

**(THIS POLICY DOES NOT HAVE THE FORCE OF LAW)**

**Responding to Algal Toxin Detections in  
Finished Water Samples at Public Water  
Systems**

Division DDAGW  
Number: WQ-18-001  
Category: Water Quality – Policy  
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**I. PURPOSE**

This document describes the process that Ohio EPA Division of Drinking and Ground Waters (DDAGW) will follow when an algal toxin is detected in finished water samples at public water systems, and provides a recommended course of action for public water systems.

**II. BACKGROUND**

Ohio EPA is conducting sampling at public water supply lakes around the state as part of an Inland Lakes Program ([www.epa.ohio.gov/dsw/inland\\_lakes/index.aspx](http://www.epa.ohio.gov/dsw/inland_lakes/index.aspx)). Lake sampling will include a complete lake assessment with algae speciation and toxin analysis. A number of lakes used as a source of public drinking water may be sampled each year. In the event Ohio EPA receives a report of significant algal blooms, sampling at additional public water supply sources may occur, in accordance with the “Ohio Harmful Algal Bloom Response Strategy.”

Algal toxins in drinking water are not currently regulated by the U.S. Environmental Protection Agency, but are being considered for future regulation. Microcystin-LR appears along with other algal toxins on U.S. EPA’s Contaminant Candidate List 3 (CCL3), which is used to prioritize research and data collection efforts to aid the decision on whether a specific contaminant should be regulated. The World Health Organization (WHO) has established a provisional health-based drinking water guideline of 1.0 µg/L for the algal toxin Microcystin-LR based on a lifetime exposure for adults. WHO has not established drinking water guidelines for other algal toxins. The Ohio Department of Health (ODH) and Ohio EPA developed thresholds for drinking water and recreational use, which are the basis for this policy. Should U.S. EPA establish a drinking water standard or develop other guidance regarding microcystin or other algal toxins in the future, this policy will be reviewed and revised as appropriate.

In the event that an algal toxin is detected in finished waters, this document outlines the actions Ohio EPA staff should take and provides a recommended course of action for public water systems. General information about harmful algal blooms (HABs) can be found at [www.ohioalgaefinfo.com](http://www.ohioalgaefinfo.com). Information specific for public water system operators can be found at [www.epa.ohio.gov/ddagw/HAB.aspx](http://www.epa.ohio.gov/ddagw/HAB.aspx).

### III. APPLICABLE REGULATIONS AND GUIDANCE

Ohio Revised Code § 6109.12: Public Water System Analysis

Ohio Administrative Code (OAC) rule 3745-81-32: Public Notification

Ohio EPA policy WQ-07-002: Tier 1 Public Notification Requirements

World Health Organization, 1999. Toxic Cyanobacteria in Water: A Guide to their Public Health Consequences, Monitoring and Management. Geneva.

([www.who.int/water\\_sanitation\\_health/resourcesquality/toxiccyanbact/en/](http://www.who.int/water_sanitation_health/resourcesquality/toxiccyanbact/en/))

Global Water Research Coalition, 2009. International Guidance Manual for the Management of Toxic Cyanobacteria. London.

Water Quality Research Australia (WQRA), 2009. Management Strategies for Cyanobacteria (Blue-Green Algae): A Guide for Water Utilities. WQRA research report 74.

([www.wqra.com.au/publications/report74\\_management\\_strategies\\_BGA.pdf](http://www.wqra.com.au/publications/report74_management_strategies_BGA.pdf))

### IV. POLICY

#### A. General Policies and Procedures

##### *Encouragement of Voluntary Monitoring*

Ohio public water systems (PWS) experiencing algal blooms are encouraged to coordinate or conduct finished water sampling to augment the Inland Lakes Program sampling, as well as, develop their own reservoir monitoring program if not already in place. Ohio EPA may recommend the PWS perform ongoing raw and finished water monitoring based on raw water results.

##### *Toxins Addressed by this Policy*

The term “microcystin” will refer to all forms of the microcystin algal toxin, including microcystin-LR, microcystin-YR, and other variants. Other algal toxins addressed by this policy include anatoxin-a, saxitoxin and cylindrospermopsin.

##### *Testing Methods*

There are a number of testing options available for algal toxins. Ohio EPA currently accepts the ELISA method for analysis of raw and finished drinking water for microcystin, saxitoxin and cylindrospermopsin. For anatoxin-a, Ohio EPA uses Liquid Chromatography-Mass Spectrometry (LC/MS), Liquid Chromatography-Tandem Mass Spectrometry(LC/MS/MS) or high-performance liquid chromatography Photo Diode Array (HPLC-PDA). There are other analytical methods that may be deemed acceptable by the Ohio EPA. PWSs considering use of other methods should contact the PWS HAB Coordinator in the Division of

Drinking and Ground Waters. Commercially available test kits can also be used for screening purposes.

