Division of Drinking and Ground Waters
October 2015

Overview of Public Water System Harmful Algal Blooms Draft Rules — Questions and Answers

These questions were generated during a webinar held on October 7, 2015. See related presentation file for more details.

Rule Development

Q: Do you foresee these proposed rules changing after public comments are reviewed?
A: We take comments provided by our stakeholders very seriously. This webinar was intended to provide additional information and clarification of the draft rules, to help participants better understand them and submit informed comments. We will take all of the comments submitted into consideration for potential changes to the rules. DDAGW will provide written responses to all comments received.

Q: When will the rules be finalized?
A: The goal is to finalize the rules by June 2016.

Year-Round Weekly Monitoring Requirements

Q: Will systems considered ground water under the influence of surface water need to meet Harmful Algal Bloom (HAB) monitoring requirements?
A: Yes. "Ground water under the influence systems" are surface water systems and subject to all rules a surface water system is required to meet.

Q: Can existing monitoring results be used to reduce the 12-month monitoring requirements?
A: No, the draft rules would not allow a reduction based upon results collected prior to the rule. There are very few systems that have year-round sampling using an accepted or certified method.

Q: Can other information be used also, such as MPA data or algal toxin analyses done with HPLC or LC MS/MS?
A: No, the draft rules specify the use of the "Ohio EPA Total (Extracellular and Intracellular) Microcystins - ADDA by ELISA Analytical Methodology, Version 2.1 (August 2015)" (Ohio EPA ELISA-ADDA) method as the approved analytical method. The rules do provide for other analytical methods to be accepted by the director.

Q: Can data be grandfathered in for reduced monitoring?
A: No, the draft rules do not provide for a reduction in the first year of weekly monitoring based upon previous sampling results.

Q: Which method is required for the weekly screening - ELISA or quantitative Polymerase Chain Reaction (qPCR)?
A: The draft rules require collecting weekly cyanobacteria screening (qPCR) and routine microcystins monitoring (OEPA ELISA-ADDA). Ohio EPA's Division of Environmental Services (DES) will be conducting the qPCR analysis for at least the first year. Public water systems would be required to have the analysis for microcystins samples performed in a laboratory certified by Ohio EPA. There is a provision in the draft rules that would allow for decreased monitoring once 12 months of monitoring data is collected. This point will be clarified in the rule. If we can show a strong correlation between the microcystins production gene and microcystins concentrations, we could potentially decrease the weekly monitoring for microcystins.

Q: Will the sampling requirements be on the monitoring schedule for 2016 for each system?
A: No, the monitoring requirements will not be on the 2016 monitoring schedules. The schedules are mailed in December and the rules are not anticipated to be effective until June 2016. Revised schedules will be sent to the appropriate public water systems when the rules go into effect.

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Q: Have you looked at the cost to the public water systems for the 52 weeks of sampling? Is this not a hardship to smaller public water systems?
A: Yes, as a requirement of the rule adoption process, we've considered the costs of the draft rules on public water systems, accounting for 52 weeks of sampling. Ohio EPA recognizes that this will come with a cost to public water systems to complete the required sampling and analysis. Ohio EPA made $1 million dollars in grants available to public water systems to establish their own analytical capabilities to provide some assistance and relief for these costs.

Q: Will public water systems be required to conduct their weekly sampling on a specific day of the week?
A: We intend to add definitions for "week" and "weekly" in the rules, but we do not intend to require sampling on any specific day of the week.

Q: Could you sample late in the week the first week then early the next and run both sets of samples in one run the second week?
A: Yes, so long as the samples are analyzed within five days. However, a public water system that does this will lose some of the flexibility in the 10-day advisory; if those samples were over an action level, then the water system has used up some of the time to adjust treatment.

Q: If a public water system misses a week in the 52 week testing period will they still be able to get a reduction in testing the following years?
A: Failure to submit samples would be, at a minimum, a violation of the monitoring requirements. The circumstances surrounding the lack of a sample or samples would be considered as part of making a determination on reduced monitoring requirements.

Q: If a surface water system only operates for a few weeks per year (or not at all), how will sampling be handled?
A: They will need to sample during the time period they're open and operating. This will be clarified in the rule.

