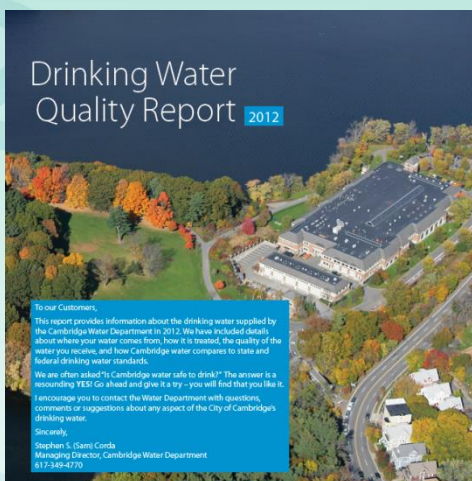


Converting Laboratory Units into Consumer Confidence Report Units



The National Primary Drinking Water Regulations (NPDWRs) establish drinking water standards. These standards are Maximum Contaminant Levels (MCLs), Maximum Residual Disinfectant Levels (MRDLs), Action Levels (ALs), and treatment techniques (TTs). These standards are typically numbers less than 1.0, because the detected concentrations in drinking water are so low. The Consumer Confidence Report (CCR) Rule requires community water systems (CWSs) to present drinking water standards and water sample results as numbers greater than or equal to 1.0 in order to enhance consumer understanding of their drinking water quality. These units are often referred to as CCR units. (Please note that the water sample or laboratory result may be less than 1.0 after conversion.)

TTs are required processes intended to reduce the level of a contaminant in drinking water. There is no conversion for TTs.

This factsheet is designed to assist CWSs, to convert their laboratory results into CCR units. Several conversion examples are provided as well as resources for more information. In addition, the complete list of NPDWR standards in CCR units and their accompanying conversion factors is included at the end of this factsheet.

Why Do I Only Need to Convert Some Results?

Laboratories may report results in a different concentration unit than what is required for the CCR. For certain contaminants, the CWS must then convert the laboratory results before reporting them in the CCR. There are some instances however, where the drinking water standard is reported as a number greater than or equal to 1.0 and then a conversion is not needed.

The CCR is an annual water quality report that all CWSs are required to provide to their customers. Some states have more stringent requirements and may require non-community water systems to create a CCR, so check with your state to see if the requirement applies to your system. The CCR aims to inform customers about their water source, detected contaminants, the health effects of those contaminants and compliance history.

Key elements:

- Tables displaying the levels of detected regulated contaminants.
- Health-related and educational information on the detected contaminants.

This document provides a summary of federal drinking water requirements; to ensure full compliance, please consult the federal regulations at 40 CFR 141 and any approved state requirements.

What Are Examples of How to Convert Laboratory Results to CCR Units?

The following examples explain how to prepare results for CCRs. Appendix A is modified from the Code of Federal Regulations and contains much of the basic information you need to include in your CCR. For additional guidance refer to *Preparing Your Drinking Water Consumer Confidence Report* available at <http://www.epa.gov/safewater/ccr>.

