

**AGENDA
JOINT MEETING
BOARD OF SELECTMEN, CONSERVATION COMMISSION, BOARD OF HEALTH,
PLANNING BOARD, SEWER COMMISSION**

**MONDAY, NOVEMBER 8, 2021
WAQUOIT MEETING ROOM
MASHPEE TOWN HALL
16 GREAT NECK ROAD NORTH
MASHPEE, MA 02649**

Broadcast Live on Local Cable Channel 18

Streamed Live on the Town of Mashpee Website: <https://www.mashpee.ma.gov/channel-18>

6:30 p.m. – Convene Meeting in Open Session

PLEDGE OF ALLEGIANCE

MOMENT OF SILENCE

NEW BUSINESS

- Presentation and Review of Phase 1 of the Wastewater Management Plan: *Sewer Commission Chair*
- Summary of Water Quality in Ponds and Bays: *Department of Natural Resources*
- Presentation by the Board of Health on Regulations Governing Septic Systems and Cesspools, Report on Counts, Enforcement Authority and Enforcement Strategy
- Water Quality Report: *Mashpee Water District Operations Manager*

ADDITIONAL TOPICS

(This space is reserved for topics that the Chairman did not reasonably anticipate would be discussed)

NEXT MEETINGS AND TOPICS

ADJOURNMENT

MASHPEE TOWN CLERK

NOV 04 2021

RECEIVED BY: SM

September 22, 2021

To Members of the Mashpee Select Board,

The Mashpee Board of Sewer Commissioners, working with the Town Engineer and our consultants, GHD, is currently in the process of submitting Mashpee's State Revolving Fund application to support Phase One of the town's wastewater treatment and sewerage program.

We are also exploring ways to expand the area of and accelerate the timetable for the projected Phase Two, focusing on remediation and protection of Mashpee's ponds as well as its estuaries. Everything we have been learning as a community in recent months accentuates the need to pursue a more ambitious timetable than originally planned.

To that end, as we gather information, estimates, and preliminary plans, we ask the Select Board to consider an article for the Spring 2022 Town Meeting warrant to fund a 25 percent design of a newly configured Phase Two of the wastewater and sewerage program.

Sincerely,


The Mashpee Sewer Commission

cc: Rodney Collins
Christopher Gallagher

Town of Mashpee's 2021 Clean Water Plan

DRAFT

Overview: The Town of Mashpee currently has a Comprehensive Watershed Nitrogen Management Plan approved by the Massachusetts Department of Environmental Protection in 2015. This plan was enacted in order to access federal, state and local funds required to rehabilitate our dying estuaries. The estuaries are dying because nitrogen and phosphorus added to groundwater by thousands of septic systems, stormwater and fertilizer usage have caused excessive algal growth that leads to cyanobacteria blooms and a lack of oxygen necessary to sustain life in our estuaries and our ponds.

Since 2015 the citizens of Mashpee have become increasingly aware that the same problems that exist in our estuaries also exist in our freshwater lakes and ponds. Several of the ponds have experienced cyanobacteria blooms in the past few years and have been closed for recreational contact usage. This is occurring with increased frequency.

It is for this reason that Mashpee is amending the 2015 plan by making it a plan that addresses both estuarine and fresh water quality: A Mashpee Clean Water Plan.

The 2015 plan was anticipated to take 25 years to sewer the portions of watersheds contributing groundwater to Popponesset and Waquoit Bays. The goal was to remove enough pollution through sewerage and stormwater management to allow the estuaries to meet their respective Total Maximum Daily Loads (TMDL). TMDLs are a water quality standard assigned each individual water body that allows it to achieve the water quality necessary to support the ecosystems associated with that particular body. Currently, the estuaries in Mashpee are far too polluted to be anywhere close to meeting their TMDL.

Although our freshwater lakes and ponds do not currently have approved TMDLs' the degradation of water quality is readily visible and requires remediation.

The evolution to a comprehensive nutrient management plan modifies the original sewerage plan for the second phase of sewerage. Now instead of focusing sewerage strictly for the benefit of the estuaries we will also be focusing on freshwater bodies.

Introduction: The following modifications to the MA DEP approved 2015 Town of Mashpee Comprehensive Nitrogen Management Plan are aimed at including and improving the health of estuaries, freshwater lakes and ponds in Mashpee. Completion and approval of this revised plan is necessary in order to acquire state funding for repairing freshwater bodies as well as the estuaries considered in the 2015 plan. In the original Massachusetts Estuaries Project (MEP) lakes and ponds were considered nitrogen "sinks." This meant that the freshwater bodies retained some of the nitrogen that flowed into them via groundwater which is the predominant source of water for the ponds. This phenomenon reduces nitrogen flowing into the estuaries, but intensifies the problem for the ponds. This retention was included in models that helped establish Total Maximum Daily Loads (TMDLs) for the estuaries fed by Mashpee's watersheds.

Rationale: Most freshwater bodies in Mashpee exhibit high levels of eutrophication (pollution) caused by an overabundance of nutrients which are feeding the excessive growth of algae and rooted aquatics. Two of the ponds (Santuit and Mashpee-Wakeby) have for the last several years had forced closures to swimming due to the presence of cyanobacteria. Many species of cyanobacteria create neurotoxins that can cause a multitude of health issues for humans and animals contacting and/or ingesting the polluted water. The goal of this document is describe how the Town of Mashpee plans to address this hazardous situation and restore the water quality in our estuaries, lakes and ponds.

Pollutants and their sources: The two nutrients that are causing the decay of our fresh and marine waters are phosphorus and nitrogen. Historically the assumption has been made that phosphorus is the nutrient that accelerates excessive cyanobacteria growth which pollutes our lakes and ponds. High nitrogen levels in fresh water bodies has recently been confirmed to be an influence in supporting cyanobacteria blooms and is considered the growth limiting nutrient in our estuaries. Unnatural ratios of nitrogen to phosphorus have been shown to be a determinant in prompting algal and weed growth. And nitrogen levels in ponds have recently been shown to be influences in stimulating cyanobacteria blooms. For these reasons the goal of our nutrient management plan is to address both nutrients that are degrading our marine and fresh waters.

The primary sources of nutrients to ponds and marine environments are septic systems, stormwater and fertilizers.

Septic systems far outweigh the other two sources. Septic systems and cesspools do not treat either nutrient. They are designed to remove bacteria only and avoid hydraulic failure. A fully complying Title V system releases both nitrogen and phosphorus to the ground in concentrations similar to the wastewater entering the Title V system. Population growth using Title V systems, the volume of flow allowed per unit land area under Title V and the increasing duration of time they have been in use are why our estuaries and ponds are so polluted.

Stormwater contains both nitrogen and phosphorus. The degree to which stormwater influences water quality has been increasing with climate change. More intense storms increase loads to waterways. Road runoff from both paved and unpaved roads add nutrients to waters in the form of suspended solids to which phosphorus is bound and nitrogen is dissolved. Lawn fertilizers generally contain both nitrogen and phosphorus. With increased storm intensity lawn fertilizers are washed into storm drains, seep into groundwater or are washed directly into the fresh water bodies and estuaries. Controlling stormwater runoff is an element of this new plan as well as management of lawn fertilizers.

Sewering: Since on-site septic systems and cesspools are the predominant source of nutrients to our ponds, we propose to modify the coverage of our approved Phase Two Plan to include portions of watersheds in Mashpee that contribute nutrient rich groundwater to our estuaries and ponds. Phase 1 and the newly proposed Phase 2 provide sewerage coverage for Ashumet and John's pond and areas contributing polluted groundwater to Santuit and Mashpee-Wakeby ponds. These areas are identified in Figure One. The sewerage of these areas (2A, 2B, 2C and 2D and Phase 1 will significantly decrease pollutants flowing into the Mashpee River, Popponesset Bay, Shoestring Bay and both Mashpee-Wakeby and Santuit ponds. In the Waquoit watershed Phase 2 (2E) will reduce pollutants flowing into John's and Ashumet Ponds and Waquoit Bay. Table 1 demonstrates the anticipated flows associated with sewerage Phase 1 and the modified Phase 2 as well as the nitrogen removal associated with these areas. The towns of Sandwich and to a lesser degree Barnstable contribute groundwater flow to Santuit and Mashpee-Wakeby ponds as shown in Figure 2. Discussions have already commenced with both towns to sewer their portions of the watersheds in time frames matching Mashpee's new proposed Phase 2. These will be on-going discussions for the next year.

Stormwater Management: Sources of stormwater pollution to each of the four ponds will be identified, assessed and addressed during Phase One and Phase Two timeframes.

Lawn Fertilization: The Town of Mashpee will institute a by-law banning the use of lawn fertilizer around the periphery of all water bodies. This "no fertilizer" zone will extend 300 feet from the shoreline of all waters, fresh and marine. Controlling lawn fertilizer runoff and sources of stormwater are actions that can be implemented much more quickly than sewerage and will reduce the flow of nutrients to our water bodies.

Santuit Pond: Santuit is a very shallow pond suffering from severe eutrophication. Algae blooms and presence of cyanobacteria are annual events that last longer each year. A number of corrective actions are under consideration for implementation in the near term before sewerage can be brought to Santuit.

Recycling of nitrogen and phosphorus from a substantial build-up of polluted bottom sediments has prompted discussions about dredging with the Army Corps of Engineers. According to the Corps, dredging is predicated on the town(s) sewerage around the pond. The Corps is currently evaluating the feasibility of dredging Santuit, and a report is expected in early 2022. The density of development around Santuit, the extreme number of Title 5 systems and the physical characteristics of the pond indicate that a multi-pronged approach of sewerage and dredging are necessary to improve Santuit Pond's water quality.

Mashpee-Wakeby: Mashpee's Department of Natural Resources is currently preparing a proposal for a diagnostic feasibility study to be undertaken on the lake. The results of this study will be used to support acquisition of state SRF funding for sewerage around portions of the Lake. Mashpee-Wakeby has had closures for the last two years related to cyanobacteria blooms. Funds for this study will hopefully be approved at our October Town Meeting.

