

# A TRADITION OF **INNOVATION**

2017 Annual Report

Madison Metropolitan  
Sewerage District



MADISON  
NINE SP



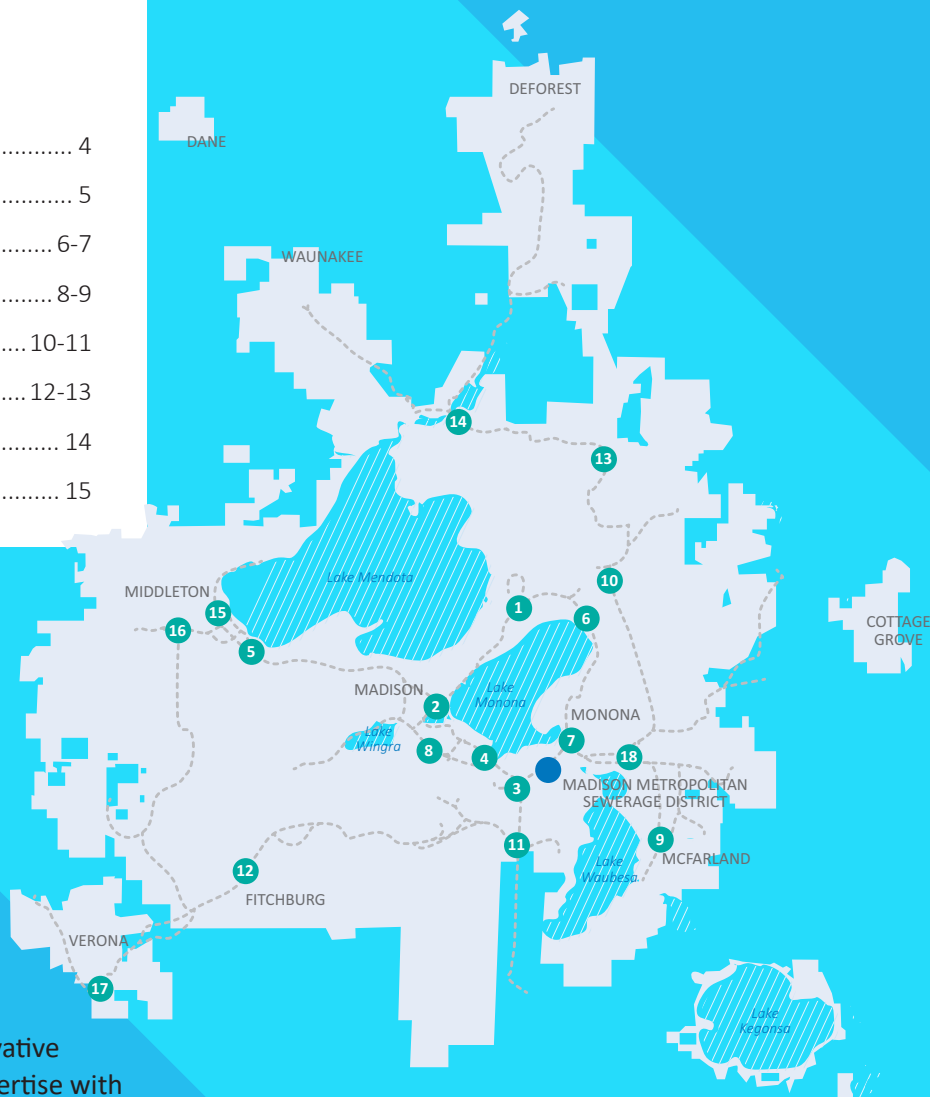
## TABLE OF CONTENTS

Good ideas, great results .....	4
2017 Operating Budget .....	5
Then and now: environmental innovation .....	6-7
Then and now: workforce development .....	8-9
Building on our past, investing for the future .....	10-11
A long-term commitment to our communities.....	12-13
District research drives innovation .....	14
About the district .....	15

## Our Mission

PROTECT PUBLIC HEALTH  
AND THE ENVIRONMENT

We are a passionate and experienced resource recovery team focused on protecting public health and the environment. Every time we clean and return wastewater safely back to nature or apply Metrogro to help farmers grow more food, we are taking steps to create a cleaner and better world. We are known for our innovative engineering, conservation leadership and expertise with resource recovery. We are also cost-conscious ratepayers, just like you.



## Our Vision

## ENRICH LIFE THROUGH CLEAN WATER AND RESOURCE RECOVERY

Our vision is to enrich the community by improving living conditions for people, plants and animals while seeking partnerships with others to better conserve our shared resources. Water is finite; we can't create more of it. By changing the way we think about and use water, together we have the power to enhance the quality of life on our planet. By making small changes and respecting every drop of water we have today, we can set the tone for a resource-conscious and sustainable community tomorrow.

