

Nomination: 580

Metropolitan St. Louis Sewer District

Started at: 3/25/2022 04:16 PM - Finalized at: 4/8/2022 07:03 PM

Page: EIM Nomination Form

APPLICATION DEADLINE: April 8, 2022, 11:59 pm EST

All fields indicated by a red asterisk (*) must be completed

Category

EIM Platinum Level

SUBMITTING AGENCY'S INFORMATION

Submitting Agency's Name

Metropolitan St. Louis Sewer District

Name and Title of Application Submitter

Crystal Howard, Public Affairs Specialist

Email of Individual Submitting Application

choward@stlmsd.com

Signature of Individual Submitting Application (pdf/jpg)

City

St. Louis

State (Abbreviation ONLY)

MO

Service Area Population

1.3 million

Agency Logo - Hi-Res Picture (.jpg or .png)

NOMINATION SUBMITTAL

Please Indicate One

Platinum (9 Attributes)

All Attribute descriptions should be single-spaced, using the 12-point font (Times Roman or equivalent), with no less than 1-inch margins on 8.5 x 11-inch paper. A header must be included on each page with the following information:

NACWA Excellence in Management Recognition Program

Agency Name

Attribute (being described) add "resubmitted Gold/Silver from 2021" for re-submittals

Note that every applicant is required to include Product Quality and Financial Viability as part of their minimum demonstrated Attributes.

Please review the APPLICATION BASICS (<https://eim.secure-platform.com/a/page/Guidelines/AppBasics>) and/or SAMPLE APPLICATIONS (<https://eim.secure-platform.com/a/page/Guidelines/SampleApps>) to ensure correct formatting and content

Please check the appropriate boxes (at least 5 that includes Product Quality and Financial Viability)

Select Submitted Attributes

Product Quality (Required Attribute for all Applicants), Financial Viability (Required Attribute for all Applicants), Customer Satisfaction (Metrics Required), Stakeholder Understanding & Support, Operational Optimization (Metrics Required)

Select Submitted Attributes

Employee & Leadership Development, Enterprise Resiliency (Inclusive of all enterprise resiliency initiatives, not solely emergency management) , Infrastructure Strategy & Performance (Metrics Desired), Community Sustainability, Water Resource Sustainability

Attributes Narrative (pdf)

Download File (<https://vo-general.s3.amazonaws.com/1791819d-f6fc-46c3-b1b7-a1d38a2bd4d4/9c4c1bf5-e4c5-4c46-9ac3-09c3ef940048?AWSAccessKeyId=AKIAJ4PRWO26HAX3IOCA&Expires=1737567478&response-content-disposition=inline%3B%20filename%3D%22EIM%202022%20MSD%20St.%20Louis.pdf%22&response-content-type=application%2Fpdf&Signature=oznrYOe5U323%2F6FH5XEq78zwGNw%3D>)

REFERENCE MATERIALS

Strategic Plan Hyperlink (URL)

<https://msdprojectclear.org/about/our-organization/strategic-business-operating-plan/> (<https://msdprojectclear.org/about/our-organization/strategic-business-operating-plan/>)

Relevant Page References

direct link

Financial Plan Hyperlink (URL)

<https://msdprojectclear.org/about/fiscal-investor-relations/budget/> (<https://msdprojectclear.org/about/fiscal-investor-relations/budget/>)

Relevant Page References

direct link

Strategic Metrics (URL)**

https://msdprojectclear.org/wp-content/uploads/2021/08/FY2022-ADOPTED-Fiscal-Year-Budget-DIGITAL-version_compressed.pdf (https://msdprojectclear.org/wp-content/uploads/2021/08/FY2022-ADOPTED-Fiscal-Year-Budget-DIGITAL-version_compressed.pdf)

Relevant Page Number References

direct link

APPLICATION AUTHORIZATION

Please contact btrombino@nacwa.org (<mailto:btrombino@nacwa.org?subject=Who%20is%20Our%20NACWA%20Primary%20Contact%20for%20the%20EIM%20Application%3F>) if you do not know the name of your NACWA Representative (SUBJECT: Who is Our NACWA Primary Contact for the EIM application?)

