6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 141

[EPA-HQ-OW-2015-0218; FRL-9956-71-OW]

RIN 2040-AF49

Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 4) for Public Water Systems and Announcement of Public Meeting

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule; notice of public meeting.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is finalizing a Safe Drinking Water Act (SDWA) rule that requires public water systems to collect occurrence data for contaminants that may be present in drinking water but are not yet subject to EPA's drinking water standards set under the SDWA. This rule identifies eleven analytical methods to support water system monitoring for a total of 30 chemical contaminants, consisting of nine cyanotoxins and one cyanotoxin group; two metals; eight pesticides plus one pesticide manufacturing byproduct (hereinafter collectively referred to as "pesticides"); three brominated haloacetic acid disinfection byproduct groups; three alcohols; and three semivolatile organic chemicals. EPA is also announcing a public meeting and webinar to discuss the implementation of the fourth Unregulated Contaminant Monitoring Rule.

DATES: This final rule is effective on **[insert date 30 days after date of publication in the FEDERAL REGISTER]**, 30 days after publication in the Federal Register. The incorporation

by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of **[insert date 30 days after date of publication in the FEDERAL REGISTER]**.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. **EPA-HQ-OW-2015-0218.** All documents in the docket are listed on the https://www.regulations.gov website. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through https://www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: Brenda D. Parris, Standards and Risk Management Division (SRMD), Office of Ground Water and Drinking Water (OGWDW) (MS 140), Environmental Protection Agency, 26 West Martin Luther King Drive, Cincinnati, OH 45268; telephone number: (513) 569-7961; or email address: parris.brenda@epa.gov; or Melissa Simic, SRMD, OGWDW (MS 140), Environmental Protection Agency, 26 West Martin Luther King Drive, Cincinnati, Ohio 45268; telephone number: (513) 569-7864; or email address: simic.melissa@epa.gov. For general information, contact the Safe Drinking Water Hotline. Callers within the United States can reach the Hotline at (800) 426-4791. The Hotline is open Monday through Friday, excluding federal holidays, from 10:00 a.m. to 4:00 p.m., eastern time. The Safe Drinking Water Hotline can also be found on the Internet at: https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-hotline.

SUPPLEMENTARY INFORMATION:

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Abbreviations and Acronyms

µg/L	Microgram per liter
Adda	(2*S*,3*S*,8*S*,9*S*,4*E*,6*E*)-3-amino-9-methoxy-2,6,8-trimethyl-10-phenyl-4,6-decadienoic acid
ASDWA	Association of State Drinking Water Administrators
ASTM	ASTM International
CAS	Chemical Abstract Service
CBI	Confidential Business Information
CCC	Continuing Calibration Check
CCL	Contaminant Candidate List
CFR	Code of Federal Regulations
CRA	Congressional Review Act
CWS	Community Water System
D/DBPRs	Disinfectants and Disinfection Byproducts Rules (including Stage 1 and Stage 2 D/DBPRs)
ELISA	Enzyme-linked Immunosorbent Assay
EPA	United States Environmental Protection Agency
EPTDS	Entry Point to the Distribution System

ESI	Electrospray Ionization
FR	Federal Register
GC	Gas Chromatography
GC/ECD	Gas Chromatography/Electron Capture Detection
GC/MS	Gas Chromatography/Mass Spectrometry
GW	Ground Water
GWUDI	Ground Water Under the Direct Influence of Surface Water
HAAs	Haloacetic Acids
HAA5	Dibromoacetic Acid, Dichloroacetic Acid, Monobromoacetic Acid, Monochloroacetic Acid, Trichloroacetic Acid
HAA6Br	Bromochloroacetic Acid, Bromodichloroacetic Acid, Dibromoacetic Acid, Dibromochloroacetic Acid, Monobromoacetic Acid, Tribromoacetic Acid
HAA9	Bromochloroacetic Acid, Bromodichloroacetic Acid, Chlorodibromoacetic Acid, Dibromoacetic Acid, Dichloroacetic Acid, Monobromoacetic Acid, Monochloroacetic Acid, Tribromoacetic Acid, Trichloroacetic Acid
IC	Ion Chromatography
IC-MS/MS	Ion Chromatography-Tandem Mass Spectrometry
IC/ESI-MS/MS	Ion Chromatography/Electrospray Ionization/Tandem Mass Spectrometry
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
ICR	Information Collection Request

IDC	Initial Demonstration of Capability
IS	Internal Standard
LFB	Laboratory Fortified Blank
LRB	Laboratory Reagent Blank
LC/ESI-MS/MS	Liquid Chromatography/Electrospray Ionization/Tandem Mass Spectrometry
LC-MS/MS	Liquid Chromatography/Tandem Mass Spectrometry
LT2	Long Term 2 Enhanced Surface Water Treatment Rule
M	Million
MAC	Mycobacterium Avium Complex
MRL	Minimum Reporting Level
NAICS	North American Industry Classification System
NARA	National Archives and Records Administration
NCOD	National Contaminant Occurrence Database
NPDWRs	National Primary Drinking Water Regulations
NTNCWS	Non-transient Non-community Water System
OGWDW	Office of Ground Water and Drinking Water
OMB	Office of Management and Budget
PA	Partnership Agreement
PRA	Paperwork Reduction Act
PT	Proficiency Testing
PWS	Public Water System
PWSID	Public Water System Identification

QC	Quality Control
QCS	Quality Control Sample
QHS	Quality HAA Sample
RFA	Regulatory Flexibility Act
SBA	Small Business Administration
SDWA	Safe Drinking Water Act
SDWARS	Safe Drinking Water Accession and Review System
SDWIS/Fed	Federal Safe Drinking Water Information System
SM	Standard Methods for the Examination of Water and Wastewater
SMP	State Monitoring Plan
SOP	Standard Operating Procedure
SPE	Solid Phase Extraction
SR	Source Water
SRF	Drinking Water State Revolving Fund
SRMD	Standards and Risk Management Division
SUR	Surrogate Standard
SVOCs	Semivolatile Organic Chemicals
SW	Surface Water
TNCWS	Transient Non-community Water System
TOC	Total Organic Carbon
UCMR	Unregulated Contaminant Monitoring Rule
UMRA	Unfunded Mandates Reform Act of 1995

USEPA United States Environmental Protection Agency

I. General Information

A. Does this action apply to me?

The fourth Unregulated Contaminant Monitoring Rule (UCMR 4) applies to public water systems (PWSs). PWSs are systems that provide water for human consumption through pipes, or other constructed conveyances, to at least 15 service connections or that regularly serve an average of at least 25 individuals daily at least 60 days out of the year. This rule applies to all large community and non-transient non-community water systems (NTNCWSs) serving more than 10,000 people. A community water system (CWS) is a PWS that has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. A NTNCWS is a PWS that is not a CWS and that regularly serves at least 25 of the same people over six months per year. Some examples of NTNCWS are schools, factories, office buildings and hospitals, which have their own water systems. EPA selects the nationally representative sample of small CWSs and NTNCWSs serving 10,000 or fewer people that are required to monitor (see "Statistical Design and Sample Selection for the Unregulated Contaminant Monitoring Regulation" (USEPA, 2001a) for a description of the statistical approach for the nationally representative sample). This rule does not apply to transient non-community water systems (TNCWSs) (i.e., non-community water systems that do not regularly serve at least 25 of the same people over six months per year). A TNCWSs provides water in a place such as a gas station or campground, where people do not remain for long periods of time.

States, territories and tribes with primary enforcement responsibility (primacy) to administer the regulatory program for PWSs under the SDWA can participate in the implementation of UCMR 4 through Partnership Agreements (PAs). Primacy agencies with PAs

can choose to be involved in various aspects of the UCMR 4 monitoring for the PWSs they oversee; however, the PWS remains responsible for compliance with the rule requirements. Examples of potentially regulated categories and entities are identified in the following table.

Category	Examples of potentially regulated entities	NAICS[a]
State, local & tribal governments	States, local and tribal governments that analyze water samples on behalf of PWSs required to conduct such analysis; states, local and tribal governments that directly operate CWSs and NTNCWSs required to monitor.	924110
Industry	Private operators of CWSs and NTNCWSs required to monitor.	221310
Municipalities	Municipal operators of CWSs and NTNCWSs required to monitor.	924110

[a] NAICS = North American Industry Classification System

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table summarizes the types of entities that EPA is aware could potentially be regulated by this action. If you are uncertain whether your entity is regulated by this action, carefully examine the definition of a PWS found in §§141.2 and 141.3, and the applicability criteria found in §141.40(a)(1) and (2) of Title 40 in the Code of Federal Regulations (CFR). If you have questions, please consult the contacts listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the Agency taking and why?

This final rule requires PWSs to analyze drinking water samples for 29 unregulated contaminants that do not have health based standards set under the SDWA, as well as one group of regulated contaminants (described in section I.C), and to report their results to EPA. This is the fourth national monitoring effort under the UCMR program, and builds upon the framework established under the prior three UCMR actions (see section II.A). The monitoring provides data

to inform future regulatory actions to protect public health.

The public benefits from the information about whether or not unregulated contaminants are present in their drinking water. If contaminants are not found, consumer confidence in their drinking water will improve. If contaminants are found, illnesses may be avoided when subsequent actions, such as regulations, reduce or eliminate those contaminants.

C. What is the Agency's authority for taking this action?

As part of its responsibilities under the SDWA, EPA implements section 1445(a)(2), "Monitoring Program for Unregulated Contaminants." This section, as amended in 1996, requires that once every five years, beginning in August 1999, EPA issue a list of no more than 30 unregulated contaminants to be monitored by PWSs. The list can include contaminants included in previous UCMR cycles but will generally focus on contaminants not yet monitored under UCMR. SDWA section 1445(g)(7) requires that EPA enter the monitoring data into the Agency's publicly-available National Contaminant Occurrence Database (NCOD). The SDWA also requires that EPA ensures that systems serving a population larger than 10,000 people, as well as a nationally representative sample of PWSs serving 10,000 or fewer people, monitor for the unregulated contaminants. EPA must vary the frequency and schedule for monitoring based on the number of persons served, the source of supply, and the contaminants likely to be found. EPA is using this authority as the basis for monitoring 29 of the 30 contaminants.

Section 1445(a)(1)(A) of the SDWA, as amended in 1996, requires that every person who is subject to any SDWA requirement establish and maintain such records, make such reports, conduct such monitoring and provide such information as the Administrator may reasonably require by regulation to assist the Administrator in establishing SDWA regulations. Pursuant to this provision, EPA can also require the monitoring of contaminants already subject to EPA's

drinking water standards. EPA is using this authority as the basis for monitoring one of the chemical groups (Haloacetic Acids 5 (HAA5)) under this rule. Sample collection and analysis for HAA5 can be done concurrently with the unregulated HAA monitoring (for HAA6Br and HAA9) described in section III.B.3 (resulting in no significant additional burden since all three HAA groups can be measured by a single method) and will allow EPA to better understand co-occurrence between regulated and unregulated disinfection byproducts.

Hereinafter, all 30 chemicals/groups are collectively referred to as "contaminants."

D. What is the estimated cost of this action?

EPA estimates the total average national cost of this action will be $24.3 million per year from 2017-2021. EPA has documented the assumptions and data sources used in the preparation of this estimate in the Information Collection Request (ICR) (USEPA, 2016a). EPA identified eleven analytical methods (nine EPA-developed analytical methods and two alternate, equivalent, consensus organization-developed methods) to analyze samples for 30 UCMR 4 contaminants. EPA's estimate of the analytical cost for the UCMR 4 contaminants and related indicators is $2,500 per sample set. EPA calculated these costs by summing the laboratory unit cost of each method.

Small PWSs selected for UCMR 4 monitoring sample an average of 6.7 times per PWS (i.e., number of responses per PWS) across the three-year ICR period. The estimated labor burden per response for small PWSs is 2.8 hours. Large PWSs and very large PWSs sample and report an average of 11.4 and 14.1 times per PWS, respectively, across the three-year ICR period. The estimated labor burden per response for large and very large PWSs is 6.1 and 9.9 hours, respectively.

Exhibit 1 presents a breakdown of estimated annual average national costs. Estimated

PWS (i.e., large and very large) and EPA costs reflect the analytical cost (i.e., non-labor) for all UCMR 4 methods as well as labor-related cost. EPA pays for the analytical costs for all systems serving a population of 10,000 or fewer people. Laboratory analysis and sample shipping account for approximately 79% of the total national cost for UCMR 4 implementation. EPA estimated laboratory unit costs based on consultations with multiple commercial drinking water laboratories. The cost of the laboratory methods includes shipping the sample from the facility to the laboratory as part of the cost for the analysis.

EPA expects that states will incur labor costs associated with voluntary assistance with UCMR 4 implementation. EPA estimated state costs using the relevant assumptions from the State Resource Model, which was developed by the Association of State Drinking Water Administrators (ASDWA) (ASDWA, 2013) to help states forecast resource needs. Model estimates were adjusted to account for actual levels of state participation under UCMR 3. State participation is voluntary; thus, the level of effort is expected to vary among states and will depend on their individual agreements with EPA.

Additional details regarding EPA's cost assumptions and estimates can be found in the "Information Collection Request for the Unregulated Contaminant Monitoring Rule (UCMR 4)" (USEPA, 2016a) EPA ICR Number 2192.08, which presents estimated cost and burden for the 2017-2019 period, consistent with the 3-year timeframe for ICRs. Estimates of costs over the entire 5-year UCMR 4 period of 2017-2021 are attached as an appendix to the ICR. Specifically, most of the burden is incurred in the second, third and fourth year (i.e., monitoring and sample analysis) of the UCMR 4 monitoring period. The first year (the planning year) involves a lesser burden, and the final fifth year involves the least burden since the program is concluding. The next ICR period will overlap with the last two years of the 5-year UCMR 4 period, and therefore

will have substantially lower figures.

Copies of the ICR and its appendix are available in the EPA public docket for this final rule, under Docket ID No. EPA-HQ-OW-2015-0218. The total estimated annual costs (labor and non-labor) are as follows:

Exhibit 1: Estimated Average Annual Costs of UCMR 4

Respondent	**Avg. Annual Cost All Respondents (2017-2021)** [1]
Small Systems (25-10,000), including labor[2] only (non-labor costs[3] paid for by EPA)	$0.2 M
Large Systems (10,001-100,000), including labor and non-labor costs	$15.0 M
Very Large Systems (100,001 and greater), including labor and non-labor costs	$4.1 M
States, including labor costs related to implementation coordination	$0.5 M
EPA, including labor for implementation and non-labor for small system testing	$4.5 M
AVERAGE ANNUAL NATIONAL TOTAL	**$24.3 M**

[1] Totals may not equal the sum of components due to rounding.
[2] Labor costs pertain to systems, states and EPA. Costs include activities such as reading the rule, notifying systems selected to participate, sample collection, data review, reporting and record keeping.
[3] Non-labor costs will be incurred primarily by EPA and by very large and large PWSs. They include the cost of shipping samples to laboratories for testing and the cost of the laboratory analyses.