Explanation of Phase 2: The areas selected for Phase 2 (Figure 1 2A-2E) are based on their ability to connect to Phase 1, their removal of nutrients from both Popponesset and Waquoit Bays and their treating sewage that would otherwise flow into Mashpee-Wakeby, Santuit, John's and Ashumet ponds. Phase 2 has a design flow from all 5 areas of 1,051,000 gallons per day (gpd). Flows from Phase 1 and 2A-2D (838,000gpd) will be piped to the treatment plant at the transfer station built under Phase 1. It is anticipated that we will send flows from 2E (213,000gpd) in the Waquoit watershed to the Joint Base Cape Cod wastewater treatment plant which has an additional 250,000 gpd of space. The sewerage of areas 2A-2C will collect sewage that flows into groundwater and rapidly feeds not only Santuit and Mashpee-Wakeby but also the Mashpee River. This is important because polluted groundwater flowing into the river makes its way into Popponesset Bay within hours. On the west side of town the sewerage of the dense development around the periphery of Ashumet and John's pond will collect sewage that would otherwise flow quickly via groundwater into the two ponds.

Area 2D, directly up gradient of Santuit pond, includes portions of Sandwich. It is anticipated that subsequent discussion with Sandwich will result in Sandwich sewerage the watershed areas to the north and west of Wakeby pond in exchange for Mashpee picking up this portion of Sandwich that lies in the Popponesset watershed.

Summary: Changes to Mashpee's currently approved Comprehensive Nitrogen Management Plan are necessary in order to address escalating water quality problems in our freshwater ponds and Lakes. These changes include modifying our currently proposed Phase 2 to include sewerage around both Santuit Pond and Mashpee-Wakeby Lake. We propose to call our future amended plan 2021 Mashpee Clean Water Plan. This document will be submitted to the Massachusetts Department of Environmental Protection and MEPA for approval.

Comprehensive Watershed Nutrient Management Plan/Phase 2 2021

Popponesset Watershed, Santuit and Mashpee-Wakeby Ponds

<u>AREA</u>	<u>ANTICIPATED FLOWS GPD</u>
A	110,000
B	290,000
C	68,000
D	110,000
Phase 1	110,000
Willowbend, Stratford	150,000
Total	838,000

Waquoit Watershed, Ashumet and John's Ponds

E	260,000
F	54,300
G	78,000
Total (Assume only Section E)	*260,000

*Flows directed to Joint Base Cape Cod wastewater treatment plant

TABLE 1

FIGURE 2

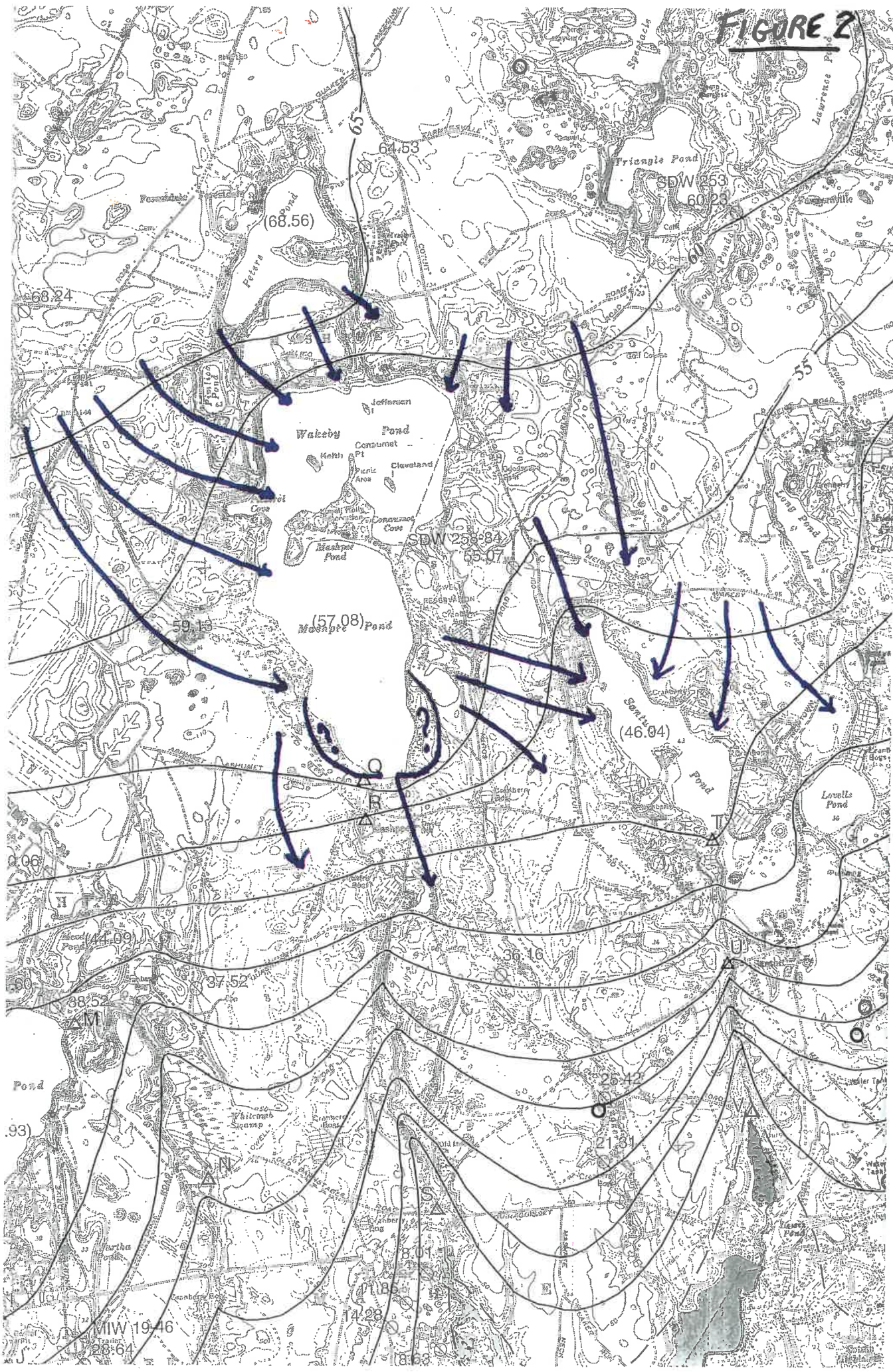
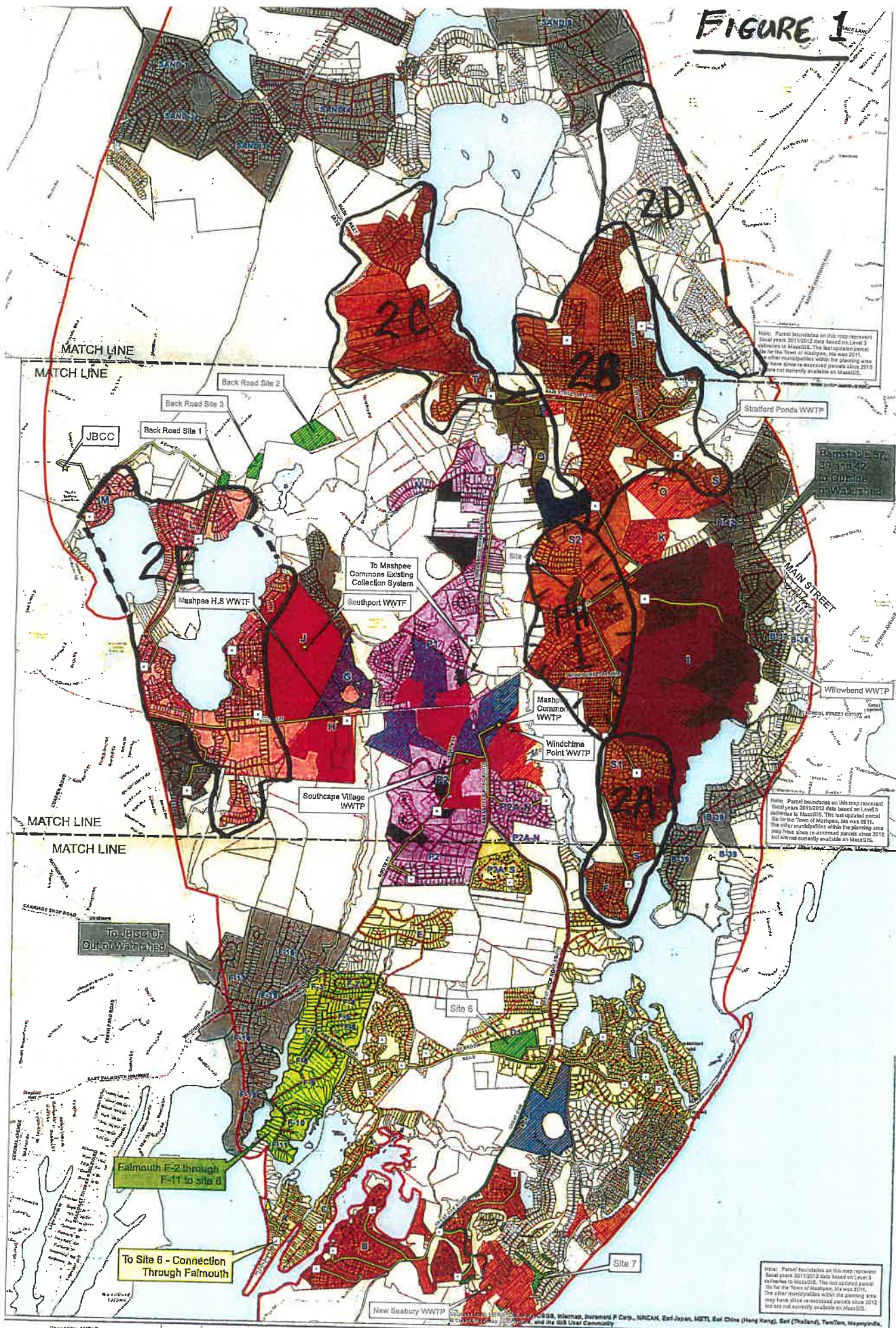


