Appendix M

Preparing Your Massachusetts Drinking Water

Consumer Confidence Report

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Massachusetts Department of Environmental Protection (MassDEP)
Bureau of Water Resources – Drinking Water Program

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Adapted from MassDEP's October 2012 Appendix M, EPA's 2010 CCR Guidance for Water Suppliers, and MassDEP's 2009 Tips for Preparing User-Friendly CCRs

Disclaimer

This document provides guidance to community public water suppliers on the Massachusetts Department of Environmental Protection's (MassDEP's) implementation requirements and recommendations for preparing annual consumer confidence reports (CCRs) in accordance with the federal CCR Rule. This document is not a substitute for MassDEP's regulations or for the regulations promulgated by the U.S. Environmental Protection Agency (EPA). While MassDEP has made every effort to ensure the accuracy of the discussion in this guidance, the guidance may not apply to a particular situation based upon its circumstances. In the event of a conflict between the information in this document and any statute or regulation, this document would not be controlling.

MassDEP, US EPA, and other decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from those described in this guidance, where appropriate. MassDEP may change this guidance in the future.

Throughout this document, the term "state" refers to the Commonwealth of Massachusetts, which has primacy for administering the federal Safe Drinking Water Act in Massachusetts.

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Acronyms

AL	Action level
BDL	Below detection limit
CCR	Consumer Confidence Report
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
DBP	Disinfection byproduct
DBPP	Disinfection byproduct Precursor
DBPR	Disinfection byproduct Rule
DWSRF	Drinking Water State Revolving Fund
EPA	U.S. Environmental Protection Agency
FDA	U.S. Food and Drug Administration
GWR	Ground Water Rule
HA	Health advisory
HAA5	Five haloacetic acids
IDSE	Initial distribution system evaluation
IESWTR	Interim Enhanced Surface Water Treatment Rule
LCR	Lead and Copper Rule
LRAA	Locational running annual average
LT1ESWTR	Long-Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	Long-Term 2 Enhanced Surface Water Treatment Rule
LRAA	Locational running annual average
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum contaminant level
MCLG	Maximum contaminant level goal
MFL	Million fibers per liter
MDL	Method detection limit
mg/L	Milligrams per liter (the same as parts per million or ppm)
mrem	Millirem

MRDL	Maximum residual disinfectant level
MRDLG	Maximum residual disinfectant level goal
N/A	Not applicable
ND	Not detected
NTU	Nephelometric turbidity units
ORSG	Massachusetts Office of Research and Standards Guideline
pCi/L	Picocuries per liter (a measure of radioactivity)
PFAS	Per- and polyfluoroalkyl substances
ppb	Parts per billion (the same as micrograms per liter or ug/L)
ppm	Parts per million (the same as milligrams per liter or mg/L)
ppt	Parts per trillion (the same as nanograms per liter or ng/L)
PWS	Public water system
RAA	Running annual average
RTCR	Revised Total Coliform Rule
SDWA	Safe Drinking Water Act
Stage 1 DBPR	Stage 1 Disinfectants and Disinfection Byproducts Rule
Stage 2 DBPR	Stage 2 Disinfectants and Disinfection Byproducts Rule
SWAP	Source Water Assessment and Protection Program
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TOC	Total organic carbon
TT	Treatment technique
TTHM	Total trihalomethanes
UCMR3	Unregulated Contaminant Monitoring Rule - Third Cycle
ug/L	Micrograms per liter (the same as parts per billion or ppb)

Introduction

This document is intended to be used by water suppliers who are preparing their drinking water Consumer Confidence Reports (CCRs) for their customers. This guide explains the Massachusetts requirements for report content, format, and distribution in accordance with 310 CMR 22.16A and the federal CCR Rule, including revisions since 1998.

The MassDEP Drinking Water Program website includes additional information, which can help you prepare your annual CCR: http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html#7. On the website, you will find the CCR template, CCR certification form, a sample CCR, optional source protection and water conservation tips, and a list of common CCR errors. If you need additional help, you can contact the Program.Director-DWP@state.ma.us and they will get you in touch with the appropriate person to help you.

As the system operator/manager, you are a guardian of the quality of your drinking water supply and the public health in your community. Your customers have the right to know about the source of their drinking water, the quality of their water, and your compliance with state and federal drinking water regulations. CCRs help consumers make informed choices that affect the health of themselves and their families. CCRs also encourage consumers to consider and appreciate the challenges of delivering safe drinking water and the need for infrastructure improvements. Educated consumers are more likely to help protect their drinking water sources and to understand the true costs of safe drinking water.

Section I

What is a Consumer Confidence Report?

In 1996, Congress amended the Safe Drinking Water Act (SDWA) to improve the safety of public drinking water and address the public's right to know what is in their water. Among other things, the amendments directed each community public water system (PWS) to deliver to its customers an annual report covering information from the previous calendar year. CCRs must summarize the water quality results that each PWS already collects, showing highest detections, the range of detections, applicable standards, and violations. CCRs also must provide definitions, educational language, and information on source water, public participation opportunities, compliance history, and the health effects of contaminants.

Beyond the mandatory requirements, CCRs provide an important opportunity to communicate with your customers. A well-prepared CCR can help you to build community trust, promote wise use, and encourage necessary investment in resource protection and infrastructure.

Section II

Who Must Prepare a Consumer Confidence Report?

Every community PWS, regardless of size, must prepare and distribute an annual CCR to its customers. Very small community systems can include condominiums, apartment complexes, mobile home parks, nursing homes, boarding schools, and prisons that supply water to 25 or more residents year-round. In each case, the community PWS must prepare and distribute an annual report to the people who drink the water.

A consecutive community system (one that purchases water from another PWS) must prepare a CCR using its own sampling data and contact information, as well as the applicable water quality results, compliance information, and source data from the wholesale system.

Wholesale systems (drinking water systems that sell water to one or more consecutive systems) are responsible for providing the consecutive system with relevant source information and monitoring and compliance data so that the consecutive system can include this information in

their CCR. The wholesaler must provide this information to the consecutive system by April 1 of each year in order to allow the consecutive system time to prepare their CCR. Wholesale systems are not responsible for creating a CCR for their purchasing systems, nor are they responsible for providing data on contaminants that the consecutive system monitors (such as total coliforms, lead, or TTHMs).

If the consecutive system has no new data to add to the information supplied by the wholesaler, it could simply send out the wholesale system's CCR with a cover letter that provides its own PWS ID number, contact list, and public participation information. Regardless of who produces the report, the consecutive system is still responsible for ensuring that its customers receive a report containing all required content.

Non-community systems do not prepare a CCR. When MassDEP prepares a report for noncommunity systems, they are posted on line at: http://www.mass.gov/eea/agencies/massdep/water/drinking/pws-documents-search-tool.html. The non-community system must select their report from the drop-down list, print it, sign, and post their CCRs in conspicuous places so that their customers can view them. In the case of vending machines, it is suggested to leave a stack of reports available for customers to take with them.

Section III

When Must a Water System Distribute its Report?

The CCR deadline is July 1 of each year. All delivery to customers (including a minimum of three good faith efforts) must be completed by that date. July 1 is also the date when the CCR and certification form must be received by MassDEP and other agencies. Your submittal to MassDEP also must include attachments that document your primary delivery method and your good faith efforts (certification form). Electronic delivery to customers and agencies is now permitted. See Section VI for more information on delivery requirements and options.

A system may contract with an outside company to prepare its CCR, but the PWS is ultimately responsible for the content and on-time distribution of its CCR.

A new community water system must deliver its first report by July 1 of the year after its first full calendar year in operation, and annually thereafter.

A wholesale system must provide each purchasing (consecutive) system with monitoring data and other information by April 1 of each year unless the two systems make a different contractual agreement. This gives the consecutive system enough time to prepare and deliver its CCR before the deadline of July 1.

Community public water systems are the main source of distribution for CCRs and are required to keep copies on file for no less than three years and to provide copies on request.

Section IV

What Content Should Be in The CCR?

You may call your report a "Consumer Confidence Report," a "Water Quality Report," or choose another similar title, but the year of the report should match the calendar year of the information, *not* the year of distribution. The CCR you deliver in 2016 is for calendar year 2015 and should indicate that in the title.

The basic elements of a CCR are system and source information, public participation information, definitions, water quality tables, required health language, and compliance history. You can also use your CCR to meet your annual cross-connection education requirement and to provide public notification for Tier 3 violations that occurred within the past 12 months.

You do not need a fancy computer, a large budget, or a graphic designer to produce a CCR that is inviting to customers. While color printing is attractive, many excellent CCRs are in black-and-white only, using "white space" and headings to make sections stand out.

Customers are most interested in a clear statement of whether or not their drinking water meets all standards. Be cautious in using the word "safe" since water that meets standards and is safe for most people might not be safe for infants, chemotherapy patients, or people with compromised immune systems.

Recommended tips for preparing a user-friendly CCR :

- Use your CCR as an opportunity to tell your customers about the things you are doing well. Highlight any improvements you made in the past year.

- "Introduce" your customers to the people who work at your water system or serve as commissioners. You can include just their names and positions, or you can add photos.
- Limit wordiness – write short sentences and keep your paragraphs short as well. A report that is full of technical jargon can discourage consumers from learning about their drinking water.
- Do not make your text size too small. You might want to squeeze a few extra sentences into your CCR, but if you add too much, people might ignore the entire report.
- Pay attention to overall organization so the information fits your headings.
- Provide information to your customers in a way they will understand. Be truthful and straight forward about issues such as detections, violations, and treatment concerns.
- If you think a picture or graph would help your customers understand your report, considering including one.
- Be sure to proofread your report for spelling, grammar, punctuation, content accuracy, and completeness.
- Ask non-technical people to read your draft report to ensure you are communicating your message. After you publish your CCR, invite customers to provide comments.

Section V

What Information Is Required?

Although the community water system will have some flexibility in determining the form and content, the annual report must contain eight basic elements, as seen in the chart on the next page. These items are explained in more detail on the pages that follow.

If you think that an added picture or graph would help your customers to understand your report, add it. If your customers would benefit from an explanation of your need for new treatment facilities, tell them. Provide information to your consumers in a way that they understand. For example, when discussing units of measure, explain it in terms that a consumer may understand: for example if an Olympic-sized pool were filled with ping-pong balls, a ppb would be

equivalent to one ping-pong ball in that pool. As long as additional educational information is consistent with, and not detracting from the report, you may add it.

Note to consecutive systems: You have two options on how to produce your report. You may prepare a complete report using your own information and the data from the seller, or you may send customers the seller's CCR attached to a one-page report that contains your (the purchasing system) PWS ID number, contact information, public participation information, enforcement information, and system-specific sampling results. The seller is not required to make your CCR for you. They are required to send the pertinent information to you by April 1 each year.

Eight Basic Requirements for CCRs

Item 1: Water System and Outreach Information

- PWS name, city or town, PWS ID #
- Name/phone number of contact person
- Information on public participation opportunities
- Information for non-English speaking populations, if applicable

Item 2: Sources of Water

- Type (surface/ground), name, source ID #, and general location of water sources
- Availability of Source Water Assessment and Protection (SWAP) report
- Susceptibility ranking and information on significant sources of contamination, if available

Item 3: Mandatory Educational Statements

- Explanation regarding contaminants that may be expected to be found in drinking water
- Statement about how drinking water is regulated by EPA, MassDEP, FDA, and Mass DPH
- Statement that some people may be more vulnerable to contaminants in drinking water
- Information about the sources of drinking water
- Lead health language

Item 4: Variances and Exemptions

- Explanation of variances/exemptions, if applicable

  (Variances and exemptions are rare in Massachusetts. They are not the same as monitoring waivers.)

Item 5: Definitions

- Mandatory definitions (MCL and MCLG)
- Others as needed (ex: AL, TT, MRDL, ORSG)
- All acronyms and abbreviations should be spelled out the first time they are used.

Item 6: Tables

- Tables summarizing detected regulated and unregulated contaminant and using CCR units of measure
- Reporting secondary contaminants
- Identification of any violations or exceedances
- Corrected data from previous years if directed by MassDEP
- Statement about monitoring waivers for SOCs, VOCs, IOCs, or perchlorate

Item 7: Specific Contaminants and Rules

- Health statements on arsenic, *Cryptosporidium,* nitrate, and manganese (if above certain levels)
- Explanation of unregulated contaminants (including radon and UCMR contaminants) and their presence in drinking water, if detected
- Health effects language for any contaminants or TT with violations or exceedances

Item 8: Compliance and Enforcement Information

- Summary of all violations related to water quality monitoring and the steps taken to correct each one
- Tier 3 public notification if a water system chooses to meet its PN requirements in the CCR for monitoring and reporting violations
- Information about administrative consent orders or other higher-level enforcement that was issued in the year of the CCR or still in place

Section V. What information is required?

Item 1: Water System and Outreach Information

You must provide the following information about your water system:

- PWS name, city or town where it's located, and PWS ID number
- The name and telephone number of a person at the water system who can answer questions about the report.
- Information about commissioners' meetings or other opportunities for customers to discuss water quality issues publicly. If you do not hold regular meetings, you may offer to set one up with the residents.
- If your system serves communities with 10% or greater than 1000 people (whichever is fewer) of non-English speaking consumers, your CCR must contain a statement in the appropriate languages(s) regarding the importance of the report. Such as:

  > *This report contains important information about your drinking water. Have someone translate it for you or speak with someone who understands it.*

- If 25% or more of the population served by your system speak one particular language, the entire report must be translated into that specific language.

  See next two pages for a table that lists the cities and towns to which this requirement applies plus a table of translation statements.

  Please note that you must deliver a copy of the translated CCR along with your English version to MassDEP before the July 1 deadline. The translated version must be readily available in your files; when a request is made for one, it can be sent out immediately.

You may also wish to include the following optional information in your CCR:

- E-mail contact information and a link to your system's website if you have one.
- A list of your staff and water commissioners.

- A description of your system's components (for example, miles of water main, number of service connections, capacity of storage tanks)
- Information about improvements to your water system over the past year
- A description of the treatment methods and chemicals used to ensure compliance with MassDEP requirements for safe drinking water.
- Any other information you might want customers to know about your system

Language Translation Requirements for Specific MA Cities and Towns

The cities of **Chelsea** and **Lawrence**, must translate their entire CCR into Spanish.

The cities and towns below must provide the statement below in your CCR, translated into the languages identified for each applicable community:

> *"This report contains important information about your drinking water. Please translate it, or speak with someone who understands it."*

City/Town	Languages required for statement on the importance of the CCR	
Barnstable	Portuguese	
Boston	Arabic	Chinese
	French	Italian
	Portuguese	Russian
	Spanish	Vietnamese
Brockton	French	Portuguese
	Spanish	
Brookline	Chinese	Russian
Cambridge	Chinese	French
	Spanish	
Chicopee	Polish	Spanish
Dartmouth	Portuguese	
Everett	French	Portuguese
	Spanish	
Fall River	Portuguese	Spanish
Fitchburg	Spanish	
Framingham	Portuguese	Spanish
Haverhill	Spanish	
Holyoke	Spanish	
Hudson	Portuguese	
Leominster	Spanish	
Lowell	Mon-Khmer	Portuguese
	Spanish	Vietnamese
Ludlow	Portuguese	

City/Town	Languages required for statement on the importance of the CCR	
Lynn	Mon-Khmer	Spanish
	Russian	
Malden	Chinese	French
	Portuguese	Spanish
Marlborough	Portuguese	Spanish
Medford	Portuguese	
Methuen	Spanish	
Milford	Portuguese	
New Bedford	Portuguese	Spanish
Newton	Chinese	Russian
Peabody	Portuguese	
Quincy	Chinese	Vietnamese
Randolph	French	
Revere	Arabic	Portuguese
	Spanish	
Salem	Spanish	
Somerville	Portuguese	Spanish
Southbridge	Spanish	
Springfield	Spanish	Vietnamese
Stoughton	Portuguese	
Taunton	Portuguese	
Waltham	Spanish	
West Springfield	Russian	
Worcester	Chinese	Portuguese
	Spanish	Vietnamese

Used with permission from the Washington State Department of Health. MassDEP makes no claim on the validity or correctness of these translations.
More Translations are available at:
https://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/PublicNotification/TranslationsforPublicNotification

Translations for the English Text:

"This report contains important information about your drinking water.
Have someone translate it for you, or speak with someone who understands it."

Arabic:

هذا التقرير يحتوي على معلومات مهمة عن ماء الشرب
الذي تستخدمه. اطلب من شخص ما ان يترجمه لك او
يستطيع فهمه.

Cambodian (Khmer):

របាយការណ៍នេះមានពត៌មានសំខា
ន់អំពីទឹកបរិភោគ ។ សូមបកប្រែ
ឬពិគ្រោះជាមួយអ្នកដែលមើលយល់
របាយការណ៍នេះ ។

Chinese (simplified):

此报告包含有关您的饮用水的重要信
息。请人帮您翻译出来，或请看懂此
报告的人将内容说给您听。

French:

Ce rapport contient des informations importantes à propos de votre eau potable. Demander à quelqu'un de traduire ces informations pour vous ou discuter avec une personne qui comprend ces informations.

Italian:

Questo rapporto contiene informazioni inportanti che riguardano la vostra aqua potabile. Traducetelo, o parlate con una persona qualificata in grado di spiegarvelo.

Polish:

Ta broszura zawiera wazne informacje dotyczace jakosci wody do picia. Przetlumacz zawartosc tej broszury lub skontaktuj sie z osoba ktora pomoze ci w zrozumieniu zawartych informacji.

Portuguese:

Este relatório contém informações importantes sobre a água potável. Ter alguém que traduzi-lo para você, ou falar com alguém que entende-lo.

Russian:

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

Spanish:

Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

Vietnamese:

Tài liệu này có tin tức quan trọng về nước uống của quý vị. Hãy nhờ người dịch cho quý vị, hoặc hỏi người nào hiểu tài liệu này.

Item 2: Sources of Water

Source Description

- Describe your water sources including number of sources, the Source IDs, commonly used names, general locations, type of water supplied (groundwater, surface water, or a blend) and information about emergency sources and interconnections. You may include a simple map if you wish.

- If you used a temporary interconnection from another system during the past year you must include the name of the system providing the water and its PWS ID #, the dates when that interconnection was used, the amount of water received, and contact information for the temporary source. If the source was used for a significant amount of time, also include that system's full sampling data in your report.

For complicated systems, explaining your various interconnections and back-up sources may be difficult, but it is important that consumers understand that the source of their water may vary during the year.

Source Water Assessment and Protection (SWAP) Report

If MassDEP has prepared a SWAP report for your system, you must let customers know where they can view the report. You must also include your susceptibility ranking and a brief summary of the threats to your source based on the findings of the assessment. See examples below of how you can present that information in your CCR.

Systems are encouraged to use the CCR as a way to discuss appropriate source water protection actions that are in the planning stages or that are already in place. Systems are also encouraged to provide tips for consumers on ways they can protect their source water and conserve water.

If a SWAP report was not prepared for your system, you must still provide information about the vulnerability of your sources and what you are doing to protect them.

Many SWAP reports are available online, so consider including a link to your system's report. See https://www.mass.gov/service-details/the-source-water-assessment-protection-swap-program for an archive of SWAP reports by region.

XYZ System's Swap Language Example for Groundwater Source:

> *Our water comes from three wells drilled about 500 feet into an underground source of water called the West End Aquifer. These wells are located west of town on the north side of City Park. The wellhead protection area for these wells extends approximately 2000 feet north, 4000 ft south and 1500 ft east and west of the well field. (Please see the map). We have a town ordinance that prohibits dumping and many other activities that could pollute our drinking water in this wellhead area. MassDEP completed an assessment of our source water in January of 2001 and has reported that our raw water is most susceptible to contamination from abandoned irrigation wells and farm runoff. The town has done a follow-up investigation and has identified two abandoned wells. They have been properly plugged. Farm runoff continues to be a concern. Please contact the County Extension Service at [phone number] to get a list of area farmers participating in a three county source water protection program. You can get a summary of our assessment by calling our office at [phone number]. A full copy of the assessment is available in the town clerk's office or on the Internet [Internet address].*
>
> (Do not use this paragraph verbatim as it just an example for a system.)

XYZ System's Swap Language Example for Surface Water Source:

> *Our utility serves you treated surface water, which is taken from the Massasoit River near Adams Street. We collect it in the Oak Street Reservoir and then pipe it to the treatment plant just northwest of town. MassDEP, through a source water assessment report has found that our drinking water is potentially most susceptible to farm runoff as well as three underground storage tanks west of the reservoir. However, we have not detected any contaminants from these sources in our drinking water. You can get a copy of the source water assessment by calling the state drinking water program at [phone number]. In 2015, we monitored for Cryptosporidium, a microbial parasite commonly found in surface water, and found some evidence of these microbes in the raw, but not the finished water. Current test methods do not enable us to determine if these organisms are capable of causing disease. We are not aware of a specific source of Cryptosporidium. Cryptosporidium may come from wildlife or cattle grazing near the reservoir. Cryptosporidium must be ingested for it to cause disease, and may be passed through other means than drinking water. Symptoms of infection include nausea, diarrhea, and abdominal cramps. These symptoms can also be the result of food related organisms or flu or ingesting untreated water. Most healthy individuals are able to overcome the disease within a few weeks.*

However, some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people living with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk. These people should seek advice from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available by emailing the EPA at safewater@epa.gov.

(Do not use this paragraph verbatim as it just an example for a system.)

Section V. What information is required?

Item 3: Mandatory Educational Statements

Every CCR must contain five educational statements about drinking water, prominently displayed somewhere in the report.

The first required statement is a brief explanation regarding contaminants that may reasonably be expected to be found in drinking water, including bottled water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by emailing the EPA at safewater@epa.gov.

The second statement contains basic information about drinking water contaminants.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.*

- *Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.*

- *Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.*

- *Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.*

- *Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.*

The third statement informs customers that some people may be more vulnerable to contaminants in drinking water than the general population and encourages those who may be particularly at risk from infection to seek advice from their health care provider.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium *and other microbial contaminants are available by emailing the EPA at safewater@epa.gov.*

The fourth statement provides information on MassDEP and EPA regulations as they pertain to drinking water and bottled water.

