish poisoning (PSP) caused by the organism *Alexandrium tamarense* has been a problem mainly in the northern New England states. The organism produces a neurotoxin that can be concentrated by shellfish which, when consumed by humans (or other mammals), can result in PSP and could be lethal. In a four-year monitoring study, from 1986 to 1989, the SCDHS found that a spring bloom of *A. tamarense* consistently occurred in Reeves Bay and also noted blooms in Terry’s and East Creeks in 1989, the one year in which they were investigated. No other stations in the Peconic Estuary were sampled.

Although *A. tamarense* has been detected on the north and south shores of Long Island and the East End bays, PSP is not believed to be a significant human health threat in Suffolk County. However, the SCDHS believes the presence of *A. tamarense* in our waters merits further screening, and has requested \$35,000 from Suffolk County Capital Funds for PSP organism investigations this year (2000). This investigation will be limited to nine sites in the Peconic Estuary, with other areas of the county being investigated in future years. Water samples will be analyzed for phytoplankton, and mussels will be deployed and later analyzed for PSP toxins.



Pfiesteria

In the summer of 1999, the NYSDEC and the Nassau and Suffolk County Health Departments and the Town of Hempstead undertook a comprehensive monitoring effort to assess the marine waters of the State for the presence of *Pfiesteria* cells. *Pfiesteria piscicida* is a complex microorganism that lives in brackish coastal waters and has been associated with fish kills and possibly with human health effects in other states. The exact conditions to trigger toxin production by *Pfiesteria* are poorly understood. *Pfiesteria* normally occurs in non-toxic forms unless triggered to develop into a toxic form. In a preliminary 1998 screening survey by the Suffolk County Department of Health Services, *Pfiesteria* was present in a few water samples. The test, using a molecular probe in the laboratory, detects the presence of *Pfiesteria* but not the toxicity. Water samples are shipped to Dr. Parke Rublee of the University of North Carolina where they are analyzed for *Pfiesteria*.

In 1999, water samples were collected for *Pfiesteria* and at the same stations dissolved oxygen, temperature and salinity were also measured. In Peconic Estuary, Suffolk County also analyzed for a full suite of water quality parameters, including nutrients, total suspended solids and *chlorophyll a*. Stations were sampled from one to three times starting in July. **Table 5-1** lists the areas sampled for the presence of *Pfiesteria* in the PEP.

Table 5-1. Areas Sampled for the Presence of *Pfiesteria* in the PEP.*

1998 Sites	Test Results
Meetinghouse Creek	+
River Avenue	
Reeves Bay	+
1999 Sites	
Reeves Bay	
Meetinghouse Creek	
Three Mile Harbor	+
Northwest Creek	+
Sag Harbor cove	
North Sea Harbor	
Mill Creek	
Hashamomuck Pond	
East Creek in Cutchogue	
East Creek in South Jamesport	
Peconic River	

+ = Positive Test

*Additional sampling is planned in 2000.



SOURCES OF PATHOGENS IN THE PECONIC ESTUARY SYSTEM

Both point sources and nonpoint sources of pollution contribute pathogens to the Peconic Estuary system. Point sources are discrete, easily identifiable sources of pollution, such as a discharge from a STP. Point sources that may contribute pathogens to the estuary include sewage treatment plant discharges and discharge from the Corwin Duck Farm on Meetinghouse Creek. Nonpoint sources refer to diffuse sources of pollution which are spread throughout the watershed and which have no easily discernable source or point of discharge or consist of many discrete sources. Stormwater runoff, which carries a multitude of pollutants from developed land, is the largest contributor of pathogens to the Peconic Estuary System.

Nonpoint Sources of Pathogen Contamination

Monitoring and research done as part of the Long Island Comprehensive Waste Treatment Management Plan (1978), the Long Island segment of the Nationwide Urban Runoff Program (1982), and the Brown Tide Comprehensive Assessment and Management Plan (1992) have shown that the major sources of pathogens to marine waters of the Peconic Estuary are nonpoint in nature. The largest nonpoint source is stormwater runoff from roads and open areas, including undeveloped land and farmland. Pathogen contributions to stormwater are dependent upon the characteristics of the land over which the water flows. Fecal coliforms running off undeveloped land are likely to have originated from wildlife (including waterfowl) while those from developed areas may be due to domestic animals and/or poorly-functioning on-site disposal systems (OSDS), including septic tanks and cesspools.

In addition to stormwater runoff, another small but possibly locally significant nonpoint source of pathogens is waste from boats, particularly in the enclosed waters around marinas and mooring areas. Boater waste includes raw or inadequately treated sewage from boat waste receptacles. Concerns about boater waste disposal in enclosed waters has led to seasonal administrative closures of shellfish beds and temporary closures of beds during times of particularly high use (*i.e.*, holiday weekends in the summer). An agreement has been reached by the East End towns, New York State and the Marine Industries for designating the entire Peconic Estuary a Vessel Waste No Discharge Area, and will be adopted in the near future.

On-site Disposal Systems

Properly functioning on-site disposal systems (OSDS) collect solid domestic wastes in a septic tank where they are decomposed by microbial activity. The liquid overflows into a cesspool and then leaches through the soil, which filters out any pathogens that might be present. Older systems may consist of only a cesspool with no septic tank. If OSDS are poorly constructed or are not maintained and the leaching field is compromised, effluent can contribute pathogens to groundwater or break through the surface and contribute pathogens directly to runoff. Studies done in the early 1980s showed that groundwater samples from around Long Island did not contain numbers of coliform bacteria exceeding State drinking water standards. Therefore, it is assumed that groundwater in general, except perhaps in some highly localized situations, is not a significant source of pathogen contamination to marine surface waters. Localized contamination most often occurs if sanitary systems have not been properly sited, and there is not an adequate separation between the leaching pool and the groundwater. While current standards for separation distances between OSDS and groundwater and surface waters are believed to be adequate with respect to protection from bacterial



contamination, historic, improper siting of OSDS may result in pathogen loadings to the estuary system.

Stormwater Runoff

The PEP has funded a regional stormwater management project to establish a comprehensive, coordinated, intergovernmental stormwater strategy. This project, which began in the summer of 2000, will capitalize on previous efforts and construct a framework for continuing management. The goal is to evaluate the entire watershed, with a very high level of detail afforded to a few key sub-watersheds. Some of the primary outputs from the project will include:

- Characterization of stormwater inputs, identification of areas impacted by stormwater runoff, and assessment of the extent of those impacts;
- Several high-quality GIS overlays and a report which will serve as a continuing management resource;
- Identification of areas in need of preservation;
- Identification of mitigation priorities based on cost-effectiveness;
- Production of a regional stormwater strategy;
- Recommendations for additional monitoring, investigations, and demonstrations; and,
- Development of inputs to the PEP computer models, and recommendations for additional investigations.



BMPs for Controlling Stormwater Runoff

Numerous Best Management Practices, or BMPs, can be used to minimize and treat stormwater runoff before it reaches a receiving body of water. Some of the ongoing projects in the Peconics are detailed below.

Grass Filter Strip. Runoff may enter a stream or bay as a direct discharge from a pipe collecting drainage from a nearby road. Often this discharge is very intense during rainfall events and can act as a significant source of coliforms. In addition, such a powerful discharge can erode streambanks and add to the sediment load of a body of water. Filter strips are areas of natural vegetation between the road and the water, which are designed to slow flow and allow time for infiltration of the runoff before it reaches the stream. There are many spots in the Peconics where stormwater runoff from roads enters bays and streams forcefully, carrying high levels of coliforms. A filter strip, such as the one constructed at Gardiners Creek on Shelter Island, may be the best solution in such areas.

Artificial Wetlands. These constructed areas of natural vegetation may be used to filter effluent from concentrated animal feeding operations, as is being demonstrated at the Corwin Duck Farm in Riverhead. Artificial wetlands also may be effective in treating stormwater moving into the estuary. As with the grass filter strip, these wetlands act to capture and filter runoff and slow the flow of water, which also eases erosion.

Open Marsh Water Management. Tidal wetlands around the Peconics were extensively ditched for mosquito control in the last century. Since mosquitoes breed in standing water, it was thought that ditching marshes to facilitate drainage would result in less standing water at low tide. However, it is now believed that the increased drainage has allowed stormwater runoff coming into the marsh to enter the main bodies of water without adequate detention time, resulting in high loading of coliform bacteria to subtidal shellfish beds. Diking the mosquito ditches will result in the retention of a greater amount of runoff. Greater retention times will result in fewer live pathogens reaching the shallow-subtidal regions of the estuary. In this way, the impacts of stormwater runoff with respect to pathogen contamination will be minimized. Demonstrations of this technique, known as Open Marsh Water Management (OMWM), are being carried out by Cornell Cooperative Extension in cooperation with the Town of East Hampton. In addition, the NYSDEC has received a grant from the US Fish and Wildlife Service (USFWS) National Coastal Wetlands Restoration Program for implementation of OMWM on state-owned tidal wetlands in the Town of Southold.