# 2017 At-a-Glance

**16.03** *billion gallons of*  
**wastewater processed**  
*(Lake Kegonsa holds 14.9 billion gallons)*

**7.4** *million*  
**kilowatt hours of**  
**energy produced**

**38%** *lower rates than*  
**comparable residential**  
**sewer charges nationwide**

## LETTER FROM THE CHIEF ENGINEER AND DIRECTOR

At Madison Metropolitan Sewerage District, we trace our tradition of innovation to our founding. And we expect the strategic infrastructure planning and groundbreaking research underway now to serve our customer communities well into the future.

Back in 1930, when few communities stood ready to invest in the public health and environmental benefits of a regional sanitary sewer system, leaders from Madison and four neighboring communities recognized the need for intergovernmental cooperation to protect area surface waters including Lake Mendota.

Today, continued support from our 26 customer communities allows us to accommodate economic growth in the region and plan strategically for the future so that we deliver safe, reliable service and conserve shared resources at an acceptable cost. We do this by engaging community members, developing our workforce and increasing our organizational effectiveness.

During 2017, our nine-member commission provided the guidance necessary to achieve key results based on science, strategic planning and sustainable stewardship. For example:

- The district continues to protect public health and the environment through compliance with permit requirements for effluent discharges to Badfish Creek and Badger Mill Creek. For 2017, the effluent remained below permitted levels for phosphorus, suspended solids, ammonia, nitrogen and biochemical oxygen demand.
- During its first year of full operation, the district-led Yahara Watershed Improvement Network project produced total phosphorus reductions for the Yahara Watershed of 40,069 pounds, nearly 42 percent of the annual reduction called for in the 20 year project.
- Continued focus on costs and preventive maintenance helped maintain affordable rates; in 2017, the average annual residential service charge of \$313 remained nearly 38 percent below the national average of \$501 for comparable utilities.

We thank you for your support and welcome your comments and feedback.

Sincerely,



Michael Mucha, P.E., ENV-SP  
Chief Engineer and Director | Madison Metropolitan Sewerage District



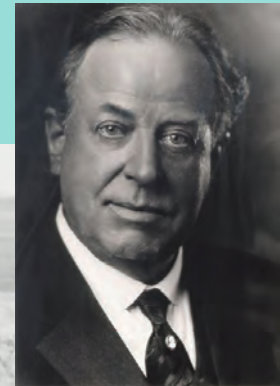
*D. Michael Mucha,  
Chief Engineer and Director*

# Good ideas, great results

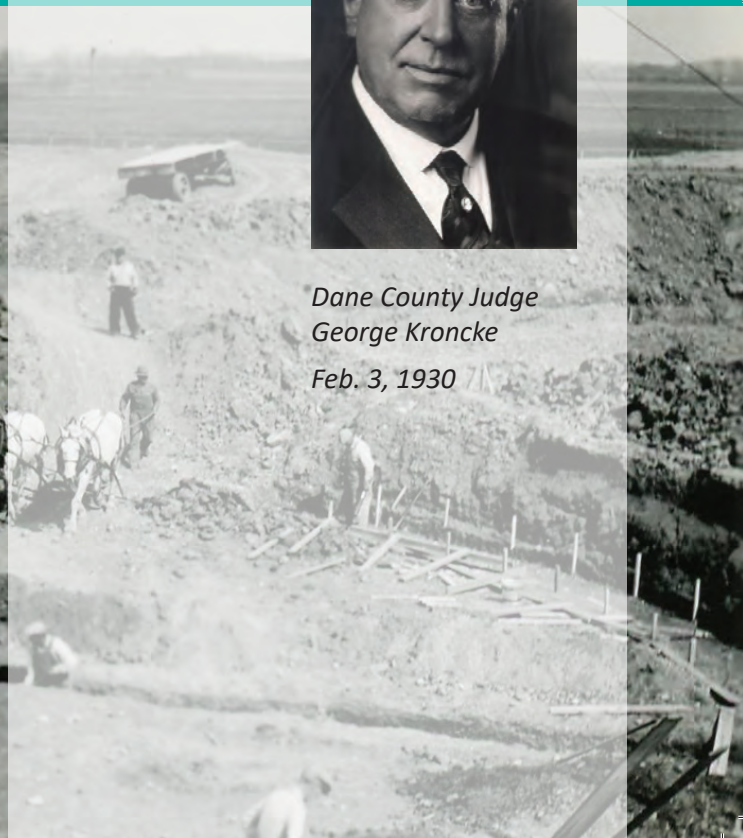
A 1927 state law enabling creation of metropolitan sewerage districts provided a way for leaders of Madison and surrounding communities to address the growing public health and environmental challenges associated with wastewater. By 1928, the Nine Springs Wastewater Treatment Plant was serving the City of Madison and in early 1930 Dane County Judge George Kroncke ordered creation of the district, writing that, "A larger district in the long run is more economical and will serve the people to better advantage, with less expense to the community as a whole."