In order to ensure that tap water is safe to drink, EPA and MassDEP prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. FDA and Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water that must provide the same protection for public health).

Finally, all CCRs must include the following educational language about lead, even if lead was not detected in your finished water. You may include this information near your lead and copper results table or elsewhere in your CCR.

> *Lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water and removing lead pipes, but cannot control the variety of materials used in plumbing components in your home. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Before drinking tap water, flush your pipes for several minutes by running your tap, taking a shower, doing laundry or a load of dishes. You can also use a filter certified by an American National Standards Institute accredited certifier to reduce lead in drinking water. If you are concerned about lead in your water and wish to have your water tested, contact [NAME OF UTILITY and CONTACT INFORMATION]. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at http://www.epa.gov/safewater/lead.*

Note: Effective November 1, 2027, the mandatory educational statement must read as follows. To follow MassDEP's recommendation and to provide the latest EPA information, you may choose to include this statement in your report(s) now.

> *Lead can cause serious health effects in people of all ages, especially pregnant people, infants (both formula-fed and breastfed),and young children. Lead in drinking water is primarily from materials and parts used in service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water and removing lead pipes but cannot control the variety of materials used in the plumbing in your home. Because lead levels may vary over time, lead exposure is possible even when your tap sampling results do not detect lead at one point in time. You can help protect yourself and your family by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Using a filter, certified by an American National Standards Institute accredited certifier to reduce lead, is effective in reducing lead exposures. Follow the instructions provided with the filter to ensure the filter is used properly. Use only cold*

water for drinking, cooking, and making baby formula. Boiling water does not remove lead from water. Before using tap water for drinking, cooking, or making baby formula, flush your pipes for several minutes. You can do this by running your tap, taking a shower, doing laundry or a load of dishes. If you have a lead service line or galvanized requiring replacement service line, you may need to flush your pipes for a longer period. If you are concerned about lead in your water, and wish to have your water tested, contact [NAME OF UTILITY and CONTACT INFORMATION]. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at https://www.epa.gov/safewater/lead

Section V.- What information is required?

Item 4: Variances and Exemptions

Variances and exemptions are state or EPA permissions that allow a public water system to not meet an MCL, an action level, or a treatment technique under certain conditions. They are not to be confused with monitoring waivers. Variances and exemptions are rarely permitted in Massachusetts.

If your system operated under a variance or exemption at any time during the year covered by the CCR, include an explanation of the justification for the variance or exemption, the date it was issued, when it is up for renewal, and a status report on what the system is doing to remedy the problem. Also, tell your customers how they may participate in the review or renewal of the variance or exemption.

Section V.- What information is required?

Item 5: Definitions

Every CCR must include definitions of key terms that consumers will need to understand the contaminant data.

All CCRs must include the definitions for MCL and MCLG:

> **Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Include the following definitions if the terms are used in your CCR tables:

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

90th Percentile: Out of every 10 homes sampled, 9 were at or below this level. This number is compared to the action level to determine lead and copper compliance.

Secondary Maximum Contaminant Level (SMCL): These standards are developed to protect aesthetic qualities of drinking water and are not health based.

Unregulated Contaminants: Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated monitoring is to assist EPA in determining their occurrence in drinking water and whether future regulation is warranted.

Office of Research and Standards Guideline (ORSG): This is the concentration of a chemical in drinking water at or below which adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Running Annual Average (RAA): The average of four consecutive quarters of data.

Include the next two definitions only if your system adds a chemical disinfectant or oxidant and is regulated by the Disinfection Byproducts Rule:

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

Include the following definitions only if your CCR contains information regarding a Level 1 or Level 2 Assessment required under the 2016 Revised Total Coliform Rule.

Level 1 Assessment: A Level 1 Assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment: A Level 2 Assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and /or why total coliform bacteria have been found in our water system on multiple occasions.

Define all units of measure in the report

ppm: parts per million or milligrams per liter (mg/L)

ppb: parts per billion or micrograms per liter (µg/L)

pCi/L: picocuries per liter (a measure of radioactivity)

NTU: Nephelometric Turbidity Units

If you use additional acronyms or abbreviations in your CCR (such as EPA, PWS, VOCs, TTHM), spell them out the first time they appear. See the acronym list at the beginning of this document for assistance.

If your system operates under a variance or exemption (see Item 4), you must include the following in your list of definitions:

Variances and Exemptions: State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

Section V.- What information is required?

Item 6: Tables

Water quality data is the most important part of your CCR. This data should be reported in several tables, depending on the contaminant, since certain contaminants must be reported differently. You may need to refer to the contaminant charts in the back of this guide when you prepare your CCR tables. Sample tables that you can use in your report can be found throughout this section of the guidance. Please review *Item 7 – Contaminants and Rules with Special Reporting Requirements* in this guide which details how to report certain contaminants as they have special reporting requirements.

The CCR must include the detected water quality monitoring results from the most recent year of sampling for each monitoring group. That would usually mean the last calendar year in most circumstances. However, if you sample less than annually for a contaminant, you must report the last available detect, going back five years. See "Less than Annual Monitoring" in this section for more information).

You must include all finished water[1] detections for monitoring required by your MassDEP sampling schedule. This includes:

- Regulated contaminants subject to a maximum contaminant level (MCL), action level (AL), maximum residual disinfectant level (MRDL) or treatment technique (TT)
- Unregulated and secondary contaminants for which monitoring is required (including UCMR3 monitoring);
- Any other contaminant for which sampling is specifically required by MassDEP.

The CCR must include all reportable detections of these contaminants even if the results comply with established MCLs or action levels.

A detected contaminant is any contaminant observed at or above its minimum laboratory detection limit (MDL). If the contaminant level is reported by the laboratory as less than the

[1] See *Item 7-Contaminants and Rules with Special Requirements* where raw water detections must be reported (Groundwater Rule and LT2 Surface Water Treatment Rule).

MDL (<MDL), not detected (ND) or otherwise below the detection limit (BDL), you are not required to include that contaminant within your report.

If the water is treated, usually only monitoring results of finished water[1] must be included. Any contaminant detected in the water prior to treatment usually should not be included in the CCR. Exceptions to this are samples taken for compliance with the Ground Water Rule, Total Coliform Rule, and the LT2 Surface Water Treatment Rule. (See *Item 7-Contamionants and Rules with Special Requirements* for more information.)

For each detected contaminant, all sample results are combined into one entry in the table. Please see "How to Report Detects" later on in this section on how to properly combine and report sample results. However, if a PWS has hydraulically independent distribution systems they are reported separately.

Hydraulically independent systems: A PWS that supplies water through two or more distribution systems that are not physically interconnected and that are fed by different raw water sources (hydraulically independent), you must issue a CCR that includes information on each source water, the levels of any detected contaminants, and compliance with drinking water rules for each distribution system. The PWS may combine this information into one report but must include separate tables and information about each service/distribution area.

Monitoring groups include, but are not limited to, the following:

- Microbiological contaminants (total coliform bacteria and fecal indicators)
- Inorganic contaminants
- Radioactive contaminants
- Synthetic organic contaminants
- Volatile organic contaminants
- Disinfection by-products and disinfectant residuals (TTHM and HAA5)
- Lead and copper
- Turbidity
- Unregulated contaminants, including those required under UCMR3
- Cryptosporidium

- Other contaminants or special purpose contaminants that MassDEP has required your system to monitor on your sample schedule.

Monitoring Waivers and Less than Annual Monitoring

If your system has applied for and received a monitoring waiver for SOCs, IOCs, VOCs, or perchlorate, you must include a statement such as the following:

> *The Massachusetts Department of Environmental Protection has reduced the monitoring requirements for [name of contaminant or contaminant group] because the source is not at risk of contamination. The last sample collected for these contaminants was taken on [date] and was found to meet all applicable EPA and MassDEP standards.*

If your system samples for contaminants less than annually, such as every 3 years, any detects found must be reported in the CCR every year until a new sample has been taken. Report the latest monitoring information available within the last five years. Data older than five years does not need to be included.

Many systems are required to sample for contaminants (such as radionuclides and lead and copper) on a cyclical basis rather than annually. These results should be clearly marked that they are from a previous year and are the most recent monitoring done in compliance with regulations. For example:

> *The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old.*

What to Include in the Tables

The name of the contaminant, the maximum allowable amount, the maximum goal amount, the reported detection, averages and/or range if multiple samples were taken and possible sources of the contamination are included in the tables. There are exceptions to this rule as explained later

in *Item 7 - Specific Contaminants*. Some contaminants are reported differently than others and need a different style table.

You may also need to include definitions and footnotes to clarify the information in the tables or to provide health effects language for MCL or AL exceedances. Remember that the goal is to make your water quality data as understandable as possible to your customers.

How to Use "CCR Units" in your Tables

Many times in your report, you will have to convert the drinking water standard and your lab detection result into CCR Units of measure for your tables.

The National Primary Drinking Water Regulations drinking water standards are MCLs, MRDLs, ALs, and TTs. These standards are typically numbers less than 1.0, because the detected concentrations in drinking water are so low. The federal CCR Rule requires systems to present drinking water standards as numbers greater than or equal to 1.0 because with less decimal places it is easier for the public to understand. These units are often referred to as CCR units. (Please note that your laboratory result will also have to converted and may still be less than 1.0 after conversion.)

See the Contamninant Charts in the back of this guide for reporting regulated, unregulated, and secondary contaminants in your CCR tables. The charts identify the CCR units to be used for reporting your detections in your tables. Each contaminant has its own CCR unit so be sure to check the charts for the correct unit for each detected contaminant.

If your laboratory uses mg/L, use the equivalent unit of ppm (parts per million) in your CCR table. The same holds true for ug/L and ppb (parts per billion) and so forth. EPA prefers the use of ppm, ppb, ppt, etc. because it is easier for the public to understand.

Example 1:

You have a lab result for lindane of 0.00010 mg/L (or ppm). The chart shows an MCL for lindane of 0.0002 ppm. This is not a whole number of 1 or greater and must be converted. You multiply the MCL (and your test result) by 1,000,000 as that chart indicates, to reach a number of 1 or greater. The converted MCL is now 200 ppt and your result will be 100 ppt.
(An easy way to multiply by 1,000,000 is to move the decimal point 6 places to the right.)

Example 2:
You have a lab result for bromate: the running annual average of monthly results is 0.06 mg/L (ppm). The chart shows an MCL of 0.010 ppm (note your result is over the MCL and you now

also have a violation to report). The MCL is not 1 or greater and must be converted. You multiply the MCL (and your test result) by 1,000 as the chart indicates, to reach a whole number of 1 or greater. The converted MCL is now 10 ppb and your result is 60 ppb.
(An easy way to multiply by 1,000 is to move the decimal point 3 places to the right.)

Example 3:
You have a lead 90th percentile of 0.0007 mg/L. The chart shows an AL for lead of 0.015 mg/L (ppm). The AL is not the number 1 or greater and must be converted. You multiply the AL (and your test result) by 1,000 as the chart indicates. The converted AL is now 15 ppb and your result is now 0.7 ppb.

Note: TTs are required processes intended to reduce the level of a contaminant in drinking water. There is no conversion for TTs. Also, you do not need to convert units of measure for total coliform bacteria, *E. coli*, total organic carbon, turbidity, radionuclides measured in mrem/year or pCi/L, or asbestos as well as any other MCL currently reported as a whole number (such as barium's MCL of 2 ppm). All others require a conversion of units.

Table Formats

MassDEP suggests that you include a brief statement before the tables that explains the timeframe for the results reported. For example:

> *The water quality information presented in the tables is from the most recent round of testing done in accordance with the regulations. All results shown were from samples collected during the last calendar year unless otherwise noted in the tables. Only the detected contaminants are shown.*

PWSs may instead want to begin with an introductory paragraph that clearly states whether or not their drinking water complied with all federal and state standards in the past calendar year. Be cautious in using the word "safe" since water that meets standards and is safe for most people might not be safe for infants, chemotherapy patients, or people with compromised immune systems. Also, using the term "safe" if you have had an MCL or AL exceedance can be misleading to the customer. For example:

> *Last year, as in years past, your tap water met all EPA and state drinking water health standards. XYZ System vigilantly safeguards its water supplies and once again, we are proud to report that our system has never violated a maximum contaminant level or any other water quality standard.*

or, if you had a violation, you may want to begin with:

Last year, we conducted more than __ tests for over 80 contaminants. We only detected __ of those contaminants and found only __ at a level higher than EPA allows. As we told you at the time, our water temporarily exceeded drinking water standards. For more information, see the paragraph marked violation on the back.

This report is a snapshot of last year's water quality. Included are details about where your water comes from, what it contains, and how it compares to EPA and state standards. We are committed to providing you with this information because informed customers are our best allies.

You most probably will need to use several different table formats in your CCR. No one table will meet all contaminants' requirements.

Regulated contaminants have MCLs and should be in one table. Secondary and unregulated contaminants have SMCLs and ORSGs instead of MCLs and should be in a separate table from the regulated contaminants table. However, combining unregulated and secondary contaminants into one table can work well.

Note: There are some regulated contaminants that need to be reported in their own separate table from the regular contaminants table because they have special reporting requirements.

- Lead and copper have action levels so they should be reported separately from regulated contaminants with established MCLs. (See *Item 7 Special Contaminants.*)
- Bacteria detections are reported differently for GW and the RTCR. Review how to report bacteria for the GWR and RTCR which are detailed in *Item 7 – Special Contaminants.*
- Turbidity is reported differently for different circumstances. (See *Item 7 Special Contaminants.*)

Reporting Regulated Contaminants

This is usually the largest table in your CCR. It should include the following column headings or something similar:

- Contaminant Name (and the units of measure)
- Date(s) Collected if collected in prior years.

- Result or Highest Result (add highest RAA to this heading if applicable)
- Range Detected (if you have more than one source or sampling date)
- MCL (or MCL/MRDL/TT if applicable)
- MCLG (or MCLG/MRDLG if applicable)
- Violation Y/N
- Possible Sources of Contamination

In the primary regulated contaminants table, MassDEP also recommends using subheadings for the different contaminant groups (IOCs, VOCs, SOCs, Radioactive Contaminants, and Disinfection Contaminants).

Example table of XYZ System's regulated contaminants:

Inorganic Contaminants	Date(s) Collected	Highest Result or Average	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation (Y/N)	Possible Sources
Nitrate (ppm)	4/6/18	2.2	1.9 – 2.2	10	10	N	Runoff from fertilizer use; leaching from septic tanks; natural deposits
Barium (ppm)	4/7/18	0.025	0.018 – 0.025	2	2	N	Erosion of natural deposits
Fluoride (ppm)	4/7/18	0.47	0 – 0.47	4①	4	N	Erosion of natural deposits
Radioactive Contaminants							
Gross Alpha (pCi/l)	4/7/16③	0.7	0 – 0.7	15	0	N	Erosion of natural deposits
Radium 226 & 228 (pCi/l)	4/7/16③	0.2	0 – 0.2	5	0	N	Decay of natural and manmade deposits
Volatile Organic Contaminants							

Tetrachloroethylene (PCE) (ppb)	6/20/13③ 10/9/13③	34	21 – 34	5	0	Y	Leaching from PVC pipes; discharge from factories; dry cleaners
Disinfection Contaminants							
Haloacetic Acids (HAA5s) (ppb)	Quarterly	23②	12 - 26	60	--	N	Byproduct of drinking water chlorination
Total Trihalomethanes (TTHMs) (ppb)	Quarterly	54②	23 - 54	80	--	N	Byproduct of drinking water chlorination
Chlorine (ppm)	7 Times a Month	0.22②	0.11 - 0.42	4 (MRDL)	4 (MRDLG)	N	Water additive used to control microbes

① Fluoride also has a secondary maximum contaminant level (SMCL) of 2.0 ppm.
② Highest Locational Running Annual Average (LRAA) = highest locational running annual average of four consecutive quarters.
③ Most of the data presented in this table is from testing done between January 1 - December 31 2018. We monitor for some contaminants less than once per year, because the concentrations for those contaminants are not expected to vary significantly from year to year. As a result, some of our data though representative is more than a year old. For those contaminants, the date of the last sample is shown in the table.

How to Report the Detects

Note that in the sample table above there is only one reported detect for each contaminant. XYZ System could have only 1 source or several. The text below will explain how you report single or combine multiple detects. (If your system has *hydraulically independent* distribution systems that are fed from different sources then you must report them separately.)

For most contaminants with MCLs, the table must include the information shown below. Report the results in the same units as the MCL and MCLG using CCR Units of Measure:

1. One sample site and one sampling date – report the detected level

In March the XYZ System detected 0.9 ppb of benzene
Report in the table the highest detected level of 0.9. Report no range

Example of XYZ System's table:

Contaminant	Sample Date	Result	Range	MCL	MCLG	Violation	Possible Source
Benzene (ppb)	3/10/xxxx	0.9	NA	5	0	no	Discharge from factories; Leaching from gas storage tanks and landfills

2. Multiple sampling dates – report the highest (or highest average if an average is used to compare to the MCL) of the samples and the range of detects.

In March the XYZ System detected barium at 3 different sites	
Barium	Mar XXXX
well #1	0.60
well #2	0.46
well #3	ND
Report in your table the highest of the samples = 0.60 AND the Range = ND - 0.60	

Example of XYZ System's table:

Contaminant	Date	Detect	Range	MCL	MCLG	Violation	Possible Source
Barium (ppm)	3/10/xxxx	0.60	ND – 0.60	2	2	no	Discharge from drilling wastes; Discharge from metal refineries; Erosion of natural deposits.

3. Compliance with MCL determined by running annual average of all samples taken from one sampling point.

XYZ System has one sampling site with multiple sampling dates.				
Atrazine	Q1 2018	Q2 2018	Q3 2018	Q4 2018
well #1	0.8	3.8	2.1	0.9
Report in the table the highest average = 3.8 AND Range = 0.8 - 3.8				

Example of XYZ System's table:

Contaminants	Average	Range of detects	MCL	MCLG	Violation	Possible Sources
Atrazine (ppb)	3.8	0.8 – 3.8	3	3	No	Runoff from herbicide used on row crops.

4. Compliance with MCL determined by a running annual average of all samples at all sampling points

XYZ System has multiple sampling sites with multiple sampling dates (TTHM example).							
TTHMs	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
site #1	-	-	-	45	60	125	70
site #2	-	-	-	40	55	115	60
site #3	-	-	-	45	60	105	70
site #4	-	-	-	50	65	135	80
Quarterly Average	55	125	65	45	60	120	70
Running Annual Average	-	-	-	73	74	73	74
Report in the table the Highest Annual Average = 74 AND Range = 40 -135							

Note: The averages for the last 3 quarters of 2009 are shown because they are needed to compute the running annual average. The reported range would include only detection data from the current year, unless one of the values from the previous year was so extraordinary that consumers would need it to understand the reported annual average.

If any of the above values for the running annual average were above 80 (the revised MCL for TTHMs, effective in 2001) the report would need to include health effects language for TTHMs.

Example of XYZ System's table:

Contaminants	Average	Range of detects	MCL	MCLG	Violation	Possible Sources
TTHM - Total Trihalomethane (ppb)	74	40 – 135	80	NA	No	Byproduct of drinking water disinfection.

Note: See *Item 7 – Contaminant and Rules with Special Reporting Requirements* for more information on how to report TTHMs.

5. Multiple sampling sites and…

- One sample date – report the highest detected level and range of detections.
- Multiple sampling dates (source samples) – report the highest result for an individual source and the range of detects for all sources. Refer to *Item 7- Specific Contaminants* for special cases for nitrite and nitrite MCL violations.
- Multiple sampling dates (running average for source samples) – report the highest running annual average calculated by individual source and the range of individual detects.
- Multiple sampling dates (running annual average for distribution samples) – report the highest running annual average of all samples and the range of all the detects. (Note that this applies to THMs and HAA5s only. Refer to *Item 7 – Contaminant and Rules with Special Reporting Requirements.)*

You should include an explanation that the numbers in the "Results" column represent the highest concentration upon which your system's compliance is based, not necessarily the highest concentration detected. So in the case of a contaminant that uses a running annual average to determine compliance (such as chlorine or TTHM) you may have higher numbers in the range column than the number in your Highest Result or RAA column.

Any contaminant detected in violation of an MCL, MRDL, TT, or exceeding an AL must be clearly highlighted as a violation in the table.

Reporting Unregulated Contaminants

If you detect unregulated contaminants for which state or federal rules require you to monitor, you must report the:

- average of the entire year's monitoring results
- range of detections – the highest detect and the lowest detect

in your CCR. This includes, but not limited to MTBE, sodium, radon222, manganese, nickel, PFAS, and all federal testing requirements under the Unregulated Contaminant Monitoring Rule (UCMR).

Below is an example of an unregulated table, note that it is different from the table for regulated contaminants.

Unregulated Contaminant	Date Collected	Result or Range of Detected	Average Detected	SMCL	ORSG	Possible Sources
Sulfate (ppm)	xx/xx/xxxx			250	NA	Natural sources
Vanadium (ppb)	xx/xx/xxxx			NA	NA	NA

You should include an explanation for the system's monitoring of unregulated contaminants. You may use the following example statement.

> *Unregulated contaminants are those for which there are no established drinking water standards. The purpose of unregulated contaminant monitoring is to assist regulatory agencies in determining their occurrence in drinking water and whether future regulation is warranted.*

Please see the Contaminant Charts in the back of this guide for a list of unregulated contaminants with any available health-based or aesthetic standards. It also gives possible sources of contamination, and potential health effects language. This information is provided for you to use in deciding how to report your results. Health effects statements are not required to be reported for unregulated contaminants. However, if your system reports detections that are near or above a standard, it is recommended that you include some health effects information.

UCMR

For systems that have been required by EPA to test under the UCMR, detections must be discussed in the CCR.

- You must report UCMR detects in your CCR just like any other unregulated contaminant discussed above. For more information please go to:

http://www.mass.gov/eea/agencies/massdep/water/drinking/us-epa-unregulated-contaminants-monitoring-rule-3.html or EPA's website at: http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/data.cfm#ucmr2013.