Corwin duck farm's NYSDEC SPDES permit allows the facility to discharge to surface waters only in the event of an extraordinary rainfall (e.g., "ten-year storm"). The effluent from the sewage treatment plants is treated year-round to kill pathogens. The need for and extent of disinfection of the effluent is determined by the classification of the waters into which the effluent is discharged (**Table 5-2**). All of the sewage treatment plants in the Peconics are required to employ year-round

Best Management Practices

Because of its nature, nonpoint source pollution is not easy to quantify or control. Often, it is difficult to collect and treat stormwater runoff due to space restrictions and the high costs associated with remediation projects. OSDS problems are difficult to track and remediate due to the cost and the lack of enforceable requirements for operation and maintenance. Boater waste is equally difficult to document and prevent. Nevertheless, protecting human health as well as maintaining the remaining certified shellfish beds and re-opening those currently closed will depend on the identification and implementation of effective measures to control these sources of pathogens. A number of projects aimed at minimizing or treating stormwater runoff have been implemented throughout the Peconics, including a grass filter strip, artificial wetlands, and Open Marsh Water Management.

Point Sources of Pathogen Contamination

Point sources of pathogens in the Peconics include STPs, as well as one duck farm in the watershed that may discharge effluent directly into Meetinghouse Creek. The



disinfection. The total coliform most probable number (MPN) limit on effluent discharged by these plants is 700 coliforms/100 ml. The average monthly MPN limit on fecal coliforms discharged in effluent from Peconic STPs is 200 coliforms/100 ml, and the maximum MPN concentration is 400 coliforms/100 ml.

Table 5-2. Sewage Treatment Plants in the Peconic Estuary System.

Sewage Treatment Plant	Receiving Waterbody	Surface Water Classification and Description ¹
Brookhaven National Lab	Headwaters of the Peconic River	Class C — Best usage is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
Riverhead	Tidal Peconic River	Class SC — Best usage is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
Shelter Island Heights	Shelter Island Sound	Class SA — Best usages are shellfishing for market purposes, primary and secondary contact recreation, and fishing. These waters shall be suitable for fish propagation and survival.
Sag Harbor	Sag Harbor	
Plum Island	Gardiners Bay	
Calverton (former Grumman Facility)	Headwaters of the Peconic River	Class C — Best usage is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

¹These classifications are for general usage and not for the harvest of shellfish, *e.g.*, portions of Shelter Island Sound, Sag Harbor, and Gardiners Bay are closed to shellfish harvesting.

Chlorination has traditionally been the disinfection method used by STPs to treat effluent because it has always been assumed that pathogens, like coliform bacteria, are killed by chlorination. There is evidence, however, that viruses are not effectively eliminated by exposure to chlorine. A second concern related to the use of chlorine is the toxicity of chlorine to marine life. For this reason, there are limits set on the concentration of chlorine discharged in effluent from STPs. The Brookhaven National Lab (BNL) and the Plum Island STPs now uses an ultraviolet (UV) disinfection process. UV has been proposed for use at Riverhead and Sag Harbor and was being pilot tested in Shelter Island Heights.

The discharge of duck waste from the Corwin Duck Farm is also considered a point source and the farm is required to have a State Pollutant Discharge Elimination System permit. In an attempt to lower the levels of coliforms in the effluent, a freshwater wetland was constructed on-site at the duck farm and is being used to filter the effluent prior to discharge. Studies elsewhere have shown that the



sediment/plant associations of freshwater wetlands are effective in removing contaminants from runoff as it flows across and through them. It is believed that the system acts as a filter that captures pathogens and retains them until they die rather than allowing them to move into a body of water along with the runoff.

There are a number of alternatives that STPs can pursue in an effort to alleviate the concern over chlorination. One alternative is to use a different, non-chemical disinfectant. The Peconic Estuary Program is demonstrating the use of ultraviolet light for pathogen removal from STP effluent. Research has shown this treatment to be deadly to viruses as well as bacteria and it leaves no residue in the effluent. This study is being conducted at the Shelter Island Heights STP. This demonstration project hopes to show that ultraviolet treatment can serve as a safe and effective replacement for, or as an adjunct to, chlorination.

MANAGEMENT ACTIONS

The actions in this chapter are categorized by point sources and nonpoint sources of pathogen contamination. Of these two, the vast majority of the actions are directed at nonpoint sources. Point sources and nonpoint sources of pollution contribute many harmful materials other than pathogens to the estuary. For this reason, the approach of the Peconic Estuary Program in formulating these actions has involved research on a variety of topics, including water quality modeling, sediment accretion and flux dynamics, and groundwater underflow and discharge determinations. So, while the actions in this chapter are primarily designed to minimize or prevent the movement of waste material and pathogen indicators into the estuary, many of the actions will also serve to reduce other forms of pollution.

The most significant sources of pathogens are stormwater runoff from roads and open land, on-site disposal systems, and domestic and wild animal waste. Another small but possibly locally significant source of pathogens is waste from boats. Actions to mitigate stormwater runoff include best management practices in construction, road-building, and storm drain construction and maintenance. Measures to mitigate waste from on-site disposal systems include tracking and upgrading failing systems and best management practices for siting, construction, and maintenance of new systems. Mitigation of pathogen input from animal waste can be addressed through best management practices for stormwater runoff. Boater waste will be addressed through the construction of pump-outs and through designation and implementation of vessel waste no discharge areas at locations throughout the estuary.

Public education about boater waste, on-site disposal systems, animal waste, and other types of nonpoint source pollution is an extremely important tool for reducing pathogens entering the estuary. The Public Education and Outreach chapter of this Plan includes actions that will address the need for education regarding the control and reduction of pathogen loadings to the estuary. The Pathogen Management Actions are listed and discussed in the pages that follow. Additional information on costs and implementing entities is contained in **Table 5-5** at the end of this chapter.

Within the CCMP, some steps within the actions have been identified as priorities, as indicated under the step number. The PEP will seek to implement priority actions in the near term. Priorities may be either new or ongoing, commitments or recommendations. Completing some priority actions does not require any new or additional resources, because they are being undertaken through "base programs" or with funding that has been committed. In other cases, in order to complete the priority actions, new or additional resources need to be secured by some or all of the responsible entities.



PATHOGENS MANAGEMENT ACTIONS

Stormwater Runoff

- P-1. Use Existing or Implement New Stormwater Management Regulations to Control Pathogen Loading and Other Forms of Nonpoint Source Pollution.
- P-2. Develop Land Use Regulations that Eliminate or Minimize New Sources of Stormwater Runoff.
- P-3. Use Construction Site Guidelines which Eliminate or Minimize Stormwater Runoff.
- P-4. Demonstrate and Implement Technologies to Remediate Stormwater Runoff.

On-site Disposal Systems

- P-5. Enhance Existing Septic System Controls and Implement New Best Management Practices.

Assess and Manage Vessel Wastes and Marinas

- P-6. Provide Pumpout Facilities and Encourage Their Use.
- P-7. Establish Vessel Waste No Discharge Areas.
- P-8. Use Administrative and Regulatory Measures to Control Pollution from Boaters and Marinas.
- P-9. Promote the Use of Best Management Practices to Control Pathogen Loadings from Marinas, Mooring Areas, and Boatyards.

Point Sources

- P-10. Ensure Adequate Disinfection at Sewage Treatment Plants.
- P-11. Monitor Effluent from the Corwin Duck Farm.

Assess and Manage Nonpoint Sources

- P-12. Identify Sources and Loadings of Nonpoint Sources of Pathogens.
- P-13. Develop and Implement Nonpoint Source Control Plans for Pathogens.
- P-14. Obtain Funding to Address Stormwater Runoff.

Water Quality Monitoring

- P-15. Conduct Water Quality Monitoring.



P-1. Use Existing or Implement New Stormwater Management Regulations to Control Pathogen Loading and Other Forms of Nonpoint Source Pollution.

Addresses Pathogen Management Objectives 1, 3, and 4.

The National Pollutant Discharge Elimination System (NPDES) program requires certain activities obtain authorization (via a permit) to discharge pollutants via stormwater runoff to surface waterways. In New York, this requirement is covered under two General Stormwater Permits through the State Pollutant Discharge Elimination System (SPDES) program. One permit covers activities associated with construction activities (> five acres in size) and the second covers the remaining activities listed in the NPDES regulations. Unless covered by a separate individual SPDES permit, the only other alternative for dischargers that need a permit is one of the general permits. The general permit requires the development and implementation of a program with the goal of preventing or reducing pollutant runoff from municipal operations. The program must include municipal staff training on pollution prevention measures and techniques (*e.g.*, regular street sweeping, reduction in use of pesticides or street salt, or frequent catch-basin cleaning). The plan need not be submitted to the NYSDEC unless asked, but must be kept on-site and continually updated. The NYSDEC may request to see these plans and may require changes in practices if adverse impacts on receiving waters have, or may have occur (red). Significant fines for violations face violators.

Phase II of the EPA Stormwater regulations were finalized in October 1999. This set of regulations contains important changes and requirements for construction activities and certain municipal separate storm sewer systems serving populations less than 100,000 and construction activities that disturb areas between one and five acres. These regulations will potentially have a significant impact on stormwater management in the Peconic Estuary. NYSDEC is currently evaluating the program changes necessary to comply with the new regulations.

Steps

- P-1.1 Continue to implement general stormwater permit programs to control the discharge of stormwater from industrial, construction, and municipal activities.
- P-1.2 Determine if general stormwater permits adequately regulate pollution from activities subject to national stormwater regulations.
- P-1.3 Investigate the need to regulate, for general stormwater management, communities with populations less than 100,000 in the Peconic Estuary watershed in order to control coliform discharges.

