WASTEWATER PLAN FOR BOURNE'S DOWNTOWN

March 19, 2015

Summary Recommendation

The Bourne Wastewater Advisory Committee recommends addressing the wastewater issues in Buzzards Bay through a two-phase process: installing a temporary packaged treatment facility with subsurface disposal on the southern portion of Queen Sewell Park, while developing a long-term regional solution for the three-town Buttermilk Bay watershed.

This strategy could quickly increase the available wastewater capacity in downtown Buzzards Bay at a cost that could be completely recovered by user fees and new tax revenue generated by redevelopment of obsolete properties in the downtown area.

It would also buy time to create a long-term solution that takes advantage of rapidly developing technological advances, potential new sources of funding, and flexibility in addressing the larger issue of degradation of Buttermilk Bay by nitrogen runoff from surrounding properties in the watershed shared by Bourne, Wareham, and Plymouth.

Issues to be Addressed

The most pressing wastewater issue facing the town at this time is the limited treatment and disposal capacity in Buzzards Bay that is preventing further redevelopment of the downtown area. While the town has found an apparently ideal site for subsurface disposal of treated wastewater, it has not identified a suitable location for a conventional treatment plant that can handle all future needs.

Further complicating these issues are the high cost and extensive permitting requirements of a conventional treatment plant. Massachusetts has a loan program that can support some of the cost, with provision for partial principle forgiveness, but there is currently no federal money available. At least three-quarters of the capital cost would have to come from municipal bonds, local tax revenue, and user fees.

While Bourne has focused its wastewater efforts exclusively on the downtown area, it cannot afford to ignore the larger problem of nitrogen contamination in Buttermilk Bay. At some point the town will be forced, either by lawsuit or regulation, to deal with this issue.

And while the watershed feeding Buttermilk Bay lies primarily in Plymouth, the largest source of nitrogen in the bay comes from the nearly 800 houses with on-site disposal systems located between the Main Street Bypass and Head of the Bay Road in Bourne. A similar neighborhood that lies between Head of the Bay Road and Route 25 in Plymouth has 450 houses on small lots.

Plymouth has two treatment plants, but the isolated nature of this neighborhood has prevented connection to the Plymouth system. Another area of houses on small lots on the western shore in Wareham has been sewered, as has the Hideaway Village area on the northern shore in Bourne.

Phase One: Interim Solution

Phase one calls for installing a prefabricated wastewater treatment plant in or under the ground, with subsurface disposal of treated wastewater, in the southern portion of Queen Sewell Park along the Main Street Bypass. That area is currently wooded and not part of the ball field,

playground, or memorial. Clearing and leveling a portion of it would enable construction of additional recreational fields on top of the disposal area.

This would be only an interim solution intended for replacement within ten years. Packaged treatment plants are designed to last 25 years or more, so this facility would leave the town with more time to solve the regional issues if necessary. It could also be moved to another location, such as the school complex south of the canal.

The estimate of additional wastewater capacity needed to serve practical buildout projections of the downtown Main Street area is 335,000 gpd, but the phase one facility would be designed for only 100,000 gpd. There are several reasons to limit the size of the interim plant.

First, 100,000 gpd is the typical size limit of most packaged plants; larger capacity would require multiple units, which results in a multiplier of cost. Second, subsurface disposal fields for this capacity could be placed entirely within the portion of Queen Sewell Park where groundwater flows toward the canal and not into Buttermilk Bay. And third, it is not likely that demand for additional wastewater flow will exceed this amount for at least a decade.

The biggest advantage to this approach is that a facility can potentially be permitted, constructed, installed, and operational in less than two years. A secondary advantage is that costs for a packaged plant are relatively low in comparison to a traditional treatment plant. And thirdly, the facility can be quickly and easily removed when it is no longer needed.

There are many different technologies used by various manufacturers of packaged treatment plants. The Wastewater Committee will be evaluating each for suitability and cost before making a final recommendation to the Board of Sewer Commissioners.