#### *Data Reporting*

Ohio EPA requests PWS submit all raw and finished water monitoring results for algal toxins to the PWS HAB Coordinator in DDAGW.

#### *Thresholds*

Drinking water health advisories in this guidance have been developed by ODH and Ohio EPA. The actions described in this policy will be taken when one or more thresholds below are exceeded in a finished water sample, along with the presence of an algal bloom that has the potential to produce toxins.

| Threshold (µg/L)                    | Microcystin** | Anatoxin-a | Cylindrospermopsin | Saxitoxin** |
|-------------------------------------|---------------|------------|--------------------|-------------|
| Recreation – Public Health Advisory | 6             | 80         | 5                  | 0.8         |
| Recreation – No Contact Advisory*   | 20            | 300        | 20                 | 3           |
| Drinking – Do Not Drink             | 1             | 20         | 1                  | 0.2         |

\* Recreation – No Contact Advisory thresholds are also used as Drinking – Do Not Use thresholds.

\*\* Microcystin and saxitoxin thresholds are intended to be applied to total concentrations of all reported congeners of those toxins.

#### *Confirmatory Analysis and Sampling*

Ohio EPA will repeat analysis of any sample that exceeds a threshold, and may, on a case by case basis, coordinate with the PWS for collection of a confirmation sample, before taking the actions described in this policy.

#### *Alternative Water Supply*

In the event a public notification is required with use restrictions for any population, the public water system is encouraged to provide a supply of alternate emergency water for their consumers.

#### *Consumer Confidence Report*

As a baseline public notification measure, community public water systems are encouraged to reference finished water algal toxin detections above the threshold levels in the annual Consumer Confidence Report, with the exception of the results of field screening tests.

#### *Notification of State Personnel*

The PWS HAB Coordinator will notify the Chief of the Division of Drinking and Ground Waters (DDAGW), the Manager of the DDAGW Compliance Assurance Section, and the DDAGW District Office Drinking Water Program Manager of any initial finished water detection. The Ohio EPA Director's Office will also be notified of

any situation where public notification will be issued. In the event of a DO NOT DRINK or DO NOT USE public notice, Ohio EPA will also coordinate with the local and state emergency management agencies. All correspondence between Ohio EPA and the PWS regarding case-specific public notifications requirements will be provided to ODH and the local health department.

**B. Case-Specific Procedures for Public Notification**

Ohio EPA, in consultation with ODH, will determine appropriate public notification requirements, including health effects language and use restrictions, on a case-by-case basis. General guidelines for these determinations are outlined below. Duration of the contamination event may be considered in the determination of any recommended use restrictions. Public notification will be required under the authority of OAC rule 3745-81-32 and must be conducted in accordance with the provisions contained in the rule.

| Tier 1 Public Notice Use Restrictions | Toxin Level (µg/L) |            |                    |           |
|---------------------------------------|--------------------|------------|--------------------|-----------|
|                                       | Microcystin        | Anatoxin-a | Cylindrospermopsin | Saxitoxin |
| DO NOT DRINK WARNING                  | 1 - 20             | 20 - 300   | 1 - 20             | 0.2 - 3   |
| DO NOT USE WARNING                    | > 20               | > 300      | > 20               | > 3       |

If public notification is required, the PWS HAB Coordinator will coordinate with the DDAGW district office, call the PWS operator of record and send a letter requiring them to issue immediate, Tier 1 public notice informing all customers of the situation. A public notice template will be provided containing the appropriate health effects language and use restrictions. Ohio EPA may also issue a news release.

The use restrictions may be modified when toxin levels for two consecutive samples collected at least twenty-four hours apart indicate the modification is appropriate. This change will require additional public notification. The PWS HAB Coordinator will work with Ohio EPA central and district office management, ODH and the PWS as to the timing and wording of the additional public notice.

The PWS may end issuance of public notification when the algal toxin levels are below the drinking water thresholds in two consecutive samples collected a minimum of 24 hours apart.

**V. HISTORY**

The Division of Drinking and Ground Waters first issued this policy on June 23, 2011.

# DRINKING WATER WARNING

Algal toxins are present in [name] water system

## DO NOT DRINK THE WATER

Toxins from harmful algal blooms were recently found in our treated water supply. A sample collected on [date] shows microcystin toxin at [level] µg/L. The Ohio Environmental Protection Agency recommends that you do not drink the water at microcystin levels above 1 µg/L.

