

Public Water System Harmful Algal Blooms - Overview of New Rules

April 13, 2016

Presentation Outline

- Background
- Rule Development Process
- Rule Overview
 - Monitoring
 - Treatment Technique
 - Public Notification and CCR
 - Recordkeeping
 - Laboratory Certification
- Next Steps

Background

- 2010:** Ohio EPA began sampling for cyanotoxins at PWS
-Finished water detection at inland PWS.
- 2011:** OEPA/ODNR/ODH created Ohio HAB Strategy
- 2012:** Separate Strategy documents developed for recreational and PWS (updated annually)
- 2013:** Finished water threshold exceedance at small PWS
-Drinking Water Advisory Issued.
- 2014:** Finished water threshold exceedance at large PWS
- Drinking Water Advisory Issued.
- 2015:** U.S. EPA released health advisory levels for microcystin and cylindrospermopsin
- Ohio EPA revised PWS HAB Response Strategy
 - Finished water microcystins detections at 5 PWSs
- No Drinking Water Advisories Issued.
 - Senate Bill 1 passed



Senate Bill 1/ORC 3745.50

- Ohio Senate Bill 1 - passed in July 2015
 - Directed Ohio EPA to implement actions to protect against cyanobacteria in the western basin of Lake Erie and in public water supplies
- Ohio Revised Code 3745.50
 - Authorized Ohio EPA to serve as the coordinator of harmful algae management and response and to implement action that:
 - Protect against cyanobacteria in the western basin and Public water systems
 - Manage wastewater and limit nutrient loading
 - Develop and implement protocols and actions including:
 - Analytical protocols for monitoring at PWS intakes
 - Testing for cyanobacteria in Lake Erie
 - Establishment of health advisories and public notification protocols and triggers
 - Provisions on sampling, treatment technique, algaecide application
 - Protocols requiring PWS to notify OEPA when; cyanotoxins detected in finished water, cyanobacteria detected in the source water and application of algaecide is anticipated.

Rulemaking Process and Timeline

2015

- **June** - Initial Early Stakeholder Outreach
- **September** - Draft rules distributed for interested party review
- **October** – Webinar on Proposed Rules comment period (9/22-10/23)
- **December** – Business Impact Analysis and Summary of Revision

2016

- **February** – Public Notice (2/4)
Public Hearing (2/24)
Public Comment Period (1/29-2/24)
- **March** – Filed response to Comments (3/18)
- **April** – JCARR Hearing, Rules approved (4/4)
- **June 1, 2016** – Effective Date



Image courtesy of the Capitol Square
Review and Advisory Board

Key Rule Revisions

- Reduced screening requirements from weekly to bi-weekly.
- Reduced weekly microcystin monitoring (both raw and finished) during lower-risk months to bi-weekly (raw only).
- Clarified and broadened provision for revised schedule.
 - Include potential revised schedule for both cyanobacteria screening and microcystin requirements.
 - Added consideration of historical microcystin data, other screening tools and treatment information.
 - Struck language limiting revised schedule provision use until after one year.

Key Rule Revisions

- Extended timeline for analysis of daily, resamples, repeat and distribution samples.
- Removed requirement for reanalysis of initial finished water exceedances.
- Revised trigger for cyanotoxin general plan.
- Added provision indicating treatment protocols and general plans are not public records.

Summary of Revisions and Response to Comments are posted online:

<http://epa.ohio.gov/ddagw/rules.aspx#110542564-policies-and-guidance>



Applicability

- Surface water systems
 - All requirements apply
- Consecutive (purchased) surface water systems from out-of-state sources
 - Finished water microcystins monitoring only
- In-State consecutive (purchased) surface water systems
 - Routine monitoring and treatment technique requirements do not apply; However, if wholesale system has action level exceedance then monitor at distribution sampling points.
- Ground water systems
 - Routine monitoring requirements do not apply