Phase Two: Regional Solution

The Cape Cod Commission has completed a Section 208 Regional Wastewater Plan for Cape Cod that recommends the fifteen Cape towns be divided into four regional wastewater districts based on shared watersheds. Bourne is an outlier, not included in any of these districts because it shares only a small portion of any watershed with any other Cape towns.

Bourne does share a major watershed with Plymouth and Wareham, however, but neither of those towns is on Cape Cod or in Barnstable County. This watershed feeds into Buttermilk Bay, which has suffered water quality degradation from excess nitrogen generated primarily by on-site septic systems and cesspools on surrounding residential and commercial properties.

In 2011 the Boston-based Conservation Law Foundation (CLF) sued the Federal Environmental Protection Agency to force development of a new regional water quality plan by the Cape Cod Commission as required by Section 208 of the Federal Clean Water Act. Christopher Killian, vice-president for the Foundation's Clean Water and Healthy Forests Program, has said that the Foundation is prepared to initiate additional legal action to insure that the 208 plan is carried out by the responsible communities.

It is not unreasonable, therefore, to assume that CLF might sue the Towns of Bourne, Wareham, and Plymouth if the three towns do not take coordinated action to address the nitrogen pollution affecting Buttermilk Bay.

Bourne and Wareham have been operating within an inter-municipal agreement (IMA) for 25 years under which Wareham treats up to 200,000 gpd of wastewater generated by Bourne's Main Street area and Hideaway Village. Wareham has refused all requests to increase that allocation because of its own limitations on disposal of treated wastewater into the Agawam River.

Wareham's treatment plant currently occupies about 30 acres of a 66-acre site. It has been cited as one of the most efficiently operated and effective treatment facilities in the state. Because of its location on a tidal backwater, however, Wareham has not been able to expand its capacity.

A recent change in Massachusetts Department of Environmental Protection (MassDEP) rules now allows ocean outfall disposal of treated effluent. Ocean outfalls had been prohibited, but that prohibition actually created increased degradation of waterways because it made it more difficult or impossible for many coastal communities to find suitable means to dispose of treated effluent.

Because of topographic conditions, running an ocean outfall from Wareham's treatment plant within the town's jurisdiction would be extremely costly; and any outfall pipe into Buzzards Bay would encounter dispersal problems. Bourne, however, has the canal, which thoroughly flushes with every tide cycle, making it an ideal place to discharge treated effluent. That situation gives Bourne leverage for negotiations with Wareham and Plymouth to create a regional solution.

Add to that Plymouth's responsibility to the Buttermilk Bay watershed, and the desire of Massachusetts Maritime Academy (MMA) to shift its wastewater disposal to a municipal facility, and you have the basis for a regional solution. Such a regional approach would make it far easier to get state and federal assistance, and other financing, for construction. It also reduces duplication of facilities, and therefore lowers costs to each community.

With a canal outfall, Wareham's plant could be expanded to treat five million gallons per day or more. Two million gpd assigned to Bourne could serve full buildout of downtown Buzzards Bay, all of the properties south of Head of the Bay Road, and all of the expanded Maritime Academy. Even the Buzzards Bay Coalition admits that five million gpd discharged into the canal would probably not be measurable once dispersed by the canal currents. Participation in a regional solution also solves Bourne's problem of not having a suitable site for a large treatment plant.

A regional solution will take time to create. It will require positive action by all entities through inter-municipal agreements; creation of a regional sewer commission across county boundaries; and detailed contracts apportioning costs and fees. By installing an interim solution, Bourne will gain time to participate in regional negotiations while freeing the town from pressure to rush into a long-term agreement in order to increase wastewater capacity in its downtown.

Delaying long-term solutions often leads to higher ultimate costs, but that might not happen in this situation. New technologies and alternative approaches to wastewater treatment are now being developed that could ultimately replace traditional treatment approaches. Water quality concerns are also rising to attention nationwide, and that could lead to new state and federal funding programs that are not available now.

Long-range Alternatives

The engineering to expand the Wareham treatment plant with an ocean outfall is straight-forward. Legal and financial aspects are less certain, however. It is reasonable to ask what

happens if Bourne proceeds with an interim solution and at some point the regional plan falls apart. That would put Bourne back to where it is now but with more alternative options.