Early commissioners Ernest Warner, Frank Blied and Charles Seastone quickly established a vision for the regional district that set the stage for its prudent financial stewardship and continued technological advancements today.

*"Considering the matter from every angle and from every aspect of the general necessities of the situation as applied to the preservation of public health, safety, comfort, convenience and welfare of the community within its boundaries...the district should be organized and it is so ordered."*



Dane County Judge  
George Kroncke  
Feb. 3, 1930



# 2017 Operating Budget

## REVENUE

For 2017, operating revenues totaled \$34.9 million, up \$400,000 or 1 percent from \$34.5 million in 2016. Stronger than expected revenue from sewer service charges, servicing pumping stations for others and struvite fertilizer sales contributed to the results.

## EXPENDITURES

Operating expenditures for 2017 totaled \$34.5 million, less than the budgeted \$35.2 million but up \$2.6 million or 8 percent from \$31.9 million in 2016. Expenses were lower than budgeted for administration, engineering and the district’s pre-treatment program but higher than expected for wastewater collection, biosolids reuse program, capital outlays, servicing pumping stations owned by others and wastewater treatment.

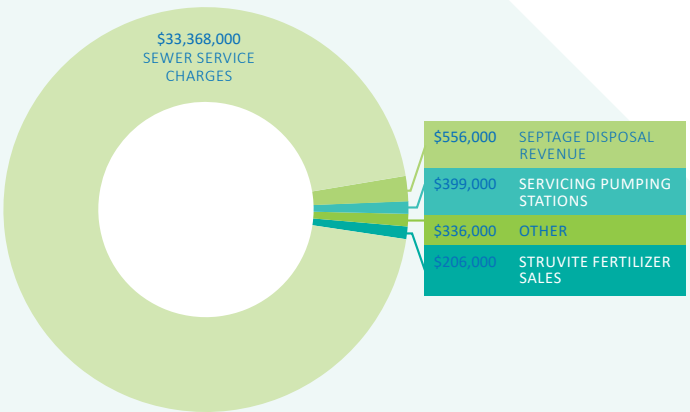
## OPERATING FUND BALANCE

The district’s operating fund balance increased to \$16.6 million, up \$400,000 or roughly 2 percent from \$16.2 million in 2016. The operating fund balance at the end of 2017 included unrestricted operating reserves of 230 days of operating expenses and met the district’s end-of-year minimum balance of 180 days of operating expenses.

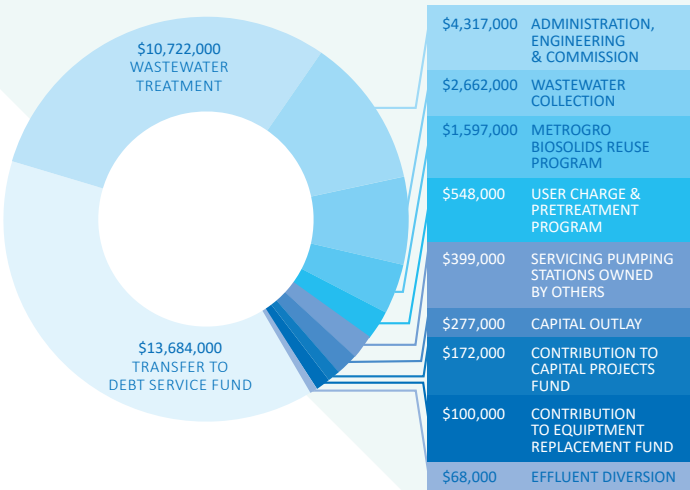
## RATES

In 2017, the average annual residential sewer service charge of \$313 remained nearly 38 percent below the national average of \$501 for comparable utilities. The district’s rate includes \$170 for services provided by the district and \$143 for services provided by the municipality. The national results are drawn from a 2017 survey of 174 of the nation’s largest municipalities.

2017 ACTUAL OPERATING REVENUES  
Total Operating Revenue \$34,865,000



2017 ACTUAL OPERATING EXPENDITURES  
Total Operating Expenditures \$34,546,000



## BEST PRACTICES IN BUDGETING

*The Government Finance Officers Association Distinguished Budget Award recognizes best practices and transparency in reporting on use of public funds. The district earned the GFOA award in 2017 as it has since 2013.*



# Then and now: environmental innovation

From inception, Madison Metropolitan Sewerage District has worked to reclaim natural resources and put them to beneficial use. In August 1929, several months before the regional district was formed, the Nine Springs Wastewater Treatment Plant's City of Madison superintendent treated 40 state power plant engineers attending a UW-Madison training program to a cookout with a special twist: the hamburgers were grilled on a stove powered by recovered biogas.