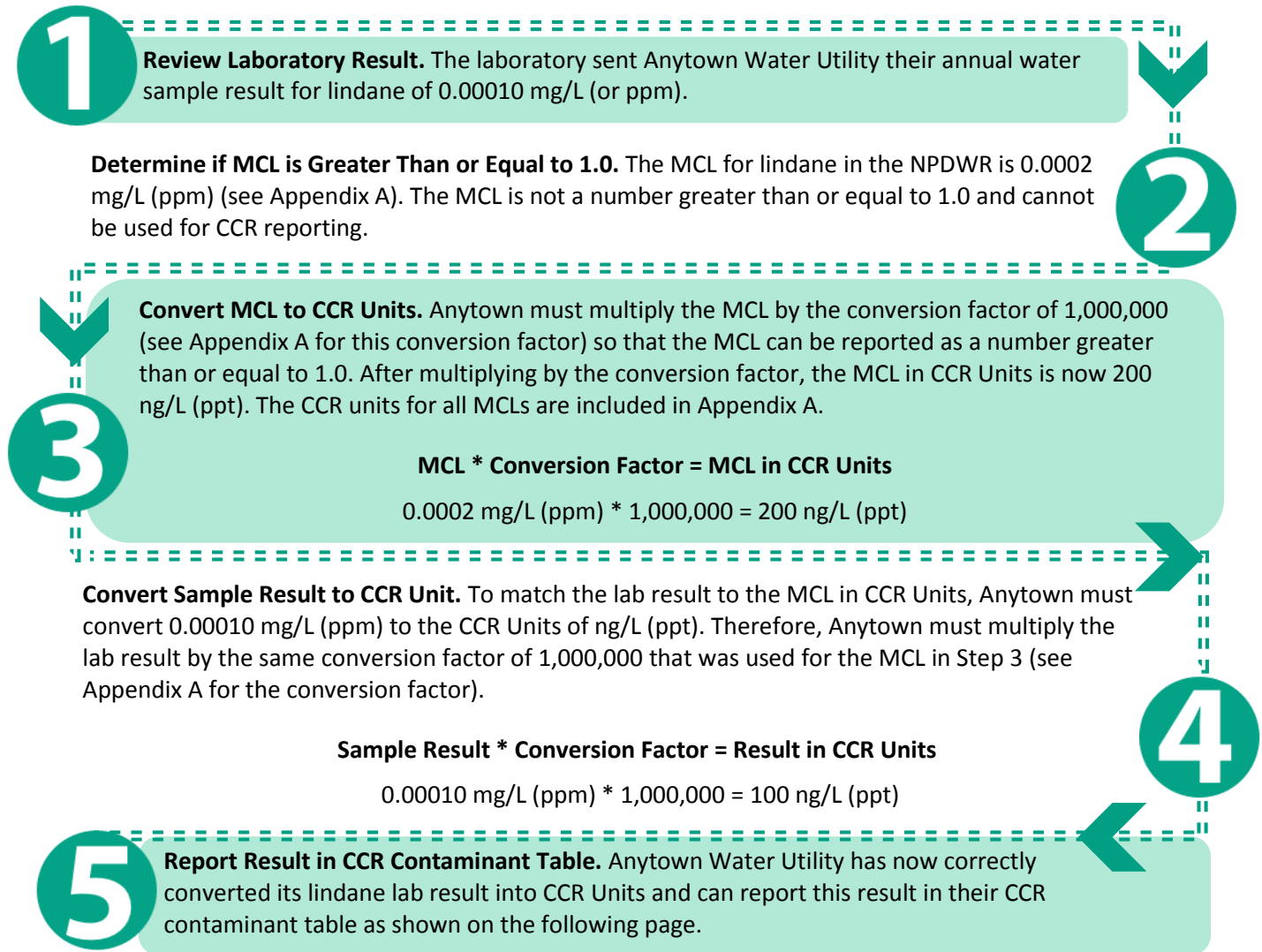
Types of Reporting Units

milligrams per liter (mg/L)	=	parts per million (ppm)
micrograms per liter (µg/L)	=	parts per billion (ppb)
nanograms per liter (ng/L)	=	parts per trillion (ppt)
picograms per liter (pg/L)	=	parts per quadrillion (ppq)

Did You Know?

Another way to define these reportable units is by equating ppm to “1 drop in 1 million gallons,” ppb to “1 drop in 1 billion gallons,” ppt to “1 drop in 1 trillion gallons,” and ppq to “1 drop in 1 quadrillion gallons,” which shows that these units reflect a very small amount.

Example A: Converting MCLs from Parts per Million (ppm) to Parts per Trillion (ppt)



Contaminant	MCL (Highest Level Allowed)	MCLG (Ideal Goal)	Your Water	Range of Results	Violation	Sources in Drinking Water
Lindane	200 ppt	200 ppt	100 ppt	NA	NO	Runoff or leaching from insecticide used on cattle, lumber, gardens

Example B: Converting MCLs from Parts per Million (ppm) to Parts per Billion (ppb)

1

Review Laboratory Result. The laboratory sent Anytown Water Utility their water sample result. The running annual average of monthly results for bromate is 0.06 mg/L (ppm), which is greater than the MCL thus resulting in an MCL violation.

