

Bare Hill Pond Town Beach Algal Bloom Procedure

Version for 2023

Updated (as to Contact Info. Only): July 2023

1. Introduction

This document lays out the roles and responsibilities for Town Boards and residents in ensuring the quality and safety of the water at the Town Beach when the Beach is officially open (June-August). As use of the Town Beach continues through September, the process will continue into September.

Monitoring water quality will take the cooperation of several Town boards: the Board of Health (BoH), Bare Hill Pond Watershed Management Committee (Pond Committee), Parks and Recreation (Parks & Rec), the Select Board, the Beach Director, the Harbor Master – and town residents and users of the Pond. This joint effort will provide the best protection for our residents and visitors to Harvard.

The Bare Hill Pond Water Quality Working Group consists of representatives of each of the BoH, Pond Committee, Parks & Rec, the Select Board, as well as the Beach Director and the Harbor Master.

2. Definitions

Throughout this document:

1. The **Board of Health (BoH)** refers to the Harvard Board of Health or the Nashoba Associated Boards of Health (NABH)
2. **Blue-green algae** and **cyanobacteria** are used interchangeably
3. **Hazardous algae bloom** or **HAB** are used interchangeably
4. **Observations** refer to visual observations of water quality
5. **“In water” activities (aka primary activities)** take place in the water or have significant exposure to water, e.g., swimming, water skiing, tubing (not complete list).
6. **“On water” activities (aka secondary activities)** take place on the water or have limited exposure to the water, e.g., paddling, boating, sail boarding, rowing, fishing (not complete list).

3. Responsibilities

3.1 Harvard Board of Health

Responsibilities for the BoH/Health Agent shall include:

1. Perform weekly visual observations of the water quality at the beach area (including the boat launch area), including discoloration of the water and floating scum
2. Perform weekly sampling at the Town Beach and conduct fluorometer analysis (July-September)
3. Collect water sample at Town Beach when indicated by fluorometer results between July and September to send for lab analysis of blue-green algae/Cyanobacteria bloom.
4. Record and maintain water quality, visibility, and temperature data log.

5. Respond within 48 hours¹ to phone calls reporting water quality concerns and within two working days to all emails.
6. Respond to requests for non-routine inspections.
7. Inform the Boards/Committees of the Bare Hill Pond Water Quality Working Group of any changes in water quality and organize a meeting if necessary.
8. Post and share Advisory and closure notifications.

3.2 Other Boards and Committees

Other boards and committees with interests in water quality include: Pond Committee, Parks and Recreation, the Harbor Master, and the Select Board. Their responsibilities are to:

- Contact either the Harvard Board of Health or the Nashoba Associated Boards of Health as soon as they notice any changes to water quality
- Share any water quality data they have access to, including visual observations and/or secchi disk readings
- Join any planning meetings, if required, organized by the BoH.

See 5. Contact Information below.

3.3 Residents /Citizen Scientists

Residents also have a role to play in monitoring water quality. Several areas in Town have private access to the Pond. Ideally, each area will designate one person to look for changes in water quality and report any changes to the BoH. Possible areas include: Bowers Road, Clinton Shores Drive, Peninsula Road, Turner Lane, and Willow Road. Residents are to report any observed or suspected changes in water quality to the BoH.

See 5. Contact information below.

3.4 Other committees and groups to keep informed of cyanobacteria results

In addition, advisories will be sent to:

- Dept of Public Health, Recreational Water Quality Section
- Harvard Emergency Manager/Fire Chief, Rick Sicard
- Harvard Ambulance Director, Jason Cotting
- Conservation Agent, Liz Allard
- Executive Assistant to Select Board, Julie Doucet
- Camp Green Eyrie
- The Harvard Press

¹ The Board of Health Administrative Assistant hours are posted on the Board of Health website. On days the Board of Health Administrative Assistant is not working, residents should contact a Board member.

4. Procedure:

This section describes the process to 1) observe water quality throughout the summer, 2) proposes a water testing protocol, and 3) identifies the required actions for both 1) and 2).