By 1936, recovered biogas was being used to help run the plant itself; the biogas powered a blower that provided air to support microbial digestion in the aeration tanks as part of the wastewater treatment process.

During 2017, the district recovered a record volume of biogas as it churned out 305 million cubic feet, up from 270 million cubic feet in 2016. The district used this biogas supply to generate more than 7.4 million kilowatt-hours of electric power to offset its own energy use.

The district also shipped a record volume of struvite fertilizer out of the watershed under the brand name Crystal Green. During 2017, the district produced 585 tons of struvite



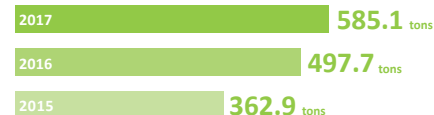
Ashten Bischoff and Chris Kaufmann (ETC) listen as Ralph Erickson describes the struvite harvesting process.

fertilizer, up from 498 tons in 2016. The struvite total is equivalent to 146,000 pounds of pure phosphorus and as a controlling nutrient, a single pound of phosphorus can lead to 500 pounds of algae.

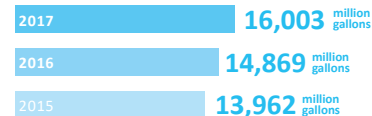
## RESOURCE RECOVERY



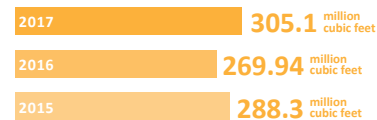
### STRUVITE



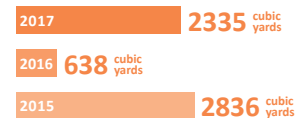
### CLEAN WATER



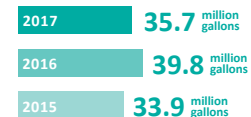
### BIOGAS



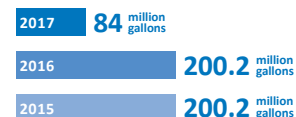
### METROMIX



### METROGRO



### REUSED EFFLUENT



## IN OTHER HIGHLIGHTS:

- The district cleaned and reclaimed 16.03 billion gallons of water, up from 14.87 billion in 2016 and the highest total since 2010. The district returned approximately 14.8 billion gallons of water to Badfish Creek and 1.2 billion gallons to Badger Mill Creek while reusing 184 million gallons for purposes within the plant.
- Other resources reclaimed by the district in 2017 included processing of 2.1 million gallons of liquid biosolids into Class A cake biosolids, which hold potential in diverse markets including residential application. The district also produced 35.8 million gallons of Metrogro biosolids for use as a sustainable, local fertilizer by farmers in the region.



*Biogas fuels a boiler*



*A district employee bags Nitrohumus.*

*Early district leaders recognized the potential of biosolids reclaimed as part of the wastewater treatment process. In the 1930s, the district ran an advertising campaign for a backyard fertilizer product. Today, work on an improved Metromix product that meets federal Class A biosolids*

*standards is expected to lead to diverse new market opportunities, including use by residential customers and landscape professionals. In the years ahead, Metromix is expected to account for a growing share of the district's biosolids production. For now, the majority of the district's biosolids continue to be injected into more than 5,000 acres of area farm fields each year through the Metrogro program, which carries the federal Class B biosolids designation and has been used as a model by the U.S. Environmental Protection Agency.*



**Fix Up Your Lawn and Shrubbery Before Winter!**

An application now of "Nitrohumus" Fertilizer will provide a good head start to the grass, perennials and shrubbery for next year.

Nitrohumus is economical, easy to apply, and produces results.

Delivered in Madison:	
In 100-Lb. Sacks.....	\$0.75
In Ten Quantities.....	7.00
At the Nine Springs Sewage Treatment Plant:	
In 100-Lb. Sacks.....	\$0.50
In Ten Quantities.....	5.00

Phone: F. 6827-N—Nine Springs Sewage Treatment Plant  
B. 5281—Main Processing Station  
F. 6314—District Office

**Madison Metropolitan Sewerage District**

# Then and now: workforce development

## DEDICATED EMPLOYEES MAKE THE DIFFERENCE

From its earliest days to the present, the district has relied on the dedication of its employees and their unwavering commitment to protect public health and the environment. While engineers and tradespeople accounted for most of the early employees, operation of a modern wastewater facility requires additional skills ranging from laboratory analysis and geographic information system mapping to strategic planning and asset management. Today, the district's customer communities benefit from the work of 102 full-time employees who bring these and other skills to the job each day.