Name of Submitting Agency's NACWA Representative

Brian Hoelscher, PE

Title of Submitting Agency's NACWA Representative

Executive Director & Chief Executive Officer

FedEx Delivery Address for NACWA Representative

2350 Market Street
St. Louis Missouri 63103 US

Email of Submitting Agency's NACWA Representative

BLHOEL@stlmsd.com

Signature of Submitting Agency's NACWA Representative (pdf/jpg)

Please review your application prior to finalizing it. All fields with a red asterisk (*) must be completed. If you have any questions in regard to submitting your application, please contact [Brédy Trombino](mailto:btrombino@nacwa.org) (<mailto:btrombino@nacwa.org?subject=EIM%20Application%20Questions%20-%20PreCompletion>) at 202.533.1820.

NACWA Excellence in Management Recognition Program
 Metropolitan St. Louis Sewer District
Product Quality

The Metropolitan St. Louis Sewer District (MSD) operates seven wastewater treatment plants, with +6,500 miles of wastewater sewers, + 3,000 miles of stormwater sewers, treating +350,000,000 gallons of wastewater p/day. MSD is the fourth largest wastewater sewer system in the nation, in terms of miles. The District delivers consistent, high-quality customer service, producing treated effluent and processed residuals, and complies with all legal and regulatory requirements.

In 2021, MSD’s treatment plants had only two days of non-compliance, for a total of 2,137 compliance points during the year, equaling a 99.9 % compliance rate.

The tables reflect the awarding-winning details of the two most recent years, which date back to 1997. For 2021, we expect to receive four Platinum, two Gold, and one Silver Award.

NACWA Peak Performance Awards

Facility	2020 Award Level	2020 Total Compliance Points	2020 Violations	2020 Design Capacity	2021 Award Level	2021 Total Compliance Points	2021 Total Violations	2021 Design Capacity
Bissell Point Plant	Silver	400	1	350 MGD	Silver	400	2	350 MGD
Coldwater	Gold	463	0	40 MGD	Gold -2	463	0	40 MGD
Grand Glaize	Platinum-6	288	0	21 MGD	Platinum - 7	288	0	21 MGD
Fenton	Platinum - 13	238	0	6.75 MGD	Platinum - 14	238	0	6.75 MGD
Lemay	Gold	260	0	340 MGD	Gold -2	260	0	340 MGD
Lower Meramec	Platinum -	276	0	15 MGD	Platinum - 14	276	0	15 MGD
Missouri River	Platinum – 7	239	0	38 MGD	Platinum - 8	239	0	38 MGD

Score Card Measures

Measure	Goal	2018 Year Total	2019 Year Total	2020 Year Total	2021 Year Total
Plant Compliance	100% Compliance	99.8%	99.9%	99.96%	99.9%
Customer Response	90% Emergency Response <4 hr.	92%	81%	85%	92%
Maintenance Related Backups	<1 Backup per 1000 Homes per Year (424k Cust. Accts.)	.5	.7	.7	.6
Maintenance Related Overflows	<2.5 Overflows per Hundred Miles Pipe (6500 Miles Pipe)	2.8	3.2	2.8	2.3

NACWA Excellence in Management Recognition Program
 Metropolitan St. Louis Sewer District
Financial Viability

MSD’s financial viability is governed by the District’s [Charter Plan](#), providing a framework for fiscal responsibility by requiring a balanced budget, an independent annual audit, and establishing an independent [Rate Commission](#).

MSD had a balanced budget in each of the last three years, as demonstrated by the table to the right.

MSD’s compliance with the independent audit requirement was fulfilled by engaging CliftonLarsonAllen LLP to perform an audit of the District’s financial statements for fiscal years 2017 through 2021. CliftonLarsonAllen will also perform the audit for fiscal years 2022 through 2026 but with a new lead partner in charge, as required by the Charter Plan, amended by the voters on April 6, 2021.

