

**Minutes of the Water Quality Management Committee, June 26, 2023, 4:30pm
Falmouth Public Library, 300 Main Street, Falmouth, MA 02540**

Members present: Ken Foreman, Steve Rafferty, Eric Turkington, Matt Charette, Tom Duncan, Jordan Mora. Also present: Amy Lowell, Falmouth Wastewater Superintendent; E.J. Neafsey, LG Sonics; Peter McConarty and Steve Cadorette, Director and Deputy Director Falmouth DPW; John Waterbury, Board of Health; Sheri Caseau, Martha's Vineyard Commission; Ed Jalowiec from the Falmouth Heights-Maravista Improvement Association; several members of the public; Gilda Geist, Falmouth Enterprise;

Chairman Turkington opened the meeting by recognizing the contributions made to the Water Quality Management Committee by member Matt Charette who was completing his term with the committee. Turkington presented him with a plaque and thanked him for his eight years of service. Steve Rafferty noted the contributions of Chairman Turkington to the committee and community over his 11 years of service.

1. Presentation by LG Sonics on ultrasound algae control technology

Chairman Turkington introduced E.J. Neafsey from LG Sonics and acknowledged the technology was brought to the committee's attention by Dave Calhoun from Saxon Partners.

Neafsey reviewed general issues caused by algae in recreational waterways and drinking water reservoirs. He discussed the impacts of toxins produced by some algae as well as how algae can affect water chemistry. He also reviewed traditional algae control methods and highlighted the pros and cons of each method.

Neafsey then described algae control using ultrasonic sound waves. He explained this technology aims to prevent phytoplankton and cyanobacteria from being able to reach the photic zone in the water column thus eliminating their ability to photosynthesize and reproduce. In this way blooms would not be able to form. He also stated that the use of ultrasound does not rupture cells and therefore any potential toxins from species present would not be released into the water column. He said the level of sound waves does not impact any other flora or fauna. Neafsey described the buoy system of ultrasonic transmitters coupled with additional monitoring buoys reporting real time data. He said this allows for adjustments to the operations of the systems as conditions change. He presented a review of several case studies from drinking water reservoirs where the system has shown success as well as a proposal for deployment of the system in the Great Pond watershed.

Tom Duncan asked whether LG Sonics had any saltwater applications. Neafsey replied there is a successful international deployment in a saltwater marina setting. Duncan raised a concern that in shallow systems (which is mostly what Falmouth's estuaries are) even if algae are restricted to the bottom, they are not below the photic zone and can still photosynthesize. Ken Foreman followed stating that in Falmouth's estuaries, algae and cyanobacteria are not the primary issues, but rather macroalgae are, and asked whether the system has any impact on macroalgae. Neafsey replied that if the plant is multicellular and controls its buoyancy then it is a problem for the system.

Additional questions were raised about the choice of site, how LG Sonics can quantify the effectiveness of the system, coverage of each buoy, winter maintenance, life expectancy and others. Dave Calhoun from Saxon Partners commented that they [Saxon Partners] are looking at ways to help improve water quality until the proposed sewerage has an impact to allow for recreational use of the waters and prevent closures due to algal blooms. Tom Duncan commented that this technology is a potential solution for a mostly aesthetic problem especially pertaining to the estuaries. He assumes the amount of cyanobacteria in the estuary contributes a very small fraction of biologically available nitrogen compared to septic systems and that the system would likely not address nitrogen in the estuary in a meaningful way. Steve Rafferty agreed and noted that the technology appears to have potential benefits for freshwater systems and might not be good for estuaries yet. Jordan Mora asked if the system was deployed in saltwater, and it reduced the amount of chlorophyll, whether it could then make the macroalgae problem worse because more nitrogen would be available to macroalgae. Tom Duncan, Matt Charette and Ken Foreman all responded with 'yes'.

Chairman Turkington closed the discussion.

2. Presentation Falmouth's pilot permeable reactive barrier (PRB) project: final sampling results and recommendation - Matt Charette, WHOI

Matt Charette gave a brief background on the history of the Shorewood Drive permeable reactive barrier project. He described the objective, design and general results of the study. He noted that the emulsified vegetable oil (EVO) that was injected for the PRB was thought to be a two-year dose but was still denitrifying at three years. Charette recommended that since the largest cost in the installation of an EVO-PRB is the oil itself, that it would be important to continue monitoring progress to help understand the longevity of the oil in the system.

Charette posed the question to the committee whether they felt the PRB should continue to be monitored and presented several recommendations for that monitoring. Tom Duncan commented that it would be foolish to discontinue monitoring and Ken Foreman agreed. One member remarked that the groundwater velocity at the site was initially thought to be much higher while the design of the PRB was occurring then what was subsequently measured post injection and wondered whether this could factor into the increased longevity of the two-year dose. Charette said that could be a contributing factor to it. Foreman asked whether there should be additional groundwater flow monitoring done. Charette felt there is enough data being collected from the other PRBs in the region (Orleans, Eastham and the Vineyard) that those measurements wouldn't be necessary. He felt it should be possible to pull that data together to determine a generalization for the duration of a known volume of EVO to a specific groundwater flow rate.

