

# Milwaukee Water Works

*Safe, Abundant Drinking Water.*

## 2011 Annual Report - Narrative

**Tom Barrett, Mayor, City of Milwaukee**  
**Ghassan Korban, Commissioner of Public Works**  
**Carrie M. Lewis, Superintendent**  
**Laura Daniels, Administration & Projects Manager**

**Zeidler Municipal Building, 841 N. Broadway**  
**Milwaukee, WI 53202**  
[www.milwaukee.gov/water](http://www.milwaukee.gov/water)  
[GreatMilwaukeeWater.com](http://GreatMilwaukeeWater.com)

### **About the Milwaukee Water Works**

The Milwaukee Water Works (MWW) is a national leader in providing high-quality drinking water and water quality monitoring. While contributing to a high quality of life, the water works provides a reliable supply of pure water at a low price to support business, industry, and research.

The Milwaukee Water Works is the publicly owned utility of the City of Milwaukee. Policy is set by the Mayor and Common Council. The utility is regulated by the EPA and the Wisconsin Department of Natural Resources (DNR) for facilities, operations, and water quality; and the Public Service Commission of Wisconsin (PSC), for rates and accounting.

The utility's budget is funded through revenue from water rates and proceeds of borrowing. City property tax levy revenue is not used to fund the utility operations. In addition, Milwaukee Water Works revenue is used to reduce the tax rate for the city. In 2011, the utility made an \$11 million Payment In Lieu Of Taxes to offset the city tax levy, reducing the tax rate by \$0.40 per thousand dollars of assessed valuation. The utility also pays other city departments for services it uses and covers the cost of its own employee benefits.

### **The importance of investment - "Buried No Longer"**

A modern, efficient, reliable water utility is one of the most important foundations of Milwaukee's quality of life. Communities depend on the Milwaukee Water Works to deliver safe drinking water to protect public health from waterborne illness, to provide water for drinking and cooking and sanitation. The "safety" also refers to providing adequate water pressures throughout the distribution system for fire suppression. Reliable pressure and water in a community are reflected in lower property insurance rates. The utility provides the foundation for supplying the water needs

of manufacturing, processing, business, and research. Investments in the utility ensure that residents of Milwaukee and nearby suburbs have adequate supplies of high quality water at all times.

It is important that a water utility carefully prioritize investments to ensure reliable and cost-effective support of public health and safety and economic vitality of the community. Because only a portion of the utility is visible to the public, attention is needed to reinvest in treatment, pumping, and distribution. This investment comes in the form of water customers paying sufficient rates to cover expenses and provide for maintenance and replacement of infrastructure. Strong infrastructure replacement and renewal program enable proactive attention in a controlled manner to aging systems rather than reactive response to failures.

Utility managers balance operating and capital needs with available revenue and authority for borrowing. The operating budget covers the day-to-day financial needs of the utility's several work units. Two Water Treatment Plants provide 24-hour-a-day drinking water treatment and operational activities. Water Quality ensures all water quality regulations are met and exceeded. Water Distribution activities focus on scheduled preventive maintenance and repair of 1,964 miles of underground piping throughout Milwaukee and the utility's retail customer suburbs, and fire hydrant inspection. Water Engineering collaborates with other sections in applied research needs and developing and overseeing the Capital Improvements Program. Business includes accounting, customer service, billings and collections, marketing and public outreach. Meter Services ensures that water meters are operating properly and accurately represent water usage. Technical Services provides informational technology support.

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### Customers

The Milwaukee Water Works serves a population of 867,282 in 16 communities with a service area of 196 square miles. Water is provided to wholesale customers who operate their own water utilities, metering and billing customers, and maintaining distribution systems. These include Brown Deer, Butler, Greendale, Menomonee Falls, Mequon, New Berlin, Shorewood, Thiensville, Wauwatosa, West Allis, and the Milwaukee County Grounds. Retail customers receive full water service, including customer billing and distribution system maintenance. These include Greenfield, Hales Corners, St. Francis, Franklin (a portion); West Milwaukee receives billing services from MWW and maintains its own distribution system.

The Milwaukee Municipal Services Bill includes charges for Milwaukee city services and Milwaukee Metropolitan Sewerage District (MMSD) services. The Milwaukee Water Works manages the billing and forwards the collected charges to the City Treasurer for distribution to other city departments and the MMSD.