MSD Budget in Millions of Dollars			
	FY21	FY20	FY19
Revenues			
Wastewater User Charges	433.3	437.1	403.3
Stormwater User Charges	-	-	-
Revenue Bonds	165.7	139.4	190.0
Taxes	42.7	34.7	33.3
Investment and Other			
Income	12.3	10.4	11.9
Use of Fund Balances	80.0	63.0	75.7
Total District Revenue	734.0	684.7	714.2
Expenses			
Operating Budget	221.0	215.9	210.5
CIRP	391.7	350.1	381.6
Debt Service	121.3	118.7	122.1
Total District Expenses	734.0	684.7	714.2

Audit Results	FY21	FY20	FY19
Unqualified Opinion	Yes	Yes	Yes

Finally, the Rate Commission process is the most comprehensive way in which MSD demonstrates its financial viability. Established in 2000, the Rate Commission consists of 15 member organizations

representing a broad cross-section of the customers and community MSD serves. The Rate Commission provides management with input on community expectations and the Rate Proposal as a long-term financial planning tool, in which it strives to balance the use of long-term debt and cash financing to support capital spending, operations and maintenance, and debt service expenses. Rates are established for a four-year rate cycle, using a cost-of-service study approach based on the principles endorsed by the Water Environment Federation. MSD then sets a rate that recovers those costs, but also properly funds reserve balances, and meets other criteria important to bond rating agencies. The District’s bonds have maintained [AAA/Aa1/AA+](#) long-term ratings from S&P/Moody’s/Fitch throughout the measurement period, providing the District access to funds from the capital markets, state SRF program, and the federal WIFIA program.

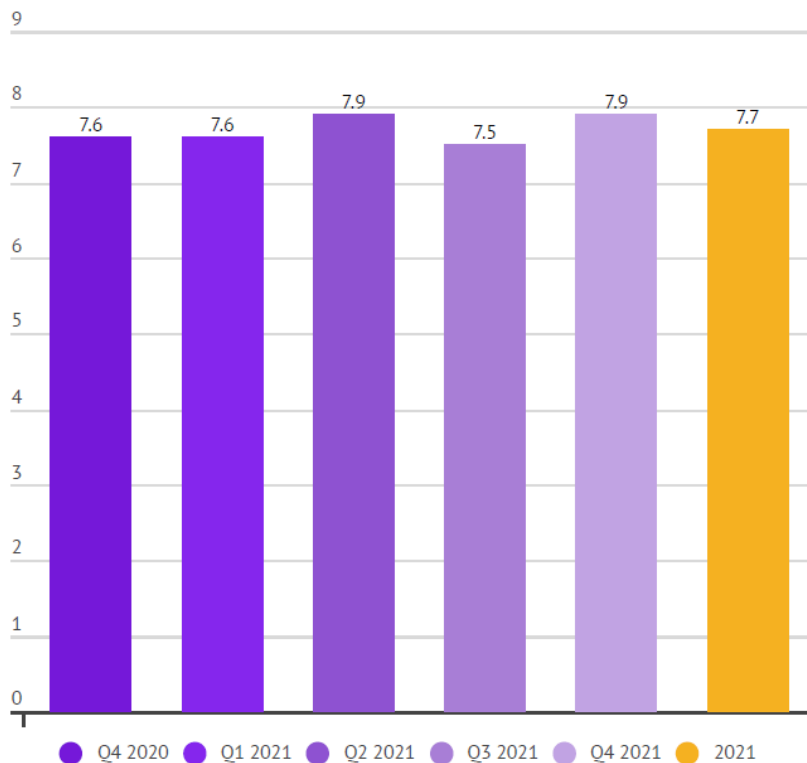
Debt and Liquidity Metrics supported by the MSD Rate Commission Process				
(Based on Metrics used in the March 4, 2019 Rate Proposal)				
Metric	Target	Results		
		FY21	FY20	FY19
Senior Lien Debt Service Coverage	>2.5X	3.1X	3.7X	3.1X
Total Debt Service Coverage	>1.8X	2.1X	2.5X	2.1X
Days Cash on Hand	550 Days	969 Days	971 Days	877 Days