FIGURE 1



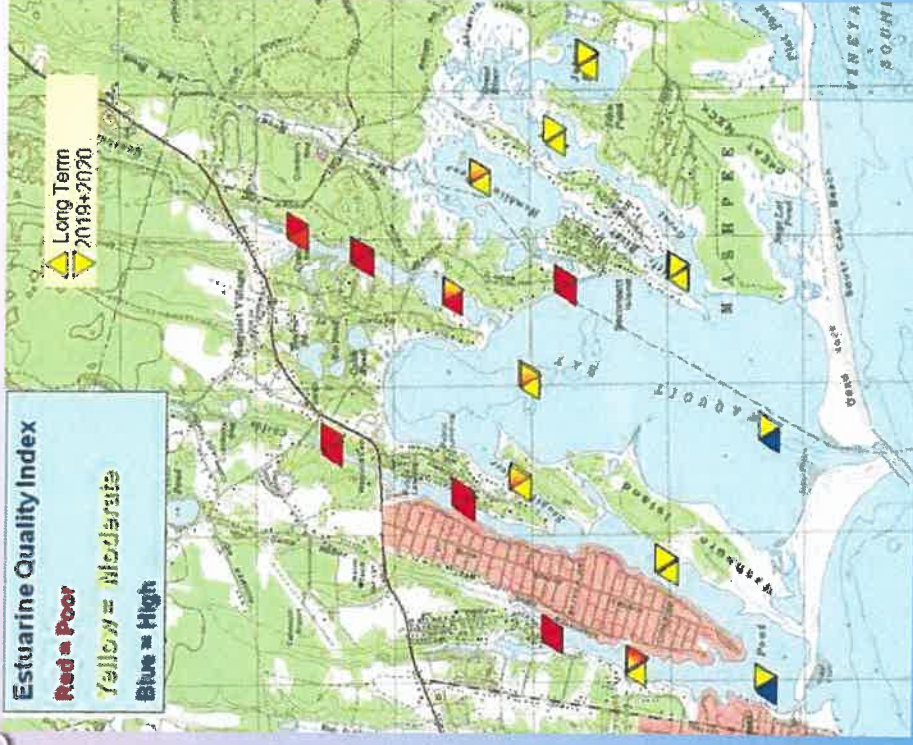
The background of the page features a vertical gradient from light blue at the top to white at the bottom. Scattered across this gradient are numerous water droplets of various sizes, some appearing as simple circles and others with more complex, realistic shading to give them a three-dimensional appearance.

SUMMARY OF MASHPEE WATERBODY HEALTH

MASHPEE ESTUARIES

- “BOTH WAQUOIT AND POPPONESSET BAYS SUPPORT IMPAIRED HABITATS THROUGHOUT THEIR TIDAL REACHES AND REMAIN BELOW THE WATER QUALITY LEVELS SET BY THE MASSDEP/EPA. THIS IS CONSISTENT WITH THE FACT THAT THE THRESHOLD NITROGEN LEVEL SPECIFIED IN THE TMDL WAS NOT ATTAINED WITHIN ANY BASIN IN 2019 AND 2020, INDICATING THAT THE IMPAIRMENTS ARE CAUSED BY NITROGEN ENRICHMENT.” HOWES ET. AL.

WAQUOIT BAY

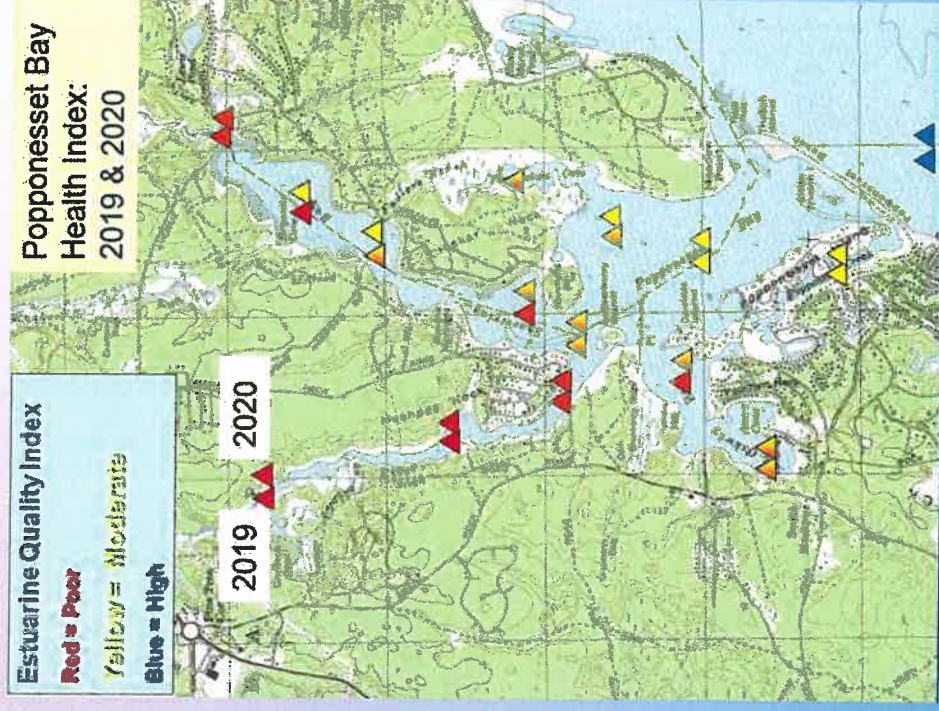


- JEHU POND: DECLINING. ONE OF THE LAST KNOWN AREAS IN THE EASTERN BASINS OF WAQUOIT BAY TO BE SUITABLE FOR EEL GRASS. ALL AREAS WHERE EEL GRASS ONCE WAS (2018 ISH) HAS SINCE DISAPPEARED. SHELLFISH HABITAT IS NOW SCARCE. THE DNR'S SEEDING ACREAGE HAS SEVERELY REDUCED OVER THE PAST 5 YEARS. TREATMENT - SEWERING, SHELLFISH AQUACULTURE, AND STORMWATER IMPROVEMENTS.
- QUASHNET RIVER: UNCHANGING. SEVERELY DEGRADED. PROHIBITED TO SHELL FISHING. AREA CANNOT SUPPORT HIGH SPECIES DIVERSITY. TREATMENT - SEWERING AND STORMWATER IMPROVEMENTS
- MAIN BASIN: DECLINING. THERE IS NO LONGER ANY HIGH WATER QUALITY IN THE LOWER REACHES OF WAQUOIT BAY. TREATMENT-SEWERING, STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE.

WAQUOIT BAY

- LITTLE RIVER: DECLINING. PAST SHELLFISH SEEDING SHOWED INITIAL IMPROVEMENTS IN THE AREA FOR THE 2019 TESTING PERIOD, HOWEVER NUTRIENT INPUTS WERE TOO HIGH TO SHOW IMPROVEMENTS IN 2020 EVEN THOUGH SEEDING EFFORTS WERE SIMILAR. TREATMENT-SEWERING , STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE.
- GREAT RIVER: DECLINING. IN 2021 AREAS OF GREAT RIVER AR4E NOW CLASSIFIED AS CONDITIONALLY APPROVED (SEASONAL) TO SHELLFISHING, WHICH WILL REDUCE SHELLFISHING HARVESTING IN THE AREA. TREATMENT-SEWERING , STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE.
- HAMBLIN POND: DECLINING SHELLFISH SEEDING WAS INCREASED IN 2019 AND 2020 WITHIN HAMBLIN POND, BUT NO MAJOR IMPROVEMENTS WERE SEEN. 2019 DATA RESULTS ALSO SHOWED INITIAL IMPROVEMENTS, BUT WERE NOT DISPLAYED IN 2020 WATER QUALITY RESULTS. HAMBLIN POND, ALONG WITH LITTLE RIVER, JEHU POND, AND HAMBLIN POND SHOW THE MOST HOPE FOR SHORT-TERM IMPROVEMENTS. TREATMENT-SEWERING , STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE.

POPPONESSET BAY



- OCKWAY BAY: SIGNIFICANTLY IMPAIRED AND CONDITIONS ARE UNCHANGING. 2016-2020 CHLOROPHYLL-A LEVELS ARE GENERALLY HIGHER THAN THE LONG-TERM HISTORICAL DATA. NO OTHER YEARS HAVE BEEN HIGHER, AND CONDITIONS CONTINUE TO DECLINE ON A YEARLY BASIS. TREATMENT-SEWERING, STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE
- SHOESTRING BAY: INCREASED LEVELS OF TOTAL NITROGEN WERE EVIDENT IN SHOESTRING BAY FOR 2020. SPECIES DIVERSITY HAS DECLINED SUBSTANTIALLY OVER THE PAST 6 YEARS DUE TO POOR CONDITIONS. SOME OF THE LARGEST BLOOMS WERE SEEN IN SHOESTRING BAY THIS PAST YEAR (HIGHEST BLOOM CONCENTRATIONS SEEN THIS YEAR OUT OF THE 20 YEARS OF DATA COLLECTION). TREATMENT-SEWERING, STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE. TREATMENT-SEWERING, STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE (NOW LIMITED DUE TO INCREASING IMPAIRMENT AND REDUCED OXYGEN LEVELS).
- MAIN BASIN: SHOWING DECLINE. NO GOOD WATER QUALITY IS LEFT IN POPPONESSET BAY. CHLOROPHYLL -A LEVELS ARE GENERALLY HIGH THAN THE LONG-TERM HISTORICAL MEAN SUPPORTING THAT THE AREA IS NOW NITROGEN ENRICHED AND THE CONDITIONS ARE STEADILY ON THE DECLINE. TREATMENT-SEWERING, STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE (NOW LIMITED DUE TO INCREASING IMPAIRMENT AND REDUCED OXYGEN LEVELS).