### Water Treatment Process

The utility uses ozone gas as the primary form of disinfection in the water treatment process. As water from Lake Michigan enters the first stage of treatment, ozone is bubbled into the water in large contactor tanks. This highly reactive gas destroys illness-causing microorganisms such as *Cryptosporidium* and *Giardia*. Ozone also removes taste and odor, and reduces the formation of chlorinated disinfection byproducts. Following inactivation of microorganisms, the processes

of coagulation, flocculation, settling, and biologically active filtration remove additional particles. After filtration, chlorine is added as a secondary disinfectant. A regulated amount of fluoride is added to help prevent dental cavities among consumers. A phosphorous compound is added to help control corrosion of pipes. This helps prevent lead and copper from leaching from plumbing into the water. As the water leaves the treatment plants, ammonia is added to change the free chlorine to chloramine. This is a very stable form of chlorine disinfectant that maintains the residual protection in the distribution system. The Wisconsin Department of Natural Resources (DNR) requires water utilities to maintain a detectable level of disinfectant throughout the distribution system to maintain bacteriological protection.

### Exceptional Water Quality

Milwaukee's treated drinking water quality meets or exceeds all EPA and DNR standards. The Milwaukee Water Works has expanded its water quality monitoring and screening activities to include organisms and contaminants that are not yet regulated but considered of "emerging concern." The utility tests source and treated drinking water for over 500 contaminants even though the EPA requires tests for only 90. This is done as a precaution to ensure safe water, to collect baseline data for study, and to meet future regulations. Milwaukee was one of the first U.S. cities to test its source and treated water for emerging contaminants. Milwaukee was the first U.S. city to post the results on the Internet, demonstrating our commitment to water quality and transparency.

### A strategy to operate as efficiently as possible

As water use and revenues fall, the Milwaukee Water Works has focused on reducing costs and making operational efficiencies. The strategy results in savings in energy, chemicals, manpower, and other costs to maintain low and reasonable water rates.

Part of this strategy is the practice of supply-side conservation. The utility saved over one billion gallons of water from 2006 to 2011 through operational changes in treating and distributing water, flushing mains and hydrants. It would take decades of conservation by utility customers to equal this amount of water savings.

### Use Water Wisely

The Milwaukee Water Works is helping customers find and fix leaks, too. The "Use Water Wisely" program, in collaboration with Clean Wisconsin, won the 2011 Utility Special Achievement Award from the Wisconsin Water Association. Utility employees work with customers to understand their water bills, find and fix leaks, reduce wasted water, and control their water costs. Customer Service staff look at billing data to identify customers with high water use. They mail these customers a brochure with instructions for finding and fixing leaks; toilet leak-detecting dye tabs, and a postage-paid feedback card. Customer Service staff provide over-the phone counseling to help the customer find and fix leaks. Water meter services staff investigate leaks and high water use at customer locations and during routine meter replacement visits. In 2011, Meter Services sent over 10,000 letters concerning multiple estimates, 3,000 letters regarding

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high use, and provided over 500 onsite investigations for high usage. Please visit

<http://city.milwaukee.gov/water/usewaterwisely>

### WAVE Rate for Business Customers

Mayor Tom Barrett has pledged City of Milwaukee collaboration to encourage water research and business development. In June, he launched the WAVE Rate (Water Attracting Valued Employers). Also known as an Economic Development Rate, the WAVE is intended to encourage business growth and retention. The rate is available to new and existing business customers in the utility's service area for a period of five years in exchange for increased water usage and creation and retention of at least 25 jobs. The rate was designed by the Public Service Commission. The utility is conducting marketing outreach to publicize the WAVE Rate. Please visit [GreatMilwaukeeWater.com](http://GreatMilwaukeeWater.com).

For all customers, the Milwaukee Water Works provides a Declining Block Rate (DBR) in which cost per unit of water decreases with increased water usage. This is an advantage for commercial customers who use more than 34 Ccf per month (25,000 gallons/month).

### Infrastructure Maintenance

The capital budget is based on long-term planning to replace or upgrade existing infrastructure, and to install new infrastructure as needed. The capital program prioritized projects based on results of water-related research, new technology, and condition assessments of existing systems. The program includes treatment process facilities, laboratories, pumping and water storage, equipment, water mains, hydrants, and meters. The current emphasis is on the distribution system, including remote pumping and storage facilities and water mains and backup power generation. Since 1993, the Milwaukee Water Works has invested \$406 million in its infrastructure. Preventive maintenance is an important component of assuring that all components of infrastructure are in top functional condition. While public health is the primary consideration in the delivery of water, the Milwaukee Water Works systems were designed to provide sufficient water to suppress all fires.

### Major Projects of 2011

A multi-year project to provide backup electric power generation at five locations of critical infrastructure reached a hallmark in 2011 with the substantial

completion of the project at the Riverside Pumping Station. Three 2500-kW diesel generators stand ready to power the pumps at the station in the event of an electrical outage. The Florist Station on the northwest side was the second location addressed, with design 90% complete in 2011. Also in 2011, design began at the Linnwood Water Treatment Plant.