- PWS need only report UCMR detects in their CCR for the current year. The 5-year reporting requirement does not apply to UCMR since it is special testing and not a regularly scheduled testing.

- Public Notice (PN) must be given to consumers within 12 months of receiving the UCMR results; regardless if there are any detects. The fact that EPA selects your system for UCMR triggers the PN requirement.

  If the timing is correct, you may use your CCR for PN or you can deliver PN separately. UCMR PN has less requirements than a usual PN. Please see the above web address for more UCMR info. Detailed PN info on UCMR can be found at http://www.mass.gov/eea/docs/dep/water/drinking/alpha/i-thru-z/pnucmr.pdf.

See "Section 7 – Reporting for Special Contaminants or Rules" for more details on reporting UMCR4 contaminants especially HAA ad PFAS.

Reporting Secondary or Other Contaminants

If voluntary monitoring indicates the presence of secondary contaminants or other special contaminants in the finished water, it is not required that the results be reported in the CCR. However, water systems must report detections of any secondary or special contaminants for which MassDEP required you to test, such as manganese.

If the system chooses to report secondary results, they must be displayed in a separate table from the regulated contaminants; however, they may combined with the unregulated table. It is recommended that the table include the following information:

- The average and range of the detections
- An explanation of the significance of the results
- Any applicable definitions
- Any applicable secondary contaminant or guideline levels (Contaminant Charts can be found in the back of this guide.)

Reporting Contaminants with Proposed MCLs or HA

If a system performed additional monitoring that indicates the presence of other contaminants found in the finished water, the system must report any results that may indicate a health concern. A health concern would be any detects above a proposed MCL or health advisory (HA) level.

Report in the CCR:

- The results of the monitoring
- An explanation of the significance of the results
- HA or proposed MCL (PMCL) level

Refer to the Contaminant Charts at the back of this guide for Unregulated Contaminants for proposed MCLs or Office of Research and Standards Guidelines (ORSG). You may also get this data from "Drinking Water Standards and Guidelines for Chemicals in Massachusetts Drinking Waters," available on the Web at http://www.mass.gov/eea/agencies/massdep/water/drinking/standards/standards-and-guidelines-for-drinking-water-contaminants.html.

Be careful not to list guidelines or secondary maximum contaminant levels (SMCLs) as MCLs. Report only the contaminants that were detected. Remember that exceeding a secondary MCL, guideline, or health advisory level is not a violation.

Multiple Distribution Systems

If your system supplies water through two or more distribution systems that are not physically interconnected and that are fed by different raw water sources (hydraulically independent), you must issue a CCR that includes information on all the source waters, the levels of any detected contaminants, and compliance with drinking water rules for all distribution systems. You may issue one or multiple reports to your customers. If you issue one report, make sure to include a separate table of detection data for each service/distribution area in the main table of detected contaminants.

Reporting on Additional Monitoring

If your system has performed voluntary monitoring that indicates the presence of contaminants that you were not required to monitor for in your finished water, you are encouraged to report any results that may indicate a health concern. Public knowledge of potential problems is in your interest as well as your customers'. You should report any detection above a proposed MCL or health advisory level to indicate concern. Email the Safe Drinking Water Hotline *(safewater@epa.gov)* for this information. For these contaminants, it is recommended that the CCR contain:

- The results of monitoring.
- An explanation of the significance of the results, noting the existence of the health advisory or proposed MCL.

Section V.- What information is required?

Item 7 - Contaminants and Rules with Special Reporting Requirements

The contaminants or rules with special circumstances are listed in this section alphabetically. Some contaminant groups have special reporting and table formatting requirements based on how they are regulated, others have special educational language that is needed, or additional footnotes, etc. Please read up on these individual contaminants in order to report them correctly in your CCR.

Arsenic

Systems with arsenic above 5 ppb (50 percent of the MCL), but at or below 10 ppb (the MCL) must include the statement below. The PWS may write its own language with written approval from MassDEP.

> *While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.*

Acrylamide and Epichlorohydrin.

If you violate either treatment technique, you must include the relevant health effects language:

> *Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood and may have an increased risk of getting cancer.*

> *Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems and may have an increased risk of getting cancer.*

Bacteria and Microbiology

Revised Total Coliform Rule

Under the RTCR systems do not report all coliform/*E coli* detects as before. Systems report assessment information and violations (plus a detects table in this case). They report if they triggered the requirement to perform a Level 1 or Level 2 Assessment or had MCL or TT violations. To comply with the RTCR, systems must inform their customers of these events in their CCR.

If the system reports a Level 1 or 2 assessment in their CCR they must define these in their definition section as such:

> ***A Level 1 assessment*** *is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.*
>
> ***A Level 2 assessment*** *is a very detailed study of the water system to identify potential problems and determine (if possible) why an E. coli MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.*

Any system required to comply with the Level 1 or Level 2 Assessment requirement that is **not** due to an *E.coli* MCL violation must include the following text in the CCR.

> *Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify any problems that were found during these assessments.*

For Level 1 Assessments add:

> *During the past year, we were required to conduct [insert number] Level 1 assessments. [insert number] Level 1 assessments were completed. In addition, we were required to take [insert number] corrective actions and we completed [insert number] of these actions.*

For Level 2 Assessments add:

> *During the past year, [insert number] Level 2 assessments were required to be completed for our water system. [insert number] Level 2 assessment were completed. In addition, we were required to take [insert number] corrective actions and we completed [insert number] of these actions.*

Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

> *During the past year we failed to conduct all of the required assessment(s).*

and/or

> *During the past year we failed to correct all identified defects that were found during the assessment(s).*

Any system required to conduct a Level 2 Assessment due to an ***E.coli*** **MCL violation** (detects or lack of required testing) must include in the report a table and the following text:

> *E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found E. coli bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that were found during these assessments.*
> *We were required to complete a Level 2 assessment because we found E. coli in our water system. In addition, we were required to take [insert number] corrective actions and we completed [insert number] of these actions.*

Any system that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique (TT) requirement and must also include one or both of the following statements, as appropriate:

> *We failed to conduct the required assessment.*

> *We failed to correct all sanitary defects that were identified during the assessment we conducted.*

If a system detects *E. coli* and has violated the *E.coli* MCL, in addition to completing a table for *E. coli,* the system must include one or more of the following statements to describe any noncompliance, as applicable:

We had an E. coli-positive repeat sample following a total coliform-positive routine sample.

We had a total coliform-positive repeat sample following an E. coli-positive routine sample.

We failed to take all required repeat samples following an E. coli- positive routine sample.

We failed to test for E. coli when any repeat sample tests positive for total coliform.

If a system detects *E. coli* and has **not** violated the *E. coli* MCL, in addition to completing a table for *E. coli* in the CCR, the system may include a statement that explains that although they have detected E. coli, they are not in violation of the *E. coli* MCL.

If you need to report bacteria detections, you will need a special table as they are reported differently than most contaminants. Use the sample table below.

Sample table of XYZ System for reporting RTCR *E. coli* violation:

Bacteria	MCL / TT	MCLG	Value	Date	Violation (Y/N)	Possible Sources
E. coli	MCL	0	positive	xx-xx-xxxx	Yes*	Human and animal fecal waste
* System XYZ detected *E. coli* in the distribution system; the sample was collected in response to a TC+ routine sample collected on xx/xx/xxxx. More information about this situation is provided in the situation section below.						

[Then in the situation section describe what was required of you to do and if it was completed. Then describe on what date and what you tested for, how many samples were taken, how may were positive, health language for the contaminant. Go on to describe your response actions such as PN. If you completed your assessments, additional collection, neg/pos results and any additional oversight of the system.]

To view various sample CCR RTCR scenarios to fit your specific situation please go to EPA's RTCR Implementation Guide found at: https://www.epa.gov/sites/production/files/2015-10/documents/rtcrimplementation_guidance.pdf; page 69 for CCR Requirements and page 115 for the specific scenarios. You can tailor these situations to fit your own.

Sample table of XYZ System reporting a total coliform TT violation (Failure to perform a Level 1 assessment):

Bacteria	MCL / TT	MCLG	Value	Date	Violation (Y/N)	Possible Sources
Total Coliform Bacteria	TT	0	positive	xx-xx-xxxx	Yes*	Human and animal fecal waste
*XYZ System triggered a Level 1 assessment on xx/xx/xxxx, and failed to complete the required assessment on time. More information about this situation is provided in the situation section below.						

[Then in the situation section describe what was required of you to do and if it was completed. Then describe on what date and what you tested for, how many samples were taken, how may were positive, health language for the contaminant. Go on to describe your response actions such as PN. If you completed your assessments, additional collection, neg/pos results and any additional oversight of the system.]

To view various sample CCR RTCR scenarios to fit your specific situation please go to EPA's RTCR Implementation Guide found at: https://www.epa.gov/sites/production/files/2015-10/documents/rtcrimplementation_guidance.pdf; page 69 for CCR Requirements and page 115 for the specific scenarios. You can tailor these situations to fit your own.

Cryptosporidium

If your system has performed monitoring that indicates the presence of *Cryptosporidium* in either its source water or its finished water, you must include the detected results in your CCR. It is recommended that you distinguish whether the data is linked to samples collected at the source or samples collected in the finished water by putting the results on different lines in the table. If the results of your monitoring indicated the presence of *Cryptosporidium*, you must include the following information separate from the detected contaminant table:

- A summary of the results of the monitoring. You may choose whether or not to report the actual analytical results as a part of this summary.
- An explanation of the significance of the results. Tell customers if they need to be concerned by the information that the CCR provides.

Example table:

Contaminant	Date	Result (Oocysts/L)	MCL/ MCRDL/TT	MCGL	Violation (Y/N)	Possible Sources
Cryptosporidium			TT	0		Discharged especially where water is contaminated with sewage or animal waste.

Cryptosporidium *is a microbial pathogen found in surface water throughout the U.S. Although filtration removes* Cryptosporidium*, the most commonly used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water and/or finished water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of* Cryptosporidium *may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection.* Cryptosporidium *must be ingested to cause disease, and it may be spread through means other than drinking water.*

Disinfectants and Disinfection By-Products

All systems that add a chemical disinfectant to the water must include disinfectant levels and disinfection by-products (DBPs) in their CCR. Disinfectant and disinfection by-products results should be reported as follows in a separate table.

Free, Total, or Combined Chlorine (Chloramines). Report the highest quarterly running annual average and the range of any of the daily detects for the year.

Bromate. Report the highest quarterly running annual average and the range of detects.

Chlorite. Report the highest monthly three-sample set average and the range of detects in all three-sample sets collected during the year.

Chlorine Dioxide. Report the highest individual sample result taken at the entry point and the range of detects at the entry point only. If your system experienced a chlorine dioxide violation, you must include the following statement:

> *Compliance with the MRDL for chlorine dioxide is based on consecutive daily samples. [System name] had [number of violations] MRDL violations in [year].*

Total Trihalomethanes (TTHM) / Haloacetic Acids (HAA5)

Depending on how your compliance is calculated there are several different ways to report TTHM and HAA5 in your CCR. Usually, you would report the highest quarterly locational running annual average and the range of detects. Systems must also report in their CCR if they failed to monitor for TTHM or HAA5.

- **Stage 1 DBPR**
  If compliance is determined based on a system-wide running annual average [under the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR)], include the system-wide average and the detected range of the results for the system.

  Stage 1 DBPR requires that all violations of treatment techniques be reported in a detected contaminant table: Failure to remove required amount of total organic carbon (TOC) [disinfection byproduct precursor (DBPP)] (conventional filtration systems only). Please see TOC information within this section.

How to report multiple site and sampling dates for TTHM for XYZ System:				
TTHM Results* in ppb	**Q1**	**Q2**	**Q3**	**Q4**
Site1	53	62	125	70

How to report multiple site and sampling dates for TTHM for XYZ System:				
TTHM Results* in ppb	**Q1**	**Q2**	**Q3**	**Q4**
Site 2	55	62	119	60
Site 3	50	63	117	70
Site 4	54	69	135	84
System-wide Quarterly Average	53	64	124	71
System-wide Running Annual Average	75	77	82	78
*Reported RAA for Q 1-3 are based on results from previous quarters that are not reported in this table. The revised (2001) running annual average is 80 ppb. Thus this report will need to include health effects language for TTHMs.				

Sample Table for XYZ System:

	Date	Average	Range	MCL	MCLG	Violation	Source
TTHM (ppb)	quarterly	78	50-125	80	NA	Yes*	Byproduct of drinking water disinfection
*While the average for this year did not exceed the MCL there was an individual MCL violation that was determined during the year.							

When there is a violation of the MCL, below the table, include discussion of the TTHM MCL violation, explain the violation, the length of the violation, steps taken to correct it, and health effects language.

- **Stage 2 DBPR**

  The Stage 2 DBPR, promulgated in May 2008, applies to systems that add a primary or residual disinfectant other than ultraviolet light or deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light. Under the Stage 2 DBPR some systems were required to conduct Initial Distribution System Evaluation (IDSE) monitoring for trihalomethanes (THM) and haloacetic acids (HAA5). In addition to the THM and HAA5 results you currently include in your CCR for the Stage 1 DBPR you must now include the IDSE results. The IDSE monitoring results are not used to determine compliance with MCLs under the Stage 1 DBPR so they should not be included in the running annual average column in the CCR, but they must be included in the range (highest /lowest detect) columns. The individual IDSE results are not required to be reported in the CCR. For some systems, the IDSE monitoring period straddles two calendar years and as such the IDSE data will be split between two CCRs.

If Stage 2 DBPR compliance is determined based on a locational running annual average (LRAA), include the highest LRAA for TTHM and HAA5 and the range of individual samples results for all monitoring locations. If more than one monitoring location exceeds the TTHM or HAA5 MCL, include the locational running annual averages for all locations that exceed the MCL.

XYZ System got these results				
TTHM Results (ppb)	**Q1**	**Q2**	**Q3**	**Q4**
Site 1 Q Results	45	60	125	70
Site 1 LRAA*	47	51	74	75
Site 2 Q Results	40	55	115	60
Site 2 LRAA*	42	49	71	68
Site 3 Q Results	45	60	105	70
Site 3 LRAA*	40	48	69	70
Site 4 Q Results	50	65	135	75
Site 4 LRAA*	49	55	78	81
*Reported LRAA for Q 1-3 are based on results from previous quarters not reported on this table.				

Example table for XYZ System:

	Date	Average	Range	MCL	MCLG	Violation	Source
TTHM (ppb)	Quarterly	81	40-135	80	NA	Yes*	Byproduct of drinking water disinfection

*Include, below the table, a discussion of the TTHM MCL violation at Site 4, explain the violation, the length of the violation, steps taken to correct it, and health effects language.

Note

Under Stage 2 DBPR, for TTHM and HAA5, systems with no LRAA (locational running annual average) MCL exceedances or only one location with an exceedance, must report the highest LRAA and the range of quarterly results (for all locations) in the main detected contaminant table.

Systems that have more than one MCL exceedance must use additional rows on their table to list each site that has exceedances:

Example table for XYZ System:

	Date	Average	Range	MCL	MCLG	Violation	Source
System TTHM (ppb)	Quarterly	88 Highest LRAA	40-135	80	NA	Yes*	Byproduct of drinking water disinfection
TTHM Site 1	Quarterly	88	62-125	80	NA	Yes*	Byproduct of drinking water disinfection
TTHM Site 3	Quarterly	82	50-135	80	NA	Yes*	Byproduct of drinking water disinfection

*Include, below the table, a discussion of the TTHM MCL violations at Sites 1 and 3, explain the violation, the length of the violation, steps taken to correct it, and health effects language.

Example table for XYZ System HAA5 detection:

Contaminant	Date Collected	Highest result or RAA*	Range of Detects	MCL	MCLG	Violation	Possible Sources
Total Haloacetic Acids (HAA5) (ppb)	Quarterly	23	12-26	60	n/a	N	By product of drinking water disinfection

Filter Backwash Recycling Rule (FBRR)

FBRR CCR Rule requires that all violations of treatment techniques be reported in a detected contaminant table(s); Failure to return recycle flows through the processes of the existing filtration system or to an alternate state-approved location (conventional and direct filtration systems only).

The table must include the TT violation, an explanation of the violation, the length of the violation, any potential adverse health effects, and steps taken to correct the violation.

Fluoride

The optimal fluoride concentration in water, and the target to best support dental health, is 0.7mg/L (or ppm).

The optimal range is 0.6 – 0.8 mg/L or (ppm).

The federal MCL is still 4.0 mg/L and the secondary MCL is 2.0 mg/L.

The systems that adjust their fluoride level for the health benefit for their customers should report fluoride differently in the "Sources of Contamination" column in their table.

MassDEP and MassDPH have identified the following three areas in your CCR where specific information on fluoride should be clearly stated in order to be most helpful to your consumers. It is very important, for systems that add fluoride to their water for tooth decay prevention, that the CCR provide the following information.

Necessary Information in your CCR Contaminant Table

When fluoride appears in the contaminant table, the source of the fluoride must be clearly stated as ″Water additive which promotes strong teeth″ or similar phrase like “Water additive to help prevent tooth decay”.

XYZ System’s example table:

Contaminant	Date(s) Collected	Highest Result or Highest Running Average Detected	Range Detected	MCL	MCLG	Violation (Y/N)	Possible Sources of Contamination
Fluoride (ppm)	4-23-xxxx	1.1	0.9 - 1.1	4.0	4.0	No	Water additive which promotes strong teeth
Fluoride also has a secondary contaminant level (SMCL) of 2.0 ppm.							

Necessary Information for Treatment Description Section

The PWS could explain, in the treatment summary area of the CCR, why the treatment was added. Here are some examples:

- Fluoride was adjusted to prevent tooth decay/cavities.
- Fluoride has been adjusted since (insert year) to prevent tooth decay/cavities.
- Fluoride addition was passed by referendum vote in (insert year) and the level in the water supply was adjusted in (insert year) to prevent tooth decay and improve dental health.
- Fluoride is naturally occurring in many water supplies in trace amounts. In our system the fluoride level is adjusted to an optimal level averaging 0.7 part per million (ppm or mg/L) to improve oral health and prevent tooth decay. At this level, it is safe, odorless, colorless, and tasteless. Our water system has been providing this treatment since (insert year). There are over four million people in Massachusetts water systems and 184 million people in the United States who receive the health and economic benefits of fluoridation.

Additional Fluoride Info for Your Consumers

MassDPH would like you to consider using this “Community Water Fluoridation Status – Consumer Information” table (below) as a resource to help educate your consumers. You can fill

it out each year and include it with your CCR or keep on hand when consumers call for more information.

To prepare the "Community Water Fluoridation Status – Consumer Information" for each year's CCR, the water system should respond to the question prompts from the left column by selecting the one best response from the right column prompts provided. You may delete the ones you do not use. You can contact MA DPH with any questions you may have on this table.

Community Water Fluoridation Status - Consumer Information

This table is designed to share beneficial consumer information about drinking water and fluoride. The Massachusetts Department of Public Health strongly supports community water fluoridation as a safe, cost-effective, and proven practice that promotes good oral health within our communities. The question and responses listed here are a summary regarding fluoride and your water system.

For this past reporting year…	*Water system response…*
1.Did your water meet the fluoridation levels needed to **best** prevent tooth decay and support oral health?[1]	☐ Report "Yes" if the water system maintained a monthly average fluoride concentration of 0.6-0.8 ppm for a minimum of 9 of 12 months being reported. ☐ Report "No, we are a non-fluoridated water system." ☐ Report "No. Although we are a fluoridated water system, we **did not** maintain the optimal average monthly fluoride range of 0.6 – 0.8 parts per million (ppm) for a minimum of 9 months of the reporting year." ***Optional:*** ☐ In addition to one of the Yes or No responses from above, add "See Additional Water System Comments below." and be sure to complete that section with additional consumer information.
2.Was **any** fluoride added (or adjusted) to your water to help support oral health?[2]	☐ Report "Yes" if the water system added or adjusted fluoride for any months in the reporting year. ☐ Report "No" otherwise.
3. Has there been a **change** to your water fluoridation status since last year's report?[3]	☐ Report "Yes, the water system has started to add or adjust fluoride in the water since last year's report." Also, be sure to complete the FLUORIDATION CHANGE – NOTIFICATION PROCESS below. ☐ Report "Yes, the water system has discontinued fluoridation since last year's report." Also, be sure to complete the FLUORIDATION CHANGE – NOTIFICATION PROCESS below. **FLUORIDATION CHANGE – NOTIFICATION PROCESS:** •**The water operator may notify their Local Board of Health contact(s) communicating the background and nature of the fluoridation change. On the email, include copy to** **oral.health@mass.gov** and **program.director-dwp@mass.gov**

	☐ Report "No" otherwise.
4. Was there a disruption (i.e., more than 90 continuous days) to your water fluoridation status since last year's report[3]	☐ Report "Yes, adding or adjusting fluoridation was stopped for a period of 90 continuous days or greater within this reporting year. See Additional Water System Comments below." Also, be sure to complete the FLUORIDATION DISRUPTION – NOTIFICATION PROCESS below. **FLUORIDATION DISRUPTION – NOTIFICATION PROCESS:** •**The water operator may notify their Local Board of Health contact(s) communicating the background and nature of the fluoridation disruption. On the email, include copy to oral.health@mass.gov** and **program.director-dwp@mass.gov** ☐ Otherwise, report "No or not applicable."
Additional Water System Comments	☐ For water systems adding an explanation around not meeting the fluoridation levels needed to **best** prevent tooth decay and support oral health, we recommend reporting the actual monthly averages range and the number of months which you were able to be within the optimal fluoridation range (0.6-0.8 ppm). ☐ For water systems adding an explanation around a **disruption**, we recommend describing the reason for the disruption in simple terms such as, "required system maintenance, planned equipment repair, supply chain induced challenges" etc.

1 The ideal fluoride concentration in drinking water to help prevent tooth decay and support dental health is a concentration of 0.7 parts per million (ppm) consistently. The optimal average monthly fluoridation concentration range is 0.6 – 0.8 ppm. To review the details of this information for your water system's average monthly fluoride levels, consult "My Water's Fluoride".

