Coping with Coliforms

What do coliform tests mean? Will your family become ill? Not necessarily, but your *risks* of contracting a waterborne illness are increased if coliform bacteria are found in your drinking water. Many illnesses can be waterborne, such as salmonellosis, shigellosis, hepatitis, and diarrhea. Each can be caused by different kinds of bacteria, viruses, or parasites. Testing water for *all* of these organisms would be time consuming and expensive, so laboratories test for **coliform** bacteria; these can be identified quickly and at low cost.

Coliforms themselves don't generally cause illness, but they are common in sewage and livestock wastes where disease-causing organisms also may be found. So if coliforms are found in your water supply, it's a warning that disease-causing organisms may be present too.

How Do Bacteria Enter a Well?

Coliforms and disease-causing organisms originate above ground. Storm runoff picks up and carries these biological contaminants. As water percolates slowly through the soil and into the groundwater, bacteria and viruses are filtered out. As a result, coliforms are rarely found more than a few feet below ground. If you do find coliforms in your well, it warns of possible well defects that allow water—and the bacteria carried by it—to seep directly into the well without first being filtered through the soil.

Loose or defective caps are a common problem. They let dust, insects and rodents enter, bringing bacteria with them. A well cap must fit the casing tightly. Loose boards, rags stuffed inside the casing, or a coffee can over the top, won't do.

If the cap is vented, the vent should face downward toward the ground (so that dust cannot settle into it) and it should be screened to block entry of insects and rodents. A tight seal also should be installed around pump wiring where it enters the well. Even tiny holes can let bacteria into your well.

Seepage, along the outside of the well casing, is another way contaminants get into wells. When a well is drilled, the diameter of the borehole is generally several inches larger than the casing. This makes it easy to install the casing, but it also leaves open space around the casing. Modern well construction standards call for grout, an impermeable slurry of cement or clay, to be placed around the outside of the casing to block contaminant entry. Unfortunately, many older wells were not grouted.

Holes or cracks in the casing wall also are a problem, particularly in old wells. If these occur near the top of the well, they allow contaminated water to enter without being filtered through the soil. Wells with concrete tile, or brick casing are prone to this type of contamination since these materials leak.

A faulty plumbing system can cause problems too. If a water sample taken from a tap at the well is safe, while samples drawn at other locations are contaminated, plumbing system problems may be the cause.

Low water system pressure, for example, can allow contaminants to be drawn in through leaky joints and pipes, or through submerged hoses left dangling in watering troughs or sinks. Buried connections with abandoned water lines can cause contamination too. These problems can be hard to identify. If you suspect plumbing system defects, you may need help from an experienced sanitarian or water system contractor.

Bacteria…What are the Options?

Coliform bacteria are found nearly everywhere (above ground), so it's very easy to accidentally contaminate a water sample as you fill the bottle. As a result, bacteria occasionally show up in a water sample even though the water system itself is safe. If your well is relatively new, and visual inspection reveals no obvious defects, submit another sample to the lab to verify a bacteria problem before making costly water system changes.

If high bacteria is the only water quality problem, you have three general options: well repair, well replacement, or installation of continuous disinfection equipment.

Well Repair…Successful well repair generally is feasible if defects are simple and few in number. A defective well cap, for example, is easily replaced or tightened at relatively little expense. Simple landscaping improvements can be used to divert storm runoff, and the contaminants it carries, away from the well site.

Seepage through cracks or corrosion holes in steel well casing is a more difficult problem. If they are very near the top of the well, these openings can be repaired by excavating around the well and replacing the damaged section.

Seepage along the outside of the casing is difficult to remedy. It's nearly impossible to place grout around old wells after soil and rock have collapsed against them. Occasionally old casing can be pulled and new casing installed and grouted. But this can be so expensive and time consuming that a new well may be a better investment.

Since dirt and bacteria are likely to be introduced, be sure to sanitize the well and plumbing system after repairs are completed. After chlorine dissipates from the system, submit another sample to the laboratory to verify the repair's success and the water's safety.

Well repair isn't a "sure thing." If several defects are present and all are not located and repaired, bacteria problems will persist. Before making the decision to repair a well, discuss the problem thoroughly with your groundwater district and/or well driller. Extensive repair of antiquated wells can be nearly as expensive as a new well, and the resulting water quality may not match your expectations, particularly

if the repaired well is located near septic tanks, feedlots, and other sources of contamination.

Well Replacement…Well construction is a complex field requiring knowledge not only of modern well construction techniques, but also of groundwater law, geology, and the potential health effects of water supply contamination. Poor well construction or repair techniques can lead to water supply contamination and groundwater pollution.

As you make plans for a new well, remember that abandoned wells can lead to serious personal injury or property damage. Open wells also may permit groundwater contamination that eventually affects your new well. Ask your well drilling contractor to properly plug your old well at the same time your new well is constructed. For more information, see the rules of the SPUWCD.

Continuous Disinfection…Most public health officials agree that the best solutions to bacterial problems are to prevent contamination by repairing water system defects or to find a new water source that is safe. If well repair or a new well is not feasible, however, you may want to consider installing continuous disinfection equipment.

Many people have heard about "shock chlorinating" a well. This involves placing a **single** highly-concentrated dose of chlorine into the well and plumbing system. Shock chlorination is commonly used to sanitize newly constructed wells and water systems or those that have been opened for repair or maintenance.

Many people confuse shock chlorination with continuous disinfection. **But shock chlorination is not a continuous process, and it cannot provide continuous protection against contaminants.** As soon as the highly-concentrated chlorine solution dissipates, your protection is gone. If your well or plumbing is defective, contaminants will enter continuously. **Don't rely on shock chlorination to cure bacterial problems.** If your water system is defective, it must be tightened up—to prevent continuous bacterial contamination—or be **continuously** disinfected.

For more complete information on coliform bacteria and disinfection methods, contact the SPUWCD.

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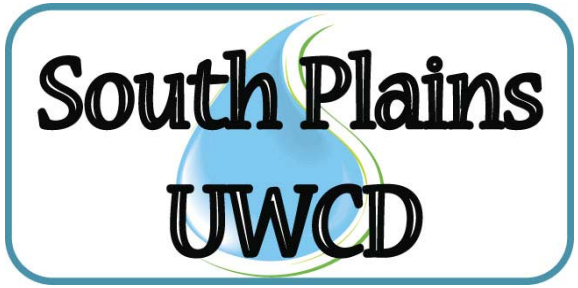
Coping With Contaminated Wells



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