

Primary (Health-related) Organic Contaminants

Contaminants	MCLG+,mg/L	MCL+, mg/L	Treatment Methods	
Acrylamide	zero (action level)	0.0005	Control of water treatment chemicals and surfaces in contact with water	
Alachlor	zero	0.002	Activated Carbon	
Atrazine	0.003	0.003	Activated Carbon	
Benz(a)anthracene	zero (P)*	0.0001 (P)*	Activated Carbon	
Benzene	zero	0.005	Activated Carbon	Air Stripping
Benzo(a)pyrene	zero	0.0002	Activated Carbon	
Carbofuran	0.04	0.04	Activated Carbon	
Carbon tetrachloride	zero	0.005	Activated Carbon	Air Stripping
Chlordane	zero	0.002	Activated Carbon	
Chlorobenzene	0.1	0.1	Activated Carbon	Air Stripping
2, 4-D	0.07	0.07	Activated Carbon	
Dalapon	0.2	0.2	Activated Carbon	
1,2-Dibromo 3-chloropropane(DBCP)	zero	0.0002	Activated Carbon	Air Stripping
o-Dichlorobenzene	0.6	0.6	Activated Carbon	Air Stripping
p-Dichlorobenzene	0.075	0.075	Activated Carbon	Air Stripping
1,2-Dichloroethane)	zero	0.005	Activated Carbon	Air Stripping
1,1-Dichloroethylene	0.007	0.007	Activated Carbon	Air Stripping
Dichloromethane	zero	0.005	Air Stripping	
cis-1,2-Dichloroethylene	0.07	0.07	Activated Carbon	Air Stripping
trans-1,2-Dichloroethylene	0.1	0.1	Activated Carbon	Air Stripping
1,2-Dichloropropane	zero	0.005	Activated Carbon	Air Stripping
Di(2-ethylhexyl)adipate	0.4	0.4	Activated Carbon	Air Stripping
Di(2ethylhexyl)phthalate	zero	0.006	Activated Carbon	
Dinoseb	0.007	0.007	Activated Carbon	
Dioxin(2,3,7,8-TCDD)	zero	0.00000003	Activated Carbon	
Diquat	0.02	0.02	Activated Carbon	
Endothall	0.1	0.1	Activated Carbon	
Endrin	0.002	0.002	Activated Carbon	
Epichlorohydrin	zero (action level)	0.002	Control of water treatment chemicals and surfaces in contact with water	
Ethylbenzene	0.7	0.7	Activated Carbon	Air Stripping
Ethylene Dibromide	zero	0.00005	Activated Carbon	Air Stripping
Glyphosate	0.7	0.7	Activated Carbon	Oxidation
Heptachlor	zero	0.0004	Activated Carbon	
Heptachlor Epoxide	zero	0.0002	Activated Carbon	
Hexachlorobenzene	zero	0.001	Activated Carbon	
Hexachlorocyclopentadiene	0.05	0.05	Activated Carbon	Air Stripping
Lindane	0.0002	0.0002	Activated Carbon	
Methoxychlor	0.04	0.04	Activated Carbon	
Oxamyl (Vydate)	0.2	0.2	Activated Carbon	
Pentachlorophenol	zero	0.001	Activated Carbon	
Picloram	0.5	0.5	Activated Carbon	
Polychlorinated byphenyls (PCBs)	zero	0.0005	Activated Carbon	



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Primary (Health-related) Organic Contaminants cont.

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Simazine	0.004	0.004	Activated Carbon	
Styrene	0.1	0.1	Activated Carbon	Air Stripping
Tetrachloroethylene	zero	0.005	Activated Carbon	Air Stripping
Toluene	1	1	Activated Carbon	Air Stripping
Toxaphene	zero	0.003	Activated Carbon	
2,4,5-TP (silvex)	0.05	0.05	Activated Carbon	
1,2,4-Trichlorobenzene	0.07	0.07	Activated Carbon	Air Stripping
1,1,1-Trichloroethane	0.2	0.2	Activated Carbon	Air Stripping
1,1,2-Trichloroethane	0.003	0.005	Activated Carbon	Air Stripping
Trichloroethylene	zero	0.005	Activated Carbon	Air Stripping
Vinyl chloride	zero	0.002	Air Stripping	
Xylenes (total)	10	10	Activated Carbon	Air Stripping

(P)* = Proposed Standard

MCLG+ = Maximum Containment Level Goal established at the level at which no known or anticipated adverse effects on the health of per-sons occur and which allows an adequate margin of safety; expressed per liter unless otherwise specified.