HAB Rules - Overview

- PWS requirements - new rules in OAC Chapter 3745-90
 - Microcystins action levels in drinking water
 - Monitoring requirements
 - Treatment technique requirements
 - Public notification and Consumer Confidence Report (CCR) requirements
 - Recordkeeping requirements
- Laboratory Certification requirements – new OAC rule 3745-90-04 and amended rules in Chapter 3745-89
 - Laboratory certification
 - Analytical techniques
 - Reporting deadlines

Microcystins Action Levels

- Based on U.S. EPA's health advisory levels
 - Based on oral ingestion of drinking water at these levels for up to ten days
 - Applied to total concentrations of all congeners/variants
 - *Includes nursing and pregnant women, individuals with liver disease and those on dialysis
- Exceedance in a finished water sample will require:
 - Additional monitoring
 - Treatment optimization
 - Potentially other actions (e.g. public notification)

Action Level	Total Microcystins (µg/L)
Children under 6 and sensitive populations*	0.3
Children 6 and older and adults	1.6

Monitoring Requirements

Microcystins

- Routine monitoring for total microcystins

May – October:

- Weekly raw and finished water monitoring
- Raw water detections >5 ug/L and any finished water detections trigger additional sampling
- If no raw water detections, eligible for seasonal reduced monitoring

November – April:

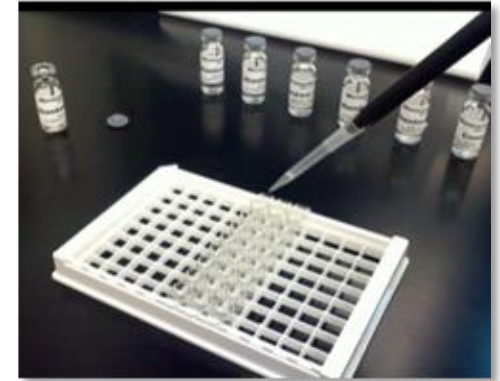
- Raw water only every other week
- Detections trigger additional monitoring

- Weekly finished water microcystins monitoring required for systems purchasing SW from out of state (year round).



