MISSISSIPPI STATE UNIVERSITY EXTENSION

What to Do about Coliform Bacteria in Well Water

Coliform bacteria are a large group of many kinds of bacteria, including fecal coliform bacteria, which occur naturally in the intestines of warm-blooded animals. The group also includes non-fecal coliform bacteria.

One species of fecal coliform bacteria is *Escherichia coli*. If *E. coli* or other fecal coliform bacteria are in well water, the water has come into contact with human or animal waste and could cause disease.

People who drink water from a private well should have the water tested at least once a year to make sure that it is safe to drink. If you receive a positive test result (present) for total coliform or coliform bacteria, follow the guidelines below.

1. Retest to confirm contamination.

If you have received a positive test result (present) for total coliform or coliform bacteria, collect another water sample, and have it screened or tested for fecal coliform bacteria or *E. coli*. Although the coliform bacteria can indicate something may be wrong with the well, the first water sample that was screened or tested may have been contaminated during the collection process.

Coliform bacteria are common and do not necessarily indicate that the water has come in contact with human or animal waste. But the presence of fecal coliform or *E. coli* in water definitely indicates contamination by contact with human or animal waste.

When you have the water screened or tested again, test it specifically for fecal coliform or *E. coli*, and take these steps to get an accurate result:

- Carefully follow the laboratory's instructions for collecting a water sample.
- Before collecting water, remove any aerator, filter, or hose from the faucet.
- Wash your hands, and do not touch the inside of the container or the cap of the container.
- Use the faucet that is as close to the well as possible, or use water from a different faucet than you used for the first sample.

2. Do not drink the water.

Use bottled water for drinking and cooking until you receive the results from the second water screen or test. If bottled water is unavailable, boil the water used for drinking, cooking, and brushing your teeth to make it safe.

For information on how to disinfect small amounts of water, see Emergency Disinfection of Drinking Water by the U.S. Environmental Protection Agency (EPA).

3. Find the source, and fix the problem.

Possible causes of contamination include a faulty wellhead or improper well construction; a well that is shallow or is near a body of surface water (a pond, lake, stream, or river); an old, unused, or abandoned well; a septic system; or another concentrated source of contamination nearby.

Faulty wellhead or improper well construction

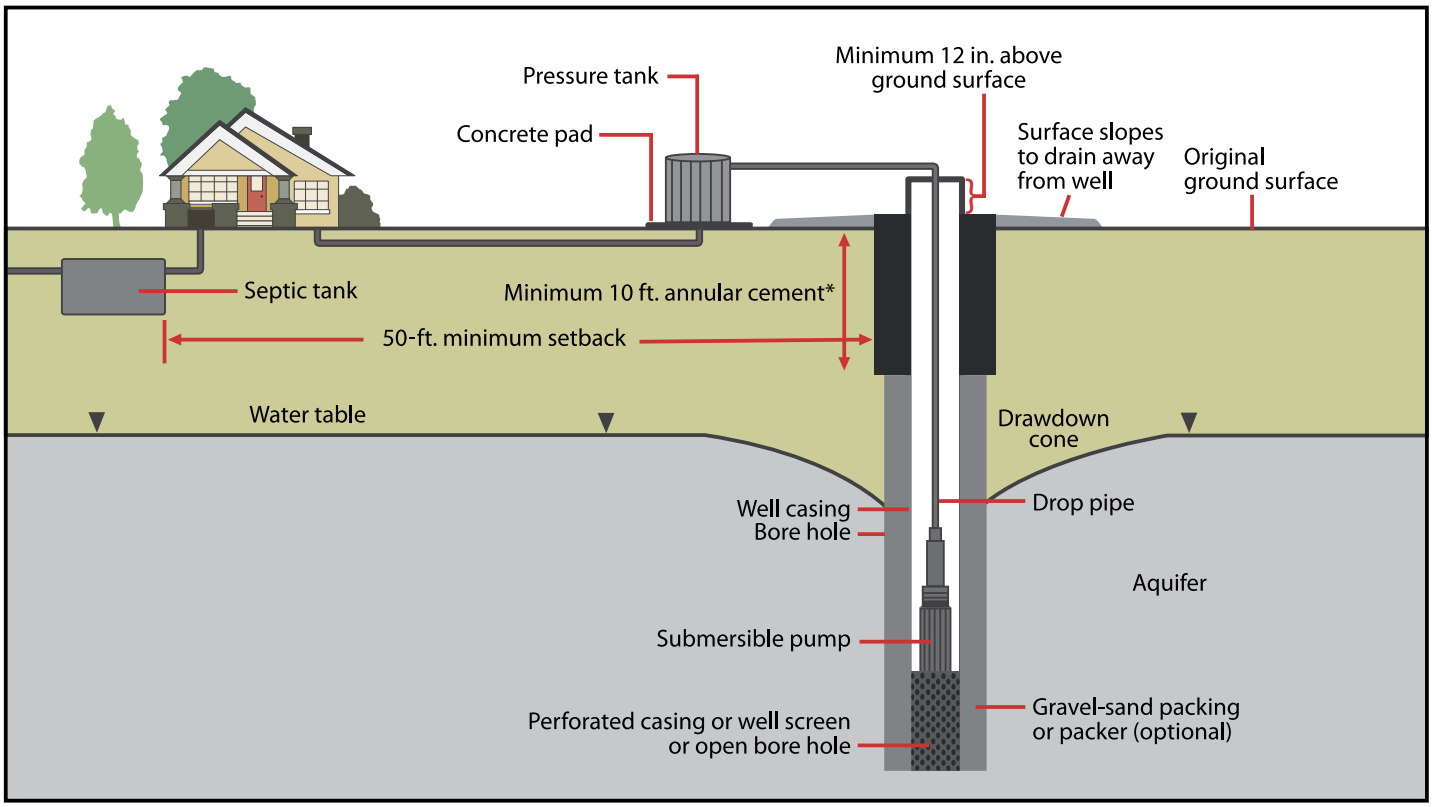
A diagram of a properly completed well is shown in Figure 1. For other completion methods authorized in Mississippi, see Well Contractors/Drillers/Pump Installers Regulations (pages 16–21) by the Mississippi Department of Environmental Quality (MDEQ).

