Milwaukee
Water Works
Safe, Abundant Drinking Water

Environmental Stewardship

Milwaukee has an abundant water resource in Lake Michigan. Water used is returned to the lake. As a steward of this resource, the Milwaukee Water Works (MWW) uses sustainable practices such as supply side conservation, water accountability, energy conservation, operational efficiency, and consumer advocacy to "Use Water Wisely." These practices ensure the long-term availability of safe and affordable drinking water while considering other water uses (e.g., agricultural, recreational) and other priorities (e.g., environmental health, economic prosperity and social welfare).

The need for efficiency and water savings

Water use in Milwaukee has steadily declined during the past three decades, a result of more efficient water use and conservation, high-efficiency appliances and industrial machinery, and changes in the industrial landscape. The MWW has more than adequate capacity for water treatment and distribution, operating at one-third of its rated capaicty.

- Water sold decreased from 58 billion gallons in 1976 to 29.6 billion gallons in 2015.
- Our customers reduced water use by 27% from 2000 through 2015. While we do not activity promote literal conservation, we offer a Use Water Wisely program to help customers find and fix leaks, avoid wasted water, and to control customer costs.
- The daily per-person, indoor and outdoor use in Milwaukee was 93 gallons in 2014 (calculated using water sold to residential customers only). The U.S. Geological Survey reports nationwide, daily per-person use of 80-100 gallons.
- Wastewater and sewer charges are based on water usage, motivating customers to use less water to hold down charges on their water and sewer bills.

Average daily pumpage for 2015 was 98 million gallons, a decrease from 103 million gallons/day in 2014. The Milwaukee Water Works could provide over 100 million additional gallons per day while still providing for fire suppression. Less water sold translates into declining revenue as costs to treat and pump drinking water increase. As water use and revenues fall, the MWW focuses on reducing costs, making operational efficiencies, and using sustainable practices.

Supply side conservation

The utility saved more than one billion gallons of water from 2006 to 2015. It would take decades for customers to equal this amount through conservation.

The AWWA has recognized the MWW with three awards for water efficiency. The first was a national 2008 Gimmicks & Gadgets Award for a tank-rinsing device (see bullet point four); the second was a 2008 Utility Achievement Award for reducing wasted water; a 2011 Utility Special Achievement Award recognized the Use Water Wisely program. Other activities:

- At the two water treatment plants, staff modified the operation of filters by extending the length of the filter runs and reducing the volume of water used to backwash filters. This efficient operation maintains high quality treated water and provides ongoing savings of 165 million gallons of treated water a year, as well as energy savings associated with less frequent use of the large wash water pumps.
- Hydrant and water main flushing programs are based on water quality parameters, not a specified length of time. Personnel use hand-held turbidimeters (devices that measure water clarity) to flush hydrants or mains only long enough to reduce turbidity to the proper level.

- To help reduce sewer overflows into Lake Michigan, flushing mains and hydrants in the combined sewer area is not scheduled during rainy periods.
- Staff invented a tank-rinsing device to dilute residual in sodium hypochlorite storage tanks before inspection, resulting in reduced water use from 95,000-150,000 gallons per process to 19,000 gallons, a savings of about 500,000 gallons of treated water per year.
- Studies are underway at the Howard Avenue Water Treatment Plant (WTP) to optimize the use of chemicals while maintaining high water quality standards. Operational adjustments to reduce energy usage include careful timing of pump starts and stops to eliminate extra energy charges and replacement of older equipment with energy efficient equipment.
- Leaks in the distribution system are limited through a number of activities. Scheduled preventive maintenance includes targeted leak surveys to identify non-surfacing water leaks. A system-wide water leak survey was conducted in 2008 and has been followed up with surveys in targeted high-leak areas.
- In 2011, Distribution began a pilot program using an Automatic Flushing Device which automatically flushes select hydrants at a scheduled time to reduce water waste and eliminate the need for an employee to travel to the hydrant to conduct the flushing.
- The utility pressure-tests new and replacement water mains on delivery and before construction to verify they will not leak when put into service.
- The Department of Public Works and its contractors eliminated the use of hydrants to flood water and sewer main projects to settle the soil and complete backfill around underground trenches. The change saves an estimated 20 million gallons of water per year and saves wear and tear on hydrants.
- Installation of over 2,800 hydrant-locking devices and a public education campaign has eliminated the waste of millions of gallons of treated water by reducing illegal hydrant openings during hot weather. Water wasted decreased from 447 million gallons (745 hydrants) in 2006 to 54 million gallons (91 hydrants) in 2013.
- Milwaukee Water Works was one of the first utilities in the U.S. with 100% metering, a public works distinction in 1910.
- MWW reviews non-firefighting use of hydrants for water accountability and public safety. Metering of permitted hydrants has been increased. Cross-connection inspections are aggressively pursued. Meter Services offers a bulk water filling station where contractors and landscapers pay for the water they use.
- In its proactive Vacant Property Turn-Off Program, the utility disconnects water at vacant properties in Milwaukee, preventing frozen pipe damage and wasted water. MWW provides a list of addresses where the water is to be turned off to the City's Department of Neighborhood Services (DNS); DNS notifies Water Distribution when they have confirmed vacant properties and the water works turns off the water at those properties.
- The Focus on Energy Program awarded an Industrial Sector cash incentive to the MWW upgrade of its Grange Pumping Station. The 5 million-gallon-per day (mgd) capacity pump had reached its useful life and the station needed an upgrade to meet increased demands and to reduce pressure fluctuations in the district. The project included replacement of the pump with two 12-mgd pumps with variable frequency drive to maximize energy efficiency.