2 Regarding any fluoride being added or adjusted to your drinking water to help prevent tooth decay and support oral health, in Massachusetts this decision is made locally; refer to M.G.L. c. 111, § 8C.

3 Changes or disruptions to your drinking water system's fluoridation status are important to know due to their potential health implications. Be sure to carefully review any related changes or disruptions that may be listed. To avoid any potential negative health outcomes, review these changes with your medical and dental/oral health providers for any changes in your homecare routine that may be recommended.
For more information, visit: https://www.mass.gov/orgs/office-of-oral-health

Groundwater Rule

This rule is for systems whose sources are 100 percent groundwater that are not under the influence of surface water nor are manifolded with surface water. These systems must test for microbial contamination in their source or raw water. The fecal indicators are *E.coli*, enterococci, and coliphage. If detects are found, they must be reported in the CCR (if detects are not invalidated by MassDEP).

The table must include the violation, the source of contamination, an explanation of the violation, the dates or length of the violation, any potential adverse health effects, and steps taken to correct the violation.

- Report the total number of positive samples for the year for all fecal indicator positive ground water source (or raw water) samples.
- Report the likely sources of the contamination to the best of the operator's knowledge. The sanitary survey or even the SWAP report can be used. If the operator lacks specific knowledge, then use a typical source of contamination such as shown below in the example table.
- Public Notice (PN) must also be done for fecal indicators or significant deficiencies and in some cases the CCR can be used for that purpose. (See PN section below.)
- Treatment technique violations for failure to maintain 4-log treatment of viruses for more than 4 hours for systems required to treat to 4-log
- Failure to take corrective action within the required time frame or be in compliance with a state-approved corrective action plan and schedule for a fecal indicator-positive source sample
- Failure to take corrective action within the required timeframe or be in compliance with a state-approved corrective action plan and schedule for a significant deficiency.

Example table:

Fecal Indicators	Result	Range	MCL	MCLG	Violation (Y/N)	Possible Sources of Contamination
E.coli			TT	NA		Human and animal fecal waste
Enterococci			TT	NA		Human and animal fecal waste
Coliphage			TT	NA		Human and animal fecal waste

If your system was triggered to conduct source water monitoring after a positive sample and if both the distribution and source were positive for E. coli you would report it as below.

XYZ System's table:

Fecal Indicators	Result	Range	MCL	MCLG	Violation (Y/N)	Possible Sources of Contamination
E.coli (in distribution system)	1 positive sample	ND - 1	0	0	Yes*	Human and animal fecal waste
E.coli (in ground water source)**	2 positive samples	ND -1	0	0	No	Human and animal fecal waste

*We were notified on 12-9-15 of an *E coli* positive sample in the distribution system. You may remember receiving public notice of this violation on 12-10-15. Because of this we took Spring Street well off-line on 12-11-15 for two days.

**On 12-10-15 we sampled Spring and Elm St wells for E coli. On 12-11-15 we were notified that Spring St well tested positive for *E coli.* On 12-12-15 we took 5 additional samples and were notified that 2 of the 5 were positive for *E coli* on 12-13-15. We immediately took the Spring St well off-line. We are in contact with MassDEP, and we have a state-approved plan to abandon this well and replace it with a new well. We will have the new well completed by 7-5-16. The old well will be abandoned. As an interim measure, we will only use this well as an emergency source, but we have not had to utilize it sine the sampling revealed the contamination.

Health Effects: Fecal coliform and *E. coli* are bacteria whose presence indicates that the water maybe contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some elderly, and people with severely compromised immune systems.

If your system had sampled and found enterococci or coliphage as their fecal indicator, you could use the table below.

Fecal Indicators	Result	Range	MCL	MCLG	Violation (Y/N)	Possible Sources of Contamination
Enterococci (in ground water source)*	2 positive samples	ND - 1	TT	NA	No	Human and animal fecal waste

Fecal Indicators	Result	Range	MCL	MCLG	Violation (Y/N)	Possible Sources of Contamination
Coliphage (in ground water source)*	2 positive samples	ND -1	TT	NA	No	Human and animal fecal waste
*Health Effects: Enterococci and Coliphage are microbes whose presence indicates that the water maybe contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some elderly, and people with severely compromised immune systems.						

XYZ System's example:

If your system did not take corrective action or set a corrective action plan with MassDEP within 120 days of the fecal indicator-positive additional sample, you will be in violation of a TT and could use a table such as below.

XYZ System's example:

TT Violation	Explanation	Length	Step taken to correct the violation	Health effects Language
Corrective Action for GW Fecal Indicator Source Sample	We were required to take corrective action to address the fecal contamination in our well.	3 months	We have contacted MassDEP and are now on a corrective action plan. We will abandon the contaminated well and drill a new one. We will have the new well completed by July 5, 2016 and the old well will be abandoned.	Inadequately protected or treated water may contain disease-causing organism. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

A ground water system must also provide special notice for any significant deficiency that is uncorrected by the end of the calendar year.

- The nature of the significant deficiency and the date it was identified by MassDEP
- A MassDEP plan and schedule for correction including interim measures, progress to date, and any interim measures completed.
- You must continue to inform your customers annually until MassDEP determines the significant deficiency is corrected.
- In certain circumstances MassDEP may require you include in your CCR significant deficiencies that were corrected by the end of the year, If so directed, you must inform your customers of the deficiency, how it was corrected, and the date it was corrected.

Note that systems that have 4-log treatment are exempt under the GWR to report fecal indicators in source water **but** under the Total Coliform Rule (TCR) they must still report raw or source *fecal* indicators. After April 2016 the RTCR will apply and they do not have to report raw or source *fecal* indicators. Please see RTCR section.

Groundwater Rule and PN

Systems that are required to comply with the GWR may have instances where they must do Public Notification (PN) in their CCR.

If the system has an uncorrected significant deficiency notice from MassDEP or if the system has a fecal indicator-positive source (raw) water sample, the PWS must inform their customers of this in their CCR. The system must annually include this information in their CCR until the deficiency is corrected and the fecal contamination is addressed (determined by MassDEP). The following must be included in the PN:

- The nature of the significant deficiency or source of fecal contamination (if known)
- Date the deficiency was identified by MassDEP or date the fecal samples were taken
- Date the fecal contamination had been addressed, if applicable
- MassDEP-approved correction plan if deficiency or contamination was not addressed (which will include interim measures, progress to date, and any interim measures that were completed to date)
- Health effect language for fecal contamination located in the charts in the back of this guide

Most significant deficiencies that were corrected before report time would not have to be reported in the CCR unless you are directed to do so by MassDEP. In such cases, you must report the nature of the deficiency, how the deficiency was corrected, and the date of correction.

Lead and Copper

Lead and copper are reported differently than most regulated contaminants. They have action levels (AL) not MCLs and therefore need a special table.

When reporting your lead and copper sampling results, you may refer to your calendar year's Lead and Copper Review Summary Sheets if available from your MassDEP Regional Office. Those sheets will provide the 90th percentile values as calculated by MassDEP and information about any exceedances. If you do not have that handy, please see below on how to calculate the 90%.

Report the full calendar year's results for lead and copper in your table. School testing data is not included in determining your 90th percentile and not reported in the CCR.

Include the number of sites sampled, the 90th percentile concentration of the most recent round(s) of sampling (if you are on twice annual monitoring, include both rounds of sampling) the number of sampling sites exceeding the action level, and the range of tap sampling results.

Examples of how to calculate the 90% for lead and copper:

The results of all samples taken for XYZ System during a monitoring period are placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sample result is assigned a number starting with the number 1 for the lowest value. The number of samples taken during the monitoring period is multiplied by 0.9. The contaminant concentration in the numbered sample yielded by this calculation is the 90th percentile value.

Example 1 for XYZ System Lead Results – 90th percentile above the Action Level

	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**	**Site 7**	**Site 8**	**Site 9**	**Site 10**
Date	ND	ND	ND	ND	3	4	8	12	19	22
10 samples x 0.9 = 9 therefore, the ninth value is the 90th percentile value. – Report in Table: 90th percentile=19 ppb, the number of sites above action level (15 ppb) = 2, and the range of lead results = ND-22										

Example 1 Reporting table of XYZ System's lead and copper – 90th percentile above the Action Level:

Lead and Copper	Date Collected	90TH percentile	Action Level	MCLG	# of sites sampled	# of sites above Action Level	Range	Possible Source of Contamination
Lead (ppb)	xx-xx-xxxx	19	15	0	10	2	ND - 22	Corrosion of household plumbing
Copper (ppm)	xx-xx-xxxx	0.22	1.3	1.3	10	1	ND – 1.6	Corrosion of household plumbing

Exposure to lead in drinking water can cause serious health effects in all age groups. Infants and children can have decreases in IQ and attention span. Lead exposure can lead to new learning and behavior problems or exacerbate existing learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney, or nervous system problems.

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson 's Disease should consult their personal doctor.

Example 2 for XYZ System Lead Results – 90th percentile below the Action Level

	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**	**Site 7**	**Site 8**	**Site 9**	**Site 10**
Date	ND	ND	ND	ND	ND	ND	3	4	8	12
10 samples x 0.9 = 9 therefore, the ninth value is the 90th percentile value. – Report in Table: 90th percentile=8 ppb, the number of sites above action level (15 ppb) = 0, and the range of results = ND-12										

Example 1 Reporting table of XYZ System's lead and copper – 90th percentile below the Action Level:

Lead and Copper	Date Collected	90TH percentile	Action Level	MCLG	# of sites sampled	# of sites above Action Level	Range	Possible Source of Contamination

Lead (ppb)	xx-xx-xxxx	8	15	0	10	0	ND - 12	Corrosion of household plumbing
Copper (ppm)	xx-xx-xxxx	0.22	1.3	1.3	10	0	ND – 0.5	Corrosion of household plumbing

For any violations, including failure to meet corrosion control treatment, source water treatment or lead service requirements you must include an explanation of the violation, and actions taken to address the violation.

Regardless of whether lead is detected in your system, you must include the mandatory informational statement about lead in your report, which is provided in Section V – Item 3 of this guide.

If your 90th percentile exceeded the action level, you must also include the following health effects language:

> *Exposure to lead in drinking water can cause serious health effects in all age groups. Infants and children can have decreases in IQ and attention span. Lead exposure can lead to new learning and behavior problems or exacerbate existing learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney or nervous system problems.*

Note: Effective November 1, 2027, the required health effects language must read as follows. To follow MassDEP's recommendation and to provide the latest EPA information,you may choose to include this health effects language in your report(s) now.

> *There is no safe level of lead in drinking water. Exposure to lead in drinking water can cause serious health effects in all age groups, especially pregnant people, infants (both formula-fed and breastfed), and young children. Some of the health effects to infants and children include decreases in IQ and attention span. Lead exposure can also result in new or worsened learning and behavior problems. The children of persons who are exposed to lead before or during pregnancy may be at increased risk of these harmful health effects. Adults have increased risks of heart disease, high blood pressure, kidney or nervous system problems. Contact your health care provider for more information about your risks.*

If you exceeded the AL for copper, you must include the following health effects language:

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson 's Disease should consult their personal doctor.

LCR CCR Rule requires that all violations of treatment techniques be reported in a detected contaminant table(s). The table must include the TT violation, an explanation of the violation, the length of the violation, any potential adverse health effects, and steps taken to correct the violation.

- Failure to meet corrosion control treatment, source water treatment, lead service line replacement, or public education requirements.

Include a statement that a service line inventory (including inventories consisting only of a statement that there are no lead service lines) has been prepared and include instructions to access the service line inventory.

Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR or LT2)

The LT2 Rule, promulgated in May 2008, applies to systems that use surface water sources, or groundwater sources that are under the influence of surface water. In addition to the information you currently include in your CCR for the Surface Water Treatment Rule, Interim Enhanced Surface Water Treatment Rule and the Long Term 1 Enhanced Surface Water Treatment Rule you must now include information for the LT2 Rule. Systems serving at least 10,000 people were required to monitor their raw source water for *Cryptosporidium*, *E. coli*, and turbidity. Systems serving less than 10,000 people may have only been required to monitor for *E. coli*. Since *E. coli* (bacteria) and turbidity are already tested and reported in the CCR no additional reporting is needed; however, any *Cryptosporidium* detects found in either the raw or finished water must be reported. Look in this section under *Cryptosporidium* for more information on how to report it.

Based on a system's schedule under the LT2, a surface water system must report the TT violations in their CCR related to this rule. The system must provide the TT violation, and explanation of the violation, the length of the violation, steps taken to correct the violation, and health effect language.

TT violations include failure to cover an uncovered finished water reservoir, provide treatment of the reservoir's discharge, or be in compliance with a state-approved schedule to cover the reservoir(s) or treat the reservoir(s) discharge by April 1, 2009.

Failure to maintain required inactivation level based on mean *Cryptosporidium* results.

- Filtered systems
    - Failure to determine and report bin classification.
    - Failure to provide or install an additional level of treatment using a microbial toolbox option by the required date.
    - Failure to achieve required treatment credit to meet the bin classification requirements using a microbial toolbox option.
- Unfiltered systems
    - Failure to calculate and report mean *Cryptosporidium* level.
    - Failure to install a second disinfectant to treat for *Cryptosporidium* by required date.
    - Failure to achieve required inactivation level by required date.

Note: Surface water systems that collected *E. coli* samples at the source under LT2 are not required to report these results in their CCR. However, they are required to discuss if they failed to monitor for *E. coli* at the source.

XYZ System examples:

TT Violation	Explanation of Violation	Length of Violation	Steps Taken to Correct Violation	Health Effect Language
Provide or install and additional level of treatment	Based on our Bin Classification, we were required to provide or install an additional level of treatment by July 20XX	7 Months	We have hired an engineering firm to prepare a report, which listed treatment alternatives. We selected one of the alternatives and are in the process of constructing it. We anticipate that it will be completed by Jan XXXX	Inadequately treated water may contain disease-causing organisms that can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

TT Violation	Explanation of Violation	Length of Violation	Steps Taken to Correct Violation	Health Effect Language
Uncovered and untreated finished water reservoir	The South Street finished water reservoir is uncovered and the discharge is not treated. We were required to address this situation by April 1, XXXX.	17 months	We have hired an engineering firm to design a cover for the tank. We intend to have the tank covered by September XXXX.	Inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.
Determine and Report Bin Classification	After conducting our source water monitoring for *Cryptosporidium*, we were required to determine and report our Bin Classification by [date].	1 month	We have since determined our bin classification and reported this to the DEQ.	Inadequately treated water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

Manganese

Manganese is a secondary contaminant that (starting in 2014) is required testing and has been put on all Massachusetts PWSs sampling schedules. Detections of this secondary contaminant must be reported in the CCR as shown in the tables below.

If your system detects manganese greater than 50 ug/L (or ppb), you must report these concentrations in your CCR tables.

Example table:

Secondary Contaminant	Date collected	Result or Range Detected	Average detected	SMCL	ORSG or Health Advisory	Possible Sources
Manganese (ppb)	xx/xx/xxxx			50	300*	Erosion of natural deposits
*US EPA and MassDEP have established public health advisory levels for manganese to protect against concerns of potential neurological effects and a one-day and 10-day HA of 1000 ppb for acute exposure.						

For manganese concentrations 300 ug/L and greater you must, in addition to the table, include an educational statement. You should also include a statement of what your system is doing to reduce manganese levels below 300 ppb.

You may use the educational statement below or get MassDEP's written approval for alternative CCR language. The educational statement for manganese should explain the significance of the manganese detects and if customers need to be concerned by its presence. The bold-faced text in the language below is required and must be included verbatim in the CCR. Please contact MassDEP if you want to change the suggested, non-mandatory language.

Manganese is a naturally occurring mineral found in rocks, soil, groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but can have undesirable effects on certain sensitive populations at elevated concentrations. The United States Environmental Protection Agency (EPA) and MassDEP have set an aesthetics-based Secondary Maximum Contaminant Level (SMCL) for manganese of 50 ug/L (microgram per liter), or 50 parts per billion. In addition, MassDEP's Office of Research and Standards (ORS) has set a drinking water guideline for manganese (ORSG), which closely follows the EPA public health advisory for manganese. ***Drinking water may naturally have manganese and, when concentrations are greater than 50 ppb, the water may be discolored and taste bad. Over a lifetime, the EPA recommends that people drink water with manganese levels less than 300 ppb and over the short term, EPA recommends that people limit their consumption of water with levels over 1000 ppb, primarily due to concerns about possible neurological effects. Children younger than one year old should not be given water with manganese concentrations over 300 ppb, nor should formula for infants be made with that water for more than a total of ten days throughout the year.*** *The ORSG differs from the EPA's health advisory because it expands the age group to which a lower manganese concentration applies from children less than six months of age to children up to one year of age to address concerns about children's susceptibility to manganese toxicity. See EPA Drinking Water Health Advisory for manganese at: https://www.epa.gov/sites/production/files/2014-09/documents/support_cc1_magnese_dwreport_0.pdf and MassDEP Office of Research and Standards (ORSG) for manganese http://www.mass.gov/eea/agencies/massdep/water/drinking/lead-and-other-contaminants-in-drinking-water.html#11*

Mosquito Spray Monitoring

Systems that conducted mosquito spraying are required by MassDEP to test for the Anvil 10 + 10 mosquitocide in their surface waters. If detected in the finished water, the mosquitocide components must be listed the CCR.

The mosquitocide used recently for EEE spraying is composed of the pesticide, Sumithrin (also known as d-Phenothrin) plus the synergist, piperonyl butoxide. If these are detected in your finished water, they must be included in your CCR in the unregulated table.

Example of mosquitocide detection in an unregulated table

Unregulated Contaminant	Date Collected	Result or Range of Detected	Average Detected	SMCL	ORSG (*or other health benchmark)	Possible Sources
Sumithrin (d-Phenothrin)	xx/xx/xxxx			NA	40 ppb *US EPA HHBP[4]	Deposition and run-off from pesticide application for mosquitoes
Piperonyl butoxide	xx/xx/xxxx			NA	992 ppb *US EPA HHBP[4]	Deposition and run-off from pesticide application for mosquitoes

[4]HHBP: US EPA Office of Pesticide Programs Human Health Benchmark for Pesticides

MTBE - Methyl tert-butyl ether

MTBE is an unregulated VOC and required sampling for PWSs. Any detections of MTBE must be reported in the CCR in the unregulated table. See unregulated section on how to report.

Nitrate

Systems with nitrate above 5 ppm (50 percent of the MCL), but below 10 ppm (the MCL) must include the statement below. The PWS may write its own statement only with written approval by MassDEP.

> *Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.*

PFAS

Per- and polyfluoroalkyl substances (PFAS) samples must be reported in the CCR. In October 2020 PFAS6 was regulated with a maximum contaminant level (MCL) of 20 parts per trillion (ppt). PFAS6 are comprised of six compounds: perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorodecanoic acid (PFDA). PFAS6 detections must be reported in the regulated contaminant table. Other PFAS detections not included in PFAS6 must be reported in your unregulated table.

If, you sampled for PFAS during the calendar year and there were no detections, you are not required to include that information in your CCR. However, you may wish to notify your consumers of your sampling results.

How to Report Regulated PFAS6

In accordance with 310 CMR 22.16A(4)(g) and (i)

If your community system detected PFAS6 in any finished water sample, you must report the concentrations in your CCR Regulated Contaminant Table. PFAS6 is considered one contaminant even though it is a combination of six different PFAS. Results are averaged for each individual quarterly sampling site. You report the highest average of all your sampling sites. But if several sites are over the MCL then all of those must be reported in the CCR.

Note that "j values" are not included in your reporting as they are estimates only.

The table must include:

- the contaminant name and unit of measure
- the MCL
- the highest quarterly average of all the monitoring locations. (If more than one location exceeds the MCL, include the quarterly average of all locations that exceed the MCL using one line in the table – see examples below.)
- the range - aka the highest and the lowest detection of all the individual tests (not averages)
- sources of contamination
- note any violations

Note any abbreviations (i.e., ppt or ng/L) you use in the definition section of your CCR. Health risk language from 310 CMR 22.16A(27)(a) must be included if the MCL was violated. If your lab reports your detections in mg/L you will need to convert them into CCR units; the MCL must be converted to a whole number using the conversion number in the chart and remember to convert your results as well. This results in using ppt instead of mg/L. (See regulated contaminant charts in the back of this guide, or in 310 CMR 22.16A <https://www.mass.gov/regulations/310-CMR-22-the-massachusetts-drinking-water-regulations>.)

Table 1 is an example of a PFAS6 detection in a CCR regulated table. You would change the table numbers to fit your detection levels.

Table 1 - Example PFAS6 CCR Table

Regulated Contaminant	Date(s) Collected	Detect Result or Range	Highest Quarterly Average	MCL	Violation	Possible Sources	Health Effects
PFAS6 (ppt)	2022	2 to 45	21	20	yes	Discharges and emissions from industrial and manufacturing sources associated with the production or use of these PFAS, including production of moisture and oil resistant coatings on fabrics and other materials. Additional sources include the use and disposal of products containing these PFAS, such as fire-fighting foams.	Some people who drink water containing these PFAS in excess of the MCL may experience certain adverse effects. These could include effects on the liver, blood, immune system, thyroid, and fetal development. These PFAS may also elevate the risk of certain cancers.

How to Report Unregulated PFAS

In accordance with 310 CMR 22.16A(4)(l), and 310 CMR 22.16A(5)(c)

If detected, you must report unregulated PFAS detections in your CCR in the unregulated table. To report unregulated contaminants, you must report the name of the contaminant, the average concentration found, the range (low to high) of all detections found. Adding any ORSG limits, source of contamination, and health language is recommended.

Note any abbreviations (i.e., ppt or ng/L) you use in the definition section of your CCR. If your lab reports your detections in mg/L you will need to convert them into CCR units; the ORSG or reported numbers must be converted to a whole number using the conversion number in the chart

and remember to convert your results as well. This results in using ppt instead of mg/L. (See unregulated contaminant charts in the back of this guide, or in 310 CMR 22.16A <https://www.mass.gov/regulations/310-CMR-22-the-massachusetts-drinking-water-regulations>.)