Q: How many screening samples are required and when is the first sample due?
A: The draft rules require weekly raw water cyanobacteria screening using qPCR and weekly raw and finished water routine microcystins monitoring, beginning once the rules become effective. Ohio EPA will provide water systems with a revised monitoring schedule informing them of when to begin monitoring. The rules do not state a minimum number of samples which must be collected, but the routine microcystins monitoring frequency may be decreased after May 1, 2017 at the discretion of the director if cyanobacteria screening or microcystins data supports a modified monitoring schedule. Note: the draft rules only included cyanobacteria screening results to support this reduction. It was Ohio EPA's intent to also consider microcystins samples collected after the effective date of the rule in this evaluation. This will be clarified in the rule.

Increased Monitoring Requirements

Q: How was the 5 µg/L in raw water concentration chosen as trigger for increased monitoring?
A: 5 µg/L is the concentration where we typically see the exponential growth phase of a bloom and a rapid increase in microcystins concentration. This is also when we have typically seen finished water detections.

Q: Will any consideration be given for reducing the "increased monitoring due to raw water microcystin concentrations above 5 µg/L" for public water systems that have demonstrated the capability to remove microcystins or ways to avoid using raw water containing microcystins?
A: Yes, there is a provision in the rules that allows public water systems to demonstrate treatment effectiveness in their Cyanotoxin General Plan and reduce monitoring to an alternate frequency. If the concentration is greater than the 5 µg/L trigger, the system would be required to submit a Cyanotoxin General Plan. It would be acceptable to submit and implement a Cyanotoxin General Plan before it is officially required under the rule in order to take advantage of this reduction in increased monitoring. This will be clarified in the rule and Cyanotoxin General Plan guidance will be developed.

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Quantitative Polymerase Chain Reaction (qPCR) Analysis

Q: Is qPCR an approved U.S. EPA or Standard Method test?
A: qPCR is not currently an approved U.S. EPA method. The Division of Environmental Services (DES) intends to develop standardized analytical methodology and begin certifying laboratories beginning in 2017. Until then, DES will analyze all the qPCR samples required under these rules.

Q: Is there a draft Standard Operating Procedure for qPCR methodology?
A: DES will complete research and develop a standardized qPCR analytical method including Quality Control (QC) requirements for the Ohio EPA by May 1, 2016. The Quality Control criteria will be established to enable laboratory certification staff to certify other laboratories for cyanobacteria analysis by qPCR. This standard method will be developed in collaboration with state and national experts in qPCR.

Q: Will qPCR be the only acceptable method for the screening requirement or can a utility perform traditional algal counts and/or identification to meet the screening requirement?
A: The draft rules require cyanobacteria screening using the qPCR analysis. Unlike qPCR, Ohio EPA has not been to identify a process for standardizing and certifying analytical methods for algae counts or biovolumes.

Q: Can a utility perform qPCR on its own to meet the requirement?
A: Until we have a standard protocol and are approving laboratories for that method, qPCR analyses will all be done by Ohio EPA's laboratory.

Q: Does qPCR give you a toxin result?
A: No, qPCR does not give a toxin concentration; it indicates genes with the potential for the toxin production are present in the bloom.

Q: How will a public water system know if there is potential for saxitoxin, anatoxin-a or cylindrospermopsin production by a cyanobacteria?
A: The cyanobacteria screening using qPCR will detect the presence of the toxin-producing genes; you cannot have toxins if you don't have those genes. All surface water public water systems will be required to collect weekly samples and ship them to DES for qPCR analysis.

Q: Will the water system be required to test for other toxins, if the toxin production genes are detected by qPCR?
A: qPCR results will trigger additional sampling and analysis by Ohio EPA (not the public water system, at this time) because we would be looking for toxins other than microcystins - saxitoxin and cylindrospermopsin. The public water system may be asked to assist with sampling.

Q: What will the cost be per sample for cyanobacteria screening and who will incur the costs?
A: The initial cost estimates are between $70 and $140 per sample, but these costs will be refined as part of the process to develop a standard operating procedure for qPCR. Ohio EPA will not be charging public water systems for qPCR analysis conducted by DES. Public water systems will incur the cost for sample collection, analysis for microcystins and for shipping the qPCR samples to the Ohio EPA laboratory.

Treatment Optimization and Cyanotoxin General Plans

Q: There are public water systems that are not at risk that have not had to submit a Cyanotoxin General Plan. Should they submit a Cyanotoxin General Plan to qualify for reduced monitoring with regards to the 5 µg/L trigger for increased monitoring?
A: A public water system can submit and implement a Cyanotoxin General Plan to demonstrate that the water system can provide reliable treatment to avoid detections and support a reduced monitoring frequency.