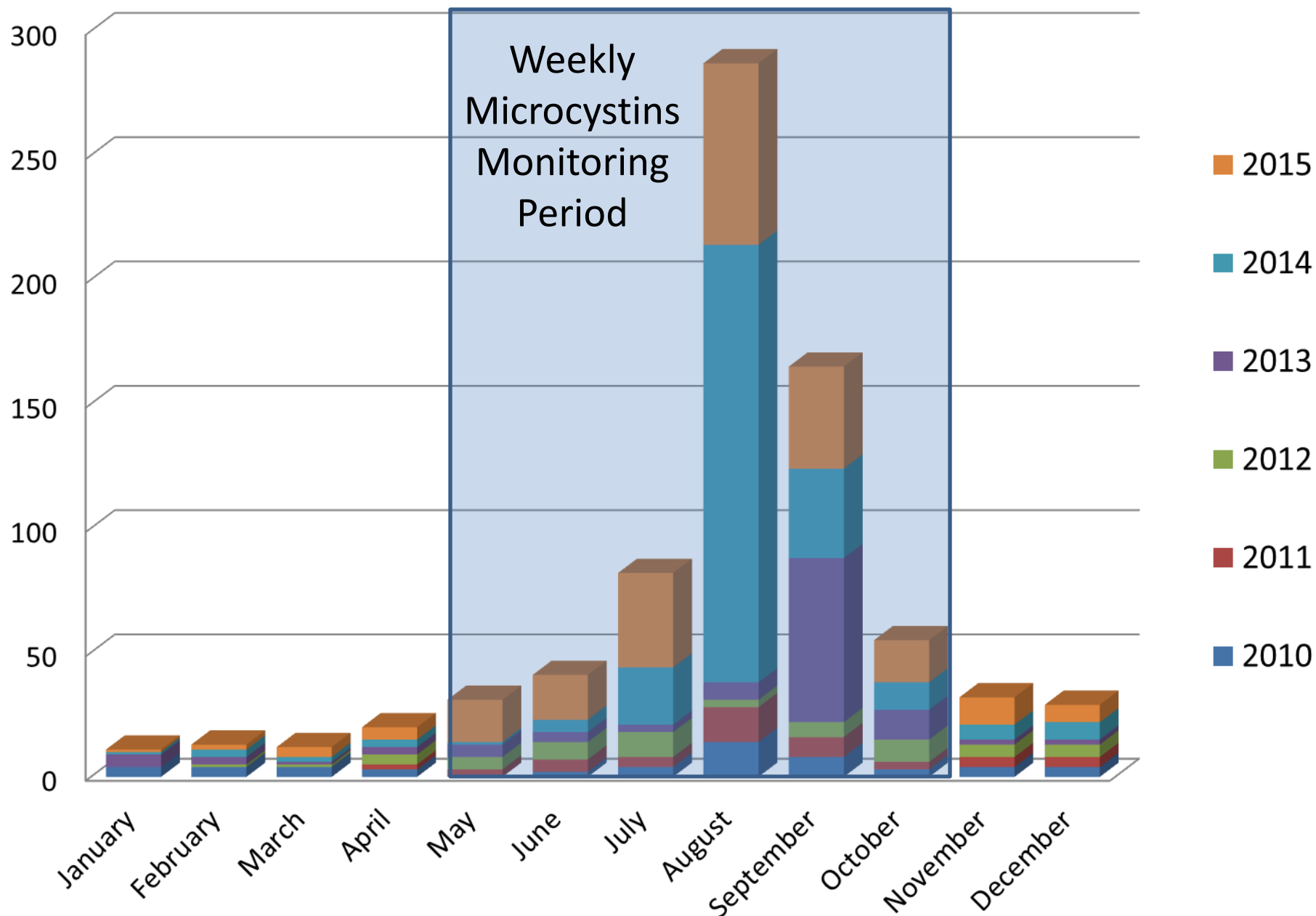
Monitoring Requirements Cyanobacteria Screening

- Routine raw water genomic cyanobacteria screening (every other week)
 - Collected at the same time as the weekly total microcystins raw water sample
 - Information will be used to determine if monitoring for cyanotoxins other than microcystins needs to be conducted by Ohio EPA (or voluntarily by the PWS)
- Option for a decreased monitoring schedule



Monitoring schedules to be sent early May 2016!

Frequency of Source Water Microcystins Detections > 1.6 ug/L in Ohio



Increased Monitoring - Microcystins

- 3 days/week if $>5 \mu\text{g/L}$ in the raw water
- Daily if detected in finished water
- Resample and Repeat samples if action level exceedance in finished water
 - **Resample.** Collect raw and finished resample as soon as possible but no later than 24 hours after notified of exceedance. Analyze w/in 24 hours of collection.
 - **Repeat.** Collect raw and finished repeat samples within 24 hours of collecting the resample. Analysis of Repeat sample must be completed w/in 24 hrs of collection.
 - Resample and repeats count as daily monitoring

