Wastewater Charges National Symposium
June 19 & 28, 2018

Summit on the Park
46000 Summit Pkwy, Canton, MI 48188

Dear Member Partners,

One of GLWA's three brand pillars is high quality through innovation. A way that we can pursue innovation is to consistently scan the industry to learn how peer organizations operate, deliver services, and charge for those services in an equitable and stable way.

To that end, GLWA is hosting a Wastewater Charges National Symposium. The Symposium is a two-day event, June 19 & 28, where you'll hear brief presentations from a select panel of the country's leading wastewater service providers with systems similar to GLWA's. The presentations will be focused on each system's wastewater charges methodology. You will also have the opportunity to interact with the panelists and with other GLWA members, to build consensus on the most important topics of consideration for the future state for GLWA charge methodology.

- **Day One**, June 19, each panelist will share their methodology and welcome questions from participants. Descriptions of each methodology will be provided in advance of the Symposium; we ask that you review the information and come prepared with your questions. ***Note: the panelists will be with us only this first day.***
- **Day Two**, June 28, will provide a platform for GLWA and our member partners to engage in deep-dive discussions about the various methodologies and how they may or may not inform GLWA's methodology. The goals will be:
    - To achieve consensus around which elements of our current wastewater charges methodology we wish to explore changing; and
    - To develop a "road map" for conducting that exploration (i.e., who will gather what data, by when, in order to build consensus toward the implementation of a new wastewater charges model).

Please plan to join us Tuesday, June 19th and Thursday, June 28th to learn how some of our peer utilities charge for wastewater services and begin to map the future of GLWA's approach.

An Outlook notice has been sent to regular attendees. Please RSVP for the meeting by either accepting the meeting notice or contacting the GLWA Member Outreach Team at outreach@glwater.org or 313-964-9301.

The GLWA Member Outreach Team

Wastewater Charges National Symposium
Day One Agenda
June 19, 2018 – 8:30 a.m. to 3:30 p.m.
Summit on the Park, 26000 Summit Pkwy, Canton

Time	Topic
8:30 a.m.	**Refreshments available**
9:00 a.m.	**Welcome, agenda review, desired outcomes – Kerry Sheldon, Bridgeport Consulting** ▪ To understand a variety of wastewater charge methodologies developed by national utility leaders ▪ Coalesce around a few key areas of interest that GLWA and members agree deserve investigation for potential implementation during the 2021 charge season and beyond
9:05 a.m.	**Opening remarks – Sue McCormick, CEO of Great Lakes Water Authority**
9:20 a.m.	**Kevin Shafer – Milwaukee, WI** *Executive Director, MMSD* ▪ Presentation (25 minutes) ▪ Table discussion: What key questions do you have? (5 minutes) ▪ Report-out and responses; Bridgeport captures discussion highlights (15 min.)
10:05 a.m.	**Kyle Colvin – St. Paul, MN** *Engineering Programs Manager, MCES* ▪ Presentation (25 minutes) ▪ Table discussion: What key questions do you have? (5 minutes) ▪ Report-out and responses; Bridgeport captures discussion highlights (15 min.)
10:50 a.m.	**10-minute break**
11:00 a.m.	**Aleah Menefee – Denver, CO** *Governmental/Public Utility Programs Administrator, Metro Wastewater Reclamation District* ▪ Presentation (25 minutes) ▪ Table discussion: What key questions do you have? (5 minutes) ▪ Report-out and responses; Bridgeport captures discussion highlights (15 min.)

Time	Topic
11:45 a.m.	**Tom Lienesch – Seattle, WA** *Senior Economist, King County Wastewater Treatment Division* ▪ Presentation (25 minutes) ▪ Table discussion: What key questions do you have? (5 minutes) ▪ Report-out and responses; Bridgeport captures discussion highlights (15 min.)
12:30 p.m.	**Lunch (35 minutes)**
1:05 p.m.	**Video: Massachusetts Water Resources Authority Charge Structure**
1:15 p.m.	**Jan Beecher – Michigan State University** *Director of Institute of Public Utilities Policy Research & Education*
2:00 p.m. (10 min.)	**Prioritization of topics to be addressed in panel discussion** ▪ At tables, consider the new questions or topics you would like the panelists to address after the break; write on cards and share with Bridgeport for compilation
2:10 p.m.	**10-minute break**
2:20 p.m.	**Panel discussion with all presenters – moderated by Jan Beecher** ▪ Summary of topics prioritized for consideration (5 minutes) ▪ Discussion (40 minutes)
3:20 p.m.	**Summary – Kerry Sheldon, Bridgeport Consulting** ▪ Confirmation of main topics participants appear to be coalescing around for further discussion among the membership and GLWA on June 28
3:25 p.m.	**Closing remarks – Sue McCormick**
3:30 p.m.	**Adjourn** ▪ Please complete an evaluation form before you leave

PRESENTER BIOGRAPHIES

2018 Wastewater Charges Symposium

KEVIN L. SHAFER, P. E.

Kevin Shafer, Executive Director of the Milwaukee Metropolitan Sewerage District (MMSD), is responsible for the overall management, administration, leadership, and direction for MMSD and represents MMSD to its customers, bond rating agencies, and the public. Shafer is a civil engineer, previously working for an international engineering firm and the U.S. Army Corps of Engineers.

He is a past president of the National Association of Clean Water Agencies. He serves on the EPA's Local Government Advisory Committee and is the Co-chair of the Water Research Foundation Board of Directors.

KYLE COLVIN, P. E.

Manager, Engineering Programs
Metropolitan Council Environmental Services

Mr. Colvin received his Bachelor of Science degree from Michigan Technological University in 1984. He is a licensed Professional Engineer in Minnesota and Michigan. He began his professional career working at engineering consulting firms, first in Michigan, then in Minnesota, before coming to the Metropolitan Council Environmental Services (MCES) in 1991.

During his 27-year tenure at MCES, Mr. Colvin has been involved with, and responsible for, the regional wastewater cost allocation process. In his spare time, he enjoys fishing, travel and competing in highland bagpipe competitions throughout the US and Canada.

PRESENTER BIOGRAPHIES

ALEAH MENEFEE

Aleah Menefee currently serves as the Governmental and Public Utility Programs Administrator at the Metro Wastewater Reclamation District (District) near Denver, Colorado. In her position, Aleah manages the Annual Charges for Service and Sewer Connection Charge systems, and is the liaison between the District and its customers. She is implementing a robust service and communication plan for the District's customers to increase information sharing and transparency around fees levied by the District. Prior to joining the District, Aleah provided economic development services to municipalities across the country, centered around business incentives, and impacts of the creative economy.

Aleah earned a Bachelor of Arts in Architecture and History of Art from the University of Kansas and a Master of Arts in Urban and Regional Planning with a concentration in Economic and Community Development from the University of Colorado.

TOM LIENESCH

Tom Lienesch, is currently the senior economist for the King County Wastewater Treatment Division (WTD). During his 20 years with the Utility he has focused on rate setting, analyzing and creating alternative rate structures, developing financial policies and capital financing. Prior to WTD, he was Chief of the Regional Analysis Branch at the Bureau of Economic Analysis in Washington DC where he worked on economic forecasting, multi-state modeling of Federal policy impacts and regional economic analysis.

He holds a master's degree in economics from the Johns Hopkins University and a bachelor of arts in economics from the University of Washington,

JANICE A. BEECHER, PH.D.

Institute of Public Utilities, Michigan State University

Dr. Janice Beecher has served as Director of the Institute of Public Utilities since 2002, bringing more than thirty years of applied research experience to the position. Her areas of interest include regulatory principles, institutions, governance, and pricing and she specializes in the water sector. She is a frequent author, lecturer, and participant in professional forums and Editor of the journal Utilities Policy.

She presently serves on the U.S. EPA's Environmental Finance Advisory Board and chairs the Water Rates Subcommittee of the Flint Water Interagency Coordinating Committee. In 2016, she served on Michigan's 21st Century Infrastructure Commission. Dr. previously held positions at The Ohio State and Indiana Universities and the Illinois Commerce Commission. She holds a Ph.D. in Political Science from Northwestern University.