POPPONESSET BAY

- MASHPEE RIVER: IMPAIRED AND THE TREND IS UNCHANGING AND DECLINING IN AREAS. TN DECLINE NOTED DUE TO SHELLFISH AQUACULTURE. CONTINUED DECLINE DUE TO NITROGEN POLLUTION. TOTAL NITROGEN LEVELS CONTINUE TO INCREASE YEARLY. THE LEVELS ARE NOW ALMOST 3 TIMES THE ACCEPTABLE LEVELS OR TMDL (TOTAL MAXIMUM DAILY LOAD) REQUIRED FOR TARGET RESTORATION.
- DISSOLVED OXYGEN (DO) LEVELS ARE BELOW 4 MG/L FOR LONG PERIODS OF TIME, CAUSING STRESS AND LOSS OF BENTHIC ANIMALS. 2021 SHOULD BE NOTED FOR A REPORTED BLUE CRAB DIE OFF WITHIN THE RIVER. DUE TO DECLINING CONDITIONS, THE SHELLFISH DIVISION WAS FORCED TO MOVE MILLIONS OF OYSTERS OUT OF THE AREA TO ENSURE THEIR SURVIVAL. AS YOU MOVE AWAY FROM THE HEAD OF THE RIVER, WATER CONDITIONS SLIGHTLY IMPROVE. ACCUMULATION OF BOTTOM MUCK FROM THICK ALGAL BLOOMS CONTINUES TO SUFFOCATE THE BENTHOS. DO LEVELS DROPPED TO 0-4 MG/L 50% OF THE TIME THIS SUMMER.
- CHLOROPHYLL LEVELS AND OTHER WATER QUALITY PARAMETERS CLASSIFY THIS AREA AS HYPERTROPHIC OR EXTREMELY EUTROPHIC. ALGAL BLOOMS ARE INCREASING AS A DIRECT RESULT OF NUTRIENT POLLUTION RESULTING IN LITTLE TO NO WATER CLARITY. SECCHI DEPTHS ARE CONTINUOUSLY LESS THAN 0.25 METERS OR 0.8 FEET DURING THE MONTHS OF JULY AND AUGUST. TREATMENT-SEWERING , STORMWATER IMPROVEMENTS, AND SHELLFISH AQUACULTURE (NOW LIMITED DUE TO INCREASING IMPAIRMENT AND REDUCED OXYGEN LEVELS).

MASHPEE PONDS

- NUTRIENT SAMPLING THROUGH THE PALS (PONDS AND LAKES STEWARDSHIP) PROGRAM 2018 AND 2020 RESULTS PRESENTED, ALONG WITH MASHPEE / APCC CYANOBACTERIA (BLUE GREEN ALGAE) SAMPLING FROM 2021:
- MOST RECENT DATA SHOWS A CONTINUING NEGATIVE TREND IN ALL PONDS. ALL PONDS ARE BECOMING INCREASINGLY IMPAIRED DUE TO GROUNDWATER AND SURFACE WATER DISCHARGE CONTAINING EXCESS NUTRIENTS AND CONTAMINANTS.
- LAKES ARE CLASSIFIED BY TROPHIC STATE INDEX:
 - OLIGOTROPHIC : “GOOD” WATER QUALITY
 - MESOTROPHIC : “FAIR” WATER QUALITY
 - EUTROPHIC / HYPEREUTROPHIC : “POOR” WATER QUALITY

ASHUMET POND

- SURFACE WATER (0.5 METERS):
 - 2018: 17.25 UM TOTAL NITROGEN, 0.51 UM TOTAL PHOSPHORUS
 - 2020: 23.49 UM TOTAL NITROGEN, 1.05 UM TOTAL PHOSPHORUS
- MID WATER (9 METERS):
 - 2018: 20.79 UM TOTAL NITROGEN, 0.65 UM TOTAL PHOSPHORUS
 - 2020: 22.30 UM TOTAL NITROGEN, 0.69 UM TOTAL PHOSPHORUS
- BOTTOM WATER (18 METERS):
 - 2018: 47.93 UM TOTAL NITROGEN, 6.31 UM TOTAL PHOSPHORUS
 - 2020: 17.81 UM TOTAL NITROGEN, 0.73 UM TOTAL PHOSPHORUS
- ASHUMET HAS BEEN TREATED WITH NUTRIENT INACTIVATION - ALUMINUM SULFATE. BOTTOM WATER WILL SEE A DECREASE IN TOTAL PHOSPHORUS FROM THE TREATMENT.

ASHUMET POND

- Cyanobacteria 2021: Average cyano species cell count between 5/30- 11/3 – 3,459 cells/ ml
1 posted advisory based on DPH guidelines (7/15-8/2): presence of a scum layer and high cell counts
- Trophic State: Mesotrophic / Eutrophic – nutrient inactivation when eutrophic reduces nutrient availability and will remain mesotrophic until the inactivation treatment becomes ineffective due to continued external nutrient input.
- Contaminants: Mercury – No fish consumption for largemouth bass. Phosphorus load from septic systems addressed with nutrient inactivation treatment. Chlorinated solvents – PRB . Abnormal Fish Deformities, Erosions, Lesions, Tumors (DELTS)

JOHN'S POND

- DATA PRESENTED SHOWS UNCHANGING CONDITIONS IN NUTRIENT CONCENTRATIONS, ALTHOUGH MORE SAMPLING IS NEEDED.

- SURFACE WATER (0.5 METERS):

2018: 16.87 UM TOTAL NITROGEN, 0.36 UM TOTAL PHOSPHORUS

2020: 20.50 UM TOTAL NITROGEN, 0.58 UM TOTAL PHOSPHORUS

- MID WATER (9 METERS):

2018: 26.12 UM TOTAL NITROGEN, 0.65 UM TOTAL PHOSPHORUS

2020: 21.10 UM TOTAL NITROGEN, 0.46 UM TOTAL PHOSPHORUS

- BOTTOM WATER (16 METERS):

2018: 73.57 UM TOTAL NITROGEN, 0.65 UM TOTAL PHOSPHOROUS

2020: 30.67 UM TOTAL NITROGEN, 0.54 UM TOTAL PHOSPHOROUS

JOHN'S POND

- CYANOBACTERIA 2021: AVERAGE CYANO SPECIES CELL COUNT BETWEEN 5/30- 11/3 - 1,984 CELLS/ ML
NO ADVISORIES POSTED FOR CYANOBACTERIA, EXCEPT FOR 1 E.COIL SWIMMING ADVISORY

CYANOBACTERIA SCUM LAYER PRESENCE NEAR THE SHORELINE SEEN BY RESIDENTS THIS SUMMER IN AND AROUND THE FISH LADDER.

- TROPHIC STATE: EUTROPHIC. POOR OXYGEN CONDITIONS NOTED DURING THE SUMMER MONTHS.
- INVASIVE SPECIES : COY FISH, AND MILFOIL (TREATED IN 2021 WITH ALGAECIDE)
- CONTAMINANTS: PFAS AND MERCURY - NO CONSUMPTION OF FISH ORDER ISSUED MY MASS. DPH.
CHLORINATED SOLVENTS - EXTRACTION WELL. MERCURY IN FISH TISSUE.

MASHPEE WAKEBY POND

- MASHPEE WAKEBY : (TREATED AS TWO PONDS FOR PROFILE SAMPLING PURPOSES)
- MASHPEE POND: CONTINUED TOTAL PHOSPHORUS AND TOTAL NITROGEN INCREASE
- WAKEBY : CONTINUED TOTAL PHOSPHORUS AND TOTAL NITROGEN INCREASE, WITH PARTICULATE CYANOBACTERIA PRESENCE BECOMING THE NORM.

MASHPEE SIDE OF MASHPEE WAKEBY

- SURFACE WATER (0.5 METERS) :

2018: 19.34 UM TOTAL NITROGEN, 0.51 UM TOTAL PHOSPHORUS
2020: 23.49 UM TOTAL NITROGEN, 0.54 UM TOTAL PHOSPHORUS

- MID WATER (9 METERS) :

2018: 19.05 UM TOTAL NITROGEN, 0.99 UM TOTAL PHOSPHORUS
2020: 25.29 UM TOTAL NITROGEN, 0.80 UM TOTAL PHOSPHORUS

- BOTTOM WATER (16 METERS) :

2018: 75.64 UM TOTAL NITROGEN, 6.09 UM TOTAL PHOSPHOROUS
2020: 146.30 UM TOTAL NITROGEN, 8.28 UM TOTAL PHOSPHORUS

MASHPEE SIDE OF MASHPEE WAKEBY

- CYANOBACTERIA 2021: AVERAGE CYANO SPECIES CELL COUNT BETWEEN 5/30- 11/3 – 105 CELLS/ ML

1 ADVISORY POSTED DUE TO THE PRESENCE OF A SCUM LAYER
(6/24- 7/7)

- TROPIC STATE: MESOTROPHIC – GENERALLY HAS MODERATE NUTRIENT CONCENTRATIONS THROUGHOUT THE POND. SECCHI DEPTH (WATER CLARITY) IS GREATER THAN 8 FEET. NOTE- HIGH PHOSPHOROUS FROM GROUNDWATER INFILTRATION.

WAKEBY SIDE OF MASHPEE WAKEBY

- SURFACE WATER (0.5 METERS) :

2018: 23.88 UM TOTAL NITROGEN, 0.65 UM TOTAL PHOSPHORUS

2020: 29.18 UM TOTAL NITROGEN, 0.73 UM TOTAL PHOSPHORUS

- MID WATER (9 METERS) :

2018: 22.23 UM TOTAL NITROGEN, 0.58 UM TOTAL PHOSPHORUS

2020: 27.08 UM TOTAL NITROGEN, 0.69 UM TOTAL PHOSPHORUS

- BOTTOM WATER (10 METERS) :

2018: 52.06 UM TOTAL NITROGEN, 2.26 UM TOTAL PHOSPHOROUS

2020: 52.51 UM TOTAL NITROGEN, 2.65 UM TOTAL PHOSPHOROUS

WAKEBY SIDE OF MASHPEE WAKEBY

- CYANOBACTERIA: AVERAGE CYANO SPECIES CELL COUNT BETWEEN 5/30- 11/3 - 717 CELLS/ ML
1 ADVISORY POSTED DUE TO THE PRESENCE OF A SCUM LAYER (6/24-7/7)
- TROPIC STATE: MESOTROPHIC / EUTROPHIC - GENERALLY HAS MODERATE NUTRIENT CONCENTRATIONS. SECCHI DEPTH (WATER CLARITY) IS REDUCED IN COMPARISON TO MASHPEE SIDE, AT ROUGHLY 5 FEET THROUGHOUT THE SUMMER MONTHS. NOTE- ALSO SEEING HIGHER PHOSPHOROUS CONCENTRATIONS FROM GROUNDWATER INFILTRATION.
- CONTAMINANTS: RECENT PFAS/MERCURY. FISHING ADVISORY POSTED.

