Recognized Treatment Techniques for meeting the National Primary Drinking Water Regulations with the Application of Point-Of-Use-Systems:

National Primary Drinking Water Regulations (NPDWRs or primary standards) are legally enforceable standards that apply to public drinking water system.s Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in drinking water. The following tables divide these contaminants into Microorganisms, Radionuclides, Inorganic Chemicals, Organic Chemical and Disinfectant/ Disinfectant Byproducts.

For simplicity, WQA uses the term Point-Of-Use (POU) when referring to both treatment at the tap and for whole house treatment.

Except for instances of contamination through inhalation or dermal adsorption, the WQA notes that in-home treatment of drinking and cooking water only is often the most economical and preferred method of choice for consumer protection from these drinking water health contaminants. Of course, the particular contaminant found in the water will determine the appropriate treatment technique.

The recognized treatment methods listed here reflect the fact that point-of-use systems on the market today may differ widely in their effectiveness to treat any specific contaminant. Also, many of the these can appear in a variety of forms (ionic and/or organic). Examples include arsenic, lead,chromium and mercury which may require different or multiple treatment techniques. Anyone contemplating use of such point-of-use equipment for a specific application or purpose should make their selection only after careful investigation and substantiation of the of the performance capabilities. As part of the installation procedure, the performance of the system should be verified through an appropriate water analysis. In addition, the product water should be monitored and appropriately serviced to ensure continued satisfactory performance.

It is the general consensus of the manufacturers and sellers of the point-of-use systems employing the listed technologies that, if these systems are defect-free, properly applied and installed and maintained strictly according to the manufacturers' installation and maintenance instructions, they may be considered for use in meeting the requirements of the National Primary Drinking Water Regulations (NPDWR).

Note: This document addresses the United States Environmental Protection Agency National Primary Drinking Water Regulations in effect at its time of publication. These regulations are continually being reviewed and updated at the federal level. Accordingly, this list of recognized treatment technologies will be reviewed and amended periodically.

Primary (Health-related) Microbial and Turbidity Contaminants

Contaminants	MCLG+	MCL+	Treatment Methods
Turbidity	-	0.5 to 1 NTU in 95% of samples; maximum of 5 NTU under certain circumstances	Coagulation/Filtration; Submicron Filtration; Sediment Reduction; Ultrafiltration; Reverse Osmosis; Distillation; Cartridge Filtration matched to turbidity particle size
Coliform bacteria	zero	zero in 95% of samples	Turbidity or sediment reduction to 1 NTU, then: Disinfection; Chlorination; Ozone; Iodine (Polyiodide Resins); Ultraviolet Radiation; Distillation; Submicron (absolute) Filtration (<0.45 micron)
Viruses	zero	99.99% reduction or inactivation	Turbidity reduction to 1 NTU, disinfection: Chemical Oxidation/Disinfection; Chlorination; Ozone; Iodine; Ultraviolet Radiation; Distillation
Giardia lamblia and Cryptosporidium cysts	zero	99.9% reduction or inactivation	Turbidity or sediment reduction to 1 NTU, then: Disinfection; Ultraviolet Light; Ozone; Distillation; Absolute Filtration of less than 3 micron-sized particles
Legionella	zero	TT	Sediment reduction to one NTU turbidity, then: disinfection; Ultraviolet Light; Chlorination; Ozone; Iodine
Heterotrophic Plate Count (HPC)	zero	TT	Sediment reduction to one NTU turbidity, then: disinfection; Ultraviolet Light; Chlorination; Ozone; Iodine

Primary (Health-related) Radionuclide Contaminants

Contaminants	MCLG+	MCL+	Treatment Methods
Beta particle and photon activity (formerly man-made radionuclides)	none	4 mrem/year	Ion Exchange (mixed bed); Distillation; Reverse Osmosis; Electrodialysis
Gross alpha particle activity	none	15 pCi/L*	Treatment method depends on the specific radionuclide-e.g., radium, radon or uranium. See below.
Radium 226 and Radium 228	none	5 pCi/L	Cation Exchange; Reverse Osmosis; Distillation; Electrodialysis
Radon	zero (P)*	300 pCi/L (P)*	Activated Carbon; Air Stripping
Uranium	zero (P)*	0.03 mg/L (P)*	Coagulation/Filtration; Submicron Filtration; Anion Exchange; Activated Alumina; Reverse Osmosis; Distillation; Electrodialysis

(P) = Proposed Standard*

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

MCL+=Maximum Contaminant 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.

** = 1 pCi = 2.2 atom disintegrations per minute*

TT = Treatment Technique

Primary (Health -Related) Inorganic Contaminants

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

Primary (Health-related) Inorganic Contaminants cont.

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)	0.05 (total selenium)	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

(P)* = Proposed Standard

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

MCL+ = Maximum Contaminant 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) 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
cis-1,2-Dichloroethylene	0.07	0.07	Activated Carbon Air Stripping
trans-1,2-Dichloroethylene	0.1	0.1	Activated Carbon Air Stripping
Dichloromethane	zero	0.005	Air Stripping