Wastewater Charges Symposium

Great Lakes Water Authority
Detroit, Michigan
June 19, 2018

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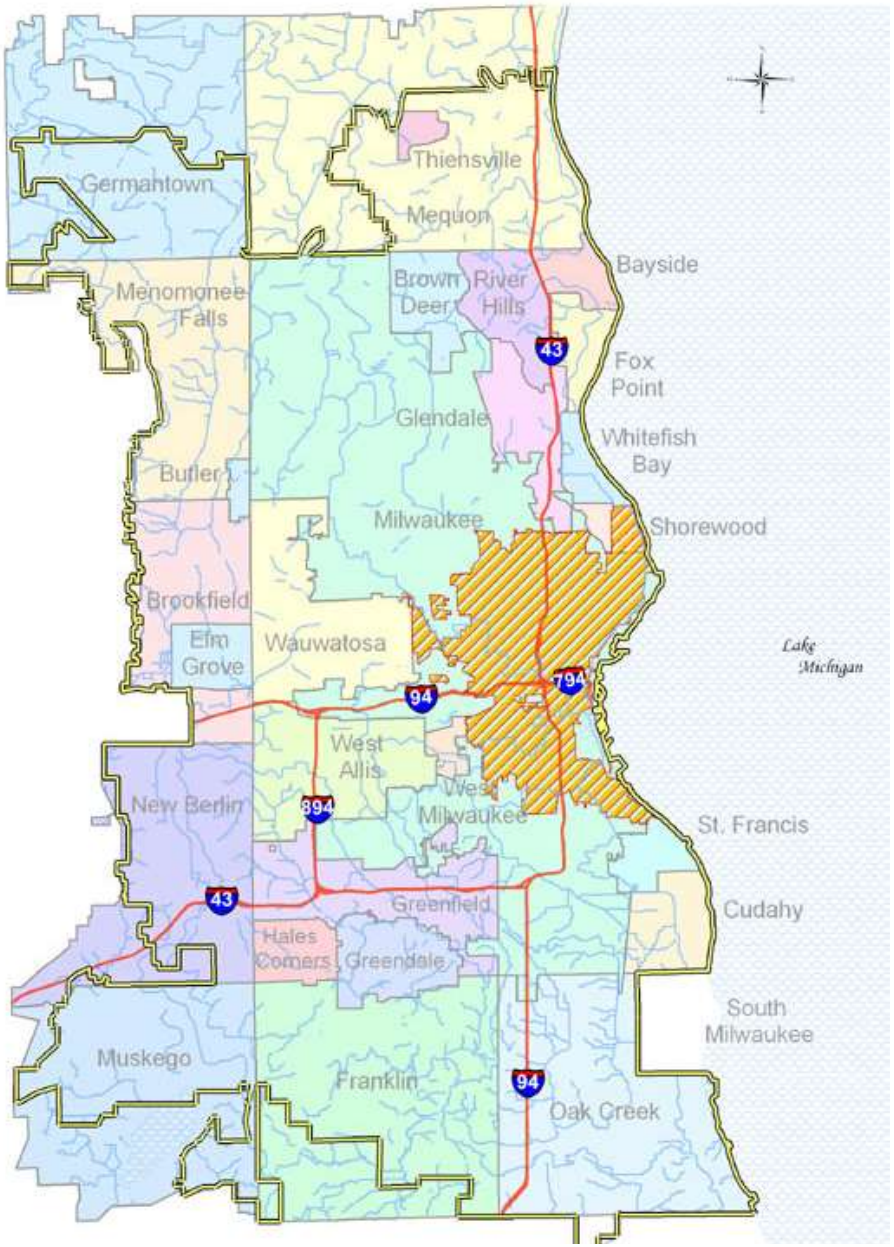
Milwaukee Metropolitan Sewerage District



We Serve:

- 1.1 Million Customers
- 28 Municipalities
- 411 Square Miles

We Protect the Public & Lake Michigan:

- Convey/Store/Reclaim Wastewater
- Manage Flooding

We Have:

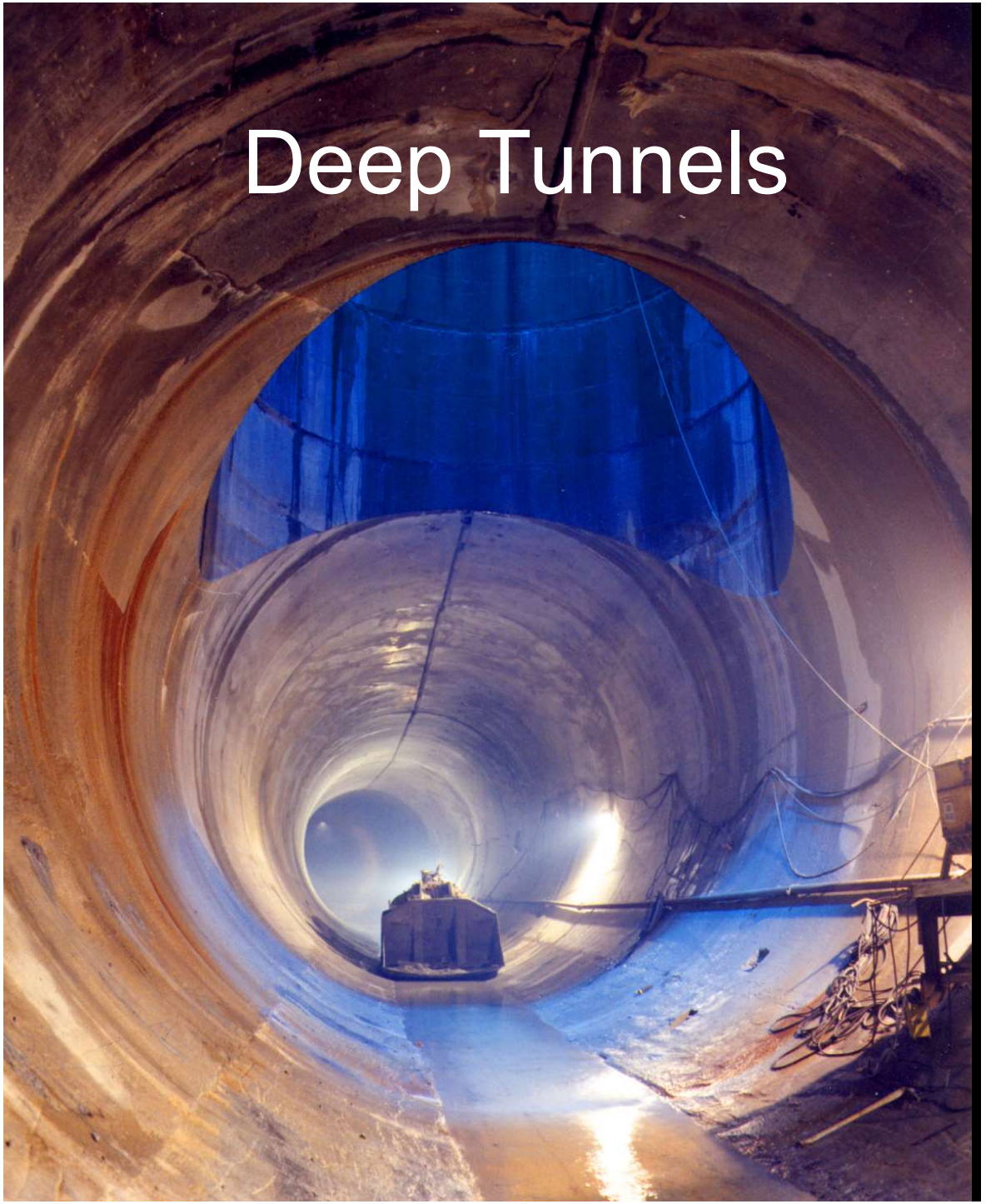
- 300 Miles of Sewers (Municipalities and individuals have 6,000 miles!)
- 521 MG Tunnel System
- 2 Water Reclamation Facilities

