



Drinking Water Safety

People expect water out of the faucet to be clean and safe, and, in Dane County, it almost always is. But problems occasionally do occur in

such areas as:

- the source of the water for both private wells and public utilities
- the processing, storage and delivery of drinking water
- commercial water products; and
- internal and external malfunctions in plumbing, sewer and septic systems.

Private Well Users

Since private wells are usually shallow (less than 300 feet), they can be contaminated by nearby use of fertilizers and other agricultural or industrial chemicals. Private wells are especially at risk for contamination by fertilizer nitrates, which are particularly hazardous to infants and pregnant women. Animal waste run-off and in-ground septic systems create the potential for bacterial contamination of surface waters and nearby shallow wells. For example, diarrhea, cramping and vomiting are caused by *E. coli*, *Cryptosporidia* and other microbes and have been linked to animal and human waste-contaminated drinking water.

Public Water Utility Users

Dane County has 34 public water utilities that supply households and businesses in our urban/suburban communities and villages. These utilities, which are regulated by federal and state authorities, have made substantial investments to assure consistent delivery of safe and clean drinking water to their customers. They monitor the water supply for contaminants on a daily basis. However, these are complex systems and problems can occur. High mineral content, e.g., iron and manganese, can be a problem and may accumulate in piping systems, affecting some households. Original plumbing in older homes often contains lead, a well-known hazard. Newer plumbing contains copper which under certain conditions could dissolve into the water. Over time, drinking water delivery systems can break down or be damaged during construction or by maintenance errors. These situations could link the home's water supply to hazards from the surface or from sewage systems.

Common Water Quality Concerns

Lead

Exposure to lead harms the development of infants and young children (under 5 years of age). Here are a few examples of how the threat of lead exposure can show up:

- **Paint and Pipes:** Although lead-based paint is by far the most common source of exposure, homes built before 1930 may have lead pipes and service lines, which pose a high risk, especially to infants.
- **Lead Solder:** Lead in solder was banned in 1986. But lead solder used in brass fixtures installed or repaired before 1986 may release lead into drinking water.
- **Hot Water:** It is important when making infant formula, never to use hot water straight from the tap, not to boil water for too long a time (more than one minute) because small amounts of lead or other minerals can become more concentrated in the water.
- **Flush the Lead:** In homes with lead plumbing, it is always safest to run drinking water tap for a few minutes each morning to flush out any possible lead sediment.
- **Ongoing Challenge of Lead:** When the Environmental Protection Agency lowered the maximum allowable level of lead in drinking water from 50 ppb (parts per billion) to 15 ppb in 1991; many water quality experts became concerned about exceeding this stricter limit. This highlighted the need for ongoing water testing.

Copper

Copper is commonly used in plumbing components, including piping and in brass fixtures. Copper may dissolve in water and has been known to cause health problems at relatively low concentrations. In 1993, illnesses related to copper leaching from copper pipes was discovered in the City of Monona. The investigation of this problem revealed that a treatment chemical that was added to one of the municipal wells to reduce iron content had the side effect of leaching copper into the water. This condition is not normally detected by routine water utility sampling.

Manganese

Long-term consumption of drinking water with high levels of manganese may cause neurological problems. Concerns about manganese in

Madison's drinking water were addressed in 2006 and 2007. The solution involved shutting down two wells, the installation of a costly filter system and the implementation of a stronger citywide flushing program.

Fluoride

A small amount of fluoride is essential to healthy teeth but too much can be harmful. Many public water utilities in Dane County add fluoride to their drinking water to the proper level of approximately 1 ppm. Private wells in Dane County frequently have inadequate levels of fluoride. Children drinking private well water should take daily fluoride supplements. Free fluoride tablets can be obtained through the Public Health-Madison and Dane County Dental Program at (608) 242-6529.

Nitrate

Drinking water can be contaminated with nitrates from fertilizers, manure and septic systems. High nitrate levels are dangerous to pregnant or breast-feeding mothers and infants by decreasing the capacity of blood to carry oxygen, which can cause the "blue baby syndrome." All new wells, including any wells that supply water to pregnant and breastfeeding women and children, should be tested for nitrates at least every few years. Levels of nitrate between 2 ppm and 10 ppm suggest the need for more frequent, seasonal testing.

Microbes

Drinking water contaminated by bacteria, viruses and protozoa can cause sudden or ongoing intestinal illness. Although most public water utilities in Dane County, chlorinate drinking water to kill microbes, occasional problems can occur. One potential problem area is that private well water is not disinfected at all. Additionally, there have been more serious problems:

- In 1993 in Milwaukee, 400,000 people became ill when a water purification plant failure allowed the protozoa *Cryptosporidia* to enter the system.
- Newly installed drinking water systems in new buildings can become heavily contaminated with bacteria if they are not sufficiently protected and disinfected during construction.



Household Testing

Public Health-Madison and Dane County's certified public health laboratory tests drinking water for a variety of chemical and microbial contaminants for public water utilities and private wells. PHMDC testing is convenient, inexpensive and accurate, and the best way to ensure that household drinking water is clean and safe. Experienced PHMDC professionals also provide consultation on:

- Appropriate types of testing
- The meaning of the test results
- Reasonable responses to identified problems

Private well drinking water should be tested yearly, especially in households that include pregnant women, infants or young children.

Public utility drinking water is extensively tested by the utilities at many points in the system. However, when concerns arise, Public Health staff are available to help. Unexplained illnesses or changes in taste, odor or appearance of water may suggest the need for testing. Testing after significant flooding is also recommended.

When water is temporarily cloudy or discolored, it may be due to routine flushing of water mains necessary for normal cleaning and maintenance. The cloudiness/discoloration should clear up after a few minutes of running the water and does not necessarily indicate a need for testing.

You may download and print this brochure from the PHMDC website:
www.publichealthmdc.com/publications

Arrangements for Testing

For information on making arrangements for testing, send an e-mail to: health@cityofmadison.com or call the PHMDC Laboratory at (608) 243-0357.

Water Testing Kits

To order by mail, call (608) 243-0357 or kits can be picked up during business hours (8:00 a.m. to 4:30 p.m.) at the PHMDC Laboratory, City-County Building, 210 Martin Luther King, Jr. Blvd., Room 516B, Madison, WI.

Certified PHMDC Laboratory Testing and Expert Consultation

Testing for iron, manganese, arsenic, lead, copper, other metals, fluoride, water hardness, fertilizers, pesticides and other contaminants is also available. Costs for these tests vary. Laboratory staff can assist in selecting appropriate tests and in interpreting results. Call or go online for test prices (phone & link above).

To Local Water Utility Managers

The PHMDC Laboratory has substantial experience assisting public water utilities with certified laboratory testing, interpretation of tests, and providing expert consultation on human risk assessment, risk communication and rapid response to emergencies. Our professional staff are very familiar with the common challenges of providing quality drinking water, including issues concerning manganese, arsenic, volatile organic compounds (VOCs), fluoridation and chlorination. To find out if the PHMDC Laboratory can meet your needs, call PHMDC at (608) 266-4821.

Safe Drinking Water

Testing & Consultation for Household Drinking Water



Public Health
MADISON & DANE COUNTY

Healthy people and places

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