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Private Well 101: Drinking Water Standards[1]

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Introduction

Drinking water comes from a variety of sources, including public water systems, private wells, or bottled water. While public water systems are monitored under the federal Safe Drinking Water Act, private wells are not regulated (US Environmental Protection Agency 2004). Private well users are responsible for the management and protection of their wells and water quality.

This EDIS publication is for Florida homeowners who are interested in learning more about drinking water standards. It also serves as a reference for well owners to understand their drinking water quality.

Primary Drinking Water Standards

Drinking water supplied by municipal water systems is monitored for many contaminants. As authorized by the 1974 Safe Drinking Water Act and its amendments, the US Environmental Protection Agency (EPA) has established limits on the concentration of certain drinking water contaminants allowed in public water supplies. These limits are set to protect your health and ensure that your water is of good quality. The Florida Department of Environmental Protection (FDEP) has accepted the National Standards as published herein.

The EPA standards for drinking water fall into two categories: Primary Standards and Secondary Standards. Primary Standards are based on health considerations and are enforced by the EPA. They protect you from three classes of toxic pollutants:

- Pathogens: Disease-causing organisms such as bacteria, fungi, or viruses.
- Radioactive elements: Substances that emit radiation, such as radium, uranium, and plutonium. Radiation can cause cancer in people and other living things.
- Toxic chemicals: Substances that can injure or kill people.

Additionally, the Primary Standards establish a limit, called the Maximum Contaminant Level (MCL), on the highest allowable concentration of a contaminant in drinking water supplied by municipal water systems. The MCL is usually expressed in milligrams per liter (mg/L). Table 1-1 to Table 1-6 contain the current primary drinking water standards.

How Primary Standards Are Set

EPA regulators develop Primary Standards for drinking water contaminants based on three criteria:

- The contaminant causes adverse health effects.
- It is detectable in drinking water.
- It is known to occur in drinking water.

When establishing Primary Standards for a drinking water contaminant, the government first looks at all the toxicological data on that contaminant, usually obtained from acute and chronic animal studies. Occasionally human clinical or epidemiological data are also available. Experts use this information to estimate the concentration of a drinking water contaminant that may be toxic and the concentrations, if any, that may cause no adverse effects. Because the levels of contaminants found in drinking water are rarely high enough to cause acute health effects, health officials are most concerned about chronic health effects such as cancer, birth defects, miscarriages, nervous system disorders, and organ damages. These health effects may occur after prolonged exposure to small amounts of a substance.

If the EPA decides not to regulate a contaminant based on the above three criteria, they may decide to develop a health advisory. A health advisory is a nonenforceable federal limit. It serves as technical guidance for federal, state, and local officials.

Regulators treat cancer-causing substances (carcinogens) differently from contaminants that cause other health effects.

Noncancerous Chemicals

For chemicals that cause adverse health effects other than cancer, Acceptable Daily Intake (ADI) levels are determined. ADI is the daily dose of a substance that a person can ingest over a lifetime without harming their health. The ADI level also includes a conservative safety margin. Regulators use the ADI to establish a Maximum Contaminant Level Goal (MCLG). The MCLG is the concentration of a contaminant that experts believe a

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person can drink safely over their lifetime. It is based entirely on health considerations and, as a health goal, is set at a level where no adverse health effects should occur. The MCLG is not enforced by the EPA. It is used to set enforceable drinking water standards, the Maximum Contaminant Level (MCL). The MCL is the Primary Standard measurement enforced by the EPA. It is set as close as possible to the MCLG. When setting the MCL, EPA regulators consider the feasibility and the combined cost of analyzing water for a contaminant and for treating water to remove the contaminant in addition to public health considerations. Therefore, the MCL is often less stringent than the MCLG.

Cancerous Chemicals

When establishing primary standards for chemicals that are believed to cause cancer, no concentration is considered safe. Therefore, the lifetime goal, the MCLG, is set at zero. However, a zero level is not always feasible to achieve. For example, laboratories may not be able to detect carcinogens found at low levels, or the cost of maintaining the levels of carcinogens below the MCL may not be feasible. In addition, when carcinogens are found at very low concentrations, the risk of cancer becomes so small that it is considered negligible. Therefore, regulators must decide what level of risk is acceptable. It may be one excess cancer in 10,000 persons or one excess cancer in 1 million persons exposed over a lifetime of 70 years. The concentration of chemical estimated to cause this "acceptable level" of risk is called the Risk Estimate. It is then used to set the MCL.