Table 2 is an example of an unregulated PFAS detection in a CCR unregulated table. You would change the table numbers to fit your detection levels.

Table 2 - Example Unregulated PFAS Table

Unregulated Contaminant (CASRN)	Date Collected	Detect Result or Range	Average	ORSG	Possible Sources	Health Effects
Perfluorotetradecanoic acid. (PFTA)(376-06-7) ppt	2021	ND to 25	7.5	†	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFTA has not been well studied, because it is similar to other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.

†There is no ORS Guideline for this compound.

Radionuclides

For all radionuclides, use only the numbers prior to the +/- when reporting your results.

Beta Particles - The MCL for beta particles is 4 mrem/year. EPA recognizes that laboratories often report these results in pCi/L, and that there is no simple conversion between the two units. Therefore, it is acceptable for systems to report the detected level for beta particles in pCi/L. So

that consumers may have a standard against which to compare the detected level, systems should place 50 in the MCL column and include a footnote explaining that EPA considers 50 pCi/L to be a level of concern for beta particles.

XYZ System's sample table:

	Date	Result	Range	MCL	MCLG	Violation	Source
Beta particles (pCi/L)	xx/xx/xxxx	10**	ND - 10	50*	0	No	Erosion of natural deposits
* The MCL for beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles.							
** Because the beta particle results were below 50 pCi/L, no testing for individual beta particle constituents was required.							

If you detect beta particles above 50 pCi/L, you must determine the actual radioactive constituents present in the water to calculate the dose exposure level in mrem/year, and must report both the detected level and MCL as mrem/year.

Gross Alpha. For gross alpha detections, the reported results should reflect the subtraction of any uranium (pCi/l) values detected.

A gross alpha particle activity measurement may be substituted for the required *radium* measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/L.

XYZ System's example table:

	Date	Result	Range	MCL	MCLG	Violation	Source
Gross Alpha (pCi/L)	xx/xx/xxxx	3*	ND - 10	15	0	No	Erosion of natural deposits
* If the results of this sample had been above 5 pCi/L, our system would have been required to do additional testing for radium. Because the results were below 5 pCi/L, no testing for radium was required.							

A gross alpha particle activity measurement may be substituted for the required *uranium* measurement if the measured gross alpha particle activity does not exceed 15 pCi/L.

XYZ System's example table:

	Date	Result	Range	MCL	MCLG	Violation	Source
Alpha emitters (pCi/L)	xx/xx/xxxx	12*	ND - 12	15	0	No	Erosion of natural deposits

* If the results of this sample had been above 15 pCi/L, our system would have been required to do additional testing for uranium. Because the results were below 15 pCi/L, no testing for uranium was required.

Uranium. Report uranium detections in parts per billion (ppb). If uranium values are not listed on the laboratory report in ppb units of measure, convert available ppm or pCi/l values to the appropriate ppb value: (pCi/L uranium x 1.49 = ppb uranium) or (ppm x 1000 = ppb).

Radium-226 & Radium-228. For radium- 226 and radium-228 detections, add the two results together and report the total combined value, which can then be compared to the MCL of 5 pCi/L.

Radon is an unregulated contaminant and detections must be reported in your Unregulated Contaminant table. If your system has performed monitoring that indicates the presence of radon in its finished water, you must include it in your CCR table.

Example table:

	Date	Range	Average	SMCL	OSG	Source
Radon (pCi/L)	xx/xx/xxxx			NA	10,000	Natural Sources

You can explain the significance of the results. Tell customers if they need to be concerned by the information that the CCR provides.

Example:

Radon is a radioactive gas that you cannot see, taste, or smell. It is found throughout the U.S. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. (You should pursue radon removal for your home if the level of radon in your air is 4 picocuries per liter of air (pCi/L) or higher. There are simple ways to fix a radon problem that are not too costly. For additional information, call your state radon program or call EPA's Radon Hotline (800-SOS-RADON).

Sodium

Sodium is an unregulated inorganic compound and is required testing for all PWSs regardless if an IOC monitoring waiver was issued. Detections of sodium must be reported in your CCR. See the unregulated section on how to report unregulated contaminants.

Surface Water Treatment Rule (SWTR)

SWTR- CCR Rule requires that all violations of treatment techniques be reported in a detected contaminant table(s). The table must include the TT violation, an explanation of the violation, the length of the violation, any potential adverse health effects, and steps taken to correct the violation. Listed below are some TT violations of SWTR.

- Failure to install adequate filtration or disinfection equipment or processes.
- Failure of the filtration or disinfection equipment or process.
- TT violation associated with acrylamide and epichlorohydrin.
- Failure to have redundant components for disinfection.
- Failure to maintain a distribution system disinfectant residual.
- Failure to maintain at least 0.2 ppm disinfectant residual at the entry point for more than 4 hours.
- Failure to meet inactivation requirements at the treatment plant (CT value).
- Failure to meet watershed control program requirements.

Total Organic Carbon (TOC)

Under the DBPR, conventional treatment plants using surface water or groundwater under the influence of surface water (GWUDI) must sample for TOC in the raw and finished water monthly. The actual TOC percentage removed is compared to the required percentage removed (specific to each PWS based on raw water TOC and alkalinity) and expressed as a ratio. Compliance is based on a running annual average, calculated quarterly. This is a TT, not an MCL, but is still regulated and reported in the CCR. Violations of TTs must be noted in the CCR.

If any of the following apply, you must report a TT violation for the enhanced coagulation or enhanced softening, if applicable.

- Alternate compliance criteria for enhanced coagulation or enhanced softening cannot be met
- Quarterly TOC monitoring does not demonstrate the percentage removal of TOC (see table below)
- A system does not obtain MassDEP approval for alternate minimum TOC removal requirements

The example table below is for a conventional surface water treatment system with source water TOC between 2-4 mg/L and with a source water alkalinity between 0-50 mg/L.

TT Violation	Explanation of violation	Length of Violation	Corrective steps taken	Health Effects
Failure to remove required amount of TOC	On March 3 we collected samples for TOC before and after the treatment process to determine the percentage of TOC being removed. Results showed that we were removing 25 percent. We are required to remove 35 percent.	One Month	We examined our treatment process to see if we could improve our removal of TOC. We adjusted our process on March 29. Samples collected after that time show that we are able to achieve 35 percent removal.	TOC has no health effects. TOC provides a medium for the formation of THM and HAA5. Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

If you would like to report additional information on TOC, your table could look like this:

Contaminant	Date	Result	Range	MCL	Violation	Possible Sources
Total Organic Carbon	xx/xx/xxxx			TT		Naturally present in the environment
Disinfectants and Disinfectant By-Products There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.						

Turbidity

Example Table 1:
When reported as an MCL for systems that must install filtration but have not, include the highest average monthly value.

	Highest Monthly Average	MCL	MCLG	Violation	Source
Turbidity (NTU)		5	NA		Soil runoff

Example Table 2:
When reported as a TT for systems that meet the criteria for avoiding filtration, include the highest value found in any month.

	Highest Detected Daily Value	TT	MCLG	Violation	Source
Turbidity (NTU)		5	NA		Soil runoff

Example Table 3:
When reported as a TT for systems that filter and use turbidity as an indicator of filtration performance, include the highest single measurement *and* the lowest monthly percentage of samples meeting the turbidity limits specified in 310 CMR 22.20 for the relevant filtration technology in the last calendar year. In this case you may want to report the data in two rows in the example table shown below.

Turbidity	TT	Lowest monthly% of samples	Highest Detected Daily Value	Violation	Possible Source of Contamination
Daily Compliance (NTU)	5	NA			Soil runoff
Monthly Compliance*	At least 95%		NA		
Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of water quality.					
*Monthly turbidity compliance is related to a specific treatment technique (TT). Our system filters the water so at least 95% of our samples each month must be below the turbidity limits specified in the regulations.					

As part of an explanation for measuring turbidity, systems may wish to explain that turbidity is a measure of treatment performance and is regulated as a TT.

UCMR

After testing for Unregulated Monitoring Contaminants Rule (UCMR), any detects must be reported in the CCR.

Put the UCMR detections in the unregulated contaminants table in your CCR just as you would any other unregulated detect. (See unregulated contaminants section.) Take note that you only need enter the results in your CCR for the current year. The five-year rule does not apply to UCMR as this is special testing from EPA.

Note: Because EPA had you test for UCMR contaminants, that in itself requires you to also distribute a Tier 3 PN regardless if you had detections or not. You may use your CCR for this Tier 3 PN if the timing is right e.g., if you *deliver* your CCR to your customers 12 months or less from when you received the results of your UCMR test results. There is a PN Certification section on the CCR Certification Form for this purpose, so you do not have to send in a separate PN Certification Form. Otherwise, you must deliver a separate UCMR Tier 3 PN. Since UCMR PN is a bit different than the regular PN, see the PN Template with instructions for UCMR at: https://www.mass.gov/lists/public-notification-forms-and-templates

(See PFAS section for how to report PFAS in your table.)

Section V.- What information is required?

Item 8: Compliance and Enforcement

If your water system violated one of the following requirements during the year covered by your CCR, you must describe the violation(s) in your CCR. just as you must explain the potential health effects of any MCL violation, you must provide a clear and readily understandable explanation of any other violation, potential adverse health effects (if any), and the steps the system has taken to correct the violation. For health effects language, refer to the charts in the back of this document.

- Treatment techniques
  Filtration, disinfection requirements, lead and copper requirements, acrylamide and epichlorohydrin are all TT. Any violations of TTs must be reported in your CCR.

- Monitoring and reporting of compliance data
  If your system failed to take a sample on time (i.e., failure to monitor), the CCR should say "health effects unknown." If your system took the samples accurately and on time, but mailed the results late, you do not need to discuss health effects.
- Record keeping requirements
- Special monitoring requirements

- Violation of a variance, an exemption, or an administrative or judicial order
- Ground Water Rule
- Capacity
  Report any capacity deficiencies as determined by MassDEP
- SWTR violations

Including Tier 3 Public Notices in CCRs

If you are required to provide Tier 3 Public Notice (PN) for a monitoring violation or other type of violation or situation, you may consider including the notice in your CCR. If you use the CCR for PN, make sure you meet the content requirements under the PN Rule at: https://www.mass.gov/lists/water-systems-operations-ii#public-notification-. Also, remember that the timing and delivery requirements for CCRs differ from those for public notices. Be careful to adhere to the PN requirement that Tier 3 PNs be completed no later than 12 months from the date the violation or situation was reported. To minimize the timing conflict, you can publish your CCR early – as soon after the end of the calendar year as possible; or you can mail a separate PN for the violations occurring in January through June of the current year in the same envelope as your CCR covering the previous calendar year.

Please note that if you sent out a PN separately from the CCR during the year you must still make mention of the PN in your current CCR but you do not have to place the entire PN in the CCR.

Reporting Enforcement Orders

Your CCR should include information about operating under a drinking water Administrative Consent Order (ACO) or a Unilateral Administrative Order (UAO). This could include

- Do Not Drink Orders
- Boil Orders
- Declarations of Water Emergency
- Lead and Copper Consent Orders
- Surface Water Treatment Rule Consent Orders

- Any other orders relating to water quality or water quantity issues

Describe the terms of the order, the reason for the order, and the actions being taken to comply with the order. Additionally, it is suggested that you state what progress has been made with the terms of the order, and what the estimated date is for completing the order.

Other Educational Information

You are not limited to providing only the required information in your CCR. You may want to include:

- An explanation (or include a diagram of) your system's treatment processes.
- Source water protection tips
- Water and energy conservation tips
- The cost of making the water safe to drink including the cost of sustaining the infrastructure.
- Efforts your system has made to promote "green infrastructure" (e.g., stormwater pollution prevention measures).
- A statement from the mayor or general manager.
- Information to educate customers such as taste and odor issues, affiliations with programs such as the Partnership for Safe Water, opportunities for public participation, etc.

Section VI

Delivery Options and Certification

Depending on the number of people your water system serves, you must mail or deliver a copy of your CCR to customers using one of several options. In addition, PWSs of all sizes must complete a minimum of three good faith efforts to reach non-bill-paying consumers and others in your community. Delivery must be completed no later than July 1 each year; not postmarked on July 1. Any copies sent to newspapers, town offices, bill stuffers, etc. must also be completed by July 1. You must also be ready to mail out your CCR to the public when requested to do so.

Besides delivery of the CCR to customers, systems must send a copy of their CCR, Certification Form, and any additional required documentation to MassDEP-Boston, MassDPH, and the local board of health by the July 1 deadline. (MassDEP regional offices are not accepting CCRs anymore. Please send only to the Boston Office.)

Water systems now have the option of using approved electronic delivery methods. EPA issued an interpretation of the existing regulations that allows PWSs to use the web and e-mail to reach customers in a more cost-effective manner. EPA's full memorandum is posted on their website at http://water.epa.gov/lawsregs/rulesregs/sdwa/ccr/upload/ccrdeliveryoptionsmemo.pdf. You may also review MassDEP's e-delivery guidance discussed later in this section.

Systems serving 10,000 or more people

You may include your CCR with water bills, if feasible, you may send it as a separate mailer to all postal patrons, or you may electronically deliver it (see below). Sending your CCR to all postal patrons will likely be more effective, and you will reach renters who may not receive water bills directly.

Systems that serve 100,000 or more people must post their CCRs on the internet. Other systems can use this option as a good faith effort. Many local governments have sites where you can post your CCR, even if your system itself does not have a web site. You can also send your CCR link to EPA. They sponsor a national repository of CCRs at: http://ofmpub.epa.gov/apex/safewater/f?p=136:104:0.

Systems serving fewer than 10,000 people

For community systems serving fewer than 10,000 people, the Massachusetts Governor waived the requirement to mail or directly deliver the CCR to each customer. Systems serving fewer than 10,000 customers may still mail their CCR or take the following steps instead:

- Publish the full content of the CCR in one or more local newspapers.
- Include a statement in the newspaper that the CCR will not be mailed but is available upon request, with a phone number to call.
- May electronically deliver the CCR (see below)

Very small systems serving 500 or fewer people do not have to publish the CCR in the newspaper. However, they must notify customers through a mailed, e-mailed, delivered, or posted notice that the CCR is available upon request, with a phone number to call. MassDEP encourages very small systems to find cost-effective ways to work with homeowners' associations, resident councils, or other community groups to distribute their CCRs each year. A variety of methods may be possible, including newsletters, CCR distribution at meetings, and e-mail.

Note: If you choose to use your CCR to meet the requirements of the Public Notification Rule for any monitoring and reporting Tier 3 violations received in the previous year, you **must directly deliver** your CCR to all customers, rather than publishing your CCR in a newspaper or posting a notice of availability. (You cannot take advantage of the Governor's Waiver in this case.) Electronic delivery is now acceptable for tier 3 PN in the CCR (see e-delivery section below).

In addition, small and very small community systems must still perform at least three good faith efforts. For very small systems, MassDEP recommends posting the complete CCR (rather than simply a notice of availability) in public areas such as lobbies, mailboxes, recreational areas, or laundry rooms where residents and visitors are likely to see the report. Additional good faith efforts may include giving copies of the CCR to the rental office, distributing copies to all new residents, or including a notice in a newsletter. Senior communities and boarding schools may consider sending copies to the Council on Aging and/or to families of the residents.

Electronic Delivery

MassDEP's full guidance of e-delivery can be found at:
http://www.mass.gov/eea/agencies/massdep/water/drinking/optional-e-delivery-of-ccr.html.

On January 3, 2013, EPA interpreted the existing federal regulations pertaining to direct delivery of CCRs as allowing several options for electronic delivery (e-delivery). No changes were made to the CCR regulation. Community public water systems must continue to meet all the same requirements (e.g., content, Good Faith Efforts to reach non-bill paying consumers, foreign language, certification, etc.).

Please note that e-delivery is optional. Systems may choose to continue past delivery methods including regular mail, door-to-door delivery or posting in an appropriate location (when approved).

For PWSs that intend to use e-delivery the following information is applicable:

- Community PWSs must prominently display a message informing their customers of the option of obtaining a hardcopy CCR and how they can do so.

- E-delivery to customers can be by a mailed post card, bill stuffer, or other notice that includes a direct URL (i.e., web address); an email that contains a direct URL; or an email that contains the full CCR as part of the message (either as an attachment or as an embedded image). Any other e-delivery method must be approved by MassDEP prior to its use. Direct URLs must directly open to the CCR without the need to click onto other web pages.

  Note: if you plan on mailing out notice of CCR availability to customers by way of the water bills, **all** customers must receive their water bills (with notice of CCR availability) before July 1.

- The CCR may include a QR Code along with the URL. They must both open up the same document. The QR Code is simply an additional way to get to the CCR.

- Electronic CCRs be must be delivered to customers by July 1 of each year. If an email method is used and it is un-deliverable for any reason, a paper CCR must be mailed to that customer by July 1.

- The CCR URL must be posted and continuously live until the next year's CCR is issued. You must keep at last 3-years CCR available to the public.

- MassDEP has updated the CCR certification form to include e-delivery options (http://www.mass.gov/eea/agencies/massdep/water/approvals/drinking-water-forms.html#2). All community PWSs must use this new form.

- The signed certification, the complete CCR, and any other required documents (including a sample of water bills or postcards) can be delivered to MassDEP at: program.director-

dwp@mass.gov . Mass DPH e-delivery address is: dph.ccr@massmail.state.ma.us. Contact your local board of health to see if they will accept their copy via email.

Make sure you send in one PDF file with the Certification Form first, followed by the CCR and then by any other needed documentation. Label the file as: (PWS ID Number)(PWS Name)(20XX CCR).

- Social media (e.g., Twitter, Facebook) and automated phone calls do not meet the direct delivery requirement but can be used to meet Good Faith Effort requirements.

The full EPA memorandum can be found on the EPA website at: https://blog.epa.gov/blog/2013/03/youve-got-mail-and-its-your-electronic-drinking-water-report/.

Good Faith Delivery Options

Since many consumers of your water may not receive bills (such as apartment dwellers, or people who work in your town) you must make a serious and "good faith" effort to reach non-bill paying consumers. A good faith effort means selecting the most appropriate methods to reach those consumers from a menu of options. In Massachusetts, you are required to choose, implement, and document a minimum of three methods by July 1, regardless of the size of your system. Those options include but are not limited to:

- Posting the CCR on the Internet using web sites, email notifications, podcasts, blogs, or Tweets
- Mailing the CCR to all postal patrons
- Advertising the availability of the CCR in newspapers, TV, and radio
- Publishing the complete CCR in a local newspaper
- Posting the CCR in public places such as cafeterias and lobbies of public buildings, libraries, churches, and schools
- Post report in lobby of apartment complexes
- Delivering multiple CCRs for distribution by single-biller customers such as apartment buildings or large private employers
- Delivering the CCR to community organizations
- Post the CCR in your town or city hall, or library
- Other system-specific efforts designed to reach consumers

Section VII

Keeping CCR Copies on File

You must keep copies of each CCR on file for a minimum of three years. Even after delivering your CCR to all customers, be sure to keep copies of your last three CCRs accessible so you can provide it on request. Keep hard copies, electronic copies, or both, whichever way is easiest to deliver upon request. If you post your CCR on-line it must be posted live all year until you post a new CCR.

If you are required to have your CCR translated into another language, you must keep copies of that as well, to deliver upon request. (Note that you must also deliver a translated copy to MassDEP along with your original delivery to MassDEP.)

Section VIII

Technical Assistance for your CCR

The regulations for the CCR rule is 310 CMR 22.16A. You can read these regulations on the MassDEP website at: http://www.mass.gov/eea/agencies/massdep/water/regulations/310-cmr-22-00-massachusetts-drinking-water-regulations.html.

Appendix M to the regulations (this document) which is the guidance document for CCRs can be found on the web at http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html#7 .

Also on that website you can find the CCR Template and various other items pertaining to CCRs. The template is a Word document that you can download from the Drinking Water/CCR section of the MassDEP website at: http://www.mass.gov/eea/agencies/massdep/water/drinking/water-systems-ops.html#7.

If you still have questions or need advice on how to prepare and distribute your CCR, please contact Program.Director-DWP@state.ma.us or 617-292-5770 and the director will put you touch with staff that can help you.

Attachments

Attachment A - Contaminant Charts
with CCR units, major sources of contamination, and health effects language.