Responsible Entities

- P-1.1 NYSDEC (lead) and EPA (data management system)
- P-1.2 PEP (lead for assessment) and NYSDEC (permit issuance)
- P-1.3 NYSDEC (lead)



P-2. Develop Land Use Regulations that Eliminate or Minimize New Sources of Stormwater Runoff.

Addresses Pathogen Management Objectives 1, 2, 3, and 4.

Much of the runoff to the estuary from private property enters from land directly adjacent to the water. Commercial operations along the waterfront may require a large area of hard surfaces such as parking lots, which often result in the removal of natural vegetation. These conditions can result in increased stormwater runoff. The impact of this runoff in terms of erosion and pathogens can be mitigated by permit conditions (*e.g.*, Articles 24 and 25, NYSDEC wetland regulations), use restrictions, or other controls on activities taking place on waterfront property. Controlling stormwater runoff from non-waterfront property and vacant lands can be accomplished through a variety of land use regulations, such as protective zoning, transfer of development rights to limit density, and standards for stormwater discharges from lands developed or redeveloped in the future.

Local legislation that is highly protective of the coastal zone, such as the East Hampton Harbor Protection Overlay District (HPOD), has proven very effective on a relatively discrete, enclosed body of water entirely within local jurisdiction. However, in order for such a measure to be protective of a regional body of water such as the entire Peconic Estuary, this type of legislation must be enacted on a system-wide basis.

Steps

- P-2.1 Evaluate existing, and develop model land use regulations that eliminate or minimize new sources of stormwater runoff.
Priority
- P-2.2 Review the East Hampton HPOD legislation and the results of its implementation; adopt similar regulations for other East End towns and villages.
- P-2.3 Adopt land use regulations that eliminate or minimize new sources of stormwater runoff.
- P-2.4 Control the impacts of waterfront development through a prohibition on all new non-water-dependent commercial development.

Responsible Entities

- P-2.1 PEP (lead) through contractor
- P-2.2 PEP (lead) with contractor assistance, and towns and villages
- P-2.3 Towns of East Hampton, Southampton, Shelter Island, Southold, and Brookhaven; and incorporated villages
- P-2.4 Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; and NYSDOS



P-3. Use Construction Site Guidelines which Eliminate or Minimize Stormwater Runoff.

Addresses Pathogen Management Objectives 2 and 3.

Construction sites of all types and sizes can be significant sources of pollutants to stormwater runoff because the natural vegetation and land forms which would normally slow and absorb runoff have been removed. The Clean Water Act requires stormwater permits for construction activities on sites involving soil disturbances of five acres or more. However, the threshold will be reduced to one or more acres of disturbance in March 2003. These permits contain a requirement for the permittee to develop a sediment and erosion control plan for the project.

Developing official guidelines for sediment and erosion control plans would ensure that construction sites of all sizes would have access to information about appropriate BMPs for controlling runoff. These guidelines could be incorporated into recommendations for stormwater plans required for General Stormwater permits or they could be required by town planning boards for incorporation into site plans. State Building Codes could also be expanded to include provisions for sediment and erosion control measures.

Steps

- P-3.1 **Priority** Require the use of BMPs to control stormwater runoff and sediment erosion at construction sites.
- P-3.2 Pursue the expansion of the State Building Code to include provisions for stormwater runoff control practices and erosion and sediment control for all construction activities.
- P-3.3 Implement standards for building permits and subdivision approvals that will require new developments to retain and treat all stormwater runoff on the property to the extent practicable.
- P-3.4 Continue, through Federal programs (Clean Water Act, section 404) and State programs (the Tidal Wetlands Regulatory Program, Article 25, the Freshwater Wetlands Program, Article 24, and the Protection of Waters Program, Article 15), to regulate all construction projects to ensure that they prevent or minimize impacts to wetlands and other natural resources from stormwater runoff and septic system leakage.
- P-3.5 Require sediment and erosion control and stormwater runoff pollution prevention plans for new development greater than five acres, as well as to areas of disturbance that are one acre or more, effective in March 2003.
- P-3.6 Review the Suffolk County contractor licensing process for effectiveness and amend regulations to provide for fines and revocation where repeated violations of land use and site plan laws are committed by contractors.



Responsible Entities

- P-3.1 Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; and incorporated villages
- P-3.2 NYSDOS and NYSDEC (co-leads)
- P-3.3 Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven and incorporated villages
- P-3.4 USACE (Federal lead), NYSDEC (state lead), EPA and NMFS
- P-3.5 Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; and incorporated villages
- P-3.6 PEP (lead for review) and Suffolk County (lead for making amendments), SCDHS, NYSDEC, EPA



P-4. Demonstrate and Implement Technologies to Remediate Stormwater Runoff.

Addresses Pathogen Management Objectives 2, 3, and 4.

One way to reduce pathogen loadings to the estuary system is to remediate stormwater runoff. A number of projects aimed at minimizing or treating stormwater runoff have been implemented throughout the Peconics. For example, the New York State Department of Transportation (NYSDOT) has committed millions of dollars for mitigation of runoff from State roads and is working with the towns to identify the priority sites for remediation. The Town of Southampton has already developed and implemented a comprehensive program financed through a \$2 million bond act that was passed in 1994. The New York State Clean Water/Clean Air Bond Act also provides funding for stormwater remediation in the Peconic Estuary. An example is the remediation of highway stormwater discharge to Hashamomuck Pond in the Town of Southold (\$600,000 State and \$600,000 local match). Other towns have identified some priority locations and will remediate them as funds are made available. Examples of specific remediation projects include a grass filter strip on Shelter Island (\$10,000 in Near Coastal Waters funds), artificial wetlands at several locations in Southold (\$10,000 FY 1995 Action Plan Demonstration Project funds), and Open Marsh Water Management in both East Hampton and Southold (\$11,000 Near Coastal Waters fund for Northwest and Accobonac Harbors; \$236,000 USFWS funds for Long Beach Bay).

In addition to general recommendations regarding remediation, two of the actions below highlight ongoing projects in the Peconics which have been designed to mitigate coliform contamination. The effectiveness of existing and new remediation projects needs to be assessed through water quality monitoring both before and after project implementation. The Peconic Estuary Program is also funding a Regional Stormwater Management Plan.

For related actions, see P-13 and P-14.

Steps

- P-4.1 Demonstrate a variety of different technologies to remediate stormwater runoff and determine the effectiveness and appropriateness of the technologies in various settings around the estuary.
- P-4.2 Ensure that information on ongoing, successful stormwater remediation projects is shared among the NYSDOT, Suffolk County Department of Public Works, and towns and villages in a timely fashion.
- P-4.3 Ensure that the NYSDEC and the SCDHS continue to work cooperatively with East End towns on stormwater remediation projects by providing monitoring support following the implementation of management actions, providing ambient coliform loading data, helping to evaluate sources of coliform bacteria, and assessing localized impacts of runoff, particularly on shellfish beds and bathing beaches.
- P-4.4 Implement the Town of East Hampton Ditch Plains Oceanside Drainage Project to restore the water quality of South Lake Montauk.



- P-4.5 Conduct a pilot project to construct and operate a composting waste toilet facility at the East Hampton Town Beach on Lake Montauk. Evaluate the effectiveness of such a facility and determine if there are other locations around the estuary where this type of toilet could be installed for public use.
- P-4.6 Develop a “Regional Stormwater Management Plan” to evaluate and recommend **Priority** technologies to remediate stormwater runoff in the estuary.

Responsible Entities

- P-4.1 PEP (lead)
- P-4.2 PEP (lead) through contract with Cornell Cooperative Extension
- P-4.3 NYSDEC Shellfish Sanitation Program and SCDHS Office of Ecology (co-leads)
- P-4.4 Town of East Hampton (lead) and Cornell Cooperative Extension
- P-4.5 Town of East Hampton
- P-4.6 PEP (lead) through contractor and Peconic Baykeeper, EPA, NYSDEC, SCDHS



P-5. Enhance Existing Septic System Controls and Implement New Best Management Practices.

Addresses Pathogen Management Objectives 1, 2, 3, and 4.

Wastewater treatment for most of the residences, businesses, and institutions of the watershed of the Peconics is serviced by on-site disposal systems (OSDS), such as septic tanks or cesspools. In some areas, these systems are decades old and have not been properly maintained. Systems that have not had the solids pumped regularly and whose leaching fields have been compromised by clogging may eventually release inadequately filtered fluids that contain high concentrations of pathogens. Once released to the surface, these fluids can be carried into the estuary via stormwater.

One of the simplest and most effective methods of pinpointing septic system leakage is through the placement of dye in the toilets of the suspected system. The appearance of the dye in nearby surface waters after a period of time will indicate a compromise of the leaching field. However, these tests can only be done with the cooperation of the homeowner, and it is often difficult to obtain permission to run the tests since a positive result may end in a requirement for the homeowner to repair, upgrade, or replace the entire system. Providing a means to obtain funding for repairing and upgrading OSDS might result in fewer failing systems.

Because current inspections by government agencies and voluntary dye-testing may not be effective at identifying and remediating all substandard or malfunctioning OSDS in the Peconic area, it may be necessary to mandate inspections and repair/replacement of OSDS under certain circumstances.

For related actions, see Public Outreach and Education POE-3.3, POE-5.5, POE-5.6, and N-5.