Water Reclamation Facilities

Jones Island

South Shore


Milorganite®
CELEBRATING 90 YEARS



300 feet
Below ground

521 Million
Gallons of Storage

28.5 Miles
Long

17- to 32-feet
In Diameter

Designed to minimize basement backup and CSO's to 1-2 per year

Northwest Side Deep Tunnel

89 million gallons

7.1 miles long

27th Street Deep Tunnel

27 million gallons

2 miles long

98.5%

Capture & Clean

Since 1993

MMSD

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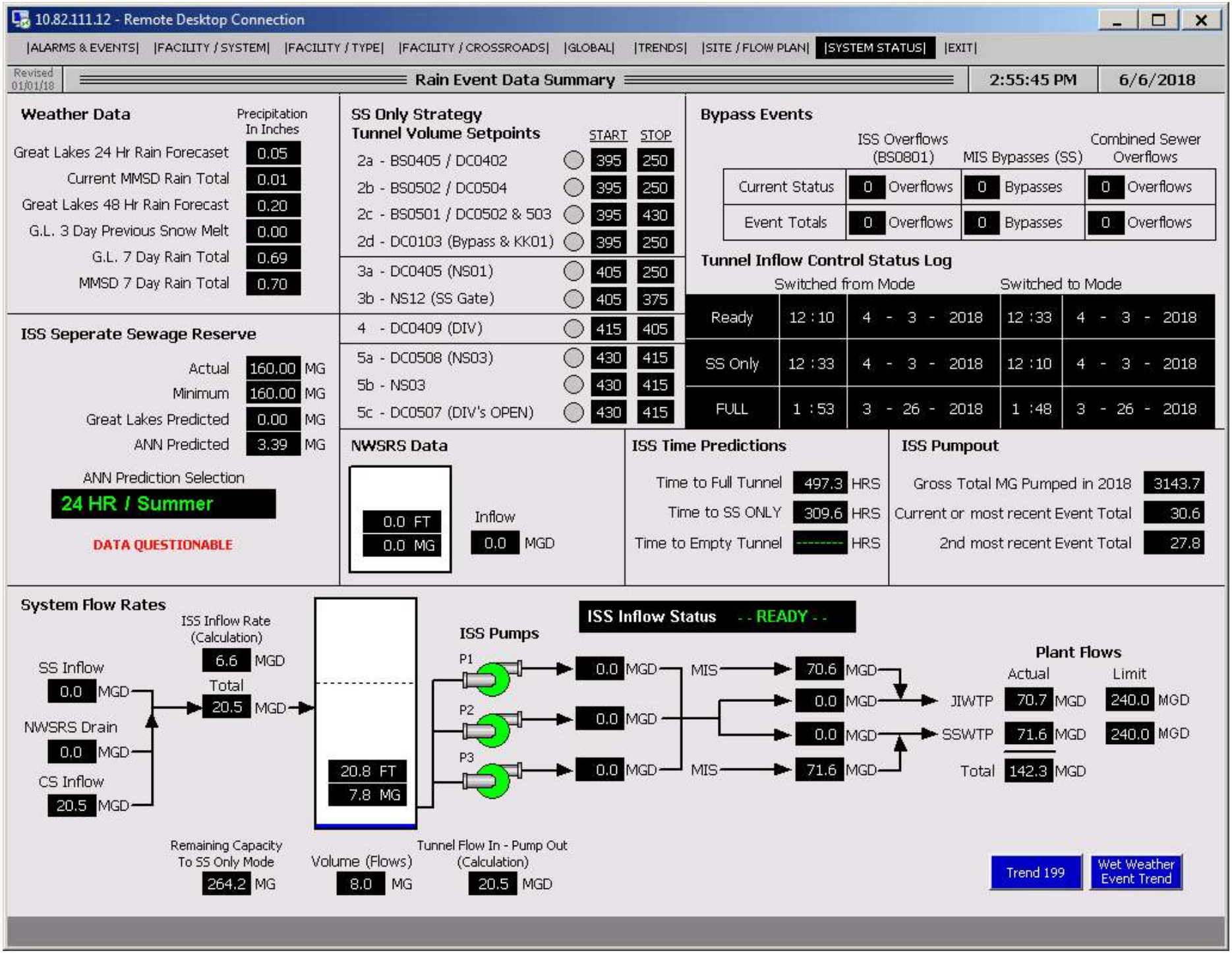
10.82.111.12 - Remote Desktop Connection
|ALARMS & EVENTS| |FACILITY / SYSTEM| |FACILITY / TYPE| |FACILITY / CROSSROADS| |GLOBAL| |TRENDS| |SITE / FLOW PLAN| |SYSTEM STATUS| |EXIT|
Revised 01/01/18
Rain Event Data Summary
2:55:45 PM
6/6/2018
Weather Data
Precipitation In Inches
Great Lakes 24 Hr Rain Forecaset 0.05
Current MMSD Rain Total 0.01
Great Lakes 48 Hr Rain Forecast 0.20
G.L. 3 Day Previous Snow Melt 0.00
G.L. 7 Day Rain Total 0.69
MMSD 7 Day Rain Total 0.70
ISS Seperate Sewage Reserve
Actual 160.00 MG
Minimum 160.00 MG
Great Lakes Predicted 0.00 MG
ANN Predicted 3.39 MG
ANN Prediction Selection
24 HR / Summer
DATA QUESTIONABLE
SS Only Strategy
Tunnel Volume Setpoints
START STOP
2a - BS0405 / DC0402 395 250
2b - BS0502 / DC0504 395 250
2c - BS0501 / DC0502 & 503 395 430
2d - DC0103 (Bypass & KK01) 395 250
3a - DC0405 (NS01) 405 250
3b - NS12 (SS Gate) 405 375
4 - DC0409 (DIV) 415 405
5a - DC0508 (NS03) 430 415
5b - NS03 430 415
5c - DC0507 (DIV's OPEN) 430 415
Bypass Events
ISS Overflows (BS0801)
MIS Bypasses (SS)
Combined Sewer Overflows
Current Status 0 Overflows 0 Bypasses 0 Overflows
Event Totals 0 Overflows 0 Bypasses 0 Overflows
Tunnel Inflow Control Status Log
Switched from Mode
Switched to Mode
Ready 12 : 10 4 - 3 - 2018 12 : 33 4 - 3 - 2018
SS Only 12 : 33 4 - 3 - 2018 12 : 10 4 - 3 - 2018
FULL 1 : 53 3 - 26 - 2018 1 : 48 3 - 26 - 2018
NWSRS Data
0.0 FT
0.0 MG
Inflow 0.0 MGD
ISS Time Predictions
Time to Full Tunnel 497.3 HRS
Time to SS ONLY 309.6 HRS
Time to Empty Tunnel ------- HRS
ISS Pumpout
Gross Total MG Pumped in 2018 3143.7
Current or most recent Event Total 30.6
2nd most recent Event Total 27.8
System Flow Rates
ISS Inflow Rate (Calculation) 6.6 MGD
SS Inflow 0.0 MGD
NWSRS Drain 0.0 MGD
CS Inflow 20.5 MGD
Total 20.5 MGD
20.8 FT
7.8 MG
ISS Inflow Status - - READY - -
ISS Pumps
P1 0.0 MGD
P2 0.0 MGD
P3 0.0 MGD
MIS 70.6 MGD
0.0 MGD
MIS 0.0 MGD
71.6 MGD
Plant Flows
Actual Limit
JIWTP 70.7 MGD 240.0 MGD
SSWTP 71.6 MGD 240.0 MGD
Total 142.3 MGD
Remaining Capacity To SS Only Mode 264.2 MG
Volume (Flows) 8.0 MG
Tunnel Flow In - Pump Out (Calculation) 20.5 MGD
Trend 199
Wet Weather Event Trend

MMSD's 2035 Vision

Integrated Watershed Management Goals:

Zero sanitary sewer overflows

Zero combined sewer overflows

Zero homes in the 100 year floodplain

Acquire an additional 10,000 acres of river buffers through Greenseams®

Use green infrastructure to capture the first 0.5 inch of rainfall

Harvest the first 0.25 gallon per square foot of area of rainfall

Energy Efficiency and Climate Mitigation & Adaptation Goals:

Meet 100% of MMSD's energy needs with renewable energy sources

Meet 80% of MMSD's energy needs with internal, renewable sources

Use the Greenseams® Program to provide for 30% sequestration of MMSD's carbon footprint