Regulated Contaminants (grey)

Unregulated Contaminants (beige)

Secondary Contaminants (blue)

Attachment B - Certification Form for Massachusetts CCRs

Regulated Contaminants Chart

Key

AL=Action Level
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Level Goal
MFL=Million fibers per liter
MRDL = Maximum Residual Disinfectant Level
MRDLG=Maximum Residual Disinfectant Level Goal
mrem/year=millirems per year (a measure of radiation absorbed by the body)
NTU=Nephelometric Turbidity Units
pCi/l=picocuries per liter (a measure of radioactivity)
ppm=parts per million, or milligrams per liter (mg/L)
ppb=parts per billion, or micrograms per liter (ug/L)
ppt=parts per trillion, or nanograms per liter (ng/L)
ppq=parts per quadrillion, or picograms per liter (pg/L)
TT=Treatment Technique

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Microbiological Contaminants						
Cryptosporidium	TT	-	TT	0	Discharged especially where water is contaminated with sewage or animal wastes	Some people who drink water containing *Cryptosporidium* could experience severe gastrointestinal effects.
Giardia lamblia	TT	-	TT	0	Discharged especially where water is contaminated with sewage or animal wastes	Some people who drink water containing Giardia lamblia could experience severe gastrointestinal effects.
Heterotrophic plate count	TT	-	TT	n/a	Heterotrophic plate count is an indicator method that measures a range of naturally-occurring bacteria in the environment	Heterotrophic plate count is not associated with health effects but is a method that measures the bacterial quality of the water as an indicator of the adequacy of water treatment.
Legionella	TT	-	TT	0	Natural sources; multiplies in heating and air-conditioning systems.	Some people who use drinking water containing Legionella could experience Legionnaire's Disease, a type of pneumonia.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Total Coliform Bacteria	TT	NA	TT	na	Naturally present in the environment	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.
E.coli	Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform- positive repeat sample for *E. coli.*			0	Human and animal fecal waste.	E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.
Fecal Indicators (*E. coli*, enterococci, or coliphage) Groundwater Rule	TT	-	TT	n/a	Human and animal fecal waste	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Total organic carbon	TT	-	TT	n/a	Naturally present in the environment	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increase risk of getting cancer.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Turbidity	TT	-	TT	n/a	Soil runoff	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Viruses (enteric)	TT	-	TT	0	Discharged especially where water is contaminated with sewage or animal wastes	Some people who drink water containing viruses could experience severe gastrointestinal effects.
Radioactive Contaminants						
Beta/photon emitters	4 mrem/yr	-	4 mrem/yr	0	Decay of natural and man-made deposits	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters	15 pCi/l	-	15 pCi/l	0	Erosion of natural deposits	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium	5 pCi/l	-	5 pCi/l	0	Erosion of natural deposits	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer
Uranium	0.030 mg/L	1000	30 ppb*	0	Erosion of natural deposits	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity
* To convert pCi/L to ppb: pCi/L uranium x 1.49 = ppb uranium						

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Inorganic Contaminants						
Antimony	0.006 mg/L	1000	6 ppb	6 ppb	Discharge from fire retardants; ceramics; electronics; solder	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
Arsenic	0.01 mg/L	1000	10 ppb	n/a	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Asbestos	7 MFL	-	7 MFL	7 MFL	Decay of asbestos cement water mains; Erosion of natural deposits	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium	2 mg/L	-	2 ppm	2 ppm	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium	0.004 mg/L	1000	4 ppb	4 ppb	Discharge from electrical, aerospace, and defense industries; erosion of natural deposits	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Bromate	0.010 mg/L	1000	10 ppb	0	By-product of drinking water disinfection	Some people who drink water containing bromate in excess of the MCL over many years have an increased risk of getting cancer.
Cadmium	0.005 mg/L	1000	5 ppb	5 ppb	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Chloramines	MRDL= 4 mg/L	-	MRDL= 4 ppm	MRDLG= 4 ppm	Water additive used to control microbes	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
Chlorine	MRDL= 4 mg/L	-	MRDL= 4 ppm	MRDLG= 4 ppm	Water additive used to control microbes	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Chlorine dioxide	MRDL= 0 .8 mg/L	1000	800 ppb	MRDLG= 800 ppb	Water additive used to control microbes	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
Chlorite	1 mg/L	-	1 ppm	0.8 ppm	By-product of drinking water disinfection	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chromium	0.1 mg/L	1000	100 ppb	100 ppb	Discharge from steel and pulp mills; Erosion of natural deposits	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Copper	AL=1.3 mg/L	-	AL= 1.3 ppm	1.3 ppm	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Cyanide	0.2 mg/L	1000	200 ppb	200 ppb	Discharge from metal facto-ries; Discharge from plastic and fertilizer factories	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
Fluoride	4 mg/L *	-	4 ppm	4 ppm	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.
*Add this footnote: Fluoride has a secondary contaminant level (SMCL) of 2 ppm to better protect human health.						

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Lead	AL= 0.015 mg/L	1000	AL=15 ppb	0	Corrosion of household plumbing systems; Erosion of natural deposits	Exposure to lead in drinking water can cause serious health effects in all age groups. Infants and children can have decreases in IQ and attention span. Lead exposure can lead to new learning and behavior problems or exacerbate existing learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney, or nervous system problems. Note: Effective November 1, 2027, the required health effects language must read as follows. To follow MassDEP's recommendation and to provide the latest EPA information,you may choose to include this health effects language in your report(s) now. There is no safe level of lead in drinking water. Exposure to lead in drinking water can cause serious health effects in all age groups, especially pregnant people, infants (both formula-fed and breastfed), and young children. Some of the health effects to infants and children include decreases in IQ and attention span. Lead exposure can also result in new or worsened learning and behavior problems. The children of persons who are exposed to lead before or during pregnancy may be at increased risk of these harmful health effects. Adults have increased risks of heart disease, high blood pressure, kidney or nervous system problems. Contact your health care provider for more information about your risks.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Mercury [inorganic]	0.002 mg/L	1000	2 ppb	2 ppb	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate	10 mg/L	-	10 ppm	10 ppm	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite	1 mg/L	-	1 ppm	1 ppm	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Perchlorate	0.002 mg/L	1000	2 ppb	N/A	Rocket propellants, fireworks, munitions, flares, blasting agents	Perchlorate interferes with the normal function of the thyroid gland and thus has the potential to affect growth and development, causing brain damage and other adverse effects, particularly in fetuses and infants. Pregnant women, the fetus, infants, children up to the age of 12, and people with a hypothyroid condition are particularly susceptible to perchlorate toxicity.
PFAS6	0.000020 mg/L	1,000,000	20 ppt	N/A	Discharges and emissions from industrial and manufacturing sources associated with the production or use of these PFAS, including production of moisture and oil resistant coatings on fabrics and other materials. Additional sources include the use and disposal of products containing these PFAS, such as fire-fighting foams.	Some people who drink water containing these PFAS in excess of the MCL may experience certain adverse effects. These could include effects on the liver, blood, immune system, thyroid, and fetal development. These PFAS may also elevate the risk of certain cancers.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Selenium	0.05 mg/L	1000	50 ppb	50 ppb	Discharge from metal refineries; Erosion of natural deposits; Discharge from mines	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium	0.002 mg/L	1000	2 ppb	0.5 ppb	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
Synthetic Organic Contaminants Including Pesticides and Herbicides						
2,4-D (ppb)	0.07 mg/L	1000	70 ppb	70 ppb	Runoff from herbicide used on row crops	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP [Silvex]	0.05 mg/L	1000	50 ppb	50 ppb	Residue of banned herbicide	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	TT	-	TT	0	Added to water during sewage/ wastewater treatment	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Alachlor	0.002 mg/L	1000	2 ppb	0	Runoff from herbicide used on row crops	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Atrazine	0.003 mg/L	1000	3 ppb	3 ppb	Runoff from herbicide used on row crops	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene [PAH]	0.0002 mg/L	1,000,000	200 ppt	0	Leaching from linings of water storage tanks and distribution lines	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
Carbofuran (ppb)	.04 mg/L	1000	40 ppb	40 ppb	Leaching of soil fumigant used on rice and alfalfa	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane	0.002 mg/L	1000	2 ppb	0	Residue of banned termiticide	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon	0.2 mg/L	1000	200 ppb	200 ppb	Runoff from herbicide used on rights of way	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di(2-ethylhexyl) adipate	0.4 mg/L	1000	400 ppb	400 ppb	Discharge from chemical factories	Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties.
Di(2-ethylhexyl) phthalate	0.006 mg/L	1000	6 ppb	0	Discharge from rubber and chemical factories	Some people who drink water containing di (2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Dibromochloropropane (DBCP)	0.0002 mg/L	1,000,000	200 ppt	0	Runoff/leaching from soil fumigant used on soybeans, cotton, and orchards	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb	0.007 mg/L	1000	7 ppb	7 ppb	Runoff from herbicide used on soybeans and vegetables	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat	0.02 mg/L	1000	20 ppb	20 ppb	Runoff from herbicide use	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin [2,3,7,8-TCDD] (ppq)	0.00000003 mg/L	1,000,000,000	30 ppq	0	Emissions from waste incineration and other combustion; Discharge from chemical factories	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Endothall	0.1 mg/L	1000	100 ppb	100 ppb	Runoff from herbicide use	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Endrin	0.002 mg/l	1000	2 ppb	2 ppb	Residue of banned insecticide	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Epichlorohydrin	TT	-	TT	0	Discharge from industrial chemical factories; An impurity of some water treatment chemicals	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Ethylene dibromide	0.00002 mg/L	1,000,000	20 ppt	0	Discharge from petroleum refineries	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Glyphosate	0.7 mg/L	1000	700 ppb	700 ppb	Runoff from herbicide use	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor	0.0004 mg/L	1,000,000	400 ppt	0	Residue of banned pesticide	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
Heptachlor epoxide	0.0002 mg/L	1,000,000	200 ppt	0	Breakdown of heptachlor	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
Hexachlorobenzene	0.001 mg/L	1000	1 ppb	0	Discharge from metal refineries and agricultural chemical factories	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
Hexachlorocyclopentadiene	0.05 mg/L	1000	50 ppb	50 ppb	Discharge from chemical factories	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane	0.0002 mg/L	1,000,000	200 ppt	200 ppt	Runoff/leaching from insecticide used on cattle, lumber, gardens	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor	0.04 mg/L	1000	40 ppb	40 ppb	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl [Vydate]	0.2 mg/L	1000	200 ppb	200 ppb	Runoff/leaching from insecticide used on apples, potatoes and tomatoes	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
PCBs [Polychlorinated biphenyls]	0.0005 mg/L	1,000,000	500 ppt	0	Runoff from landfills; Discharge of waste chemicals	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Pentachlorophenol	0.001 mg/L	1000	1 ppb	0	Discharge from wood preserving factories	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram	0.5 mg/L	1000	500 ppb	500 ppb	Herbicide runoff	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Simazine	0.004 mg/L	1000	4 ppb	4 ppb	Herbicide runoff	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene	0.003 mg/L	1000	3 ppb	0	Runoff/leaching from insecticide used on cotton and cattle	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Volatile Organic Contaminants						
Benzene	0.005 mg/L	1000	5 ppb	0	Discharge from factories; Leaching from gas storage tanks and landfills	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
Carbon tetrachloride	0.005 mg/L	1000	5 ppb	0	Discharge from chemical plants and other industrial activities	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Chlorobenzene	0.1 mg/L	1000	100 ppb	100 ppb	Discharge from chemical and agricultural chemical factories	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene	0.6 mg/L	1000	600 ppb	600 ppb	Discharge from industrial chemical factories	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
p-Dichlorobenzene	0.005 mg/L	1000	5 ppb	5 ppb	Discharge from industrial chemical factories	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
1,2-Dichloroethane	0.005 mg/L	1000	5 ppb	0	Discharge from industrial chemical factories	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
1,1-Dichloroethylene	0.007 mg/L	1000	7 ppb	7 ppb	Discharge from industrial chemical factories	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene	0.07 mg/L	1000	70 ppb	70 ppb	Discharge from industrial chemical factories	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene	0.1 mg/L	1000	100 ppb	100 ppb	Discharge from industrial chemical factories	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane	0.005 mg/L	1000	5 ppb	0	Discharge from pharmaceutical and chemical factories	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
1,2-Dichloropropane	0.005 mg/L	1000	5 ppb	0	Discharge from industrial chemical factories	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene	0.7 mg/L	1000	700 ppb	700 ppb	Discharge from industrial chemical factories	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Haloacetic Acids (HAA5)	0.060 mg/L	1000	60 ppb	N/A	By-product of drinking water disinfection	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene	0.1 mg/L	1000	100 ppb	100 ppb	Discharge from rubber and plastic factories; Leaching from landfills	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloroethylene	0.005 mg/L	1000	5 ppb	0	Discharge from factories and dry cleaners and asbestos cement lined pipes	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
1,2,4-Trichlorobenzene	0.07 mg/L	1000	70 ppb	70 ppb	Discharge from textile-finishing factories	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1-Trichloroethane	0.2 mg/L	1000	200 ppb	200 ppb	Discharge from metal degreasing sites and other factories	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
1,1,2-Trichloroethane	0.005 mg/L	1000	5 ppb	3 ppb	Discharge from industrial chemical factories	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.

Contaminant	MCL	To convert for CCR, multiply by	MCL in CCR units	MCLG in CCR units	Major Sources in Drinking Water	Health Effects Language
Trichloroethylene	0.005 mg/L	1000	5 ppb	0	Discharge from metal degreasing sites and other factories	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
TTHMs [Total trihalomethanes]	0.08 mg/L	1000	80 ppb	n/a	By-product of drinking water disinfection	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Toluene	1 mg/L	-	1 ppm	1 ppm	Discharge from petroleum factories	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
Vinyl Chloride	0.002 mg/L	1000	2 ppb	0	Leaching from PVC piping; Discharge from plastics factories	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes	10 mg/L (10,000 ppb)	1000	10 ppm 10,000 ppb	10 ppm	Discharge from petroleum factories; Discharge from chemical factories	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

Unregulated Contaminants Chart

ORSG and other health values -- Sources to Drinking Water -- Health Effects

Abbreviations:
CASRN - Chemical Abstract Services Registry Number
CCL3 - EPA 3rd Candidate Contaminant List
HRL - health reference level
mg/L - milligrams per liter (same as ppm)
MRL - minimum reporting level
NA - not applicable
ORSG - Office of Research and Standards Guideline
pCi/L - picocuries per liter
ppm - parts per million
ppb - parts per billion
ppt - parts per trillion
ppq - parts per quadrillion
UCMR - Unregulated Contaminant Monitoring Rule
WHO - World Health Organization

Notes:
1. The following unregulated contaminants, if detected, *must* be in your CCR along with the required source and health effects language: manganese, MtBE, nickel, radon-222, PFAS (non-PFAS6) and sodium.

Chemical (CASRN)	**ORSG** [*or other drinking water health value]	**To convert for CCR, multiply by**	**ORSG in CCR units** [*or other drinking water health value]	**Source to Drinking Water**	**Health Effects**
Acetone (67641)	6.3 mg/L	--	6.3 ppm	Discharge from industrial production and use, in automobile exhaust, from landfills and natural sources	Some people who drink water containing acetone at high concentrations for many years could experience effects on the blood, kidney, liver, and reproductive system.
Aldicarb (116063)	0.003 mg/L	1000	3 ppb	Run-off from use as a pesticide	Some people who drink water containing aldicarb at high concentrations for many years could experience effects on the central nervous system.
Aldicarb sulfone (1646884)	0.002 mg/L	1000	2 ppb	Degraded from aldicarb by plants	Some people who drink water containing aldicarb sulfone in high concentrations for many years could experience effects on the central nervous system.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Aldicarb sulfoxide (74839)	0.004 mg/L	1000	4 ppb	Degraded from aldicarb by plants	Some people who drink water containing aldicarb sulfoxide in high concentrations for many years could experience effects on the central nervous system.
Aldrin (309002)	†	--	--	Run-off from insecticide use	Some people who drink water containing aldrin in high concentrations for many years could experience liver damage, kidney effects.
Alpha-hexachlorocyclohexane[2] (319-84-6)	*[0.000006 mg/L (one in one million cancer risk) 0.0006 mg/L (one in ten thousand cancer risk)][3]	1000000	6ppt 600ppt	Though not produced in the U.S. since 1976, alpha-hexachlorocyclohexane is imported for use as an insecticide and prescription medicine for mites and head lice. Due to its persistence in the environment, it may also be found in soil and surface water at hazardous waste sites.	Long-term consumption of alpha-hexachlorocyclohexane in drinking water may produce adverse effects on the liver, kidney and nervous system. Animals fed alpha-hexachlorocyclohexane had a reduced ability to fight infection as well as damage to the reproductive system. The US EPA determined that there is suggestive evidence of carcinogenicity of alpha-hexachlorocyclohexane from animal studies, but the evidence is not sufficient to assess its human carcinogenic potential.
Anatoxin-a[2] (64285-06-9)	†	--	--	Certain algal blooms	Short-term consumption of anatoxin-a in drinking water may produce adverse nervous system effects and may also interfere with the action of anticholinergic agents, recommended for treatment of various medical conditions, as well as with anesthetics.
4-androstene-3,17-dione	†	--	--	--	--
(Bromide[2]) This was a UCMR4 *indicator* and does not need to be reported in your CCR.	--	--	--	Agricultural applications; road runoff; industrial discharges	Bromide in drinking water has a low degree of toxicity. However, the presence of bromide in water disinfected with chlorine or chloramine can result in the formation of disinfection byproduct compounds that may increase the risk of cancer.
Bromobenzene (108861)	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing bromobenzene in high concentrations for many years could experience central nervous system effects

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Bromomethane[1] (74839)	*[0.01 mg/L][7, 9]	1,000	10 ppb	Run-off from use as a fumigant	Some people who drink water containing bromomethane at high concentrations for many years could experience digestive tract effects, and headaches.
	*[140 ug/L][7, 9]	--	140 ppb		
Bromodichloromethane (75274)	†	--	--	Trihalomethane; by-product of drinking water chlorination	Some people who drink water containing bromodichloromethane at high concentrations for many years could experience liver and kidney problems.
Bromochloromethane[1] (Halon 1001) (74975)	*[90 ug/L] [6]	--	90 ppb	Used as a fire-extinguishing fluid, an explosive suppressant, and as a solvent in the manufacturing of pesticides	Based on laboratory animal studies, some people who consume water containing bromochloromethane at high concentrations could experience effects on the liver.
Bromoform (75252)	†	--	--	Trihalomethane; by-product of drinking water chlorination	Some people who drink water containing bromoform at high concentrations for many years could experience liver and kidney problems.
Butachlor (23184669)	†	--	--	Run-off from use as a herbicide	Some people who drink water containing butachlor at high concentrations for many years could experience liver effects.
1,3 Butadiene[1] (106990)	*[0.01 to 1.0 ug/L] [3, 9]	1,000	10 to 1,000 ppt	Used in rubber manufacturing and occurs as a gas	In some people, long-term exposures to high levels of 1,3-butadiene in drinking water may increase the risk of some types of cancers. USEPA considers 1,3-butadiene to be a probable human carcinogen.
1-butanol[2] (71-36-3)	*[0.7 mg/L][3]	1000	700 ppb	Industrial intermediate; solvent for paints, lacquers and varnishes, natural and synthetic resins, gums, vegetable oils, dyes and alkaloids, cosmetic products; food flavoring substance.	Some people who drink water containing 1-butanol at high concentrations for many years could experience effects on the nervous system and liver. In a study in which female rats were exposed to 1-butanol in water, developmental effects were produced in their fetuses.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Butylbenzene isomers (n; sec; tert)	†	--	--	Run-off from industrial use	Some people who drink water containing butylbenzene isomers at high concentrations for many years could experience central nervous system effects.
Butylated hydroxyanisole[2] (25013-16-5)	†	--	--	Antioxidant and preservative in food, food packaging, animal feed, cosmetics, rubber, petroleum products and medicine.	While butylated hydroxyanisole used as a food preservative is generally recognized as safe by the US FDA, there is conflicting evidence on its toxicity from long-term studies in which animals were given very high doses. Some studies indicate that this compound may be carcinogenic and may potentially interfere with hormone function, while others suggest that it is an antioxidant and has beneficial anticancer properties.
Carbaryl (63252)	†	--	--	Run-off from use as an insecticide	Some people who drink water containing carbaryl at high concentrations for many years could experience kidney and liver effects.
Chlorpyrifos[2] (2921-88-2)	*[0.002 mg/L][3]	1000	2 ppb	Deposition and run-off from pesticide application	Long-term exposure to chlorpyrifos produces inhibition of an enzyme in the body called cholinesterase (ChE) that is responsible for regulating nerve activity. ChE inhibition may result in nervous system effects including cognitive changes in the brain (i.e., confusion, memory, decision-making). Besides ChE inhibition, long-term exposure of animals to chlorpyrifos in drinking water also caused effects on liver chemistry, adrenal glands and the eyes. However, available information does not indicate that chlorpyrifos causes adverse effects beyond ChE inhibition in humans.
Chlorate[1] (14866683)	*[210 ug/L] [3, 4]	--	210 ppb	Agricultural defoliant or desiccant; disinfection byproduct; and used in production of chlorine dioxide	People exposed to high concentrations of chlorate in drinking water could experience effects on the thyroid, blood and kidneys. Because it inhibits thyroid iodide uptake, people deficient in dietary iodide are most at risk of chlorate's thyroid effects, which in turn could impact fetal and neonatal development.
Chlorodifluoromethane[1] (HCFC-22) (75456)	†	--	--	Occurs as a gas, and used as a refrigerant, a low-temperature solvent, and in fluorocarbon resins	Long-term exposure to high concentrations of chlorodifluoromethane in drinking water may increase the risk of degenerative effects on the brain, effects on red blood cells, and nutritional and metabolic effects, such as weight loss.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Chloroethane (75003)	†	--	--	Discharge from industrial uses	Some people who drink water containing chloroethane at high concentrations for many years could experience dizziness, nausea, and vomiting.
Chloroform (67663)	0.07 mg/L	1000	70 ppb	Trihalomethane; by-product of drinking water chlorination. [In non-chlorinated sources, chloroform may be naturally occurring.]	Some people who drink water containing chloroform at high concentrations for many years could experience liver and kidney problems and may have an increased risk of cancer.
Chloromethane[1] (methyl chloride) (74873)	* [2.69 to 269 ug/L] [3, 9]	1000	2,690 to 269,000 ppt	Discharge from industrial uses	Some people who drink water containing chloromethane at high concentrations for many years could experience dizziness and fatigue.
o-Chlorotoluene (95498)	†	--	--	Discharge from industrial use	Some people who drink water containing o-chlorotoluene at high concentrations for many years could experience central nervous system effects.
Chromium (744473)	MCL = 100 ug/L	--	100 ppb	Discharge from steel and pulp mills; Erosion of natural deposits	See Chromium-6
Please note: Chromium is a regulated inorganic contaminant (IOC) with an MCL of 100 ug/L and any detects should be listed in your regulated table along with any other detected IOCs. However, US EPA has also included it on their UCMR3 list - with a very low detection level. Please list any chromium UCMR3 detects in the unregulated table.					
Chromium-6[1] (18540299)	See Footnote 5	--	See Footnote 5	Discharge from steel and pulp mills; Erosion of natural deposits	Some people who consume drinking water with elevated concentrations of chromium-6 may experience gastrointestinal lesions, skin reactions and an increased risk of oral and intestinal cancers. USEPA is currently reassessing the toxicity of chromium-6.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Cobalt[1] (7440484)	*[70 ug/L] [3]	--	70 ppb	Naturally occurring element found in the earth's crust and at low concentrations in seawater, and in some surface and ground water; cobaltous chloride was formerly used in medicine and as a germicide	Cobalt is an essential element for proper health but can be harmful at high concentrations. Exposures to excess cobalt have been associated with effects on the blood and on lung function.
Cylindrospermopsin[2] (143545-90-8)	†	--	--	Certain algal blooms	Short-term consumption of cylindrospermopsin in drinking water may produce adverse effects on the liver and kidney, including a hepatitis-like illness, particularly in sensitive members of the population, including children, pregnant women, nursing mothers, the elderly, and persons with kidney and/or liver disease, especially those on dialysis.
Dibromochloromethane (124481)	†	--	--	Trihalomethane; by-product of drinking water chlorination	Some people who drink water containing dibromochloromethane at high concentrations for many years could experience liver and kidney problems.
Dicamba (1918009)	†	--	--	Run-off from use as a herbicide	Some people who drink water containing dicamba at high concentrations for many years could experience central nervous system effects.
m-Dichlorobenzene (541731)	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing m-dichlorobenzene at high concentrations for many years could experience damage to red blood cells.
Dichlorodifluoromethane (Freon 12) (75718)	1.4 mg/L	--	1.4 ppm	Discharge from use as a refrigerant	Some people who drink water containing dichlorodifluoromethane at high concentrations for many years could experience dizziness and headaches.
1,1-Dichloroethane[1] (75343)	*[0.07 mg/L][3, 9]	1000	70 ppb	Discharge from use as a degreasing agent	Some people who drink water containing 1,1-dichloroethane at high concentrations for many years could experience liver and kidney effects.
	*[6.14 to 614 ug/L][3, 9]	--	6.14 to 614 ppb		