E. What is the applicability date?

The determination of whether a PWS is required to monitor under UCMR 4 is based on the type of system (e.g., CWS, NTNCWS, etc.) and its retail population served, as indicated by the Federal Safe Drinking Water Information System (SDWIS/Fed) inventory on December 31, 2015. SDWIS/Fed can be accessed at https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information-system-sdwis-federal-reporting. If a PWS believes its retail population served in SDWIS/Fed is inaccurate, the system should contact its state to verify its population as of the applicability date and request a correction, if necessary. The 5-year UCMR 4 program will take place from January 2017 through December 2021, with sample collection occurring between January 1, 2018, and December 31, 2020.

II. Background

A. How Has EPA implemented the Unregulated Contaminant Monitoring Program?

EPA published the list of contaminants for the first UCMR (UCMR 1) in the Federal Register (FR) on September 17, 1999 (64 FR 50556, (USEPA, 1999)), the second UCMR (UCMR 2) on January 4, 2007 (72 FR 368, (USEPA, 2007)) and the third UCMR (UCMR 3) on May 2, 2012 (77 FR 26072, (USEPA, 2012a)). EPA established a three-tiered approach for monitoring contaminants under the UCMR program. Assessment Monitoring for "List 1" contaminants typically relies on analytical methods, techniques or technologies that are in common use by drinking water laboratories. Screening Survey monitoring for "List 2" contaminants typically relies on newer techniques or technologies that are not as commonly used, such that laboratory capacity to perform List 2 analyses may be limited. Finally, Pre-Screen Testing for "List 3" contaminants is often associated with techniques or technologies that are very recently developed and/or are particularly complex. In addition to method cost and complexity and laboratory capacity, EPA considers sampling frequency and the relevant universe of PWSs when deciding which of the three tiers is appropriate for the monitoring of a contaminant.

EPA designed the Assessment Monitoring sampling approach (USEPA, 2001a) to ensure that sample results would yield a high level of confidence and a low margin of error. The design for a nationally representative sample of small systems called for the sample set to be stratified by water source type (ground water (GW) or surface water (SW)), service size category and state (where each state is allocated a minimum of two systems in its state monitoring plan (SMP)).

This final action identifies 30 List 1 contaminants to be measured during Assessment Monitoring from 2018-2020, with pre-monitoring activity in 2017 and post-monitoring activity

in 2021. EPA developed this rule after considering input from public comments. For more information on EPA's response to public comments, please see section III.

B. How are the Contaminant Candidate List, the UCMR program, the Regulatory Determination process and the NCOD interrelated?

Under the 1996 amendments to the SDWA, Congress established a stepwise, risk-based approach for determining which contaminants would become subject to drinking water standards. Under the first step, EPA is required to publish, every five years, a list of contaminants that are not yet regulated but which are known or anticipated to occur in PWSs; this is known as the Contaminant Candidate List (CCL). Under the second step, EPA must require, every five years, monitoring of up to 30 unregulated contaminants (many of which have been selected from the CCL for the UCMR monitoring to-date) to determine their occurrence in drinking water systems; this is known as the UCMR program. Under the third step, EPA is required to determine, every five years, whether or not to begin the process of developing a national primary drinking water regulation for at least five CCL contaminants; this is known as a Regulatory Determination and involves evaluating the following questions:

(1) May the contaminant have an adverse effect on human health?

(2) Is the contaminant known to occur or substantially likely to occur in PWSs with a frequency and at levels of public health concern?

(3) In the sole judgement of the Administrator, does regulation of such contaminants present a meaningful opportunity for risk reduction for people served by PWSs?

Finally, the SDWA requires EPA to issue national primary drinking water regulations (NPDWRs) for contaminants the Agency determines should be regulated.

The CCL process identifies contaminants that may require regulation, while the UCMR program helps provide the data necessary for the Regulatory Determination process previously outlined. The data collected through the UCMR program are stored in the drinking water NCOD to facilitate analysis and review of contaminant occurrence, and support the Administrator's determination on whether regulation of a contaminant is in the public health interest, as required under SDWA section 1412(b)(1). UCMR results can be viewed by the public at: https://www.epa.gov/dwucmr. PWSs are also responsible for addressing UCMR results in their annual Consumer Confidence Reports, consistent with prior UCMR cycles and as required by §141.153.

III. What are the key requirements of the rule, including notable changes between UCMR 3, the proposed UCMR 4 and the final UCMR 4?

EPA published "Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 4) for Public Water Systems and Announcement of a Public Meeting;" Proposed Rule, on December 11, 2015 (80 FR 76897, (USEPA, 2015a)). The UCMR 4 proposal identified eleven new analytical methods to support water system monitoring for a total of 30 new contaminants, and detailed other potential changes relative to UCMR 3. Among the other changes reflected in the UCMR 4 proposal were identification of water systems subject to UCMR 4 and provisions for sampling locations, timeframe and frequency, as well as updated data elements.

EPA received input on the UCMR 4 proposal from 34 public commenters, including state and local government, utilities and utility stakeholder organizations, laboratories, academia, non-governmental organizations and other interested stakeholders . After considering the comments, EPA made the changes described in Exhibit 2 to develop the final UCMR 4 action. Sections III A-C summarize key aspects of this final rule and the associated notable and

recurring comments received in response to the proposed rule. EPA has compiled all public comments and EPA's responses in the "Response to Comments Document for the Unregulated Contaminant Monitoring Rule (UCMR 4)," (USEPA, 2016b), which can be found in the electronic docket listed in the **ADDRESSES** section of this notice.

EXHIBIT 2: NOTABLE CHANGES TO UCMR 4 BETWEEN PROPOSED AND FINAL RULE

CFR Rule Section		Description of Change	Corresponding Preamble Section
Number	**Title/Description**		
§141.40(a)(3)	Related specifications for the analytes to be monitored	Revises Table 1 to include EPA Method 546 Enzyme-linked Immunosorbent Assay (ELISA) and removes source water as a sample location for cyanotoxins	III.A. & III.B.
§141.40(a)(3) and §141.40(a)(4)	Sampling design requirements – frequency	Revises Table 1 to update the monitoring dates to January 2018 through December 2020 for the 20 additional contaminants, and also updates Table 2 to reflect the traditional sample collection timeframe (consecutive 12-month period) for the 20 additional contaminants. Additionally, updates Table 2 to reflect the traditional sample collection frequency (four consecutive quarters for SW and ground water under the direct influence of surface water (GWUDI) water systems, and twice, 5-7 months apart, for GW systems) for those 20 contaminants.	III.B. & I.E.
§141.40(a)(3) and §141.40(a)(4)	Phased sample analysis for microcystins	Removes source water samples from the phased sample analysis for microcystins.	III.B.2
§141.40(a)(3)	Applicability of HAA monitoring requirements	Removes UCMR 4 HAA requirement for water systems that are not subject to HAA5 monitoring under the Disinfectants and Disinfection Byproduct Rules (D/DBPRs).	III.B.3
§141.35(e)	Reporting requirements - Data elements	Updates and clarifies data elements to address disinfecting and treatment types, and adds data elements to account for the metadata collected for the cyanotoxins.	III.C.

A. What contaminants are in UCMR 4?

1. This Rule

EPA is maintaining the proposed list of unregulated contaminants and the methods associated with analyzing those contaminants, with the exception of updating the ELISA method for "total microcystins" (see Exhibit 3). Further information on the prioritization process, as well as contaminant-specific information (source, use, production, release, persistence, mobility, health effects and occurrence) that EPA used to select the contaminants is contained in "UCMR 4 Contaminants – Information Compendium for Final Rule" (USEPA, 2016c). This Information Compendium can be found in the electronic docket listed in the **ADDRESSES** section of this notice.

2. Summary of Major Comments and EPA Responses

Commenters who expressed an opinion about the proposed UCMR 4 analytes were generally supportive. Some commenters suggested alternative ways to collect the HAA information. Suggestions included collecting results for all nine HAAs individually; only collecting results for HAA9; or doing targeted research studies of HAAs independent of UCMR. EPA has concluded that monitoring for the three HAA groups (HAA5, HAA6Br and HAA9) will provide the information of interest on the relative occurrence between regulated and unregulated HAAs as well as brominated versus chlorinated HAAs. Though the targeted research proposed by some commenters is beyond the scope of today's action, EPA will take the recommendation under advisement and consider how such research may complement the UCMR data.

Some commenters supported EPA's proposal to not include *Legionella pneumophila* and *Mycobacterium avium* Complex (MAC) in UCMR 4; others encouraged EPA to add Legionella, and in some cases MAC. The latter commenters identified several candidate methods, suggested that Legionella is not exclusively a premise plumbing issue, and pointed to concerns with health effects. While EPA recognizes the Legionella concern, the Agency has

concluded that this national survey will not be able to adequately address many of the variables, complexities and uncertainties discussed by commenters. More research is needed to identify the optimal sampling location, frequency of sampling events and proper sampling population, and address biofilms and associated indicators. Further research is also needed on the dose-response ecology of Legionella in the distribution system to identify the correct method needed to monitor at a level that would be instructive and cost effective.

Multiple commenters expressed concerns with the ELISA methodology and some of the specific elements of the ELISA Standard Operating Procedure (SOP) (Ohio EPA, 2015) identified in the proposal for cyanotoxins. In 2016, EPA finalized EPA Method 546: "Determination of Total Microcystins and Nodularins in Drinking Water and Ambient Water by Adda Enzyme-Linked Immunosorbent Assay" as the prescribed method for total microcystins (USEPA, 2016e). The fundamentals of Method 546 are quite similar to those of the Ohio EPA methodology, and Method 546 addresses concerns expressed about minimum reporting levels (MRLs), holding times and quality control.

Exhibit 3: 30 UCMR 4 Analytes

List 1 Analytes	
One Cyanotoxin Group using EPA Method 546 (Adda ELISA)[1]:	
"total microcystins"	
Seven Cyanotoxins using EPA Method 544 (SPE LC-MS/MS)[2]:	
microcystin-LA	microcystin-RR
microcystin-LF	microcystin-YR
microcystin-LR	nodularin
microcystin-LY	
Two Cyanotoxins using EPA Method 545 (LC/ESI-MS/MS)[3]:	
anatoxin-a	cylindrospermopsin
Two Metals using EPA Method 200.8 (ICP-MS)[4] or alternate SM[5] or ASTM[6]:	
germanium	manganese

Nine Pesticides using EPA Method 525.3 (SPE GC/MS)[7]:	
alpha-hexachlorocyclohexane	profenofos
chlorpyrifos	tebuconazole
dimethipin	total permethrin (cis- & trans-)
ethoprop	tribufos
oxyfluorfen	
Three Brominated HAA Groups using EPA Method 552.3 (GC/ECD) or 557 (IC/ESI-MS/MS)[8,9,10]:	
HAA5	HAA9
HAA6Br	
Three Alcohols using EPA Method 541 (GC/MS)[11]:	
1-butanol	2-propen-1-ol
2-methoxyethanol	
Three Semivolatile Organic Chemicals (SVOCs) using EPA Method 530 (GC/MS)[12]:	
butylated hydroxyanisole	quinolone
o-toluidine	

[1] EPA Method 546 Adda Enzyme-Linked Immunosorbent Assay (ELISA) (USEPA, 2016e)
[2] EPA Method 544 (Solid phase extraction (SPE) liquid chromatography/tandem mass spectrometry (LC-MS/MS)) (USEPA, 2015b). This method will only be used if analyses by ELISA (for "total microcystins") yield results above reporting limits.
[3] EPA Method 545 (Liquid chromatography/electrospray ionization/tandem mass spectrometry (LC/ESI-MS/MS)) (USEPA, 2015c).
[4] EPA Method 200.8 (Inductively coupled plasma mass spectrometry (ICP-MS)) (USEPA, 1994).
[5] Standard Methods (SM) 3125 (SM, 2005a) or SM 3125-09 (SM Online, 2009).
[6] ASTM International (ASTM) D5673-10 (ASTM, 2010).
[7] EPA Method 525.3 (SPE Gas chromatography/mass spectrometry (GC/MS)) (USEPA, 2012b).
[8] EPA Method 552.3 (Gas chromatography/electron capture detection (GC/ECD)) (USEPA, 2003) and EPA Method 557 (Ion chromatography-electrospray ionization-tandem mass spectrometry (IC-ESI-MS/MS)) (USEPA, 2009a). HAA5 includes: dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, trichloroacetic acid. HAA6Br includes: bromochloroacetic acid, bromodichloroacetic acid, dibromoacetic acid, chlorodibromoacetic acid, monobromoacetic acid, tribromoacetic acid. HAA9 includes: bromochloroacetic acid, bromodichloroacetic acid, chlorodibromoacetic acid, dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, tribromoacetic acid, trichloroacetic acid.
[9] Regulated HAAs (HAA5) are included in the monitoring program to gain a better understanding of co-occurrence with currently unregulated disinfection byproducts.
[10] Brominated HAA monitoring also includes sampling for indicators total organic carbon (TOC) and bromide using methods approved for compliance monitoring. TOC methods include: SM 5310B, SM 5310C, SM 5310D (SM, 2005b, 2005c, 2005d), or SM 5310B-00, SM 5310C-00, SM 5310D-00 (SM Online, 2000a, 2000b, 2000c), EPA Method 415.3 (Rev. 1.1 or 1.2) (USEPA, 2005, 2009b). Bromide methods include: EPA Methods 300.0 (Rev. 2.1), 300.1 (Rev. 1.0), 317.0 (Rev. 2.0), 326.0 (Rev. 1.0) (USEPA, 1993, 1997, 2001b, 2002) or ASTM D 6581-12 (ASTM, 2012).
[11] EPA Method 541 (GC/MS) (USEPA, 2015d).
[12] EPA Method 530 (GC/MS) (USEPA, 2015e).

B. *What are the UCMR 4 sampling design and timeline of activities?*

EPA is maintaining the 2018 to 2020 monitoring timeframe identified in the proposal. Preparations prior to 2018 will include coordinating laboratory approval, selecting representative

small systems (USEPA, 2001a), developing SMPs and establishing monitoring schedules. Exhibit 4 illustrates the major activities that will take place in preparation for and during the implementation of UCMR 4.