Check the well for signs of faulty seals, and inspect the surrounding area:

- Is water standing near the well?
- Is the well cap sealed properly?
- Are there problems with the annular seal[1] between the well casing and the soil?

It is usually most efficient to have a licensed well driller check the well and fix the problem. Refer to the list of licensed well drillers in Mississippi:

Figure 1. A properly completed well.



*Wells located within 100 feet of a potential source of pollution, such as sewers, septic tanks, landfills, and waste and raw material piles, must be grouted from a depth of at least 50 feet below the land surface. *Miss. Code Ann, 51-3-1 Title 11, Part 7, Chapter 2, Rule 2.12 A(1)(g), except as specified in paragraphs h, i, j, k, l, n, and o.*
Grout for all holes must consist of neat cement, cement grout, cement-bentonite mixture (5–8 percent bentonite), or bentonite. *Miss. Code Ann. 51-3-1 Title 11, Part 7, Chapter 2, Rule 2.12A(1)(n).*

[1]The annular seal is the material between the borehole wall and the casing, usually placed near the land surface. It is designed to keep surface water and other potential contamination out of the well. Materials commonly used include bentonite (a sticky clay) and neat cement grout (cement and water with no sand). Source: Typical Water Well Construction and Terms, Montana Ground Water Information Center.

The well is shallow and/or near a body of surface water

The well may be shallow (especially hand-dug wells), or it may be drawing water from a river or stream that is contaminating the well water. If this is the case:

- decontaminate the water using a distillation, ozone, ultraviolet (UV), or continuous-chlorination treatment method, or
- find another source of water, such as by drilling a deeper well, using bottled water, or connecting with a community water system.

Old, unused, or abandoned wells nearby

Old wells that have not been plugged may be acting as a conduit for contamination.

- Determine whether old water wells are near your active well.
- If so, follow the guidelines in Well Contractors/Drillers/Pump Installers Regulations (pages 23–25).
- A better option may be to work with a licensed well driller to have the well(s) plugged properly.

A septic system near the water well

A septic tank should be a minimum of 50 feet from the water well. Septic drainfields or spray fields should be at least 100 feet from the well.

- Maintain or pump your septic system as needed. Refer to Managing Household Wastewater: An Environmental Self-Assessment for Homes with Private Wells.
- Repair the tank or drainfield as needed to prevent leaks that contribute bacteria and nutrients into your drinking water.

Other concentrated contaminants near the well

Animal waste is a common source of bacteria in water wells. A possible source is runoff from feedlots, pastures, dog runs, or any other land containing animal waste.

- Check the well area for sources of animal waste.
- Move the source(s) if possible.

If you cannot move the source, make sure that the well components are in good condition, and inspect the wellhead regularly.

4. Disinfect the well.

After you have addressed the causes of bacterial contamination, have the well disinfected by shock chlorination. To reduce your risk of exposure to hazardous chemicals and to protect the well components, have a licensed well driller/pump installer disinfect the well. You do not have to wait until bacteria is present to have your well disinfected. It is recommended that wells be disinfected once per year.

Refer to MDEQ's list of licensed well contractors/drillers/pump installers in Mississippi.

If you shock-chlorinate the well yourself, follow the instructions in the publication Private Well Disinfection. Also, review the owner's manual or manufacturer's literature to avoid damaging the components of your well or water-treatment system.

5. Retest the water.

Have the well water retested before drinking it untreated. After any negative test results, retest the water in 6 months to a year and at least annually.

For More Information

Resources on the MDEQ website listed under Related Links:

- List of licensed well contractors/drillers/pump installers in Mississippi
- *Guidelines for Securing the Services of a Water Well Driller*
- *Homeowner's Water Well Checklist*

Emergency Disinfection of Drinking Water. EPA. June 2020. Office of Water 4606-M, EPA 816-F-15-003.

Managing Household Wastewater: An Environmental Self-Assessment for Homes with Private Wells. Mississippi State University Extension Service Publication 1869.

Private Well Disinfection. Mississippi State Department of Health.

Mississippi State University Extension Service county offices.

Mississippi Well Owner Network.

What to Do about Coliform Bacteria in Well Water. Drew M. Gholson, Diane E. Boellstorff, and Mark L. McFarland. (2014). Texas A&M AgriLife Extension.

Private Well Disinfection. Mississippi State University Extension Service Publication 3398.

Publication 3078 (POD-09-23)

By **Jason R. Barrett**, PhD, Associate Extension Professor and Associate Director, Water Resources Research Institute; **Drew M. Gholson**, PhD, Assistant Professor, Delta Research and Extension Center; and Diane E. Boellstorff, PhD, Associate Professor and Extension Water Resource Specialist, Texas A&M AgriLife Extension Service.

Produced by Agricultural Communications.

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. ANGUS L. CATCHOT JR., Director