

Table 2. Drinking Water Treatment Systems

Treatment System	Use for	How it works
Ion Exchange/Water softener	Hard water (high levels of calcium and manganese)	In an ion exchange system the water passes through resin beads. The beads are coated with positively charged sodium ions. The sodium ions exchange place with calcium or magnesium, the hard ions.
	Removes some bad odors and colors	Water treated in an ion exchange system may contain elevated levels of sodium. People with hypertension should be aware of that.
	Removes barium, radium, dissolved iron, manganese	
	An added anion exchange unit can remove nitrate and fluoride	
Reverse Osmosis	Radium, sulfate, calcium, magnesium, potassium, nitrate, fluoride, phosphorous	the water is passed through a semi-permeable membrane. The membrane will remove radium sulfate, magnesium, potassium, nitrate, fluoride, phosphorous and other inorganic compounds. The membrane will also remove some organic compounds such as pesticides.
	May remove some pesticides and other organic compounds	The reverse osmosis unit is frequently used with other treatment technologies such as an activated carbon filter or a mechanical filter
Disinfection		
Chlorination	Kills bacteria and some viruses. Removes bad odor, tastes, and color	Chlorination is done one of two ways (1) shock chlorination. Chlorine is pumped through the plumbing system on a one time basis to kill bacteria (2) continual chlorination. Chlorine is added continually through a small pump to kill bacteria. Chlorination will continue to work for some time after treatment stops. Chlorination is often combined with other treatment methods such as a mechanical filter or activated carbon.
UV Radiation	Kills bacteria and some viruses	The UV radiation system used a mercury lamp to kill most bacteria and viruses. It will not work on cysts such as giardia or worms. The lamp will have to be replaced according to the manufacturers suggestions, probably annually to remain effective.
Ozonation	Kills bacteria and some viruses Removed some pesticides, can remove iron, sulfur, and manganese	Ozone is generated electrically and kills the pathogens, bacteria as well as some pesticides. Ozonation is often combined with activated carbon or a mechanical filter and can remove iron, sulfur, manganese.
Filtration		
	Removes organic compounds, radon gas, pesticides	The activated carbon filters absorb the organic contaminants from the water by one of the following methods:
Activated carbon	Hydrogen sulfide, mercury, chlorine	Granular activated carbon (GAC) use loose granules of carbon when the contaminants are absorbed to. The filters can become saturated with impurities and bacteria and lose some of their effectiveness.
	Some types of activated carbon can remove cryptosporidium and giardia cysts	Solid block activated carbon (SBAC) is as the name indicates, a solid block of activated carbon. Because the carbon is compressed it can absorb some of the cysts such as cryptosporidium other treatment systems cannot address. The SBAC are also easily plugged with organic matter and have to be replaced
Mechanical Filtration	Sand, silt, clay, organic matter	The mechanical filters are made of fabric, or fiber, or another kind of screening material that removes material suspended in the water such as sand, silt or organic matter. The mechanical filter cannot remove fine particles or dissolved contaminants. Mechanical filters are often used along with other methods