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Customer Satisfaction

MSD conducts quarterly post-contact surveys with customers after interactions with The District. In 2021, an independent surveying company contacted a random sample of 1,800 customers who interacted with MSD for either a billing issue or maintenance problem. The major findings are rated on a 10-point scale:

- Overall satisfaction with the quality of customer service provided by Billing for 2021 was 7.9, which is considered high by industries standards. Since 2010, the overall quality of customer service has remained near 8.0.
- Based on customers' experience with Billing employees over the phone, ratings for 6 of the 8 areas assessed on the survey had satisfaction levels above 90 percent. The highest ratings pertained to courteous employees and respect shown by employees for their customers.
- Customers' overall satisfaction with Field Service employees providing phone calls for service in 2021 was 8.3. This level has remained consistent over the years.

Q8c Satisfaction with overall quality of services provided overall
All Respondents



- When customers received field service calls, they rated in 4 of the 7 specific qualities over 95% in the 4th quarter. These high ratings pertained to punctuality, the employee's appearance, competence, and courteous employees. Overall, for the 2021 calendar year, customer satisfaction ratings are consistently in the 7.5 out of 10 range.

- Overall satisfaction with overall quality of services provided for both billing and field responses remain consistently high, as noted in the table.

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Stakeholder Understanding & Support

To *Educate and partner with stakeholders to build support* remains a key focus in the MSD Strategic Business and Operating Plan. It would have been easy to say we can't have meetings or events with the community or stakeholders—it's a PANDEMIC! However, as a utility providing a vital public health service, MSD got creative to reimagine new and innovative ways keep the public, local government, and all the stakeholders informed, educated, and involved in even more meaningful ways than before.

In March 2020, a \$500 million dollar ballot initiative to determine how the St. Louis region would pay for wastewater improvements for the next four years, was postponed due to COVID-19. The vote was rescheduled for April 2021. This required all-hands on deck to reeducate voters virtually to ensure they could make an informed decision on funding. To make an already complex issue even more challenging, five plan amendments affecting MSD's Charter were also on the ballot. By scheduling virtual town halls, voters were able to get information and ask questions from the comfort of their own homes. Voters in St. Louis City and St. Louis County approved all six ballot measures, including 81.6% approval to fund necessary improvements to our regional wastewater system through June 2024.

Most wastewater utilities educate their rate payers regarding keeping Fats, Oils and Grease (FOG) from their personal plumbing and their system. MSD created a 30-second PSA that was seen more than 135,000 times on TV, [YouTube](#), and social media in the St. Louis television market. The cherry on top...the video won a Mid-America Regional Emmy for Best Public Service Announcement (PSA)!

Before the pandemic, MSD provided wastewater treatment plant tours to students and teachers, scout troops, home schoolers, etc. Also, people wanted to see the large tunnels we are building, even though it is not safe to have the public in those tunnels. Virtual tours were the answer—but not just any virtual tour. After 14 months of planning prior to production, a first-of-its-kind 3D VR-compatible model of the [Maline Creek Storage Tunnel](#) in north St. Louis debuted in May. Anyone with a phone, tablet, computer, or VR goggles can explore the tunnel end-to-end, learn about how it was built, and how it works.

MSD also produced a close up, 360-degree look in and around the [Lower Meramec Wastewater Treatment Plant](#) where you can walk around and explore on your own from the comfort of your computer. The Maline Creek Tunnel Experience already has more than 1,600 “explorers”. The Lower Meramec Wastewater Treatment Plant has more than 500 views since May 2021—much more than we usually provide doing in-person tours in a working treatment plant.

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Operational Optimization

MSD continues to utilize performance metrics to monitor, measure, and compare the efficiency of the organization. Managers, supervisors, and employees can view performance dashboards available on The District's Intranet. Strategic and tactical goals at the crew level are set daily, weekly, monthly, and annually, which is incorporated into annual performance reviews. The dashboards are based on information pulled directly from the computerized maintenance management system (IBM Maximo).

