



Wastewater Management on the Vineyard: Lessons from the Cape

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What can towns do to improve wastewater management, especially to reduce the amount of nitrogen that is undermining the health of our coastal ponds?

This question was addressed last Wednesday, when Mike Giggey, of Wright Pierce, came to the Martha's Vineyard Commission to summarize the results of an extensive project he helped coordinate on Cape Cod that identified tools for effective wastewater management. The year-long process involved fifteen people representing the Cape Cod Commission, a wide variety of town boards of health, planning boards, and other citizens.

Giggey said that when the project started, various participants had different, sometimes conflicting, ideas of what the problems were and what were the best solutions. This process allowed them to work through the issues in a comprehensive and objective way. The result is a 130-page report, *Enhancing Wastewater Management on Cape Cod: Planning, Administrative, and Legal Tools* that gives a broad overview of wastewater management on the Cape and discusses recommended solutions to the challenges. Each town can now decide what parts of the toolkit it wants to use.

The essence of the challenge is that every new house adds nitrogen to our coastal ponds, which are already negatively impacted by excessive nitrogen levels. Symptoms include eelgrass loss and algae growth. The excessive nitrogen entering the groundwater today may not fully impact the pond for a decade or more but, by the time the more dramatic symptoms are evident in a pond, it will be too late. Loss of shellfisheries and foul-smelling beaches will detract from our quality of life and our visitor-based economy.

Giggey said that 85% of wastewater systems on both the Vineyard and the Cape have

limited nitrogen removal. Compared to the Vineyard, the Cape has ponds that are generally in worse shape and it has higher population densities that make centralized sewers more feasible.

There are four basic types of wastewater treatment systems.

- Individual On-site Systems: There are about 123,000 Standard Title 5 septic systems on the Cape and about 15,000 on the Vineyard. However, these systems are not designed to remove nitrogen. Enhanced nitrogen treatment can replace a standard system and reduce the nitrogen released by about 40%. Giggey feels that the performance from enhanced systems has been mixed, mainly because of the difficulty of getting regular inspection and maintenance. Presently, the least expensive DEP-approved systems cost about \$10,000. Hopefully, less expensive systems will become available and methods can be found to manage them more cheaply.
- Cluster or shared systems: There are fewer than 20 situations on the Cape and 6 on the Vineyard where several properties are served by one septic system, typically handling between 1000 and 10,000 gallons per day.
- Satellite systems: There are 44 satellite systems on the Cape and 2 on the Vineyard, namely the Airport Business Park and the Wampanoag Tribal Housing. A satellite system has a design capacity of more than 10,000 gallons per day (equivalent to thirty 3-bedroom houses) and requires a DEP groundwater discharge permit. These systems remove more than 80% of nitrogen.
- Central Sewers: There are 5 central sewers on the Cape and 3 on the Vineyard, namely Edgartown, Oak Bluffs, and Tisbury. These systems are the most effective at nitrogen removal – over 90% – but also the most expensive.

Giggey said that the Cape study suggested that the cluster and satellite systems are more effective for nitrogen removal than enhanced individual systems and less expensive than central sewers.

The Commonwealth is sponsoring the Massachusetts Estuaries Project (MEP), which is doing detailed analyses of each coastal pond and watershed in Massachusetts in order to determine how much nitrogen can safely be released. Several Vineyard ponds are already in the MEP and the results for the first pond, the Edgartown Great Pond, should be available next summer. However, it could take five years before all our watersheds go through the process.

The Vineyard dilemma is the same as faced on the Cape. Should we wait for the Estuaries Project results or act now? The Cape study concluded that some interim actions should be undertaken now, for several reasons. Development is continuing and new projects should be designed to minimize their impact by incorporating nitrogen-reduction technologies or allowing for this possibility in the future by reserving land or easements. Also, the locations of potential wastewater treatment infrastructure should be determined and reserved to ensure that they are not developed. We can start by identifying which watersheds are clearly problematic, where the density of development might justify some kind of collective solution, and where on-site systems suffice. Projects generating 2000 or more gallons of wastewater a day could be required to install, or at least to study the installation of a cluster system.

Another possible interim action is guidelines for Developments of Regional Impact. The Cape Cod Commission has a zero net nitrogen policy for DRIs in critical watersheds. Projects must not only use aggressive nitrogen-reduction techniques, but must also remove an equivalent amount of nitrogen from the watershed, for example by tying other buildings into a project's nitrogen-reduction system, or by acquiring open space elsewhere in the watershed to reduce development potential.

Comprehensive planning by watershed can identify the most cost-effective solutions. Giggey gave the theoretical example of a watershed that would require reducing nitrogen

levels by half to maintain the health of the coastal pond. Even if individual enhanced systems could reduce the nitrogen by 40-50% on every property, it would probably be more cost effective and remove more nitrogen to put in a satellite or expand an existing centralized system in a higher-density part of the watershed that would remove 80-90% of the nitrogen from 60% of the properties.

Various entities benefit from improving wastewater treatment: the owners of the properties getting system improvements, all property owners in the watershed, and – to the extent that it protects our ponds – everyone in the town or even the whole Island. A future challenge will be to find an equitable formula for sharing the associated costs. A Wastewater Management District for each town or the Island as a whole could be established to manage systems and share costs. It could, for example, set up a system to economically maintain and inspect enhanced on-site septic systems.

The priorities for dealing with wastewater and water quality on the Vineyard are: first, moving ahead with the preliminary water testing required to get most Vineyard ponds into the MEP, secondly, raising public awareness of the need to protect our coastal ponds and groundwater, particularly the need to limit nitrogen, and thirdly, choosing the best way to deal with the challenges through good planning and management.

In general, we face similar challenges to the Cape and reading the Cape report would be a useful step in dealing with planning and management options on the Vineyard. Next year, we'll have the results of the Mass Estuaries Project's work on the Edgartown Great Pond and can start working on a wastewater management plan for that watershed. In addition, it might be useful to carry out a process similar to the one that Giggey described, to better understand the challenges on the Vineyard and to outline possible solutions.

Giggey's presentation is being broadcast on MVT and the Cape report is available at www.capecodcommission.org/water/WastewaterToolsReport.