SANTUIT POND

- SURFACE WATER (0.5 METERS):

2018: 58.54 UM TOTAL NITROGEN, 1.53 UM TOTAL PHOSPHORUS

2020: 80.63 UM TOTAL NITROGEN, 1.34 UM TOTAL PHOSPHORUS

- MID WATER (2 METERS):

2018: 71.51 UM TOTAL NITROGEN, 0.65 UM TOTAL PHOSPHORUS

2020: 87.21 UM TOTAL NITROGEN, 1.38 UM TOTAL PHOSPHORUS

- BOTTOM WATER (2.5-3 METERS): MID WATER IS FOR ALL INTENSIVE PURPOSES
CONSIDERED BOTTOM WATER DUE TO THE OVERALL DEPTH OF THE POND.

SANTUIT POND

- CYANOBACTERIA: AVERAGE CYANO SPECIES CELL COUNT BETWEEN 5/30-11/3 – 70,475 CELLS/ ML.

ADVISORY POSTED ALL SUMMER

- TROPIC STATE: EUTROPHIC / HYPERTROPHIC – HEAVY ALGAL BLOOMS POSSIBLE THROUGHOUT THE SUMMER, EXTENSIVE MACROPHYTE ISSUES, OFTEN UNDER HYPERTROPHIC CONDITIONS.
- CONTAMINANTS/ TOXINS: TOXINS PRESENT FROM HAB SPECIES (CYANOBACTERIA – MICROCYSTIN). ABNORMAL FISH DEFORMITIES, EROSIONS, LESIONS, TUMORS (DELTS).

PONDS LISTED BY RANK OF IMPAIRMENT FROM MOST TO LEAST TAKING ALL SUPPORTING DATA INTO CONSIDERATION:

- SANTUIT POND
- ASHUMET POND
- JOHN'S POND
- WAKEBY SIDE OF MASHPEE WAKEBY
- MASHPEE SIDE OF MASHPEE WAKEBY



TOWN OF MASHPEE
DEPARTMENT OF NATURAL RESOURCES
Mashpee Town Hall
16 Great Neck Road North
Mashpee, Massachusetts 02649
Telephone – (508) 539-1410

MEMORANDUM

November 05, 2021

TO: Rodney C. Collins, Town Manager
Mashpee Select Board

FROM: Ashley Fisher, Director of Natural Resources

RE: State of Mashpee Waters

State of Mashpee Estuaries :

“Both Waquoit and Popponesset Bays support impaired habitats throughout their tidal reaches and remain below the water quality levels set by the MassDEP/EPA. This is consistent with the fact that the Threshold Nitrogen Level specified in the TMDL was not attained within any basin in 2019 and 2020, indicating that the impairments are caused by nitrogen enrichment.” Howes et. al.

Waquoit Bay – No high water quality areas remain (See Figure 1)

Jehu Pond: Declining. One of the last known areas in the eastern basins of Waquoit Bay to be suitable for eel grass. All areas where eel grass once was (2018 ish) has since disappeared. Shellfish habitat is now scarce. The DNR’s seeding acreage has severely reduced over the past 5 years. Treatment – sewerage, shellfish aquaculture, and stormwater improvements.

Quashnet River: Unchanging. Severely degraded. Prohibited to shell fishing. Area cannot support high species diversity. Treatment – Sewering and stormwater improvements

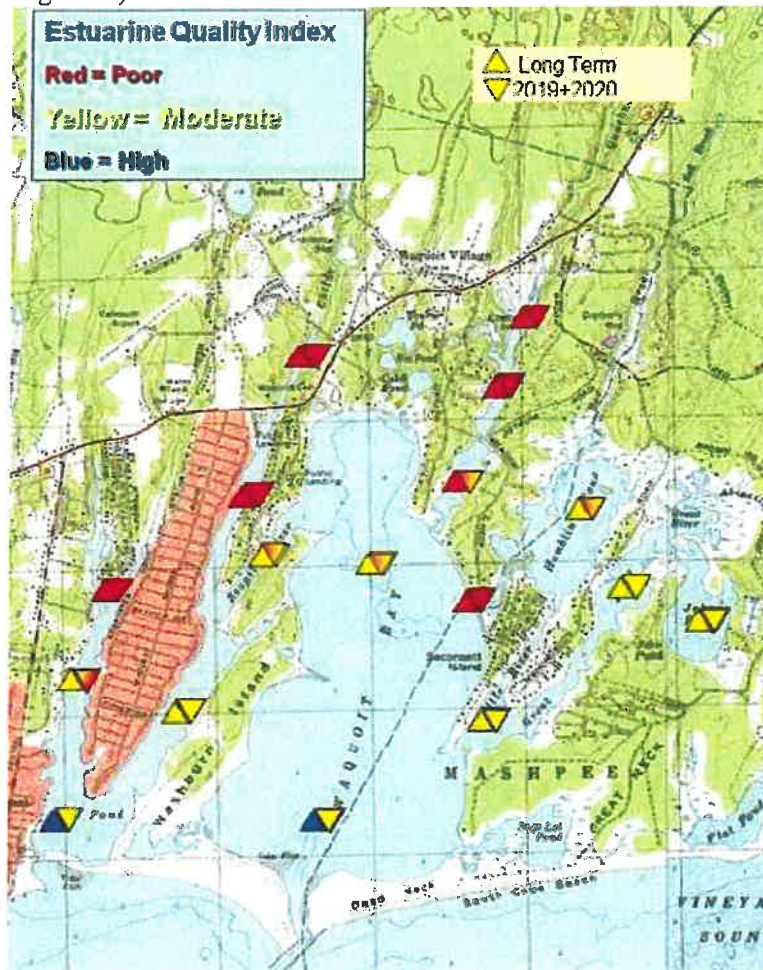
Main Basin: Declining. There is no longer any high water quality in the lower reaches of Waquoit Bay. Treatment-Sewering , stormwater improvements, and shellfish aquaculture.

Little River: Declining. Past shellfish seeding showed initial improvements in the area for the 2019 testing period, however nutrient inputs were too high to show improvements in 2020 even though seeding efforts were similar. Treatment-Sewering , stormwater improvements, and shellfish aquaculture.

Great River: Declining. In 2021 areas of Great River are now classified as conditionally approved (seasonal) to shellfishing, which will reduce shellfishing harvesting in the area. Treatment-Sewering , stormwater improvements, and shellfish aquaculture.

Hamblin Pond: Declining Shellfish seeding was increased in 2019 and 2020 within Hamblin Pond, but no major improvements were seen. 2019 data results also showed initial improvements, but were not displayed in 2020 water quality results. Hamblin Pond, along with Little River, Jehu Pond, and Hamblin Pond show the most hope for short-term improvements. Treatment-Sewering , stormwater improvements, and shellfish aquaculture.

Figure 1.)



Popponesset Bay— No high water quality areas remain. (See Figure 2) All areas are unchanging due to lack of remedial action above and beyond shellfish aquaculture.

Ockway Bay : Significantly impaired and conditions are unchanging. 2016-2020 chlorophyll-a levels are generally higher than the long-term historical data. No other years have been higher, and conditions continue to decline on a yearly basis. Treatment-Sewering , stormwater improvements, and shellfish aquaculture

Mashpee River: Impaired and the trend is unchanging and declining in areas. TN decline noted due to shellfish aquaculture. Continued decline due to nitrogen pollution. Total nitrogen levels continue to increase yearly. The levels are now almost 3 times the acceptable levels or TMDL (Total Maximum Daily Load) required for target restoration.

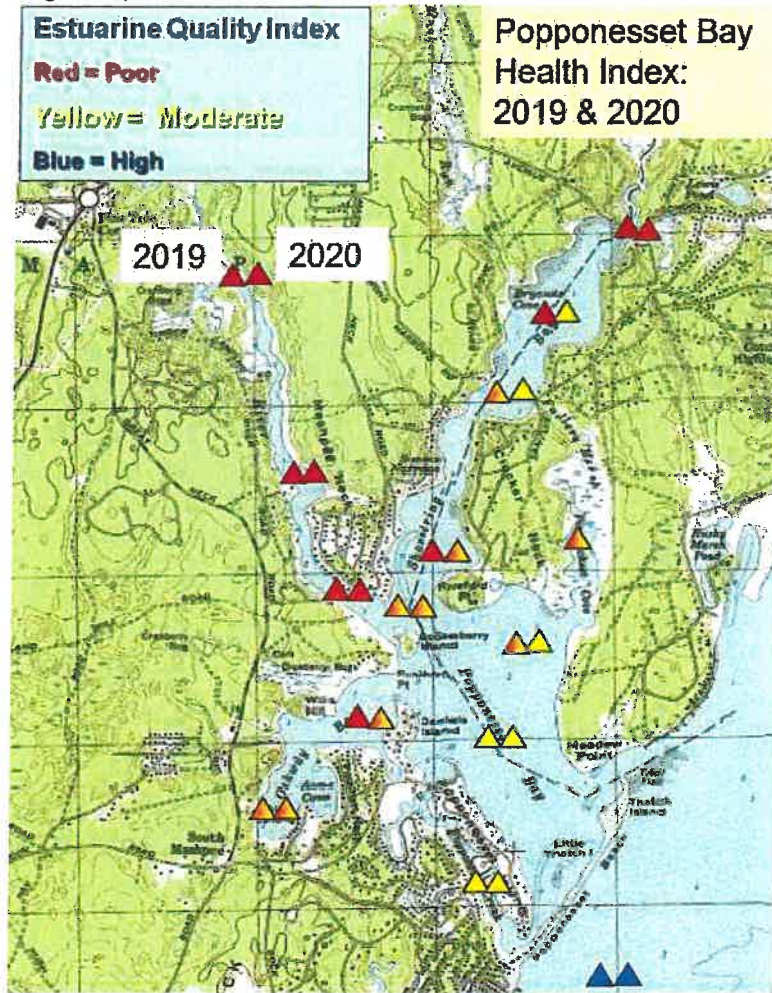
Dissolved oxygen (DO) levels are below 4 mg/L for long periods of time, causing stress and loss of benthic animals. 2021 should be noted for a reported blue crab die off within the River. Due to declining conditions, The Shellfish Division was forced to move millions of oysters out of the area to ensure their survival. As you move away from the head of the river, water conditions slightly improve. Accumulation of bottom muck from thick algal blooms continues to suffocate the benthos. DO levels dropped to 0-4 mg/L 50% of the time this summer.