Since inception, the Capacity Management, Operations, and Maintenance (CMOM) Plan Program in 2012, it has significantly reduced the number of non-capacity overflow events and maintenance-related building backups. This trend continues as shown below:

	<u>2019</u>	<u>2020</u>	<u>2021</u>
• Non-capacity SSO events per 100 miles of sanitary sewer =	3.2	2.9	2.5
• Maintenance related building backups per 1000 homes =	1.3	1.1	.77

The Wet Weather Optimization Study project was established to design and implement a wet weather control strategy for the Lemay Service Area, under varied conditions from present to the end of the Consent Decree Program. The goal of the project is to evaluate opportunities to improve water quality by increasing the level of service of existing infrastructure and planned capital improvements, and to reduce capital expenditures where opportunity and flexibility is determined to be beneficial. In order to accomplish this goal, the project will develop control strategies that allow the real-time, integrated operation of the system using existing and new instrumentation, communication networks, and software. The result will be the implementation of a Real Time Decision Support System (RT-DSS) that will operate existing infrastructure with the ability to incorporate future planned infrastructure. The operational control strategy will be designed to utilize real-time data and integrated control strategies that allow the District to optimize the performance of its facilities.

The SCADA System Upgrade project will enhance and modify the District's existing SCADA infrastructure. The improvements consist of designing the necessary instrumentation network; Remote Terminal Unit (RTU) upgrades; communications backbone upgrades; server and other hardware improvements; and software upgrades. These improvements support the District's plans to operate portions of its existing, and planned, wet-weather storage and conveyance system as a globally integrated, system utilizing the RT-DSS. In addition, the planned SCADA infrastructure improvements will support District plans to collect data from existing, or planned assets, for the purposes of system analysis and optimization, support reliability and redundancy enhancements to existing SCADA infrastructure. In addition, it will support current cyber-security requirements, and the implementation of a predictive maintenance program for designated critical assets.

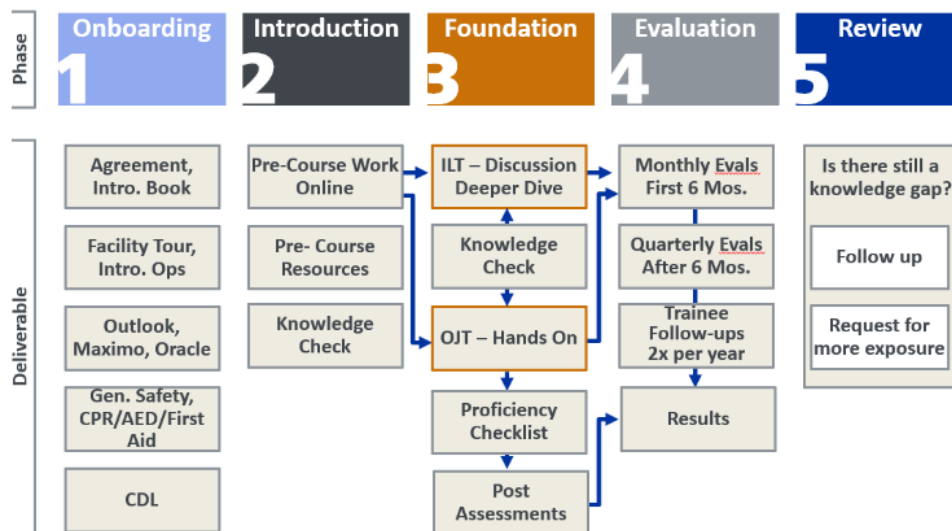
NACWA Excellence in Management Recognition Program
 Metropolitan St. Louis Sewer District
 Employee & Leadership Development

A key value in MSD’s Strategic Business and Operating Plan is our *Employees: Developing successful, responsible, and safety conscious employees and acknowledging their contributions.* As part of our commitment to employee development, MSD continues to improve on previous initiatives in employee development.