Steps

- P-5.1 Implement existing programs that identify failing septic systems and work with property owners to have the systems repaired or replaced. Regular inspection and testing could be done by local agencies, particularly in older communities, to ensure that problems are detected and addressed in a timely manner. For those municipalities with existing inspection regulations, those regulations should be enforced.
- P-5.2 Work with waterfront residents to conduct voluntary dye tests on their septic systems to determine if there are significant leakage problems.
- Priority**
- P-5.3 Develop and implement a requirement for inspection and certification of OSDS at specified intervals or upon transfer of property. If a system does not meet current standards, the homeowners would be required to repair or replace the system.
- P-5.4 Investigate the need for and feasibility of establishing an OSDS (septic system) district(s) to provide homeowners access to low-interest loans available through the State Revolving Fund to repair and upgrade malfunctioning OSDS.



- P-5.5 Conduct a workshop with appropriate State, Suffolk County, and town officials to review and evaluate existing septic system controls (including system monitoring, required maintenance, and repair and replacement of failing systems) and current BMPs for septic systems.
- P-5.6 Implement OSDS BMPs contained in NYSDEC guidance for new developments.

Responsible Entities

- P-5.1 Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; and SCDHS
- P-5.2 Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; and SCDHS
- P-5.3 PEP (lead); Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; and SCDHS
- P-5.4 PEP (lead), State Environmental Facilities Corporation, towns, SCDHS
- P-5.5 PEP
- P-5.6 Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; and SCDHS

**P-6. Provide Pumpout Facilities and Encourage Their Use.****Addresses Pathogen Management Objectives 1, 3, and 4.**

One of the ways to reduce the potential for pathogen loading in marina and mooring areas from human sewage is to minimize boater discharges. Boats on which people stay for extended periods of time represent a particular concern because of the amount of waste generated on these vessels. There is currently legislation that requires that marinas, which dock houseboats/barges, have a functioning pumpout station. This law needs to be rigorously enforced. The use of shoreside restrooms and the use of Type III marine sanitation devices (MSD) on boats (which have holding tanks), combined with pumpout facilities at marinas, would minimize the potential for release of pathogens into the water through untreated wastes and wastes from boats with Types I and II marine sanitation devices.

The Federal Clean Vessel Act (CVA) provides money to the States to develop a plan for siting and constructing pumpout facilities at docks and marinas in an effort to reduce the potential contamination of coastal waters with human sewage from boats. The Act also provides grant money to be administered by the States for subsidizing the construction of these facilities once the need has been identified at specific sites. Currently funded projects are listed in **Table 5-3**. All funds from the CVA have currently been obligated; it is not anticipated that additional funding will be available through this legislation.

For related actions, see Public Outreach and Education POE-3.4 and POE-3.5.

Steps

- P-6.1 Continue to provide boaters with incentives to use pumpout stations, such as providing pumpout stations that are easy to use, clean, quick, free (or low-cost), and land-based or mobile.
- P-6.2 Conduct a survey of recreational vessels and pumpout stations in the Peconic Estuary, and prepare a plan for the construction, installation, maintenance, and repair of pumpouts and waste reception facilities sufficient to qualify all or parts of the Peconics for designation as a vessel waste no discharge area. (See P-7 for related action.)
- P-6.3 Administer Statewide Clean Vessel Act (CVA) grants (and any other similar grants) for the construction, installation, maintenance, and repair of pumpout and waste reception facilities pursuant to the State Clean Vessel Act Plan developed by NYSDOS.
- P-6.4 Promote the use of shore-based toilets, holding tanks on boats, and pumpout stations, especially in areas of heavy boat traffic or environmentally sensitive areas. Marinas should encourage their patrons to use shore toilet facilities when berthed at a dock, particularly if they remain overnight.



- P-6.5 Ensure strict enforcement of the Suffolk County Article 12 requirement that marinas which facilitate overnight docking of houseboats or housebarges maintain a waste pumpout facility.

Responsible Entities

- P-6.1 Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; and private marina owners
- P-6.2 NYSDOS (lead), NYSDEC and PEP No-Discharge Area (NDA) Committee, EPA
- P-6.3 NYSDEC (administers the plan in New York State for the U.S. Fish and Wildlife Service which is responsible for the CVA) and municipal and private marina owners
- P-6.4 NY Sea Grant Extension Service Pumpout Education Program (lead), Association of Marine Industries, local governments, NYSDEC, and NYSDOS
- P-6.5 SCDHS



Table 5-3. Clean Vessel Act Grants in the Peconics.

Location	Town	Amount Requested
Sag Harbor Pumpout Boat	Southampton — Sag Harbor	\$25,000
Peconic Bays Pumpout Boat	Southampton — all others	\$25,000
Shagwong Marina	East Hampton — Three Mile Harbor	\$ 6,145
Strong’s Marina	Southold — Great Peconic Bay	\$ 7,500
Montauk Sportsman’s Dock	East Hampton — Lake Montauk	\$ 6,214
Game Fishing Marina	East Hampton — Lake Montauk	\$ 7,166
Larry’s Lighthouse Marina	Riverhead — Meetinghouse Creek	\$ 8,111
Marine Park Docks	Village of Sag Harbor	\$ 5,250
East Creek Marina	Southold — East Creek	\$11,250
Cutchogue Harbor Marina	Southold — Cutchogue Harbor	\$13,183
New Suffolk Shipyard	Southold — Cutchogue Harbor	\$24,366
Gateway Marina	Southampton — Flanders Bay	\$ 4,939
East Hampton Point Marina	East Hampton — Three Mile Harbor	\$ 3,675
Coecles Harbor Marina and Boatyard	Shelter Island — Coecles Harbor	\$13,856
Albertson Marine	Southold — Budds Pond	\$ 4,650
Downtown Riverhead Pumpout Station	Riverhead	\$14,930
Star Island Pumpout Facility	East Hampton — Lake Montauk	\$25,000
Claudio’s Marina	Southold — Greenport Harbor	\$ 6,952
Great Peconic Bay Marina	Riverhead — Kings Creek	\$12,926



P-7. Establish Vessel Waste No Discharge Areas.

Addresses Pathogen Management Objectives 1, 3, and 4.

Through the Clean Water Act, waterbodies may be designated as “Vessel Waste No Discharge Areas (or Zones).” The discharge of untreated vessel waste is prohibited within the three-mile jurisdiction of State coastal waters and navigably connected waters. However, treated waste from approved Marine Sanitation Devices (MSDs) can be discharged in these waters. Within no discharge areas, vessels are prohibited from discharging both treated and untreated waste into surface waters.

Local governments may submit No Discharge Area (NDA) petitions through NYSDEC seeking the Federal NDA designation, which is administered by EPA. The EPA will approve state designation of waterbodies as No Discharge Areas when the petitioner can demonstrate that there is a need for greater protection of the resources and there are sufficient pumpout facilities to service the number of boats using the waterbody. In addition, the petition includes information on enforcement and public education.

In an effort to advance the idea of a NDA in the Peconics, a committee was formed made up of representatives from the Peconic Estuary Program, New York State, Association of Marine Industries, and the Peconic BayKeeper. The group reached an agreement that supports the recommendation of designating the entire estuary as a NDA. The Peconic Baykeeper has met with the five East End Towns and asked for their support in designating the entire estuary a NDA. All five towns are in support and expressed their willingness to act as partners in the application process. Officials from the NYS Department of State with assistance from the BayKeeper are currently preparing the petition on the Municipalities behalf. The draft petition is nearing completion and is expected to be provided to the Towns and reviewing agencies so it can be implemented for the 2001 boating season.

Steps

- P-7.1 Develop agreement on Peconic Estuary Program Vessel Waste No Discharge Area.
- P-7.2 Develop and submit an appropriate application for a vessel waste no discharge area based on recommendations provided by the committee in P-7.1.
Priority
- P-7.3 Implement and enforce a vessel waste no discharge area throughout the estuary.
Priority



Responsible Entities

- P-7.1 PEP CAC Chair and AMI representative (co-leads); NYSDOS; PEP; Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; AMI; and Peconic Baykeeper
- P-7.2 Application development and submission: NYSDEC and NYSDOS (co-leads), in conjunction with Towns; determination of adequacy of pumpout and treatment facilities and approval of NYSDEC designation: EPA (lead); enforcement of no discharge area: local enforcement agencies (lead), USCG, and NYSDEC.
- P-7.3 NYSDOS, Peconic Baykeeper (implementation), NYSDEC, U.S. Coast Guard, and Town Bay constables (enforcement)



P-8. Use Administrative and Regulatory Measures to Control Pollution from Boaters and Marinas.

Addresses Pathogen Management Objectives 1, 3, and 4.

There is an existing law in Suffolk County mandating the investigation of reported nuisances at marinas. This law may be broadly interpreted to include problems resulting in pollution of surface waters such as stormwater runoff, malfunctioning septic systems at shoreside restrooms, and improper use of pumpout facilities. Currently, enforcement of this law is in response to complaints. Pollution problems may be addressed under this law through some provision for routine inspection of marinas and shore facilities.

Steps

- P-8.1 Investigate the administrative, regulatory, and programmatic elements of the Suffolk County Law to investigate reported nuisances at marinas in order to determine if this law could be applied to evaluate and manage pollution from marinas and other sources.
- P-8.2 Examine existing site plan review process and special permit legislation and amend to accommodate close scrutiny of marinas and all waterfront projects to address pathogen sources.