Exhibit 4: Timeline of UCMR 4 Activities

2017	2018	2019	2020	2021
After final rule publication: EPA/state primacy authorities (1) develop SMPs (including the nationally representative sample); (2) inform PWSs/ establish monitoring plans; and (3) continuation of laboratory approval	← **Assessment Monitoring** → List 1 Contaminants *All large systems serving more than 10,000 people;* *800 small systems serving 10,000 or fewer people for cyanotoxins;* *800 small systems serving 10,000 or fewer people for the 20 additional contaminants.* Reporting and analysis of data			Complete reporting and analysis of data

To minimize the impact of the rule on small systems (those serving 10,000 or fewer people), EPA pays for the sample kit preparation, sample shipping fees and analysis costs for these systems. In addition, no small system will be required to monitor for both cyanotoxins and the 20 additional UCMR contaminants. Consistent with prior UCMRs, large systems (those serving more than 10,000 people) pay for all costs associated with their monitoring. A summary of the estimated number of systems subject to monitoring is shown in Exhibit 5.

Exhibit 5: Systems to Participate in UCMR 4 Monitoring

System Size (# of people served)	National Sample: Assessment Monitoring Design		Total # of Systems per Size Category
	10 List 1 Cyanotoxins	**20 Additional List 1 Contaminants[3]**	
Small Systems[1] (25 – 10,000)	800 randomly selected SW or GWUDI systems	800 randomly selected SW, GWUDI and GW systems	1,600
Large Systems[2] (10,001 and over)	All SW or GWUDI systems (2,725)	All SW, GWUDI and GW systems (4,292)	4,292
TOTAL	**3,525**	**5,092**	**5,892**

[1] Total for small systems is additive because these systems will only be selected for one component of UCMR 4 sampling (10 cyanotoxins or 20 additional contaminants). EPA will pay for all analytical costs associated with monitoring at small systems.
[2] Large system counts are approximate. The number of large systems is not additive. All SW and GWUDI systems will monitor for cyanotoxins; those same systems will also monitor for the 20 additional List 1 contaminants, as will the large GW systems.
[3]Water systems that are not subject to HAA5 monitoring under the D/DBPRs (§141.Subparts L and V) are not required to monitor for the UCMR 4 HAAs or associated indicators (TOC and bromide).

1. Sampling frequency, timing

a. This Rule

Today's rule maintains the proposed increased sampling frequency and narrower monitoring timeframe for total microcystins and the nine cyanotoxins. Sampling will take place twice a month for four consecutive months (total of eight sampling events) for SW and GWUDI systems. These water systems will collect samples during the monitoring timeframe of March through November (excluding December, January and February). GW systems are excluded from cyanotoxin monitoring.

Monitoring for the 20 additional UCMR 4 contaminants will be based on the traditional UCMR sampling frequency and timeframe. For SW and GWUDI systems, sampling will take place for four consecutive quarters over the course of 12 months (total of four sampling events). Sampling events will occur three months apart. For example, if the first sample is taken in

January, the second will then occur anytime in April, the third will occur anytime in July and the fourth will occur anytime in October. For GW systems, sampling will take place twice over the course of 12 months (total of two sampling events). Sampling events will occur five to seven months apart. For example, if the first sample is taken in April, the second sample will then occur anytime in September, October or November.

EPA, in conjunction with the states, will initially determine schedules (year and months of monitoring) for large water systems. These PWSs will then have an opportunity to modify their schedule for planning purposes or other reasons (e.g., to conduct monitoring during the months the system or the state believes are most vulnerable, spread costs over multiple years, address a situation where the sampling location will be closed during the scheduled month of monitoring, etc.). PWSs are not permitted to reschedule monitoring specifically to avoid sample collection during a suspected vulnerable period for the cyanotoxins. EPA will schedule and coordinate small system monitoring by working closely with partnering states. SMPs provide an opportunity for states to review and revise the initial sampling schedules that EPA proposes.

b. Summary of Major Comments and EPA Responses

Commenters generally supported the narrower timeframe for cyanotoxin sampling but disfavored the narrower March through November timeframe for the 20 additional contaminants. For the latter group of contaminants, EPA received multiple comments that recommended using the traditional sampling frequency and timing of previous UCMR cycles. Commenters cited the potential for cost savings by allowing the UCMR 4 HAAs to be sampled on the same schedule as compliance monitoring, and they also suggested that traditional 12-month monitoring would be appropriate for assessing lifetime exposure. EPA agrees with these points and today's rule includes the traditional monitoring schedule for the 20 additional contaminants. EPA's response

is detailed more fully in the "Response to Comments Document for the Unregulated Contaminant Monitoring Rule (UCMR 4)," (USEPA, 2016b), which can be found in the electronic docket listed in the **ADDRESSES** section of this notice.

Several commenters recommended that the Agency reduce the number of sample events for GW systems to one instead of the traditional two. Commenters provided an assessment of data on UCMR 3 contaminants in GW systems, and suggested that there is no significant statistical difference between the results for the two sample events for many of the contaminants. EPA acknowledges that based on the UCMR 3 data, the correlation between sample event 1 and sample event 2 for GW systems can be high, and the distributions of measured values can be very similar. However, when making regulatory determinations, EPA evaluates the number of systems (and populations) with means or single measured values above health levels of concern, as both values provide important information on the occurrence of UCMR contaminants in PWSs. The approach suggested by commenters would yield less accurate data for several reasons. First, the analysis provided by the commenters shows that the counts or percentage of systems above a concentration of interest can vary between sample events, and that there are individual cases where the contaminant is not detected in one sample event but occurs at significant levels in the second event. In addition, the analysis by commenters did not find a strong correlation between the two GW sampling events for chlorate, a disinfectant byproduct, likely due to the temporal variability in disinfection practices. This strongly suggests that having a single sample event may not be appropriate for temporally variable contaminants like pesticides and other anthropogenic contaminants. EPA did consider making exceptions for certain classes of contaminants (e.g., those contaminants that are not as temporally variable), however, the UCMR design must address all types of contaminants on a national scale, often

without advance knowledge about the degree to which the contaminant occurrence may vary over time. Making exceptions would increase the complexity of the sample design. In addition, statistical means based on two measurements have considerably less error than a single measurement per system and provide a more robust dataset for future regulatory decisions. EPA also notes that the analysis provided by commenters only addressed a limited set of contaminants (i.e., those from UCMR 3) and did not examine the results from other UCMR cycles; if EPA were to consider reducing sampling frequency as suggested, the Agency would need more robust information. EPA will re-evaluate this issue in future UCMR cycles if new information becomes available.

Finally, it is worth noting that the Agency does allow systems the opportunity to reduce monitoring by using approved GW representative entry points and, in the case of water systems that purchase water from the same source, by using representative connections.

2. Phased sample analysis for microcystins

a. This Rule

Today's rule utilizes a phased sample analysis approach for the microcystins to reduce analytical costs (i.e., PWSs will collect all required samples for each sampling event but not all samples may need to be analyzed). However, that phased approach has been simplified relative to the proposed approach and will begin with sample collection at the entry point to the distribution system (EPTDS). Three samples will be collected at the EPTDS for cyanotoxins. One sample will be collected for EPA Method 546 (Adda ELISA), another for potential analysis by EPA Method 544, and another for analysis by EPA Method 545. Adda ELISA is a widely used screening assay that allows for the aggregate detection of numerous microcystin congeners; it does not allow for measurement of the individual congeners (USEPA, 2015f; Fischer et al.,

2001; McElhiney and Lawton, 2005; Zeck et al., 2001). If the EPTDS ELISA result is less than 0.3 micrograms per liter (µg/L) (i.e., the reporting limit for total microcystins), then the sample collected for Method 544 will not be analyzed for that sample event and only the Adda ELISA result will be reported to EPA. If the ELISA result is greater than or equal to 0.3 µg/L, the result will be reported to EPA and the EPA Method 544 sample will then be analyzed to identify and quantify nodularin and the six specific microcystin congeners identified in Exhibit 3. Cylindrospermopsin and anatoxin-a will only be monitored at the EPTDS, with analysis by EPA Method 545.

In lieu of the proposed source-water ELISA monitoring, this final rule requires PWSs to answer four simple "metadata" questions (identifying the appropriate responses from the options provided) to help EPA understand the source water quality at the time their EPTDS samples are collected. These questions are identified in the Data Elements section III.C.1.

b. Summary of Major Comments and EPA Responses

EPA received multiple comments on the proposed phased approach to microcystins and the utility of measuring pH and temperature in the source water. Some commenters recommended omitting source water sampling for microcystins, suggesting that a correlation cannot be drawn between source water and finished water using the proposed approach. Commenters also suggested the following: targeted studies should collect treatment plant metadata to support future analyses; the phased approach could potentially miss an increase in cyanotoxins released as a result of treatment (e.g., cell rupture during treatment); the inclusion of both source water data and drinking water data in NCOD and other outreach materials would confuse consumers; and more appropriate candidate indicators could be considered. EPA has considered these concerns and is not requiring source water microcystin monitoring in the final

rule, nor is the Agency requiring pH and temperature data collection. UCMR 4 focuses instead on finished water cyanotoxin data collection and a more qualitative characterization of source water. EPA estimates that the final rule approach, relying on the collection of source water metadata in lieu of source water sampling, reduces $1.8 million in costs from the proposed regulation over the five-year period of the UCMR 4. The collection of source water metadata can easily be incorporated into the data reporting system and will complement the quantitative analytical drinking water data used to support future regulatory determinations.

EPA also received comments reflecting confusion about the interpretation of results from the Adda ELISA microcystin method and Method 544 (microcystins by LC-MS/MS). EPA notes that the two methods provide different measures of microcystin occurrence and risk, and one result cannot practically be used to confirm the other. The Adda ELISA allows for an aggregate quantification of a wide spectrum of microcystin congeners based on the ability of the antibodies used in the assay to recognize microcystins, while Method 544 focuses on quantifying six specific microcystin congeners. The microcystins addressed in Method 544 may or may not be the dominant congeners in particular source waters.

3. Applicability of HAA monitoring requirements

a. This Rule

If a water system is not subject to HAA5 monitoring under the D/DBPRs (see §141.622 for D/DBPR monitoring requirements), the water systems is not required to collect and analyze UCMR 4 HAA samples.

b. Summary of Major Comments and EPA Responses

One commenter suggested that EPA remove the UCMR 4 requirement for water systems to monitor for HAAs if the system is not subject to HAA5 monitoring under the D/DBPRs. The

logic is that non-disinfecting GW systems would not be expected to have measureable HAAs as DBPs. EPA agrees with the comment and has removed the requirement. This change reduces the UCMR 4 cost by $826,000 from the proposed rule's cost over the 5-year UCMR 4 period.

4. Representative sampling

a. This Rule

Consistent with previous UCMRs and as described in §141.35(c)(3), UCMR 4 maintains the option for large GW systems that have multiple EPTDSs to sample, with prior approval, at representative sampling locations rather than at each EPTDS. Representative sampling plans approved under prior UCMRs will be recognized as valid for UCMR 4. Systems must submit a copy of documentation from their state or EPA representing the prior approval of their alternative sampling plan. Any new GW representative monitoring plans must be submitted to EPA for review (by the state or EPA) within 120 days from publication of this final rule. Once approved, these representative EPTDS locations, along with previously approved EPTDS locations from prior UCMRs, must be loaded into the Safe Drinking Water Accession and Review System (SDWARS) by the water system by December 31, 2017.

Consistent with previous UCMRs and as described in §141.40, Table 1, systems that purchase water with multiple connections from the same wholesaler may select one representative connection from that wholesaler. This EPTDS sampling location must be representative of the highest annual volume connections. If the connection selected as the representative EPTDS is not available for sampling, an alternate highest volume representative connection must be sampled. Water provided by multiple wholesalers will be considered different sources and will each need a representative connection.

b. Summary of Major Comments and EPA Responses

EPA received multiple comments about representative wholesale connections from consecutive systems. Commenters were concerned that this approach to reduce monitoring would be eliminated in UCMR 4. The proposed rule preamble explicitly highlighted the flexibility for representative ground water sampling, but did not highlight the option for representative wholesale connections (i.e., for consecutive systems). In this preamble, EPA is affirming the opportunity for water systems that purchase water (with multiple connections from the same wholesaler) to reduce monitoring; this option will continue in UCMR 4. EPA will likewise address this in future meetings, webinars and outreach materials.

5. Sampling Locations

a. This Rule

Sample collection for the UCMR 4 contaminants will take place at the EPTDS for all contaminant groups except for the HAAs, which will take place in the distribution system. Sampling for the HAA indicators, TOC and bromide, will take place at a single source water influent for each treatment plant.

If the system's treatment plant/water source is subject to the D/DBPR's HAA5 monitoring requirements under §141.622, the water system will collect samples for the UCMR 4 HAAs at the D/DBPR sampling location(s). UCMR 4 HAA samples and D/DBPR HAA5 compliance monitoring samples may be collected by the PWS at the same time. However, EPA notes that PWSs are required to arrange for UCMR 4 HAA samples to be analyzed by a UCMR 4 approved laboratory using EPA Method 552.3 or 557 (both of which are compliance methods also approved for analysis of D/DBPR samples).

For those systems subject to UCMR 4 HAA monitoring, sampling for the HAA indicators (TOC and bromide) will take place at the source water influent for each treatment plant

(concurrent with UCMR 4 HAA sampling in the distribution system). This indicator-monitoring requirement does not pertain to consecutive systems (i.e., those purchasing water from other systems). For purposes of TOC and bromide sampling, EPA defines source water influent under UCMR as untreated water entering the water treatment plant (i.e., at a location prior to any treatment).

SW and GWUDI systems subject to TOC monitoring under the D/DBPRs will use their TOC source water sampling site(s) defined at §141.132 for UCMR 4 TOC and bromide samples. If a SW or GWUDI system is not subject to the D/DBPR TOC monitoring, it will use its Long Term 2 Enhance Surface Water Treatment Rule (LT2) source water sampling site(s) (§141.703) to collect UCMR 4 samples for TOC and bromide. GW systems that are subject to the D/DBPRs will take TOC and bromide samples at their influents entering their treatment train.

b. Summary of Major Comments and EPA Responses

With the exception of microcystin monitoring, commenters generally agreed with the sampling location approach described in the proposal. Changes made to address the microcystin comments are addressed in section III.B.2.

C. What are the reporting requirements for UCMR 4?

1. Data elements

a. This Rule

Today's final rule maintains the 26 data elements described in the proposed rule and updates some of the definitions for clarity and consistency in the reporting requirements. Additionally, EPA has included four data elements to address collection of the source water metadata discussed in section III.B.2.