Reduce MMSD's carbon footprint by 90% from its 2005 baseline

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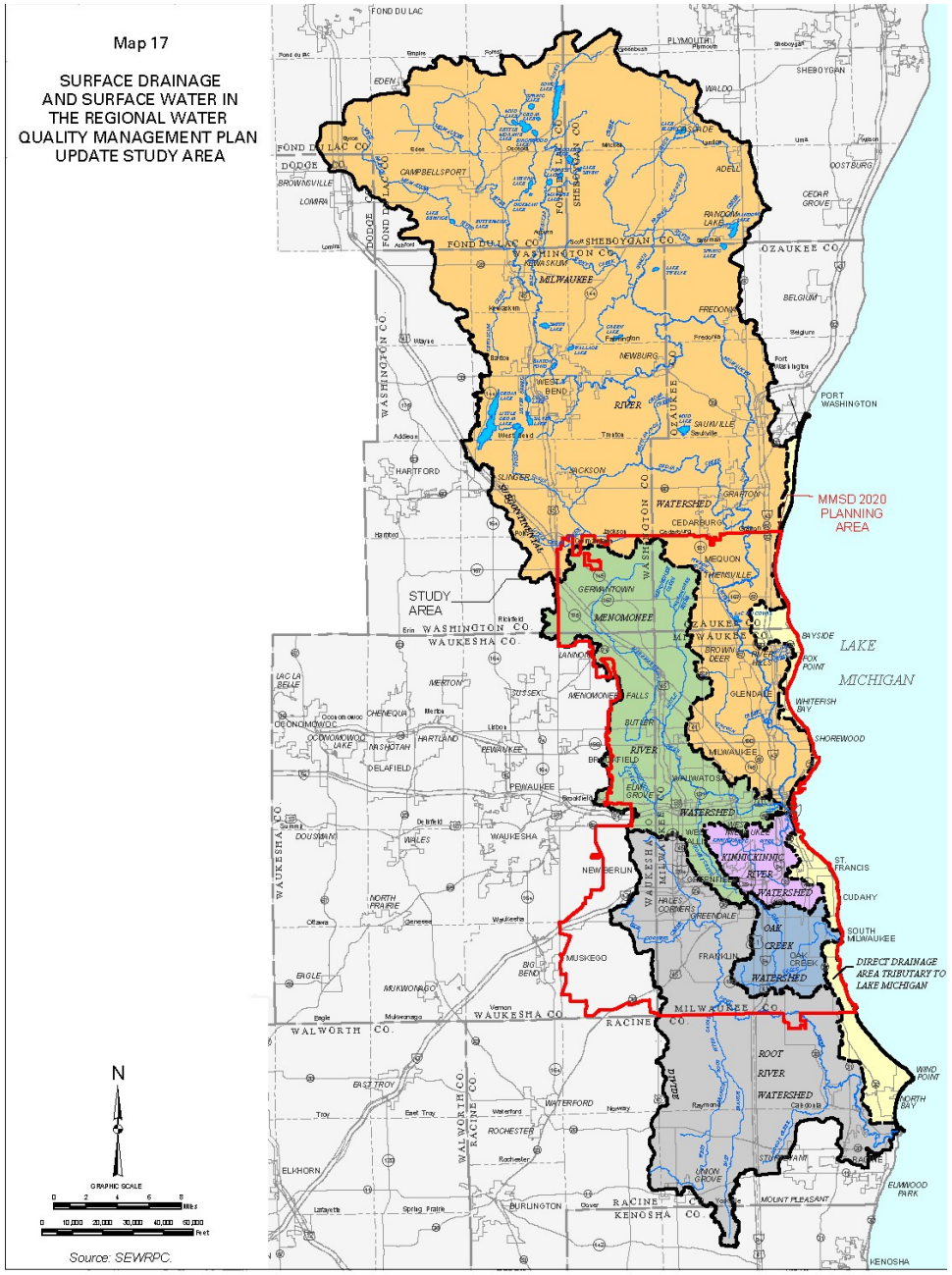
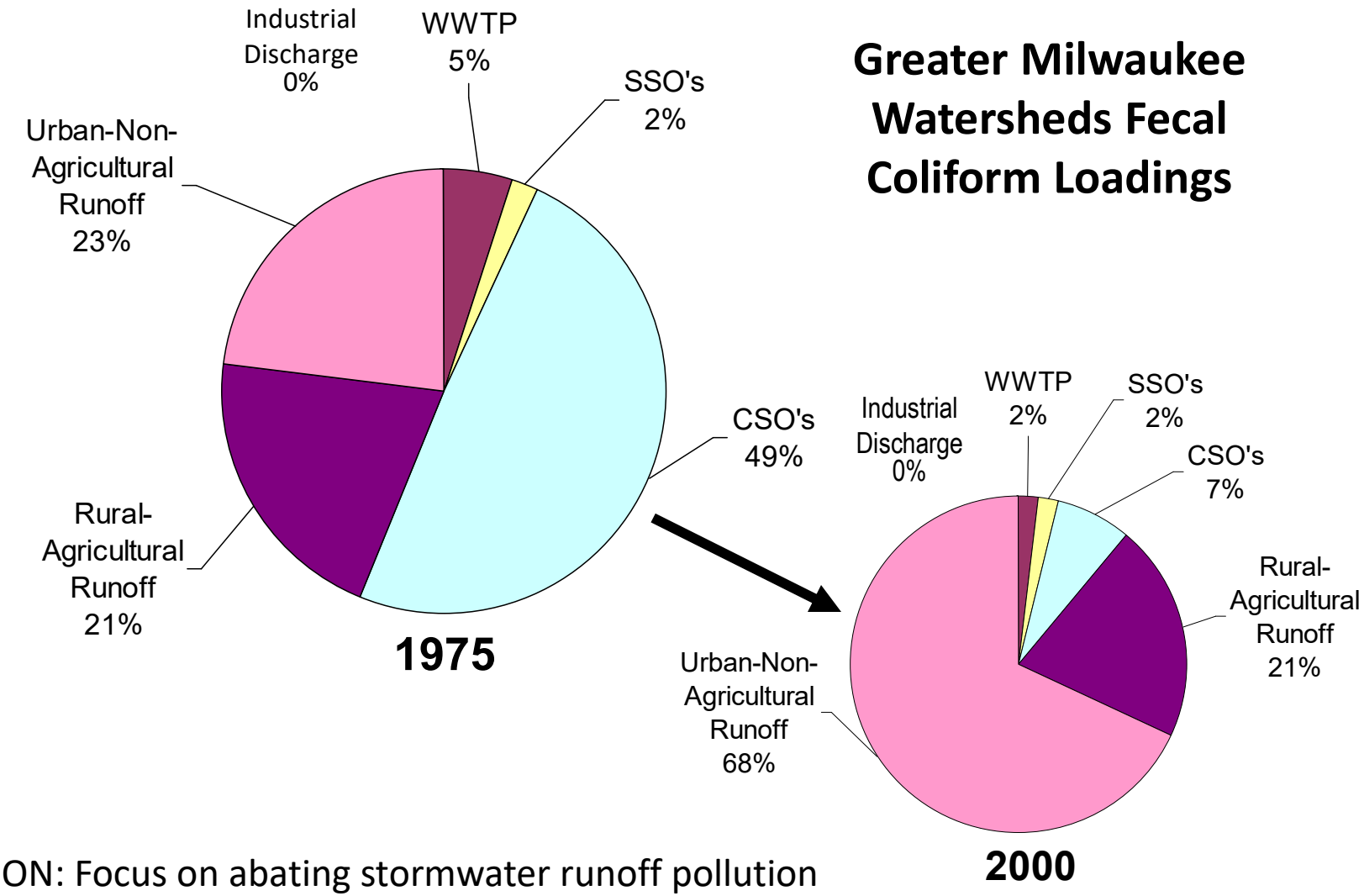
The Greater Milwaukee River Watersheds

Watershed	Area (square miles)
Kinnickinnic River	24.7
Menomonee River	135.8
Milwaukee River	700.0
Oak Creek	28.2
Root River	197.6
Lake Michigan Direct Drainage Area	40.7
Total	1,127.0

