

Coliform Bacteria

Coliform bacteria are commonly found in nature; in soil, in plants, and in the intestinal tracts of humans and animals. The presence of this bacteria is used throughout the United States as an indication of potentially unsafe drinking water.

SOURCES

Almost all surface waters contain some coliform bacteria. However, groundwater in a properly constructed well or spring should be free of coliform bacteria. If it is found in a well or spring, it generally means that surface water has somehow leaked into the well water. This could happen if rain runoff or snowmelt makes its way into the well or spring through cracks in ledge outcroppings, gravelly soil, or sandy soil. It could also be due to poor construction or cracks in the well or spring casing.

Coliform bacteria may enter the drinking water if rain or snow runoff pools around the well or spring casing, if the well or spring cover is not airtight, or if the pipe leading to the house is not properly inserted and welded or grouted into the well or spring. In addition, insects, snakes, mice or other creatures getting into the well or spring can cause contamination.

Improperly maintained treatment devices can also be a source of contamination. Home water filters and other water treatment devices should be changed and maintained in accordance with manufacturer's recommendations.

LABORATORY ANALYSIS

The laboratory test for bacterial presence has two steps. The first step is the analysis for Total Coliform which indicates that coliform bacteria have entered the well or spring. The result will state whether the bacteria have been detected.

If the result shows Total Coliform bacteria, the same sample is checked again, this time to determine whether the coliform bacteria in the water was of fecal origin. This result indicates whether recent animal or human waste has entered the water. The result specifically states whether *Escherichia coli* (*E.coli*) bacteria

have been detected.

Homeowners purchasing test kits from the Vermont Department of Health Laboratory for routine testing should order Kit A which shows whether the bacteria is absent or present. In some instances, it may be necessary to take a series of tests to monitor changes in the well water over time. For this type of monitoring order Kit NU. This kit provides the number of both total and *E.coli* colonies.

If there is a suspicion that the contamination is linked to a septic system or animal manure, a nitrate analysis should also be conducted.

HEALTH EFFECTS

Coliform or other bacteria in drinking water will not necessarily make you ill. However, since these organisms have been able to enter your water system, other disease-causing organisms could enter as well.

Health symptoms related to drinking water contaminated with bacteria generally range from no ill effects to cramps and diarrhea (gastrointestinal distress). Two common waterborne diseases are giardiasis and cryptosporidiosis; both cause intestinal illness. *E. coli* 0157:H7 has also been associated with drinking contaminated water and can cause intestinal illness. In very rare cases, it can cause hemolytic uremic syndrome, a serious kidney condition.

The bacterial tests performed at the Vermont Department of Health Laboratory do not detect giardia or cryptosporidium, or specify which strains of *E.coli* are present.

PRECAUTIONS

Boil for one minute all water to be used for drinking, cooking, ice cubes, baby formula, reconstituted juices, produce washing, and teeth brushing. Let dishes dry thoroughly before use. (Licensed restaurants and other facilities have additional requirements.) Bathing should pose no risk although reasonable care should be taken to insure that children do not ingest water by sucking on washcloths or sponges.

The above precautions should be taken if



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the drinking water tastes or smells unusual or is of unknown quality. If test results confirm that there is a problem, continue with all precautions until subsequent test results show absence of bacterial contamination.

WELL OR SPRING TREATMENT

If coliform bacteria is detected in your drinking water supply, visually inspect your system. Look for leaks, unmortered joints, loose caps, ripped vent screens, etc. Attempt to identify any known sources of bacterial contamination in the area surrounding the well. Repair any deficiencies noted. If you need help, call the Vermont Department of Health for a list of groundwater consultants.

Once repairs have been made, shock chlorinate your well in order to sanitize the system. (Refer to the handout, "Disinfection" for instructions.) Once the chlorine odor is gone, retest your water. If the bacterial problem continues, even after shock chlorinating several times, consider permanent treatment for your water supply. Treatment options include installing a chlorinator that injects precise amounts of chlorine into your home's plumbing system when the water is being pumped to the home taps, or ultraviolet light treatment preceded by a filter when appropriate. Water treatment professionals who specialize in these treatment devices can be found in the yellow pages.

FOR MORE INFORMATION

Contact the Vermont Department of Health for —

- Fact sheets on drilled wells, dug wells, springs and specific contaminants and technical assistance:
Call 800-439-8550 or 652-0358 (Environmental Health)
- Fact sheets on Giardia and Cryptosporidiosis:
Call 800-640-4374 or 863-7240 (Epidemiology)
- Test kits and testing information:
Call 800-660-9997 or 863-7335 (Laboratory)
- Web information:
www.state.vt.us/health/_hp/waterquality/safewater.htm
www.epa.gov/safewater/ecoli.html

Contact the Vermont Department of Environmental Conservation for —

- Information about public water systems:
Call 800-823-6500 or 241-3400 (Water Supply Division)
- Web information:
www.anr.state.vt.us/dec/watersup/wsd.htm