The four new metadata elements are all yes or no questions, with a corresponding drop

down menu of options if yes is selected:

(1) Bloom Occurrence - preceding the finished water sample collection, did you observe an algal bloom in your source waters near the intake?

(2) Cyanotoxin Occurrence - 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)?

(3) Indicator of Possible Bloom – Treatment – preceding the finished water sample collection, did you notice any changes in your treatment system operation and/or treated water quality that may indicate a bloom in the source water?

(4) Indicator of Possible Bloom – Source Water Quality Parameters – preceding the finished water sample collection, did you observe any notable changes in source water quality parameters (if measured)?

Please see Table 1 of §141.35(e) for the complete list of data elements, definitions and drop down options that will be provided in the data reporting system.

b. Summary of Major Comments and EPA Responses

EPA received many comments on the proposed data elements, particularly regarding the complexity and utility of collecting the new quality control (QC) parameters; concerns with how the data will be gathered and processed; and questions about how the database will function.

EPA will collect all 30 data elements in SDWARS 4, an updated version of the data reporting system used in previous UCMR actions. More than half of these data elements (e.g., inventory and analytical results) were used in prior UCMR cycles and were included in the previous SDWARS system. The new QC data elements are already generated by the laboratory and do not constitute new analytical requirements.

SDWARS 4 will include improvements in the user interface and new QC checks will be built into the system to review the data in real-time. Consistent with prior UCMR cycles, states and EPA will have access to data once posted by the laboratory and reviewed by the PWS (or 60 days after the laboratory posting, whichever comes first). EPA will offer two database training sessions in 2017 to help users become familiar with the new system. One training session will be for the water systems and the other training session will be for the laboratories. A future Federal Register announcement will provide more details on these training sessions.

Other comments regarding the data elements included the following specific points: a request for a simpler classification of treatment "bins"; a recommendation that the final rule collect the primary and secondary disinfectant practice in place at the time of HAA sampling; an observation that the UCMR 4 data are more informative when there is information describing the associated treatment; a recommendation that EPA simplify the data elements and data definitions; and a recommendation that the rule not collect metadata about oxidant addition, oxidant order of application, oxidant dose and oxidant contact time.

The final rule simplifies and clarifies the treatment options available for the PWS to select as metadata; includes the collection of all disinfectant practices and information describing the treatment in place; simplifies the data elements and data definitions; and does not include the collection of metadata about oxidant order of application, dose or contact time. EPA's response is detailed more fully in the "Response to Comments Document for the Unregulated Contaminant Monitoring Rule (UCMR 4)," (USEPA, 2016b), which can be found in the electronic docket listed in the **ADDRESSES** section of this notice.

IV. How are laboratories approved for UCMR 4 monitoring?

Consistent with the proposal, and with past practice, the final rule requires EPA approval of all laboratories conducting analyses for UCMR 4. EPA will follow the traditional Agency approach, outlined in the proposal, to approving UCMR laboratories, which requires laboratories seeking approval to: (1) provide EPA with data that demonstrates a successful completion of an initial demonstration of capability (IDC) as outlined in each method; (2) verify successful analytical performance at or below the MRLs as specified in this action; (3) provide information about laboratory operating procedures; and (4) successfully participate in an EPA proficiency testing (PT) program for the analytes of interest. Audits of laboratories may be conducted by EPA prior to and/or following approval. The "UCMR 4 Laboratory Approval Requirements and Information Document" (USEPA, 2016d) provides guidance on the EPA laboratory approval program and the specific method acceptance criteria.

EPA may supply analytical reference standards for select analytes to participating/approved laboratories when reliable standards are not readily available through commercial sources.

This final rule's structure for the laboratory approval program is the same as that proposed for UCMR 4 and employed in previous UCMRs, and provides an assessment of the laboratories' ability to perform analyses using the methods listed in §141.40(a)(3), Table 1. The UCMR 4 laboratory approval process is designed to assess whether laboratories possess the required equipment and analyst skills and can meet the laboratory-performance and data-reporting criteria described in this action. Laboratory participation in the UCMR laboratory approval program is voluntary. However, as in previous UCMRs and as proposed for UCMR 4, EPA will require PWSs to exclusively use laboratories that have been approved under the

program to analyze UCMR 4 samples. EPA expects to post a list of approved UCMR 4 laboratories to https://www.epa.gov/dwucmr. Laboratories are encouraged to apply for UCMR 4 approval as early as possible, as EPA anticipates that large PWSs scheduled for monitoring in the first year will be making arrangements for sample analyses soon after the final rule is published. The steps and requirements for the laboratory approval process are listed in sections A through F below.

A. Request to participate

Laboratories interested in the UCMR 4 laboratory approval program can request registration materials by emailing EPA at UCMR_Sampling_Coordinator@epa.gov to request registration materials.

B. Registration

Laboratory applicants will provide registration information that includes: laboratory name, mailing address, shipping address, contact name, phone number, email address and a list of the UCMR 4 methods for which the laboratory is seeking approval. This registration step provides EPA with the necessary contact information, and ensures that each laboratory receives a customized application package. Laboratories must complete and submit the necessary registration information by **[Insert date 60 days after date of publication in the Federal Register]**.

C. Application package

Laboratories wishing to participate will complete and return a customized application package that includes the following: IDC data, including precision, accuracy and results of MRL studies; information regarding analytical equipment and other materials; proof of current drinking water laboratory certification (for select compliance monitoring methods); and example

chromatograms for each method under review. Laboratories must complete and submit the necessary application materials by **[Insert date 120 days after date of publication in the Federal Register]**.

As a condition of receiving and maintaining approval, the laboratory is expected to confirm that it will post UCMR 4 monitoring results and quality control data that meet method criteria (on behalf of its PWS clients) to EPA's UCMR electronic data reporting system, SDWARS.

D. EPA's review of application packages

EPA will review the application packages and, if necessary, request follow-up information. Laboratories that successfully complete the application process become eligible to participate in the UCMR 4 PT program.

E. Proficiency testing

A PT sample is a synthetic sample containing a concentration of an analyte or mixture of analytes that is known to EPA, but unknown to the laboratory. To be approved, a laboratory is expected to meet specific acceptance criteria for the analysis of a UCMR 4 PT sample(s) for each analyte in each method, for which the laboratory is seeking approval. EPA intends to offer at least two opportunities for a laboratory to successfully analyze UCMR 4 PT samples after publication of the final rule. A laboratory is expected to pass one of the PT studies for each analytical method for which it is requesting approval, and will not be required to pass a PT study for a method it has already passed in a previous UCMR 4 PT study. EPA does not expect to conduct additional PT studies after the start of system monitoring; however, laboratory audits will likely be ongoing throughout UCMR 4 implementation. Initial laboratory approval is expected to be contingent on successful completion of a PT study. Continued laboratory approval

is contingent on successful completion of the audit process and satisfactorily meeting all the other stated conditions.

F. Written EPA approval

For laboratories that have already successfully completed the preceding steps (A through E), EPA will have sent the applicant a letter listing the methods for which approval is pending (i.e., pending promulgation of this rule). Because no changes have been made to the final rule that impact the laboratory approval program, laboratories that received pending approval letters will be granted approval without further action on their part. Additional approval actions (i.e., for those laboratories that apply and have not already proceeded to the point of being in "approval pending" status) will be based on laboratory completion of Steps A through E. In both cases, EPA will document its final decision in writing.

EPA did not receive any adverse comments on the laboratory approval process or criteria that it proposed.

V. What is the past and future stakeholder involvement in the regulation process?

A. What is the states' role in the UCMR program?

UCMR is a direct implementation rule (i.e., EPA has primary responsibility for its implementation) and state participation is voluntary. Under previous UCMRs, specific activities that individual states, tribes and territories agreed to carry out or assist with were identified and established exclusively through PAs. Through PAs, states, tribes and territories can help EPA implement the UCMR program and help ensure that the UCMR data are of the highest quality possible to best support Agency decision making. Under UCMR 4, EPA will continue to use the PA process to determine and document the following: the process for review and revision of the SMPs; replacing and updating system information; review and approval of proposed GW

representative monitoring plans; notification and instructions for systems; and compliance assistance. EPA recognizes that states/primacy agencies often have the best information about PWSs in their state and encourages states to partner.

SMPs include tabular listings of the systems that EPA selected and the proposed schedule for their monitoring. Initial SMPs also typically include instructions to states for revising and/or correcting system information in the SMPs, including modifying the sampling schedules for small systems. EPA will incorporate revisions from states, resolve any outstanding questions and return the final SMPs to each state.

B. What stakeholder meetings have been held in preparation for UCMR 4?

EPA incorporates stakeholder involvement into each UCMR cycle. Specific to the development of UCMR 4, EPA held three public stakeholder meetings and is announcing a fourth in today's preamble (see section V.C). EPA held a meeting focused on drinking water methods for CCL contaminants on May 15, 2013, in Cincinnati, Ohio. Participants included representatives of state agencies, laboratories, PWSs, environmental organizations and drinking water associations. Meeting topics included an overview of the regulatory process (CCL, UCMR and Regulatory Determination) and drinking water methods under development, primarily for CCL contaminants (see USEPA, 2013 for presentation materials). EPA held a second stakeholder meeting on June 25, 2014, in Washington, DC. Attendees representing state agencies, tribes, laboratories, PWSs, environmental organizations and drinking water associations participated in the meeting via webinar and in person. Meeting topics included a status update on UCMR 3; UCMR 4 potential sampling design changes relative to UCMR 3; UCMR 4 candidate analytes and rationale; and the laboratory approval process (see USEPA, 2014 for meeting materials). The third stakeholder meeting was held on January 13, 2016, via a

webinar, during the public comment period for the proposed rule. Attendees representing state agencies, laboratories, PWSs, environmental organizations and drinking water associations participated. Meeting topics included the proposed UCMR 4 monitoring requirements, analyte selection and rationale, analytical methods, the laboratory approval process and GW representative monitoring plans (see USEPA, 2016f for meeting materials).

C. How do I participate in the upcoming stakeholder meeting?

EPA will hold the fourth UCMR 4 public stakeholder meeting in Washington, DC, on April 12, 2017. Attendees can participate in person or via webinar. Topics will include the final UCMR 4 requirements for monitoring, sampling and reporting, analytical methods, the laboratory approval process, GW representative monitoring plans and consecutive system monitoring plans.

1. Meeting participation

Those who wish to participate in the public meeting, whether in person or via webinar, need to register in advance no later than 5:00 p.m., eastern time on April 7, 2017, by going to https://www.eventbrite.com/e/ucmr-4-public-stakeholder-meeting-registration-28264984329. To ensure adequate time for questions, individuals or organizations with specific questions should identify any upfront questions when they register. Additional questions from attendees will be taken during the meeting and answered as time permits. The number of webinar connections available for the meeting is limited and will be available on a first-come, first-served basis. Further details about registration and participation can be found on EPA's Unregulated Contaminant Monitoring Program “Meetings and Materials” website at https://www.epa.gov/dwucmr.

2. Meeting materials

Materials are expected to be sent by email to all registered attendees prior to the meeting. EPA will post the materials on the Agency's website for persons who are unable to participate.

D. How did EPA consider Children's Environmental Health?

Executive Order 13045 does not apply to UCMR 4, however, EPA's Policy on Evaluating Health Risks to Children is applicable (See VII.G. Executive Order 13045). By monitoring for unregulated contaminants that may pose health risks via drinking water, UCMR furthers the protection of public health for all citizens, including children. EPA considered children's health risks during the development of UCMR 4. This includes considering public comments about candidate contaminant priorities.

The objective of UCMR 4 is to collect nationally representative drinking water data on a set of unregulated contaminants. EPA generally collects occurrence data for contaminants at the lowest levels that are feasible for the national network of approved drinking water laboratories to quantify accurately. By setting reporting levels as low as is feasible, the Agency positions itself to better address contaminant risk information in the future, including that associated with unique risks to children.

E. How did EPA address Environmental Justice?

The EPA has concluded that this action is not subject to Executive Order 12898 (59 FR 7629, February 16, 1994) because it does not establish an environmental health or safety standard (see VII.J. Executive Order 12898). This regulatory action provides EPA and other interested parties with scientifically valid data on the national occurrence of selected contaminants in drinking water. By seeking to identify unregulated contaminants that may pose health risks via drinking water from all PWSs, UCMR furthers the protection of public health for

all citizens. EPA recognizes that unregulated contaminants in drinking water are of interest to all populations and structured the rulemaking process and implementation of the UCMR 4 rule to allow for meaningful involvement and transparency. EPA organized public meetings and webinars to share information regarding the development of UCMR 4; coordinated with tribal governments; and convened a workgroup that included representatives from several states.

EPA will continue to collect U.S. Postal Service Zip Codes for each PWS's service area, as collected under UCMR 3, to support assessment in future regulatory evaluations of whether or not minority, low-income and/or indigenous-population communities are uniquely impacted by particular drinking water contaminants.

VI. What documents are being incorporated by reference?

The following methods are incorporated by reference into this section for UCMR 4 monitoring. All approved material is available for inspection electronically at https://www.regulations.gov (Docket ID No. EPA-HQ-OW-2015-0218), or from the sources listed for each method. EPA has worked to make these methods and documents reasonably available to interested parties. The EPA and non-EPA methods that support monitoring under this rule are as follows:

A. *Methods from the U.S. Environmental Protection Agency*

The following methods are from the U.S. Environmental Protection Agency, Water Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Avenue, NW, Washington, DC 20004.

1. Method 200.8 "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry," Revision 5.4, EMMC Version, 1994. Available on the Internet at https://www.nemi.gov. This is an EPA method for

the analysis of elements in water by ICP-MS and will measure germanium and manganese during UCMR 4.

2. Method 300.0 “Determination of Inorganic Anions by Ion Chromatography Samples,” Revision 2.1, August 1993. Available on the Internet at https://www.nemi.gov. This is an EPA method for the analysis of inorganic anions in water samples using ion chromatography (IC) with conductivity detection. It will be used for the measurement of bromide, an indicator for the HAAs.
3. Method 300.1 “Determination of Inorganic Anions in Drinking Water by Ion Chromatography,” Revision 1.0, 1997. Available on the Internet at https://www.epa.gov/dwanalyticalmethods. This is an EPA method for the analysis of inorganic anions in water samples using IC with conductivity detection. It will be used for the measurement of TOC, an indicator for the HAAs.
4. Method 317.0 “Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis,” Revision 2.0, July 2001, EPA 815-B-01-001. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.This is an EPA method for the analysis of inorganic anions in water samples using IC with conductivity detection. It will be used for the measurement of bromide, an indicator for the HAAs.
5. Method 326.0 “Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis,” Revision 1.0, June 2002, EPA 815-R-03-007. Available on the Internet at

https://www.epa.gov/dwanalyticalmethods. This is an EPA method for the analysis of inorganic anions in water samples using IC with conductivity detection. It will be used for the measurement of bromide, an indicator for the HAAs.