MCL+ = Maximum Containment Level established as close to the MCLG as feasible taking into consideration costs and treatment techniques applicable at public water systems; expressed in milligrams per liter unless otherwise specified.

Primary (Health-related) Disinfectants/Disinfectant By Products

Contaminants	MCLG+,mg/L	MCL+, mg/L	Treatment Methods	
Bromate	zero	0.010	Activated Carbon	Air Stripping
Bromodichloromethane	zero	see TTHMs	Activated Carbon	Air Stripping
Bromoform	zero	see TTHMs	Activated Carbon	Air Stripping
Chloramines	4 (total chlorine)	4 (total chlorine)	Activated Carbon	
Chlorine	4 (as free chlorine)	4 (as free chlorine)	Activated Carbon	
Chlorine Dioxide	0.3 (as ClO ₂)	0.8 (as ClO ₂)	Activated Carbon	
Chlorite	0.8	1.0	Activated Carbon	
Chloroform	zero	see TTHMs	Activated Carbon	Air Stripping
Dibromochloromethane	0.06	see TTHMs	Activated Carbon	Air Stripping
Dichloroacetic Acid	zero	see HAA5	Activated Carbon	
Haloacetic Acids (HAA5)	zero	0.06 (0.050) (P)*	Activated Carbon	
Trichloroacetic Acid	0.3	see HAA5	Activated Carbon	
Total Trihalomethanes (TTHMs)	zero	0.080 0.040 (P)*	Activated Carbon Reverse Osmosis (20-90%)	Air Stripping Distillation (20-90%)
Bromodichloromethane			Ultrapurification for precursor removal prior to chlorination	
Bromoform				
Chloroform				
Dichlorobromomethane				

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Primary (Health-related) Inorganic Contaminants

Contaminants	MCLG+,mg/L	MCL+, mg/L	Treatment Methods	
Antimony	0.006	0.006	Coagulation/Filtration Reverse Osmosis Distillation	Submicron Filtration Ultrafiltration
Arsenic (total)	zero (P)*	0.01	Chemical oxidation to convert to Arsenic +5, then use Arsenic +5 treatment methods	
Arsenic (+3)				
Arsenic (+5)			Coagulation/Filtration Anion Exchange Reverse Osmosis Iron Oxide Media Iron/Alumina Media	Submicron Filtration Activated Alumina Distillation Electrodialysis
Arsenic (organic complexes)			Activated Carbon	
Asbestos	7 MFL	7 million fibers per liter (MFL) (longer than microns)	Coagulation/Filtration Reverse Osmosis Ultrafiltration	Submicron Filtration Distillation
Barium	2.0	2.0	Cation Exchange Distillation	Reverse Osmosis Electrodialysis
Beryllium	0.004	0.004	Coagulation/Filtration Activated Alumina Reverse Osmosis Electrodialysis Submicron Filtration/Activated Carbon	Ultrafiltration Cation Exchange Distillation
Cadmium	0.005	0.005	Coagulation/Filtration Submicron Filtration Reverse Osmosis Electrodialysis	Ultrafiltration Cation Exchange Distillation
Chromium(total)	0.1	0.1		
Chromium (+3)	\$		Coagulation/Filtration Reverse Osmosis Electrodialysis	Cation Exchange Distillation
Chromium (+6)			Anion Exchange Distillation	Reverse Osmosis Electrodialysis
Chromium (organic complexes)			Activated Carbon	
Copper	\$ &	1.3 (action level)	Corrosion Control pH Adjustment Polyphosphate Silicate Feed Cation Exchange (20% - 90%)	Reverse Osmosis Distillation Electrodialysis
Cyanide	0.2	0.2	Chemical Oxidation Reverse Osmosis Electrodialysis	Anion Exchange Distillation
Fluoride	4.0	4.0	Activated Alumina Reverse Osmosis Electrodialysis	Bone Char Distillation
Lead	zero	0.015 (action level)	Cation Exchange (20% - 90%) Coagulation/Filtration Submicron Filtration/Activated Carbon Reverse Osmosis	Electrodialysis Distillation
Mercury (total)	0.002	0.002		
Mercury (+2)	0.002	0.002 (total mercury)	Submicron Filtration/Activated Carbon Cation Exchange (20% - 90%) Distillation	Reverse Osmosis Electrodialysis
Mercury (HgCl 3 -1)			Anion Exchange Distillation	Reverse Osmosis Electrodialysis
Mercury (organic complexes)			Activated Carbon	