4.1 Observations

The Board of Health or its Health Agent will make visual observations of water quality for water color, water clarity, and floating scum at least weekly during the typical beach season (June - September). Upon a report from a collaborating Board or a resident of a water quality issue, the BoH Inspector will conduct a water quality observation at the first possible time.

Determination of the severity and potential human health risk due to diminished water quality is at the discretion of the BoH Inspector. The Inspector will consult with the Harvard Board of Health and the MA Department of Public Health.

Additional advisories for “In water” Activities and “On water” Activities shall be made after consultation with the Harvard Board of Health.

Table 1: Visual Monitoring and BoH Risk Reduction Actions

Status	Observation	Metric	Allowable Pond use	BOH actions
NORMAL	Clear water No scum Water visibility > 4 feet	Visual observation Secchi disk	Normal activities	Weekly observation. Weekly sampling and fluorometer analysis. Weekly secchi disc reading.
ALGAL BLOOM	Limited visibility, e.g., Secchi disk < 4 feet	Visual observation Secchi disk	No Swimming	Weekly observation. Weekly sampling and fluorometer analysis. Start laboratory cyanobacteria testing. BoH meets. Inform other Boards. Consult MA DPH. Issue “No Swimming” Advisory.
ALGAL SCUM	Scum on surface of water	Visual observation	No Swimming	Continue cyanobacteria testing. BoH meets. Inform other Boards. Consult MA DPH.

4.2 Proposed testing protocol for blue-green algae:

Starting in July, a water sample will be collected every week from the Town Beach area (or other public area) to analyze water quality by fluorometer for a determination of cyanobacteria cell counts. Samples will be sent as needed to an outside laboratory for confirmation of fluorometer analysis of cyanobacteria levels. Regular weekly water sampling and fluorometer analysis will continue through mid-September (see below for non-normal cases).

Table 2: Cyanobacteria Testing and BoH Risk Reduction Actions

Level	Metric	Allowable Pond use	BOH actions
LOW			
	Fluorometer analysis equivalent to and/or cell counts under 50,000 cells per milliliter (c/mL)	Normal activities	Weekly observations
			Sample water weekly mid-July to mid-September for fluorometer cyanobacteria analysis
			Set Water Quality and Safety dial sign to green
MEDIUM			
	Fluorometer analysis equivalent to and/or cell counts 50,001-70,000 c/mL	Normal activities	Weekly observations
			Weekly water sample for fluorometer cyanobacteria analysis
			Inform Bare Hill Pond Water Quality Working Group
			Dial sign stays at green

(Table continues on next page.)

HIGH			
	Fluorometer analysis equivalent to and/or cell counts of 70,001 - 1,000,000 c/mL	No Swimming or pets in the water	Continue weekly observations
		No "In water" Activities	Weekly water sample for fluorometer cyanobacteria analysis and/or laboratory analysis
		"On water" Activities permitted	Inform Bare Hill Pond Water Quality Working Group
			Inform DPH of analysis results and discuss toxin analysis plan
			Send out alert to BoH and Town e-alert subscribers
			Issue "No Swimming" Advisory. Send Advisory to those listed in Section 3.4.
			Move dial sign to Orange. Post signs indicating "No Swimming, No Pets in the Water".
EXTREME			
	Fluorometer analysis equivalent to and/or cell counts in excess of 1,000,001 c/mL	No Swimming or pets in the water No Contact with Water	Continue weekly observations
		No "In-water" activities	Weekly fluorometer water sample for cyanobacteria analysis
		Advisory against "On water" activities	Inform Bare Hill Pond Water Quality Working group
		Close the ramp to boating access, if necessary	Update DPH; discuss conducting toxin analysis
			Send out alert to BoH and Town e-subscribers
			Issue "No Contact" Advisory. Send advisory to those listed in Section 3.4.
			Move dial to Red. Post "No Water Contact" signs.

