Rev. DW122216E

WHITE WATER ASSOCIATES, INC.

DRINKING WATER QUALITY

Identify Problems and Solutions with Your Private Well

When Should I Test My Water?

- Once a year for monitoring the health of the well.
- When a new well is constructed, or any component of the well system has undergone replacement or repair, including pump, pressure tank, piping, or any other component.
- When flood waters or surface water inundates well.
- When you suspect bacterial contamination by continuous illness in the house.

Publication Highlights:

White Water Associates, Inc.
PO Box 27, 429 River Lane, Amasa MI 49903
P (906) 822-7889
F (906) 822-7977
Web: www.white-water-associates.com
Email: info@white-water-associates.com

What are Coliform Bacteria?

Coliform bacteria are microorganisms commonly found in surface water, soil, decaying vegetation, and the intestinal tract of humans and animals. While most bacteria are harmless to human health, some are capable of causing disease. Coliform bacteria in a water sample indicate a potential pathway for fecal wastes and other pathogenic organisms to enter your well. Possible health threats include gastrointestinal diseases, hepatitis, and others.

The water test used in laboratories to detect coliform bacteria also detects E. coli which is a type of coliform bacteria. If E. coli is present, the water is likely to contain disease-causing organisms from fecal contamination. These bacteria die off fairly quickly outside the host, usually within 30 days. When a well shows a persistent presence of coliform bacteria, it is a strong indication that bacteria are continuously entering the well as the water is withdrawn.

Understanding Coliform Bacteriological Results

If your drinking water source is from a private well, testing on a yearly basis is ideal to monitor the health of your well. Bacterial contamination does not change the appearance, smell, or taste of water. Testing by a certified lab is the only way to determine if the water is free of harmful contaminates.

The most cost effective way to determine the presence of bacteria is to test for Total Coliform/E. coli bacteria.

Left - NEGATIVE result for Total Coliform and E. coli bacteria

Middle – POSITIVE result for Total Coliform and E. coli bacteria

Right – POSITIVE result for Total Coliform and NEGATIVE for E. coli

Your Well Water is Groundwater!

Groundwater is water found underground in the cracks and crevices in sand, soil and rock. The geologic formations underground where groundwater is stored is called an aquifer.

Results of Coliform Analysis

"Negative" - Coliform bacteria are *absent* in the water sample. Water is considered bacteriologically **SAFE**.

"Positive" - Coliform bacteria are *present*. Water supply is considered bacteriologically **UNSAFE**. Resampling is advised.

If your water sample is **Positive** for both Total Coliform and E. coli, do **NOT** drink, cook, or brush teeth with the water. Contact your local health department. Further water testing should be done after corrective measures have been taken.

Comments/Flags - Comments/Flags may have been added to your results. Possible reasons may include sample exceeds holding time, wrong bottles were used in collection, insufficient volume of sample was taken, etc. Additional verification on comments/flags can be obtained on the report form. Contact your local health department or White Water Associates for more information.

Pathways for Contamination

Each of the instances below identifies a possible error condition. In many cases, errors creating positive bacterial results can be differentiated from those bacteria attributed to poor construction and/or poor soil filtration by taking additional bacterial samples. Errors will not likely be repeated, whereas real construction or filtration problems will show either a constant or highly irregular presence of bacteria. Neither one good nor one bad bacteria sample can be considered sufficient testing to judge the long term consistency of a system's water quality.

1. Sample Collection was Improperly Performed

Improper bacteria sample collection is a common error. Improper sampling can make a good water sample appear to be bad. The following procedure should be used when collecting a bacteria sample.

a. Sample water closest to the water source (before the water softener).
b. Remove all faucet devices (aerators, strainers, hoses, filters).
c. Disinfect the tap with bleach or alcohol in a shallow glass for 1-2 minutes.
d. Wash hands thoroughly, do NOT open sample bottle until ready to proceed.
e. The COLD water tap must be used. Run the water for at least 2 minutes.
f. Fill sample bottle ABOVE the 100 ml line. Recap bottle. We have to reject samples under 100 ml per Michigan Department of Environmental Quality.
g. Now turn off water.

For more information about sample technique, see Water Sampling Tips, page 3 (sidebar).

Water Sampling Tips

Use a clean, indoor faucet.

Use a fixed (non-swivel) faucet.

Try to avoid threaded taps or leaky faucets.

Avoid touching the inside of the cap or sample bottle.

Do not let the sample bottle touch the faucet.

