Well Disinfection Methods

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When a water test is done on a private well, the results frequently show the presence of bacteria. Even if no bacteria show up on a particular test, it doesn't mean that bacteria might not be present a day, week, or month later. A water test is a good thing to do but it has to be considered a "snapshot" and the best check of a well is to have someone look at the well construction as that will serve as a better indicator of the safety of the well.

Disinfection can be broken down into two types: (1) one-time shock disinfection or (2) continuous disinfection by means of some mechanical system. Shock chlorination is of value if you have a properly constructed well that has been contaminated. Poorly constructed wells should really be renovated (reconstructed to current construction standards) but sometimes that may not be feasible or affordable. Continuous disinfection with chlorine or ultraviolet light might then be the best choice.

Shock chlorination is the injection into the well of high levels of chlorine to kill off microorganisms that are present. Since the chlorine will be gone within a day or two, this isn't effective if the well lets micro-organisms in easily. Properly constructed wells should be shock chlorinated after repair (State/County Code requires well repairman to do this) to kill microorganisms introduced by the repair work. A good well might be flooded in a heavy rain event and in that case shock chlorination would be beneficial.

Poorly constructed wells will not benefit from shock chlorination except for a few days. If such a well cannot be renovated to water-tight standards, then use of a water treatment system would be the best choice. There are a number of methods that can be employed but two are the easiest for long term use. Boiling or distillation will remove microorganism but is time-consuming and not a source of a large supply of water. Although reverse osmosis (RO) will remove most microorganisms, it is NOT considered the pro-per way to remove them for various reasons. RO is primarily a method of removing things such as hardness, chemicals, etc. from the water. It is an excellent means (and about the only means) of removing nitrates.

The two most common disinfection systems used on wells would be continuous chlorination and ultraviolet light (UV). Twenty years ago chlorination was the preferred method and is still quite common. But UV disinfection is gaining wider usage today. Each has advantages and disadvantages.

Chlorination systems are readily available and have been serviced by plumbers for decades. There are liquid feed and pellet feed systems that go directly into the well or some that feed chlorine into the house line. If there is contact with the microorganisms for adequate time, the chlorine will kill most of them. Drawbacks would include: (1) smell or taste in the water, (2) concern that any added chemical could have long-term health effects, (3) mechanical problems with the equipment, and (4) running out of chlorine.

Ultraviolet light systems are more commonly available today but not all plumbers deal with them. This is a light tube that shines on a section of clear pipe as the water passes through the clear tube to your fixtures. The UV rays kill or damage the microorganisms so that they cannot reproduce. Advantages are: (1) there is nothing

added to the water for taste, smell, or health concern purposes and (2) there is only a bulb to be concerned with (little real mechanical equipment to go wrong). Bulbs do have to be replaced on a scheduled basis and the clear tube should be wiped off periodically so that the UV rays get through to the water. Since this light is on continuously, there is some electrical usage involved.

Knowledgeable plumbers and water treatment companies would be good sources to visit with regarding this. Installers can inform you of what might be an appropriate sized unit, how long the bulbs will last, and how different brands might compare in price. Also, our office can answer questions and provide you with some brochures. The Iowa State Extension Service office is another good source of literature on this topic. Such brochures will give a much more detailed explanation of these methods, including how to properly shock chlorinate a well.