Responsible Entities

- P-8.1 SCDHS
- P-8.2 SCDHS (lead), with stormwater contractor assistance (see P-12); and Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead



P-9. Promote the Use of Best Management Practices to Control Pathogen Loadings from Marinas, Mooring Areas, and Boatyards.

Addresses Pathogen Management Objectives 1, 3, and 4.

In addition to BMPs for boat waste, the Coastal Nonpoint Source Program Guidance for CZARA section 6217 also lists recommendations for minimizing pollution from marinas and boatyards from runoff and septic system leakage. These BMPs could be codified and required as permit conditions for the construction of new marinas and boatyards or the expansion of existing ones.

Steps

- P-9.1 Select and promote the use of BMPs to control pathogen loadings from new and existing marinas, mooring areas, and boatyards in accordance with section 6217 of CZARA.
- P-9.2 Include BMPs in accordance with section 6217 of CZARA to permit conditions for new marinas, mooring areas, and boatyards.

Responsible Entities

- P-9.1 NYSDOS (lead); Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; and NYSDEC
- P-9.2 Towns of East Hampton, Southampton, Southold, Shelter Island, and Riverhead; and NYSDEC; NYSDOS



P-10. Ensure Adequate Disinfection at Sewage Treatment Plants.

Addresses Pathogen Management Objectives 1, 2, 3, and 4.

Disinfection of effluent from sewage treatment plants is essential to prevent the spread of disease. Disinfection can be accomplished by a variety of methods, all of which have been proven effective under specific conditions. There are concerns about the use of chlorine as a disinfectant because chlorine may not effectively eliminate certain viruses from effluent. In addition, chlorine may have toxic effects on living organisms when it becomes complexed in seawater with organic compounds.

Steps

- P-10.1 Ensure that adequate disinfection at sewage treatment plants continues.
- P-10.2 Encourage all sewage treatment plants to use ultraviolet disinfection.

Responsible Entities

- P-10.1 NYSDEC (lead); and operators of the Town of Riverhead, Shelter Island Heights, BNL, NWIRP, Village of Sag Harbor, and Plum Island Disease Control Center STPs
- P-10.2 PEP (lead)



P-11. Monitor Effluent from the Corwin Duck Farm.

Addresses Pathogen Management Objectives 1, 3, and 4.

Meetinghouse Creek in the Town of Riverhead has been identified as being significantly contaminated with coliform bacteria. In the past, duck waste was diluted, filtered, and allowed to discharge into the creek. In an attempt to lower the levels of coliforms in the effluent, a freshwater wetland was constructed on-site to capture and retain pathogens until they die rather than allowing them to move into a body of water along with the runoff. Monitoring is necessary to evaluate the effectiveness of the artificial wetland treatment system.

Steps

- P-11.1 Monitor Meetinghouse Creek receiving waters to determine efficacy of the wetland treatment system installed to treat effluent from the Corwin Duck Farm.

Responsible Entities

- P-11.1 USDA-Natural Resources Conservation Service (NRCS) (lead) and Suffolk County Soil and Water Conservation District



P-12. Identify Sources and Loadings of Nonpoint Sources of Pathogens.

Addresses Pathogen Management Objectives 1, 2, 3, and 4.

Knowing the sources of pathogens in the estuary as well as the total loadings of pathogens to various embayments is a crucial first step in designing remedial activities. A reliable, first-order quantification of pathogen sources in the estuary would aid in determining the most cost-effective management and remedial actions that would result in lowered coliform levels and, ultimately, reopened shellfish beds. The PEP has funded a “Regional Stormwater Management” project to establish a comprehensive stormwater strategy. This project, which will begin in the summer of 2000, will include a system-wide stormwater inventory, an integrated characterization effort, and a stormwater management strategy.

Pollutant loadings can be estimated using land use data and land cover information. Land cover information is available from a variety of sources including the NOAA Coastal Change Analysis Program (C-CAP) which derives its data from satellite imagery. These data have been acquired by the NYSDOS and have been ground-truthed with existing aerial photographs for the New York coastal region. A land use analysis for the study area has been conducted by the Suffolk County Department of Planning, and a preliminary stormwater contributing area map has been developed from the stormwater data collected by the Towns, County and State.

Steps

- P-12.1 Identify and assess the major nonpoint source and stormwater inputs and quantify loadings of pathogens to local harbors in the Peconic Estuary System.
- P-12.2 Develop a DNA “library” of coliform bacteria isolated from feces of animals, including humans. *See related Public Outreach and Education Action POE-3.1.*
- P-12.3 Pilot the use of a DNA library to assess coliform sources in selected embayments. This knowledge can potentially be used to identify loading pathways and, thus, the means by which to remediate those loadings.
- P-12.4 Perform land cover analyses for the study area which can be used to determine stormwater runoff loadings. Include tabulation and mapping of existing land cover types and analysis of land cover changes over time.

Responsible Entities

- P-12.1 PEP (lead) with contractor assistance; Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; villages; NYSDEC; SCDHS; EPA
- P-12.2 Cornell Cooperative Extension (lead) in cooperation with PEP
- P-12.3 Cornell Cooperative Extension (lead) in cooperation with PEP
- P-12.4 PEP through contract with NYSDOS (lead)



P-13. Develop and Implement Nonpoint Source Control Plans for Pathogens.

Addresses Pathogen Management Objectives 1, 2, 3, and 4.

Comprehensive planning involving multiple levels of government is required to address a pathogen-contaminated waterbody, particularly since contamination is often due to a variety of sources, including stormwater runoff, septic systems (cesspools), vessel wastes and even wildlife and domestic animal wastes.

This action recognizes the need for the plans to be developed for specific waterbodies, as well as the need to secure funding for pathogen management through the Suffolk County Water Quality Coordinating Committee.

Steps

- P-13.1 **Priority** Develop nonpoint source control plans for specific embayments for each nonpoint source category associated with potential pathogen contamination (such as stormwater runoff, on-site disposal systems, and marinas/boating) through the “Regional Stormwater Management Plan” and sub-watershed management pilot projects for each town (see Action P-12).
- P-13.2 Continue to promote nonpoint source management of pathogens through the Suffolk County Water Quality Coordinating Committee (SCWQCC), and coordinate Committee activities with the PEP. (The SCWQCC is comprised of agencies [including the NYSDEC and SCDHS] which have a stake in improving water quality of the Peconic Estuary System.)

Responsible Entities

- P-13.1 PEP (lead), with contractor assistance in concert with state and local governments; SCDHS; NYSDEC; EPA; SCDPW; NYSDOT
- P-13.2 SCWQCC, chaired by the Suffolk County Soil and Water Conservation District (lead), and PEP



P-14. Obtain Funding to Address Stormwater Runoff.

Addresses Pathogen Management Objectives 1, 2, 3, and 4.

Some actions in this chapter can be implemented without additional outside funding. For example, the local highway or public works departments in many municipalities already have the appropriate equipment and trained personnel for carrying out many of the BMPs for stormwater runoff remediation. Several towns incorporate funds every year into their highway or public works department budgets specifically for this purpose.

Other actions will require additional funding. State funds are available through the New York Department of Transportation as well as the NYSDEC from the Bond Act. The members of the Peconic Estuary Program have been very successful at applying for and receiving Federal funds under the Clean Water Act. Projects funded since the inception of the PEP in 1993 are contained in **Table 5-4**.

Steps

- P-14.1 Include an annual amount in the highway operating budget specifically for the correction of existing road runoff problems. Implementation of this action would support the effort described in Action P-4.
- P-14.2 Identify projects in the Peconic Estuary watershed that are fundable under the Transportation Efficiency Act and NYSDOT capital budget that will improve water quality by preventing or remediating road runoff.
- P-14.3 Identify projects in the Peconic Estuary watershed under the New York Clean Water/
Priority Clean Air Bond Act that will improve water quality by preventing or remediating road runoff.

Responsible Entities

- P-14.1 Suffolk County DPW; Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; and incorporated villages; PEP
- P-14.2 Suffolk County DPW; Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; incorporated villages; PEP HRWG; NYSDOT; SCDPW
- P-14.3 Suffolk County; Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; incorporated villages; and PEP HRWG, NYSDEC

**Table 5-4. Peconic Estuary Demonstration/Implementation Projects — Pathogen Mitigation.**

Project Title	Federal/State Funding
Near Coastal Waters Grants	
Filter Strip Project/Stormwater Abatement	\$ 10,000
Open Marsh Water Management Project	\$ 246,385 ¹
“Saving the Bay” Poster/Pamphlet Project	\$ 5,000
Corwin Duck Farm Constructed Wetlands	\$ 68,000
FY94 Action Plan Demonstration Projects	
Composting Waste Public Restroom Facility	\$ 18,730
Wetland Restoration Project	\$ 36,970 ²
Ultraviolet Disinfection/Shelter Island Heights STP	\$ 6,800
FY95 Action Plan Demonstration Projects	
Nonpoint Source Pollution Prevention/Coecles Harbor Marina	\$ 47,359 ³
Stormwater Quality Management (“Stormtreat”)	\$ 12,650
Shallow Wetland/Biofiltration	\$ 19,500
Ozone Treatment of Stormwater Runoff	\$ 18,850
Storm Drain Outfall (Ecoboom)	\$ 20,000
Stormwater Education/Outreach	\$ 4,000
FY96 Action Plan Demonstration Projects	
Nonpoint Source/Boat Ramps	\$17,000
Section 319 Nonpoint Source Grants⁴	
Town of East Hampton Surface Water Pollution Abatement	\$ 34,500
Stormwater Mitigation at Goose Creek	\$ 15,000
Hashamomuck Point Stormwater Remediation	\$ 39,000
Stormwater Vac-Con Sewer Cleaning Machine	\$ 180,000
Bay Avenue Drainage Improvements	\$ 50,000
East Creek Stormwater Retention/Biofilter	\$ 62,000

¹\$11,385 Near Coastal Water grant; project expanded with \$235,000 U.S. Fish and Wildlife Service grant to NYSDEC

²\$9,970 FY94 APDP grant; project expanded with \$27,000 U.S. Fish and Wildlife Service grant to NYSDEC

³Funded in part with CWA section 319 Nonpoint Source grant (\$16,409)

⁴Clean Water Act section 319 grants are through NYSDEC



P-15. Conduct Water Quality Monitoring.