The Learning District, MSD’s learning management system was implemented in the summer of 2017. Since then, it has been fully utilized by all departments at MSD. The Learning District was especially beneficial throughout the COVID-19 pandemic, allowing all of our departments to continue to provide all required trainings virtually and online. The Talent Development team was able to convert a group of instructor-led courses for safety, and technical skills into online or virtual courses. The Learning District offers over 3,500 courses in categories such as business, safety, and computers, which allows the learners to develop their skills in management, leadership, safety, technical skills, and customer service. Since implementation, over 56,000 courses have been completed by approximately 950 MSD employees.

Collection Systems Technician Trainee (CSTT) training program revision took place in the Spring of 2019. Due to feedback from previous trainees and current technicians, the Talent Development team decided to address the concerns by revising the entire program. The revision of the CSTT program was to help the trainees learn the job easier and faster, which would also benefit MSD Operations as a whole. Parts of the revision included the adjusting the schedule.

The previous CSTT training program lasted 3 years. The new schedule allows trainees to spend a year at each of the yards that service different areas in St. Louis City and County, in addition to a year in each of the disciplines (maintenance, construction and rehab).

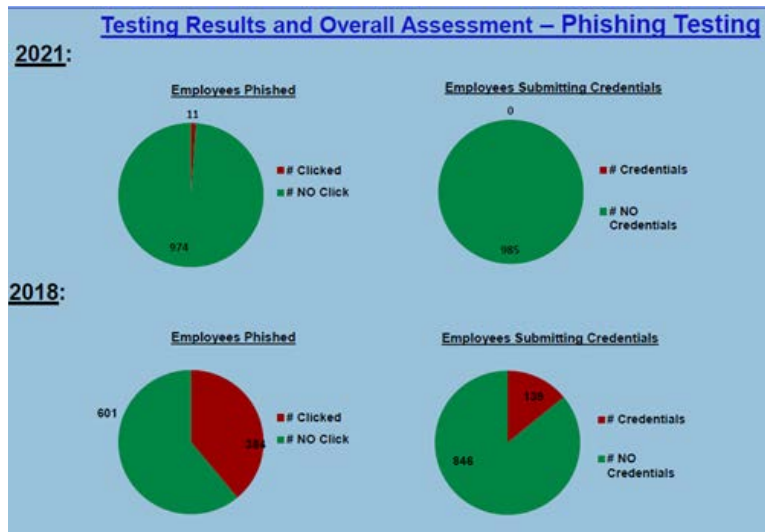


The revision includes development of new materials. Previous training consisted of classroom presentation and on-the-job training (OJT). The revised program includes job site visits, which serve as an intro to a topic, video summary for each topic, classroom sessions (presentation and knowledge check), hands-on equipment training and OJT. Positive feedback was received from trainees, team leaders, and supervisors. Our videos received the most amount of positive feedback, an example can be seen [here](#).

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Enterprise Resiliency

MSD strives to maintain a corporate culture that continuously evaluates and improves its risk posture by developing plans and defenses that can best safeguard people and assets from both physical and cyber security threats. The Emergency Operation Plan (EOP), including Payroll EOP, allows MSD to quickly respond to various natural and man-made disasters.

Emergency response is important, but maintaining the continuity of IT infrastructure and services, during emergencies is too. For cyber security, MSD hired a chief information and security officer (CISO) and added three staff positions to handle information and cyber security. An onsite Security Operations Center (SOC) to house the staff, tools, and equipment required to monitor threats was acquired. To identify gaps, MSD procured a “Security Risk Assessment” and added annual penetration testing to its internal audit plan. In response to the assessment, a



security incident response plan was created, nine IT-related policies were updated, and policies for patch management, vulnerability management, as well as remote access were created. In response to ransomware threats targeting local governments in 2020 - 2021, threat intelligence monitoring tools were implemented, cyber security insurance was procured, and multifactor authentication was implemented to minimize unauthorized access to MSD’s information system.

Prevention is even more critical the emergency response. MSD added Information Systems Disaster Recovery (DR) as a strategic objective. A geographically diverse DR site was procured to back-up all critical business systems. The site buildout was completed and tested in 2021. In addition, MSD implemented a phishing campaign tool monitor and improve behavior to minimize cybersecurity risk.