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Q: What triggers the Cyanotoxin General Plan?
A: Any detection of microcystins in finished water or microcystins in raw water above 1.6 µg/L (Rule 3754-90-05(B)). This will only apply if the samples are collected after the effective date of the rule.

Q: Will an Optimization Plan be required if the raw water has detections of 1.6 µg/L microcystins? Why?
A: The draft rules would require a public water system (not including consecutive systems) to develop and submit written treatment protocols following any detection in raw or finished water, not just at for concentrations at or above of 1.6 µg/L. The purpose of a treatment protocol is to ensure the public water system has investigated the capability of its existing treatment plant to remove microcystins and outlined procedures for optimization to prevent a breakthrough of microcystins into the treated finished water. Most surface water systems have the ability to make short-term treatment adjustments to effectively target microcystins removal during a HAB event, but these adjustments are not necessarily consistent with normal operational needs. The treatment protocols must address treatment adjustments to be made under various raw and finished water conditions. In developing the protocols, the public water system must review and optimize existing treatment for microcystins removal, utilizing techniques that avoid lysing cyanobacterial cells, optimize removal of intact cells, optimize barriers for extracellular cyanotoxin removal or destruction, optimize sludge removal and discontinue or minimize backwash recycling.

Q: Will guidance be available to satellite (consecutive) public water systems for the locations and number of samples to be taken if the system they purchase from exceeds an action level?
A: Ohio Administrative Code rule 3745-85-01 requires each community water system to develop contingency plans for supplying water to the public in the event of an emergency. Satellite systems which purchase treated surface water will need to include a HAB response and recovery procedure in their contingency plans. This includes the need for distribution sampling for cyanotoxins. The goal of distribution sampling is to potentially isolate portions of the distribution system and limit the extent of an advisory. The sampling points for cyanotoxin sampling may coincide with existing sampling points for total coliform. Public water systems need to ensure the sampling points are accessible at any hour and day of the week. These points need to include interconnections with other public water systems, input and output from finished water storage and areas of the distribution systems served by different sources. This information is included in the Public Water System Harmful Algal Bloom Response Strategy (July 2015). In addition, characterization of the distribution system should consider areas that can be isolated by valving, areas that achieve a minimum contact time and if booster chlorination is used, pressure zones and how they are fed. Guidance on distribution system sampling for cyanotoxins will be developed.

Grants

Q: Will Ohio EPA offer grant assistance for third party testing?
A: We have no plans to offer grants for third party testing.

Q: Where can a public water system find grant money to purchase an auto-analyzer?
A: We have an application for grant money available on Ohio EPA's website (***epa.ohio.gov/ddagw/HAB.aspx***). The amount requested exceeds the $1 million we have made available for grants. Less than half of those systems approved have sought reimbursement, so it is possible systems may actually request less than they originally applied for. If this happens, additional funds may become available.

Q: Can public water systems modify their grant applications to remove microscopes, since the microscopes will effectively become obsolete for HAB monitoring with the use of qPCR?
A: We think microscopes are a beneficial tool for public water systems to have access to for algal identification. If a water system would want to change its application and not proceed with the purchase of a microscope, they may choose to do so.

Q: Will Ohio EPA be reviewing sondes and fluorometers as other screening methods for HAB monitoring?
A: Although data from sondes and fluorometers are not included in the draft rules due to the variability of the equipment and difficulty in developing a validation methodology, we think they are still an extremely valuable tool for public

water systems. The data helps the system understand what is happening with its source water quality so staff can make rapid adjustments in treatment rather than wait until they have results of a weekly sample. We did evaluate the use of phycocyanin concentrations as a screening tool but unfortunately the concentrations are highly variable and depended on what type of cyanobacteria was present, sediment concentrations in the water and other environmental factors, so it couldn't be really used as a quantitative tool for assessing the presence of cyanobacteria that would be toxin producing.

Laboratory Certification

Q: Does Ohio EPA intend to provide interim certification for laboratories have the capabilities for qPCR methodology prior 2017?

A: No. Ohio EPA will be developing a standard operating procedure that it will use during the first year of analysis. Once the standard operating procedure has been developed, Ohio EPA will begin the certification of laboratories. The goal is to have adequate laboratory capacity in 2018 with certified public water system and commercial laboratories.

Q: If new analysts are added will there be an additional certification fee?

A: No. If a lab has paid the $1,550 fee and obtained certification, a process is in place that allows a new analyst to be certified for microcystins by submitting an acceptable MDL study to the Ohio EPA Laboratory Certification Section.