Determine if MCL is Greater Than or Equal to 1.0. The MCL for bromate in the NPDWR is 0.010 mg/L (ppm) (see Appendix A). The MCL is not a number greater than or equal to 1.0 and cannot be used for CCR reporting.

2

Convert MCL to CCR Units. Anytown must multiply the MCL by the conversion factor of 1,000 (see Appendix A for this conversion factor) so that the MCL can be reported as a number greater than or equal to 1.0. After multiplying by the conversion factor, the MCL in CCR Units is now 10 µg/L (ppb). The CCR units for all MCLs are included in Appendix A.

3

$$\text{MCL} * \text{Conversion Factor} = \text{MCL in CCR Units}$$

$$0.010 \text{ mg/L (ppm)} * 1,000 = 10 \text{ } \mu\text{g/L (ppb)}$$

Convert Sample Result to CCR Unit. To match the lab result to the MCL in CCR Units, Anytown must convert 0.06 mg/L (ppm) to the CCR Units of µg/L (ppb). Therefore, Anytown must multiply the lab result by the same conversion factor of 1,000 that was used for the MCL in Step 3 (see Appendix A for the conversion factor).

$$\text{Sample Result} * \text{Conversion Factor} = \text{Result in CCR Units}$$

$$0.06 \text{ mg/L (ppm)} * 1,000 = 60 \text{ } \mu\text{g/L (ppb)}$$

4

5

Report Result in CCR Contaminant Table. Anytown has now correctly converted its bromate result into CCR Units and can report this result in their CCR contaminant table. Because this bromate sample result caused Anytown's running annual average to exceed the MCL, Anytown must explain the bromate MCL violation in their CCR, as seen in the contaminant table below and health effects language on the following page.

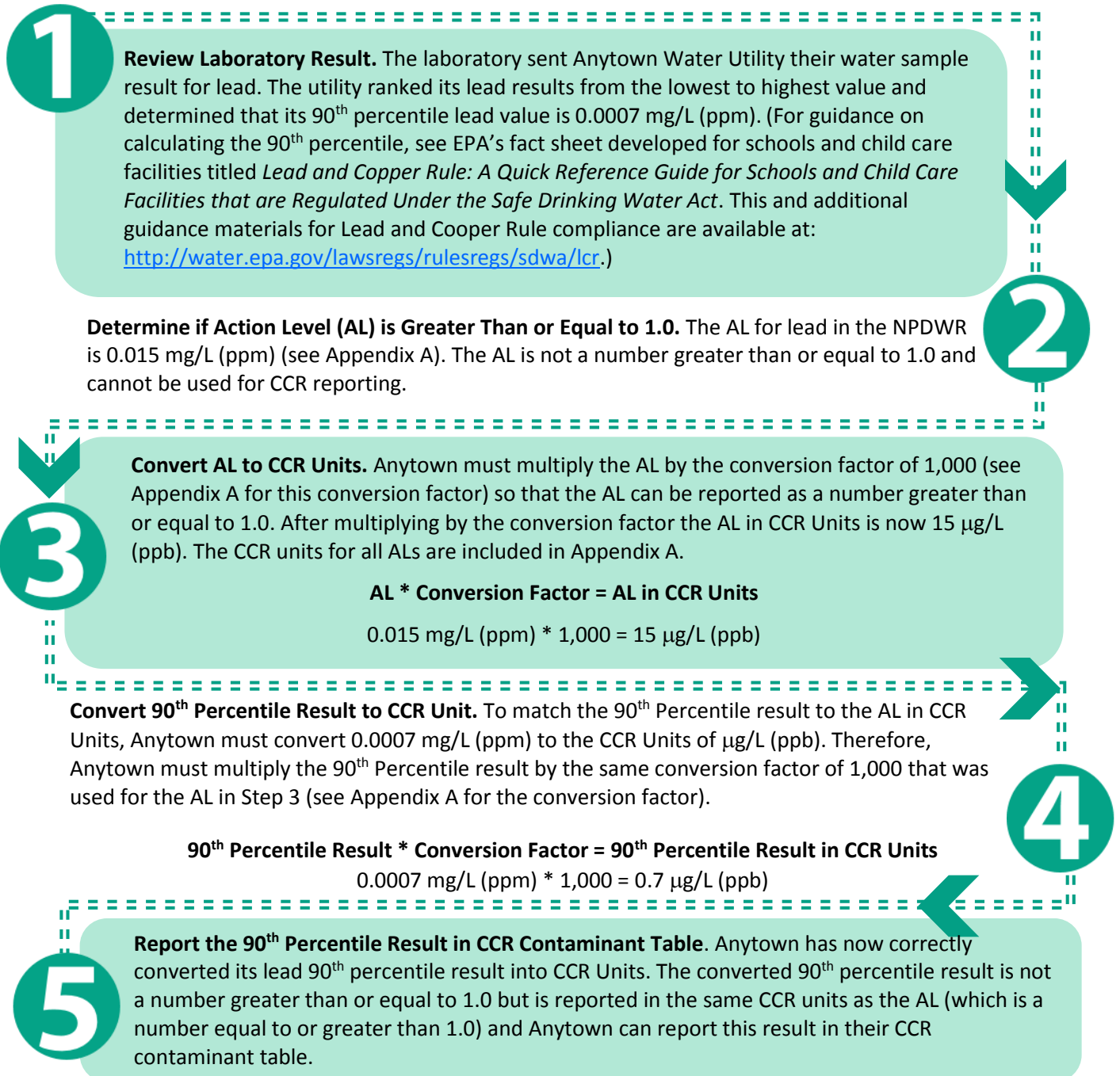
Contaminant	MCL (Highest Level Allowed)	MCLG (Ideal Goal)	Your Water	Range of Results	Violation	Sources in Drinking Water
Bromate	10 ppb	0 ppb	60 ppb	40-80 ppb	YES	By-product of drinking water disinfection

