Cyanobacteria Bloom Response Job Aide - June 2022

Note: Results shared by the in-state contract lab with VDH (a 3 - 7 day turnaround time is typical from date the lab receives samples) will be shared via email with the local health district Environmental Health manager, Emergency Coordinator, the Public Information Officer, and Health Director, in addition to Office of Environmental Health Services/Division of Shellfish Safety & Waterborne Hazards directors and management, and Office of Drinking Water staff.

1. *Until further review, results external to the HAB Task Force will not be considered for review for the issuing or lifting of either "recreational advisories" or "benthic alerts".*
2. *Visual observations of potential blooms or mats external to the HAB Task Force which are submitted may be reviewed and evaluated for further response (similar to other HAB reports).*

Purpose. This document outlines the recommended implementation of management actions for VDH staff in the 2022 recreational season (May - October) for benthic cyanobacteria bloom response. This document is complementary to the adopted management guidance posted here: https://www.vdh.virginia.gov/content/uploads/sites/178/2022/01/FINAL_SIGNED_Guidance_for_Cyanobacteria_Recreational_Advisory_Mgt.5Aug2021-1.pdf. Pages of this document which are relevant to benthic cyanobacteria bloom response can be found on pages 4 and 13-14.

Response sampling for suspected HAB events will focus on water column sampling. The sampling and analytical methodology as well as the advisory threshold values for water column samples are well established. Sampling of solid algal material will be suspended for the 2022 recreation season in order to address and resolve multiple issues. These include:

1. establishing additional guidance on criteria for making management decisions for a waterbody (e.g. health advisories or alerts) based on data from benthic algal blooms or from solid material samples; and
2. establishing additional field methodology for benthic blooms and solid algal materials, to include field safety and sample collection procedures; and
3. establishing laboratory capacity for performing benthic HAB analyses, which is currently lacking; and
4. determining training needs to ensure that HAB task force partners can collect data appropriate for evaluating the criteria established in resolving issue 1 above.

   Should lab capacity, field staff resources, and funding allow, and should the issues above be resolved, collection and analysis of solid algal materials by Task Force partners may resume.

Recommendations for VDH staff during benthic cyanobacteria bloom response:

1. When benthic cyanobacteria bloom reports are received via the HAB report portal (online or hotline), VDH Waterborne Hazards staff notify the HAB task force partners within the vicinity of the bloom, to request initial investigation.

2. VDH Waterborne Hazards staff will notify the local health district Environmental Health (EH) Manager, Emergency Coordinator, the Public Information Officer (PIO), and Health Director, in addition to Office of Environmental Health Services (OEHS)/ Division of Shellfish Safety and Waterborne Hazards (DSSWH) directors/managers of the complaint

and the status of the investigation. The Office of Drinking Water (ODW) Emergency Services Coordinator will also be cc'd on this correspondence.

3. HAB Task Force partners (ex. DEQ field staff) when investigating reports, will only collect water column samples for analysis at contracted state labs. Water samples will be analyzed for Identification (ID) and enumeration of potentially toxigenic (PTOX) algal taxa based on the current PTOX taxa list, as well as for algal toxin concentrations (µg toxin/L of sample), and collected using the ODU Phytoplankton Analysis Lab - HAB Sample Collection for Virginia (2022) instruction and the ODU Phytoplankton Analysis Lab - Field Collection Chain of Custody Sheet.

4. Field data related to visual observations of benthic mats, whenever possible, should include photographic evidence of presence/absence, as they assist in the confirmation of benthic mats at a site and provide some reference to the density of benthic mats in the area. Potentially toxic benthic cyanobacteria mats may or may not be visually distinct from non-harmful algae which may also be present. If a prior benthic cyanobacteria bloom has been observed in a waterbody, visual confirmation based on comparative photos of prior blooms may be sufficient to establish "presence" of cyanobacteria in subsequent blooms. A primary factor in evaluating a cyanobacteria mat is whether or not the mat is extensive. As described in the August 2021 Guidance, a mat is extensive …**"when cyanobacteria mats at the surface or benthos are extensive and widespread in the waterbody, such that it cannot be avoided during water recreation activities"**.

5. **Recreational Advisories.** VDH staff will review results of water samples in accordance with adopted cyanobacteria advisory guidance based on the thresholds found in Table 1 of the August 2021 guidance. When these thresholds are exceeded, a **Recreational Advisory** will be recommended to the local health district for a specific waterbody extent. All established efforts as identified in the existing guidance, including follow-up monitoring and analyses, should continue as resources allow to characterize the bloom for determining whether or not it poses a health risk to swimmers, and lift the recreational advisory when possible. Spatial guidance for determining the advisory extent may include the following:
    a. DEQ or other regional HAB partners with knowledge of field conditions may be consulted and provide recommendations on the spatial extent of an advisory.
    b. Prior history of advisories and alerts at or near the site should be considered.
    c. Predetermined segments (such as DEQ Assessment Units (AUs) may be used for initial segmentation of the waterbody for alert extent determination purposes. Other features to consider include: high recreational use areas, easily recognizable reference points such as boat ramps, public access points, and other factors.
    d. When no information is available that helps define the spatial extent, the extent may be set to a default of 2.5 miles above and below the site.