Table 1-1 to Table 1-6 list the current primary drinking water standards for different categories of contaminants: microorganisms, disinfection byproducts, disinfectants, inorganic chemicals, organic chemicals, and radionuclides.

Secondary Drinking Water Standards

Secondary Standards regulate contaminants that cause offensive taste, odor, color, corrosivity, foaming, and staining in drinking water. The concentration limit is called the Secondary Maximum Contaminant Level (SMCL). Secondary Standards are not enforced because they are not considered to pose a risk to human health at the recommended SMCL. They are guidelines for water treatment plant operators and state governments attempting to provide communities with the best quality water possible. Table 2 lists the current secondary drinking water standards.

Drinking Water Standards Are Not Absolute

Drinking water standards do reflect sound scientific judgment and are based on the best and most current knowledge available. They also include margins of safety to reduce adverse health effects and protect human health. The Safe Drinking Water Act also requires EPA to review each national primary drinking water regulation at least once every six years and revise them, if appropriate. As part of the "Six-Year Review," EPA evaluates any newly available data, information, and technologies to determine if any regulatory revisions are needed. Revisions must maintain or strengthen public health protection.

However, it is also important to understand that Primary Standards for drinking water contaminants do not guarantee that water with a contaminant level below the standard is risk-free, nor do they mean that water with a higher level is unsafe. It is mainly because setting drinking water standards is an imperfect process:

- Regulatory decisions are often complicated by economic, political, and social considerations.
- Data relating human health effects to chemicals in drinking water are limited, and scientists have difficulty predicting the effects of drinking small amounts of chemicals for many years.
- The standards do not take into account the possible presence of other chemicals, which may increase or decrease the toxicity of the contaminant.

Current Drinking Water Standards

As mentioned earlier, the EPA has set MCLs for microorganisms, disinfection byproducts, disinfectants, inorganic chemicals, organic chemicals, and radionuclides. The EPA periodically issues standards for additional organic and inorganic chemicals, microbes, and viruses. Many more organic chemicals known to be present in drinking water are not currently regulated by either state or federal standards.

Working through state governments, the EPA monitors community drinking water. When a standard is exceeded, the EPA requires that contaminant level to be reduced to the MCL. The corrective treatment is left to the individual water system, usually a private utility.

State Responsibilities

Ultimately, regulatory officials in your state set and enforce drinking water standards for EPA-regulated contaminants and for other contaminants. However, states are not permitted to set standards that are less stringent than the MCLs set by the EPA.

Drinking water standards represent conservative judgements of scientists and regulators and are based on all available information on the health effects of drinking water contaminants. Although current drinking water standards do not guarantee that the glass of water you draw from your tap will be absolutely safe and pure, they

do reflect sound scientific judgment and are based on all the knowledge that is available.

Private Well Owner Responsibility

As a private well owner, you are responsible for the quality of your own drinking water. Private wells are usually not required to test their drinking water to meet primary drinking water standards. However, you can use the public drinking water standards as guidelines when evaluating the quality of your drinking water.

For more information about drinking water standards, please see US EPA, "Drinking Water Requirements for States and Public Water Systems": https://www.epa.gov/dwreginfo.

Publication History

Stewart, Judith C., Ann T. Lemley, Sharon I. Hogan, and Richard A. Weismiller. 1989. "Health Effects of Drinking Water Contaminants." Cornell University and University of Maryland.

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US Environmental Protection Agency. February 17, 2022. "Secondary Drinking Water Standards: Guidance for Nuisance Chemicals." https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals

Table 1-1. US EPA Primary Drinking Water Standards—Microorganisms.

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3] (mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Cryptosporidium	zero	TT	Gastrointestinal illness (such as diarrhea, vomiting, and cramps)	Human and animal fecal waste
Giardia lamblia	zero	TT	Gastrointestinal illness (such as diarrhea, vomiting, and cramps)	Human and animal fecal waste
Heterotrophic plate count (HPC)	n/a	TT	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment.
Legionella	zero	TT	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems
Total Coliforms (including fecal coliform and *E. coli*)	zero	5.0%	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present.	Coliforms are naturally present in the environment as well as feces; fecal coliforms and *E. coli* only come from human and animal fecal waste.
Turbidity	n/a	TT	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (such as whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff
Viruses (enteric)	zero	TT	Gastrointestinal illness (such as diarrhea, vomiting, and cramps)	Human and animal fecal waste

[1] MCLG—Maximum Contaminant Level Goal: 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 and are nonenforceable public health goals.