Chlorophyll levels and other water quality parameters classify this area as hypertrophic or extremely eutrophic. Algal blooms are increasing as a direct result of nutrient pollution resulting in little to no water clarity. Secchi Depths are continuously less than 0.25 meters or 0.8 feet during the months of July and August. Treatment-Sewering , stormwater improvements, and shellfish aquaculture (now limited due to increasing impairment and reduced oxygen levels).

Shoestring Bay : Increased levels of total nitrogen were evident in Shoestring Bay for 2020. Species diversity has declined substantially over the past 6 years due to poor conditions. Some of the largest blooms were seen in Shoestring Bay this past year (highest bloom concentrations seen this year out of the 20 years of data collection). Treatment-Sewering , stormwater improvements, and shellfish aquaculture. Treatment-Sewering , stormwater improvements, and shellfish aquaculture (now limited due to increasing impairment and reduced oxygen levels).

Main Basin : Showing decline. No good water quality is left in Popponesset Bay. Chlorophyll –a levels are generally high than the long-term historical mean supporting that the area is now nitrogen enriched and the conditions are steadily on the decline. Treatment-Sewering , stormwater improvements, and shellfish aquaculture (now limited due to increasing impairment and reduced oxygen levels).

Figure 2.)



State of Mashpee Ponds:

Nutrient Sampling through the PALS (Ponds and Lakes Stewardship) Program 2018 and 2020 results presented, along with Mashpee / APCC Cyanobacteria (Blue Green Algae) Sampling from 2021: Most recent data shows a continuing negative trend in all ponds. All ponds are becoming increasingly impaired due to groundwater and surface water discharge containing excess nutrients and contaminants.

Lakes are classified by Trophic State Index:

- Oligotrophic : “good” water quality
- Mesotrophic : “Fair” water quality
- Eutrophic / Hypereutrophic : “Poor” water quality

Ashumet Pond:

Surface Water (0.5 meters):

2018: 17.25 uM Total Nitrogen, 0.51 uM Total Phosphorus

2020: 23.49 uM Total Nitrogen, 1.05 uM Total Phosphorus **high external input from surface runoff

Mid Water (9 meters):

2018: 20.79 uM Total Nitrogen, 0.65 uM Total Phosphorus

2020: 22.30 uM Total Nitrogen, 0.69 uM Total Phosphorus

Bottom water (18 meters):

2018: 47.93 uM Total Nitrogen, 6.31 uM Total Phosphorus

2020: 17.81 uM Total Nitrogen, 0.73 uM Total Phosphorus

*** Ashumet has been treated with nutrient inactivation – Aluminum Sulfate. Bottom water will see a decrease in total phosphorus from the treatment.

Cyanobacteria 2021: Average cyano species cell count between 5/30- 11/3 – 3,459 cells/ ml
1 posted advisory based on DPH guidelines (7/15-8/2): presence of a scum layer and high cell counts

*** See attachment A

Trophic State: Mesotrophic / Eutrophic – nutrient inactivation when eutrophic reduces nutrient availability and will remain mesotrophic until the inactivation treatment becomes ineffective due to continued external nutrient input.

Contaminants: Mercury – No fish consumption for largemouth bass. Phosphorus load from septic systems addressed with nutrient inactivation treatment. Chlorinated solvents – PRB . Abnormal Fish Deformities, Erosions, Lesions, Tumors (DELTS)

John's Pond: Data presented shows unchanging conditions in nutrient concentrations, although more sampling is needed.

Surface Water (0.5 meters):

2018: 16.87 uM Total Nitrogen, 0.36 uM Total Phosphorus

2020: 20.50 uM Total Nitrogen, 0.58 uM Total Phosphorus

Mid Water (9 meters):

2018: 26.12 uM Total Nitrogen, 0.65 uM Total Phosphorus

2020: 21.10 uM Total Nitrogen, 0.46 uM Total Phosphorus

Bottom Water (16 meters):

2018: 73.57 uM Total Nitrogen, 0.65 uM Total Phosphorous

2020: 30.67 uM Total Nitrogen, 0.54 uM Total Phosphorous

Cyanobacteria 2021: Average cyano species cell count between 5/30- 11/3 – 1,984 cells/ ml
No advisories posted for cyanobacteria, except for 1 E.coli swimming advisory

Cyanobacteria scum layer presence near the shoreline seen by residents this summer in and around the fish ladder.

Trophic State: Eutrophic. Poor oxygen conditions noted during the summer months.

Invasive Species: Coy fish, and milfoil (treated in 2021 with algaecide)

Contaminants: PFAS and Mercury – No consumption of fish order issued by Mass. DPH.
Chlorinated solvents – extraction well. Mercury in Fish Tissue.

Mashpee Wakeby : (Treated as Two Ponds for Profile Sampling Purposes)

Mashpee: Continued Total Phosphorus and Total Nitrogen Increase

Surface Water (0.5 meters):

2018: 19.34 uM Total Nitrogen, 0.51 uM Total Phosphorus

2020: 23.49 uM Total Nitrogen, 0.54 uM Total Phosphorus

Mid Water (9 meters):

2018: 19.05 uM Total Nitrogen, 0.99 uM Total Phosphorus

2020: 25.29 uM Total Nitrogen, 0.80 uM Total Phosphorus

Bottom Water (16 meters):

2018: 75.64 uM Total Nitrogen, 6.09 uM Total Phosphorus

2020: 146.30 uM Total Nitrogen, 8.28 uM Total Phosphorus

Cyanobacteria 2021: Average cyanobacteria species cell count between 5/30- 11/3 – 105 cells/ml

1 advisory posted due to the presence of a scum layer (6/24- 7/7)

Trophic State: Mesotrophic – Generally has moderate nutrient concentrations throughout the pond. Secchi Depth (water clarity) is greater than 8 feet. Note- high phosphorus from groundwater infiltration.

Wakeby : Continued Total Phosphorus and Total Nitrogen Increase

Surface Water (0.5 meters):

2018: 23.88 uM Total Nitrogen, 0.65 uM Total Phosphorus

2020: 29.18 uM Total Nitrogen, 0.73 uM Total Phosphorus

Mid Water (9 meters):

2018: 22.23 uM Total Nitrogen, 0.58 uM Total Phosphorus

2020: 27.08 uM Total Nitrogen, 0.69 uM Total Phosphorus

Bottom Water (10 meters):

2018: 52.06 uM Total Nitrogen, 2.26 uM Total Phosphorous

2020: 52.51 uM Total Nitrogen, 2.65 uM Total Phosphorous

Cyanobacteria: Average cyano species cell count between 5/30- 11/3 – 717 cells/ ml

1 advisory posted due to the presence of a scum layer (6/24- 7/7)

Trophic State: Mesotrophic / Eutrophic – Generally has moderate nutrient concentrations. Secchi Depth (water clarity) is reduced in comparison to Mashpee side, at roughly 5 feet throughout the summer months. Note- also seeing higher phosphorous concentrations from groundwater infiltration.

Contaminants: Recent PFAS/Mercury. Fishing advisory posted.

Santuit Pond :

Surface Water (0.5 meters):

2018: 58.54 uM Total Nitrogen, 1.53 uM Total Phosphorus

2020: 80.63 uM Total Nitrogen, 1.34 uM Total Phosphorus

Mid Water (2 meters):

2018: 71.51 uM Total Nitrogen, 0.65 uM Total Phosphorus

2020: 87.21 uM Total Nitrogen, 1.38 uM Total Phosphorus

Bottom Water (2.5-3 meters): Mid Water is for all intensive purposes considered bottom water due to the overall depth of the pond.

Cyanobacteria: Average cyano species cell count between 5/30- 11/3 – **70,475 cells/ ml.**

Advisory posted all summer

Trophic State: Eutrophic / Hypertrophic – Heavy algal blooms possible throughout the summer, extensive macrophyte issues, often under hypertrophic conditions.

Contaminants/ Toxins: Toxins present from HAB species (Cyanobacteria – microcystin).

Abnormal Fish Deformities, Erosions, Lesions, Tumors (DELTS).