Addresses Pathogen Management Objectives 1, 3, and 4.

In order to accurately assess the levels of pathogen indicators in the system, routine water quality sampling is critical. The NYSDEC Shellfish Sanitation Program is the primary entity that carries out this activity for the purpose of protecting human health from the consumption of shellfish contaminated with pathogens. The Suffolk County Department of Health Services (SCDHS) is the lead entity for the purpose of protecting human health from pathogens at bathing beaches. SCDHS also analyzes water samples for coliforms as part of a larger program to assess overall quality of the waters in the Peconic system. In order to determine the impact of control measures on pathogen indicator concentrations in the water, it is important that these monitoring programs be maintained.

Water quality monitoring is required for assessing the status of all shellfish beds. There are a number of small, shallow embayments in the Peconics that are closed to shellfishing as a result of coliform contamination. The towns are interested in reopening these areas on a conditional or seasonal basis to access the shellfish resources that exist there. More intensive water quality sampling (increased frequency and number of stations) by the State Shellfish Sanitation Program may result in more detailed assessments of the amount, timing, and sources of contamination in these bodies of water. This additional information may result in upgrading the classification of some sections of these embayments to shellfishing for at least part of the year.

In 1998, several New York marine surface water samples were analyzed for *Pfiesteria piscicida*; some of the samples from Peconic Estuary waters contained *Pfiesteria piscicida*. *Pfiesteria* is a microscopic organism that has a complex life cycle that includes toxin-producing stages. The exact conditions that are necessary to trigger toxin production by *Pfiesteria piscicida* are poorly understood, but it is believed these conditions do not commonly occur in New York coastal waters. The New York State Departments of Environmental Conservation and Health are working with county health departments to complete comprehensive sampling for *Pfiesteria* and developing plans for responding to possible toxic *Pfiesteria piscicida* outbreaks.

Steps

- P-15.1 Maintain the water quality sampling programs run by the NYSDEC Shellfish Sanitation Program and the SCDHS Bureau of Marine Resources in order to monitor pathogens in shellfish beds and public beaches and to assess the results of mitigation measures, respectively.
- P-15.2 Conduct *Pfiesteria piscicida* sampling effort to characterize embayments with respect to this organism.

Responsible Entities

- P-15.1 NYSDEC and SCDHS (co-leads)
- P-15.2 NYSDEC and SCDHS (co-leads), NYSDOH, and NYS *Pfiesteria* workgroups



BENEFITS OF MANAGEMENT ACTIONS

Successful implementation of the actions in this chapter will result in environmental benefits, human health benefits, and economic benefits to the estuary system by ensuring cleaner water and continued or increased availability of shellfish lands for harvesting. Although these benefits have not been quantified in monetary terms, their value is potentially quite high. Ensuring open beaches for tourists and clean water for recreational users supports a variety of local businesses, such as restaurants, hotels, and shops. The re-opening of shellfish beds to harvesting would have the benefit of increasing the revenue generated from this fishery. The value of this increased revenue would depend on the abundance per unit area of shellfish (primarily hard clams) in the closed beds and the market price at the time of re-opening. Finally, it is worthwhile to note that actions to reduce pathogen loadings also will often reduce inputs of sediment particles and nutrients into the system.

COSTS OF MANAGEMENT ACTIONS

Estimated costs for each of the pathogen management actions are provided in **Table 5-5**. As shown in the table, for some actions, costs can not be estimated due to the variables involved. Other actions rely on implementation using current levels of effort and funding. Many of the actions have secondary or indirect costs that also are difficult to measure. For these reasons, it is not possible to estimate the total cost of implementing the proposed pathogen management actions.

For example, in order to re-open shellfish beds to reharvesting, the sources of pollution in each separate growing area would have to be identified. Then the cost of remediating each separate source could be estimated. A conservative estimate would involve locating the point at which each stormwater discharge enters an embayment and determining the cost of remediating each of those discharges. Sources of leachate from on-site disposal systems could be determined through dye tests done in conjunction with each individual residence or business. Those septic systems that are shown to contribute substantial quantities of pathogens would need to be replaced or upgraded, and this cost would be added to the total. Suspected vessel discharges could be monitored and enforcement of laws prohibiting discharge of raw sewage could be increased. The increased expense of monitoring and enforcement for any designated vessel waste no discharge area would also have to be added in. If wildfowl are determined to be a significant source, some action might have to be taken regarding these populations, including a public education campaign on not feeding them, and this would require an additional cost.

The cost of implementing all of these actions could run into the millions of dollars and would have to be compared to the increased value of the harvest to be taken out of the estuary as well as the values placed on cleaner water, reduced human health risks, and better recreational opportunities.

The total cost of all new actions for the pathogens management in the chapter is \$1,718,750 in one-time costs and \$1,530,000 annually. (See “Action Costs” in **Chapter 1** for an explanation of how these costs were determined.)



PATHOGENS ACTIONS SUMMARY TABLE

Table 5-5 provides the following summary information about each of the actions presented in this chapter.

Status

An action's status is designated in the table by either an "R" for "Recommendation" or a "C" for "Commitment." Actions that are commitments are being implemented because resources or funding and organizational support is available to carry them out. Actions that are "recommendations" require new or additional resources by some or all of the responsible entities. "O" refers to ongoing activities; "N" indicates new actions.

Timeframe

This category refers to the general timeframe for action implementation. Some actions are ongoing or nearing completion; implementation of other actions is not anticipated until some time in the future.

Cost

Information in the cost column represents the PEP's best estimate of the costs associated with action implementation. "Base Program" means that no new or additional funds will be needed outside of the responsible entity's operating budget to implement the action. Where additional funding is needed, resources to implement an action may be expressed in dollar amounts or work years or both. One full time equivalent employee or "FTE" is estimated as costing \$75,000 per year, which includes salary, fringe benefits and indirect costs. The "Action Costs" description in both **Chapter 1** and **Chapter 9** provides an expanded explanation of base programs and action costs.

Table 5-5. Pathogens Management Actions.

Action	Responsible Entity	Timeframe	Cost	Status	
P-1	Use Existing or Implement New Stormwater Management Regulations to Control Pathogen Loading and Other Forms of Nonpoint Source Pollution. (Objectives 1, 3, and 4)				
P-1.1	Continue to implement general stormwater permit programs to control the discharge of stormwater from industrial, construction, and municipal activities.	NYSDEC (lead), EPA (data management system)	Ongoing	Base Program Enhanced Program: NYSDEC – 1.0 FTE/yr	C/O R
P-1.2	Determine if general stormwater permits adequately regulate pollution from activities subject to national stormwater regulations.	PEP (lead for assessment), NYSDEC (permit issuance)	Post-CCMP	NYSDEC – 1.0 FTE PEP – 1.0 FTE	R
P-1.3	Investigate the need to regulate, for general stormwater management, communities with populations less than 100,000 in the Peconic Estuary watershed in order to control coliform discharges.	NYSDEC (lead)	Following EPA issuance of new stormwater regulations	NYSDEC – 1.0 FTE	R
P-2	Develop Land Use Regulations that Eliminate or Minimize New Sources of Stormwater Runoff. (Objectives 1, 2, 3, and 4)				
P-2.1 Priority	Evaluate existing and develop model land use regulations that eliminate or minimize new sources of stormwater runoff.	PEP (lead) through contractor	Post-CCMP	\$50,000	R
P-2.2	Review the East Hampton HPOD legislation and the results of its implementation, adopt similar regulations in other East End towns and villages.	PEP (lead) with contractor assistance, and towns and villages	Post-CCMP	\$50,000 PEP – 0.2 FTE Towns – 0.5 FTE each	R
P-2.3	Adopt land use regulations that eliminate or minimize new sources of stormwater runoff.	Towns of East Hampton, Riverhead, Southampton, Shelter Island, Southold, and Brookhaven; and incorporated villages	Post-CCMP	Towns – 0.5 FTE each	R