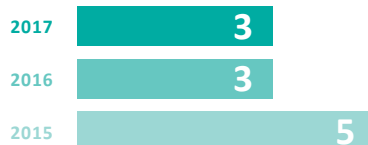


*Workers lower pipe into a trench during original construction of the northeast interceptor.*

Over time, the district's commitment to employee development, inclusion and diversity, workplace safety and organizational effectiveness also has grown.

## RECORDABLE INJURIES REMAIN LOW

During 2017, the district saw a continued low level of recordable injuries among district employees. The metric measures incidents that require medical treatment beyond first aid as well as incidents that cause death, days away from work, restricted work, transfer to another job or loss of consciousness. The incidents are tracked as Occupational Safety and Health Administration recordable injuries.



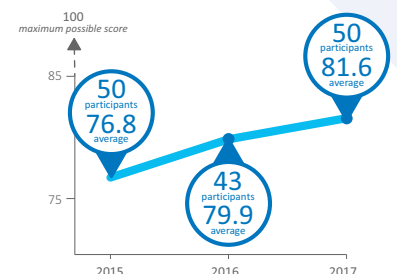
## INCLUSION AND DIVERSITY EFFORTS EXPAND

During 2017, the district extended its efforts to develop a more inclusive and diverse workforce.



## HEALTH AND WELLNESS FOCUS CONTINUES

Employee health and wellness remains a central focus of the district. In addition to offering a variety of optional wellness activities throughout the year, the district conducts an annual voluntary health risk assessment. Employees who have the skills to manage their own health tend to be more productive and engaged. A healthy workforce also lowers health insurance costs over time and reduces unplanned absences.





*District employee Jenny Faust at work.*

## DISTRICT APPRENTICESHIP PROGRAM GROWS

*Started in the mid-1990s, the district's state-registered apprenticeship program continues today by offering a path for career advancement in the wastewater industry. Initially developed for mechanics and electricians, the program was expanded in 2017 based on the district's need for additional heating, ventilation and air conditioning work. The new HVAC technician apprenticeship is a four year program that includes formal classroom instruction through Madison College as well as on-the-job skill building.*



*Logan Miller serves as the district's first HVAC apprentice.*

## EMPLOYEE LEADERSHIP COUNCIL TACKLES ISSUES

*After forming in late 2016, the district's Employee Leadership Council established operating guidelines and worked diligently throughout 2017 to engage staff in identifying shared priorities and concerns. Agenda items ranged from performance evaluations and shift differential pay to vacation crediting and internal communications. In December, the Madison Metropolitan Sewerage District Commission approved a new policy on work-alone and undesirable pay based on the council's recommendations. The*



*Employee Leadership Council members tackled key issues including work-alone pay during 2017.*

*eight-member council includes representation from operations and maintenance, administrative services, ecosystem services and the supervisors' group in addition to non-voting representation by human resources.*

# Building on our past, investing for the future

## INFRASTRUCTURE WORK ADVANCES

Since its founding, the district's reliable operations have depended on well-engineered infrastructure. Capital projects account for the district's largest budget expenses and during 2017, the district continued its effectiveness at scoping, designing and managing capital projects.

### CAPITAL PROJECTS MANAGEMENT

#### PROJECTS ON TARGET

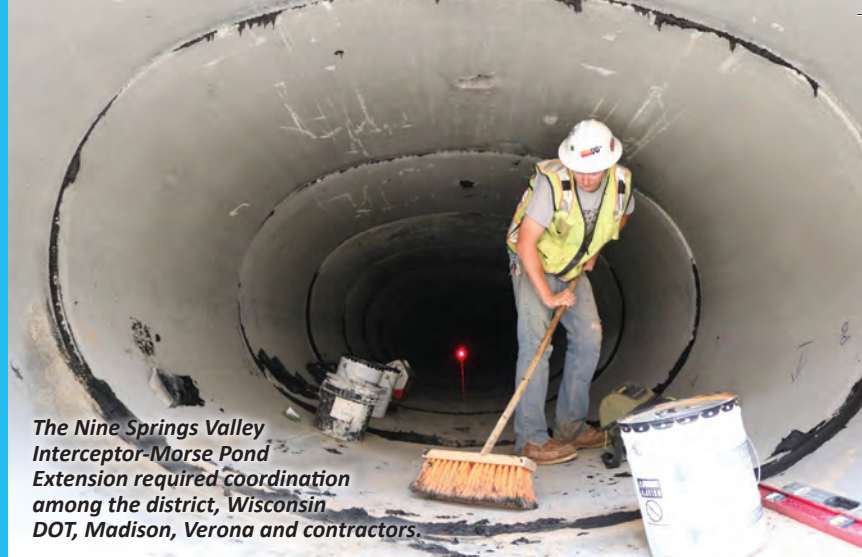
- ✓ West Interceptor- PS5 to Gammon Extension Rehab
- ✓ Liquid Processing Improvements-Phase 1
- ✓ Lower Badger Mill Creek-Phase 4
- ✓ Northeast Interceptor- Truax Extension Relief
- ✓ Pumping Station 7 Improvements
- ✓ Southwest Interceptor- Haywood Drive Replacement
- ✓ Grass Lake Dike Restoration
- ✓ Pumping Station 15 Rehab
- ✓ SEI Rehab Upstream of Pumping Station 9
- ✓ Southeast Interceptor- Relocation at Yahara River