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
2,2-Dichloropropane	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing 2,2-dichloropropane at high concentrations for many years could experience central nervous system effects.
1,3-Dichloropropane (142289)	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing 1,3-dichloropropane at high concentrations for many years could experience central nervous system effects.
1,1-Dichloropropene 542756	0.0004 ppm	1000	4 ppb	Discharge from use in chemical manufacturing	Some people who drink water containing 1,1-dichloropropene at high concentrations for many years could experience central nervous system effects.
1,3-Dichloropropene (cis,trans) (542756)	0.0004 mg/L	1,000,000	400 ppt	Run-off from use as a nematocide	Some people who drink water containing cis or trans-1.3-dichloropropene at high concentrations for many years could experience irritation of the eyes, ears, nose, and throat or cancer.
Dieldrin (60571)	†	--	--	Run-off from pesticide application	Some people who drink water containing dieldrin at high concentrations for many years could experience liver damage, convulsions, or cancer.
Dimethipin[2] (55290-64-7)	*[0.14 mg/L][3]	1000	140	Deposition and run-off from use as a defoliant and herbicide	In long-term studies, animals fed dimethipin had effects on the liver and reproductive effects in males. The US EPA has classified dimethipin as a possible human carcinogen.
1,4-Dioxane[1] (123911)	*[0.0003 mg/L][3, 9]	1,000,000	300ppt	Discharge from chemical manufacturing and landfills	Some people who drink water containing 1,4-dioxane at high concentrations for many years could experience chronic kidney and liver effects and liver cancer.
	*[0.35 to 35 ug/L] [3, 9]	1,000	350 to 35,000 ppt		
Enteroviruses (N/A)	†	--	--	--	--
Equilin[1] (474862	*[0.35 ug/L][3]	1,000	350 ppt	--	--

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
17-β-estradiol[1] (50282)	*[0.0009 to 0.09 ug/L][3, 9]	1,000,000	900 to 90,000 ppq	Estrogenic hormone naturally produced in the human body; and used in pharmaceuticals	--
Estriol 16-α-hydroxyestradiol[1] (50271)	*[0.35 ug/L] [3]	1,000	350 ppt	Estrogenic hormone naturally produced in the human body; and used in veterinary and human pharmaceuticals	--
Estrone[1] (53167)	*[0.35 ug/L] [3]	1,000	350 ppt	Estrogenic hormone naturally produced in the human body; and used in veterinary and human pharmaceuticals	--
Ethoprop[2] (13194-48-4)	*[0.00114 mg/L (one in one million cancer risk) 0.114 mg/L (one in ten thousand cancer risk)][3]	1000	1.14 ppb (one in one million cancer risk) 114 ppb (one in ten thousand cancer risk)	Deposition and runoff from insecticide application	Long-term exposure to ethoprop produces inhibition of an enzyme in the body called cholinesterase (ChE) that is responsible for regulating nerve activity. ChE inhibition may result in nervous system effects including cognitive changes in the brain (i.e., confusion, memory, decision-making). In long-term animal studies, the principal non-carcinogenic effects were on ChE, as well as on the liver and the blood. The US EPA has designated ethoprop as likely to be carcinogenic to humans.
Ethylene glycol (107211)	14 mg/L	--	14 ppm	Run-off from use as a deicing chemical; discharge from antifreeze and industrial solvents	Some people who drink water containing ethylene glycol at high concentrations for many years could experience effects on the kidneys, nervous system, and the heart.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
17-α-ethynylestradiol (ethinyl estradiol)[1] (57636)	*[0.35 ug/L] [3]	1,000	350 ppt	Synthetic steroid; prepared from estrone	-
Germanium[2] (7440-56-4)	†	--	--	Erosion of natural deposits; also commonly found in phosphors, transistors and diodes and in electroplating.	Long-term consumption of germanium in drinking water may produce adverse effects on the kidney and nervous system, as well as anemia.
HAA5[2]	*[0.06 mg/L][3]	1000	60ppb	Disinfection byproduct	Some people who drink water containing HAA5 at high concentrations above the MCL for many years could experience effects on the liver as well as an increased risk of cancer.
HAA6Br, HAA9[2]	†	--	--	Disinfection byproduct	Some people who drink water containing HAA6Br or HAA9 at high concentrations above the MCL for many years could experience effects on the liver as well as an increased risk of cancer.
Hexachlorobutadiene (87683)	†	--	--	Discharge from use as an industrial solvent	Some people who drink water containing hexachlorobutadiene at high concentrations for many years could experience kidney effects and effects on a fetus.
3-Hydroxycarbofuran	†	--	--	Breakdown product from the use of the pesticide carboxyfuran	Some people who drink water containing 3-hydroxycarbofuran at high concentrations for many years could experience liver effects.
Imidacloprid	*[0.36 mg/L][7]	1000	360 ppb	Runoff/leaching from insecticide used on structures, gardens, turf and domestic animals	Laboratory animals fed high concentrations of imidacloprid for a long period of time had effects on the thyroid, immune system, nervous system and testes.
Isopropylbenzene (98828)	†	--	--	Discharge from chemical manufacturing	Some people who drink water containing isopropylbenzene at high concentrations for many years could experience central nervous system effects.
Isopropyltoluene	†	--	--	Discharge from chemical manufacturing	Some people who drink water containing isopropyltoluene at high concentrations for many years may experience central nervous system effects.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Lithium (7439-93-2)	†	--	--	Abundant element in the earth's crust, present in certain minerals, especially in areas of volcanic activity and in fluids associated with gas and oil well drilling; anthropogenic sources of lithium include its use in batteries, ceramics, glass, lubricants, metallurgy, and medicine and so it may be found in leachate from landfills, septic systems, and sewage treatment plants.	Some people who drink water containing lithium at high concentrations for many years could experience effects on the nervous system, kidney, thyroid, and heart, as well as on the developing fetus.
Manganese[2] (7439-96-5)	[general pop: 0.3 mg/L (lifetime) >1.0 (ten-day exposure) Infants < 1 yr old: 0.3mg/L (limit exposure to > 0.3 mg/L to 10 days]	1000	300 ppb 1000 ppb 300 ppb	Erosion of natural deposits	Infants and children who drink water containing manganese at high concentrations may have learning and behavior problems. People with liver disease who drink water containing manganese at high concentrations may have neurological disorders.
2-methoxyethanol[2] (109-86-4)	†	--	--	Industrial solvent in the manufacture of varnishes, dyes, and resins also additive in airplane deicing solutions.	Some people who drink water containing 2-methoxyethanol at high concentrations for many years could experience effects on the central nervous system, blood, bone marrow, kidneys, and liver. Long-term exposure of animals to 2-methoxyethanol via either the inhalation or ingestion route caused developmental and reproductive effects.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Methyl ethyl ketone (78933)	4.0 mg/L	1000	4 ppm	Discharge from use as a production solvent and degreaser	Some people who drink water containing methyl ethyl ketone at high concentrations for many years could experience effects on the kidney.
Methyl isobutyl ketone (108101)	0.35 mg/L	--	350 ppb	Discharge from use as a production and extraction solvent	Some people who drink water containing methyl isobutyl ketone at high concentrations for many years could experience effects on the kidney and liver.
Methyl tertiary butyl ether or MtBE (1634044)	0.07 mg/L	1000	70 ppb	Fuel additive; leaks and spills from gasoline storage tanks	Some people who drink water containing methyl tertiary butyl ether at high concentrations for many years could experience chronic effects on the kidney and liver and possible cancer.
US EPA has established a lifetime Health Advisory (HA) for MtBE of 0.3 mg/L and an acute HA at 1.0 mg/L					
Methomyl (16752775)	†	--	--	Runoff from use as an insecticide	Some people who drink water containing methomyl at high concentrations for many years could experience kidney effects.
Metolachlor (51218452)	0.1 mg/L	1000	100 ppb	Run-off from use as an herbicide	Some people who drink water containing metolachlor at high concentrations for many years could experience cancer.
Metribuzin (21087649)	†	--	--	Run-off from use as an herbicide	Some people who drink water containing metribuzin at high concentrations for many years could experience liver and kidney effects.
Total microcystin[2]	*[0.0003 mg/L bottle-fed infants and young children][3]	1,000,000	300 ppt	Certain algal blooms	Short-term consumption of microcystins in drinking water may produce adverse effects on the liver, kidney, and reproductive system, particularly in sensitive members of the population, including children, pregnant women, nursing mothers, the elderly, and persons with kidney and/or liver disease, especially those on dialysis.
	[0.0016 mg/L school-age children and adults][3]	1000	1.6 ppb		

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
Microcystin-LA[2] (96180-79-9) Microcystin-LF[2] (154037-70-4) Microcystin-LR (101043-37-2) Microcystin-LY[2] (123304-10-9) Microcystin-RR[2] (111755-37-4) Microcystin-YR[2] (101064-48-6)	†	--	--	--	--
Molybdenum[1] (7439987)	*[40 ug/L][6]	--	40 ppb	Naturally occurring element found in ores and present in plants, animals and bacteria; commonly used form molybdenum trioxide used as a chemical reagent	Exposure to high levels of molybdenum in drinking water may lead to increased levels of uric acid in the blood, and potential gout-like symptoms, in some people.
Naphthalene (91203)	0.140 mg/L	1000	140 ppb	Discharge from use in mothballs and other domestic products	Some people who drink water containing naphthalene at high concentrations for many years could experience damage to red blood cells, nausea and vomiting.
Nickel (7440020)	0.1 mg/L	1000	100 ppb	Discharge from domestic wastewater, landfills, and mining and smelting operations	Some people who drink water containing nickel at high concentrations for many years could experience effects on the lung, stomach, blood, liver, kidneys, immune system, reproduction, and development.

Chemical (CASRN)	ORSG [*or other drinking water health value]	To convert for CCR, multiply by	ORSG in CCR units [*or other drinking water health value]	Source to Drinking Water	Health Effects
N-Nitrosodimethylamine (NDMA) (62759)	0.00001 mg/L	1,000,000	10 ppt	Discharge from industrial use; as a by-product of drinking water treatment; produced from naturally occurring precursor chemicals	Some people who drink water containing NDMA at high concentrations as well as infants born to pregnant women who drink the water may experience an increased risk of cancer. This chemical may also produce liver disease and kidney effects after short-term exposure to high doses or long-term exposure to lower doses.
Nodularin[2] (118399-22-7)	†	--	--	Certain algal blooms	Nodularin is similar to microcystins in chemical structure. Therefore, while there isn't as much information on nodularin as there is on microcystins, based on the information available nodularin and microcystins may have cause similar health effects.
Noroviruses (N/A)	†	--	--	--	--
n-propylbenzene (103651)	†	--	--	Discharge from chemical manufacturing	Some people who drink water containing n-propylbenzene at high concentrations for many years may experience central nervous system effects.
o-toluidine[2]	†	--	--	Solvent used in the manufacture of dyes, rubber, chemicals and pesticides; curing agent in epoxy resin systems.	Some people who drink water containing o-toluidine at high concentrations for many years could experience effects on the spleen, liver, urinary bladder, body weights and blood. EPA has classified o-toluidine as a known or likely human carcinogen.
Oxyfluorfen[2] (42874-03-3)	*[0.2 mg/L][3]	1000	200 ppb	Deposition and runoff from herbicide application	In long-term studies, animals fed oxyfluorfen had effects on the liver, the blood, and the blood-forming organs. The US EPA has designated oxyfluorfen as likely to be carcinogenic to humans.

Per- and Polyfluoroalkyl Substances (PFAS)					
hexafluoropropylene oxide dimer acid (HFPO-DA) (13252-13-6) ** (Commonly referred to as GenX Chemicals)	†	--	--	Manmade chemical; developed as an alternative to PFOA; used in products to make them stain, grease, heat, and water resistant; also, a byproduct of the process used to produce other fluoropolymer compounds	Based on studies of laboratory animals, people exposed to elevated levels of HFPO-DA, depending on the level and length of exposure, could experience effects on the liver, kidneys, and immune system and may cause developmental effects.
n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA) (2991-50-6)	†	--	--	Manmade chemical; used to manufacture surfactant and surface protection products.	NEtFOSAA has not been well studied. However, because this compound is a precursor to PFOA, PFOS and other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, thyroid, and immune system.
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA) (2355-31-9)	†	--	--	Manmade chemical; used to manufacture surfactant and surface protection products.	NMeFOSAA has not been well studied. However, because this compound is a precursor to PFOA, PFOS and other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, thyroid, and immune system.
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA) (151772-58-6)	†	--	--	Manmade chemical; developed as an alternative to PFOA and used in products to make them stain, grease, heat, and water resistant	NFDHA has not been well studied. However, because it is structurally related to PFBA and other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver and thyroid.
perfluorobutanesulfonic acid (PFBS) (375-73-5) **	†	--	--	Manmade chemical; used as a replacement for perfluorooctane sulfonic acid (PFOS); used in the manufacture of paints, cleaning agents, and water- and stain-repellent products and coatings, including carpeting, carpet cleaners, floor wax and food packaging.	Based on studies of laboratory animals, people exposed to elevated levels of PFBS, depending on the level and length of exposure, could experience effects on the liver, thyroid, blood, and kidneys. PFBS is less toxic and is cleared from the body much faster than PFOS, PFOA and other longer-chain PFAS.

perfluorobutanoic acid (PFBA) (375-22-4)	†	--	--	Breakdown product of other PFAS that are used in stain-resistant fabrics, paper food packaging, and carpets; also historically used for manufacturing photographic film.	Based on studies of laboratory animals, people exposed to elevated levels of PFBA, depending on the level and length of exposure, could experience effects on the liver and thyroid. It may cause developmental effects. PFBA is cleared from the body faster than PFOS, PFOA and some other long-chain PFAS so may be less toxic than these compounds.
Perfluorodecanoic acid (PFDA) (335-76-2) *This is in the UCMR5 but is regulated in MA*	*[0.000020 mg/L]	1,000,000	20 ng/L	Manmade chemical; used in stain and grease-proof coatings on food packaging, furniture, upholstery, and carpet and as a lubricant; also used as a wetting agent, plasticizer, and corrosion inhibitor	Based on studies of laboratory animals and chemical similarity to PFOS and PFOA, depending on the level and length of exposure, PFDA in drinking water may affect the liver, cholesterol levels, thyroid, and immune system and may cause developmental effects.
Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA) (113507-82-7)	†	--	--	Manmade chemical; developed as an alternative to PFOS and used in products to make them stain, grease, heat, and water resistant	Although PFEESA has not been well studied, because it is structurally similar to HFPO-DA and some other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
Perfluorododecanoic acid (PFDoA) (307-55-1)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFDoA has not been well studied, because it is structurally similar to PFDA and other long-chain perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, thyroid, and immune system.
Perfluoroheptanesulfonic acid (PFHpS) (375-92-8)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFHpS has not been well studied, because it is structurally similar to PFOS and other long-chain perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, thyroid, and immune system.
Perfluoroheptanoic acid (PFHpA) (375-85-9) *This is in the UCMR5 but is regulated in MA*	*[0.000020 mg/L]	1,000,000	20 ng/L	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Based on studies of laboratory animals and chemical similarity to PFOS and PFOA, depending on the level and length of exposure, PFHpA in drinking water may affect the liver, cholesterol levels, thyroid, and immune system and may cause developmental effects.

Perfluorohexanesulfonic acid (PFHxS) (355-46-4)** *This is in the UCMR5 but is regulated in MA*	*[0.000020 mg/L]	1,000,000	20 ng/L	Manmade chemical; used as a surfactant to make fluoropolymers, in water- and stain-protective coatings for carpets, paper, and textiles in consumer products, such as food-contact papers, water-proofing agents, cleaning and polishing products and in firefighting foams; also an impurity from industrial production processes	Based on studies of laboratory animals and chemical similarity to PFOS and PFOA, depending on the level and length of exposure, PFHxS in drinking water may affect the liver, cholesterol levels, thyroid, and immune system and may cause developmental effects.
Perfluorohexanoic acid (PFHxA) (307-24-4)	†	--	--	Manmade chemical; breakdown product of stain- and grease-proof coatings on food packaging and household products	Based on studies of laboratory animals, depending on the level and length of exposure, PFHxA in drinking water may affect the liver, the blood, the thyroid and may cause effects on the developing fetus. PFHxA is generally considered less toxic than PFOA and is cleared from the body much faster than PFOS, PFOA and other longer-chain PFAS.
Perfluoro-3-methoxypropanoic acid (PFMPA) (337-73-1)	†	--	--	Manmade chemical; developed as an alternative to PFOA and used in products to make them stain, grease, heat, and water resistant	Although PFMPA has not been well studied, because it is structurally similar to HFPO-DA and some other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
Perfluoro-4-methoxybutanoic acid (PFMBA) (863090-89-5)	†	--	--	Manmade chemical; developed as an alternative to PFOA and used in products to make them stain, grease, heat, and water resistant	Although PFMBA has not been well studied, because it is structurally similar to HFPO-DA and some other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
Perfluorononanoic acid (PFNA) (375-95-1)** *This is in the UCMR5 but is regulated in MA*	*[0.000020 mg/L]	1,000,000	20 ng/L	Manmade chemical; used in the production of fluoropolymers; also used in aqueous film-forming foam (AFFF) for fire suppression	Based on studies of laboratory animals and chemical similarity to PFOS and PFOA, depending on the level and length of exposure, PFNA in drinking water may affect the liver, cholesterol levels, thyroid, and immune system and may cause developmental effects.

Perfluorooctanesulfonic acid (PFOS) (1763-23-1) ** *This is in the UCMR5 but is regulated in MA*	*[0.000020 mg/L]	1,000,000	20 ng/L	Surfactant or emulsifier; used in fire-fighting foam, circuit board etching acids, alkaline cleaners, floor polish, and as a pesticide active ingredient for inset bait traps; U.S. manufacture of PFOS phased out in 2002; however, PFOS still generated incidentally.	Exposure to PFOS in drinking water may affect the liver and cholesterol and thyroid hormone levels. Some studies indicate that exposures to elevated levels of PFOS could cause immunological effects, developmental effects, and some types of cancer in laboratory animals and in people.
Perfluorooctanoic acid (PFOA) (335-67-1) ** *This is in the UCMR5 but is regulated in MA*	*[0.000020 mg/L]	1,000,000	20 ng/L	Used for its emulsifier and surfactant properties in or as fluoropolymers (such as Teflon), fire-fighting foams, cleaners, cosmetics, greases and lubricants, paints, polishes, adhesives, and photographic films	Exposure to PFOA in drinking water may affect the liver and cholesterol and thyroid hormone levels. Some studies indicate that exposures to elevated levels of PFOA could cause immunological effects, developmental effects, and some types of cancer in laboratory animals and in people.
Perfluoropentanoic acid (PFPeA) (2706-90-3)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFPeA has not been well studied, because it is structurally similar to PFBA and some other shorter-chain perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver and thyroid. Like PFBA, PFPeA may be less toxic than PFOA and PFOS, and is cleared from the body much faster than these and other longer-chain PFAS.
Perfluoropentanesulfonic acid (PFPeS) (2706-91-4)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFPeS has not been well studied, because it is structurally similar to PFBS and some other shorter-chain perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver and thyroid. Like PFBS, PFPeS may be less toxic than PFOA and PFOS, and is cleared from the body much faster than these and other longer-chain PFAS.
Perfluorotetradecanoic acid (PFTA) (376-06-7)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFTA has not been well studied, because it is similar to other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
Perfluorotridecanoic acid (PFTrDA) (72629-94-8)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFTrA has not been well studied, because it is similar to other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.

Perfluoroundecanoic acid (PFUnA) (2058-94-8)	†	--	--	Manmade chemical; used in products to make them stain, grease, heat, and water resistant	Although PFUnA has not been well studied, because it is similar to PFDA and other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (763051-92-9)	†	--	--	Manmade chemical; developed as an alternative to PFOS; used in products to make them stain, grease, heat, and water resistant	Although 11Cl-PF3OUdS has not been well studied, because it is similar to PFOS and some other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS) (756426-58-1)	†	--	--	Manmade chemical; developed as an alternative to PFOS; used in products to make them stain, grease, heat, and water resistant	Although 9Cl-PF3ONS has not been well studied, because it is similar to PFOS and some other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
4,8-Dioxa-3H-perfluorononanoic acid (ADONA) (919005-14-4)	†	--	--	Manmade chemical; developed as an alternative to PFOA and used in products to make them stain, grease, heat, and water resistant	Although ADONA has not been well studied, it is structurally related to PFOA and some other perfluorinated compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS) (39108-34-4)	†	--	--	Manmade chemical; used to manufacture surfactant and surface protection products and/or are present as intermediate transformation products of these raw materials	8:2 FTS has not been well studied. However, because this compound is a precursor to PFOS and other fluorinated sulfonic acid compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS) (757124-72-4)	†	--	--	Manmade chemical; used to manufacture surfactant and surface protection products and/or are present as intermediate transformation products of these raw materials	4:2 FTS has not been well studied. However, because this compound is a precursor to PFOS and other fluorinated sulfonic acid compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.

