What are coliform bacteria and why should I be concerned?
Coliform bacteria are found in the environment and in the feces of humans and animals. Most coliform bacteria do not cause illness, but they can indicate that other disease-causing organisms are present in the water. Waterborne illness from these other organisms can cause nausea, vomiting, fever, and diarrhea.

Total coliform, fecal coliform, and E. coli – what’s the difference?
Total coliform, fecal coliform, and E. coli are all indicators of drinking water quality:

- **Total coliform** bacteria are found in the environment (soil or vegetation) and are usually harmless. If only total coliform bacteria are found, the source is probably environmental. If environmental contamination can enter the system, there may be a way for other pathogens to also enter the system.

- **Fecal coliform** bacteria are a sub-group of the total coliform group. They are found in the intestines and feces of warm-blooded animals. Fecal coliform in a drinking water sample often indicates recent fecal contamination, meaning there is a greater risk that other pathogens are present. Most outbreaks of E. coli are due to food contamination caused by a specific strain known as *E. coli* 0157:H7, which can cause serious illness and death. When a drinking water sample is reported as “*E. coli* present” it does not mean this strain. However, it does indicate recent fecal contamination and should be addressed.

- **E. coli** is a subgroup of the fecal coliform group. They are also found in the intestines of people and warm-blooded animals. Most E. coli are harmless but some strains may cause serious illness. E. coli in a drinking water sample indicates recent fecal contamination, meaning other pathogens are likely present. Most outbreaks of E. coli are due to food contamination caused by a specific strain known as *E. coli* 0157:H7, which can cause serious illness and death. When a drinking water sample is reported as “*E. coli* present” it does not mean this strain. However, it does indicate recent fecal contamination and should be addressed.

How can bacteria get into drinking water?
Coliform bacteria do not occur naturally in groundwater. However, coliform bacteria can live within slime formed by naturally occurring ground water microorganisms. The slime (or biofilm) clings to the well’s screen, casing, drop pipe, and pump. Disturbances during well construction, pumping or maintenance can cause the slime to dislodge, releasing the coliform bacteria into the water. The following can also lead to contamination:

- Missing/defective well cap - seals around wires, pipes or where the cap meets the casing may be cracked
- Cracks or holes in the well casing - allow water that has not been filtered through the soil to enter the well (common in wells made of concrete, clay tile, or brick)
- Many older wells were not sealed with grout when constructed - allows contaminant to seep into well
- Well flooding - common problem for wellheads below ground in frost pits that flood during wet weather
- Close proximity of a well to septic tanks, drainfields, sewers, drains, privies, barnyards, animal feedlots, abandoned wells and surface water - contamination can enter the well
- Cross-connections with wastewater plumbing - wastewater can mix with the well water

How do I test for coliform bacteria in my water?
Since you can’t see, smell or taste bacteria, collecting a water sample and testing for bacteria is the only way to know if your water is safe. The most basic test for bacterial contamination of a water supply is the test for total coliform bacteria. Sampling containers can be obtained from Washtenaw County Environmental Health. Be sure to follow the instructions that come with the water sample container. A clean, well-maintained, and frequently used faucet should be used to collect the sample.

- Remove the screen or aerator from the faucet tip. Dip the tip of the faucet into a small cup of bleach for 30 seconds. Let sit for 5 minutes. Once the faucet tip has been disinfected, turn on the cold water and let it run for 5 minutes. While the water is still running, remove the lid from the sample bottle. DO NOT touch the interior of the lid or sample bottle. If there is a pill or powder inside the bottle, leave it in the bottle. Fill the bottle to ½ inch from the top and replace the lid. Place the screen or aerator back on the faucet.
- Samples must be delivered to our office by 3:00 p.m. Monday through Friday. It’s best to collect the sample just before delivery to our office. Refrigerate or chill samples while stored or transported.