6. **Benthic Cyanobacteria Mat Alerts.** At locations where the water sample results do not exceed adopted water column cyanobacteria advisory thresholds, but **"...cyanobacteria mats at the surface or benthos are extensive and widespread in the waterbody, such that it cannot be avoided during water recreation activities"**, VDH Waterborne Hazards staff will recommend the local health district issue a **Benthic Alert** to notify the public regarding the presence of a benthic cyanobacteria bloom in the waterbody.
    a. Benthic cyanobacteria mat alert notifications are not analogous to recreational swimming advisories, however, they have a similar intent of raising public awareness to the presence of potentially toxic benthic mats in the waterbody. People, pets, and livestock should avoid contact with the mats. Pets and livestock in particular are more likely to consume mat materials along the shoreline. Benthic cyanobacteria mats producing toxins which are consumed by pets and livestock can result in rapid onset of illness as well as death of the animal.

    b. The factors considered in designating the spatial extents of a benthic alert are the same as those listed in recommendations above for a recreational advisory.

    c. If a benthic alert is necessary in the vicinity of a public drinking water intake, the extent of the alert above/below may be extended through recommendation by the VDH Office of Drinking Water in order to capture the intake location. The rationale is to discourage contact with mats in the vicinity of a public drinking water intake, as disturbing mats may cause mats to release toxin into the water column, which could impact drinking water.

    d. When a waterbody has been previously identified as supporting benthic cyanobacteria mats (i.e. - visually, microscopy, toxins in the current or prior seasons), VDH may further extend existing benthic alerts as additional visual observations of benthic cyanobacteria mats are reported within the waterbody. VDH may use the default 2.5 miles above/below the reported site or utilize landmarks if available for alert extent purposes.

    e. Not all benthic cyanobacteria blooms may be visually distinguished from other algal growth along the bottom of the waterbody. However, when benthic mats are visually obvious from other benthic algae and macrophytes, photographs with associated latitude/longitude may be added to HAB map entries to help the public discern mats from other organic material which may be present.

    f. If there are reported health impacts (human health and/or pet/livestock mortalities), including those from an area where a Benthic Alert has been issued, this may result in the issuance of additional outreach including Recreational Advisories and the recommendation for additional water sampling and analyses to be conducted.

7. **Benthic Alerts. Issuance period and follow-up.**
    a. If a benthic alert has been issued for a waterbody it will remain in place for the duration of the swimming season (defined as May - October for HAB response purposes), unless the following criteria are met.
    b. If the extent of benthic cyanobacteria mats are absent or no longer "widespread and unavoidable" for a minimum of 2 consecutive observations within a benthic alert extent (as resources allow over a 2 week/10-day time period) the alert may be re-evaluated. As resources allow, water samples may be collected.
        i. **If water samples indicate presence of PTOX taxa or toxins above the** water column thresholds, a recreation advisory is recommended (possibly in addition to a benthic cyanobacteria mat alert) for issuance by the local health department to replace the benthic alert.
        ii. Additional follow-up water samples, should resources allow, may be collected at a minimum of every two weeks (10-days apart providing that through continued visual observations, benthic mats are absent or are decreasing), or as resources allow, to re-evaluate for PTOX taxa and toxins.
        iii. If mats are absent or no longer "widespread and unavoidable" and follow up water sample results indicate toxins below detection limits and PTOX densities below water column thresholds, then a benthic cyanobacteria mat may be lifted if desired.
        iv. Alerts may remain in place if desired by local health district or waterbody manager if desired out of an abundance of caution.
        v. All alerts lifted and removed at end of Recreation Season (November 1) unless otherwise directed by local health district or waterbody manager.

8. **Benthic Alerts. Outreach and Communication with the Public.**
Note - These are general guidelines, but may be modified as necessary due to holidays, extraordinary circumstances, or other unforeseen circumstances.
    a. The locations of benthic alerts which have been issued for waterbodies will be posted to the online HAB map and updated weekly during normal work hours, with a goal of no later than Friday of each week and ahead of holidays. Alerts will be delineated by their extents as described above.
    b. Status reports will be posted on the HAB website www.swimhealthyva.com (one status report per waterbody) and updated monthly.
    c. Information in the alerts will include guidance to owners of pets and livestock to prevent them from wading in waterbodies where a benthic alert is issued. Guidance will include that animals should not have access to mats which may accumulate along the shoreline to prevent consumption of mat material, which may be toxic.
    d. Benthic alert outreach materials for veterinarians and health care providers will be available on the HAB website www.swimhealthyva.com.
    e. A flow chart which visually depicts the steps expected during HAB response events based on this job aide and the existing recreational guidance is available on page 5 (Figure 1) of this document.
    f. PDFs of signage for placement at public access points in the benthic alert extent of the waterbody will be available at www.swimhealthyva.com and on page 6 (Figure 2) of this document. Health District may request an editable publisher version of signs to personalize them.