The Grange Pumping Station is an integral part of water service to customers in the southwest pressure district of the distribution system. An existing five-million-gallon-per day (mgd) capacity pump had reached the end of its useful life and the station needed upgrading to meet increased demands and to stabilize pressure in the district. The upgrade in 2011 included demolition of the old pump and installation of two 12-mgd pumps, and associated valve, piping, electrical, concrete, and steel work. The variable frequency pumps will provide energy savings. The Milwaukee Water Works upgrade project was awarded a cash incentive from the Focus on Energy Program Industrial Sector.

Another project completed in 2011 was the painting and repair of the two million-gallon water storage tank in the Grange-Oklahoma pressure district. The tank, located in the City of Greenfield, was showing significant deterioration of the exterior and interior coatings with delamination and corrosion on the surface. The tank's appurtenances were upgraded for improved safety. Containment tarps were installed around the entire tank to prevent dust and overspray from escaping while the tank was being abrasive-blasted and painted.

Another upgrade of equipment took place at the Linnwood Water Treatment Plant. The existing storage and chemical feed systems for the addition of fluoride to the treated water were replaced.

### Meter Replacement Program

The Milwaukee Water Works is replacing 155,967 water meters in homes and small businesses in Milwaukee, Greenfield, Hales Corners, St. Francis, and West Milwaukee. The suburbs are retail customers of the utility which provides water, system maintenance, and billing. Customers with meters sized one inch or smaller receive a new meter, automated meter reading device (AMR), and battery. The original meters were installed in 1996 and the batteries are reaching the end of their useful life. The replacement project will take place over the next seven to eight years to allow the utility to

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continue normal meter service operations and maintenance. At the end of 2011, replacement was 12% complete. Meters mechanically measure the water as it moves through the device. The AMR device, a radio transmitter powered by a battery, is connected to the

meter. As the meter reading van passes by the building on the street, a data-collecting device records the meter reading transmitted from the AMR.

### General Statistics

The Milwaukee Water Works was organized on April 18, 1871. The utility began pumping Lake Michigan water into a distribution system in September 1874. Treatment of the water to prevent illness began in 1910.

Howard Avenue Treatment Plant rated capacity 105 million gallons per day (MGD)

Linnwood Treatment Plant rated capacity..... 275 MGD

Average Daily Pumpage..... 101 million gallons (MG)

Total Annual Water Sales..... 32 billion gallons (BG)

Water mains, total length..... 1,956 miles

Water meters in service..... 161,611

Hydrants..... 19,847

Population served..... 861,249 in Milwaukee and 15 communities

Area served..... 196 sq. mi.

Residential water use..... 46 gallons per person per day

Pumping stations -- Two supply stations at the treatment plants, three pumping stations, eight re-pumping stations

Storage -- 40 million gallons in eight tanks

The highest actual pumpage for a 24-hour period was 322 million gallons, on Aug. 2, 1988.

Cost of drinking water: Five gallons cost \$0.01 (one cent). Water use is measured in 100 cubic feet, or Ccf. One Ccf, the equivalent of 748 gallons, costs \$1.68.

Retail customers - The utility provides water and billing to Greenfield, Hales Corners, St. Francis, and a portion of Franklin. West Milwaukee receives billing services from MWW and maintains its own distribution system.

Wholesale customers – The MWW sells water to these communities which operate their own water utilities: Brown Deer, Butler, Greendale, Menomonee Falls, Mequon, New Berlin, Shorewood, Thiensville, Wauwatosa, and West Allis. The MWW also sells water to the Milwaukee County Grounds on a wholesale basis.

**Milwaukee Water Works Customer Service Center** 841 N. Broadway, Fourth Floor  
Monday – Friday, 7:30 a.m. – 5:00 p.m. **Telephone** (414) 286-2830 **Fax** (414) 286-5452 **TDD** (414) 286-8801  
Non-emergency email: [watwebcs@milwaukee.gov](mailto:watwebcs@milwaukee.gov)  
[www.milwaukee.gov/water](http://www.milwaukee.gov/water) Milwaukee Water Works 24-Hour Control Center (414) 286-3710  
Para una explicación en español, por favor llame al (414) 286-2830.

The Milwaukee Water Works is a member of the [American Water Works Association](#), the [Association of Metropolitan Water Agencies](#), the [Water Research Foundation](#), the [Wisconsin Water Association](#), the Milwaukee Water Council, and the [M7 \(FaB\) Food and Beverage Network](#).