Do not rinse the bottle.

Hold the cap during sampling with the cap facing down.

Do not sample through a hose.

Maintain a steady, low-flow stream.

Seal the container as soon as filled.

2. Poor Well Construction

Poor well construction is the most prevalent cause of bacterial contamination. There are numerous problems that can occur with a dug well including:

- A lack of mounded backfill around the outside of the well casing.
- Insufficient casing height above the ground level.
- Inadequate or leaky well cover or cap.
- Holes, cracks, or unsealed joints in the sidewall of the upper portion of the well casing.

3. New Construction, Replacement, or Repair

When a submersible pump is taken out of a well or when a new pump is prepared for installation, it is typically placed directly on the ground near the well. When this happens, bacteria-laden dirt often adheres to the pump, the water discharge line, and/or the electrical power cable. This material then contaminates the well when the pump is installed. The installation of any new well normally allows for substantial bacteria to enter the fractures of the bedrock or the soil around the outside of the dug well casing. Mud and soil particles protect these bacteria from disinfection. Sustained flushing is necessary to remove this dirt, mud, pulverized rock, and bacteria. Disinfection should be conducted only after first flushing to loosen the material.

4. Physical Damage to the Aquifer's Filtration Capability

Bacteria are normally removed from groundwater as the water percolates through soil. It is possible, but unlikely, that bacteria will move through the soil or bedrock fractures for a significant distance.

Drilling a new well can also create localized short-term bacterial contamination of bedrock fractures. Normally these construction activities will be short in duration. Conditions which normally remove filtering soil and expose fractures in the bedrock include:

- Road cuts through bedrock outcrops.
- Excavations into bedrock for swimming pools or house foundations.
- Artesian well drilling on other lots.
- Abandoned but uncapped bedrock wells on other lots.

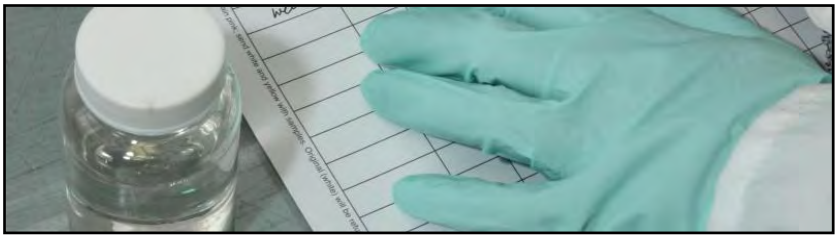
Water quality should improve once the soil is replaced and has achieved compaction. There could be weeks of time between the replacement of soils and the end of the bacterial presence.

5. Biological Activity Occurring within Treatment Equipment and Piping

Water treatment equipment often uses sand or other media to filter bacteria from drinking water. This action typically brings bacteria together on the filter media. In such cases, the filtration provides an easily-obtained, concentrated food supply for these bacteria to sustain themselves creating a "biofilm". The "biofilm" created on the inside of pipes and tanks can cause a coliform detection.

6. Dirty Sample Bottle, Data Recorded Inaccurately

As a certified lab we take all the necessary precautions to avoid contamination. However, other possible error conditions include old sample bottles or bottles subject to contamination during preparation or transit. Laboratory processing may create positive bacterial test as may a clerical error. These are very rare occurrences and these can be addressed by taking one or more additional samples.



How Can I Get More Information?

White Water Associates laboratory also tests for other drinking water contaminates such as nitrate, metals, hardness, chlorides, sulfates, organic solvents, gasoline and diesel fuels, pesticides, PCBs and others. For a list of these tests and more information about drinking water sampling and testing, visit: www.white-water-associates.com

Feel free to contact us at:

White Water Associates, Inc.
PO Box 27, 429 River Lane, Amasa MI 49903
P (906) 822-7889
F (906) 822-7977
Web: www.white-water-associates.com
Email: info@white-water-associates.com

Sources of Information

Interpreting Drinking Water Test Results
G3558-4
University of Wisconsin – Extension

Understanding Common Drinking Water Sample Results
DEQ Fact Sheet

Coliform Bacteria in Your Water
C 858-7
UGA Extension

Protect Yourself from Coliform Bacteria in Your Well
Water Fact Sheet – July 2009
North Carolina Public Health & Human Services

Environmental Fact Sheet
WD-DWGB-4-2
New Hampshire Department of Environmental Services

You & Your Well
PUB-DG-002 2003
Wisconsin Dept. of Natural Resources