### What should I do?

- **DO NOT DRINK THE WATER. Alternative water should be used for drinking, making infant formula, making ice, brushing teeth, and preparing food. Pets should not drink the water.**
- Healthy adults may use the water for bathing, washing hands, washing dishes and doing laundry. Special attention may be needed when bathing children to prevent ingestion. The water may be used for flushing toilets. Skin irritation, such as a rash may occur from exposure when bathing and washing hands. Providing a final rinse of skin with uncontaminated water is recommended.
- **Do not boil the water.** Boiling the water will not destroy toxins. Some toxins may become more dangerous as a result of boiling.
- Consuming water containing algal toxins may result in abnormal liver function, diarrhea, vomiting, nausea, numbness or dizziness. Seek medical attention if you feel you have been exposed to algal toxins and are having adverse health effects. Skin contact with contaminated water can cause irritation or rashes. Contact a veterinarian immediately if pets or livestock show signs of illness.

### What happened? What is being done?

[Lake name], which is a source of drinking water for the [public water system] is experiencing a harmful algal bloom (HAB). These organisms are capable of producing a number of toxins that may pose a risk to human and animal health. HABs occur when excess nitrogen and phosphorus are present in lakes and streams. Such nutrients can come from runoff of over-fertilized fields and lawns, from malfunctioning septic systems and from livestock pens.

Additional monitoring is being conducted, and we will let you know when the situation has been resolved or if additional precautions should be taken. The water system is [describe what is being done]. We are working closely with [insert partners] to minimize any potential harm.

For more information, please contact \_\_\_\_\_ at \_\_\_\_\_.  
Additional information about harmful algal blooms can be found at [www.ohioalgaefinfo.com](http://www.ohioalgaefinfo.com).

**If you believe you or your children have been exposed to algal toxins and are experiencing adverse health effects, you should seek medical attention. After contacting medical personnel,**

**individuals are also encouraged to report human health concerns to your local health department, [Insert local health department name] at [Insert telephone number].**

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

PWSID#: \_\_\_\_\_ STUID#: \_\_\_\_\_ Date distributed: \_\_\_\_\_

# **DRINKING WATER WARNING**

Algal toxins are present in [name] water system

## **DO NOT USE THE WATER**

Toxins from harmful algal blooms were recently found in our treated water supply. A sample collected on [date] shows microcystin toxin at [level] µg/L. The Ohio Environmental Protection Agency recommends that you do not use the water at microcystin levels above 20 µg/L.

### **What should I do?**

- **DO NOT USE THE WATER. Alternative water should be used for drinking (including pets), making infant formula, making ice, brushing teeth, preparing food, bathing/showering, washing hands, washing dishes or doing laundry.** If an alternate source of water is not available for washing dishes or doing laundry, providing a final rinse with uncontaminated water is recommended. If people or pets come into contact with water, promptly shower or rinse off in uncontaminated water. Skin irritation, such as a rash may occur from exposure when bathing and washing hands.
- **DO NOT BOIL THE WATER.** Boiling the water will not destroy toxins. Some toxins may become more dangerous as a result of boiling.
- You may use the water for flushing toilets.
- Consuming water containing algal toxins may result in abnormal liver function, diarrhea, vomiting, nausea, numbness or dizziness. Seek medical attention if you feel you have been exposed to algal toxins and are having adverse health effects. Skin contact with contaminated water can cause irritation or rashes. Algal toxins may pose a special health risk for young children, pregnant women, people with compromised immune systems, medically fragile individuals and pets. Contact a veterinarian immediately if pets or livestock show signs of illness.

### **What happened? What is being done?**

[Lake name], which is a source of drinking water for the [public water system], is experiencing a harmful algal bloom (HAB). These organisms may produce a number of toxins that may pose a risk to human and animal health. HABs occur when excess nitrogen and phosphorus are present in lakes and streams. Such nutrients can come from runoff of over-fertilized fields and lawns, from malfunctioning septic systems and from livestock pens.

Additional monitoring is being conducted, and we will let you know when the situation has been resolved or if additional precautions should be taken. The water system is [describe what is being done]. We are working closely with [insert partners] to minimize any potential harm.

For more information, please contact \_\_\_\_\_ at \_\_\_\_\_.  
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**If you believe you or your children have been exposed to algal toxins and are experiencing adverse health effects, you should seek medical attention. After contacting medical personnel, individuals are also encouraged to report human health concerns to your local health department, [Insert health department name] at [Insert telephone number].**

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