**Working Guidance for Cyanobacteria Bloom Advisory Management**

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For more information on this guidance please contact Margaret.Smigo@vdh.virginia.gov. This guidance is posted at [www.SwimHealthyVa.com](http://www.SwimHealthyVa.com).

**Advisory thresholds**

The Environmental Protection Agency (EPA) issued recommended recreational water quality criteria for microcystin and cylindrospermopsin in May 2019. These recommendations include water column thresholds for both cyanobacteria cell counts and specific toxin concentrations. The Virginia Department of Health (VDH) thresholds described here are based on the EPA recommendations. Recreational (swimming) advisories will be recommended when water column sample concentrations are greater than or equal to any of the below thresholds associated with Harmful Algal Blooms (HABs; Table 1). In addition, the presence and extent of potentially toxic algal scums or mats may be used in conjunction with these thresholds as grounds for issuance of advisories. Responses to suspected blooms are prioritized during the recreational season (May 1 through October 31) and in publicly accessible water bodies.

Table 1: Draft cyanobacteria bloom recreational advisory thresholds.

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| **Criteria** | **Concentration** |
| *Microcystis* species | 40,000 (total cells/mL) |
| Total toxigenic species\* | 100,000 (total cells/mL) |
| Microcystin toxin | 8 µg/L (ppb)  |
| Cylindrospermopsin toxin | 15 µg/L (ppb)  |

*\*Toxigenic species list is subject to change based on most recent research and is available upon request.*

**Follow-up Monitoring**

Once an advisory is in place, the focus of monitoring is to provide information that will inform VDH on whether it is appropriate to lift, extend, or modify the advisory. The frequency of follow-up monitoring is subject to the availability of staff, resources, and lab capacity. Monitoring every two weeks is ideal if personnel and resources are available but this frequency is not essential in every case and may not be possible based on resource and personnel availability.Most follow-up sampling includes both cell counts and toxin assays (microcystin and cylindrospermopsin). However, each follow-up investigation is designed by the HAB task force as most appropriate for the specific case and the resources available, therefore, the type and number of samples analyzed is expected to vary among HAB advisories. If the waterbody in question is a drinking water source, toxin assays should be done to provide the VDH Office of Drinking Water a reference of toxin concentration at the source water.

Swimming advisories are typically lifted when two consecutive sampling events, taking place at least 10 days apart, indicate that water column cell counts and toxins are below all advisory thresholds. In certain circumstances, VDH may recommend lifting advisories with fewer than two consecutive samples, or may extend advisories when water column concentrations are below thresholds but other factors indicate a continued risk of HAB exposure. Special circumstances such as these will be described in announcements related to specific advisories. Advisories may be lifted after October 31 (end of the recreation season) when prior sample results indicate that the thresholds are exceeded.

**Assessing Cyanobacteria Exposure Risk of Scums or Floating/Benthic Mats**

Should field staff judge that conditions warrant, investigations may also include collection of “solid material” samples (i.e. algal scums or mats that are suspended in the water column, on the surface, or on the bottom). Sampling of solid material is warranted when algal growth at the surface or on the bottom is spatially extensive, such that it cannot easily be avoided when accessing a water body for recreation. When warranted, samples containing solid material that does not disperse into the water column sample will be collected to provide supplemental information to the public and stakeholders on the bloom compositions.  These samples will be evaluated in the laboratory to determine if algal toxins are detectable or not and to determine the proportion of potentially toxic cyanobacteria present in the sample, relative to non-toxigenic algae.  Neither cell densities (algal cells per unit volume) nor toxin concentrations (mass toxin per unit volume) will be reported from solid material samples.  Because there are currently no accepted nor published advisory thresholds for solid materials for Virginia waters, information from solid materials will not be used as grounds alone for issuance of advisories.  Exceptions to this are cases where water column thresholds are exceeded, or when solid material at the surface with confirmed toxins and/or potentially toxigenic species is extensive and widespread in the waterbody, such that it cannot be avoided during water recreation activities and is therefore likely to result in accidental ingestion.

**References:**

World Health Organization (WHO). 2003. *Guidelines for Safe Recreational Water Environments*. http://whqlibdoc.who.int/publications/2003/9241545801.pdf?ua=1

Environmental Protection Agency (EPA).2019. *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystin and Cylindrospermopsin*. https://www.epa.gov/sites/production/files/2019-05/documents/hh-rec-criteria-habs-document-2019.pdf