

Water Safety

Testing Well Water to Assure Drinking Quality



When to have Well Water Tested

A good practice is to check a well every spring to make sure there are no mechanical problems. Every two to three years, a well should be tested for bacteria and harmful chemicals. It should also be tested if:



- There are known problems with well water in the area
- If any part of the well system has been repaired or replaced
- Experiencing any problems near well (*i.e., flooding, land disturbances, near-by waste disposal sites, chemical spills*)
- There is a notable change in appearance, taste or smell of water.

How to Find Out if a Well is Contaminated

The only way to find out if well water is contaminated is to have it tested. Contact the health department or a private laboratory to test for germs and harmful chemicals. In some states, the drilling contractor must test a new well after it is built. However, it is up to the well owner to maintain the well and have it tested regularly.

How Germs and Chemicals Get into Well Water

Germs and chemicals can get into well water and contaminate it in different ways. Some germs and chemicals occur naturally. For example, heavy metals like arsenic, lead, and cadmium are naturally found in rocks and soil and sometimes seep into ground water. Other contaminants come from human and animal waste resulting from polluted storm water runoff, agricultural runoff, flooded sewers, or individual septic systems that are not working properly.

What Bacteria and Chemicals to Test for

Several things to consider testing for are listed below:

Coliform Bacteria: Testing for indicators such as total coliforms, fecal coliforms, or *E. coli* to monitor water quality is very important. If the water system has a positive test for one of these indicators, it can mean recent contamination with soil or human feces. *If the total coliform count is high, then it is very possible that harmful germs like viruses, bacteria, and parasites might also be found in the water.* A positive test for total coliforms always requires more tests for fecal coliforms or *E. coli*. A confirmed positive test for fecal coliforms or *E. coli* means action needs to be taken immediately.

Remember that *most coliform bacteria are a normal part of the environment.* They do not cause disease but do indicate the water might be contaminated by soil or feces. Some rare types of coliforms, such as *E. coli* O157:H7, can cause serious illness. Although most *E. coli* O157:H7 outbreaks are from eating raw or undercooked food, cases from contaminated drinking water can occur, but are rare.

Nitrates: Nitrate is naturally found in many types of food. However, high levels of nitrate in drinking water can make people sick. Nitrate in well water can come from animal waste, private septic systems, waste water, flooded sewers, polluted storm water runoff, fertilizers, agricultural runoff, and decaying plants. The presence of nitrate in well water also depends on the geology of the land around a well. *A nitrate test is recommended for all*

wells. If the nitrate level in the water is higher than the EPA standards, look for other sources of water or ways to treat water.

Volatile Organic Compounds (VOCs): VOCs are industrial and fuel-related chemicals that may cause bad health effects at certain levels. Which VOCs to test depends on where a person lives. Contact the health department to find out if any VOCs are a problem in this region. Specific VOCs to ask about testing for are Benzene, Carbon Tetrachloride, Toluene, Trichloroethylene, and Methyl Tertiary Butyl Ether (MTBE).

pH: The pH level tells how acidic or basic the water is. The pH level of the water can change how the water looks and tastes. If the pH of water is too low or too high, it could damage pipes, cause heavy metals like *lead* to leak out of the pipes into the water, and eventually make a person sick.