6. Method 415.3 "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," Revision 1.1, February 2005, EPA/600/R-05/055. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods. This is an EPA method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.
7. Method 415.3 "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," Revision 1.2, September 2009, EPA/600/R-09/122. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods. This is an EPA method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.
8. Method 525.3 "Determination of Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)," Version 1.0, February 2012, EPA/600/R-12/010. Available on the Internet https://www.epa.gov/water-research/epa-drinking-water-research-methods. This is an EPA method for the analysis of semivolatile organic chemicals in drinking water using SPE and GC/MS and will measure the nine UCMR 4 pesticides (alpha-hexachlorocyclohexane, chlorpyrifos, dimethipin, ethoprop, oxyfluorfen, profenofos, tebuconazole, total cis- and trans- permethrin and tribufos).

9. Method 530 “Determination of Select Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Gas Chromatography/Mass Spectrometry (GC/MS),” Version 1.0, January 2015, EPA/600/R-14/442. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods. This is an EPA method for the analysis of semivolatile organic chemicals in drinking water using SPE and GC/MS and will measure butylated hydroxyanisole, o-toluidine and quinoline.
10. EPA Method 541: “Determination of 1-Butanol, 1,4-Dioxane, 2-Methoxyethanol and 2-Propen-1-ol in Drinking Water by Solid Phase Extraction and Gas Chromatography/Mass Spectrometry,” November 2015, EPA 815-R-15-011. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods. This is an EPA method for the analysis of selected alcohols and 1,4-dioxane in drinking water using SPE and GC/MS and will measure 1-butanol, 2-methoxyethanol and 2-propen-1-ol.
11. Method 544 “Determination of Microcystins and Nodularin in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS),” Version 1.0, February 2015, EPA 600-R-14/474. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods. This is an EPA method for the analysis of selected cyanotoxins in drinking water using SPE and LC-MS/MS with electrospray ionization (ESI) and will measure six microcystins (microcystin-LA, microcystin-LF, microcystin-LR, microcystin-LY, microcystin-RR and microcystin-YR) and nodularin.
12. EPA Method 545: “Determination of Cylindrospermopsin and Anatoxin-a in

Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)," April 2015, EPA 815-R-15-009. Available on the Internet at https://www.epa.gov/dwanalyticalmethods. This is an EPA method for the analysis of selected cyanotoxins in drinking water using LC-MS/MS with ESI and will measure cylindrospermopsin and anatoxin-a.

13. EPA Method 546: "Determination of Total Microcystins and Nodularins in Drinking Water and Ambient Water by Adda Enzyme-Linked Immunosorbent Assay," August 2016, EPA-815-B-16-011. Available on the Internet at https://www.epa.gov/dwanalyticalmethods. This is an EPA method for the analysis of total microcystins and nodularins in drinking water using ELISA.
14. Method 552.3 "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-Liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection," Revision 1.0, July 2003, EPA 815-B-03-002. Available on the Internet at https://www.epa.gov/dwanalyticalmethods. This is an EPA method for the analysis of haloacetic acids and dalapon in drinking water using liquid-liquid microextraction, derivatization, and GC with ECD, and will measure the three UCMR 4 HAA groups (HAA5, HAA6Br and HAA9).
15. EPA Method 557: "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)," Version 1.0, September 2009, EPA 815-B-09-012. Available on the Internet at https://www.epa.gov/dwanalyticalmethods. This is an EPA method for the analysis of haloacetic acids, bromate, and dalapon in drinking water using IC-MS/MS with ESI, and will measure the three UCMR 4 HAA groups

(HAA5, HAA6Br and HAA9).

B. Methods from American Public Health Association – Standard Methods (SM)

The following methods are from American Public Health Association – Standard Methods (SM), 800 I Street NW, Washington, DC 20001-3710

1. "Standard Methods for the Examination of Water & Wastewater," 21st edition (2005).
    a. SM 3125 "Metals by Inductively Coupled Plasma/Mass Spectrometry." This is a Standard Method for the analysis of metals and metalloids in water by ICP-MS and is used for the analysis of germanium and manganese.
    b. SM 5310B "Total Organic Carbon (TOC): High-Temperature Combustion Method." This is a Standard Method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.
    c. SM 5310C "Total Organic Carbon (TOC): Persulfate-UV or Heated-Persulfate Oxidation Method." This is a Standard Method for the analysis of TOC in water samples using conductivity detector or a nondispersive infrared detector.
    d. SM 5310D "Total Organic Carbon (TOC): Wet-Oxidation Method." This is a Standard Method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.
2. "Standard Methods Online.," approved 2000 (unless noted). Available for purchase on the Internet at http://www.standardmethods.org.
    a. SM 3125 "Metals by Inductively Coupled Plasma/Mass Spectrometry" Editorial revisions, 2011 (SM 3125-09). This is a Standard Method for the

analysis of metals and metalloids in water by ICP-MS and is used to measure germanium and manganese.

b. SM 5310B "Total Organic Carbon: High-Temperature Combustion Method," (5310B-00). This is a Standard Method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.

c. SM 5310C "Total Organic Carbon: Persulfate-UV or Heated-Persulfate Oxidation Method," (5310C-00). This is a Standard Method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.

d. SM 5310D "Total Organic Carbon: Wet-Oxidation Method," (5310D-00). This is a Standard Method for the analysis of TOC in water samples using a conductivity detector or a nondispersive infrared detector.

C. Methods from ASTM International

The following methods are from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

1. ASTM D5673-10 "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry," approved August 1, 2010. Available for purchase on the Internet at http://www.astm.org/Standards/D5673.htm. This is an ASTM method for the analysis of elements in water by ICP-MS and is used to measure germanium and manganese.
2. ASTM D6581-12 "Standard Test Methods for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Suppressed Ion Chromatography," approved March 1, 2012. Available for purchase on the Internet at

http://www.astm.org/Standards/D6581.htm. This is an ASTM method for the analysis of inorganic anions in water samples using IC with conductivity detection. It will be used for the measurement of bromide, an indicator for the HAAs.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review. Any changes made in response to OMB recommendations have been documented in the docket, "Documentation of OMB Review Under Executive Order 12866: Revisions to the Unregulated Contaminant Monitoring Regulation (UCMR 4) for Public Water Systems." The EPA prepared an analysis of the potential costs associated with this action, and this is also available in the docket, "Information Collection Request for the Unregulated Contaminant Monitoring Rule (UCMR 4)."

B. Paperwork Reduction Act (PRA)

The information collection activities in this rule have been submitted for approval to OMB under the PRA. The ICR document that the EPA prepared has been assigned EPA ICR number 2192.08. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The ICR requirements are not enforceable until OMB approves them.

The information that EPA will collect under this rule fulfills the statutory requirements of section 1445(a)(2) of the SDWA, as amended in 1996. EPA will collect information that describes the source of the water, location and test results for samples taken from PWSs as described in 40 CFR §141.35(e). The information collected will support Agency decisions as to whether or not to regulate particular contaminants under the SDWA. Reporting is mandatory.

The data are not subject to confidentiality protection.

EPA received a number of comments regarding cost and burden of the proposed rule. Those comments recommended the following: omit source water monitoring for microcystins; omit UCMR 4 HAA monitoring for PWSs that do not conduct HAA compliance monitoring; allow monitoring over a 12-month period for contaminants other than cyanotoxins; and provide more accurate cost estimates. Based on these public comments, the following changes were made to the final rule. EPA's response is detailed more fully in the "Response to Comments Document for the Unregulated Contaminant Monitoring Rule (UCMR 4)," (USEPA, 2016b), which can be found in the electronic docket listed in the **ADDRESSES** section of this notice.

1. Removed the proposed source water monitoring requirement for microcystins, temperature and pH.
2. Limited UCMR 4 HAA monitoring to only those PWSs that are subject to the D/DBPRs.
3. Restored the traditional 12-month monitoring schedule for the 20 additional (non-cyanotoxin) contaminants. This will support PWSs that wish to do concurrent HAA compliance monitoring and UCMR 4 sampling.
4. Increased the wage estimates to 2016 rates using the Employment Cost Index for waters and salaries in trade, transport and utilities.
5. Updated the analytical costs of each method with new cost estimates from more laboratories.

The annual burden and cost estimates described in this section are based on the implementation assumptions described in section III. In general, burden hours were calculated by:

1. Determining the activities that PWSs and states would complete to comply with the UCMR activity;
2. Estimating the number of hours per activity;
3. Estimating the number of respondents per activity; and
4. Multiplying the hours per activity by the number of respondents for that activity.

Respondents to UCMR 4 include 1,600 small PWSs (800 for cyanotoxin monitoring and a different set of 800 for monitoring the additional 20 contaminants), the ~4,292 large PWSs and the 56 states and primacy agencies (~5,948 total respondents). The frequency of response varies across respondents and years. System costs (particularly laboratory analytical costs) vary depending on the number of sampling locations. For cost estimates, EPA assumed that systems will conduct sampling evenly from January 2018 through December 2020, excluding December, January and February of each year for cyanotoxins (i.e., one-third of the systems in each year of monitoring). Because the applicable ICR period is 2017-2019, one year of monitoring activity (i.e., 2020) is not captured in the ICR estimates; this will be addressed in a subsequent ICR renewal for UCMR 4.

Small PWSs that are selected for UCMR 4 monitoring will sample an average of 6.7 times per PWS (i.e., number of responses per PWS) across the 3-year ICR period. The average burden per response for small PWSs is estimated to be 2.8 hours. Large PWSs (those serving 10,001 to 100,000 people) and very large PWSs (those serving more than 100,000 people) will sample and report an average of 11.4 and 14.1 times per PWS, respectively, across the 3-year ICR period. The average burden per response for large and very large PWSs is estimated at 6.1 and 9.9 hours, respectively. States are assumed to have an annual average burden of 244.3 hours related to coordination with EPA and PWSs. In the aggregate, during the ICR period, the average

response (e.g., responses from PWSs and states) is associated with a burden of 6.9 hours, with a labor plus non-labor cost of $1,636 per response.

The annual average per-respondent burden hours and costs for the ICR period are: small PWSs – 6.1 hours, or $169, for labor; large PWSs – 23.3 hours, or $684, for labor and $5,756 for analytical costs; very large PWSs – 46.4 hours, or $1,253, for labor and $15,680 for analytical costs; and states – 244.3 hours, or $11,789, for labor. Annual average burden and cost per respondent (including both systems and states) is estimated to be 23.3 hours, with a labor plus non-labor cost of $3,718 per respondent. Burden is defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's rules in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the *Federal Register* and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

For purposes of assessing the impacts of this rule on small entities, EPA considered small entities to be PWSs serving 10,000 or fewer people, because this is the system size specified in the SDWA as requiring special consideration with respect to small system flexibility. As required by the RFA, EPA proposed using this alternative definition in the FR, (63 FR 7606, February 13, 1998 (USEPA, 1998a)), sought public comment, consulted with the Small Business Administration (SBA) and finalized the alternative definition in the Consumer Confidence Reports rulemaking, (63 FR 44512, August 19, 1998 (USEPA, 1998b)). As stated in that Final Rule, the alternative definition will be applied to future drinking water rules, including this rule.

An agency certifies that a rule will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden or otherwise has a positive economic effect on the small entities subject to the rule. The evaluation of the overall impact on small systems, summarized in the preceding discussion, is further described as follows. EPA analyzed the impacts for privately-owned and publicly-owned water systems separately, due to the different economic characteristics of these ownership types, such as different rate structures and profit goals. However, for both publicly- and privately-owned systems, EPA used the "revenue test," which compares annual system costs attributed to the rule to the system's annual revenues. EPA used median revenue data from the 2006 CWS Survey for public and private water systems (USEPA, 2009c). The revenue figures were updated to 2016 dollars, and increased by three percent to account for inflation. EPA assumes that the distribution of the sample of participating small systems will reflect the proportions of publicly- and privately-owned systems in the national inventory. The estimated distribution of the representative sample, categorized by ownership type, source water and system size, is presented in Exhibit 6.

Exhibit 6: Number of Publicly- and Privately-Owned Small Systems Subject to UCMR 4

System Size (# of people served)	Publicly-Owned	Privately-Owned	Total[1]
Ground Water			
500 and under	21	64	85
501 to 3,300	161	62	223
3,301 to 10,000	179	41	220
Subtotal GW	***361***	***167***	***528***
Surface Water (and GWUDI)			
500 and under	18	21	39
501 to 3,300	241	86	327
3,301 to 10,000	548	158	706
Subtotal SW	***807***	***265***	***1,072***
Total of Small Water Systems	***1,168***	***432***	***1,600***

[1] PWS counts were adjusted to display as whole numbers in each size category.

The basis for the UCMR 4 RFA certification is as follows: for the 1,600 small water systems that will be affected, the average annual cost for complying with this rule represents no more than 0.7% of system revenues (the highest estimated percentage is for GW systems serving 500 or fewer people, at 0.7% of its median revenue). Exhibit 7 presents the yearly cost to small systems and to EPA for the small system sampling program, along with an illustration of system participation for each year of UCMR 4.

Exhibit 7: Implementation of UCMR 4 at Small Systems

Cost Description	2017	2018	2019	2020	2021	Total[1]
Costs to EPA for Small System Program (Assessment Monitoring)						
	$0	$5,635,113	$5,635,113	$5,635,113	$0	$16,905,340
Costs to Small Systems (Assessment Monitoring)						
	$0	$270,848	$270,848	$270,848	$0	$812,545
Total Costs to EPA and Small Systems for UCMR 4						
	$0	**$5,905,962**	**$5,905,962**	**$5,905,962**	**$0**	**$17,717,886**
System Monitoring Activity Timeline[2]						
Assessment Monitoring: Cyanotoxins		1/3 PWSs Sample	1/3 PWSs Sample	1/3 PWSs Sample		800
Assessment Monitoring: 20 Additional Contaminants		1/3 PWSs Sample	1/3 PWSs Sample	1/3 PWSs Sample		800

[1] Totals may not equal the sum of components due to rounding.
[2] Total number of systems is 1,600. No small system conducts Assessment Monitoring for both cyanotoxins and the 20 additional contaminants.