[2] MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

[3] TT—Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

[4] For the latest primary drinking water standards in microorganisms, please visit the US EPA National Primary Drinking Water Regulations website: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Microorganisms.

Table 1-2. US EPA Primary Drinking Water Standards—Disinfection Byproducts.

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3](mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Bromate	zero	0.01	Increased risk of cancer	Byproduct of drinking water disinfection
Chlorite	0.8	1	Anemia; infants and young children: nervous system effects	Byproduct of drinking water disinfection
Haloacetic acids (HAA5)	n/a	0.06	Increased risk of cancer	Byproduct of drinking water disinfection
Total trihalomethanes (TTHMs)	n/a	0.08	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection

[1] MCLG—Maximum Contaminant Level Goal: 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 and are nonenforceable public health goals.

[2] MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

[3] TT—Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

[4] For the latest primary drinking water standards in disinfection byproducts, please visit the US EPA National Primary Drinking Water Regulations website: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Byproducts.

Table 1-3. US EPA Primary Drinking Water Standards—Disinfectants.

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3](mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Chloramines (as Cl2)	41	4.01	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes
Chlorine (as Cl2)	41	4.01	Eye/nose irritation; stomach discomfort	Water additive used to control microbes
Chlorine dioxide (as ClO2)	0.81	0.81	Anemia; infants and young children: nervous system effects	Water additive used to control microbes

[1] MCLG—Maximum Contaminant Level Goal: 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 and are nonenforceable public health goals.

[2] MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

[3] TT—Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

[4] For the latest primary drinking water standards in disinfectants, please visit US EPA National Primary Drinking Water Regulations website: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Disinfectants.

Table 1-4. US EPA Primary Drinking Water Standards—Inorganic Chemicals.

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3](mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Antimony	0.006	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	0	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass and electronics production wastes
Asbestos (fiber > 10 micrometers)	7 million fibers per liter (MFL)	7 MFL	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits
Barium	2	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium	0.004	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium	0.005	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (total)	0.1	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits
Copper	1.3	1.3	Short-term exposure: gastrointestinal distress. Long-term exposure: liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level.	Corrosion of household plumbing systems; erosion of natural deposits
Cyanide (as free cyanide)	0.2	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride	4	4	Bone disease (pain and tenderness of the bones); children may get mottled teeth.	Water additive that promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3](mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Lead	zero	0.015	Infants and children: delays in physical or mental development; children could show slight deficits in attention span and learning abilities. Adults: kidney problems; high blood pressure.	Corrosion of household plumbing systems; erosion of natural deposits
Mercury (inorganic)	0.002	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands
Nitrate (measured as Nitrogen)	10	10	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.	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits
Nitrite (measured as Nitrogen)	1	1	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.	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits
Selenium	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines
Thallium	0.0005	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

[1] MCLG—Maximum Contaminant Level Goal: 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 and are nonenforceable public health goals.

[2] MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

[3] TT—Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

[4] For the latest primary drinking water standards in inorganic chemicals, please visit the US EPA National Primary Drinking Water Regulations website: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Inorganic.

Table 1-5.US EPA Primary Drinking Water Standards—Organic Chemicals.

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3] (mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Acrylamide	zero	TT	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/wastewater treatment
Alachlor	zero	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops
Atrazine	0.003	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops
Benzene	zero	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills
Benzo(a)pyrene (PAHs)	zero	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines
Carbofuran	0.04	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa
Carbon tetrachloride	zero	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities
Chlordane	zero	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide
Chlorobenzene	0.1	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories
2,4-D	0.07	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops
Dalapon	0.2	0.2	Minor kidney changes	Runoff from herbicide used on rights of way
1,2-Dibromo-3-chloropropane (DBCP)	zero	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
o-Dichlorobenzene	0.6	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories
p-Dichlorobenzene	0.075	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories
1,2-Dichloroethane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
1,1-Dichloroethylene	0.007	0.007	Liver problems	Discharge from industrial chemical factories

