



U.S. Drinking Water Quality Standards & Regulations *Summary*

August 2010

Disclaimer: The standards & regulations provided here are attributable to the named source and are assumed to be accurate at the time of posting. This information was assembled by us as a service to our customers, but has not been independently verified or confirmed.

Primary Drinking Water Regulations

Primary Drinking Water Regulations (NPDWRs or primary standards) are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. Visit the list of regulated contaminants with links for more details.

List of Contaminants and their Maximum Contaminant Level (MLC):

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Microorganisms

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
Cryptosporidium	zero	Included in unfiltered systems	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and Animal fecal Waste
Giardia lamblia	zero	99.9% Removal	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and Animal fecal Waste
Heterotrophic plate count	N/A	500 colonies per millimeter	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water.	HPC measures a range of bacteria that are naturally present in the environment
Legionella	zero	No limit	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%	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present	Human and Animal fecal Waste
Turbidity	N/A	1 NTU	Nausea, cramps, diarrhea, and associated headaches.	Soil runoff
Viruses (enteric)	zero	99.9% Removal	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and Animal fecal Waste

Disinfectants

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
Chloramines (as Cl ₂)	4	4	Eye/Nose irritation; stomach discomfort, anemia	Water additive used to control microbes
Chlorine (as Cl ₂)	4	4	Eye/Nose irritation; stomach discomfort	Water additive used to control microbes
Chlorine Oxide (as ClO ₂)	0.8	0.8	Anemia; infants & young children: nervous system effects	Water additive used to control microbes

Disinfection Byproducts

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
Bromate	Zero	0.01	Increased Risk of Cancer	Byproduct of drinking water disinfection
Chlorite	0.8	1.0	Anemia; infants & 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

Inorganic Chemicals

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants 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	zero	0.01	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 & electronics production wastes
Asbestos (Fiber > 10 μm)	7 million fibers per liter	7 million fibers per liter	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

Inorganic Chemicals (Continued)

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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	Gastrointestinal distress -> Liver or kidney damage	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 which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Lead	Zero	0.015	Infants and children: Delays in physical or mental development; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits

Inorganic Chemicals (Continued)

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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	Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (measured as Nitrogen)	1	1	Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching 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	0.005	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

Organic Chemicals

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
Acrylamide	zero	Treatment Technique	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

Organic Chemicals (Continued)

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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

Organic Chemicals (Continued)

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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
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

Organic Chemicals (Continued)

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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	0.00000003	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	Treatment Technique	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals

Source: Environmental Protection Agency
www.epa.gov

Organic Chemicals (Continued)

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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
Hexachloro-cyclopentadiene	0.05	0.05	Kidney or stomach problems	Discharge from chemical factories

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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	0.20	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
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
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

Radionuclides

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Contaminant	MCL Goal (mg/L)	MCL limit (mg/L)	Potential Health Effects From Long Term Exposure Above the MCL	Sources of Contaminants in Drinking Water
Alpha particles	none	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	none	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)	none	5 pCi/L	Increased risk of cancer	Erosion of natural deposits
Uranium	none	30 ug/L as of 12/08/03	Increased risk of cancer, kidney toxicity	Erosion of natural deposits

Secondary Drinking Water Regulations

Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.

EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

List of Secondary Drinking Water Regulations

Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L

List of Secondary Drinking Water Regulations (Continued)

Contaminant	Secondary Standard
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L



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