

December 16, 2013

Secretary Richard K. Sullivan
Executive Office Of Energy and Environmental Affairs
Attn: MEPA Office
Re: DEIR EOEEA # 14154-Falmouth Comprehensive Wastewater management Plan

Dear Mr. Secretary Sullivan and Mr. Zavalas,
Please accept the following comments regarding Falmouth's CWMP. These comments are from The Association For Crocker Pond which is a 10 citizen group formed by potentially affected property owners and other interested parties.

The town of Falmouth is presenting a plan to protect estuaries on the southern coast of Falmouth in part by providing sewers to the Little Pond watershed. A wastewater discharge site (site 7) is being proposed 1700 ft. from upstream Crocker Pond, and will also affect Herring Creek and numerous vernal pools. As citizens who care about human impact on the environment we appreciate the importance of Falmouth's efforts. Yet we urge continued caution and careful scrutiny to be sure Crocker Pond, Herring Creek and the surface waters in between are protected and not harmed in process of sewerage Little Pond. Although we have some reservations explained below, we agree to a large extent with the comments of The Buzzards Bay Coalition.

"In brief, the best information currently available suggests that a discharge of up to 0.26 million gallons per day of tertiary treated wastewater at site 7 could be accomplished in a manner that protects waters downstream of Site 7. To do this however will require the town to offset the new nitrogen to be discharged to Herring Brook and to institute a rigorous monitoring program to track the health of Crocker Pond so that any presently unpredicted negative impacts can be mitigated. "...The most appropriate solution for Falmouth's long term wastewater disposal challenge is an ocean outfall that bypasses all of the town's sensitive coastal embayment. It is essential that Falmouth aggressively pursue that option so that it is available as additional sewerage is required."

The Association for Crocker Pond agrees that the town presents strong evidence "suggesting" that Crocker Pond will not be negatively impacted by phosphorous. But as we know the best scientific calculations can later be found to be disastrously incorrect as was the case with West Falmouth Harbor. According to studies Cape Cod soils are well suited to the adsorption of phosphorous. However a USGS article , [Zinc and Phosphate Come Back to Haunt Aquifer,](http://toxics.usgs.gov/highlights/pHexperiment/index.html) explains that with changes in conditions, such as Ph , "Contaminants such as zinc and phosphate can be released (desorbed) rapidly from contaminated sediments to groundwater.." on Cape Cod. (<http://toxics.usgs.gov/highlights/pHexperiment/index.html>)

The decision to use site 7 involves risk. One of the things to consider is whether it would ever be wise to load the upstream soils with phosphorous knowing that downstream is a healthy freshwater pond. In

this experiment “The scientists wanted to determine the ability of these adsorbed contaminants to be released back into groundwater in response to changing chemical conditions (such as pH) caused by the cessation of release of the wastewater.” Will these loaded soils be a continuous threat to the pond once site 7 reaches the end of its useful life? According to this study there is a real possibility that desorption could occur.

Falmouth recently rezoned a parcel adjacent to site 7 for light industrial use and that parcel is now home to a paving company. Phosphoric acid is an ingredient of pavement and we have asked the town if this poses a potential risk as acid is introduced to the groundwater from this site. Will there be a “subsurface zone, or plume” as described in the USGS experiment? Could we see an increase in acidity thanks to the parked equipment and the discarded piles of fresh pavement? The USGS experiment and article shows that adsorption can be reversed and contaminants can desorb when Ph conditions change. What other industrial activities exist in this area that could contribute to desorption? The Technology Park Industrial zone is close by.

Furthermore the towns answer to breakthrough of Phosphorous into groundwater, should it occur, would come at great cost to Crocker Pond. One solution involves digging a permeable reactive barrier deep into the steep forested bank of the pond. This would be extremely disruptive to surrounding habitat. The other reaction could be to treat for phosphorous at the plant level. This might take years to improve the level of Phosphorous entering the pond. Making treatment for phosphorous a condition of the permit would remove most of the risk.

Contaminants of Emerging Concern

Contaminants of Emerging Concern are not well understood. According to the town there “is no universal agreement on testing protocols”. Treatment of CECs at the plant level is summed up this way by the Town. “All WWTP and onsite systems have incidental removal and that can be increased as needed”. We feel that more should be required of the Town by the state. The November 14, 2012 MEPA Certificate says the following concerning CECs.

“In March of 2009, MassDEP revised its groundwater Discharge Regulations (314 CMR 5.00) to limit the amount of carbon-based compounds and contaminants typically found in pharmaceuticals and personal care products.....MassDEP’s TOC regulations are intended to provide increased protection of groundwater resources by limiting naturally occurring and manmade forms of organic carbon present in treated wastewater. The FEIR should provide a discussion of the potential impacts of wastewater discharges from the Blacksmith Shop Road WWTF, the proposed new wastewater effluent recharge sites and existing individual septic systems....This section of the FEIR should compare the potential TOC removal to be achieved from the sewerage of the town’s zone II areas and the construction of additional TOC treatment technologies at the Blacksmith Shop Rd. WWTF. “

The Town is satisfied with “incidental treatment” but we are concerned that the town may be relying on data that presents an overly optimistic assessment of the state of CEC’s in Cape Cod aquifers and may incorrectly negate the need for construction of additional TOC treatment technologies at the Blacksmith Shop Road WWTF.

