

We Don't Own It, But We Use It

Information About Our Drinking Water



The Aquifer

Madison's water source is a deep aquifer—water contained in underground sandstone formations that can yield the quantity needed. The water is stored in the small voids and pore spaces between rock particles, not an underground reservoir. The aquifer is recharged from rain or snow that falls on the surface and soaks into the ground. Water in the aquifer has been filtered by its downward progress and it could acquire contaminants in that flow; it may also acquire mineral and other elements from the rock formations in which it's stored.

Wisconsin Department of Natural Resources publication, *Groundwater: Wisconsin's Buried Treasure* (PUBL-DG-055 2006) and *Study Guide* (PUB-DG-076 2006).

Wisconsin's Ground Water

It's estimated that Wisconsin's ground water would cover the state's 36 million acres to a depth of 105 feet. There are more than 800,000 private or municipal wells in the state, serving more than 70% of the state's population. (Nationwide the numbers are different—195 million people are supplied by surface water and 101 million by ground water.) In the state 800 million gallons of ground water are pumped each day, approximately 25% for residential use.

substances and at representative wells for many substances in accordance with federal and state requirements and in pursuit of the most complete information about the wells and the system.

What Are the Problems and Concerns for Water in Our Communities?

There are concerns for the quantity of water needed and used and long-term supply; there are concerns about the presence of contaminants that reach the water supply and the ability of communities to prevent such contamination and correct for it; there are concerns about water distribution system aging and replacement. Responsibility for addressing water issues is shared by water users, governments, industry and agriculture—by all of us.

Things most of us can do include (1) managing our personal and community water use so that we meet our needs without wasting water, (2) working to protect ground water from contamination, (3) learning as much as possible about the resource, and (4) being sure water utilities, municipal leaders, regional, state and national leaders know our concerns.

Please check Madison Water Utility's web site, www.madisonwater.org, for suggestions for conservation and ground water protection and for links to good information on these topics; call or write the Water Quality Section of the Utility at 608-266-4654, 119 E. Olin Avenue, Madison WI 53713; attend the Board of Water Commissioners monthly meeting the third Tuesday of each month at 4:35 p.m. at 119 East Olin Avenue.

What Does the Water Utility Do?

- We use deep wells—vertical borings from the surface down to underground water—to pump water to the surface for consumption and fire protection. Residential wells are often less than 100 feet in depth, but Madison's range from 700 to 1100 feet, reaching the deep aquifer. Electricity powers pumps at the wells, pulling the water up from the aquifer and pumping it to storage facilities and then to the water main pipes and connected smaller water service line pipes to homes and businesses. When possible, storage facilities are on high ground to use gravity to help distribute the water.
- The Utility oversees construction of the system, so that new installations meet requirements for size, material, depth and connections. We plan for system expansion, adding wells and new mains and services.
- We have responsibility for maintaining and repairing the mains, valves, curb box shutoff fixtures, and hydrants. We schedule replacement of parts of the system that need to have greater capacity, as happens when a condominium project replaces single-family housing, or where frequent main breaks indicate that pipe is in poor condition, or when the pipe reaches the end of its predicted useful life. We repair main breaks that occur as ground shifts and the buried pipe ages and is affected by underground conditions. In 2006 we pumped about 11.3 billion gallons of water, through 828 miles of water main to 60,870 service lines, with 8,226 hydrants and 18,746 valves in service. We monitor pumping operations 24 hours a day; we check facilities.
- We add chlorine and fluoride to the water before it goes into the distribution system, closely monitoring the amounts added and checking levels at sample sites in the system. We test at all the wells for many

Around Wisconsin: Some Comparisons of Water Supplies

- If you drink water from a private well, you may have safe water but little testing is required and so your information will be limited to that testing and your aesthetic judgment.
- If you drink water from a municipal surface-water source, you will have access to information that identifies the specific source or sources and the utility responsible for answering your questions; you'll know that it is likely to be "softer," with less mineral content than ground water, that it has been through steps of disinfection, filtration and treatment, including fluoride and higher levels of chlorine than those required for ground water, that extensive required and supplementary testing has been performed and that any concern or violation has been communicated to you.
- If you drink tap water from Madison's municipal ground water source (and most other municipal ground water systems in Wisconsin), you will have access to information that identifies the source and the utility responsible for answering your questions; you'll know that it is "hard" in comparison with surface water, containing minerals from the rock formations, that it has been treated only with relatively small amounts of chlorine and fluoride, that extensive required and supplementary testing has been performed and that any concern or violation has been communicated to you.

Careful Water Use Is Very Cool

Rain barrels help protect ground water.

2007 would be a very good year for installing a well-designed rain barrel to capture water from roofs for use in the garden rather than sending it to the storm sewer. Madison Water Utility supports the Sustain Dane Rain Barrel Program and encourages all our customers to connect with Sustain Dane, install one or more rain barrels, and learn more about developing sustainable communities!



In areas away from pavement and buildings, rain falls to the earth's surface and then travels downhill or filters slowly deep into the ground. When the surface is covered by pavement or buildings, the process is changed—the covered area receives no water at all and the rain that fell is excess water.

In our community most of that extra water goes to the storm water collection system, and the storm water goes to our lakes, transporting everything in its path as it goes: dust, dirt, fertilizer and pesticide, leaves, grass clippings, branches and other plant litter, trash, animal droppings. Everything.

Rain barrels capture water that has fallen on roofs and makes it available for use on the site. That reduces demand on the municipal water supply and reduces the amount of rain going to the storm drain. Like rain gardens, rain barrels help use the rainfall in the area where it fell, letting it be handled by downward filtration and evaporation rather than as runoff to surface water.

How much of Madison is pervious (open to rainfall) and how much is impervious?

The city calculates that in 2006 we had about 1,342.5 million square feet of pervious area (grass, terrace, park, garden, or wetland)—48 square miles—and 401 million square feet of impervious area (paved or roofed)—14.4 square miles—in our 59,147 parcels.

Rain water is “soft” water, distilled in the water cycle from evaporation. It doesn't have the minerals that make ground water “hard,” and it doesn't have the chlorine and fluoride that are added to municipal water supplies. It's the preferred beverage of plants, both indoors and outdoors.

Rain barrels allow directed use of the rain displaced by roofs. Lawn and garden areas can be watered by a drip irrigation “soaker” hose connected to the barrel's threaded spigot or by a watering can or bucket. Sustain Dane's rain barrels are made from recycled plastic and utilize as many locally-sourced sustainable products as possible. A single rain barrel has a 55-gallon capacity, and a tandem system can double the capacity to 110 gallons.

How can I get involved with the Rain Barrel Program and help toward improving water quality in Dane County?

- Purchase one or more rain barrels at your residence
- Volunteer to be on a rain barrel installation crew
- Volunteer to assist with rain barrel construction/assembly
- Organize a rain barrel installation workshop in your neighborhood—and learn how to install a Sustain Dane rain barrel on your own

For more information, please contact Sustain Dane at 819-0689 or visit www.sustaindane.org.

What are the incentives for using a rain barrel?

Dollar savings are modest. Rain barrel users report their incentive is the desire to have a sustained clean water supply for the future.

Rain barrel capacity: 55 gallons

\$0.97 Charge for 100 cubic feet (748.1 gallons) of Madison water
(748.1 gallons = 13.6 x 55-gallon barrels)

\$1.1335 Sewer charge for 100 cubic feet of water

\$2.1035 Total charge for 748.1 gallons

Water from one rain barrel saves \$0.154 of charges to the customer, but it saves 55 gallons of water pumped from our ground water, and nearly that much directed to the storm sewer.



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