Violations and Exceedances: Bromate

Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. Bromate is a chemical that is formed when a system uses ozone to disinfect drinking water and it reacts with naturally occurring bromide in source water. We are working to minimize the formation of bromate while ensuring an adequate level of disinfection to protect customers from exposure to bacteria. Testing results from October 2014 caused the running annual average to exceed the MCL. The Utility has taken steps to correct this violation and prevent future violations from occurring. Modifications to operational procedures have been made that should ensure that future violations do not occur. We sent a notice warning you of the problem when it occurred. If you would like more information about bromate or the violation call us at 111-2233 or Sample County's Health Department at 111-3377.

(Note: For more information on reporting violations in your CCR, please refer to *Preparing Your Consumer Confidence Report: Guidance for Water Suppliers.*)

Example C: Converting Lead Action Levels



Contaminant	AL	MCLG (Ideal Goal)	90% of Utility Levels were less than	# Sites Exceeding the AL	Violation	Sources in Drinking Water
Lead	15 ppb	0 ppb	0.7 ppb	0	NO	Corrosion of household plumbing

Where Can I Find More Information?

The following resources are available to help CWSs when performing unit conversions.

- EPA’s CCR Compliance Help/Tools for Systems. <http://water.epa.gov/lawsregs/rulesregs/sdwa/ccr>.

Appendix A. What Are the National Primary Drinking Water Regulations' CCR Units?

The following Appendix is modified from the Code of Federal Regulations, Appendix A to Subpart O of Part 141—Regulated Contaminants. This Appendix provides the contaminant MCL and MCLG, MRDLs, TTs and ALs in CCR units, along with the associated conversion factor, for all regulated contaminants that may need to be reported by a CWS. Appendix A also describes the major sources and health effects language for all regulated contaminants of drinking water that must be reported in the CCR.