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-2.4	Control the impacts of waterfront development through a prohibition on all new non-water-dependent commercial development.	Towns of East Hampton, Southampton, Southold, Shelter Island, and Riverhead; NYSDOS; NYSDEC	Post-CCMP	Towns – 0.5 FTE each	R
P-3	Use Construction Site Guidelines which Eliminate or Minimize Stormwater Runoff. (Objectives 2 and 3)				
P-3.1 Priority	Require the use of BMPs to control stormwater runoff and sediment erosion at construction sites.	Towns of East Hampton, Riverhead, Southampton, Southold, Shelter Island, and Brookhaven; and incorporated villages	Post-CCMP	Towns – 0.5 FTE each/yr	R
P-3.2	Pursue the expansion of the State Building Code to include provisions for stormwater runoff control practices and erosion and sediment control for all construction activities.	NYSDOS and NYSDEC (co-leads)	Ongoing	NYSDEC – 0.5 FTE NYSDOS – 0.5 FTE	R
P-3.3	Implement standards for building permits and subdivision approvals that will require new developments to retain and treat all stormwater runoff on the property to the extent practicable.	Towns of East Hampton, Southampton, Southold, Shelter Island, Riverhead, and Brookhaven; and incorporated villages	Following completion of Action P-3.2 or development of local standards	Towns 0.5 FTE each	R

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-3.4	Continue, through Federal programs (Clean Water Act, section 404) and State programs (the Tidal Wetlands Regulatory Program, Article 25, the Freshwater Wetlands Program, Article 24, and the Protection of Waters Program, Article 15), to regulate all construction projects to ensure that they prevent or minimize impacts to wetlands and other natural resources from stormwater runoff and septic system leakage.	USACE (Federal lead), EPA, NMFS; NYSDEC (state lead)	Ongoing	Base Programs	C/O
P-3.5	Require sediment and erosion control and stormwater runoff pollution prevention plans for new development greater than five acres, as well as to areas of disturbance that are one acre or more, effective in March 2003.	Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; incorporated villages	Post- CCMP	Base Programs	R
P-3.6	Review the Suffolk County contractor licensing process for effectiveness and amend regulations to provide for fines and revocation where repeated violations of land use and site plan laws are committed by contractors.	PEP (lead for review), Suffolk County (lead for making amendments), SCDHS, EPA, NYSDEC	Post-CCMP	EPA – 0.2 FTE NYSDEC – 0.2 FTE SCDHS – 0.3 FTE PEP – 0.2 FTE	R

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Table 5-5. Pathogens Management Actions. (continued)

Action	Responsible Entity	Timeframe	Cost	Status	
P-4	Demonstrate and Implement Technologies to Remediate Stormwater Runoff. (Objectives 2, 3, and 4)				
P-4.1	Demonstrate a variety of different technologies to remediate stormwater runoff and determine the effectiveness and appropriateness of the technologies in various settings around the estuary.	PEP (lead)	Ongoing	(Grass filter strip — \$10,000 Near Coastal Waters funds; artificial wetlands and retention rings — \$10,000 FY95 Action Plan Demonstration Project funds; OMWM — \$11,000 Near Coastal Waters fund for Northwest and Accabonac Harbors; \$235,000 USFWS funds to NYSDEC for Long Beach Bay) PEP – 0.1 FTE	C/O
P-4.2	Ensure that information on ongoing, successful stormwater remediation projects is shared among the NYSDOT, SCDPW, and towns and villages in a timely fashion.	PEP (lead) through contract with Cornell Cooperative Extension	Spring 2000	(\$10,000) PEP – 0.1 FTE	C/O
P-4.3	Ensure that the NYSDEC and the SCDHS continue to work cooperatively with East End towns on stormwater remediation projects by providing monitoring support following the implementation of management actions, providing ambient coliform loading data, helping to evaluate sources of coliform bacteria, and assessing localized impacts of runoff, particularly on shellfish beds and bathing beaches.	NYSDEC Shellfish Sanitation Program, SCDHS Office of Ecology (co-leads)	Ongoing	Base Program	C/O

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-4.4	Implement the Town of East Hampton Ditch Plains Oceanside Drainage Project to restore the water quality of South Lake Montauk.	Town of East Hampton (lead), Cornell Cooperative Extension	2 years once started	(\$65,000 East Hampton; \$175,000 ISTEPA)	C/O
P-4.5	Conduct a pilot project to construct and operate a composting waste toilet facility at the East Hampton Town Beach on Lake Montauk. Evaluate the effectiveness of such a facility and determine if there are other locations around the estuary where this type of toilet could be installed for public use.	Town of East Hampton	Construction completed; operation to commence in 1999; evaluation in 2000	(\$23,270 Town of East Hampton; \$18,730 PEP FY94 APDP funds)	C/O
P-4.6 Priority	Develop a "Regional Stormwater Management Plan" to evaluate and recommend technologies to remediate stormwater runoff in the estuary.	PEP (lead) through contractor and Peconic Baykeeper, EPA, NYSDEC, SCDHS	Summer 2000	(\$45,000 PEP FY98; \$65,100 Clean Water Act funds) EPA – 0.1 FTE NYSDEC – 0.1 FTE SCDHS – 0.1 FTE	C/N
P-5	Enhance Existing Septic System Controls and Implement New Best Management Practices. (Objectives 1, 2, 3, and 4)				
P-5.1	Implement existing programs that identify failing septic systems and work with property owners to have the systems repaired or replaced. Regular inspection and testing could be done by local agencies, particularly in older communities, to ensure that problems are detected and addressed in a timely manner. For those municipalities with existing inspection regulations, those regulations should be enforced.	Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; SCDHS	Post-CCMP	SCDHS – 1.0 FTE Towns – 0.5 FTE each/yr	R

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-5.2 Priority	Work with waterfront residents to conduct voluntary dye tests on their septic systems to determine if there are significant leakage problems.	Towns of East Hampton, Southampton, Southold, Shelter Island, Riverhead, and Brookhaven; SCDHS	Post-CCMP	Relatively inexpensive for test and time spent; may be considerable for homeowners if septic system is found to be malfunctioning SCDHS – 1.0 FTE/yr	R
P-5.3	Develop and implement a requirement for inspection and certification of OSDS at specified intervals or upon transfer of property. If a system does not meet current standards, the homeowners would be required to repair or replace the system.	PEP (lead); Towns of East Hampton, Southampton, Southold, Shelter Island, Riverhead, and Brookhaven; SCDHS	Post-CCMP	SCDHS – 1.0 FTE Towns – 0.25 FTE each	R
P-5.4	Investigate the need for and feasibility of establishing an OSDS (septic system) district(s) to provide homeowners access to low-interest loans available through the State Revolving fund to repair and upgrade malfunctioning OSDS.	PEP (lead), State Environmental Facilities Corporation, Towns, SCDHS	Post-CCMP	SCDHS – 0.3 FTE PEP – 0.2 FTE Towns – 0.1 FTE each	R
P-5.5	Conduct a workshop with appropriate State, Suffolk County, and town officials to review and evaluate existing septic system controls (including system monitoring, required maintenance, and repair and replacement of failing systems) and current BMPs for septic systems.	PEP	Fall 2000	\$10,000 PEP – 0.1 FTE	R

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-5.6	Implement OSDS BMPs contained in NYSDEC guidance for new developments.	Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; SCDHS	Post-CCMP	SCDHS – 2.0 FTE/yr Towns – 1.0 FTE/yr	R
P-6	Provide Pumpout Facilities and Encourage Their Use. (Objectives 1, 3, and 4)				
P-6.1	Continue to provide boaters with incentives to use pumpout stations, such as providing pumpout stations that are easy to use, clean, quick, free (or low-cost), and land-based or mobile.	Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; private marina owners	Ongoing	Base Programs	C/O
P-6.2	Conduct a survey of recreational vessels and pumpout stations in the Peconic Estuary, and prepare a plan for the construction, installation, maintenance, and repair of pumpouts and waste reception facilities sufficient to qualify all or parts of the Peconics for designation as a vessel waste no discharge area (See P-7 for related action.)	NYSDOS (lead), NYSDEC, PEP NDA Committee, EPA	Survey: completed Plan: Spring 2000	EPA – 0.1 FTE NYSDEC – 0.2 FTE PEP – 0.1 FTE DOS – 0.5 FTE	C
P-6.3	Administer Statewide Clean Vessel Act (CVA) grants (and any other similar grants) for the construction, installation, maintenance, and repair of pumpout and waste reception facilities pursuant to the State CVA Plan developed by NYSDOS.	NYSDEC (administers the plan in NY State for the USFWS which is responsible for the CVA), municipal and private marina owners	1993–2004	Base Programs	C/O

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-6.4	Promote the use of shore-based toilets, holding tanks on boats, and pumpout stations, especially in areas of heavy boat traffic or environmentally sensitive areas. Marinas should encourage their patrons to use shore toilet facilities when berthed at a dock, particularly if they remain overnight.	NY Sea Grant Extension Service Pumpout Education Program (lead), AMI, local governments, NYSDEC, NYSDOS	Ongoing	Base Programs	C/O
P-6.5	Ensure strict enforcement of the Suffolk County Article 12 requirement that marinas which facilitate overnight docking of houseboats or house barges maintain a waste pumpout facility.	SCDHS	Ongoing	SCDHS – 1.0 FTE	R
P-7	Establish Vessel Waste No Discharge Areas. (Objectives 1, 3, and 4)				
P-7.1	Develop agreement on Peconic Estuary Program Vessel Waste No Discharge Area.	PEP CAC Chair and AMI representative (co-leads); NYSDOS; PEP; Towns of East Hampton, Southampton, Shelter Island, Southold, and Riverhead; AMI; Peconic Baykeeper	Fall 1999	Base Program	C/O

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Table 5-5. Pathogens Management Actions. (continued)