Number of Counties	9
Number of Local Municipalities	83

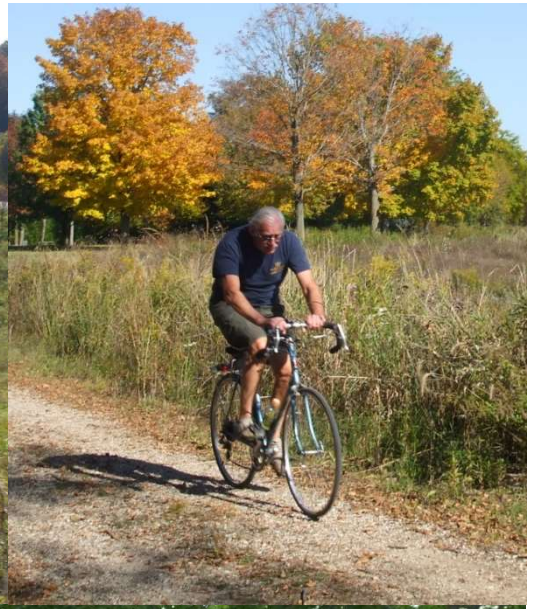


SEWRPC's Regional Water Quality Management Plan Update Pollution Sources Summary



CONCLUSION: Focus on abating stormwater runoff pollution

Menomonee River County Grounds



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Greenseams®
3,600 acres

FRESH COAST 740

MILWAUKEE, WISCONSIN

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Green Infrastructure

Since 2002

36 Million Gallons

LAKE MICHIGAN

Rain Gardens

INITIATIVE

22,187 Distributed since 2002

Rain Barrels

Total Storage = **1,150,000** Gallons

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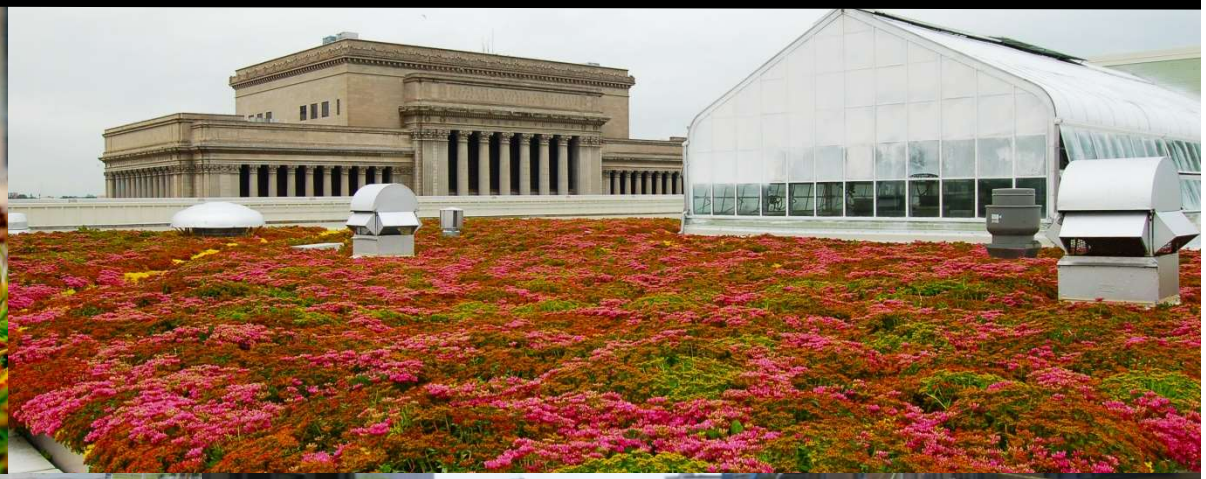
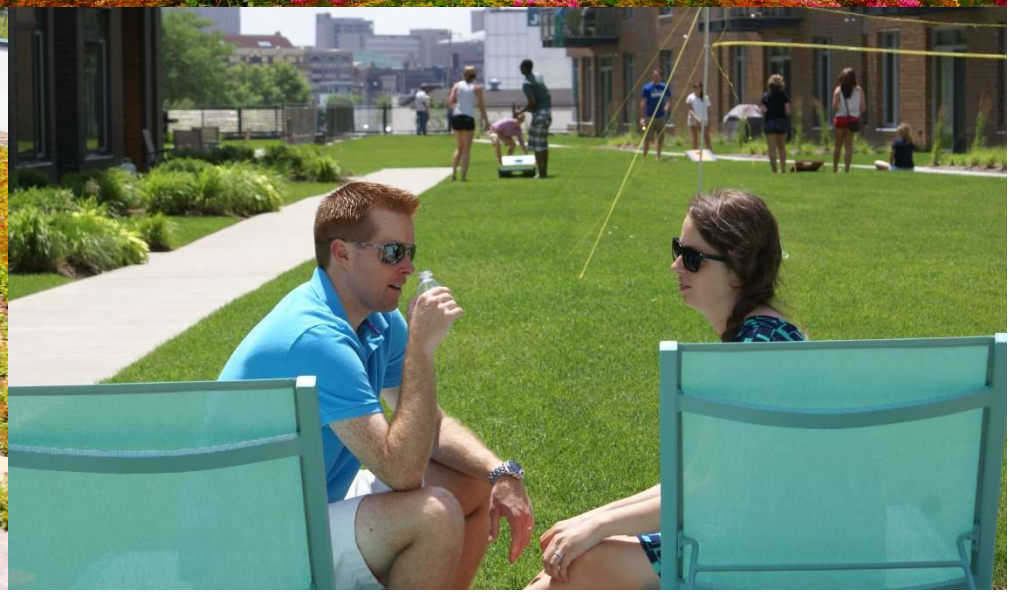
Green Roofs