Acronym	Definition
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)
N/A	Not Applicable
NTU	Nephelometric Turbidity Units (a measure of water clarity)
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 ($\mu\text{g/L}$)
ppt	parts per trillion, or nanograms per liter (ng/L)
ppq	parts per quadrillion, or picograms per liter (pg/L)
TT	Treatment Technique

Contaminant (CCR units)	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						
Total Coliform Bacteria (Until March 31, 2016)	MCL: (systems that collect ≥40 samples per month) 5% of monthly samples are positive; (systems that collect <40 samples per month) 1 positive monthly sample	–	MCL: (systems that collect ≥40 samples per month) 5% of monthly samples are positive; (systems that collect <40 samples per month) 1 positive monthly sample	0	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, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
Total Coliform Bacteria (Beginning April 1, 2016)	TT	–	TT	N/A	Naturally present in the environment	Use language found in § 141.153(h)(7)(i)(A)
Fecal coliform and <i>E. coli</i> (Until March 31, 2016)	0	–	0	0	Human and animal fecal waste	Fecal coliforms and <i>E. coli</i> are bacteria whose presence indicates that the water may be 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 of the elderly, and people with severely-compromised immune systems.
<i>E. coli</i> (Beginning April 1, 2016)	Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform positive repeat sample for <i>E. coli</i> .	–	Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform positive repeat sample for <i>E. coli</i> .	0	Human and animal fecal waste	<i>E. coli</i> 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 (enterococci or coliphage)	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Total Organic Carbon (ppm)	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 increased risk of getting cancer.
Turbidity (NTU)	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.
Radioactive Contaminants						
Beta/photon emitters (mrem/yr)	4 mrem/yr	–	4 mrem/yr	0 mrem/yr	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 particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters (pCi/L)	15 pCi/L	–	15 pCi/L	0 pCi/L	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 (pCi/L)	5 pCi/L	–	5 pCi/L	0 pCi/L	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 (pCi/L)	30 µg/L	–	30 ppb	0 ppb	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.
Inorganic Contaminants						
Antimony (ppb)	0.006 ppm	1,000	6 ppb	6 ppb	Discharge from petroleum refineries; 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 (ppb)	0.010 ppm	1,000	10 ppb	0 ppb	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 (MFL)	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Barium (ppm)	2 ppm	–	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 (ppb)	0.004 ppm	1,000	4 ppb	4 ppb	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions
Bromate (ppb)	0.010 ppm	1,000	10 ppb	0 ppb	By-product of drinking water disinfection	Some people who drink water of containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Cadmium (ppb)	0.005 ppm	1,000	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.
Chloramines (ppm)	MRDL=4 ppm	–	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 (ppm)	MRDL=4 ppm	–	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 (ppb)	MRDL=.8 ppm	1,000	MRDL=800 ppb	MRDLG = 800 ppb	Water additive used to control microbes	Some infants and young children who drink water 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 (ppm)	1 ppm	–	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 (ppb)	0.1 ppm	1,000	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Copper (ppm)	AL=1.3 ppm	-	AL=1.3 ppm	1.3 ppm	Corrosion of household plumbing systems; Erosion of natural deposits	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.
Cyanide (ppb)	0.2 ppm	1,000	200 ppb	200 ppb	Discharge from steel or metal factories; 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 (ppm)	4 ppm	-	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. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining or pitting of the teeth or both, and occurs only in developing teeth before they erupt from the gums.
Lead (ppb)	AL=0.015 ppm	1,000	AL=15 ppb	0 ppb	Corrosion of household plumbing systems; Erosion of natural deposits	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury [inorganic] (ppb)	0.002 ppm	1,000	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 (ppm)	10 ppm	-	10 ppm	10 ppm	Runoff from fertilizer use; Leaching from septic tanks, sew age; 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 (ppm)	1 ppm	-	1 ppm	1 ppm	Runoff from fertilizer use; Leaching from septic tanks, sew age; 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.
