

## **Excerpt from the MA Dept. of Public Health:**

### **Guidelines for cyanobacteria cell counts**

The available literature and the equation noted above suggest that at approximately 20,000 cells/mL, associated toxin levels may range between 2-4 ppb, while at 100,000 cells/mL, associated toxin levels may be approximately 20 ppb. If we assume a linear relationship between cyanobacteria cell counts and associated toxin levels (data are sparse in this area), a cell count of 70,000 cells/mL would correspond to a toxin level of approximately 14 ppb. This is also the concentration derived using the equation. Thus, to be protective and reduce potential exposures to levels at which there is a greater likelihood of health effects, MDPH recommends that at a cell count of 70,000 cells/mL, individuals should be advised to refrain from coming into contact with the affected water.

### **Recommendations for monitoring or advisory posting**

MDPH believes that the current literature supports the use of a cell count guideline of 70,000 cells/mL in order to prevent adverse health effects from exposure opportunities to cyanobacteria and related toxins during algal blooms. MDPH also recognizes that it is generally more feasible to monitor using cell count methods rather than toxin analytical methods. We do offer 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 guideline of 14 ppb is not exceeded. The lysing should consist of three freeze and thaw cycles.
3. If either the cell count exceeds 70,000 cells/mL or the toxin level of lysed cells meets or exceeds 14 ppb, 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.
5. 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 effect the progression of die-off, which supports a measured approach for lifting an advisory similar to that of Oregon and Australia: 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.

Signage should be posted at (all) water body entry points and should include the following: date of the posting, contact information for the posting authority, language (to be provided or reviewed by MDPH) advising against contact with the water, and a recommendation that pets accidentally entering the water be rinsed.

This proposed protocol does not pertain to the toxin anatoxin, which is produced by several species of cyanobacteria. There is no guidance in the literature for responding to detections of anatoxin. Thus, if anatoxin is detected, MDPH will evaluate such situations episodically, using supplemental information such as cyanobacteria counts, exposure scenarios (popular swimming site, for instance), and upcoming weather forecasts. The cyanobacteria *Anabaena*, which produces anatoxin, would be included in any cell counts of cyanobacteria. Therefore, there is some mechanism for managing the risk it poses.

Source: <https://www.mass.gov/info-details/guidelines-for-cyanobacteria-in-freshwater-recreational-water-bodies#guidelines-for-cyanobacteria-cell-counts->