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Contaminants	MCLG+,mg/L	MCL+, mg/L	Treatment Methods	
Nickel	0.1	0.1	Cation Exchange Distillation	Reverse Osmosis Electrodialysis
Nitrate plus nitrate (as nitrogen)	10	10	Anion Exchange Distillation Reverse Osmosis (sensitive to pressure)	Electrodialysis
Nitrite (as nitrogen)	1	1	Chemical Oxidation/Disinfection Anion Exchange Distillation	Reverse Osmosis Electrodialysis
Selenium (total)	0.05	0.05		
Selenium (+4) (total selenium)	0.05	0.05	Coagulation/Filtration Anion Exchange Reverse Osmosis Ultrafiltration Submicron Filtration/Activated Carbon	Electrodialysis Activated Alumina Distillation
Selenium (+6)			Anion Exchange Reverse Osmosis Electrodialysis	Activated Alumina Distillation
Sulfate	500 (P)*	500 (P)*	Anion Exchange Distillation	Reverse Osmosis Electrodialysis
Thallium	0.0005	0.002	Cation Exchange Distillation	Activated Alumina

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Secondary (Non-Health-Related) Drinking Water Regulations

Contaminants	MCLG+,mg/L	MCL+, mg/L	Treatment Methods	
Iron	0.3 (total iron)			
Ferrous Iron (Fe ⁺²)			Filtration (Pro-OX filters) Electrodialysis Pressure Aeration/Filtration Oxidation/Precipitation/Filtration	Distillation Cation Exchange Reverse Osmosis*
Ferric Iron (Fe ⁺³)	0.3 (total iron)		Filtration (Pro-OX filters) Greensand Calcite (also raise pH to 7.2)	Sand Cartridges
Sequestered iron			Strong oxidation and/or fine (10 micron or <) filtration	
Iron Bacteria			Disinfection and Retention followed by activated carbon filtration for dechlorination	
Colloidal Iron			Coagulation/Filtration	Submicron Filtration
*Ferrous Iron (clean water iron) is readily converted to ferric iron (red water iron) in the presence of any air or oxidizing material; precipitating ferric iron must be prevented to avoid fouling and interference with effective reverse osmosis membrane rejection.				
Manganese (Mn ⁺²)	0.05		Filtration(Pro-OX/Greensand) Reverse Osmosis Oxidation/Precipitation/Filtration Pressure Aeration/Filtration	Cation Exchange Distillation Electrodialysis
Manganese (Mn ⁺⁴)			Filtration Sand Cartridges	Calcite (raise pH to 7.2) Greensand
Sequestered Manganese			Strong Oxidation and/or fine filtration	
Colloidal Manganese			Coagulation/Filtration	Submicron Filtration
*Manganese must be maintained in the soluble manganous (Mn ^{##}) state to avoid fouling and interference with effective reverse osmosis membrane rejection.				
Methyl Tertiary Butyl Ether (MTBE)	No federal limit		Activated Carbon (similar to chloroform and TTHMs, except the treatment life of the activated carbon may be one-half or less of that for chloroform when MTBE will begin to break through). For MBTE concentrations greater than 0.1 mg/L, pre-treat with high air-to-water ratio air stripping prior to activated carbon filtration.	
Odor	3 threshold odor number		Activated Carbon Oxidation followed by retention and filtration Disinfection for sulfate-reducing bacteria If H2S is in the hot water only, remove the hot water anode rod or replace it with an aluminum anode rod.	Air Stripping
Note: Chlorine and hydrogen sulfide are examples of odors that may be reduced by the treatment methods suggested.				
),	6.5 – 8.5		Neutralizing filter (calcite or calcite plus magnesia oxide). pH may be increased by alkalies and may be decreased by acids. Chemical feed of soda ash to raise pH or white vinegar to lower pH.	
Silver (Ag ⁺)	0.1		Coagulation/Filtration Submicron Filtration/Activated Carbon Ion Exchange (Anion or Cation depending on complexed Ion Species)	Distillation Reverse Osmosis
Sulfate (SO4-2)	250		Reverse Osmosis Anion Exchange	Distillation Electrodialysis
Total dissolved solids (TDS)	500		Reverse Osmosis Deionization by Ion Exchange (Cation/Anion in two bed or mixed bed)	Distillation Electrodialysis
Zinc (Zn+2)	5		Reverse Osmosis Cation Exchange	Distillation Electrodialysis
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