Managing up to

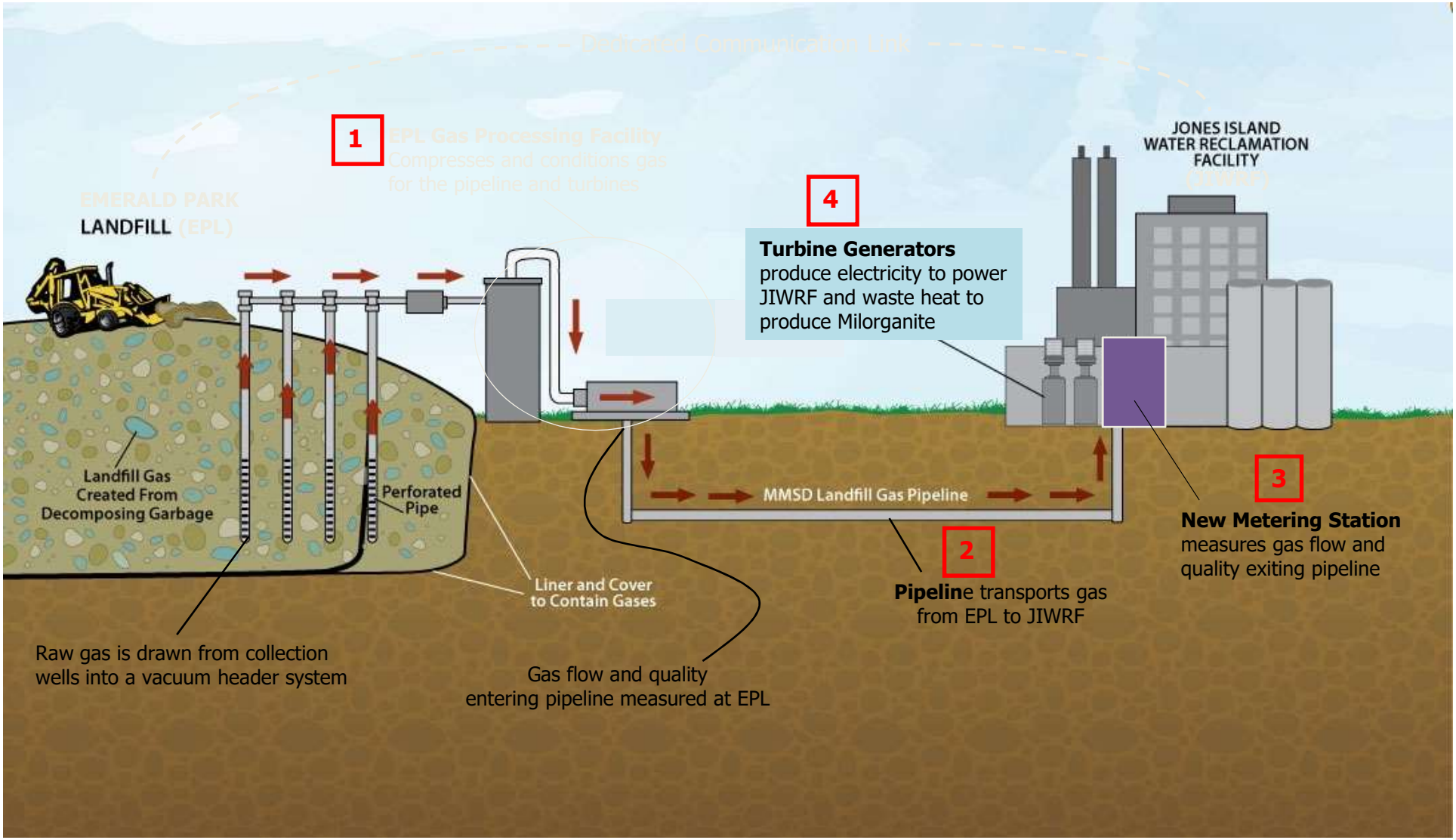
512,000

Gal. Per Storm





LFG System Components

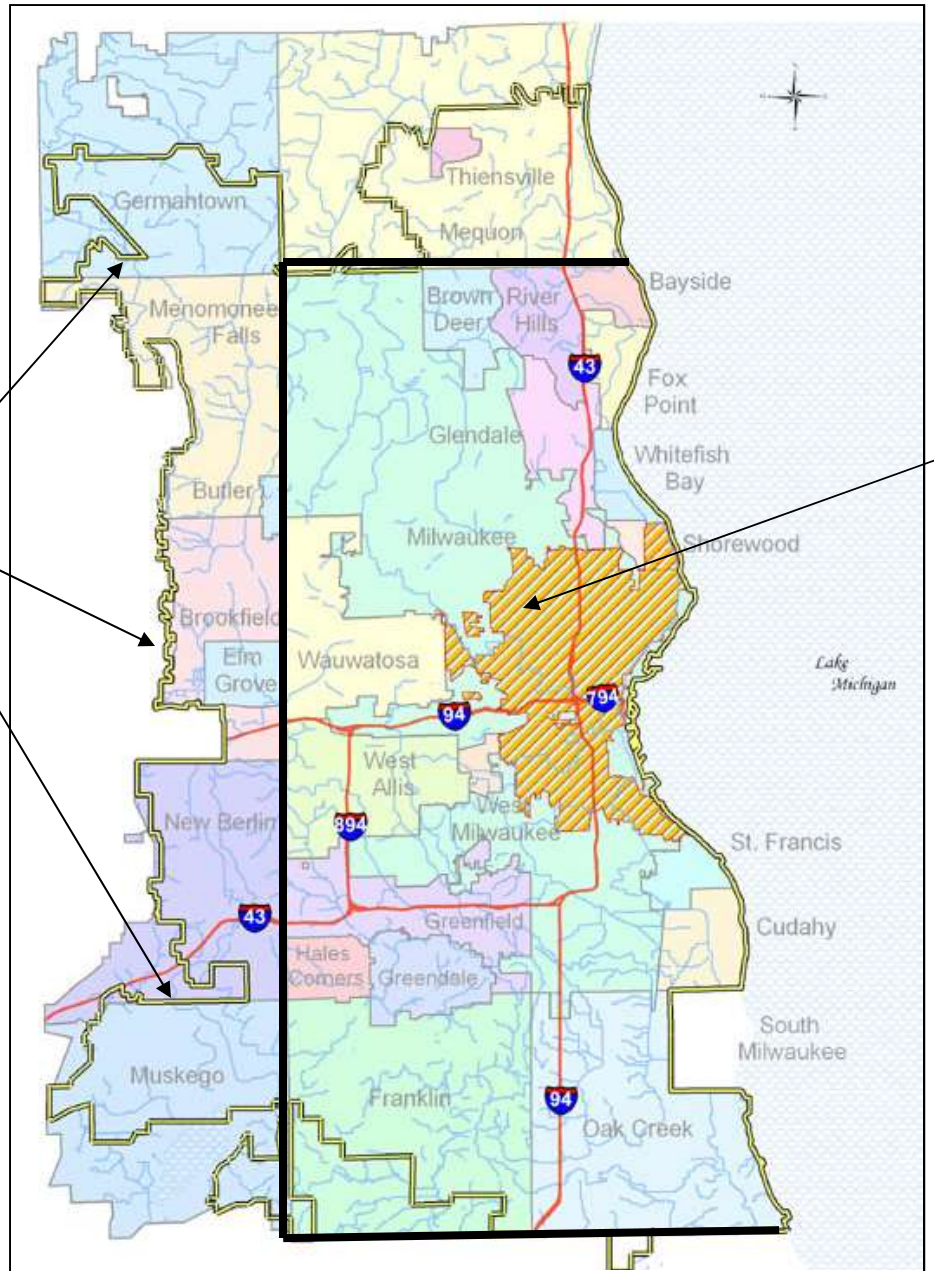


South Shore Digester Gas Improvement

Photo Courtesy of the Journal Sentinel

Milwaukee's Resource Recovery Plant

Milwaukee Metropolitan Sewerage District



10 Non-Member Municipalities

18 Member Municipalities

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Milwaukee's Sewer War

1984-1995

(not as cool as Star Wars)

- Following Clean Water Act approval, State of Illinois filed suit against Milwaukee and the State of Wisconsin to stop overflows into Lake Michigan
- Result was the development of plans to build the Water Pollution Abatement Program (WPAP) which included the Deep Tunnel
- Sewer Wars was a legal battle over how and who pays for capital costs (i.e. Deep Tunnel/WPAP)

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Sewer Wars Chronology

1984-1995

- Nonmember communities became known as FLOW (Fair Liquidation of Waste!)
- Refuse to pay the District the full capital billing
- District files suit, supported by JOBS (Joint Organization for Better Sewers), major wet industry, such as breweries and tanners
- Nonmember reasons:
  - Nonmembers have high value residential properties and low industry
  - Tax exempts don't pay
  - Most wastewater facilities are funded only by user charges
- Member reasons:
  - User charge penalizes wet industry
  - User charge is regressive
  - WPAP projects would benefit the public good through water quality, environment, public health

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Sewer Wars Chronology

1984-1995, cont'd

- Huge public relations battle and District receiving negative press
- WPAP continues
- In 1992, first User Charge Study since 1979
- Original deep tunnel completed in 1993
- Federal and State grants close
- Clean Water Fund Loan (CWFL) Program replaces grants in 1992
- To soften impact of lost grant funds, the State subsidizes CWFL interest rate (that is the District pays 55% of the market interest rate the State of Wisconsin receives)

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Sewer Wars Chronology

1996

- WPAP substantially completed
- Legislative Audit Bureau reviews WPAP
- District returns only $500,000 from $1B in grants
- State of Wisconsin Supreme Court upholds State of Wisconsin Public Service Commission (PSC) ruling in favor of District with 6 of 10 nonmembers pay > $140M in past due charges
- Sewer Wars comes to an end
- 1 major ruling against the District relates to Flood Management Expenditures
  - Flood management improvement projects can be collected from nonmembers which are tributary to the watercourse being improved

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MMSD Current Billing Methodology

- MMSD is a wholesaler; we bill the 28 municipalities
- 18 Municipalities are members and 10 municipalities are nonmembers
- Member municipalities have seven positions on the 11-person MMSD Commission
- Each municipality pays the same rates for Capital Improvements and Operations and Maintenance (O&M)
- Nonmembers receive invoices for Capital and O&M charges
- Nonmember are not billed for watercourse/flood management expenditures

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Wastewater Charge Methodology

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Capital Budget -

Funds Construction Projects

Revenue Sources:

- Property Tax Levy
- Clean Water Fund Loans
- General Obligation Bonds
- State and Federal Grants

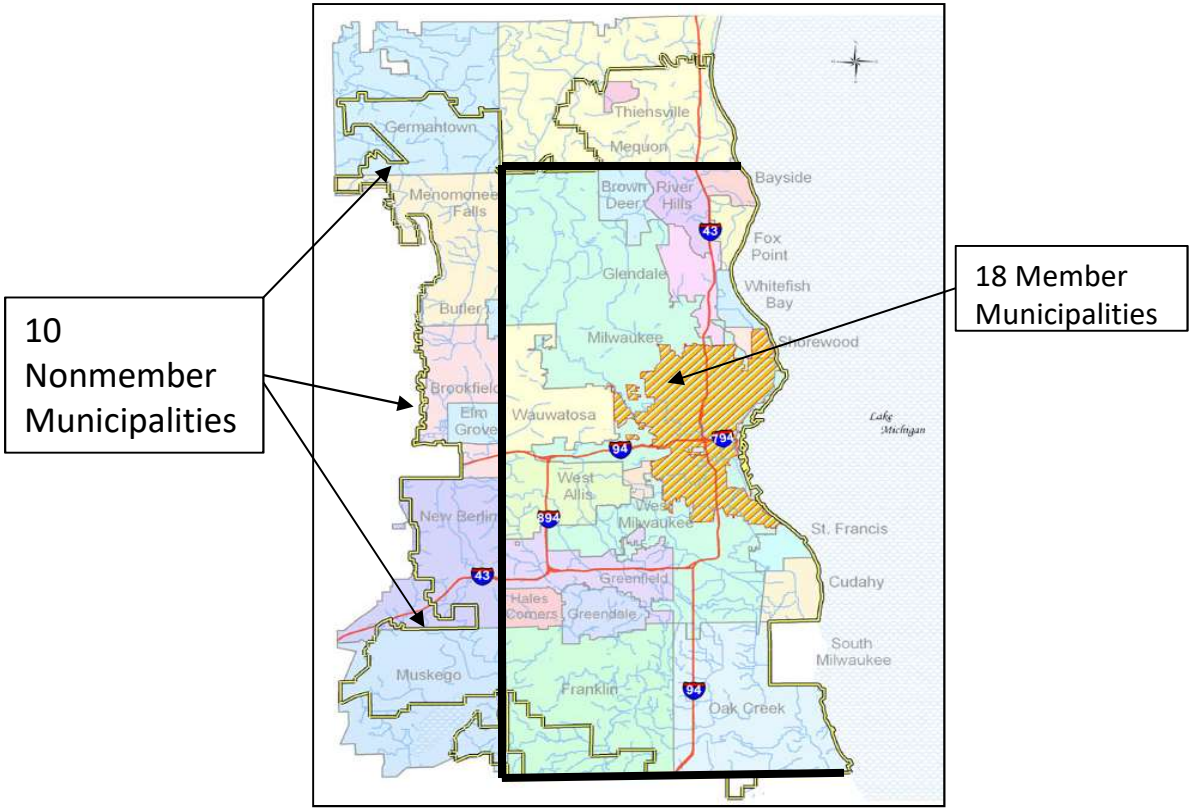
Operation and Maintenance Budget –

Funds the day-to-day collection , conveyance, treatment of wastewater and flood management

Revenue Sources:

- Sewer User Charge
- Milorganite® Sales
- HHW and IWPP cost recovery

Capital Budget - Property Tax



MMSD collects property tax based on equalized value for member municipalities

Nonmember billings is not a tax but an ad valorem equivalent capital charge. Flood management credit is included.

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O&M Budget - User Charge

MMSD allocates costs to unit processes (i.e. pumping disinfection, wages, etc.)