PWS costs are attributed to the labor required for reading about UCMR 4 requirements, monitoring, reporting and record keeping. The estimated average annual burden across the 5-year UCMR 4 implementation period of 2017-2021 is 2.8 hours at $102 per small system. Average annual cost, in all cases, is less than 0.7% of system revenues. By assuming all costs for laboratory analyses, shipping and quality control for small entities, EPA incurs the entirety of the non-labor costs associated with UCMR 4 small system monitoring, or 95% of total small system testing costs. Exhibit 8 and Exhibit 9 present the estimated economic impacts in the form of a revenue test for publicly- and privately-owned systems.

Exhibit 8: UCMR 4 Relative Cost Analysis for Small Publicly-Owned Systems (2017-2021)

System Size (# of people served)	Annual Number of Systems Impacted[1]	Average Annual Hours per System (2017-2021)	Average Annual Cost per System (2017-2021)	Revenue Test[2]
Ground Water Systems				
500 and under	4	1.5	$55	0.14%
501 to 3,300	32	1.6	$59	0.04%
3,301 to 10,000	36	1.7	$63	0.01%
Surface Water (and GWUDI) Systems				
500 and under	4	3.3	$119	0.16%
501 to 3,300	48	3.3	$119	0.04%
3,301 to 10,000	110	3.4	$124	0.01%

[1] PWS counts were adjusted to display as whole numbers in each size category.
[2] The Revenue Test was used to evaluate the economic impact of an information collection on small government entities (e.g., publicly-owned systems); costs are presented as a percentage of median annual revenue in each size category (EPA, 2009c).

Exhibit 9: UCMR 4 Relative Cost Analysis for Small Privately-Owned Systems (2017-2021)

System Size (# of people served)	Annual Number of Systems Impacted[1]	Average Annual Hours per System (2017-2021)	Average Annual Cost per System (2017-2021)	Revenue Test[2]
Ground Water Systems				
500 and under	13	1.5	$55	0.74%
501 to 3,300	12	1.6	$59	0.04%
3,301 to 10,000	8	1.7	$63	0.01%
Surface Water (and GWUDI) Systems				
500 and under	4	3.3	$119	0.28%
501 to 3,300	17	3.3	$119	0.04%
3,301 to 10,000	32	3.4	$124	0.01%

[1] PWS counts were adjusted to display as whole numbers in each size category.
[2] The Revenue Test was used to evaluate the economic impact of an information collection on small government entities (e.g., privately-owned systems); costs are presented as a percentage of median annual revenue in each size category (EPA, 2009c).

The Agency has determined that 1,600 small PWSs (for Assessment Monitoring), or approximately 4.2% of all small systems, will experience an impact of no more than 0.7% of revenues; the remainder of small systems will not be impacted.

Although this rule will not have a significant economic impact on a substantial number of small entities, EPA has attempted to reduce this impact by assuming all costs for analyses of the samples and for shipping the samples from small systems to laboratories contracted by EPA to analyze UCMR 4 samples (the cost of shipping is now included in the cost of each analytical method). EPA has set aside $2.0 million each year from the Drinking Water State Revolving Fund (SRF), with its authority to use SRF monies for the purposes of implementing this provision of the SDWA. Thus, the costs to these small systems will be limited to the labor associated with collecting a sample and preparing it for shipping.

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. The Agency therefore concluded that this action will have no net regulatory burden for all directly regulated small entities.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an annual unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action implements mandate(s) specifically and explicitly set forth in the SDWA without the exercise of any policy discretion by the EPA.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action will neither impose substantial direct compliance costs on federally recognized tribal governments, nor preempt tribal law. As described previously, this rule requires monitoring by all large PWSs. Information in the SDWIS/Fed water system inventory indicates there are 17 large tribal PWSs (ranging in size from 10,001 to 40,000 customers). EPA estimates the average annual cost to each of these large PWSs, over the 5-year rule period, to be $3,864. This cost is based on a labor component (associated with the collection of samples), and a non-labor component (associated with shipping and laboratory fees), and represents 1.1% of average revenue/sales for large PWSs. UCMR also requires monitoring by a nationally representative sample of small PWSs. EPA estimates that approximately 1.5% of small tribal systems will be selected as a nationally representative sample for Assessment Monitoring. EPA estimates the average annual cost to small tribal systems over the 5-year rule period to be $102. Such cost is based on the labor associated with collecting a sample and preparing it for shipping and represents less than 0.7% of average revenue/sales for small PWSs. All other small PWS expenses (associated with shipping and laboratory fees) are paid by EPA**.**

EPA consulted with tribal officials under the EPA Policy on Consultation and Coordination with Indian Tribes early in the process of developing this rule to permit them to have meaningful and timely input into its development. A summary of that consultation is provided in the electronic docket listed in the **ADDRESSES** section of this notice.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because EPA does not think the environmental health or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are addressed in section V.D of the preamble.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a "significant energy action" because it is not likely to have a significant adverse effect on the supply, distribution or use of energy. This is a national drinking water occurrence study that was submitted to OMB for review.

I. National Technology Transfer and Advancement Act and 1 CFR part 51

This action involves technical standards. This rule uses methods developed by the Agency and two major voluntary consensus method organizations to support UCMR 4 monitoring. The voluntary consensus method organizations are Standard Methods and ASTM International. EPA identified acceptable consensus method organization standards for the analysis of manganese and germanium. In addition, there are several consensus standards that are approved for compliance monitoring that will be available for use in the analysis of TOC and bromide. A summary of each method along with how the method specifically applies to UCMR 4 can be found in section VI of the preamble.

All of these standards are reasonably available for public use. The Agency methods are free for download on EPA's website. The methods in the Standard Method 21st edition are consensus standards, available for purchase from the publisher, and are commonly used by the

drinking water community. The methods in the Standard Method Online are consensus standards, available for purchase from the publisher's website, and are commonly used by the drinking water community. The methods from ASTM International are consensus standards, are available for purchase from the publisher's website, and are commonly used by the drinking water community.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA concludes that this action is not subject to Executive Order 12898 (59 FR 7629, February 16, 1994) because it does not establish an environmental health or safety standard. Background information regarding EPA's consideration of Executive Order 12898 in the development of this final rule is provided in section V.E of this preamble, and an additional supporting document has been placed in the electronic docket listed in the **ADDRESSES** section of this notice.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

VIII. References

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List of Subjects in 40 CFR Part 141

Environmental protection, Chemicals, Incorporation by reference, Indian-lands, Intergovernmental relations, Radiation protection, Reporting and recordkeeping requirements, Water supply.

Dated: December 8, 2016.

_____

Gina McCarthy,

Administrator.

For the reasons set forth in the preamble, EPA amends 40 CFR part 141 as follows:

PART 141 - NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11.

Subpart D—Reporting and Recordkeeping

2. In §141.35:

a. Revise the third sentence in paragraph (b)(1).

b. Revise the second and third sentences in paragraph (b)(2).

c. Remove “October 1, 2012,” and add in its place “December 31, 2017,” in paragraph (c)(1).

d. Revise the second and third sentences in paragraph (c)(2).

e. Revise the last sentence in paragraph (c)(3)(i).

f. Revise the fifth sentence in paragraph (c)(3)(ii).

g. Remove “October 1, 2012,” and add in its place **[Insert date 120 days after publication in the Federal Register]**, in paragraph (c)(4).

h. Revise paragraphs (c)(5)(i), (c)(6) introductory text, (d)(2), and (e).

The revisions and additions read as follows:

§141.35 Reporting for unregulated contaminant monitoring results.

* * * * *

(b) * * *

(1) * * * Information that must be submitted using EPA’s electronic data reporting system must be submitted through: https://www.epa.gov/dwucmr. * * *

(2) * * * If you have received a letter from EPA or your State concerning your required monitoring and your system does not meet the applicability criteria for UCMR established in §141.40(a)(1) or (2), or if a change occurs at your system that may affect your requirements under UCMR as defined in §141.40(a)(3) through (5), you must mail or email a letter to EPA, as specified in paragraph (b)(1) of this section. The letter must be from your PWS Official and must include your PWS Identification (PWSID) Code along with an explanation as to why the UCMR requirements are not applicable to your PWS, or have changed for your PWS, along with the appropriate contact information.* * *

(c) * * *

(2) * * * You must provide your sampling location(s) and inventory information by December 31, 2017, using EPA's electronic data reporting system. You must submit, verify or update the following information for each sampling location, or for each approved representative sampling location (as specified in paragraph (c)(3) of this section regarding representative sampling locations): PWSID Code; PWS Name; PWS Facility Identification Code; PWS Facility Name; PWS Facility Type; Water Source Type; Sampling Point Identification Code; Sampling Point Name; and Sampling Point Type Code; (as defined in Table 1 of paragraph (e) of this section).

(3) * * *

(i) * * * You must submit a copy of the existing alternate EPTDS sampling plan or your representative well proposal, as appropriate, **[Insert date 120 days after publication in the Federal Register]**, as specified in paragraph (b)(1) of this section.

(ii) * * * You must submit the following information for each proposed representative sampling location: PWSID Code; PWS Name; PWS Facility Identification Code; PWS Facility Name; PWS Facility Type; Sampling Point Identification Code; and Sampling Point Name (as defined in Table 1, paragraph (e) of this section). * * *

* * * * *

(5) * * *

(i) *General rescheduling notification requirements.* Large systems may change their monitoring schedules up to December 31, 2017, using EPA's electronic data reporting system, as specified in paragraph (b)(1) of this section. After this date has passed, if your PWS cannot sample according to your assigned sampling schedule (e.g.,

because of budget constraints, or if a sampling location will be closed during the scheduled month of monitoring), you must mail or email a letter to EPA, as specified in paragraph (b)(1) of this section, prior to the scheduled sampling date. You must include an explanation of why the samples cannot be taken according to the assigned schedule, and you must provide the alternative schedule you are requesting. You must not reschedule monitoring specifically to avoid sample collection during a suspected vulnerable period. You are subject to your assigned UCMR sampling schedule or the schedule that you revised on or before December 31, 2017, unless and until you receive a letter from EPA specifying a new schedule.

* * * * *

(6) *Reporting monitoring results.* For UCMR samples, you must report all data elements specified in Table 1 of paragraph (e) of this section, using EPA's electronic data reporting system. You also must report any changes, relative to what is currently posted, made to data elements 1 through 9 to EPA in writing, explaining the nature and purpose of the proposed change, as specified in paragraph (b)(1) of this section.

* * * * *

(d) * * *

(2) *Reporting sampling information.* You must provide your sampling location(s) by December 31, 2017, using EPA's electronic data reporting system, as specified in paragraph (b)(1) of this section. If this information changes, you must report updates, including new sources and sampling locations that are put in use before or during the PWS' UCMR sampling period, to EPA's electronic data reporting system within 30 days of the change, as specified in paragraph (b)(1) of this section. You must record all data

elements listed in Table 1 of paragraph (e) of this section on each sample form and sample bottle, as appropriate, provided to you by the UCMR Sampling Coordinator. You must send this information as specified in the instructions of your sampling kit, which will include the due date and return address. You must report any changes made in data elements 1 through 9 by emailing an explanation of the nature and purpose of the proposed change to EPA, as specified in paragraph (b)(1) of this section.

(e) *Data elements*. Table 1 defines the data elements that must be provided for UCMR monitoring.

TABLE 1—UNREGULATED CONTAMINANT MONITORING REPORTING REQUIREMENTS

Data element	Definition
1. Public Water System Identification (PWSID) Code	The code used to identify each PWS. The code begins with the standard 2-character postal State abbreviation or Region code; the remaining 7 numbers are unique to each PWS in the State. The same identification code must be used to represent the PWS identification for all current and future UCMR monitoring.
2. Public Water System Name	Unique name, assigned once by the PWS.
3. Public Water System Facility Identification Code	An identification code established by the State or, at the State's discretion, by the PWS, following the format of a 5-digit number unique within each PWS for each applicable facility (i.e., for each source of water, treatment plant, distribution system, or any other facility associated with water treatment or delivery). The same identification code must be used to represent the facility for all current and future UCMR monitoring.
4. Public Water System Facility Name	Unique name, assigned once by the PWS, for every facility ID (e.g., Treatment Plant).
5. Public Water System Facility Type	That code that identifies that type of facility as either: **CC** = consecutive connection **DS** = distribution system **IN =** source water influent **SS** = sampling station **TP** = treatment plant **OT** = other
6. Water Source Type	The type of source water that supplies a water system facility. Systems must report one of the following codes for each sampling location: **SW** = surface water (to be reported for water facilities that are served entirely by a surface water source during the twelve-month period). **GW** = ground water (to be reported for water facilities that are served entirely by a ground water source during the twelve-month period). **GU** = ground water under the direct influence of surface water (to be reported for water facilities that are served all or in part by ground water under the direct influence of surface water at any time during the twelve-month sampling period), and are not served at all by surface water during this period. **MX** = mixed water (to be reported for water facilities that are served by a mix of

Data element	Definition
	surface water, ground water and/or ground water under the direct influence of surface water during the twelve-month period).
7. Sampling Point Identification Code	An identification code established by the State, or at the State's discretion, by the PWS, that uniquely identifies each sampling point. Each sampling code must be unique within each applicable facility, for each applicable sampling location (i.e., entry point to the distribution system, source water influent or distribution system sample at maximum residence time). The same identification code must be used to represent the sampling location for all current and future UCMR monitoring.
8. Sampling Point Name	Unique sample point name, assigned once by the PWS, for every sample point ID (e.g., Entry Point).
9. Sampling Point Type Code	A code that identifies the location of the sampling point as either: **SR** = source water taken from plant influent; untreated water entering the water treatment plant (i.e., a location prior to any treatment). **EP** = entry point to the distribution system. **DS** = distribution system sample.
10. Disinfectant Type	All of the disinfectants/oxidants that have been added prior to the entry point to the distribution system. Please select all that apply. **PEMB** = Permanganate **HPXB** = Hydrogen peroxide **CLGA** = Gaseous chlorine **CLOF** = Offsite Generated Hypochlorite (stored as a liquid form) **CLON** = Onsite Generated Hypochlorite **CAGC** = Chloramine (formed with gaseous chlorine) **CAOF** = Chloramine (formed with offsite hypochlorite) **CAON** = Chloramine (formed with onsite hypochlorite) **CLDB** = Chlorine dioxide **OZON** = Ozone **ULVL** = Ultraviolet light **OTHD** = All other types of disinfectant/oxidant **NODU** = No disinfectant/oxidant used
11. Treatment Information	Treatment information associated with the sample point. Please select all that apply. **CON** = Conventional (non-softening, consisting of at least coagulation/sedimentation basins and filtration) **SFN** = Softening **RBF** = River bank filtration **PSD** = Pre-sedimentation **INF** = In-line filtration **DFL** = Direct filtration **SSF** = Slow sand filtration **BIO** = Biological filtration (operated with an intention of maintaining biological activity within filter) **UTR** = Unfiltered treatment for surface water source **GWD** = Groundwater system with disinfection only **PAC** = Application of powder activated carbon **GAC** = Granular activated carbon adsorption (not part of filters in CON, SCO, INF, DFL, or SSF) **AIR** = Air stripping (packed towers, diffused gas contactors) **POB** = Pre-oxidation with chlorine (applied before coagulation for CON or SFN plants or before filtration for other filtration plants) **MFL** = Membrane filtration **IEX** = Ionic exchange **DAF** = Dissolved air floatation