#### PROJECTS UNDER ADDITIONAL MONITORING

- Ⓜ NSVI – Morse Pond Extension  
(Budget increase)
- Ⓜ Pumping Station 10 Force Main Rehab  
(Budget increase)

#### PROJECTS REQUIRING COURSE CORRECTION

NONE



*The Nine Springs Valley Interceptor-Morse Pond Extension required coordination among the district, Wisconsin DOT, Madison, Verona and contractors.*



*The project involved both sanitary and storm sewer work, shown here.*



*Eric Hjellen served as the district's project engineer.*

## DURING THE YEAR, MAJOR PROJECTS INCLUDED:

- **Nine Springs Valley Interceptor-Morse Pond Extension.**

The project, which got underway during 2017 and continues through 2018, will extend sanitary sewer service to undeveloped lands near the intersection of Highways PD and M in the cities of Verona and Madison.

- **Maintenance Facility.** Construction of the \$11.8 million project was completed in 2016 and the work was formally accepted by the commission in June 2017. The facility received a platinum-level certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design program for its exceptional energy conservation and sustainable features.



- **Pumping Stations 11 and 12 Rehabilitation.**

The \$10 million rehabilitation of Pumping Stations 11 and 12 included improvements to pumping equipment, electrical systems and to the exterior of the stations. The project, which increased capacity and system redundancy, also included new heating, ventilation and air conditioning equipment and an addition to Pumping Station 11. Work was formally accepted by the commissioners in October 2017.

- **Pumping Station 15 rehabilitation.** The \$4.3 million project provides service to Middleton including growing areas such as Bishops Bay and much of the Town of Westport. Built in 1974, the pumping station now handles some 1.3 million gallons of wastewater per day and was in need of capacity, electrical and control equipment upgrades. The project, which reached substantial completion in 2017, also included public restrooms, an aquatic invasive species control station and a variety of sustainable features. The project earned an Envision Gold Award from the Institute for Sustainable Infrastructure.



*Rehabilitation of Pumping Station 15 improved resiliency.*

- **Liquid Processing Facilities Plan.** At the August 2017 meeting, the commission approved a liquid processing facilities plan that addresses the need for increased capacity, resiliency and flexibility to manage peak flows through 2040. Full implementation of the plan through 2040 would cost \$57.1 million in 2017 dollars.

# A long-term commitment to our communities

## POLLUTION PREVENTION EXTENDS EFFORTS

While capital projects account for the district's largest expense category, changing regulatory requirements and public expectations require innovative strategies to achieve the best possible environmental outcomes at the lowest possible cost. In 2017, the district's pollution prevention team extended its efforts to build partnerships and programs focused on reductions in phosphorus, chloride and other pollutants while educating the public about the district's work.



*National Association of  
Clean Water Agencies'  
Peak Performance Award*



*A district grant helped Hydrite Chemical's Ian Henderson reduce salt use by more than 3,800 pounds per month.*

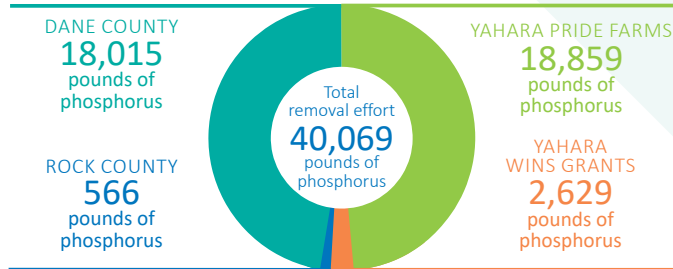


*UnityPoint Health Meriter's Ryan Unzicker has implemented projects that save more than 4,200 pounds of salt per month.*

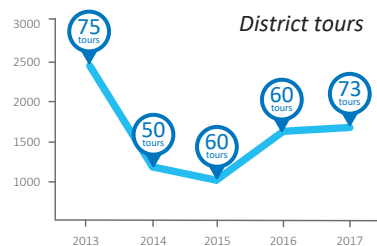
## 2017 HIGHLIGHTS INCLUDED:

- **Yahara WINS progress.** Continued progress toward watershed-wide phosphorus reduction goals through the district-led Yahara Watershed Improvement Network partnership, also known as Yahara WINS.