Ponds listed by rank of impairment from most to least taking all supporting data into consideration:

- 1.) Santuit Pond
- 2.) Ashumet Pond
- 3.) John's Pond
- 4.) Wakeby side of Mashpee Wakeby
- 5.) Mashpee side of Mashpee Wakeby

Attachment A :

Water Body	Location	Date	Cell count Total Cells/mL
Ashumet Pond	Landing	7/21/2021	821
John's Pond	Town Beach	7/21/2021	707
	Landing	7/21/2021	2,954
Mashpee Lake	Landing	7/21/2021	263
Sanuit Pond	Bryant's Neck	7/21/2021	13,443
	Landing	7/21/2021	20,817
Wakeby Lake	Bog	7/21/2021	1,456
Ashumet Pond	Landing	7/28/2021	192
John's Pond	Town Beach	7/28/2021	1,921
Mashpee Lake	Landing	7/28/2021	401
Sanuit Pond	Landing	7/28/2021	73,003
Wakeby Lake	Bog	7/28/2021	535
Ashumet Pond	Landing	8/4/2021	103
John's Pond	Town Beach	8/4/2021	531
Mashpee Lake	Landing	8/4/2021	71
Sanuit Pond	Bryant's Neck	8/4/2021	43,115
Wakeby Lake	Bog	8/4/2021	153
Ashumet Pond	Landing	8/11/2021	19,995
John's Pond	Town Beach	8/11/2021	2,402
Mashpee Lake	Landing	8/11/2021	4
Sanuit Pond	Bryant's Neck	8/11/2021	47,488
Wakeby Lake	Bog	8/11/2021	6
Ashumet Pond	Landing	8/18/2021	759
John's Pond	Town Beach	8/18/2021	390
Mashpee Lake	Landing	8/18/2021	11
Sanuit Pond	Bryant's Neck	8/18/2021	21,063
Wakeby Lake	Bog	8/18/2021	7
Ashumet Pond	Landing	8/25/2021	639
John's Pond	Town Beach	8/25/2021	1,397
Mashpee Lake	Landing	8/25/2021	83
Sanuit Pond	Bryant's Neck	8/25/2021	80,646
Santuit Pond	Town Landing	8/25/2021	169,288
Wakeby Lake	Bog	8/25/2021	1,558

Santuit Pond	Bryant's Neck	8/26/2021	79,702
Ashumet Pond	Landing	9/1/2021	1,709
John's Pond	Town Beach	9/1/2021	1,027
Mashpee Lake	Landing	9/1/2021	84
Sanuit Pond	Bryant's Neck	9/1/2021	75,516
Santuit Pond	Town Landing	9/1/2021	110,834
Wakeby Lake	Bog	9/1/2021	204
Ashumet Pond	Landing	9/8/2021	11,265
John's Pond	Town Beach	9/8/2021	1,110
Mashpee Lake	Landing	9/8/2021	63
Sanuit Pond	Bryant's Neck	9/8/2021	93,597
Santuit Pond	Town Landing	9/8/2021	70,529
Wakeby Lake	Bog	9/8/2021	127
Ashumet Pond	Landing	9/15/2021	2,060
John's Pond	Town Beach	9/15/2021	3,448
Mashpee Lake	Landing	9/15/2021	138
Sanuit Pond	Bryant's Neck	9/15/2021	89,692
	Town Landing	9/15/2021	74,050
Wakeby Lake	Bog	9/15/2021	131
Ashumet Pond	Landing	9/22/2021	1,019
John's Pond	Town Beach	9/22/2021	5,263
Mashpee Lake	Landing	9/22/2021	202
Sanuit Pond	Bryant's Neck	9/22/2021	41,092
Santuit Pond	Town Landing	9/22/2021	36,694
Wakeby Lake	Bog	9/22/2021	37
Ashumet Pond	Landing	9/29/2021	1,895
John's Pond	Town Beach	9/29/2021	3,337
Mashpee Lake	Landing	9/29/2021	31
Sanuit Pond	Bryant's Neck	9/29/2021	71,325
Santuit Pond	Town Landing	9/29/2021	45,937
Wakeby Lake	Bog	9/29/2021	311
Ashumet Pond	Landing	10/6/2021	2,231
John's Pond	Town Beach	10/6/2021	1,948
Mashpee Lake	Landing	10/6/2021	26
Sanuit Pond	Bryant's Neck	10/6/2021	121,451
Santuit Pond	Town Landing	10/6/2021	91,139

Wakeby Lake	Bog	10/6/2021	491
Ashumet Pond	Landing	10/14/2021	3,582
John's Pond	Town Beach	10/14/2021	5,116
Mashpee Lake	Landing	10/14/2021	39
Sanuit Pond	Bryant's Neck	10/14/2021	81,820
Wakeby Lake	Bog	10/14/2021	5,515
Sanuit Pond	Bryant's Neck	10/16/2021	33,512
Ashumet Pond	Landing	10/20/2021	3,009
John's Pond	Town Beach	10/20/2021	588
Mashpee Lake	Landing	10/20/2021	59
Sanuit Pond	Bryant's Neck	10/20/2021	3,995
Santuit Pond	Town Landing	10/20/2021	3,529
Wakeby Lake	Bog	10/20/2021	102
Ashumet Pond	Landing	10/28/2021	2,552
John's Pond	Town Beach	10/28/2021	432
Mashpee Lake	Landing	10/28/2021	60
Sanuit Pond	Bryant's Neck	10/28/2021	6,090
Santuit Pond	Town Landing	10/28/2021	3,678
Wakeby Lake	Bog	10/28/2021	31
Ashumet Pond	Landing	11/3/2021	41
John's Pond	Town Beach	11/3/2021	137
Mashpee Lake	Landing	11/3/2021	36
Sanuit Pond	Bryant's Neck	11/3/2021	3,954
Santuit Pond	Town Landing	11/3/2021	4,860
Wakeby Lake	Bog	11/3/2021	84



Town of Mashpee
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Public Health
Prevent. Promote. Protect.

MEMORANDUM

To: Rodney C. Collins, Town Manager

cc: Wayne Taylor, Assistant Town Manager
Terrie Cook, Administrative Assistant

From: Glen E. Harrington, C.H.O, Health Agent 

Date: November 4, 2021

Re: Status of Santuit Pond Abutter Septic System Inspection/Pumping Survey

At your request and that of the Select Board, the Board of Health ordered septic inspections and pumpings for 121 abutters whose property falls within 300' of Santuit Pond. Order letters were sent via First Class and Certified Mail on September 9, 2021.

As of the date of this memo, a total of 17 certified letters were returned undelivered with the following outcomes:

- Three (3) properties have since fully complied
- One (1) property owner has two affected properties, one of which has fully complied and the other has not performed pumping but is an automatic failure due to being on a cesspool
- Two (2) properties have since complied with the inspection component only
- One (1) property has a new owner and the order was sent to the new owner
- One (1) property owner has updated their address and the order was sent to the new address
- Nine (9) properties require additional research as to the current ownership/mailing address

As of the date of this memo, 27 of the 121 affected properties have fully complied with the order to inspect and pump, and two (2) additional properties are considered to have fully complied because they have satisfied the pumping requirements and are automatic failures due to being on cesspools. One (1) "other" property is considered to have fully complied for reasons explained below. An additional 30 affected properties have complied with the inspection component of the order, five (5) of which are considered to have complied because they are automatic failures due to being on cesspools.

For clarification, a “*Conditional Pass*” indicates that the system violates one of the failure criteria in 310 CMR 15.303, but the nature of the violation is such that it can be easily corrected by making a simple repair or replacement to a broken component (i.e. a cracked septic tank; a broken or obstructed pipe; an uneven distribution box; or a malfunctioning pump chamber). Soil absorption systems and cesspools cannot be repaired under a conditional pass.

While they are not common, there are a number of situations where an inspector will make a determination that the system “*Needs Further Evaluation*” (i.e. any portion of the SAS, cesspool or privy is below high groundwater elevation; or any portion of a cesspool or privy is within 50 feet of a potable water supply well.) In these situations, the septic inspector cannot make another determination without first consulting with the local Board of Health.

A “*Certificate of Compliance*” (COC) was accepted in lieu of an inspection when the COC was issued no more than two years prior to the date of receipt of the order letter. In these cases, there was a repair or upgrade made to the on-site septic system, and the system was deemed to be in full compliance at the time of inspection by a Health Agent.

Because Innovative/Alternative Systems (or “*I/A Systems*”) are more complex than conventional septic tank systems, Title 5 has special requirements for their installation and maintenance. I/A system owners must have in place, for the life of the system, an operation and maintenance contract with a Certified Wastewater Operator specifically licensed in Massachusetts.

The property categorized as “*Other*” has been abandoned since 2005 and is uninhabitable in its current condition. The on-site Title 5 system has seen no use in the past 16 years, and was deemed exempt from the inspection/pumping requirement.

Of the 60 properties considered to have complied with the inspection component, the following determinations were made:

- Pass: 36
- Conditional Pass: 3
- Needs Further Evaluation: 1
- Fail: 16 (includes 7 cesspools)
- Certificate of Compliance: 2
- I/A System: 1
- Other: 1

As an FYI, septic inspections performed for property transfer purposes must comply with the Mashpee Board of Health Septic Inspection Regulation. Given that these inspections are being performed under a Board of Health “order”, and are not subject to all of the provisions of the regulation, inspectors were notified that all reports should indicate “This Inspection is Not Valid for Property Transfer

Purposes", and report submittal fees have been waived, per a vote of the Board of Health at a regularly scheduled meeting.

Of the 121 affected properties, 48 properties have complied with the pumping requirement. In other words, our office has received evidence from either the septage hauler or the property owner that those systems have been pumped within the past three (3) years.

With respect to compliance, it is important to note that inspectors and haulers have notified this office that, due to overall demand and weather delays, work on these properties is being scheduled well into November. While we have not collected a specific number of inspections/pumpings scheduled in the coming weeks, we are confident that there are a number of other property owners who are working toward full compliance. We also need to take into account any delays on the part of the inspectors and haulers in submitting their inspection reports and pumping records to our office. Per Title 5, inspectors have 30 days from the date of inspection to submit their report.

If you have any questions or comments, please do not hesitate to contact me at x8553.




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MEMORANDUM

To: Rodney C. Collins, Town Manager

cc: Wayne Taylor, Assistant Town Manager
Terrie Cook, Administrative Assistant

From: Glen E. Harrington, C.H.O, Health Agent 

Date: November 4, 2021

Re: Scope of Board of Health Authority with Respect to Upgrading Failed Septic Systems and Requiring Sewer Tie-Ins

The Board of Health derives its authority to order the repair or replacement of on-site septic systems from several different laws and regulations, but primarily from Title 5 of the State Environmental Code. Title 5, 310 CMR 15.000, is the regulation that provides the requirements for the siting, repair, upgrade, and replacement of septic systems.