Data element	Definition
	CWL = Clear well/finished water storage without aeration **CWA** = Clear well/finished water storage with aeration **ADS** = Aeration in distribution system (localized treatment) **OTH** = All other types of treatment **NTU** = No treatment used **DKN** = Do not know
12. Disinfectant Residual Type	Disinfectant residual type in the distribution system for each HAA sample. **CL2** = Chlorine (i.e., originating from addition of free chlorine only) **CLO2** = chlorine dioxide **CLM** = Chloramines (originating from with addition of chlorine and ammonia or pre-formed chloramines) **CAC** = Chlorine and chloramines (if being mixed from chlorinated and chloroaminated water) **NOD** = No disinfectant residual
13. Sample Collection Date	The date the sample is collected, reported as 4-digit year, 2-digit month, and 2-digit day (YYYY/MM/DD).
14. Sample Identification Code	An alphanumeric value up to 30 characters assigned by the laboratory to uniquely identify containers, or groups of containers, containing water samples collected at the same sampling location for the same sampling date.
15. Contaminant	The unregulated contaminant for which the sample is being analyzed.
16. Analytical Method Code	The identification code of the analytical method used.
17. Extraction Batch Identification Code	Laboratory assigned extraction batch ID. Must be unique for each extraction batch within the laboratory for each method. For CCC samples report the Analysis Batch Identification Code as the value for this field. For methods without an extraction batch, leave this field null.
18. Extraction Date	Date for the start of the extraction batch (YYYY/MM/DD). For methods without an extraction batch, leave this field null.
19. Analysis Batch Identification Code	Laboratory assigned analysis batch ID. Must be unique for each analysis batch within the laboratory for each method.
20. Analysis Date	Date for the start of the analysis batch (YYYY/MM/DD).
21. Sample Analysis Type	The type of sample collected and/or prepared, as well as the fortification level. Permitted values include: **CF** = concentration fortified; the concentration of a known contaminant added to a field sample reported with sample analysis types LFSM, LFSMD, LFB, CCC and QCS. **CCC =** continuing calibration check; a calibration standard containing the contaminant, the internal standard, and surrogate analyzed to verify the existing calibration for those contaminants. **FS** = field sample; sample collected and submitted for analysis under this rule. **IS** = internal standard; a standard that measures the relative response of contaminants. **LFB =** laboratory fortified blank; an aliquot of reagent water fortified with known quantities of the contaminants and all preservation compounds. **LRB =** laboratory reagent blank; an aliquot of reagent water treated exactly as a field sample, including the addition of preservatives, internal standards, and surrogates to determine if interferences are present in the laboratory, reagents, or other equipment. **LFSM** = laboratory fortified sample matrix; a UCMR field sample with a known amount of the contaminant of interest and all preservation compounds added.

Data element	Definition
	LFSMD = laboratory fortified sample matrix duplicate; duplicate of the laboratory fortified sample matrix. **QCS =** quality control sample; a sample prepared with a source external to the one used for initial calibration and CCC. The QCS is used to check calibration standard integrity. **QHS** = quality HAA sample; HAA sample collected and submitted for quality control purposes. **SUR =** surrogate standard; a standard that assesses method performance for each extraction.
22. Analytical Results—Sign	A value indicating whether the sample analysis result was: (<) "less than" means the contaminant was not detected, or was detected at a level below the Minimum Reporting Level. (=) "equal to" means the contaminant was detected at the level reported in "Analytical Result— Measured Value."
23. Analytical Result—Measured Value	The actual numeric value of the analytical results for: field samples; laboratory fortified matrix samples; laboratory fortified sample matrix duplicates; and concentration fortified.
24. Additional Value	Represents the true value or the fortified concentration for spiked samples for QC Sample Analysis Types (CCC, EQC, LFB, LFSM and LFSMD). For Sample Analysis Type FS and LRB and for IS and surrogate QC Contaminants, leave this field null.
25. Laboratory Identification Code	The code, assigned by EPA, used to identify each laboratory. The code begins with the standard two-character State postal abbreviation; the remaining five numbers are unique to each laboratory in the State.
26. Sample Event Code	A code assigned by the PWS for each sample event. This will associate samples with the PWS monitoring plan to allow EPA to track compliance and completeness. Systems must assign the following codes: **SEC1, SEC2, SEC3, SEC4, SEC5, SEC6, SEC7 and SEC8 -** represent samples collected to meet UCMR Assessment Monitoring requirements for cyanotoxins; where "SEC1" represents the first sampling period, "SEC2" the second period and so forth, for all eight sampling events. **SEA1, SEA2, SEA3 and SEA4 -** represent samples collected to meet UCMR Assessment Monitoring requirements for the additional contaminants; where "SEA1" and "SEA2" represent the first and second sampling period for all water types; and "SEA3" and "SEA4" represent the third and fourth sampling period for SW and GU sources only.
27. Bloom Occurrence	A yes or no answer provided by the PWS for each cyanotoxin sample event. Question: Preceding the finished water sample collection, did you observe an algal bloom in your source waters near the intake? **YES =** if yes, select all the YESs that apply: **YD** = yes, on the day the UCMR cyanotoxin sample was collected **YW** = yes, between the day the sample was taken and the past week **YM** = yes, between the past week and past month **YY** = yes, between the past month and past year **YP** = yes, prior to the past year **NO** = have never seen a bloom
28. Cyanotoxin Occurrence	A yes or no answer provided by the PWS for each cyanotoxin sample event. Question: 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)? **YES** = if yes, select all the YESs that apply: **YD** = yes, on the day the UCMR cyanotoxin sample was collected **YW** = yes, between the day the sample was taken and the past week

Data element	Definition
	YM = yes, between the past week and past month **YY** = yes, between the past month and past year **YP** = yes, prior to the past year **NO** = have never detected cyanotoxins in source water **NS** = unaware of any source water cyanotoxin sampling Select all that apply (i.e., all that were detected) if you answered YES to detecting cyanotoxins in source water: **MIC** = Microcystins **CYL** = Cylindrospermopsin **ANA** = Anatoxin-A **SAX** = Saxitoxins **OTH** = Other **DK** = do not know
29. Indicator Of Possible Bloom - Treatment	A yes or no answer provided by the PWS for each cyanotoxin sample event. Question: Preceding the finished water sample collection, did you notice any changes in your treatment system operation and/or treated water quality that may indicate a bloom in the source water? **YES =** if yes, select all that apply: **DFR** = Decrease in filter runtimes **ITF** = Increase in turbidity in filtered water **ICD** = Need for increased coagulant dose **TOI** = Increase in taste and odor issues in finished water **IOD** = Need for increase in oxidant/disinfectant dose **IDB** = Increase in TTHM/HAA5 in finished water **OTH** = Describe other changes **NO** = no changes
30. Indicator of Possible Bloom – Source Water Quality Parameters	A yes or no answer provided by the PWS for each cyanotoxin sample event. Question: Preceding the finished water sample collection, did you observe any notable changes in source water quality parameters (if measured)? **YES =** if yes, select all that apply to the source water: **ITP** = Increase in water temperature **ITU** = Increase in turbidity **IAL** = Increase in alkalinity **ITO** = Increase in total organic carbon **ICD** = Increase in chlorine demand **IPH** = Increase in pH **ICA** = Increase in chlorophyll a **IPY** = Increase in phycocyanin **INU** = Increase in nutrients (example: nitrogen or phosphorus) **OTH** = Describe other changes **NO** = no changes observed

Subpart E–Special Regulations, Including Monitoring Regulations and Prohibition on Lead Use

3. In §141.40:

a. Remove “December 31, 2010” and add in its place “December 31, 2015” in paragraph (a) introductory text.

b. Revise paragraphs (a)(1), (a)(2)(i)(A), (a)(2)(ii)(A) and (C), (a)(3), and (a)(4)(i)(B) and (C).

c. Remove “October 1, 2012.” and add in its place “December 31, 2017.” in paragraph (a)(4)(i).

d. Revise paragraph (a)(4)(ii) introductory text.

e. Remove and reserve paragraph (a)(4)(ii)(F).

f. Add paragraph (a)(4)(iii).

g. Remove “August 1, 2012.” and add in its place “**[INSERT DATE 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**, and necessary application material **[INSERT DATE DATE 120 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**.” in paragraph (a)(5)(ii).

h. Revise paragraph (a)(5)(v), the second sentence in paragraph (a)(5)(vi), and paragraph (c).

The revisions and addition read as follows:

§141.40 Monitoring requirements for unregulated contaminants.

(a) * * *

(1) *Applicability to transient non-community systems.* If you own or operate a transient non-community water system, you are not subject to monitoring requirements in this section.

(2) * * *

(i) * * *

(A) *Assessment monitoring.* You must monitor for the contaminants on List 1, per Table 1, UCMR Contaminant List, in paragraph (a)(3) of this section. If you serve a retail population of more than 10,000 people, you are required to perform this monitoring regardless of whether you have been notified by the State or EPA.

* * * * *

(ii) * * *

(A) *Assessment monitoring.* You must monitor for the contaminants on List 1 per Table 1, in paragraph (a)(3) of this section, if you are notified by your State or EPA that you are part of the State Monitoring Plan for Assessment Monitoring.

* * * * *

(C) *Pre-screen testing.* You must monitor for the contaminants on List 3 of Table 1, in paragraph (a)(3) of this section if you are notified by your State or EPA that you are part of the State Monitoring Plan for Pre-Screen Testing.

(3) *Analytes to be monitored*. Lists 1, 2, and 3 contaminants are provided in the following table:

TABLE 1—UCMR CONTAMINANT LIST

1-Contaminant	2-CAS Registry Number	3-Analytical Methods [a]	4-Minimum Reporting Level [b]	5-Sampling Location [c]	6-Period During Which Monitoring to be Completed
List 1: Assessment Monitoring Cyanotoxin Chemical Contaminants					
"total microcystin"	N/A	EPA 546	0.3 µg/L	EPTDS	3/1/2018–11/30/2020
anatoxin-a	64285-06-9	EPA 545	0.03 µg/L	EPTDS	3/1/2018–11/30/2020
cylindrospermopsin	143545-90-8	EPA 545	0.09 µg/L	EPTDS	3/1/2018–11/30/2020
microcystin-LA	96180-79-9	EPA 544	0.008 µg/L	EPTDS	3/1/2018–

1-Contaminant	2-CAS Registry Number	3-Analytical Methods [a]	4-Minimum Reporting Level [b]	5-Sampling Location [c]	6-Period During Which Monitoring to be Completed
					11/30/2020
microcystin-LF	154037-70-4	EPA 544	0.006 µg/L	EPTDS	3/1/2018–11/30/2020
microcystin-LR	101043-37-2	EPA 544	0.02 µg/L	EPTDS	3/1/2018–11/30/2020
microcystin-LY	123304-10-9	EPA 544	0.009 µg/L	EPTDS	3/1/2018–11/30/2020
microcystin-RR	111755-37-4	EPA 544	0.006 µg/L	EPTDS	3/1/2018–11/30/2020
microcystin-YR	101064-48-6	EPA 544	0.02 µg/L	EPTDS	3/1/2018–11/30/2020
nodularin	118399-22-7	EPA 544	0.005 µg/L	EPTDS	3/1/2018–11/30/2020
List 1: Assessment Monitoring Additional Chemical Contaminants					
Metals					
germanium	7440-56-4	EPA 200.8, ASTM D5673-10, SM 3125	0.3 µg/L	EPTDS	1/1/2018–12/31/2020
manganese	7439-96-5	EPA 200.8, ASTM D5673-10, SM 3125	0.4 µg/L	EPTDS	1/1/2018–12/31/2020
Pesticides and a Pesticide Manufacturing Byproduct					
alpha-hexachlorocyclohexane	319-84-6	EPA 525.3	0.01 µg/L	EPTDS	1/1/2018–12/31/2020
chlorpyrifos	2921-88-2	EPA 525.3	0.03 µg/L	EPTDS	1/1/2018–12/31/2020
dimethipin	55290-64-7	EPA 525.3	0.2 µg/L	EPTDS	1/1/2018–12/31/2020
ethoprop	13194-48-4	EPA 525.3	0.03 µg/L	EPTDS	1/1/2018–12/31/2020
oxyfluorfen	42874-03-3	EPA 525.3	0.05 µg/L	EPTDS	1/1/2018–12/31/2020
profenofos	41198-08-7	EPA 525.3	0.3 µg/L	EPTDS	1/1/2018–12/31/2020
tebuconazole	107534-96-3	EPA 525.3	0.2 µg/L	EPTDS	1/1/2018–

1-Contaminant	2-CAS Registry Number	3-Analytical Methods [a]	4-Minimum Reporting Level [b]	5-Sampling Location [c]	6-Period During Which Monitoring to be Completed
					12/31/2020
total permethrin (cis- & trans-)	52645-53-1	EPA 525.3	0.04 µg/L	EPTDS	1/1/2018–12/31/2020
tribufos	78-48-8	EPA 525.3	0.07 µg/L	EPTDS	1/1/2018–12/31/2020
Brominated Haloacetic Acid (HAA) Groups[d, e]					
HAA5	N/A	EPA 552.3 or EPA 557	N/A	D/DBPR HAA location	1/1/2018–12/31/2020
HAA6Br	N/A	EPA 552.3 or EPA 557	N/A	D/DBPR HAA location	1/1/2018–12/31/2020
HAA9	N/A	EPA 552.3 or EPA 557	N/A	D/DBPR HAA location	1/1/2018–12/31/2020
Alcohols					
1-butanol	71-36-3	EPA 541	2.0 µg/L	EPTDS	1/1/2018–12/31/2020
2-methoxyethanol	109-86-4	EPA 541	0.4 µg/L	EPTDS	1/1/2018–12/31/2020
2-propen-1-ol	107-18-6	EPA 541	0.5 µg/L	EPTDS	1/1/2018–12/31/2020
Other Semivolatile Chemicals					
butylated hydroxanisole	25013-16-5	EPA 530	0.03 µg/L	EPTDS	1/1/2018–12/31/2020
o-toluidine	95-53-4	EPA 530	0.007 µg/L	EPTDS	1/1/2018–12/31/2020
quinoline	91-22-5	EPA 530	0.02 µg/L	EPTDS	1/1/2018–12/31/2020
List 2: Screening Survey					
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
List 3: Pre-Screen Testing					
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Column headings are:

1—Contaminant: The name of the contaminant to be analyzed.

