



Metropolitan Water Reclamation District of Greater Chicago

President's Annual Message 2016



The year 2016 was a great one at the MWRD. The MWRD is raising the bar on water quality initiatives, recovering resources, neutralizing energy usage, managing stormwater and improving the planet. Our size and scope make us a world leader in the water utility field and a pioneer in implementing initiatives that impact our environment. Our staff's ingenuity and unbridled passion for protecting the environment and our residents has expanded our footprint, elevated our performance and sparked many achievements in 2016. Here are a few highlights from this inspiring year.

Mariyana T. Spyropoulos
President of the Board of Commissioners

Financial Savings

In September, the GFOA again bestowed the MWRD with the GFOA Distinguished Budget Presentation Award for 2016 and for the 32nd consecutive year. This award includes special performance measures recognition for providing objective measures of progress toward accomplishing the government's mission and goals and objectives for specific units and programs. The District again received the Certificate of Achievement for Excellence in Financial Reporting (CAFR) marking 40 consecutive years putting the MWRD in the top two percent of governments receiving a consecutive award. The MWRD's CAFR documents our ability to provide assurance to investors, regulators, rating agencies and the public that the MWRD's financial condition and results of operations are fully and fairly presented. This is critically important because in July we closed on a \$427 million bond sale. We achieved savings in excess of \$120 million on future debt service. The MWRD maintains a AAA rating with Fitch Ratings and a AA+ rating from Standard and Poor's. We continue to be a national leader in cost savings. In fact, at \$197 per Chicago

resident, the average cost for the MWRD's wastewater services is less than half the cost of the national average of \$452.

The MWRD has continued to support its mission by implementing sustainable practices in resource recovery and energy efficiency while strengthening our financial foundation. We continue to maintain strong general fund balances and reserve balances for the capital improvement budget.

Legislative Assistance Advances Crucial Project

The McCook Reservoir, part of the Tunnel and Reservoir Plan (TARP), took a major step closer to becoming the world's largest combined sewage reservoir in 2016. With Phase 1 of the McCook Reservoir set for completion in 2017, our Illinois delegation successfully introduced an amendment to the Water Resources Development Act of 2016 which requires the U.S. Army Corps of Engineers to expedite the completion of McCook Reservoir Phase 2. Adopted in 1972, TARP has been instrumental in protecting the region's drinking water supply in Lake Michigan, improved water quality of local rivers and streams and provided

an outlet for floodwaters to reduce street and basement sewage backup flooding. The first phase of the McCook Reservoir will provide 3.5 billion gallons of storage. Phase 2 will be completed in 2029 and will provide an additional 6.5 billion gallons of storage. The reservoir will protect the waterways from pollution and provide more than \$114 million per year in flood damage reduction benefits to 5 million people in Chicago and 36 suburbs.

Praise for Thornton Composite Reservoir

Although McCook is on schedule to become the world's largest combined sewage reservoir, this distinction for now belongs to the MWRD's Thornton Composite Reservoir (TCR) which went online in the fall of 2015. This reservoir serves a 90-square-mile area in Cook County by holding up to 7.9 billion gallons of water before it can be treated at the nearby Calumet Water Reclamation Plant (WRP). TCR protects 556,000 people from flooding in 14 communities, including the South Side of Chicago and 13 suburban communities. Since it was brought into service, there has only been one combined sewer overflow in the Calumet River System, a prime example of the reservoir's effectiveness in protecting our waterways from pollution and our basements from flooding. The MWRD received multiple awards and honors for the reservoir: the Illinois Department of Natural Resources' Office of Mines and Minerals 2016 Illinois Mined Land Reclamation Award; the Illinois Association for Floodplain and Stormwater Management 2016 Flood Reduction Project Award; the American Public Works Association (APWA), Chicago Metro Chapter's 2016 Project of the Year; the APWA Chicago Metro Chapter's 2016 Public Works Project Excellence Award; the APWA National Conference's 2016 Project of the Year; Water and Wastes Digest's Top Projects for 2016 Award; Friends of the Chicago River's 2016 Green Ribbon Award; and the ASCE Illinois Section's 2016 Project of the Year.

Disinfection Facility Unveiled at O'Brien WRP

The new disinfection facility at the O'Brien WRP went online in time for this year's recreation season. The O'Brien WRP utilizes ultraviolet (UV) radiation to disinfect water as a final layer to its treatment process to reduce bacteria in the water that is released from the plant into the North Shore Channel. Together with the Calumet WRP disinfection system the quality of water throughout the Chicago Area Waterway System (CAWS) will dramatically improve.

Eradicating Drugs from our Water

We have always known that safer and cleaner waterways start at home. The MWRD once again partnered with the U.S. Drug Enforcement Administration (DEA) to collect hundreds of pounds

of pharmaceuticals. The success of these collections prompted the MWRD to permanently house drug drop-off boxes at four locations, including three WRPs and the Main Office Building. While educating the general public about the potential for abuse of medications and harm to the environment, we are also working to reduce accidental contamination of streams, rivers and lakes. We also partnered with the Cook County Sheriff's Office to expand their Prescription Drug Take-Back Program. In addition, we continue to push for the elimination of pesticides, microbeads, chlorides and other harmful pollutants to our waters.