Action	Responsible Entity	Timeframe	Cost	Status	
P-7.2 Priority	Develop and submit an appropriate application for a vessel waste no discharge area based on recommendations provided by the committee in P-7.1.	Application development and submission: NYSDEC and NYSDOS (co-leads) in conjunction with Towns; determination of adequacy of pumpout and treatment facilities and approval of NYSDEC designation: EPA (lead); enforcement of vessel waste no discharge area: local enforcement agencies (lead), USCG, NYSDEC	Spring 2000	Application and approval: Included in Action P-6.2 (Estimated cost for private boat owners to retrofit: the cost to install Type III devices on vessels currently having Type I or II devices is estimated at \$2,000 per vessel. It has been estimated that there are approximately 500 vessels using the Peconics regularly that would require retrofits.)	C/N
P-7.3 Priority	Implement and enforce Vessel No Waste Discharge Area throughout the estuary.	NYSDOS & Peconic Baykeeper (implementation); NYSDEC, U.S. Coast Guard, Town Bay constables (enforcement)	Summer 2002	Towns – 0.25 FTE each/yr NYSDEC – 0.5 FTE/yr USCG – 0.25 FTE/yr	R
P-8	Use Administrative and Regulatory Measures to Control Pollution from Boaters and Marinas. (Objectives 1, 3, and 4)				
P-8.1	Investigate the administrative, regulatory, and programmatic elements of the Suffolk County Law to investigate reported nuisances at marinas in order to determine if this law could be applied to evaluate and manage pollution from marinas and other sources.	SCDHS	Spring 2000	Cost to be determined	R
P-8.2	Examine existing site plan review process and special permit legislation and amend to accommodate close scrutiny of marinas and all waterfront projects to address pathogen sources.	SCDHS (lead) with stormwater contractor (see Action P-12); Towns of East Hampton, Southampton, Southold, Shelter Island, and Riverhead	Begin: Spring 2000	SCDHS – 1.0 FTE Towns – 0.2 FTE each	R



Table 5-5. Pathogens Management Actions. (continued)

Action	Responsible Entity	Timeframe	Cost	Status	
P-9	Promote the Use of Best Management Practices to Control Pathogen Loadings from Marinas, Mooring Areas, and Boatyards. (Objectives 1, 3 and 4)				
P-9.1	Select and promote the use of BMPs to control pathogen loadings from new and existing marinas, mooring areas, and boatyards in accordance with section 6217 of CZARA.	NYSDOS (lead); Towns of East Hampton, Southampton, Southold, Shelter Island, and Riverhead; NYSDEC	Ongoing	NYSDEC – 0.1 FTE/yr NYSDOS – 0.1 FTE/yr	C/O
P-9.2	Include BMPs in accordance with section 6217 of CZARA to permit conditions for new marinas, mooring areas, and boatyards.	Towns of East Hampton, Southampton, Southold, Shelter Island, and Riverhead; NYSDEC; DOS	Ongoing	NYSDEC – 0.1 FTE NYSDOS – 0.1 FTE	C/O
P-10	Ensure Adequate Disinfection at Sewage Treatment Plants. (Objectives 1, 2, 3, and 4)				
P-10.1	Ensure that adequate disinfection at sewage treatment plants continues.	NYSDEC (lead); operators of the Town of Riverhead, Shelter Island Heights, BNL, NWIRP, Village of Sag Harbor, and Plum Island Disease Control Center STPs	Ongoing	NYSDEC – 0.1 FTE/yr	C/O
P-10.2	Encourage all sewage treatment plants to use ultraviolet disinfection.	PEP (lead)	Ongoing	Included in Action P-10.1	C/O
P-11	Monitor Effluent from the Corwin Duck Farm. (Objectives 1, 3, and 4)				
P-11.1	Monitor Meetinghouse Creek receiving waters to determine efficacy of the wetland treatment system installed to treat effluent from the Corwin Duck Farm.	NRCS (lead), Suffolk County Soil and Water Conservation District	Monitoring is ongoing through 1999	Base Programs (Included in \$71,579 Near Coastal grant funds; \$3,500 from Corwin Duck Farm)	C/O

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Table 5-5. Pathogens Management Actions. (continued)

Action	Responsible Entity	Timeframe	Cost	Status	
P-12	Identify Sources and Loadings of Nonpoint Sources of Pathogens. (Objectives 1, 2, 3, and 4)				
P-12.1	Identify and assess the major nonpoint source and stormwater inputs and quantify loadings of pathogens to local harbors in the Peconic Estuary System.	PEP (lead) with contractor assistance; Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; villages; NYSDEC; SCDHS; EPA	Start Spring 2000 through Summer 2001	EPA – 0.1 FTE NYSDEC – 0.1 FTE SCDHS – 0.1 FTE Towns – 0.1 FTE each	C/O
P-12.2	Develop a DNA “library” of coliform bacteria isolated from feces of animals, including humans. (See POE-3.1)	Cornell Cooperative Extension (lead) in cooperation with PEP	Fall 1996 though Spring 2000	Base Programs (\$85,000 grant)	C/O
P-12.3	Pilot the use of a DNA library to assess coliform sources in selected embayments. This knowledge can potentially be used to identify loading pathways and, thus, the means by which to remediate those loadings.	Cornell Cooperative Extension (lead) in cooperation with PEP	Spring 1999 through December 2000	Base Programs (\$75,000 grant)	C/O
P-12.4	Perform land cover analyses for the study area which can be used to determine stormwater runoff loadings. Include tabulation and mapping of existing land cover types and analyses of land cover changes over time.	PEP through contract with NYSDOS (lead)	Fall 1999 through December 2000	PEP – 0.1 FTE (\$88,019 (\$40,500 from PEP APDP; \$47,519 from EPA 104(b)(3) funds))	C/O

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Table 5-5. Pathogens Management Actions. (continued)

Action	Responsible Entity	Timeframe	Cost	Status	
P-13	Develop and Implement Nonpoint Source Control Plans for Pathogens. (Objectives 1, 2, 3, and 4)				
P-13.1 Priority	Develop nonpoint source control plans for specific embayments for each nonpoint source category associated with potential pathogen contamination (such as stormwater runoff, on-site disposal systems, and marinas/boating) through the “Regional Stormwater Management Plan” and subwatershed management pilot projects for each town (see Action P-12).	PEP (lead), with contractor assistance in concert with state and local government; SCDHS; NYSDEC; EPA	December 2000 (start)	Base Program EPA – 0.1 FTE/yr NYSDEC – 0.1 FTE/yr SCDHS – 0.1 FTE/yr Towns – 0.1 FTE each/yr SCDPW – 0.1 FTE/yr NYSDOT – 0.1 FTE/yr	R
P-13.2	Continue to promote nonpoint source management of pathogens through the Suffolk County Water Quality Coordinating Committee (SCWQCC), and coordinate Committee activities with the PEP.	SCWQCC, chaired by the Suffolk County Soil and Water Conservation District (lead), PEP	Ongoing	SCS&WCD – 0.2 FTE/yr	R
P-14	Obtain Funding to Address Stormwater Runoff. (Objectives 1, 2, 3, and 4)				
P-14.1	Include an annual amount in the highway operating budget specifically for the correction of existing road runoff problems. Implementation of this action would support the effort described in Action P-4.	Suffolk County DPW; Towns of East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Brookhaven; incorporated villages; PEP	Post-CCMP	PEP – 0.1 FTE/yr Towns – 0.1 FTE each/yr	R

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Table 5-5. Pathogens Management Actions. (continued)

Action		Responsible Entity	Timeframe	Cost	Status
P-14.2	Identify projects in the Peconic Estuary watershed that are fundable under the Transportation Efficiency Act and NYSDOT capital budget that will improve water quality by preventing or remediating road runoff.	Suffolk County DPW; Towns of East Hampton, Southampton, Southold, Shelter Island, Riverhead, and Brookhaven; incorporated villages; PEP HRWG; NYSDOT; SCDPW	Ongoing	PEP – 0.1 FTE/yr Towns – 0.1 FTE each/yr SCDPW – 0.1 FTE/yr NYSDOT – 0.1 FTE/yr	R
P-14.3 Priority	Identify projects in the Peconic Estuary watershed under the New York Clean Water/Clean Air Bond Act that will improve water quality by preventing or remediating road runoff.	Suffolk County; Towns of East Hampton, Southampton, Southold, Shelter Island, Riverhead, and Brookhaven, incorporated villages; PEP HRWG; NYSDEC	Annually	NYSDEC – 0.2 FTE/yr Towns – 0.1 FTE each/yr SCDPW – 0.1 FTE/yr	R
P-15	Conduct Water Quality Monitoring. (Objectives 1, 3, and 4)				
P-15.1	Maintain the water quality sampling programs run by the NYSDEC Shellfish Sanitation Program and the SCDHS Bureau of Marine Resources in order to monitor pathogens in shellfish beds and public beaches and to assess the results of mitigation measures, respectively.	NYSDEC, SCDHS (co-leads)	Ongoing	Base Programs	C/O
P-15.2	Conduct <i>Pfiesteria piscicida</i> sampling effort to characterize embayments with respect to this organism.	NYSDEC, SCDHS (co-leads), NYSDOH, NYS <i>Pfiesteria</i> Workgroups	Summer 1998 through Summer 2001	Suffolk County - Base Program. NYSDEC - included in <i>Pfiesteria</i> Rapid Response Grant from EPA	C/O





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