Costs are then assigned to four billing parameters:

- Total Suspended Solids (TSS)
- Biochemical Oxygen Demand (BOD)
- Flow
- Connections

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O&M Budget – Total Waste load Estimate by Parameter

Residential Rate

Residential flow parameter is based on gallons of flow (per 1,000 gallons)

Residential Gallons are estimated by:

- ERU;
- Annual winter quarter survey; and
- Residential occupancy

2016 Rate was 52 gpcd.

Note the residential rate has dropped from around 68 gpcd in the last 20 years.

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O&M Budget – Total Waste load Estimate by Parameter

Commercial Rate

Commercial (includes buildings with more than 4 housing units, businesses and institutions)

Three Major User Classes:

- Noncertified – based on water usage from Municipality or if on a well, it is estimated
- Discharge Certified (verified through sampling)
- Wastestrength Certified (verified through sampling)

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O&M Budget – Total Waste load Estimate by Parameter

Industrial Rate

Industrial

Three Major User Classes:

- Noncertified – based on water usage from Municipality
- Discharge Certified (verified through sampling)
- Wastestrength Certified (verified through sampling)

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O&M Budget - User Charge

The TSS, BOD, and flow rates make up MMSD's volumetric charge to the municipalities. Connections is additive.

Cost Recovery Procedures Manual:

https://www.mmsd.com/application/files/2714/8454/0930/2017_Cost_Recovery.pdf

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GLWA Questions

1. Reasons for Charge Methodology – when the WPAP was started up, we applied for Federal grants which required us to have a user charge.
2. Stable & Equitable – yes but annually there are some who have concerns
3. Simple? – yes
4. Have we analyzed other methodologies? Currently looking at a third billing component for wet weather (GI and PPII)
5. Do we meter all customers? – no
6. Problems with charge methodology? – no
7. Would you change methodology? Yes, currently looking at this.

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Questions

Kevin Shafer
Executive Director
Milwaukee Metropolitan Sewerage District
kshafer@mmsd.com
414-225-2088

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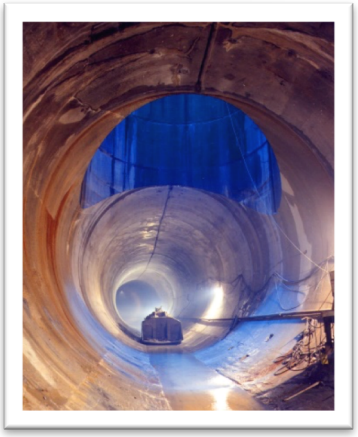
Milwaukee Metropolitan Sewerage District

Profile

The Milwaukee Metropolitan Sewerage District (MMSD) is a regional government agency that provides water reclamation and flood management services for about 1.1 million people in 28 communities in the greater Milwaukee area. MMSD serves 411 square miles that cover all, or segments of, six watersheds. Established by state law, the District is governed by 11 Commissioners with taxing authority. Operations and maintenance of the system has been performed by a private operator since 1998.

System Overview

- Jones Island Water Reclamation Facility – 330 MGD
- South Shore Water Reclamation Facility – 300 MGD
- Conveyance system with 300 miles of interceptors; 6,500 miles of tributary satellite sewers
- Service area includes combined sewer (about 23% of land area) and separated sewer systems
- Deep Tunnel – 521 MG
- 11 Pump Stations
- 20 Tunnel Dropshafts and CSO locations
- Milorganite Production and distribution
- Flood management facilities
- Greenseams – over 3,600 acres
- Green infrastructure sites



SLOW-RELEASE
Milorganite®
NITROGEN FERTILIZER

Milwaukee Metropolitan Sewerage District (MMSD) Charge Methodology

Overview

MMSD is a regional government agency that provides water reclamation and flood management services for about 1.1 million people in 28 municipalities in the Greater Milwaukee Area. 18 of the 28 municipalities are members of the District and represent cities and villages with the MMSD's legal boundary (all of Milwaukee County excluding the City of South Milwaukee). In addition to the 18 member municipalities, MMSD is authorized under Wisconsin State statutes, to provide service beyond its legal boundaries but within the portion of the multi-county drainage basin. This area includes all or parts of ten non-member municipalities outside of Milwaukee County. MMSD's total planning area is 411 square miles that cover all, or segments of, six watersheds. Established by state law, MMSD is governed by 11 commissioners, seven are appointed by the Mayor of Milwaukee, and three of the seven appointees must be elected officials. The remaining four commissioners are appointees of a body comprised of the elected executive officer of each city or village, other than the City of Milwaukee, with the District's legal boundary. Of the four appointees, three also must be elected officials

MMSD is highly regarded nationally as a leader in wastewater treatment, flood management, green infrastructure and much more. A recipient of the U.S. Water Prize and many other awards, MMSD is most proud of its record of 98.5%, since 1994, for capturing and cleaning wastewater from 28 communities in a 411-square mile area. Many metropolitan areas struggle to capture and clean the national goal of 85% of all the rain and wastewater that enters their sewer systems.

Financial Overview

MMSD operates from two budgets, one for capital projects -- primarily construction projects -- and another for the operation and maintenance expenses, mostly related to the day to day collection, conveyance, treatment of wastewater and flood management. MMSD does not handle direct customer billing. In effect, MMSD is a wholesaler, whereby it sends bills to the 28 municipalities it provides service to and the municipalities are the retailers handling the direct customer billing.

Funding of the Capital Budget

The capital budget is funded mainly through levy of property taxes on its 18 member municipalities and capital billings to the 10 non-member municipalities outside MMSD's legal boundary but within MMSD's service area. The capital billings to the non-member municipalities is not a legal tax, rather an ad valorem equivalent capital charge. The District is paid 100% of the tax levy by August 20th for the year the taxes are levied and 100% by the non-member municipalities by April 1st of the year the billings are intended. In addition to the tax levy and capital billings, other MMSD funding sources for its capital budget include:

- State of Wisconsin Clean Water Fund Loans
- MMSD issued General Obligation Bonds and Notes
- Federal and State grants
- Interest and other income

Funding of the Operations and Maintenance (O&M) Budget

The primary source of funding for MMSD's O&M budget is sewer user charge billings to the 28 municipalities receiving service. As mentioned earlier, MMSD is a wholesaler, whereby it sends bills to the 28 municipalities it provides service to and the municipalities are the retailers handling the direct customer billing. MMSD bills each municipality within its service area based on the waste strength, quantity, and number of connections of its users. MMSD sewer user charges are paid 100% in full by the 28 municipalities regardless of collections, and within 45 days from the date the municipality receives the wholesale bill. The other sources of funding MMSD's O&M budget include:

- Net sales of Milorganite fertilizer
- Smaller cost recovery programs: Household Hazardous Waste and Industrial Waste Pretreatment Program
- Interest and other income

Sewer User Charges

Cost Allocation

Amounts adopted in MMSD's O&M budget are assigned to unit processes. Unit processes represent the functional elements of the sewerage system to which cost of treatment are assigned. A few examples of unit processes are:

- Pumping, metering and screening
- Primary sedimentation
- Aeration
- Process air generation
- Clarification
- Disinfection
- Phosphorus removal
- Sludge thickening, dewatering, drying

All budgeted support service costs (Legal services, Finance, Administration, etc.) are allocated to each unit process.

Costs assigned to each unit process are assigned in whole or in part to each of the District's four billing parameters based upon the operational intent of the process.

MMSD currently uses the following four billing parameters for cost recovery:

- Flow representing the gallons of wastewater MMSD treats at its plants.
- BOD, the quantity of oxygen consumed in the biochemical oxidation of organic matter in five (5) days (organic wastestrength).
- Total Suspended Solids (TSS), solids that are suspended in wastewater (inorganic wastestrength).
- Connection (Conn), each physical connection to the municipal or District sewer system.

Costs that cannot be associated with a specific billing parameter are classified as nonspecific, excluding permit fees. Non-specific costs are allocated to each billing parameter based on the percentage of total costs accumulated for each billing parameters.

Total Infiltration/Inflow (I/I) costs related to storage and treatment are allocated to Flow and Conn billing parameters based on the percentage of total cost for each of the two billing parameters.

Permits fees are allocated to each billing parameter as surcharge (in 2018 it was 1.09% surcharge).

Wasteload Determination

MMSD staff annually estimates total wastewater to be treated by waste parameter of gallons of flow, pounds of BOD, pounds of TSS, and the number of connections served. For the 2018 user charge rates the following estimates were used:

- Flow, 87.6 million gallons per day.
- BOD, 320,964 pounds per day.
- TSS, 288,656 pounds per day.
- CONN, 305,154 number of connections.

An annual estimate of the total I/I wasteloads to be treated in terms of flow, BOD and TSS is calculated. For the 2018 user charge rates the following estimates were used:

- Flow, 82.0 million gallons per day.
- BOD, 24,186 pounds per day.
- TSS, 96,744 pounds per day.