The Town cites a 2006 Silent Spring study of septic systems by Schwartz et al to convey that CEC's disappear from effluent after reaching a depth of 6 meters. The study, however, did not research flame retardants or perfluorinated chemicals which are common in wastewater. Also, many of the chemicals in the study did break down in oxygen rich but not oxygen poor environments. The study of septic systems may or may not be applicable to the proposed site 7 effluents where the effluent from a thousand homes or businesses will be sent into the groundwater to Crocker Pond. Furthermore many CEC's do find their way into aquifers, wells and surface water, in spite of what is concluded by the Town.

In a 2008 publication, Wastewater –Contaminated Groundwater as a Source of Endogenous Hormones and Pharmaceuticals to Surface Water (Environmental Toxicology and Chemistry, Vol 27, No. 12 pp. 2457-2468) The Silent Spring Institute researchers say..." the porous nature of Cape Cod sandy aquifers increases their vulnerability to contamination.."

A 2014 report by L. Schaider of the Silent Spring Institute states "Studies of the Cape Cod aquifer have shown a high degree of persistence and long-range transport for some OWCs." It goes on to say "We found four hormones and six pharmaceuticals in Cape Cod kettle ponds, which are primarily, fed by groundwater..." (L. Schaider 2014) In this study 20 wells on Cape Cod were tested. All wells were impacted by CEC.

-18 OWCs were detected and occurred in at least one well. "Anti-biotics, Perfluorosurfactants, organophosphate flame retardants and prescription anti-biotics were the most frequently detected." "

-60% of the wells contained detectable concentrations of at least one pharmaceutical. " Notably concentrations of two pharmaceuticals exceeded any previously reported concentration in U.S. drinking water sources." (L. Schaider 2014)

-20% of the wells contained Perfluorosurfactants (PFOs and PFAs) . **These chemicals are often associated with "production facilities although Wastewater treatment plants are also sources"** (emphasis added)(L. Schaider 2014)

35% of wells contained at least one organophosphate flame retardant.

-Some compounds were not detected **above a certain level**. Compounds that had been found by other researchers in Cape Cod groundwater and surface water were not detected in this study. "While Standley et al (2008) reported androstenedione, estrone, and progesterone in groundwater fed ponds on Cape Cod...we did not detect any of the 8 hormones that we included in our analysis **above their respective MRLs (0.1-0.5)** (emphasis added) (L. Schaider 2014) (L. Schaider, Pharmaceuticals, Perfluorosurfactants, and other Organic Wastewater Compounds in Public Drinking Water wells in a Shallow Sand and Gravel Aquifer) (Science of the Total Environment journal homepage: www.elsevier.com/locate/scitotenv) This is one finding from one study that disagrees, somewhat, with finding from other studies which did find higher levels of hormones in Cape Cod surface waters.

These are but a few examples out of many showing CEC's are finding their way into our groundwater, drinking water and surface waters. The list of compounds in wastewater grows continuously as new

pharmaceuticals and other chemicals are developed and brought to market each year. Crocker Pond is planned to receive 41% of the effluent from over 1000 homes or businesses. The pond is home to fish, mollusks, amphibians, turtles, birds and mammals. People, young and old, swim and fish there.

If the Towns plan continues forward we believe that the town should move beyond “incidental treatment” and develop specific treatments for the CEC’s that are resistant to breakdown, as determined by the State. In addition the Town should also conduct ongoing and rigorous testing not only of phosphorous levels but also of the CEC’s that will be found in the ponds and surface waters of West Falmouth.

Conclusion

1. We know that the possibility for desorption of phosphorous exists as described by USGS scientists who study Cape Cod aquifers. Therefore we question the wisdom of using site 7 which is directly upstream from Crocker Pond.
<http://toxics.usgs.gov/highlights/pHexperiment/index.html>
2. If site 7 is to be used then we insist that a rigorous ongoing testing program be put in place to protect the health of all downstream waters from breakthrough of phosphorous as described in comments by The Buzzards Bay Coalition.
3. We believe that if phosphorous breakthrough occurs it may be impossible to stop for years unless a deep enough permeable reactive barrier is rapidly dug through the steep forested banks of Crocker Pond. This would be a different kind of disaster and might not work. Attempting to correct this later by installing treatment for phosphorous at the plant level will take years to have effect and so perhaps should be required from the beginning.
4. Contaminants of Emerging Concern have made their way into Cape Cod’s aquifers, wells and surface waters. The treatment facility should be engineered to treat for these contaminants before they are released because ...” the porous nature of Cape Cod sandy aquifers increases their vulnerability to contamination..” Please see numerous article by Silent Spring Institute on CEC’s and treatment of CEC’s.