Chicago Area Waterways System (CAWS) Microbiome Research

The MWRD is partnering with the U.S. Department of Energy's Argonne National Laboratory to study the typical sources and distribution of microbial communities in the CAWS. Microbial communities are key players in maintaining the CAWS' health. This seven-year study aims to understand the composition and sources of the CAWS microbial population using state-of-the-art metagenomic science. Since 2012, Argonne scientists have been analyzing samples taken monthly from the Chicago River between March and November and running the samples through a DNA sequencer to identify and count the microbes in the river. The work is measuring and recording changes in microbial communities as we begin disinfecting secondary treated water at O'Brien and Calumet WRPs and as the Thornton reservoir and the first phase of the McCook reservoir are completed. The entire study will be completed in 2019 and will record the improvements that occur as the MWRD takes steps to manage its outflow.

Resource Recovery

NUTRIENT RECOVERY UNDERWAY

In 2016, we opened the world's largest nutrient recovery facility to improve conditions as far away as the Gulf of Mexico. The new Ostara facility at the Stickney Water Reclamation Plant works to recover nutrients, such as phosphorus and nitrogen, from the wastewater treatment process. Excess phosphorus in waterways can cause algae to grow and bloom, creating toxic conditions that destroy aquatic life and severely limit recreational enjoyment of lakes and rivers. The MWRD's nutrient recovery facility will greatly reduce its nutrient effluent load to the Chicago/Calumet river system, upstream of the Mississippi river basin, and as a result, will reduce its impact on hypoxia in the Gulf of Mexico. Phosphorus and nitrogen are being recovered to create a high value fertilizer, marketed as Crystal Green. The process is both economically and environmentally viable. The new facility has a production capacity of 10,000 tons of Crystal Green per year. As part of the commercial sale of Crystal Green, the

MWRD receives revenue for every ton of fertilizer it produces. By removing phosphorus from the water and returning it to farmers and other agricultural producers, this facility represents a significant shift in the wastewater industry from treatment to recovery for reuse.

WATER REUSE

In addition to phosphorus, we are creating new opportunities to recover water through a new partnership with American Water to supply clean, reusable water to the industrial sector at the rate of about 10 million gallons per day. We have also experimented with the recovery of algae, which we can produce 24 tons daily. The algae can be harvested and converted for use in bioplastics, biochemicals, biofuels, pharmaceuticals and dyes, or used as fertilizer or as aquaculture feed, returning the phosphorus to the nutrient cycle.

WORKING TOWARD ENERGY NEUTRALITY

In September, the Board of Commissioners unanimously supported an amendment to the Resource Recovery ordinance, which allows us to begin accepting organics that will help us grow our energy production and reach our goal of energy neutrality by 2023. We are currently developing a program that will allow us to receive organic waste at our Stickney and Calumet WRPs that will help us produce biogas, which can offset the energy demands of the treatment plants. Our Calumet WRP has digester capacity to process 400 tons of food waste daily, and we are building a processing facility and a receiving station that will help expedite the process. Through the ordinance, we would also be able to receive high strength organic materials for biological phosphorus removal and organic feedstock, such as yard waste, tree trimmings, and wood chips to strengthen and add to our biosolids compost blend. These are critical initiatives that protect our planet and produce savings for our taxpayers.

BIOSOLIDS

Part of the waste that is being hauled each day to landfills is wood chips and yard waste. By combining it with our Class A biosolids, we are developing another reuse opportunity through a high-value compost. Since receiving state authority last year, we continued to develop this product and move it closer to the market. We produced approximately 145,000 dry tons annually over each of the past five years and are targeting a distribution goal of 90,000 dry tons per year. Given the demand for this product on golf courses and at park districts, we know there is a similar value to making biosolids available to the public. We held a naming contest for a product we hope to market soon. We received 726 creative submissions that will help us market our resource and educate the public on the many benefits of biosolids reuse. Receiving the materials to create the compost and selling the finished product will provide another revenue

stream for the MWRD. This compost blend will assist soil for plants, helping to increase water retention and promote root development.

Utility of the Future

Expanding our mission beyond water treatment to an array of environmental causes has made us a leader in the industry. In 2016, we were one of 61 utilities from across the U.S., Canada, and Denmark that were selected by a peer committee of utility leaders to receive the inaugural "Utility of the Future Today" designation. The recipients received a display flag and a special certificate to further identify and promote their outstanding achievement as a Utility of the Future organization. The Utility of the Future program is a partnership of water sector organizations that celebrate the progress and exceptional performance of wastewater utilities while supporting the widespread adoption of an innovative business model. Through our many endeavors in water management, resource recovery and community partnering, we are setting a national trend as a utility of the future.