In 2015, record flooding damaged two treatment plants and several pump stations. Flood response plans after 2015 helped save the plants from the same fate in 2018. Lessons learned in 2015 allowed MSD to move forward with several projects to permanently protect its critical wastewater infrastructure and improve resiliency during extreme flood events. MSD has spent close to \$15 million to complete these projects.

In 2019, MSD raised the levy around the Fenton plant approx. 5 ft, improving the headworks structure and pumping to protect the plant to manage flows during flooding. In 2021, MSD completed a permanent flood wall at Grand Glaize to protect to a 500-year flood. During the same time frame, MSD raised the critical equipment out of the floodplain at the Vance Road Pump Station and is currently relocating the Watkins Creek Pumping Station from the Mississippi River floodplain.

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Infrastructure Strategy & Performance

MSD continues to incorporate and refine its asset management program to address infrastructure strategy and performance. These principles focus on understanding risk, prioritizing critical assets, on-going condition assessment and planning for renewal when assets are beyond their useful life or service factor. The goal of the program is to ensure consistency across all operations and asset classes; to be practical in our approach; to leverage information in real time for better decision making; and to have a cohesive capital planning tool.

MSD's asset management program has four focus areas: wastewater collection system, storm water systems, treatment plants, and pump stations including force mains.

MSD's Capacity, Management, Operations, and Maintenance (CMOM) Program in the wastewater collection system has matured and become very effective. Last year, the CMOM program was changed to improve our focus with the force main and pump station inspection programs. Previously MSD utilized a High, Medium, and Low rating scale to identify the importance of its force mains and pump stations. These ratings drive MSD's inspection frequency. Several years of inspections identified the opportunity to streamline this process by categorizing the force mains and pump stations as either Critical or Non-Critical. The result is that MSD is now more appropriately inspecting assets on a frequency that better matches the asset criticality, driving a more efficient maintenance and repair program.

A District wide uniform stormwater tax was approved in April of 2016 providing funding for stormwater maintenance. MSD developed a Stormwater CMOM Program in December of 2016 and implemented the plan on January 1, 2018. The Stormwater CMOM incorporates asset management based preventive and predictive maintenance processes to keep the stormwater system in good repair and help achieve pre-established management and service level goals. The plan focuses on the inspection, maintenance, and repair of its 3,000-mile stormwater system which includes over 185,000 structures. Goals have been refined since inception to match available funding while new funding streams are being developed to better coincide with needs.

Since the implementation of the Stormwater CMOM program over 541 miles of stormwater lines, and 72,795 storm structures have been inspected. These inspections have resulted in repairs made to 3,361 stormwater lines and 5,478 repairs to stormwater structures. These inspections also identify future capital projects to be addressed when new funding streams are developed.

The Strategic Asset Management Plan (SAMP) and Tactical Asset Management Plan (TAMP) for treatment plants and pump stations continue to be reviewed annually to update goals and objectives.

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Community Sustainability

MSD is a leader in several community sustainability initiatives in collaboration with partners to improve environmental resources and public health. MSD's green infrastructure program called, rainscaping, includes both Small Grants for residents and smaller organizations and Large Scale Grants for larger organizations and developers to encourage rainscaping features that manage stormwater as close as possible to where it falls. In its 10th year, and over 100 partnerships, the rainscaping program has appropriated \$66 million toward the consent decree commitment of \$120 million. The impact on the community has been significant with over 376 drainage acreage managed by green infrastructure resulting in an annual reduction in combined sewer overflows by 75 million gallons. <https://msdprojectclear.org/what-we-do/rainscaping/large-grants/>

MSD's partnering on the City of St. Louis' Forest Park East Waterways project to complete the final connection dozens of water features in the park. The project is achieving a number of meaningful sustainability wins, including reducing the need for municipal water into the system, capturing stormwater runoff, improving the water quality and increasing the biodiversity in the park.