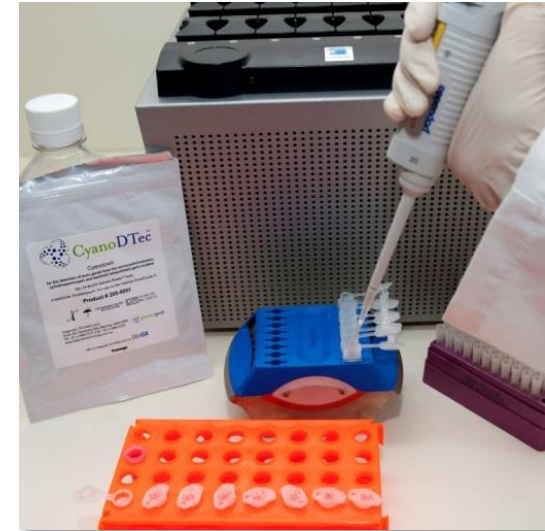
Increased Monitoring

- If any finished water Resample or Repeat samples exceed the action level:
 - **Notify any consecutive systems** (w/in 3hrs of receiving resample or repeat results that exceed Action Level)
 - **Collect distribution samples** (including consecutive systems, w/in 24 hrs of receiving the resample or repeat results that exceed Action Level)
- If finished water Repeat samples exceed the action level:
 - **Conduct public notification**

Quick treatment optimization
and source management are critical
and can prevent advisories.

Cyanobacteria Screening: qPCR

- Cyanobacteria screening
 - Quantitative polymerase chain reaction (qPCR) – identifies and quantifies the presence of total cyanobacteria along with genes responsible for production of microcystins, cylindrospermopsin and saxitoxin
 - Test completed within 2-3 hours Scalable
 - Cost effective
 - Utilizes certified reference material
 - Specific: no gene, no toxin
- Method and certification beginning in 2017
- Until sufficient capacity at certified laboratories to perform this method, Ohio EPA's laboratory will conduct these analyses at no cost to the water system.



Cyanobacteria Screening: qPCR

- From June 2016 through at least May 2017 all samples will be analyzed at Ohio EPA's Lab
 - Sampling containers will be provided at no cost
 - Samples will be analyzed at no cost
 - Shipping fees at expense of PWS
 - Unless shipping from a regional "shipping hub"
- Sample must be collected at same time as raw water microcystins sample
- Samples can only be shipped overnight (same day as collection) Monday, Tuesday, Wednesday
- Specific information on "shipping hubs" will be available with revised schedules



Treatment Technique Requirements – Treatment Optimization Protocols

- Required if microcystins are detected in raw or finished samples
 - Detected between July 16, 2015 and June 1, 2016, submit within 30 thirty days of the effective date of the rule.
 - Detected after June 1, 2016, submit within 30 days of detection (unless previously required).
- Describe treatment adjustments that will be made under various raw and finished water conditions
- Review and optimize existing treatment for microcystins
 - avoid lysing cyanobacterial cells
 - optimize removal of intact cells
 - optimize barriers for extracellular cyanotoxin removal or destruction
 - optimize sludge removal
 - discontinue or minimize backwash recycling

Treatment Technique Requirements – Treatment Optimization Protocol Guidance

- Currently in development (by early May)
- Identify requirements for complete protocol
- Components
 - PWS Summary Information
 - Reservoir Management
 - Treatment Plant Optimization
 - Establishing Triggers for Optimization Based on Raw and Finished Water Monitoring

Treatment Technique Requirement – Cyanotoxin General Plan

- Required if microcystins detected in finished water or in raw water $>1.6 \mu\text{g/L}$ (on at least two occasions within one year)
- Within 120 days, submit general plan and implementation schedule for approval
 - \$150 fee for general plan and P.E. stamp required
- Implement in accordance with approved schedule
- Include one or a combination of source water protection activities, reservoir management and in-plant treatment technologies
 - May document existing treatment is sufficient for cyanotoxin destruction or removal
 - Gives the PWS time to assess all its treatment objectives

Tier 1 Public Notification

- Repeat finished water sample exceeds an action level
 - unless Director approves extension or waiver based on extenuating circumstances
- Based on the results of resamples or distribution system samples, if required by the Director
- Failure to collect repeat samples
- May limit distribution of public notice (see Policy revisions)
 - Demonstrate cyanotoxins remain below the action level in portions of the distribution system which would not be included
 - Ongoing daily distribution monitoring (microcystins and chlorine residual)
 - Modeling, finished water travel time, and chlorine residual contact time
 - Include procedures for making this demonstration in Contingency Plan
 - Obtain written permission (email is acceptable)

