

## Water Treatment Alternatives

Water Softener - A water softener will typically remove 95 to 99 percent of the calcium and magnesium present in the water. It will replace these metals with sodium metal. Softeners require maintenance by adding salt (NaCl) to the tank on a frequent basis. If the tank runs out of salt, the softener stops removing hardness. Persons on low salt intake diets should not drink softened water. Softeners should not "backflush" into a septic tank. The high salt content will kill the microbiological flora in the tank that is needed for breakdown of organic material. Softeners will extend the life of plumbing and water heaters because they remove the chemicals that precipitate out in the plumbing.

Distilled Water - Distilling systems come in a variety of forms, but they all accomplish basically the same function. Stills typically remove 99+ percent of most chemicals in water. Certain gasses, such as ammonia and chlorine, will usually distill over into the finished product unless the still is equipped with some sort of gas trap. However, these gasses are normally in the 1 -5 mg/L range and do not compromise a large portion of the total solids in water. Although it is virtually mineral free, distilled water typically does not have an appealing taste. The absence of minerals gives distilled water a "flat" taste. By adding about 10% municipal tap water to distilled water, the taste can be improved.

Deionized Water - Deionized water is basically equal in mineral content to distilled water. Deionizers will tend to remove the gasses which are not removed during the distillation process. One adverse result of deionization is that the media in D.I. beds occasionally leaches resins into the water. The presence of these resins can be detected by boiling off a quart of water in a glass jar and examining the bottom of the jar for brown residue.

Reverse-Osmosis Water - R.O. units use a membrane to remove 85 to 96 percent of the total minerals in water. R.O. units are typically expensive to operate on a large scale, so they are usually placed under the kitchen sink where they are dedicated to drinking water and ice machines. The only maintenance required is the changing of the membrane approximately every 6 months. The frequency of membrane changes is determined by the feed water quality. R.O. water, like distilled water, may tend to have a "flat" taste, due to the lack of minerals. Again, it can be blended with small portions of municipal tap water to give it a more appealing taste.

Carbon Filters - Carbon filters are used to remove organic contaminants from water. Organics tend to cause taste and odor problems. During certain times of the year, lakes which supply municipal drinking water may go through periods of instability, due to temperature changes, high winds, and algae die-offs, which may cause organic-related odors. Decaying fish, algae, and plants often cause these odors. Carbon filters are excellent for removing these tastes and odors. Carbon filters will have no effect on tastes in water due to mineral content.

Because carbon filters accumulate concentrations of unstable organic matter, they become a breeding ground for microorganisms and bacteria. Carbon filters should be changed out on a routine basis (typically 3 to 6 months) to avoid excessive microorganism growth.

## **Summary**

If you have problems with excess chemicals or bacteria in water, you should first evaluate which treatment method will best solve your problem. It may be that a combination of the above is best. It is also smart practice to plumb your water system so that you are not over-treating your water. There is no reason to water your yard with softened or RO water. Plumb the sprinkler system separately.

A very common method of treating hard municipal drinking water in West Texas is to place a water softener on the incoming water to your house and a reverse-osmosis unit underneath the kitchen sink. The water softener will extend the life of your plumbing, water heater, and fixtures by removing calcium and magnesium metals. It will also reduce the mineral residue on dishes washed in a dishwasher and cause less soap to be needed for clothes washing machines. Water softeners require the routine addition of salt for regeneration. Most units have a microprocessor that alerts you when additional salt should be added. Monthly is very common.

A reverse-osmosis unit at the kitchen sink will remove approximately 85-95% of all minerals in the water. This will give “bottled water” quality water at the kitchen sink. In addition to reverse osmosis, most RO units today also include an activated carbon filter, which will also remove cancer causing organic compounds in the water, as well as taste and odor from chlorine and other organics. The activated carbon filter in these units should be changed out every 3-6 months. The actual RO module will usually last 1-5 years.

Refrigerator Filters – Many new refrigerators come with a cartridge-type filter installed. These filters are sediment – activated carbon filters. They will remove some taste and odor, but do not remove minerals from the water. These should be changed out every 3-6 months.