Lifting Advisories

The BoH will follow the DPH guidelines to lift, modify, or cancel any advisory. The determination to lift or modify an advisory will be based upon successive water sampling results taken at least one week apart. New or revised advisories will reflect changes to the risk levels dependent on the applicable cell count or toxin results.

5. Contact information:

In the event that a collaborating committee, a resident, or a BoH member observes a change in water quality, the BoH and the BoH Agent should be informed immediately. The BoH will contact the Pond Committee, Parks and Recreation, the Select Board Chair, the Harbor Master and Beach Director.

In the event that the observation is made over the weekend or outside of office hours, the collaborating Board member or resident should *both* email the Health Agent and at least one BoH member, and phone at least one Board member.

- Bare Hill Pond Management Committee, Chair: Bruce Leicher
- Harvard Parks and Recreation Commission, Chair: Bob O'Shea
- Beach Director (Interim): Bob O'Shea
- Director of Community Education and Recreation: New hire beginning 8/28/23
- Harbor Master: Bob O'Shea
- Harvard Select Board, Chair: Rich Maiore
- Board of Health, Liaison: Libby Levison
- Nashoba Associated Boards of Health, Health Agent: Jim Garreffo: (978-772-3335 x305; After hours: 800-698-3307)

6. Conclusion

The BoH will review this document two times a year.

- Every November, the BoH will review the process. Any proposed changes will be shared with the collaborating Boards for review.
- Every July, the BoH Administrative Assistant will update the Contact Information section.

Annex 1: MA DPH information on harmful algae blooms

The following is a summary of information from the MA Department of Public Health (DPH) at:

<https://www.mass.gov/guides/cyanobacterial-harmful-algal-blooms-cyanohabs-water>

DPH guidance recommends that individuals be advised not to contact the water when 1) a visible scum or mat is present, 2) the total cyanobacteria cell count exceeds 70,000 cells per milliliter of water (cells/ml), or 3) the microcystin level equals or exceeds 8 parts per billion (ppb) to prevent adverse health effects from exposure opportunities to cyanobacteria and related toxins during algal blooms. MDPH recognizes that it is generally more feasible to monitor a HAB using cell count methods rather than toxin analytical methods. MDPH offers the following general guidance related to monitoring potential cyanobacteria problems with the stated goal of preventing health effects before cyanobacteria or toxins reach levels of concern or higher:

1. If a visible cyanobacteria scum or mat is evident, MDPH recommends an immediate posting by the local health department, state agency, or relevant authority to advise against contact with the water body.
2. If the cell count exceeds 50,000 cells/mL, toxin testing of lysed cells should be done to ensure that the concentration of toxin microcystins does not exceed 8 ppb (= 8 µg/L). The lysing should consist of three freeze and thaw cycles.
3. If either the cell count exceeds 70,000 cells/mL or the toxin microcystins level of lysed cells meets or exceeds 8 ppb (= 8 µg/L), post an advisory against contact with the water. The lysing should consist of three freeze and thaw cycles.
4. Because cyanobacteria can multiply extremely rapidly, frequency of follow-up testing may depend in part on weather conditions, e.g., predicted hot, dry, and calm conditions, all of which promote rapid cyanobacteria generation, may suggest more frequent testing than weekly.

Since decreasing cell counts indicate cell die-off and lysing cells release toxins, algal toxin concentrations in the water may rise for a period of time *after* cell counts decrease. Many factors (e.g., wind, rain, temperature) can affect the progression of die-off, which supports a measured approach for lifting an advisory: advisories may be lifted after two successive and representative sampling rounds one week apart demonstrate cell counts or toxin levels below those at which an advisory would be posted.

Annex 2: Templates of Advisories

1. No Swimming Advisory template
2. Maintain No Swimming Advisory template
- 2.5 Maintain No swimming Advisory late Sept
3. No Contact Advisory template
- 3.5 Maintain No Contact Advisory template
4. Lift No swimming advisory template
5. Lift No Contact advisory template