Tiers 2 & 3 PN, CCR and Recordkeeping

- Tier 2 PN
 - Failure to submit treatment optimization protocols
 - Failure to submit or implement cyanotoxin general plan
- Tier 3 PN
 - Failure to monitor or report
- CCR
 - Include any finished water action level exceedance (including distribution sites)
- Recordkeeping
 - Keep records for 10 years



Certified Laboratory Requirements

- Microcystins and cyanobacteria screening are being incorporated into the existing laboratory certification program
- \$1,550 laboratory certification fee will be deferred until June 1, 2017
- Microcystins
 - Analytical method “Ohio EPA Total (Extracellular and Intracellular) Microcystins - ADDA by ELISA Analytical Methodology” version 2.2 (August 2015)
 - Ohio EPA may accept other analytical methods in the future
 - Samples must be analyzed within 5 days of collection, except in limited circumstances which require analysis within 24 hours

Reporting Deadlines

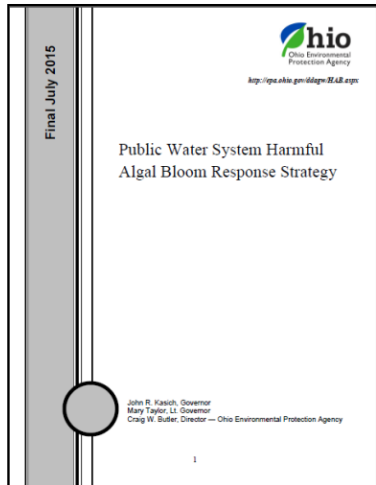
- Report by the end of the next business day to OEPA and PWS
 - all detections of microcystins in finished water samples
 - all results above 5 $\mu\text{g}/\text{L}$ microcystins in raw water samples
 - all daily, resamples and repeat samples
 - all results of cyanobacteria screening that indicate the potential for cylindrospermopsin, saxitoxins
- All others, report by the 10th day following the month in which the sample was collected.



Integration of Rules with HAB Strategy

- HAB strategy will be updated to incorporate the required compliance monitoring :

- Microcystins monitoring (and associated requirements if an action level is exceeded) will replace the current approach in the HAB Strategy
- Cyanobacteria screening will be used to determine if monitoring for cyanotoxins other than microcystins needs to be conducted by Ohio EPA (or voluntarily by the PWS)



- Ohio's 2015 Public Water System Harmful Algal Bloom Response Strategy is available online at:
<http://epa.ohio.gov/ddagw/HAB.aspx>
- Anticipate releasing a revised Draft 2016 PWS HAB Response Strategy in May, 2016

Next Steps

- Outreach Sessions (*contact craig.smith@epa.ohio.gov to register*)
 - Friday, April 15, 2016; 9:30 a.m. – 11:30 a.m.
Akron Water Treatment Plant
 - Thursday, April 21, 2016; 9:30 a.m. - 11:30 a.m.
Lake Erie Users Group, Huron
 - Tuesday, May 3, 2016; 9:30 a.m. – 11:30 a.m.
Ohio EPA- Central Office, Columbus
 - Wednesday, May 4, 2016; 9:30 a.m. – 11:30 a.m.
Washington State CC, Marietta
- Q&A Document
- Revised monitoring schedules (Early May)

Next Steps

■ **Funding Assistance**

- WSRLA HAB Infrastructure Loans (0% Interest/20 yrs) - \$50M was allocated this year (3rd year) and approximately \$20M unallocated.
- Monitoring Equipment Grants – Ohio EPA anticipates additional funds will become available after July 1, 2016; recommend that entities apply now to get on the waiting list (up to \$30K per PWS, lifetime max).

■ **Ongoing Research**

- Ohio Board of Higher Education HAB Grants
- Collaboration with USEPA and AWWA on Methods
- Collaboration with NOAA and USGS on HAB Surveillance

■ **Post-Season full evaluation of 2016**

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Questions?