

Why should my well water get tested and for what contaminants?

There are many different reasons to get your well water tested at a laboratory. People get their wells tested when they are having water quality problems (unusual color or odor), when they are selling or buying a home, and when a new well is installed or an old well or well pump is maintained. In addition, it is good practice to have your well water checked at least once a year and even to reevaluate your drinking water source if posed with health-related problems.

Local health departments are the main regulatory agency with respect to residential wells. They are required to maintain a list of environmental contaminants within their jurisdiction, and they consider this information when they issue permits for new wells. Your local health department is usually at the district or county level, and their phone number can be found in a local telephone book or online at www.malph.org. Since the local health department tracks this contaminant information, and contaminants are site-specific depending on the contaminant source, it is worthwhile to contact the local health department to determine what contaminants may be in your area. If a contaminant such as a petroleum product, industrial solvent, heavy metal, herbicide, or pesticide is in the area, the health department may recommend a test for the contaminant. When calling a local health department or health district to discuss well water quality, ask to speak with a water sanitarian.

When buying or selling a home, some testing may be required. Some counties require that wells be tested for certain contaminants upon the sale of a home (called "point of sale" testing). A test for bacteria or even an "automated partial chemistry" test may be required. The automated partial chemistry test is for the following contaminants: chloride, fluoride, hardness, iron, nitrate, nitrite, sodium, and sulfate. In addition to this point of sale testing, various lending institutions require drinking water testing before mortgage approval (e.g., the Federal Housing Administration requires testing for lead in drinking water sources before they will approve the lending transaction), so contact both the lending institution and the local health department to make an informed contaminant test selection decision.

Any time a new well is installed, or an old well or well pump is maintained, it is important to check the integrity of the well to make sure the well was installed properly and that no surface water sources are getting into the well. A bacterial test for coliform will be required and conducted for this purpose.

Another reason to test water in the home is if a household member has a health condition such as hypertension (high blood pressure). Sodium can occur naturally and is also introduced into drinking water at homes through some water softening systems. So learn whether your system introduces sodium into your water and if so, then check the function of the water softener every now and then for your health.

Many different laboratories test the quality of residential drinking water from water wells, including the State of Michigan Drinking Water Laboratory. The State of Michigan lab conducts the bacteria test for \$16; the lead test for \$18, and the automated partial chemistry test for \$18.

State of Michigan water sample kits can be picked up at your local health department. A directory of labs can also be found online at www.michigan.gov/deq, go to the search bar and type in "lab directory."

The State of Michigan Drinking Water Laboratory offers the following tips for proper sample handling:

- The test kits have a label on the bottle indicating which tests can be performed with that sample. Several bottles may be necessary when multiple contaminants are being tested.
- The sample must be sent overnight to the lab because if the test is not run within a certain time frame (e.g., 30 hours for bacteriological testing) from when the sample was taken, then the results will not be valid. Mail the samples on Monday, Tuesday or Wednesday to make sure that it is received during the work week.
- If you want to drop the sample off to the lab in person, then you must call ahead to make arrangements (517-335-8184); the lab is a secure area.
- Read and follow the sample instructions before taking the sample.

So now that my water has been tested. What do the results mean?

Bacteriological Testing:

The bacteriological test evaluates the quality of drinking water for a group of bacteria found in the intestines of warm-blooded animals, in surface water, in some soils and in decaying vegetation. These bacteria are commonly called coliform or *E. coli*. The lab result that you want to receive is negative, or not detected for coliform organisms. If you receive a positive result (reported by the State of Michigan Lab as "Pos for coliform organisms per 100 ml"), then organisms were present in the water sample and your safety cannot be assured. Worse yet, if the State of Michigan results say "EC Pos for coliform organisms per 100 ml" then this is an indication of sewage contamination in the water.

Automated Partial Chemistry:

General guidelines of ranges for automated partial chemistry results in mg/l (ppm) include:

Test	Excellent	Satisfactory	May be objectionable
Chloride	ND-20	20-250	Over 250
Fluoride	1.0-1.2	0.7-2.0	Over 4.0
Hardness	50-125	125-250	Over 250
Iron	ND-0.2	0.2-0.5	Over 0.5
Nitrate	ND	1-10	Over 10
Nitrite	ND	0-1	Over 1
Sodium	ND-20	20-160	Over 160
Sulfate	ND-50	50-250	Over 250

ND means that the contaminant was not detected in the sample. Contact your local health department for a more detailed evaluation.

It is very important to learn about your drinking water source and to be knowledgeable about the water in your home because various problems can arise.

- Objectionable levels of **chloride** may result in taste and corrosion concerns.
- Moderate levels of **fluoride** are beneficial in reducing tooth decay; high levels can cause mottling of teeth.

- Hard water (high levels of **hardness**) can cause scaling of water fixtures, laundry problems, water spotting, and discoloration. At low levels, corrosion can result (especially in copper piping).
- **Iron** in water can cause staining, turbidity, taste, color, and odor.
- Blue Baby Syndrome (methemoglobinemia) is a blood disorder reported among infants where **nitrate-** or **nitrite-**contaminated well water was used to prepare formula and other baby foods. Infants suffering from methemoglobinemia may seem healthy but show intermittent signs of blueness around the mouth, hands, and feet. They may have episodes of breathing trouble, some diarrhea, and vomiting. In some cases, an infant may have a peculiar lavender color but show little distress. This syndrome can cause marked lethargy, excessive salivation, loss of consciousness, convulsions, and even death. Nitrate and nitrite are both forms of nitrogen. More information on this very serious health concern can be found through the State of Michigan Web at www.michigan.gov/deqwater, select "Drinking Water," then "Water Well Construction," and then "Brochures and Fact Sheets" or through the link www.deq.state.mi.us/documents/deq-wd-gws-wcu-nitratedrinkingwater.pdf.
- **Sodium** may naturally be present in groundwater and is further introduced into the water supply through some water softeners. The American Heart Association recommends that people with a sodium-restricted diet use a drinking water source with less than 20 mg/l (or parts per million, ppm).
- **Sulfates** usually are not a significant health hazard. Sulfates can have a temporary laxative effect on humans. Sulfates may also cause scaling in boilers and heat exchangers.
- **Hydrogen sulfide** is a gas with a rotten egg odor that can be naturally found in well water. It can cause black stains on laundry and black deposits on pipes and fixtures. A person can detect this gas in very small quantities through smell.

As previously mentioned, the best contact related to well water quality is your local health department. In addition, the State of Michigan collects some statewide data and may be contacted through the Environmental Assistance Center at 800-662-9278 and ask for the Water Division, Ground Water Section, Contamination and Investigation Unit.