Consumer outreach emphasizes "Use Water Wisely" http://milwaukee.gov/water/usewaterwisely

The award-winning Use Water Wisely program helps Milwaukee Water Works customers find and repair water leaks to reduce water waste, control water costs, and to protect the water resource and the environment. In collaboration with Clean Wisconsin, the Milwaukee Water Works implemented the program in 2010 to effectively change consumer behavior to reduce wasted water and lower customers' personal water costs.

Of customers who returned feedback cards, 76% said they used the leak-detecting dye tabs provided by the utility in an informational package and 33% said they found and fixed leaks in their homes. Most leaks were found at toilets and faucets. Ninety-six percent of participants said they found the information helpful.

Reducing energy use

- Energy efficient interior and exterior lighting is being phased in at the water treatment plants. At the Linnwood WTP, 500-watt incandescent bulbs were replaced with 85-watt compact fluorescents. Astronomical timers, which adjust settings as daylight periods change, were installed to ensure sufficient lighting for the safety of personnel in the filter galleries. Motion sensor-activated lighting also was installed.
- At the Howard Avenue WTP, lighting needs range from 24-hour exterior and interior to rooms and facilities that require light only when staff is working in an area. An energy audit and subsequent replacement of lighting fixtures reduced the use of 497 incandescent, quartz, and fluorescent lamps and light bulbs to 226 high efficiency bulbs and lamps. The

"shedded load" of electrical use was 36,027 watts compared with the previous use of 53,050 watts (calculated on a 10-12 hour day).
- An energy efficient "on demand" hot water heater was installed at the Linnwood WTP ozone building.
- Emphasis is placed on using the most energy efficient pumps for the situation to keep water flow consistent during peak and lower demand times. For example, electrical energy use at a booster station was lowered by installing a variable frequency drive on a station pump.
- A replacement heating, ventilating and air conditioning unit installed at the Meter Services Shop South uses digital controls instead of pneumatic, resulting in energy savings.
- Energy efficient windows were installed at the Linnwood plant maintenance building. Plans call for a facilities study and energy audit of heating, ventilating and air conditioning.

Additional sustainable and green practices

- Biodiesel fuel is used as possible in utility vehicles and equipment that require diesel fuel. Hybrid electric vehicles and diesel equipment to replace gasoline units, plus ethanol E85 capable equipment, is purchased whenever possible.
- Green roof infrastructure was pioneered in the 1930s for reservoirs and wash water tanks at the Linnwood WTP and in 1959, at the Howard Avenue WTP. The plants have a total 21 acres of green roof.
- The utility renovated the Kilbourn Reservoir into a park in a multi-year public involvement project. The earth-friendly design of the park, reopened in 2008, reduces storm water pollution by returning 3.63 acres of pavement to water-absorbing vegetation.
- Natural planting areas do not require mowing, and the roots of these natural plants add stability to steep hillsides and slopes, preventing soil erosion and runoff into streets during heavy rain. Other benefits include low maintenance costs, less greenhouse gas production from mowing activities, and less water wasted on sprinkling.
- Recycling includes paper, plastic, glass, and aluminum, as well as materials such as batteries and fluorescent lighting, and concrete and asphalt at construction and maintenance sites.
- Administration and engineering offices compost food and paper waste for use by the Growing Power urban gardens.

Stewardship partners

The Milwaukee Water Works partners with other agencies to promote the health of the watershed.

- The Milwaukee Water Works has been a member of the U.S. Environmental Protection Agency (EPA) WaterSense program since 2007 and the Public Service Commission of Wisconsin (PSC) Conserve Wisconsin program since 2008 to protect water and energy resources. The utility pledged to continue to make operations more water-efficient and to provide customers with water efficiency information.
- As a member of the Milwaukee Water Council, the City of Milwaukee and the MWW provide technical support to preserve the region's freshwater resource and promote water technology business and research, and education of future water talent.
- The MWW helped produce a "Simple Solutions to Water Pollution" brochure created by Milwaukee Water Partners, a consortium of regional environmental groups and the MMSD; and co-sponsors Fix A Leak Week programs in schools with MMSD.
- The MWW promotes collection programs for household hazardous waste, residential unused medicines, and consumer electronics; household recycling, and the Me2 energy efficiency program.

About the Milwaukee Water Works

The Milwaukee Water Works is a national leader in providing high-quality drinking water and monitoring water quality. Established in 1871, the Milwaukee Water Works is proud to be the largest and oldest continuously operating water utility in Wisconsin. The City of Milwaukee-owned utility provides water to over 860,000 people in 16 communities in Milwaukee, Ozaukee, and Waukesha Counties: Milwaukee, Brown Deer, Butler, Franklin, Greendale, Greenfield, Hales Corners, Shorewood, St. Francis, Wauwatosa, West Allis, and West Milwaukee. We also provide water to the Milwaukee County Grounds facilities and portions of Menomonee Falls, Mequon, New Berlin, and Thiensville.