

Treatment Options

If your well-water test revealed problems with your water, you may want to consider treating the water. Different options treat different problems, and it may take more than one to make your water safe. Systems are either “point-of-entry” which treats all the water entering the home, or “point-of-use” systems, which treat the water at one faucet, usually used for drinking and/or cooking.

The following are common methods of home water treatment:

Shock Chlorination: Shock chlorination will take care of bacteria problems in your well. This can be done in two ways. 1) Chlorine pellets can be purchased from a certified laboratory or well driller. Pellets are poured into the well, and allowed to sit in the well itself for 24 hours. Water is then run into the pipes in the house, and allowed to sit in the pipes for another 24-48 hours. After that time, the chlorinated water is flushed from the system. 2) Chlorine bleach can be poured into the well, and allowed to circulate through the pipes. It is important that the mixture be allowed to sit for at least 24 hours. In both instances, the chlorinated water should be flushed out of the system, but **not** into septic tanks. (*Shock chlorination is explained more fully at www.ext.colostate.edu/natres/06703.pdf Bacteria*) Chlorine must be given adequate contact time in the well system and through the pipes in the household. The amount of contact time is affected by the temperature and pH of the water, the amount of organic matter in the water, and the discharge rate of the pump. Chlorine is less effective at lower temperatures and as water increases in pH. Shock chlorination should be used for new water wells, wells that have had the pump pulled for service, and for wells that suffer occasional contamination.

Ultraviolet Light: Ultraviolet light is another method used to disinfect private well systems. UV units are used for one or two faucets to provide safer drinking water, but not for whole-house treatment. UV radiation disinfects without the use of heat or chemical additives, and does not produce any by-products, but it is more difficult to monitor than chlorination. In order to be effective, UV light must pass through every particle of water. The system is more effective with a slower water flow and a thinner water film. If the water is turbid, has high iron content, suspended particles or organic matter, this treatment system is *not* effective.

Boiling Water: If you received results that indicate bacteria in your water, boiling the water for two minutes can remove most disease-causing agents. However, boiling the water also concentrates minerals (like iron, arsenic, cadmium, and salts) so this is only a temporary solution, and only viable if you do not have high mineral content. Be aware that you can still be exposed to bacteria through brushing your teeth and bathing.

Distillation: Distillation units boil water, creating a steam vapor that is condensed and collected as purified water. These units are “point-of-use” systems, and are used to reduce nitrates, and reduce dissolved salts, including chlorides, sulfates, and carbonates of sodium, potassium, and magnesium. The minerals and contaminants in the boiling chamber can build up and interfere with operation. Hard water can clog the unit.

Ozone: Ozone is a chemically active form of oxygen. It is a strong disinfectant and oxidizing agent, used much like chlorine. It cannot be purchased, and must be generated at the point of use. Municipal systems in Europe have used the ozone process for many

years. It produces a strong disinfection, and does not produce harmful by-products such as trihalomethanes (also called THM's--a group of chemicals that are formed when chlorine disinfectant products react with normal organic and inorganic products). Unlike chlorine, ozone is effective over a broad pH range. But like chlorine, it may not kill all microorganisms.

Filtration/Turbidity Control: Filters can remove particles of sand, silt, solid organic matter, plant debris, precipitated iron and some bacteria. The finer the filter medium, the more completely solid particles will be removed. This also causes a resistance to water flow, and a drop in water pressure. Activated carbon filtration can reduce offensive taste, color, odor, chlorine odor or taste, volatile organic chemicals (benzene, lindane, trichloroethylene, vinyl chloride, etc), pesticides and herbicides, and radon. Activated carbon will not remove bacteria, dissolved metals such as iron, lead, manganese or copper, or chlorides, nitrates, and fluorides.

Reverse Osmosis: If your water contains arsenic or cadmium, which are carcinogenic, reverse osmosis is the most economical way to treat the water. Reverse osmosis systems remove dissolved minerals in the water, such as nitrates, sulfates, calcium, magnesium, potassium, manganese, aluminum, fluoride, silica and boron, and treat high salt content. The RO membrane is capable of catching micro-organisms, but it can develop pinholes or tears that allow bacteria or other micro-organisms to pass into the water. RO systems should only be used for water that is bacteriologically safe.

An RO system uses a membrane, pre- and post-filters, a storage tank and a flow regulator, and is generally installed at the point of use, usually the kitchen sink. It does not treat all of the water in the home. Domestic RO systems treat 3 to 9 gallons per day, which is only enough water for drinking and cooking. Water in the system is forced against a membrane. Pure water goes through the membrane; impurities are left behind and flow out as waste. A problem with RO systems is that they waste water: only 10 to 25 percent of the water going in actually passes through the membrane; the rest goes down the drain with the contaminants. To operate properly, they need a minimum line pressure of 35 psi (pounds per square inch), and are more effective at 50 psi. The system may not be able to remove the stated contaminants at lower pressures.

Not all treatment systems are as effective as stated. You can contact Sangre de Cristo Labs at 589-1024 for more information about specific systems. And be sure to have your water tested again after treatment to make sure the system is working properly.