Selenium (ppb)	0.05 ppm	1,000	50 ppb	50 ppb	Discharge from petroleum and 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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Thallium (ppb)	0.002 ppm	1,000	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 ppm	1,000	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](ppb)	0.05 ppm	1,000	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 and 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 (ppb)	0.002 ppm	1,000	2 ppb	0 ppb	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.
Atrazine (ppb)	0.003 ppm	1,000	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] (ppt)	0.0002 ppm	1,000,000	200 ppt	0 ppt	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)	0.04 ppm	1,000	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 (ppb)	0.002 ppm	1,000	2 ppb	0 ppb	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 (ppb)	0.2 ppm	1,000	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 (ppb)	0.4 ppm	1,000	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Di(2-ethylhexyl) phthalate (ppb)	0.006 ppm	1,000	6 ppb	0 ppb	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.
Dibromochloro-propane (ppt)	0.0002 ppm	1,000,000	200 ppt	0 ppt	Runoff or leaching from soil fumigant used on soybeans, cotton, pineapples, 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 (ppb)	0.007 ppm	1,000	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 (ppb)	0.02 ppm	1,000	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 ppm	1,000,000, 000	30 ppq	0 ppq	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 (ppb)	0.1 ppm	1,000	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 (ppb)	0.002 ppm	1,000	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 (ppt)	0.00005 ppm	1,000,000	50 ppt	0 ppt	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.
Glyphosate (ppb)	0.7 ppm	1,000	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 (ppt)	0.0004 ppm	1,000,000	400 ppt	0 ppt	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 (ppt)	0.0002 ppm	1,000,000	200 ppt	0 ppt	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Hexachloroben-zene (ppb)	0.001 ppm	1,000	1 ppb	0 ppb	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.
Hexachlorocyclo-pentadiene (ppb)	0.05 ppm	1,000	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 (ppt)	0.0002 ppm	1,000,000	200 ppt	200 ppt	Runoff or 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 (ppb)	0.04 ppm	1,000	40 ppb	40ppb	Runoff or 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] (ppb)	0.2 ppm	1,000	200 ppb	200 ppb	Runoff or 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.
PCBs [Polychlorinated biphenyls] (ppt)	0.0005 ppm	1,000,000	500 ppt	0 ppt	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.
Pentachloro-phenol (ppb)	0.001 ppm	1,000	1 ppb	0 ppb	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 (ppb)	0.5 ppm	1,000	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 (ppb)	0.004 ppm	1,000	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 (ppb)	0.003 ppm	1,000	3 ppb	0 ppb	Runoff or 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 (ppb)	0.005 ppm	1,000	5 ppb	0 ppb	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
Carbon tetrachloride (ppb)	0.005 ppm	1,000	5 ppb	0 ppb	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.
Chlorobenzene (ppb)	0.1 ppm	1,000	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 (ppb)	0.6 ppm	1,000	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 (ppb)	0.075 ppm	1,000	75 ppb	75 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 (ppb)	0.005 ppm	1,000	5 ppb	0 ppb	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 (ppb)	0.007 ppm	1,000	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 (ppb)	0.07 ppm	1,000	70 ppb	70ppb	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 (ppb)	0.1 ppm	1,000	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 (ppb)	0.005 ppm	1,000	5 ppb	0 ppb	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.
1,2-Dichloropropane (ppb)	0.005 ppm	1,000	5 ppb	0 ppb	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 (ppb)	0.7 ppm	1,000	700 ppb	700 ppb	Discharge from petroleum refineries	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 (HAA) (ppb)	0.060 ppm	1,000	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 (ppb)	0.1 ppm	1,000	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 (ppb)	60 ppb	1,000	5 ppb	0 ppb	Discharge from factories and dry cleaners	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.

Contaminant (CCR units)	MCL	To Convert For CCR Multiply By	MCL in CCR Units	MCLG in CCR Units	Major Sources In Drinking Water	Health Effects Language
1,2,4-Trichlorobenzene (ppb)	100 ppb	1,000	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 (ppb)	0.2 ppm	1,000	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 (ppb)	0.005 ppm	1,000	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.
Trichloroethylene (ppb)	0.005 ppm	1,000	5 ppb	0 ppb	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] (ppb)	0.10/0.080 ppm	1,000	100/80 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 (ppm)	1 ppm	–	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 (ppb)	0.002 ppm	1,000	2 ppb	0 ppb	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 (ppm)	10 ppm	–	10 ppm	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.