The least expensive option would be to continue using the interim plant and not expanding the service capacity. Treatment volume could also be increased by adding a second packaged treatment unit and expanding the sub-surface disposal area. The hydro-geologic analysis of Queen Sewell Park shows that the site could easily handle 300,000 gpd or more.

A more expensive and more permanent option would be to construct a large treatment plant with a canal outfall that would serve all of the area in Bourne—and possibly the isolated Plymouth neighborhood—south of Route 25. As previously noted, a decade from now there are likely to be new technologies and new sources of funding that are not currently available for wastewater treatment and disposal.

Another option might be to partner with Plymouth to expand its facilities to include not only all of Buzzards Bay, but also Sagamore Beach and Bournedale, with a new outfall into the canal. Plymouth's existing outfall currently handles only a portion of the town's treated effluent, and cannot be expanded because of dispersal problems in the shallow waters of Plymouth Harbor and Cape Cod Bay.

Cost Estimates

The study of wastewater management planning for Bourne's downtown conducted in 2012 by the Cape Cod Commission and the engineering firm CH2MHill, estimated the total capital cost of a 100,000 gpd conventional treatment facility, including engineering, permitting, design, and construction, would be $8.5 to $9.3 million. In 2015 dollars that would probably be $10 to $12 million. Required mitigation measures under any new disposal permit could add another million dollars or more to install sewers serving some properties on the Buttermilk Bay shore.

Design, permitting, and construction of a conventional facility typically takes about five years. Preliminary estimates indicate that a packaged plant could be permitted and installed in less than two years for one-quarter to one-half the cost of a permanent facility.

The 2012 study did not consider a packaged plant to be cost effective as a long-term solution for volumes over 50,000 gpd. The advantages of a packaged plant for interim use, however, likely outweigh any cost inefficiencies over that of a permanent facility.

Budget estimates provided by Weston & Sampson for permitting and engineering the phase one interim solution show a total estimated cost of $200,000. This estimate assumes that the town's Wastewater Project Coordinator will prepare and process the Environmental Notification Form (ENF) through MEPA, which will save about $36,000 in engineering fees.

This estimate does not include the cost of buying and installing the treatment unit or units, pipes and pumps to connect the treatment facility to the existing collection system, or the cost of constructing the subsurface disposal field and recreation facilities at Queen Sewell Park. Those costs are likely to be $2.5 to $3.0 million. It also does not include the cost of any mitigation required under the disposal permit.

Funding Options

The Cape Cod Commission report recommended that Bourne explore the possibility of a public/private partnership to develop and build a wastewater treatment facility. This option has since proven to be highly problematic for a number of reasons. First, the cost of such facilities far exceeds the resources of developers who want to build in Buzzards Bay. Second, the legal agreements for such a partnership are complex and expensive. And third, the town would lose some degree of control of the design, construction, and operation of the plant.

Another option that came out of discussions over the past year is to contract with a private firm to build and operate a treatment facility for the downtown area. This option would require the town to cede control of wastewater to the private firm, and could prove to be more expensive over the long term. It also is limited by the lack of a suitable site for a treatment plant.

The Wastewater Advisory Committee therefore recommends that the Town of Bourne not pursue a partnership of any sort for the phase one interim solution. Initial estimates of the cost of this system are such that it could be financed with a combination of loans and municipal bonds or other appropriation that could be fully amortized within a decade from user fees, connection fees, and a district improvement financing program.

Funding options for the phase two regional solution cannot be determined at this time, but will become clearer as a regional agreement evolves.

The next step in developing the phase one interim solution, after acceptance by the Board of Sewer Commissioners, is to request funding from Town Meeting, state grants, potential developers, or other sources to initiate the engineering and permitting process.

The next step in creating a regional solution is for the town administrators of Bourne, Wareham, and Plymouth to work together on an organizational structure and financial plan that can be presented to their respective boards of sewer commissioners and selectmen.