As a leader under regulatory stormwater program, MSD is contributing to the construction of numerous stormwater best management practices (BMPs), or green infrastructure, as an example and model to our community of 61 stormwater phase 2 MS4 co-permittees. MSD partnering with the City of Brentwood on their flood mitigation and floodplain restoration project, which serves as a role model to the St. Louis region on water quality.

MSD also exhibits leadership in commitments to enhance the air environment. For nearly 60 years, MSD operated hearth incinerators at the Bissell Point and Lemay Wastewater Treatment Facilities, incinerating 68,000 tons of sewage sludge annually. Although these facilities have served the region well and continue to meet or exceed all air quality standards, their age and the development of newer, even cleaner technology makes replacing them a priority. MSD is scheduled to replace the incinerators with fluidized bed incinerators, greatly reducing air emissions. More information here: <https://msdprojectclear.org/projects/new-construction/smu/>

Finally, MSD's partnership with public health leaders to identify COVID-19 trends through wastewater testing has supported the community response to the pandemic. Since May of 2020, MSD has proudly collaborated with state agencies and public health authorities to provide a valuable tool for monitoring COVID-19 trends in our region. MSD provided weekly wastewater samples from each of its seven treatment plants to test for viral genetic material. Data from these samples along with samples from more than 50 wastewater utilities across the state are compiled to help public health officials monitor the presence of COVID-19 in the community. Missouri was one of the first states to initiate this type of testing, implementing one of the largest-scale projects in the U.S. This project can be found at <https://health.mo.gov/MOWastewaterCOVID>.

NACWA Excellence in Management Recognition Program
Metropolitan St. Louis Sewer District
Water Resource Sustainability

At the confluence of the Mississippi, Missouri, and Meramec rivers, home to a diverse number of fish and wildlife, including endangered species, MSD's treated wastewater consistently meet or exceed levels protecting drinking water, recreational uses, and aquatic life. The major river systems also experience extreme flooding, and MSD is continually planning and preparing for these events. In 2019, the Mississippi River crested at its second highest recorded elevation, and the river remained at flood stage for the longest recorded period. Throughout that flood and others, MSD continued to provide reliable service to its customers and met operating permit requirements, with minimal damage to facilities.

Protecting water quality requires many partners. MSD is the coordinating authority for the region's 61 co-permittee Phase II Stormwater NPDES permit. In 2020, the Water Environment Federation awarded the co-permittee group the National Phase II Stormwater Innovation Award. Two of the innovative programs that MSD uses are a district-wide green infrastructure cost share program and wholistic water quality media campaigns. MSD also participates in multiple voluntary section 319 clean water act watershed management efforts, which leverage state and federal funding with local investments in green infrastructure.

The District operates a large ambient water quality monitoring and gauging network. Based on water quality data MSD provided in 2021, the Environmental Protection Agency (EPA) approved delisting the Meramec River and lower Mississippi River for whole body contact recreation since MSD's data indicated these regionally important waterbodies attained that use. EPA also approved delisting two smaller Meramec River tributaries, and only one new waterbody in the MSD service area was added to the list. In streams where MSD has eliminated constructed overflows, the District is measuring significantly lower E. Coli levels. MSD's achievements in removing overflows allows it to focus new nonpoint source pollution activities like on-site wastewater treatment systems and pet waste. MSD is planning to expand these efforts as sewer overflows are eliminated from additional watersheds.

MSD continues to focus on nutrient recovery as the EPA and states in the Mississippi River basin move forward with nutrient reduction strategies to address the Gulf of Mexico hypoxia zone. MSD is executing its comprehensive nutrient master plan for wastewater systems. Along with other stakeholders, MSD is supporting Missouri on state rulemaking to require large publicly owned treatment works and major industrial dischargers to remove phosphorous from wastewater. Under this new rule, MSD would be required to remove phosphorous to 1 mg/L before 2029 or purchase an equivalent level of nutrient credits through a trading framework. The effort would be affordable for MSD's ratepayers and reduce Missouri's point-source phosphorous load to the Gulf by more than 45 percent.