1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS) (27619-97-2)	†	--	--	Manmade chemical; used to manufacture surfactant and surface protection products and/or are present as intermediate transformation products of these raw materials	6:2 FTS has not been well studied. However, because this compound is a precursor to PFOS and other fluorinated sulfonic acid compounds that have been associated with effects on various organ systems, it may cause similar effects, for example on the liver, kidneys, and immune system.
Petroleum hydrocarbons Total Petroleum Hydrocarbons Aliphatics C5-C8 (30080) C9-C12(30089) C9-C18(30092) C19-C36(30057) Aromatics C9-C10(30087) C11-C22(30048)	 0.2 mg/L 0.3 mg/L 0.7 mg/L 0.7 mg/L 14.0mg/L 0.2 mg/L 0.2 mg/L	 1000 1000 1000 1000 0 1000 1000	 200 ppb 300 ppb 700 ppb 700 ppb 14 ppm 200 ppb 200 ppb	Discharge from the production, distribution, storage, and use of petroleum in transportation and industrial applications	Some people who drink water containing petroleum hydrocarbons at high concentrations for many years could experience effects on the central nervous system, blood, immune system, liver, spleen, kidneys, developing fetus, and lungs.
Piperonyl Butoxide (51-03-6)	*[0.992 mg/L][7]	1000	992 ppb	Deposition and run-off from pesticide application for mosquitoes	Consumption of piperonyl butoxide in drinking water for many years at very high concentrations could result in effects on the liver and may possibly increase the risk of cancer.
Profenofos[2] (41198-08-7)	*[0.0003 mg/L][3]	1000000	300 ppt	Deposition and run-off from use as an insecticide	Long-term exposure to profenofos produces inhibition of an enzyme in the body called cholinesterase (ChE) that is responsible for regulating nerve activity. ChE inhibition may result in nervous system effects including cognitive changes in the brain (i.e., confusion, memory, decision-making).
2-propen-1-ol[2] (107-18-6)	*[0.035 mg/L][3]	1000	350 ppb	Solvent in the pharmaceutical industry; formed naturally in small amounts during many fermentation processes and produced in small amounts by gut microflora.	Some people who drink water containing 1-propen-1-ol at high concentrations for many years could experience effects on the liver and kidney.
Propachlor (1918167)	†	--	--	Run-off from use as a herbicide	Some people who drink water containing propachlor at high concentrations for many years could experience liver effects.
n-propylbenzene (103651)	†	--	--	Discharge from chemical manufacturing	Some people who drink water containing n-propylbenzene at high concentrations for many years may experience central nervous system effects.

Quinoline[2] (91-22-5)	*[0.00001mg/L (one in one million cancer risk)[3] 0.001mg/L (one in ten thousand cancer risk)[3]	1,000,000	10 ppt (one in one million cancer risk); 1000 (one in ten thousand cancer risk)	Environmental contaminant associated with facilities processing oil shale or coal; solvent used in the manufacture of dyes and chemicals.	Some people who drink water containing quinoline at high concentrations for many years could experience effects on the liver. The US EPA has classified o-toluidine as a likely human carcinogen.
Radon-222 (14869677)	10,000 pCi/L	--	10,000 pCi/L	Natural sources	Some people who drink water containing radon-222 at high concentrations for many years could experience cancer of the lung.
Sodium (7440235)	20 mg/L	--	20 ppm	Discharge from the use and improper storage of sodium-containing de-icing compounds or in water-softening agents	Some people who drink water containing sodium at high concentrations for many years could experience an increase in blood pressure.
Strontium[1] (7440246)	*[1500 ug/L] [3]	--	1500 ppb	Naturally occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions	Consuming high levels of strontium in drinking water could interfere with bone growth, especially in children and in individuals whose diet is low in calcium and protein.
Sulfate (14808-79-8)	†	--	--	Natural sources	Some people who drink water containing sulfate at high concentrations for many years could experience diarrhea.
Sumithrin (d-Phenothrin)	*[0.040 mg/L][7]	1000	40 ppb	Deposition and run-off from pesticide application for mosquitoes	Consumption of sumithrin in drinking water at very high concentrations could result in effects on the nervous system, including to the developing fetus, and may be irritating to eyes and skin, but these effects are very unlikely as sumithrin in water breaks down very quickly.
Tebuconazole[2] (107534-96-3)	*[0.19 mg/L][3]	1000	190 ppb	Deposition and run-off from fungicide application	Some people who drink water containing tebuconazole at high concentrations for many years could experience chronic effects on the liver, adrenal glands, blood, and nervous system. The US EPA has classified tebuconazole as a possible human carcinogen.

Tertiary-amyl methyl ether (TAME) (994058)	0.09 mg/L	1000	90 ppb	Discharge from use as an octane enhancer and oxygenate in gasoline	Some people who drink water containing TAME at high concentrations for many years could experience effects on the kidney and liver and possible cancer.
Tertiary butyl alcohol (TBA) (75650)	0.12 mg/L	1000	120 ppb	Degraded from MTBE; discharged from use as an octane enhancer and oxygenate in gasoline	Some people who drink water containing TBA at high concentrations for many years could experience effects on the kidney and bladder and possible cancer.
Testosterone (58220)	†	--	--	Androgenic steroid naturally produced in the human body; and used in pharmaceuticals	--
1,1,1,2-Tetrachloroethane (630206)	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing 1,1,1,2-tetrachloroethane at high concentrations for many years could experience liver effects.
1,1,2,2-Tetrachloroethane (79345)	†	--	--	Discharge from use in dry cleaning	Some people who drink water containing 1,1,2,2-tetrachloroethane at high concentrations for many years could experience nausea, vomiting and liver damage.
Tetrahydrofuran (109999)	0.6 mg/L	1000	600 ppb	Discharge from use as an adhesive for joining pipes in water treatment systems and as a production solvent	Some people who drink water containing tetrahydrofuran at high concentrations for many years could experience effects o the central nervous system, liver, kidney, and lung and possible cancer.
Total permethrin (cis- & trans-)[2] (52645-53-1)	*[0.003344 mg/L (one in one million cancer risk) 0.3344 mg/L (one in ten thousand cancer risk)][3]	1000	3.344 ppb (one in one million cancer risk); 334.4 ppb (one in ten thousand cancer risk)	Deposition and run-off from insecticide application	Some people who drink water containing permethrin at high concentrations for many years could experience effects on the liver and nervous system. In studies with animals, permethrin produced decreased fertility in females. Pregnant animals exposed to permethrin showed signs of possible immune system damage in males and females. The US EPA has designated permethrin as likely to cause cancer in humans.
(Total organic carbon[2]) This was a UCMR4 *indicator* and does not need to be reported in the CCR	--	--	--	Decaying natural organic matter; synthetic sources of organic matter such as detergents, pesticides, fertilizers, herbicides, industrial chemicals, and chlorinated organics.	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, such as liver or kidney problems, or nervous system effects, and may lead to an increased risk of cancer.

Tribufos[2] (78-48-8)	*[0.0006 mg/L][3]	1000000	600 ppt	Deposition and run-off from application as a plant growth regulator	Long-term exposure to tribufos produces inhibition of an important enzyme in the body called cholinesterase (ChE) that is responsible for regulating nerve activity. ChE inhibition may result in nervous system effects including cognitive changes in the brain (i.e., confusion, memory, decision-making). Available information does not indicate that chlorpyrifos causes adverse effects beyond ChE inhibition in humans. Based on the results of animal studies, a special EPA committee concluded that tribufos should be considered unlikely to be carcinogenic at low doses, but likely to be carcinogenic at high doses.
1,2,3-Trichlorobenzene	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing 1,2,3-trichlorobenzene at high concentrations for many years could experience liver effects.
1,1,2-Trichloro-1,2,2-trifluoroethane (76131)	210 mg/L	--	210 ppm	Discharge from use as a cleaning agent, production solvent, and blowing agent	Some people who drink water containing 1,1,2- trichloro-1,2,2-trifluoroethane at high concentrations for many years could experience problems on the nervous system.
Trichlorofluoromethane (Freon 11) (75694)	†	--	--	Discharge from use as a refrigerant	Some people who drink water containing trichlorofluoromethane at high concentrations for many years could experience central nervous system effects.
1,2,3-Trichloropropane[1] (96184)	*[0.0004 to 0.04 ug/L][3, 9]	1,000,000	400 to 40,000 ppq	Discharge from use in paint and varnish removers	Some people who ingest water with high concentrations of 1,2,3-trichloropropane for long periods of time could develop stomach irritation, effects on the liver and blood, and increased risk of cancer. USEPA considers this chemical likely to be carcinogenic to humans.
1,2,4-Trimethylbenzene (95636)	†	--	--	Discharge from use in dyes and paints	Some people who drink water containing 1,2,4-trimethylbenzene at high concentrations for many years could experience central nervous system effects.
1,3,5-Trimethylbenzene (108678)	†	--	--	Discharge from use in chemical manufacturing	Some people who drink water containing 1,3,5-trimethylbenzene at high concentrations for many years could experience central nervous system effects.
Vanadium[1] (7440622)	*[21 ug/L][3]	NA	21 ppb	Naturally occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst	Consumption of drinking water with high levels of vanadium could impact kidney function in some people.

† There is no ORSG or other health value for these contaminants.

* Denotes that there is no ORSG for this contaminant but lists another drinking water health value. Please see footnotes to determine which health value is used.

** On March 14, 2023, EPA released proposed National Primary Drinking Water Regulations for PFOA, PFOS and four other PFAS. EPA is proposing to set a maximum contaminant level (MCL) of 4.0 parts per trillion (ppt) for PFOA and 4.0 ppt for PFOS and is proposing to address four additional PFAS (GenX, PFBS, PFNA, and PFHxS) as a mixture using a Hazard Index. A

Hazard Index accounts for the increased risk from mixtures of PFAS. MassDEP applauds EPA for releasing its proposed drinking water regulations for a combination of six PFAS compounds and will evaluate the impacts of these new draft values as EPA works toward a final rule. Massachusetts will adopt PFAS drinking water regulations that are at least as stringent as the federal standards. This will follow the release of EPA's final drinking water standards for PFAS, will include consideration of the findings of MassDEP's three-year review of the existing state PFAS regulations, and will be finalized before the federal deadline.

[1] This was a UCMR3 contaminant.
[2] This was a UCMR4 contaminant.
[3] HRL: US EPA Health Reference Level
[4] The World Health Organization has established a provisional guidance value benchmark for chlorate of 700 ug/L.
[5] US EPA will consider other information to determine whether the drinking water standard for total chromium needs to be revised.
[6] HA: EPA Health Advisory
[7] HHBP: US EPA Office of Pesticide Programs chronic Human Health Benchmark for Pesticides
[8] MRL: Minimum reporting level
[9] Where two UCMR3 health benchmarks are listed, the first number is associated with a 10^{-6} cancer risk and the second number, a 10^{-4} risk.

Additional Information

More information on the potential health effects of these chemicals can be found at: http://www.atsdr.cdc.gov/substances/index.asp; http://www.epa.gov/iris. US EPA also provides additional information for several of these chemicals.

For further information on MassDEP Office of Research and Standards drinking water guidelines (ORSGs), which have been established for some chemicals that do not have federal US EPA standards, please see http://www.mass.gov/eea/agencies/massdep/water/drinking/standards/standards-and-guidelines-for-drinking-water-contaminants.html. ORSGs have been developed to provide health protective drinking water guidance. They are based on laboratory animal or, when available, human data. To account for uncertainties in the science, they are set at values well below those where adverse effects have been observed and account for other potential sources of exposure.

Secondary Contaminants Chart

SMCL -- Sources to Drinking Water -- Health and/or Aesthetic Effects

KEY:

CASRN - Chemical Abstract Services Registry Number
SMCL – Secondary Maximum Contaminant Level
C.U. – Color Unit
T.O.N. – Threshold odor numbers
mg/L – milligram per liter (same as ppm)
ppm – parts per million
ppb – parts per billion

Chemical (CASRN)	SMCL	To convert for CCR, multiply by	SMCL in CCR units	Source to Drinking Water	Health and/or Aesthetic Effects
Aluminum	0.2 mg/L	1000	200 ppb	Residue from water treatment process: erosion of natural deposits	May produce colored water
Chloride	250 mg/L	--	250 ppm	Runoff and leaching from natural deposits; seawater influence	May produce a salty taste
Color	15 C.U.	--	15 C.U.	--	May produce a visible tint
Copper	1 mg/L	--	1 ppm	Internal corrosion of household plumbing; erosion of natural deposits	May produce a metallic taste; blue-green staining

Chemical (CASRN)	SMCL	To convert for CCR, multiply by	SMCL in CCR units	Source to Drinking Water	Health and/or Aesthetic Effects
Corrosivity	Non-corrosive	--	--	Balance of hydrogen, carbon, and oxygen in water, affected by temperature and other factors	May produce a metallic taste; corroded pipes; fixture staining
Fluoride	2.0 mg/L	--	2 ppm	Erosion of natural deposits	May produce tooth discoloration
Foaming agents	0.5 mg/L	1000	500 ppb	Municipal and industrial waste discharge	May produce froth; cloudiness; bitter taste; odor
Iron	0.3 mg/L	1000	300 ppb	Natural and industrial sources as well as aging and corroding distribution systems and household pipes	Use of water containing iron at concentrations above the secondary MCL may result in aesthetic issues including the staining of laundry and plumbing fixtures and water with an unpleasant metallic taste and rusty odor.
Manganese*	0.05 mg/L (0.30 mg/L ORSG)	1000	50 ppb (300 ppb ORSG)	Natural sources as well as discharges from industrial uses	Use of water containing manganese at concentrations above the secondary MCL may result in aesthetic issues including the staining of laundry and plumbing fixtures and water with an unpleasant bitter metallic taste, odor, and/or black-brown color.
*EPA has established a lifetime Health Advisory (HA) of 0.3 mg/L and an acute HA at 1.0 mg/L					
Odor	3 T.O.N.	--	3 T.O.N.	Naturally occurring organic materials that form ions when in water; seawater influence	May produce a “rotten-egg”, musty, or chemical smell
pH	6.5 – 8.5	--	6.5 – 8.5	Runoff and leaching from natural deposits; seawater influence	Low pH may produce a bitter metallic taste; corrosion High pH may produce a slippery feel; soda taste; deposits
Silver	0.10 mg/L	1000	100 ppb	Naturally occurring element	May produce skin discoloration, graying of the white part of the eye

Chemical (CASRN)	SMCL	To convert for CCR, multiply by	SMCL in CCR units	Source to Drinking Water	Health and/or Aesthetic Effects
Sulfate	250 mg/L	--	250 ppm	Runoff and leaching from natural deposits; industrial wastes	May produce a salty taste
Total dissolved solids (TDS)	500 mg/L	--	500 ppm	Runoff and leaching from natural deposits; seawater influence	May produce hardness; deposits; colored water; staining; salty taste
Zinc	5 mg/L	--	5 ppm	Corrosion of household plumbing systems; erosion of natural deposits	May produce a metallic taste

Please go to http://water.epa.gov/drink/contaminants/secondarystandards.cfm for additional information on secondary contaminants.

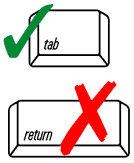
Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Drinking Water Program

Consumer Confidence Report Certification

For calendar year _____

A. PWS Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



PWS Name

City /Town

The community water system named above hereby certifies that its Consumer Confidence Report (CCR) was distributed to customers, appropriate agencies, and notices of availability have been given in compliance with 310 CMR 22.16A. Furthermore, the system certifies that the information contained in the report is correct and consistent with the compliance monitoring data previously submitted to MassDEP.
I certify under penalty of law that I am the person authorized to fill out this form and the information contained herein is true, accurate, and complete to the best of my knowledge and belief.

PWS ID#

Name

Title

Phone #

Date

Signature of Owner/Responsible Party or Certified Operator

B. Public Notice Certification

CCR delivery by newspaper or postings does not meet PN requirements. PN must be directly delivered (by hand, land, electronic).

Is this system using this CCR to provide **Tier 3** Public Notice? ☐ Yes ☐ No

What PN is included? Violation ☐ UCMR ☐ Other ☐

List other

Did you have a consultation with MassDEP ? ☐ Yes ☐ No

Consultation date

The PN can be found on page _____ of the CCR.

Date of PN Occurrence

☐ I am reporting multiple Tier 3 PNs. I have listed the additional PN information at the end of this form.

The public water system indicated above hereby affirms that a Tier 3 public notice has been provided within this CCR to consumers in accordance with 310 CMR 22.16(4) including: delivery, content, format requirements, notification deadlines, and that the public water system will meet future requirements for notifying new billing units and new customers of the violation.

C. For Systems Selling Water to Other Community Water Systems

If you did not sell water to another community PWS skip Section C.

☐ My system delivered the applicable information required at 310 CMR 22.16A(3), to the buying system(s) no later than April 1st of this year, or by the mutually agreed upon date specifically included in a written contract between the parties.

D. Annual Cross Connection Education

Is this CCR being used for your system's annual cross-connection education? ☐ Yes ☐ No
If no, what methods did you use to meet your annual CCCP requirements (citation)?

Continued on next page

ALL distribution (posting, land or e-delivery, publication, and good faith efforts) must be completed on or before July 1st.

E. Consumer Delivery Methods – Based on Population Served

For systems serving fewer than 500 persons:
(Choose #1 or #2)

Date of delivery/publication

☐ 1. My system used one or more of the following methods to notify customers that the CCR would **not** be mailed directly to them but is available to them upon request. (A copy of the notice is attached).

☐ Land mail ☐ Door-to-door ☐ Newspaper ☐ eMail ☐ Post notices

Locations of posted notices

☐ 2. My system provided a copy of the CCR to each customer by the following methods(s):

☐ Published the full CCR in a local newspaper (the published report is attached).

When email is used for delivery, any returned emails must be redelivered by land delivery ideally within 3 days but before July 1.

☐ Land mailed or hand-delivered the CCR to consumers.

☐ eMailed with PDF of CCR or ☐ eMailed with embedded CCR (email is attached)

☐ Posted the CCR on the web and sent the direct URL to customers by way of mail or email (notice is attached).

List URL

Instructions for customers to request a hard copy must also be included in e-delivery.

For systems serving between 500 and 9,999 persons:
(Choose #1 or #2)

Date of delivery/publication

☐ 1. My system provided a copy of the CCR to each customer by
☐ Land mail ☐ eMail with PDF ☐ eMail with embedded CCR

☐ Land mailed or ☐ eMailed a notice of availability of the CCR with a direct URL

When a URL is used it must be a direct link to the document.

List the URL if used.

☐ 2.My system provided the CCR to each customer by publishing the full report in a newspaper (a copy of the published CCR is attached) and provided notice to consumers of this action by either:
☐ Published a notice of this in a local newspaper
☐ Land mailed a notice of this to consumers.
☐ e-Mailed a notice of this to consumers.

For systems serving 10,000 or more persons:

Date of delivery/publication

☐ My system provided a copy of the CCR to each customer by:

☐ Land mail ☐ eMail with PDF ☐ eMail with embedded CCR
☐ Land mailed or ☐ eMailed a notice of availability of the CCR with a direct URL

List the URL if used.

☐ In addition to one of the delivery methods checked above, my system serves greater than 100,000 persons and, as required, has posted the CCR on a publicly accessible Internet site:
www.

List the URL used

F. Good Faith Delivery Methods (minimum of 3 is required)

To reach people who drink our water but are not billed customers the following were conducted in addition to the required delivery:

☐ Posted the CCR on a publicly accessible Internet site at the following address. (Only for systems under 100,000 population who did not use this method as their primary method)
www. _____
List the URL used.

☐ Mailed the CCR to all postal patrons within the service area (list of zip codes used is attached).

☐ Mailed a postcard listing the URL where the CCR can be found, to all postal patrons within the service area (list of zip codes used is attached).

www. _____
List the URL used.

☐ Advertised availability of the CCR in the following news media (the announcement is attached):
☐ Radio ☐ Newspaper ☐ Television / cable ☐ Social media
☐ Digital signboard ☐ Other _____

☐ Published the CCR in local newspaper (the published CCR is attached).

☐ Posted the CCR in public places i.e., post office, town hall, library (a list of locations is attached).

☐ Delivered multiple CCR copies to single-bill addresses serving several persons i.e., apartments, businesses, large private employers (a list of locations is attached).

☐ Delivered multiple CCR copies to community organizations (A list of organizations is attached.)

☐ Posted the CCR or a notice of availability at locations within the apartment/condo complex (list of the locations is attached).

☐ _____
Other

G. Mandatory Agency Delivery Requirements

All systems must complete all 3

☐ 1. Delivered 1 copy of CCR and the Certification Form to local board of health. (Contact your board of health as to whether they would prefer land or e-delivery of CCR.)
_____ Date completed

Agencies and consumers must **receive** CCR on or before July 1.

☐ 2. Delivered 1-copy of CCR and the Certification Form to MA Dept. of Public Health.
☐ PDF emailed to: dph.ccr@massmail.state.ma.us or
☐ Hardcopy to: 250 Washington St.; Boston, MA 02108
_____ Date completed

Scan documents into 1 PDF file. Make sure Cert form is the first page.

☐ 3. Delivered 1-copy of CCR, the Certification Form, and **all** the attachments check-marked in this form to the MassDEP Boston Office at:
☐ PDF emailed to: Program.Director-DWP@state.ma.us or
☐ Hardcopy to: CCR Program, 100 Cambridge St Ste 900; Boston, MA 02114
_____ Date completed

Do NOT send to regional offices. They will not be accepted. Email only to Boston Office. Hard copies can only be sent with MassDEP approval.