Stormwater Management

As watershed stewards during a time of changing weather patterns, one of the growing issues facing our region is flooding. Since the Illinois General Assembly granted authority to the MWRD to manage stormwater for Cook County, we have extended our resources to fight the danger of flooding to the point we now have 100 projects in stormwater management currently ongoing. We are performing preliminary engineering and design work on several alternatives recommended for phase I projects, including flood control projects and streambank restorations, while also constructing drainage improvements in phase II, moving forward with the flood prone property acquisition program and green infrastructure improvements. Many of these green infrastructure projects are drawing major acclaim while contributing to quality of life improvements for communities. The trade magazine Stormwater Solutions recently named a green infrastructure project implemented by the MWRD in Blue Island as a top 10 stormwater project in the nation. The magazine recognized the innovative green infrastructure project for its work in managing water and preventing flooding in the community. For the project, the MWRD installed six rain gardens and two permeable parking lots in flood prone areas to capture more than 150,000 gallons of stormwater per rain event and assist in mitigating flooding damages.

The MWRD has invested in and is currently working on about 20 green infrastructure projects throughout Cook County. The MWRD partners with various municipalities on these projects that use natural landscaping to manage water and provide environmental and community benefits, while preventing stormwater from entering the sewer system. We are currently

finalizing five studies across Cook County that examine the potential use of green infrastructure as a solution to managing excess stormwater. As a result of some of these findings, we are partnering with the city of Chicago on a pilot study that will gain insight into the effectiveness of various technologies aimed at reducing basement backups. The proposed dataset will be comprised of approximately 40 residential properties in the Chatham neighborhood to evaluate the effectiveness of low-cost improvements in reducing basement backups, such as downspout disconnection and extension, rain gardens and backflow preventers.

Space to Grow

No MWRD conversation about green infrastructure would be replete without a mention of our award-winning partnership known as Space to Grow. The collaborative program converts Chicago schoolyards into community spaces for physical activity, outdoor learning, environmental literacy and engagement with art, while addressing neighborhood flooding issues. This joint venture, formed between the MWRD, Chicago Department of Water Management, Chicago Public Schools, Healthy Schools Campaign and Openlands constructed three new schoolyards in 2016: Wadsworth Elementary School in the Woodlawn neighborhood, Gunsaulus Scholastic Academy in the Brighton Park neighborhood and Corkery Elementary School in the Little Village neighborhood. The program received the 2016 Best of Green School Award for Collaboration by the Center for Green Schools at the U.S. Green Building Council (USGBC) in collaboration with the Green Schools National Network (GSNN) in Pittsburgh in March, and then again in August, Space to Grow partners received the National Association of Flood and Stormwater Management Agencies' (NAFSMA) first place Green Infrastructure award in Portland, Oregon.

Rain Barrels

The free rain barrel program continued to be extremely popular among residents, municipalities, and community groups. Between January 2014 and December 2016, the MWRD worked with 88 municipal partners and two dozen non-governmental organizations to distribute more than 120,000 barrels. This demand has cultivated a newfound understanding and appreciation for managing water in addition to providing communities with a tool to combat flooding. When we started this program, we knew that a few barrels may not make a drastic difference in the amount of water overwhelming our drainage and storm sewer systems, but 120,000 rain barrels capturing rain in a one-inch event is equivalent to 6.6 million gallons of water, enough to fill 10 Olympic size swimming pools.

Restoring the Canopy

In April we launched a new program designed to inspire Cook County residents to adopt a more traditional form of green infrastructure that will truly add green to our communities while retaining stormwater. Driven by the devastation caused by the emerald ash borer and extreme weather events that have led to the loss of approximately 13 million trees, staff embarked on an ambitious plan to help restore the Cook County tree canopy. In only a few months, more than 25,000 free oak tree saplings were distributed as part of the Restore the Canopy, Plant a Tree program. This program works toward restoring the region's tree canopy and managing local stormwater which will help reduce flooding, improve local water quality by lessening the load of water overwhelming our sewer system, and promote resource recovery by planting the trees in our composted biosolids blend. To distribute these trees, the MWRD has forged partnerships with more than 25 different municipalities, 30 schools and nearly 50 community groups.

Board Changes

Commissioners Michael Alvarez and David Walsh completed their terms on the Board. Both were instrumental in guiding the vision of the MWRD during their tenure, and their presence will be missed. In 2017, we welcome two new commissioners, Josina Morita and Martin J. Durkan, to serve on the Board and look forward to their collaboration as we continue to work on behalf of the residents of Cook County.

Looking Ahead to 2017

Next year we will continue working toward our ambitious goals of transforming water and recovering resources, all while continuing to explore cost saving measures for the residents of Cook County. We have some exciting initiatives moving forward, from capturing energy from our renewable resources to promoting business opportunities for those who served through a veteran's preference policy. Our pledge to meet energy neutrality will have our engineers and scientists testing and applying the latest technologies, while our plant managers and treatment plant operators will continue to push for the best and most resourceful ways to treat water and keep operations running smoothly on a daily basis. Our team of stormwater experts will continue to develop community partnerships and find solutions that will continue to make the Chicago region a phenomenal place to call home. We realize we cannot protect our water environment all by ourselves. The water quality we have worked so hard to attain in our waterways and Lake Michigan affords us this wonderful home, and through the MWRD and our various partners we aim to keep it that way for a long time to come.