Title 5 also has protocols for emergency upgrades but, for the most part, septic inspections performed at time of property transfer encounter the most failed systems. The failure criteria of septic systems is outlined within the inspection section of the regulation. Title 5 provides that the Board of Health or DEP can require an inspection of a septic system *at any time*. This is the provision that the Board of Health used when it issued the inspection and pumping order to property owners within 300' of Santuit Pond.

Systems that are deemed in failure by inspection or under our local Cesspool Regulation must be upgraded or repaired within certain timeframes. Below is an excerpt from Title 5 that describes the required timeframes.

15.305: Deadlines for Completion of Upgrades

- (1) If a system is failing to protect public health, safety, welfare or the environment as set forth in 310 CMR 15.303(1) or 15.304(1), the owner or operator shall upgrade the system within two years of discovery unless:

- (a) a shorter period of time is set by the Local Approving Authority or the Department based upon the existence of an imminent health hazard; or
 - (b) the continued use of the system is permitted by the Local Approving Authority in accordance with the provisions of an enforceable schedule for upgrade. Bases for continued use include, but are not limited to, proposals to connect to a sanitary sewer or shared system. A fiscal commitment to the sewerage plan or shared system plan, together with an approved facility plan where appropriate, proposing connection or replacement of the failing system within five years, and an enforceable commitment by the owner to perform interim measures (for example, regular pumping) shall accompany any such local approval. Such approval shall expire in five years or upon the failure of the applicant for such approval to meet interim deadlines set forth in the enforceable schedule for upgrade and the plan. The Department may by specific written approval authorize the Local Approving Authority to allow a longer period of time, where the municipality has provided the Department a proposed implementation schedule for design and construction and has made a demonstrated financial commitment to the construction schedule. The Department may revoke any such approval if the approved schedule is not met.
- (2) If a system serving a facility with a design flow of 10,000 gpd or greater but less than 15,000 gpd is a significant threat to public health, safety, welfare or the environment as set forth in 310 CMR 15.304(2), the owner or operator shall upgrade the system within five years of discovery in accordance with the provisions of an enforceable schedule unless:
 - (a) a shorter period of time is set by the Department based upon the existence of an imminent health hazard;
 - (b) the continued use of the system is permitted by the Department because it is necessary to allow implementation of an environmentally superior solution. An enforceable commitment by the owner to perform interim measures (e.g., regular pumping, addition of fill) shall accompany any such approval by the Department. Such approval shall expire in seven years or upon the failure of the applicant for such approval to meet interim deadlines set forth in the enforceable schedule for upgrade.
- (3) The owner or operator shall take appropriate measures throughout the period between discovery of the condition requiring upgrade and completion of the upgrade to ensure that there is no backup or direct discharge of sewage or effluent to buildings, to the surface of the ground, or to surface waters. The local Approving Authority or the Department may order the owner or operator to take any measure necessary to ensure the protection of public health, safety, welfare and the environment during such period.

- (4) Except as provided in 310 CMR 15.004(3), all systems shall be abandoned in accordance with 310 CMR 15.354 and the buildings served by the systems shall be connected to a sewer when a sewer becomes available, unless:
- (a) the system is an alternative system approved for such use pursuant to 310 CMR 15.280 through 15.287;
 - (b) the Department has made the determination in approving either the remedial use of an alternative system pursuant to 310 CMR 15.284 or in certifying an alternative system for general use pursuant to 310 CMR 15.288 that any person using such system need not connect the facility to a sanitary sewer if such connection is feasible; or
 - (c) the owner of an existing system has obtained a variance from this requirement pursuant to 310 CMR 15.410 through 15.415. All systems shall be abandoned in accordance with 310 CMR 15.354 and the buildings served by the systems shall be connected to a sewer when directed to do so by the Board of Health pursuant to M.G.L. c. 83, § 11, by the Department pursuant to 310 CMR 15.000, or by court order.

To review, property owners of Title 5 systems have two years from date of inspection to complete repairs. A shorter timeframe can be ordered by the Board of Health if an imminent health hazard occurs. An imminent health hazard is usually considered when raw sewage backs up into a dwelling or breaks out onto the ground surface, drainage or water body. ***The Board has the authority, per 310 CMR 15.305 (1)(b), to extend the repair timeframe if sewers are proposed.*** An enforceable agreement can be executed by the homeowner and the Board of Health to extend the timeframe with certain requirements to tie into a sewer system in five years. An extension to five years must come from DEP. It is my understanding that a fiscal commitment and plan must be in place for extensions to be granted. ***Per 310 CMR 15.305 (4)(a), the Board of Health cannot require properties with approved innovative/alternative septic systems to connect to sewer.***

In the case of Santuit Pond, where those properties are in Phase 2 of the sewer plan, a fiscal commitment does not yet exist; therefore, any necessary repairs or upgrades would need to be performed, per 310 CMR 15.305 (1). However, funding for Phase 2 is proposed to be requested in May 2023 and, assuming that occurs, the timing would be such that we would still be “within the two years of discovery” allowed by Title 5. In that case, the Board of Health may be able to issue extensions with the requirement to tie into sewer within a specified timeframe.

In summary, the question put forth to this office was whether the Board of Health has proper authority to require septic repairs or replacements, and to require connection to the proposed sewer system. As outlined above, the Board of Health has full authority under Title 5 to require replacement of failed septic systems. Additionally, M.G.L. c.83, §11 states that *“The board of health of a town may require the owner or occupant of any building upon land abutting on a public or private way, in which there is a common sewer, to connect the same therewith by a sufficient drain, and such owner or occupant who fails to comply with such order shall be*

punished by a fine of not more than two hundred dollars.” Unfortunately, I have not had the opportunity to research the full application or interpretation of this statute. To better address questions relative to sewer connections, it will be necessary to consult with the Town Engineer and my counterparts in other Towns where sewer installation and hook-ups have occurred. A careful review of the existing sewer by-law will also be performed, in order to determine its appropriate application.

If you have any questions or comments, please do not hesitate to contact me at x8553.



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MEMORANDUM

To: Rodney C. Collins, Town Manager

cc: Wayne Taylor, Assistant Town Manager
Terrie Cook, Administrative Assistant

From: Glen E. Harrington, C.H.O, Health Agent 

Date: November 8, 2021

Re: Scope of Authority – Sewer Connections

At your request and that of the Select Board, additional research was conducted on the Board of Health's authority to require sewer connections under M.G.L. c.83, §11, which states *"The board of health of a town may require the owner or occupant of any building upon land abutting on a public or private way, in which there is a common sewer, to connect the same therewith by a sufficient drain, and such owner or occupant who fails to comply with such order shall be punished by a fine of not more than two hundred dollars."*

The use of the word "may" in Chapter 83, Section 11 introduces a question, rather than an order to connect, and is not as strong legally as using the word "shall". Another flaw is that it imposes only a one-time penalty of \$200 for failing to connect.

Sewer regulations and by-laws were recently approved and implemented in the towns of Falmouth and Chatham.

- Falmouth has a sewer by-law that includes a comprehensive definition of a house, building, or property that is required to tie in. It sets a 90-day timeframe to connect, may require water conservation appliances, and issues a \$50/day fine for violations. Falmouth does not have a Board of Health Sewer Regulation.
- Chatham has a Board of Health Sewer Connection Regulation. There is a cross-reference to perform the connections in accordance with Sewer Commission

Regulations. It sets a one-year connection requirement from sewer availability, a 30-day connection requirement if a property transfers ownership, and exempts I/A systems that are less than 10 years old from having to connect (this is stricter than Title 5 which exempts all approved I/A systems from connection). There is a \$200/day fine for violations.

The Mashpee Sewer By-law passed last year does not set a timeframe for connection to the sewer. The fine for penalties has been addressed at \$50/day, and Board of Health and Sewer Commission agents can enforce that. However, some of the criteria listed above will need to be addressed in a supplemental by-law, Sewer Commission Regulation or Board of Health Regulation. The inadequacies of M.G.L. c. 83, §11 can be addressed as well within any of those documents. This will further strengthen the legal and enforceable position of the Town. Town Counsel review of any new or revised regulations or by-laws will be necessary.

If you have any questions or comments, please do not hesitate to contact me at x8553.



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Public Health
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MEMORANDUM

To: Rodney C. Collins, Town Manager

cc: Wayne Taylor, Assistant Town Manager
Terrie Cook, Administrative Assistant

From: Glen E. Harrington, C.H.O, Health Agent 

Date: November 8, 2021

Re: Cesspool Count – All Water Bodies

At your request and that of the Select Board, the Board of Health began identifying properties within 100' and 300' of Mashpee water bodies. Additionally, our staff has begun researching the type of on-site septic system currently servicing each of those properties, along with the most recent inspection and pumping records for those addresses. We are still compiling and reviewing records, but have the following information to submit.

In total, 59 cesspools have been identified as being within 100' of a waterbody.

- Santuit Pond
 - 121 properties within 300'
 - Seven (7) cesspools total, one (1) within 100'
- Ashumet Pond
 - 98 properties within 300'
 - Nine (9) cesspools total, seven (7) within 100'
- Mashpee/Wakeby
 - 116 properties within 300'
 - Nine (9) cesspools total, one (1) within 100'
- John's Pond
 - 164 properties within 100'
 - Five (5) cesspools within 100'
- Popponeset, Ockway & Shoestring Bays
 - 320 properties within 100'

- Nine (9) cesspools within 100'
- Mashpee River
 - 33 properties within 100'
 - Three (3) cesspools within 100'
- Great & Little Rivers, Jehu & Hamblin Ponds, Waquoit Bay
 - 239 properties within 100'
 - 17 cesspools within 100'

Please note that only Santuit Pond records have been fully vetted, as it was identified by the Select Board as the priority area of focus. That information was provided in a separate memo. Research is ongoing on the remaining areas of concern.

If you have any questions or comments, please do not hesitate to contact me at x8553.