Q: Is the $1,550 for certification fee over and above the $1,800 we pay for microbiology certification?

A: The fee for microcystins lab certification is $1,550 and the certification spans a three-year period. This fee for microcystins certification is in addition to any other certifications the lab may hold.

Other Cyanotoxins

Q: Is there an SOP for cylindrospermopsin and saxitoxin? Who will be doing the testing?

A: DES has developed an ELISA SOP for both cylindrospermopsin and saxitoxins. LC-MS methods have also been established for cylindrospermopsin, saxitoxins and anatoxin-a. Ohio EPA will collect and analyze samples for cylindrospermopsin and saxitoxins (using ELISA SOPs) and anatoxin-a (LC-MS method) if screening data indicate those cyanotoxins may be present. Ohio EPA will conduct additional analysis using a LC-MS method following any finished water cylindrospermopsin, saxitoxin, or anatoxin-a detections.

Q: How many other toxins are there?

A: There are many toxins. The draft rules specifically address microcystins. Saxitoxin, cylindrospermopsin and anatoxin-a area included in the Public Water System Harmful Algal Bloom Response Strategy (July 2015).

Sample Hold Time

Q: Does the requirement to test for microcystin within five days of collection apply if the samples have been frozen?

A: Yes. The five-day time period to conduct analysis is related to the need for timely data, and is not based on preservation or hold time considerations.

Sample Turnaround

Q: Is there a projected turnaround time for results from commercial lab running ELISA analyses?

A: The samples must be analyzed within five days of collection. Results must be reported by the tenth day following the month in which the sample was collected, except for the following which must be reported by the end of the next business day: all detections of microcystins in finished water samples; all results above 5 µg/L total microcystins in raw water samples; and all results of cyanobacteria screening that indicate the potential for production of cylindrospermopsin, saxitoxins or anatoxin-a.

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Data Reporting

Q: How will these results be reported by the 10th day -- eBiz?

A: Yes, the certified laboratories will use Ohio EPA's e-business center, and Ohio EPA's eDWR reporting software, to report the results.

Public Notices

Q: Are public notices delayed until there is 10 days above the action level?

A: No, the draft rules take an approach consistent with the Public Water System Harmful Algal Bloom Response Strategy (July 2015). When U.S. EPA was establishing the health advisory levels based on 10 days exposure, it encouraged states to treat them as acute standards with flexibility. The Strategy and draft rules provide for reanalysis of any initial detection, as well as a resample of treated water and then a repeat sample. If all three of those samples are above a threshold an advisory public notice would be required at approximately 48 hours after the initial detection. The draft rules do provide for an extension of that time based upon specific bloom and public water system information.

Laboratory Equipment

Q: Can you say something more about the auto-analyzer?

A: The auto-analyzer is one of two pieces of equipment capable of running the ELISA-ADDA method required by the draft rule. There are two public water systems that currently use this equipment. For more information about the auto-analyzer, contact Vandana Deshmukh with DES at (614) 644-4240.

Laboratory Capacity

Q: Has research been done to determine if there's enough lab capacity to do the required microcystin testing?

A: Ohio EPA believes there will be adequate laboratory capacity. Ohio EPA has been providing grants to public water systems to develop their own analytical capabilities and several commercial labs have established analytical capabilities as well.

Other Analytical Methods

Q: What are the plans to utilize the new EPA methods 544 and 545? It appears that the focus is totally on ELISA.

A: The draft rules require the use of the Ohio EPA ELISA-ADDA method. The U.S. EPA health advisory levels are based on total microcystins, including all of the variants or congeners. The 544 method does not provide data for total microcystins. The draft rules do indicate the Director could authorize additional methods as more information becomes available in the future.

Responsibility for Sampling

Q: Will DES sample and analyze a public water system's weekly sample if, for some reason, they are unable to sample themselves?

A: No, public water systems will be responsible for sampling and having the samples analyzed for microcystins, and collection and shipping the qPCR samples to DES.

Cyanotoxin Research

Q: Have Ohio EPA cyanotoxin research studies been published or made available online? For example, occurrence studies that indicate microcystin variants other than LR are present?

A: Yes. *Using the MMPB technique to confirm microcystin concentrations in water measured by ELISA and HPLC (UV, MS, MS/MS)* was published in the journal *Toxicon* (104 (2015) 91e101). The authors, Amanda Foss and Mark Aubel with Greenwater labs analyzed Ohio samples as part of a microcystin variant analysis. The data or the full article can be provided by Ohio EPA upon request.