

# Cyanotoxins Incident Response Questionnaire

This questionnaire was created to be used as a guide to assess the suspected or confirmed cyanotoxins event in drinking and recreational water.

## Guidelines and Health Advisories Questions?

1. Do you have guideline values in place for cyanotoxins? Which cyanotoxins? What are the recommended guideline/advisory values?
2. Have there been any human and/or animals (including pets, fish, and livestock) illness reported?
3. Are Response Plans, and Risk Communication Plans in place? Is there an organized method for communicating with the stakeholders?

## Sampling and Methodology

1. Are you aware of historical HABs in your source water (similar question to what UCMR 4 has below)?
2. If the sample was taken from the tap, did the sample collector allow the tap to flush for a sufficient amount of time before sampling?
3. Where was the analysis of the sample performed and by what method(s)? Has the method been validated?
4. What is the experience of the analyst performing the analysis?
5. Was the method followed as written? If changes were made, were the changes within the allowed flexibility described in the method?
6. Does the system have multiple intakes? How many depths are available to draw water from?
7. Does the system purchase its water from another supplier?

## UCMR 4 Questions

1. Preceding the finished water sample collection, did you observe an algal bloom in your source waters near the intake? If yes, when (e.g. on the day the UCMR cyanotoxin sample was collected, between the day the sample was taken and the past week, between the past week and past month, between the past month and past 12 months, more than a year ago)?
2. Preceding the finished water sample collection, were cyanotoxins ever detected in your source waters near the intake and prior to any treatment (based on sampling by you or another party)? If yes, when? For which toxin (microcystins, cylindrospermopsin, anatoxin-A, saxitoxins).
3. Preceding the finished water sample collection, did you notice any of the following changes in your treatment system operation and/or treated water quality that may indicate a bloom in the source water?
  - a. decrease in filter runtimes
  - b. increase in turbidity in filtered water
  - c. need for increased coagulant dose
  - d. increase in taste and odor issues in finished water
  - e. need for increase in oxidant/disinfectant dose

- f. increase in TTHM/HAA5 in finished water
- 4. Preceding the finished water sample collection, did you observe any of the following notable changes in source water quality parameters (if measured)?
  - a. increase in water temperature
  - b. increase in turbidity
  - c. increase in alkalinity
  - d. increase in total organic carbon
  - e. increase in chlorine demand
  - f. increase in pH and/or
  - g. decrease in pH
  - h. increase in chlorophyll a
  - i. increase in phycocyanin
  - j. increase in nutrients (example: nitrogen or phosphorus)

### **Drinking Water Treatment Questions:**

1. What types of cyanotoxins have been detected? What are the concentrations of cyanotoxins in the raw water and finished water? What are the proportions of intracellular and extracellular cyanotoxins?
2. What types of treatment are being used? Conventional (coagulation/flocculation, sedimentation and filtration)? Membranes? Slow sand filtration? Is any powdered activated carbon (PAC) being added? Any GAC filters? UV? Advanced oxidation?
3. What water quality monitoring has been conducted in the raw water and within the plant? If it isn't being done already, can the plant start sampling to understand performance of each treatment unit process (i.e., develop a plant profile)? Analyze samples for chlorophyll-a or phycocyanin as indicators of cyanobacteria cell removal. Analyze cyanotoxins directly as well if possible.
4. Can the plant switch intake levels or switch intakes to avoid the HAB? Are there interconnections in place with other neighboring water distribution systems that can be used?
5. Are algaecides currently being applied in the source water?
6. Are pre-oxidants, such as permanganate, chlorine or ozone, being used? Where are these added in the treatment process? Can the dosages be reduced or stopped temporarily during the HAB?
7. Has jar testing been conducted during the HAB to optimize coagulant and polymer doses for coagulation/flocculation and sedimentation?
8. Have the sedimentation basins been cleaned recently? Can they be cleaned more frequently during the HAB?
9. How often are the filters being backwashed? Can they be backwashed more frequently during the HAB?
10. Is the plant recycling any backwash water or sludge decant water? Can this be paused during the HAB?
11. What types of oxidants/disinfectants are used at the plant? Has CT been evaluated with respect to cyanotoxin oxidation? CT is the product of disinfectant/oxidant concentration and contact time. AWWA's CyanoTOX oxidation calculator is a good tool for this evaluation.