### 2017



- **Tours and educational outreach.** Strong public interest in district tours continued throughout 2017, with more than 1,600 visitors participating in 73 tours.



- **Advancement of a chloride reduction strategy.**

The effort features nontraditional investment, incentive programs, behavior change initiatives, collaborations and industrial partnerships. Programs continue to evolve, seeking new ways to benefit ratepayers by avoiding the costs associated with new and expensive treatment technology, while protecting and improving our valuable water resources.

*2017 Commercial and Industrial chloride reduction rebates*

**13**  
awards

Total awarded:  
**\$14,000**

Results:  
**346**  
pound per day reduction

- **Measurable results.**

Laboratory results showed the lowest annual median and average values for mercury in incoming wastewater since the district's current sampling program began, suggesting that pollution prevention efforts are having an impact.

## OUTREACH KEEPS COMMUNITIES CONNECTED

During 2107, the district completed a three-year public engagement process on connection charges that included a public hearing, study sessions, meetings with customer communities, formation of a technical committee with representatives from area municipalities, an open public comment period and multiple presentations to the commission. At the conclusion of the process, the district received letters of support from developers and the commission approved a phase-in of the new rate structure. Additional meetings were held on other topics.

The district also continues to increase its efforts to connect with customer communities, ratepayers and other stakeholders through more accessible website information, an increased social media presence and other means.



Chief Engineer and Director Michael Mucha facilitates customer community members through a discussion on connection charges.

# District research drives innovation

## PROJECT EXPLORES BIOGAS EXPANSION

Could the district's digesters produce even more valuable products?

Currently, digesters use microbes to stabilize biosolids – the solid material resulting from the wastewater treatment process. In addition to producing nutrient-rich organic matter that can be used as a fertilizer, microbes in the digesters also generate a methane-rich biogas that can be burned in engines or boilers as a renewable fuel.

The district is conducting research to evaluate whether the addition of source separated organics such as household organic waste, food waste and commercial organic waste could increase methane production and potentially alter the components of the biosolids removed after digestion. The project includes UW–Madison collaborators and involves exploration of the potential to recover additional valuable products resulting from the digestion process.

Specifically, changing the types of waste added to the digester may change the microbial communities and lead to production of high-value organic chemicals. Of particular interest is a substance known as hexanoic acid, a high value commodity with applications in agriculture and the artificial flavoring industry. The trial and subsequent analysis are continuing through 2018.

*Matt Seib, the district's process and research engineer, works with food waste to explore its potential for creation of biogas and valuable chemical compounds. The project's success depends in part on the ability of waste generators to remove unwanted materials such as stray pieces of plastic, metal or wood before the material is delivered to the treatment plant, hence the name source-separated organics.*





## ABOUT THE DISTRICT

- Formed in 1930 to cover five municipalities with 84,000 people.
- Today serves 26 Madison area customer communities covering some 184 square miles and 380,000 people.
- Owns and operates 141 miles of pipe and 18 regional pumping stations.
- Receives approximately 41 million gallons of wastewater at the Nine Springs Wastewater Treatment Plant each day.
- Organized as a municipal corporation.
- A leader in sustainability and resource reclamation.
- Rates established by the Madison Metropolitan Sewerage District Commission.

*Madison Metropolitan Sewerage District is governed by nine commissioners serving staggered terms: five commissioners are appointed by the mayor of the City of Madison, three are appointed by an executive council made up of elected officials from district cities and villages, and one is appointed by an executive council made up of town-elected officials. The commissioners meet once or twice each month.*

## 2017 COMMISSIONERS

### **Thomas Hovel, President**

Commission President Thomas Hovel is a retired zoning administrator and city planner for the City of Fitchburg.

### **Ezra Meyer, Vice President**

Commission Vice President Ezra Meyer is a water resources specialist for Clean Wisconsin, an environmental advocacy group.

### **Angela James, Secretary**

Commission Secretary Angela James is a founding partner in AAJ Legal, focusing her practice on assisting businesses with environmental compliance.

### **Ken Clark**

Commissioner Ken Clark is chief operating officer of Total Water Treatment Systems, an employee-owned business, and also serves as a Village of DeForest Trustee.

### **Sara Eskrich**

Commissioner Sara Eskrich, a former Madison Common Council Member, is executive director of Political Innovation.

### **James Martin**

Commissioner James Martin is a retired attorney for the City of Madison and also served for six years as a Dane County Circuit Court judge.

### **Brad Murphy**

Commissioner Brad Murphy is a retired director of the City of Madison's planning division.