All drinking water wells should be tested annually for coliform bacteria. Also test immediately if:

- A sudden change occurs in your water’s taste, appearance or odor
- The water turns cloudy after rainfall or the top of the well was flooded
- You suspect a contamination source (e.g., septic system or barnyard) is within 50 feet of your well
- Family members are experiencing unexplained stomach flu-like symptoms
What do the results mean?
If coliform bacteria are present in your drinking water, your risk of contracting a water-borne illness is increased. A positive total coliform sample should be considered an indication of pollution in your well. Positive fecal coliform results, especially positive *E. Coli* results, should be considered indication of fecal pollution in your well.

What should I do if coliform bacteria are detected in my well?
Be concerned but do not panic if coliform bacteria are detected. Resample immediately if you have a positive sample before you treat, repair or replace the well. If you receive a second positive sample for total coliforms, or if the initial sample is positive for fecal coliforms, **do not drink the water**. Bring the water to a rolling boil for three minutes to kill the bacteria. You may also want to use bottled water as a temporary water source.

How can I eliminate coliform bacteria from my well water?
If coliform bacteria are present, the source of the problem should be identified. Resampling from several locations within the water system may be helpful. The entire water system may need to be thoroughly flushed and disinfected before a negative bacteria sample can be obtained. A well drilling contractor or a Washtenaw County Sanitarian can help identify structural defects in the system. After the defects are corrected, the system should be disinfected and the water retested before drinking.

How do I chlorinate/disinfect my well?
1) Draw off 4 gallons of water into a 5-gallon bucket. Mix 1 gallon liquid bleach with the water. (Liquid bleach should not be used with a steel well casing; use granular chlorine instead.)
2) Turn off the power to the well pump. Remove the well cap; be careful if screws or bolts are rusty. (If the well cap has one large bolt in the center, do not remove it. Have a licensed well contractor disinfect your well. If your wellhead is buried or if you have a shallow well, contact a Sanitarian at (734) 222-3800.)
3) Pour the bleach mixture into the well between the casing and the cross bar or “T” bar. DO NOT pour the mixture into the 1” center hole. Newer wells have markings or a statement next to the correct hole. Try not to get the solution on the wires inside the well.
4) Connect a clean hose to an outside spigot and extend it into the well 4 feet.
5) Turn the power on to the well pump. Turn on the spigot connected to the hose in the well and let water run in the well for 20 minutes. This distributes the disinfectant throughout the well system. Turn the spigot off.
6) Turn off the power supply to the well pump. Once the power is off, remove the hose from the well and put the well cap back on the well using the existing nuts and bolts.
7) Turn on the power to the well pump. All work is now completed on the wellhead.
8) Now it’s time to distribute the bleach to the pipes inside the home. Turn on each indoor and outdoor water faucet, run the shower, clothes washer, dishwasher, and any outside hydrants or plumbing fixtures in other buildings, and flush each toilet a couple of times. Allow cold water to run until you can smell bleach, then turn off all the faucets. (Note: Some water softening units should not be chlorinated; contact your water softening company before disinfection to see if you should bypass the softening system.)
9) Allow the solution to stay in the system for a minimum of eight hours, or overnight. During this time you should not drink, bathe, wash clothes or cook with the water, but you can use it for toilet flushing.
10) After the solution has been in the system for a minimum of eight hours, connect a hose to an outside spigot and allow water to run onto the ground for 20-30 minutes to flush the bleach from the system. Try to keep the water away from your drainfield and any plants or trees if possible. Turn off the spigot and then run each indoor and outdoor water faucet for 2-3 minutes to remove the solution that was in the pipes.
11) It is now time to collect the water sample. Follow the water sampling instructions that came with the bottle.

Where can I get more information?
Washtenaw County Department of Public Health - Environmental Health Division
705 N. Zeeb Rd., P.O. Box 8645, Ann Arbor, MI 48107-8645
(734) 222-3800
www.eWashtenaw.org
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