Figure 1. Flow chart for expected response actions related to Job Aide and Cyanobacteria Advisory Guidance (2022)

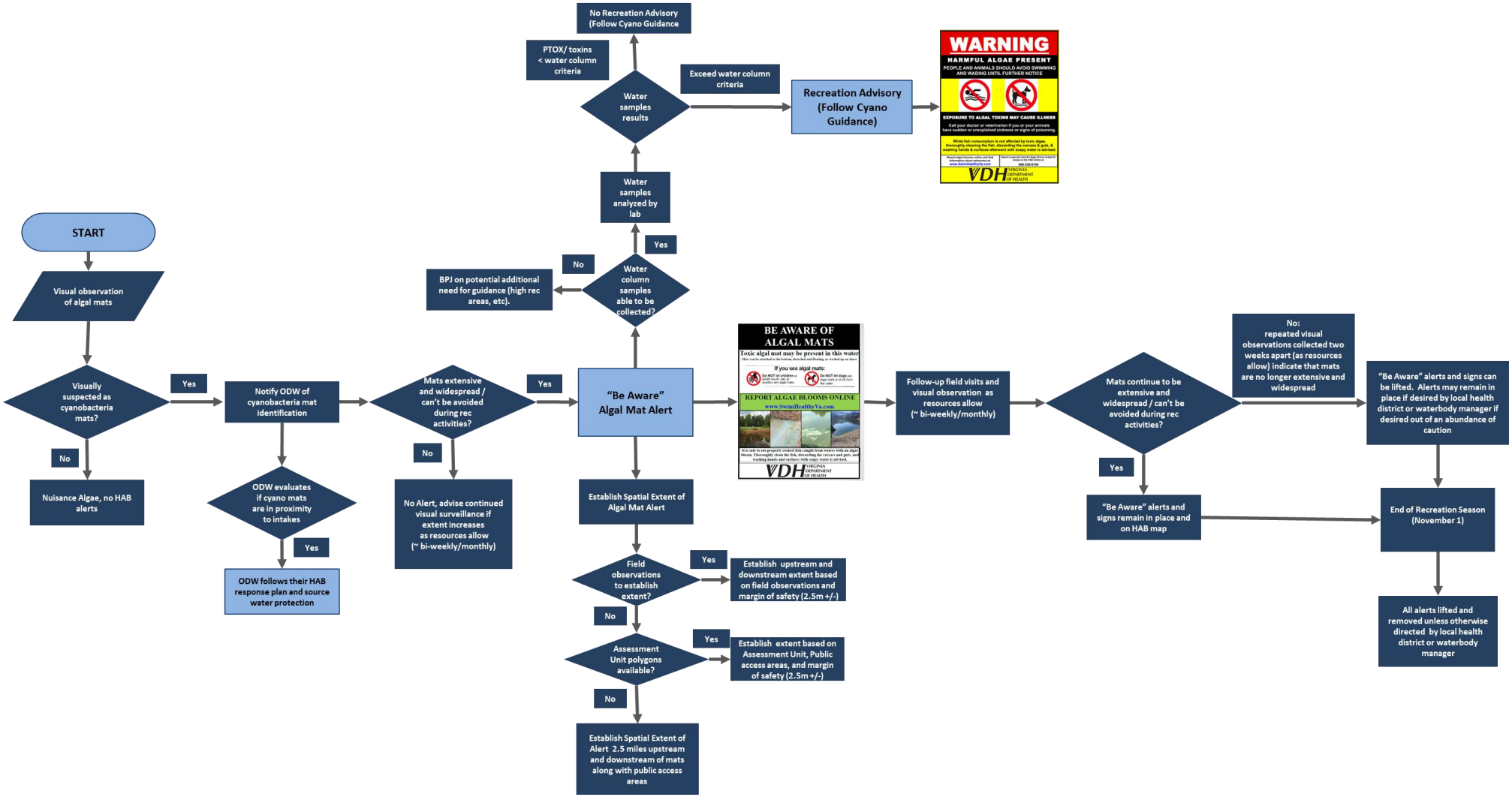

Figure 2. Signage which may be used at public access points during a Cyanobacteria Advisory or an Algae Mat Alert

Cyanobacteria Advisory Sign

Algae Mat Alert Sign

Note – this sign can be personalized with local contact information