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3] (mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
cis-1,2-Dichloroethylene	0.07	0.07	Liver problems	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	0.1	0.1	Liver problems	Discharge from industrial chemical factories
Dichloromethane	zero	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories
1,2-Dichloropropane	zero	0.005	Increased risk of cancer	Discharge from industrial chemical factories
Di(2-ethylhexyl) adipate	0.4	0.4	Weight loss, liver problems, or possible reproductive difficulties.	Discharge from chemical factories
Di(2-ethylhexyl) phthalate	zero	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories
Dinoseb	0.007	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables
Dioxin (2,3,7,8-TCDD)	zero	3E-08	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories
Diquat	0.02	0.02	Cataracts	Runoff from herbicide use
Endothall	0.1	0.1	Stomach and intestinal problems	Runoff from herbicide use
Endrin	0.002	0.002	Liver problems	Residue of banned insecticide
Epichlorohydrin	zero	TT8	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals
Ethylbenzene	0.7	0.7	Liver or kidneys problems	Discharge from petroleum refineries
Ethylene dibromide	zero	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries
Glyphosate	0.7	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use
Heptachlor	zero	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide
Heptachlor epoxide	zero	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor
Hexachlorobenzene	zero	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3] (mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Hexachlorocyclopentadiene	0.05	0.05	Kidney or stomach problems	Discharge from chemical factories
Lindane	0.0002	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	0.04	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl (Vydate)	0.2	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes
Polychlorinated biphenyls (PCBs)	zero	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals
Pentachlorophenol	zero	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories
Picloram	0.5	0.5	Liver problems	Herbicide runoff
Simazine	0.004	0.004	Problems with blood	Herbicide runoff
Styrene	0.1	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners
Toluene	1	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories
Toxaphene	zero	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle
2,4,5-TP (Silvex)	0.05	0.05	Liver problems	Residue of banned herbicide
1,2,4-Trichlorobenzene	0.07	0.07	Changes in adrenal glands	Discharge from textile finishing factories
1,1,1-Trichloroethane	0.2	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	0.003	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories
Trichloroethylene	zero	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3] (mg/L)	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Vinyl chloride	zero	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories
Xylenes (total)	10	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories

[1] MCLG—Maximum Contaminant Level Goal: 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 and are nonenforceable public health goals.

[2] MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

[3] TT—Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

[4] For the latest primary drinking water standards in organic chemicals, please visit the US EPA National Primary Drinking Water Regulations website: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Organic.

Table 1-6. US EPA Primary Drinking Water Standards—Radionuclides.

Contaminant	MCLG[1](mg/L)	MCL[2] or TT[3](mg/L)2	Potential Health Effects from Long-Term Exposure above the MCL (unless specified as short-term)	Sources of Contaminant in Drinking Water
Alpha particles	zero	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Beta particles and photon emitters	zero	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation
Radium 226 and Radium 228 (combined)	zero	5 pCi/L	Increased risk of cancer	Erosion of natural deposits
Uranium	zero	30 ug/L	Increased risk of cancer, kidney toxicity	Erosion of natural deposits

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[2] MCL—Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

[3] TT—Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

[4] For the latest primary drinking water standards in radionuclides, please visit the US EPA National Primary Drinking Water Regulations website: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Radionuclides.

Table 2. US EPA Secondary Drinking Water Standards.

Contaminant	Secondary MCL	Noticeable Effects above the Secondary MCL
Aluminum	0.05 to 0.2 mg/L	colored water
Chloride	250 mg/L	salty taste
Color	15 color units	visible tint
Copper	1.0 mg/L	metallic taste; blue-green staining
Corrosivity	Noncorrosive	metallic taste; corroded pipes/ fixtures staining
Fluoride	2.0 mg/L	tooth discoloration
Foaming agents	0.5 mg/L	frothy, cloudy; bitter taste; odor
Iron	0.3 mg/L	rusty color; sediment; metallic taste; reddish or orange staining
Manganese	0.05 mg/L	black to brown color; black staining; bitter metallic taste
Odor	3 TON (threshold odor number)	"rotten-egg," musty or chemical smell
pH	6.5–8.5	low pH: bitter metallic taste; corrosion
		high pH: slippery feel; soda taste; deposits
Silver	0.1 mg/L	skin discoloration; graying of the white part of the eye
Sulfate	250 mg/L	salty taste
Total Dissolved Solids (TDS)	500 mg/L	hardness; deposits; colored water; staining; salty taste
Zinc	5 mg/L	metallic taste

[1] For the latest second drinking water standards, please visit the US EPA Secondary Drinking Water Standards: Guidance for Nuisance Chemicals website: https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals#table.

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