2—CAS (Chemical Abstract Service) Registry Number or Identification Number: A unique number identifying the chemical contaminants.
3—Analytical Methods: Method numbers identifying the methods that must be used to test the contaminants.
4—Minimum Reporting Level (MRL): The value and unit of measure at or above which the concentration of the contaminant must be measured using the approved analytical methods. If EPA determines, after the first six months of monitoring that the specified MRLs result in excessive resampling, EPA will establish alternate MRLs and will notify affected PWSs and laboratories of the new MRLs. N/A is defined as non-applicable.
5—Sampling Location: The locations within a PWS at which samples must be collected.
6—Period During Which Monitoring to be Completed: The time period during which the sampling and testing will occur for the indicated contaminant.
[a] The analytical procedures shall be performed in accordance with the documents associated with each method, see paragraph (c) of this section.
[b] The MRL is the minimum concentration of each analyte that must be reported to EPA.
[c] With the exception of HAA monitoring, sampling must occur at entry points to the distribution system (EPTDSs), after treatment is applied, that represent each non-emergency water source in routine use over the 12-month period of monitoring. Systems that purchase water with multiple connections from the same wholesaler may select one representative connection from that wholesaler. This EPTDS sampling location must be representative of the highest annual volume connections. If the connection selected as the representative EPTDS is not available for sampling, an alternate highest volume representative connection must be sampled. See 40 CFR 141.35(c)(3) for an explanation of the requirements related to the use of representative GW EPTDSs. Sampling for UCMR 4 HAA groups must be conducted at the Disinfectants and Disinfection Byproduct Rule (D/DBPR) sampling locations (40 CFR 141.622).
[d] UCMR 4 HAA monitoring applies only to those PWSs that are subject to D/DBPR HAA5 monitoring requirements.
[e] PWSs that purchase 100 percent of their water (“consecutive systems”) are not required to collect UCMR 4 source water samples for TOC or bromide analyses. Sampling for TOC and bromide must otherwise occur at source water influent locations representing untreated water entering the water treatment plant (i.e., a location prior to any treatment). SW and GWUDI systems subject to the D/DBPR TOC monitoring must use their D/DBPR TOC source water sampling site(s) from 40 CFR 141.132 for UCMR 4 TOC and bromide samples. SW and GWUDI systems that are not subject to D/DBPR TOC monitoring will use their Long Term 2 Enhance Surface Water Treatment Rule (LT2) source water sampling site(s) (40 CFR 141.703) for UCMR 4 TOC and bromide samples. Ground water systems that are subject to the D/DBPRs, and therefore subject to UCMR 4 HAA monitoring, will take TOC and bromide samples at their influents entering their treatment train. TOC and bromide must be collected at the same time as HAA samples. These indicator samples must be collected at a single source water influent using methods already approved for compliance monitoring. TOC methods include: SM 5310 B, SM 5310 C, SM 5310 D (21st edition), or SM 5310 B-00, SM 5310 C-00, SM 5310 D-00 (SM Online), EPA Method 415.3 (Rev. 1.1 or 1.2). Bromide methods include: EPA Methods 300.0 (Rev. 2.1), 300.1 (Rev. 1.0), 317.0 (Rev. 2.0), 326.0 (Rev. 1.0) or ASTM D 6581-12. The MRLs for the individual HAAs are discussed in paragraph (a)(5)(v) of this section.

(4) * * *

(i) * * *

(B) *Frequency*. You must collect the samples within the timeframe and according to the frequency specified by contaminant type and water source type for each sampling location, as specified in Table 2, in this paragraph. For the second or subsequent round of sampling, if a

sample location is non-operational for more than one month before and one month after the scheduled sampling month (i.e., it is not possible for you to sample within the window specified in Table 2, in this paragraph), you must notify EPA as specified in §141.35(c)(5) to reschedule your sampling.

TABLE 2—MONITORING FREQUENCY BY CONTAMINANT AND WATER SOURCE TYPES

Contaminant type	Water source type	Timeframe	Frequency[1]
List 1 Cyanotoxins Chemicals	Surface water or Ground water under the direct influence of surface water (GWUDI)	March – November	You must monitor twice a month for four consecutive months (total of eight sampling events). Sample events must occur two weeks apart.
List 1 Contaminants – Additional Chemicals	Surface water or GWUDI	12 months	You must monitor for four consecutive quarters. Sample events must occur three months apart. (Example: if first monitoring is in January, the second monitoring must occur any time in April, the third any time in July and the fourth any time in October.)
	Ground water	12 months	You must monitor twice in a consecutive 12-month period. Sample events must occur 5-7 months apart. (Example: if the first monitoring event is in April, the second monitoring event must occur any time in September, October or November.)

[1] Systems must assign a sample event code for each contaminant listed in Table 1. Sample event codes must be assigned by the PWS for each sample event. For more information on sample event codes see §141.35(e) Table 1.

(C) *Location.* You must collect samples for each List 1 Assessment Monitoring contaminant, and, if applicable, for each List 2 Screening Survey, or List 3 Pre-Screen Testing contaminant, as specified in Table 1, in paragraph (a)(3) of this section. Samples must be collected at each sample point that is specified in column 5 and footnote c of Table 1, in paragraph (a)(3) of this section. PWSs conducting List 1 monitoring for the brominated HAA groups must collect TOC and bromide samples as specified in footnote

d of Table 1, in paragraph (a)(3) of this section. If you are a GW system with multiple EPTDSs, and you request and receive approval from EPA or the State for sampling at representative EPTDS(s), as specified in §141.35(c)(3), you must collect your samples from the approved representative sampling location(s).

* * * * *

(ii) *Small systems.* If you serve 10,000 or fewer people and are notified that you are part of the State Monitoring Plan for Assessment Monitoring, Screening Survey or Pre-Screen monitoring, you must comply with the requirements specified in paragraphs (a)(4)(ii)(A) through (H) of this section. If EPA or the State informs you that they will be collecting your UCMR samples, you must assist them in identifying the appropriate sampling locations and in collecting the samples.

* * * * *

(iii) *Phased sample analysis for microcystins*. You must collect the three required samples (one each for EPA Methods 544, 545 and 546 (ELISA) at the EPTDS) for each sampling event, but not all samples may need to be analyzed. If the Method 546 ELISA result is less than 0.3 µg/L, report that result and do not analyze the EPA Method 544 sample for that sample event. If the Method 546 ELISA result is greater than or equal to 0.3 µg/L, report the value and analyze the other microcystin sample using EPA Method 544. You must analyze the EPA Method 545 sample for each sample event for Cylindrospermopsin and anatoxin-a only.

* * * * *

(5) * * *

(v) *Method defined quality control.* You must ensure that your laboratory analyzes Laboratory Fortified Blanks and conducts Laboratory Performance Checks, as appropriate to the method's requirements, for those methods listed in Table 1, column 3, in paragraph (a)(3) of this section. Each method specifies acceptance criteria for these QC checks. The following HAA results must be reported using EPA's electronic data reporting system for quality control purposes.

TABLE 4 – HAA QC RESULTS

1-Contaminant	2-CAS Registry Number	3-Analytical Methods [a]	4-Minimum Reporting Level [b]	5-HAA6Br Group	6-HAA9 Group	7-HAA5 Group
Brominated Haloacetic Acid (HAA) Groups						
Bromochloroacetic acid (BCAA)	5589-96-8	EPA 552.3 or EPA 557	0.3 µg/L	HAA6Br	HAA9	
Bromodichloroacetic acid (BDCAA)	71133-14-7	EPA 552.3 or EPA 557	0.5 µg/L			
Chlorodibromoacetic acid (CDBAA)	5278-95-5	EPA 552.3 or EPA 557	0.3 µg/L			
Tribromoacetic acid (TBAA)	75-96-7	EPA 552.3 or EPA 557	2.0 µg/L			
Monobromoacetic acid (MBAA)	79-08-3	EPA 552.3 or EPA 557	0.3 µg/L			HAA5
Dibromoacetic acid (DBAA)	631-64-1	EPA 552.3 or EPA 557	0.3 µg/L			
Dichloroacetic acid (DCAA)	79-43-6	EPA 552.3 or EPA 557	0.2 µg/L			
Monochloroacetic acid (MCAA)	79-11-8	EPA 552.3 or EPA 557	2.0 µg/L			
Trichloroacetic acid (TCAA)	76-03-9	EPA 552.3 or EPA 557	0.5 µg/L			

Column headings are:
1—Contaminant: The name of the contaminant to be analyzed.
2—CAS (Chemical Abstract Service) Registry Number or Identification Number: A unique number identifying the chemical contaminants.
3—Analytical Methods: Method numbers identifying the methods that must be used to test the contaminants.
4—Minimum Reporting Level (MRL): The value and unit of measure at or above which the concentration of the contaminant must be measured using the approved analytical methods. If EPA determines, after the first six months of monitoring that the specified MRLs result in excessive resampling, EPA will establish alternate MRLs and will notify affected PWSs and laboratories of the new MRLs.
5-7 – HAA groups identified in paragraph (a)(3) of this section to be monitored as UCMR contaminants.
[a] The analytical procedures shall be performed in accordance with the documents associated with each method, see paragraph (c) of this section, and must meet all quality control requirements outlined paragraph (a)(5) of this section.
[b] The MRL is the minimum concentration of each analyte that must be reported to EPA.

(vi) * * * You must require your laboratory to submit these data electronically to the State and EPA using EPA's electronic data reporting system, accessible at https://www.epa.gov/dwucmr, within 120 days from the sample collection date. * * * * * * * * *

(c) *Incorporation by reference*. These standards are incorporated by reference into this section with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. All approved material is available for inspection either electronically at http://www.regulations.gov, in hard copy at the Water Docket, EPA/DC, and from the sources as follows. The Public Reading Room (EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC) is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for this Public Reading Room is (202) 566-1744, and the telephone number for the Water Docket is (202) 566-2426. The material is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741-6030 or go to http://www.archives.gov/federal-register/cfr/about.html.

(1) U.S. Environmental Protection Agency, Water Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave. NW, Washington, DC 20004.

(i) Method 200.8 "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry," Revision 5.4, EMMC Version, 1994. Available on the Internet at https://www.nemi.gov.

(ii) Method 300.0 "Determination of Inorganic Anions by Ion Chromatography Samples," Revision 2.1, August 1993. Available on the Internet at https://www.nemi.gov.

(iii) Method 300.1 “Determination of Inorganic Anions in Drinking Water by Ion Chromatography,” Revision 1.0, 1997. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.

(iv) Method 317.0 “Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis,” Revision 2.0, July 2001, EPA 815-B-01-001. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.

(v) Method 326.0 “Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis,” Revision 1.0, June 2002, EPA 815-R-03-007. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.

(vi) Method 415.3 “Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water,” Revision 1.1, February 2005, EPA/600/R-05/055. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods.

(vii) Method 415.3 “Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water,” Revision 1.2, September 2009, EPA/600/R-09/122. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods.

(viii) Method 525.3 “Determination of Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS),” Version 1.0, February 2012,

EPA/600/R-12/010. Available on the Internet https://www.epa.gov/water-research/epa-drinking-water-research-methods.

(ix) Method 530 "Determination of Select Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Gas Chromatography/Mass Spectrometry (GC/MS)," Version 1.0, January 2015, EPA/600/R-14/442. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods.

(x) EPA Method 541: "Determination of 1-Butanol, 1,4-Dioxane, 2-Methoxyethanol and 2-Propen-1-ol in Drinking Water by Solid Phase Extraction and Gas Chromatography/Mass Spectrometry," November 2015, EPA 815-R-15-011. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods.

(xi) Method 544 "Determination of Microcystins and Nodularin in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)," Version 1.0, February 2015, EPA 600-R-14/474. Available on the Internet at https://www.epa.gov/water-research/epa-drinking-water-research-methods.

(xii) EPA Method 545: "Determination of Cylindrospermopsin and Anatoxin-a in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)," April 2015, EPA 815-R-15-009. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.

(xiii) EPA Method 546: "Determination of Total Microcystins and Nodularins in Drinking Water and Ambient Water by Adda Enzyme-Linked Immunosorbent Assay," August 2016, EPA-815-B-16-011. Available on the Internet at

https://www.epa.gov/dwanalyticalmethods.

(xiv) Method 552.3 "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-Liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection," Revision 1.0, July 2003, EPA 815-B-03-002. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.

(xv) EPA Method 557: "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)," Version 1.0, September 2009, EPA 815-B-09-012. Available on the Internet at https://www.epa.gov/dwanalyticalmethods.

(2) American Public Health Association – Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry," approved August 1, 2010. Available for purchase on the Internet at http://www.astm.org/Standards/D5673.htm.

(i) "Standard Methods for the Examination of Water & Wastewater," 21st edition (2005).

(A) SM 3125 "Metals by Inductively Coupled Plasma/Mass Spectrometry."

(B) SM 5310B "Total Organic Carbon (TOC): High-Temperature Combustion Method."

(C) SM 5310C "Total Organic Carbon (TOC):Persulfate-UV or Heated-Persulfate Oxidation Method."

(D) SM 5310D "Total Organic Carbon (TOC):Wet-Oxidation Method."

(ii) The following methods are from "Standard Methods Online.," approved 2000 (unless noted). Available for purchase on the Internet at http://www.standardmethods.org.

(A) SM 3125 “Metals by Inductively Coupled Plasma/Mass Spectrometry” Editorial revisions, 2011 (SM 3125-09).

(B) SM 5310B “Total Organic Carbon: High-Temperature Combustion Method,” (5310B-00).

(C) SM 5310C “Total Organic Carbon: Persulfate-UV or Heated-Persulfate Oxidation Method,” (5310C-00).

(D) SM 5310D “Total Organic Carbon: Wet-Oxidation Method,” (5310D-00).

(3) ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

(i) ASTM D5673-10 “Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry,” approved August 1, 2010. Available for purchase on the Internet at http://www.astm.org/Standards/D5673.htm.

(ii) ASTM D6581-12 “Standard Test Methods for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Suppressed Ion Chromatography,” approved March 1, 2012. Available for purchase on the Internet at http://www.astm.org/Standards/D6581.htm.

[FR Doc. 2016-30469 Filed: 12/19/2016 8:45 am; Publication Date: 12/20/2016]