Bacteria: <i>microscopic living organism</i>	
Campylobacter	Found in contaminated water, and among the most common bacterial infections in humans. They produce both diarrheal and systemic illnesses. Symptoms include bloody, diarrhea or dysentery syndrome, cramping, abdominal pain, and fever.
Escherichia coli	Specifically: <i>E. coli</i> 0157H7 spread through food or water contaminated with human or animal feces. Bloody or non-bloody diarrhea, painful stomach cramps; little or no fever. May cause Hemolytic Uremic Syndrome (HUS) or kidney failure in the young children or the elderly.
Salmonella	May be found in water wells that have been contaminated with the feces of infected humans or animals. Most people infected with Salmonella develop diarrhea, fever, and abdominal cramps between 12 and 72 hours after infection. The illness usually lasts 4 to 7 days, and most individuals recover without treatment. The infection can spread from intestines to blood and other body sites causing serious illness.
Shigella	Watery or bloody diarrhea, fever, and stomach cramps starting a day or two after exposure to the bacteria, and usually resolves in 5 to 7 days. Some people who are infected may have no symptoms at all, but may still pass the <i>Shigella</i> bacteria to others.
Viruses: <i>microorganism that cannot reproduce without a host</i>	
Enterovirus	An infection of the gastrointestinal tract than can spread to the nervous system. Usually causes mild respiratory illness (common cold), hand, foot and mouth disease, acute hemorrhagic conjunctivitis, and aseptic meningitis amongst other conditions.
Hepatitis A	Hepatitis A can be spread by eating or drinking food or water contaminated with the virus. Proper chlorination of water kills Hepatitis A virus that enters the water supply. Symptoms include jaundice or yellowing eyes and skin, dark urine, tiredness, loss of appetite, nausea, vomiting, fever, and stomach ache. Most infected adults show symptoms while children often do <u>not</u> have symptoms, <i>but could still spread the virus.</i>
Norovirus	Norovirus is a very contagious virus that can infect anyone. Norovirus is transmitted from an infected person, contaminated food or water, or by touching contaminated surfaces. The virus causes the stomach or intestines or both to become inflamed. Symptoms include stomach pain, nausea, and diarrhea and vomiting. These symptoms can be serious for some people, especially young children and older adults.
Rotavirus	Rotavirus is a contagious virus that can cause inflammation of the stomach and intestines. Symptoms include severe watery diarrhea, often with vomiting, fever, and abdominal pain. Infants and young children are most likely to get rotavirus disease, becoming severely dehydrated and requiring hospitalization.
Protozoa: <i>parasites</i>	
Cryptosporidium	Symptoms generally begin 2 to 10 days (average 7 days) after becoming infected with the parasite. The most common symptoms are watery diarrhea or loose watery stools, stomach cramps, upset stomach, weight loss and fever. Usually causes mild illness, but can be serious or fatal for people with weakened immune systems.
Giardia	Found on surfaces or in soil, food, or water that has been contaminated with feces from infected humans or animals. <i>Giardia</i> is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it tolerant to chlorine disinfection. Symptoms include diarrhea or greasy stools that tend to float, stomach or abdominal cramps, upset stomach or nausea/vomiting, and dehydration (loss of fluids).

Chemicals: produced by chemistry or the phenomena of chemistry	
Atrazine	Herbicide for broad leaves. Short-term exposure causes: congestion of heart, lungs, and kidneys; low blood pressure, muscle spasms, weight loss, damage to adrenal glands. Long-term exposure causes: weight loss, cardiovascular damage, eye and muscle degeneration, cancer.
Arsenic	<u>Chronic</u> arsenic poisoning results from drinking contaminated water over a long period of time containing high concentrations of arsenic salts. Symptoms include headaches, confusion, severe diarrhea, drowsiness, convulsions and changes in fingernail pigmentation. <u>Acute</u> symptoms include diarrhea, vomiting, blood in the urine, cramping muscles, hair loss, stomach pain. The organs of the body that are usually affected by arsenic poisoning are the lungs, skin, kidneys, and liver.
Copper	An essential nutrient at very low levels. High level exposure causes upset stomach, vomiting, diarrhea, and stomach cramps. Long-term exposure at high levels can also cause liver and kidney problems. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level.
Lead	Water pipes in some older homes may contain lead or lead solder that can leach out into the water. Symptoms may include delayed physical and mental development in infants and children, shortened attention span, hearing, and learning disabilities. Adults may experience slightly increased blood pressure. Long-term exposure at high levels can include stroke, kidney disease, and cancer.
Mercury	May be naturally occurring in the environment or released into the environment. In addition to effects on the kidneys and nervous system, inorganic mercury can damage the stomach and intestines, producing symptoms of nausea, diarrhea, or severe ulcers if swallowed in large amounts. Other symptoms may include rapid heart rate and increased blood pressure.
Nitrate	Shallow, rural domestic wells are those most likely to be contaminated with nitrates, especially in areas where nitrogen based fertilizers are in widespread use. Symptoms may include a blood disorder that causes shortness of breath and blueness of skin and can lead to serious illness or death, or central nervous system disorders.
Radium	Naturally occurring in layers of rock. Increases risk of cancer. In gas form – radon.
Volatile Organic Compounds	VOCs are a class of chemicals that are volatile (evaporate easily) such as acetone and gasoline. Symptoms may include drowsiness, decreased responsiveness, skin irritation, and may cause cancer after long-term exposure.

A change in water's taste, color, or smell is often not a health concern. However, a change could be a sign of serious contamination problems. Any time a change is noticed in the water quality, have it tested.

Where to go for Well Water Testing

State and local health or environmental departments often test for bacteria and nitrates and should have a list of the state-certified (licensed) laboratories that test for a variety of substances.

St. Clair County Health Department - Division of Environmental Health

3415 28th St. Port Huron, Michigan 48060

www.stclaircounty.org/offices/health (810) 987-5306



For more sources of information on this topic visit:

ST. CLAIR COUNTY HEALTH DEPARTMENT www.scchealth.co

CENTERS FOR DISEASE CONTROL AND PREVENTION www.cdc.gov

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) www.michigan.gov/deg

MICHIGAN DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT (MDARD) www.michigan.gov/mdard