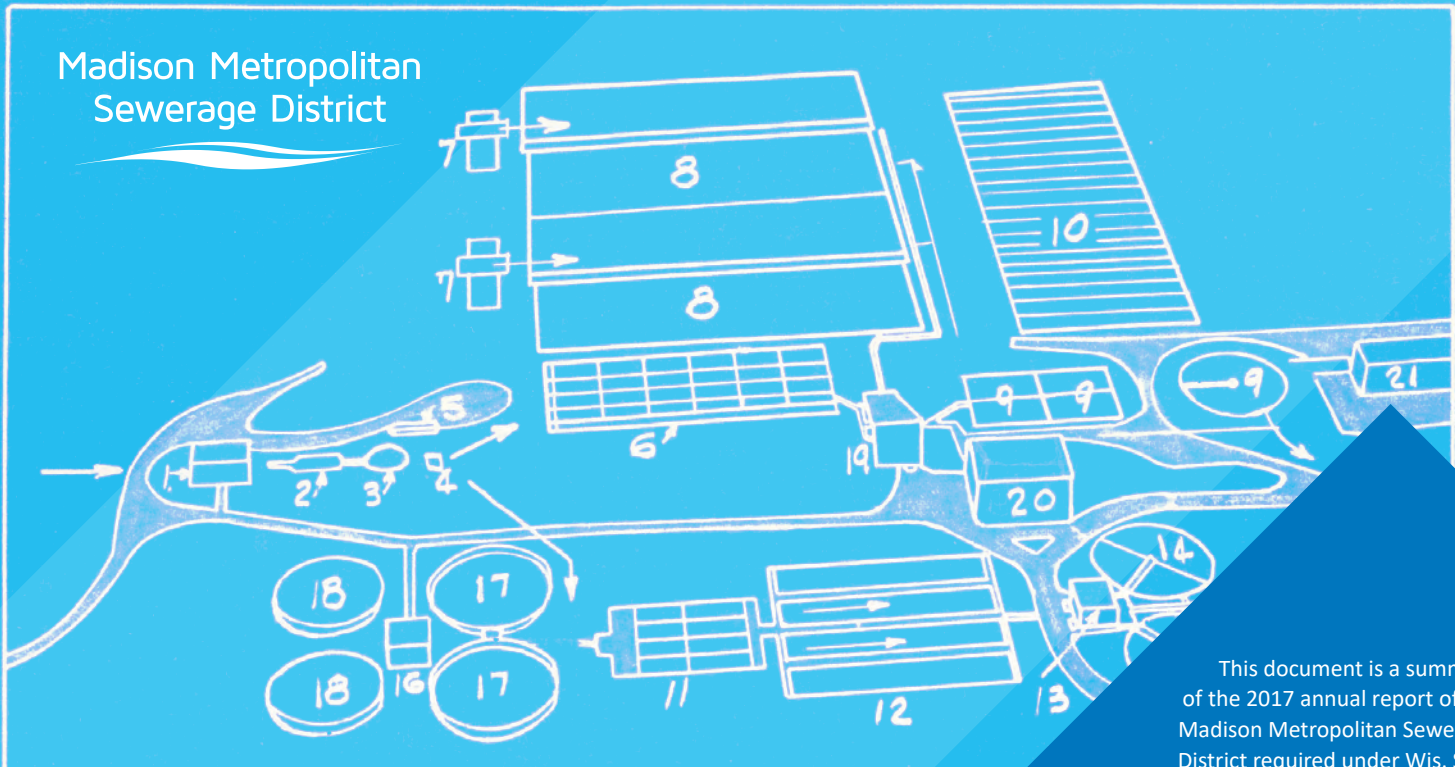
### **Brian Potts**

Commissioner Brian Potts is an environmental and energy law partner at Perkins Coie.

### **Thomas Wilson**

Commissioner Thomas Wilson serves as the attorney, administrator, clerk and treasurer for the Town of Westport and serves on the executive committee of Yahara WINS.

# Madison Metropolitan Sewerage District



Madison Metropolitan Sewerage District  
 1610 Moorland Road  
 Madison, WI 53713  
 (608) 221-1201

Protect public health and the environment.

This document is a summary of the 2017 annual report of the Madison Metropolitan Sewerage District required under Wis. Stat. 200.11(1)(e). A full copy of the annual report containing a detailed report of the district's official transactions and expenses and of all presently planned additions and major changes in district facilities and services is available at [www.madsewer.org/planning/Budget-Finance](http://www.madsewer.org/planning/Budget-Finance). A copy of the full report has been electronically filed with the Wisconsin Department of Natural Resources, Dane County Department of Health Services and the governing bodies of all cities, villages and towns having territory in the district.

Detailed financial and budget information is available online at [www.madsewer.org/Planning/Budget-Finance](http://www.madsewer.org/Planning/Budget-Finance)

[madsewer.org](http://madsewer.org)