Several additional questions were raised from members of the public including rough estimates of cost per linear foot as well as placement determination. Jordan Mora asked whether the proposed 6-month monitoring should be tailored to a specific set of seasons

(e.g. spring/fall versus summer/winter). Charette saw no difference in the seasonal performance of the PRB and said there was no preference to seasonality for monitoring. Steve Rafferty proposed that the committee consider endorsing continued monitoring every six months. He asked Science Wares to put together a cost estimate for the committee to vote at a future meeting.

3. Draft Linked Watershed Marsh Assessment and Modeling to Determine Critical Nitrogen Thresholds and Loading for the Herring Brook Estuarine System, Falmouth MA – discussion and vote

Chairman Turkington gave a brief review of the Herring Brook presentation given at the previous WQMC meeting by Ed Eicher. He stated that Eicher summarized the MEP-like evaluation completed on Herring Brook and found it to be a healthy salt marsh capable of accepting additional nitrogen inputs without a negative impact on the system. Turkington reviewed the history of why the evaluation was conducted and described the discharge plans for town. He informed all that on the agenda for this meeting was to vote to accept the report, but also add a proposed amendment which had been agreed to by Ed Eichner. The amendment proposed to be added to the report was *“To summarize, the model indicates that buildout would increase nitrogen concentration at the sentinel location over the present average concentration of 0.501 mg/L by 0.045 mg/L and that the increased municipal discharge scenario (increase to 0.76 mgd) would increase nitrogen concentration over present by 0.017 mg/L. Based on these results, it is clear that if the increased municipal discharge scenario were implemented and combined with buildout, the resulting concentration at the sentinel location would still be significantly below the threshold concentration of 1 mg/L.”*

Jordan Mora asked who wrote the language. Amy Lowell responded that it was done jointly by herself and Ed Eichner. Tom Duncan made a motion to accept the report as amended by the above statement. Ken Foreman seconded. Questions from the public required a review of the findings of the report as well as reiteration that no additional load is anticipated to be discharged to beds 14 & 15 for several years. Steve Rafferty noted that by the time the town needs the additional discharge capacity, they should know whether it is in a good place to proceed with installing an outfall or having to move to other land-based discharge sites in other watersheds. Tom Duncan explained that while there is a short-term addition of nitrogen into a system that is being shown capable of handling it [Herring Brook], in the long term if an outfall comes online, no additional nitrogen goes into any of the Buzzards Bay estuaries including West Falmouth or Herring Brook. If forced to move to a land-based site, West Falmouth and Herring Brook will still receive nitrogen inputs.

Additional concerns were raised about the impacts to Crocker Pond. Amy Lowell commented on the monitoring data that has been done to date in the vicinity of and on Crocker Pond itself and said there has been no indication of an increase in nitrogen or phosphorus in the pond.

Several committee members emphasized that increased discharge to beds 14 & 15 are not projected to have any additional discharge into West Falmouth Harbor. Ken Foreman described the history of the treatment plant at the timing between when the plant first

became operational to when increased nitrogen was measured at the shore of West Falmouth Harbor. He indicated it was approximately a 10–12-year lag time. He said the data are just now showing the decrease in nitrogen as a result of treatment plant upgrades to tertiary treatment.

Amy Lowell commented that in order to increase the amount of effluent going to beds 14 & 15, the town will need a new groundwater discharge permit, so the state will also thoroughly review the plans and decide whether to approve them.

Some additional discussions focused on the fluidity of watershed boundaries and whether there was potential for them to shift with additional discharge. Members commented that while there is a very minimal chance that could happen they emphasized that the town has been evaluating the best data from top experts and trying to move forward because not doing anything is still doing something bad.

Chairman Turkington called to vote on the motion to accept the Herring Brook report and include the proposed amendment. Unanimous in favor.

4. Reports of members and staff

Chairman Turkington reported that the MaDEP announced the revisions to the title 5 regulations and new watershed permit regulations will be promulgated on July 7th. He briefly reviewed some of the changes in the regulations since the original drafts were released for public comment in 2022. He remarked that many of the changes are in line with Falmouth's requests and the regulations are now something the Town can work with.

Steve Rafferty reported that there was a recent report from the Cape Cod and Islands Water Protection Fund (CCIWPF) which presented a revised subsidy strategy going forward. Due to the costly nature of several projects on the State's Intended Use Plan (IUP) list, the fund will no longer be able to support a 25% subsidy for projects after 2022. The fund will be moving forward with a 10% subsidy.

5. Vote minutes of prior meeting (06.05.23)

Several minor edits were suggested by several members. Matt Charette moved to accept the minutes with the suggested edits. Tom Duncan seconded. Unanimous in favor.

6. Motion to Adjourn –6:34pm. Unanimous

Minutes submitted by Kristen Rathjen

List of Documents

- Proposed amendment to the Draft Linked Watershed Marsh Assessment and Modeling to Determine Critical Nitrogen Thresholds and Loading for the Herring Brook Estuarine System, Falmouth MA
- Algae control in recreational great ponds presentation
- Shorewood Drive PRB recommendation
- Draft Title 5 and watershed permit regulations
- Draft minutes of the 06-05-2023 WQMC meeting