Billing

As mentioned earlier, MMSD is a wholesaler and bills each municipality it provides service. The bill shall include charges for all users served by the municipality. The wholesale bill shall show: (a) the total amount due from each user class; (b) the amount due from each discharge factor certified commercial user; (c) the amount due from each waste strength certified commercial user; and (d) the amount due from each industrial user.

ERU (Equivalent Residential Unit)

Customers are then responsible for their proportionate share of volume, strength, and customer related costs. The process utilized in the determination of units of service for each parameter, which includes consideration for Equivalent Residential Units (ERU) and Residential Occupancy Factors (ROF), is summarized below.

In accordance with USEPA regulations, the District's volume and strength related costs are apportioned to each class of user pursuant to their respective measures of sewerage flow and strength discharged to the system. Residential charges are based on the characteristics of a typical residential discharge (level of service standard), defined as an ERU. District surveys of winter water consumption by residential customers served by municipalities establish the basis for the annual update of the typical ERU level of service standard. Pursuant to the Cost Recovery Procedures Manual (CRPM) the resultant ERU level of service standard effective January 1, 2018 is defined as 52 gallons/capita/day (gpd) with BOD and TSS loadings of 310 and 370 milligrams/liter (mg/l), respectively.

A municipality's ROF is the average number of people residing in each residential (as defined above) housing unit and is determined by dividing estimated residential population by the number of housing units. The residential population is estimated by deducting estimated commercial population from total population. In general, a municipality's residential flows and strengths are estimated by multiplying its number of ERUs by its ROF and by corresponding flow and pollutant concentrations for each ERU. It should be noted that flow and associated strengths attributable to certified industrial and commercial uses are individually estimated by the District as discussed below.

Wholesale Billing Process

The municipal sewer user data transmission is the basis for the District wholesale bill to the municipality. Enclosed with the wholesale bill is a statement of charges for each certified user. The municipality should include this statement with the retail bill for each certified user.

The data transmission consists of three major user classes (UC):

1. Residential: User data includes "units" and "connections". Residential users discharge domestic strength wastewater only. Domestic strength characteristics are described in Section 1. Residential units are part of total housing units within a municipality. A housing unit may be a house, apartment, condominium, mobile home, etc., occupied as separate living quarters, or if vacant, intended for occupancy. A housing unit is classified either residential or commercial depending on the characteristics of the building. A residential structure usually accommodates 1-4* housing units as defined in Sec. 17.301, MMSD Rules.

2. Commercial: User data includes "water consumption" and "connections." Commercial users include buildings with more than 4* housing units, businesses and institutions. Commercial users are divided into three groups:

- Noncertified. These users have not certified discharge or wastewater strength data to the District. All the water they use is discharged to the sanitary sewer, at domestic strength. Individual non-metered users are reported on Schedule F-1 (business) or Schedule F-2 (apartments). User data for metered users is reported in total.

- Discharge Certified (UC 23). Individual users are reported on Schedule A. A percentage of the water they use is discharged to the sanitary sewer, at domestic strength.

- Wastestrength Certified (UC 32). Individual users are reported on Schedule B. A percentage of the water they use is discharged to the sanitary sewer, at a strength based on laboratory analysis of wastewater samples.

Water consumption for a certified user with a non-metered water source is initially calculated on Schedule G. The facility user data is then transferred to either Schedule A or B as appropriate.

Non-member User Charge Credits

Unique to MMSD, non-member municipalities are not billed for watercourse and flood management costs, if the municipality is not tributary to the watercourse being maintained. In addition, beginning in 2018 8 non-member municipalities have elected to not participate in the MMSD's Green Infrastructure (G/I) program. Thus, these 8 municipalities are not billed for O&M costs related to the G/I program. This also applies to the MMSD's billing of capital costs.

Industrial Waste Pretreatment Program (IWPP) and Household Hazardous Waste Program (HHWP)

Separate from MMSD's user charge system, are MMSD's IWPP and HHWP programs. MMSD bills the collection and lab analysis costs for the IWPP directly to industrial customer. The technical support costs related to the IWPP are billed to the municipalities, where the industrial customer is located, and is included on the District's wholesale user charge bill to the municipality.

Annually MMSD bills municipalities participating in the HHWP. Currently, only the 18 member communities and the City of South Milwaukee participate in this program. The actual costs incurred in operating the HHWP are billed to each municipality on the basis of residential units.

Cost Recovery Procedures Manual

The following link will provide greater detail on MMSD's user charge system:

https://www.mmsd.com/application/files/4815/1301/9485/2017_CRPM.pdf

GLWA Wastewater Charge National Symposium

Metropolitan Council Environmental Services

Kyle Colvin, PE, Manager Engineering Programs

June 19, 2018

METROPOLITAN COUNCIL

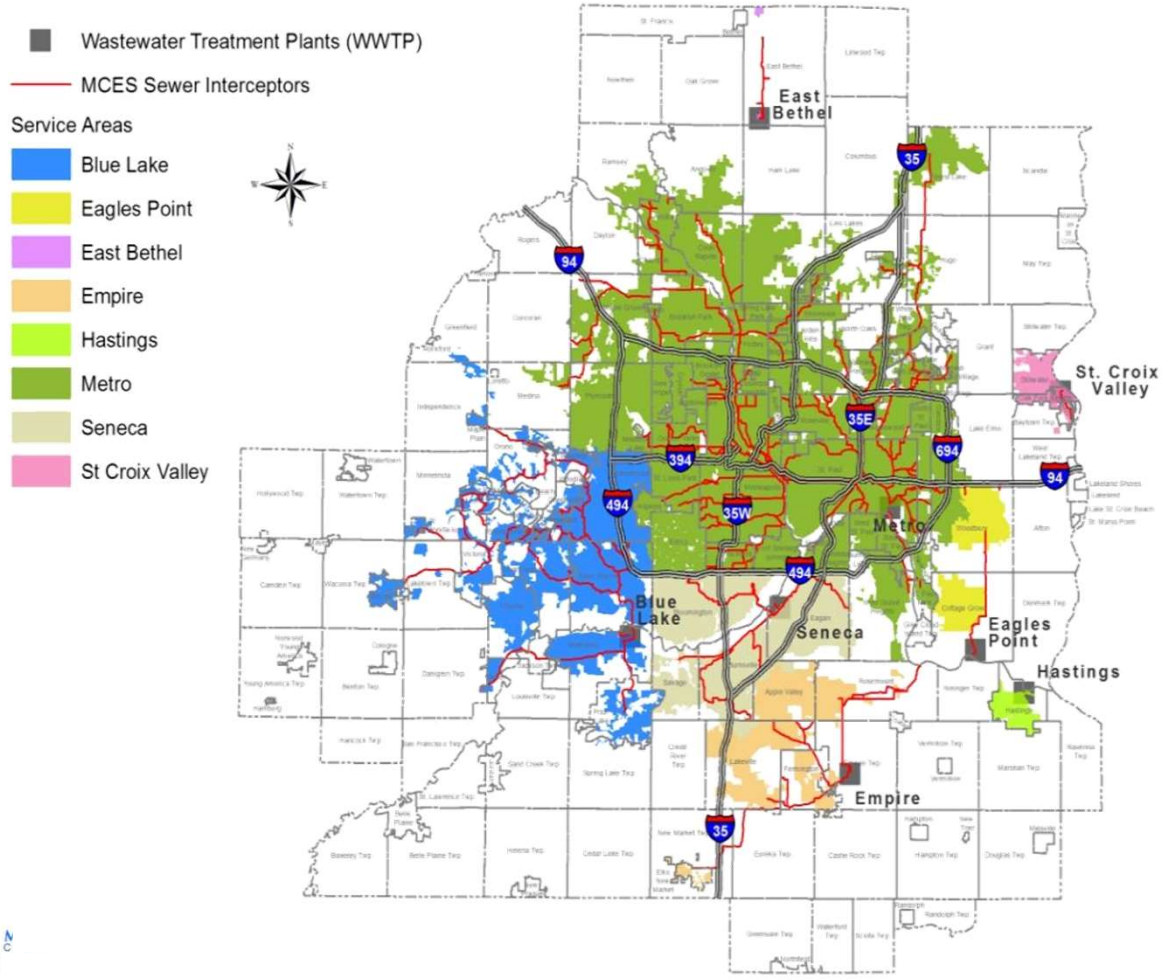
Metropolitan Council



The Council's mission is to foster efficient and economic growth for a prosperous region.

- Transit (Bus & Rail)
- Wastewater collection & treatment
- Parks
- Planning & development
  - ✓ Land Use
  - ✓ Housing
  - ✓ Transportation

Environmental Services Facilities



Protect Public Health

Manage assets effectively

Protect other infrastructure

WHO WE SERVE

7-county Twin Cities Metro Area
109 communities
3,000 square miles
2,600,000+ people

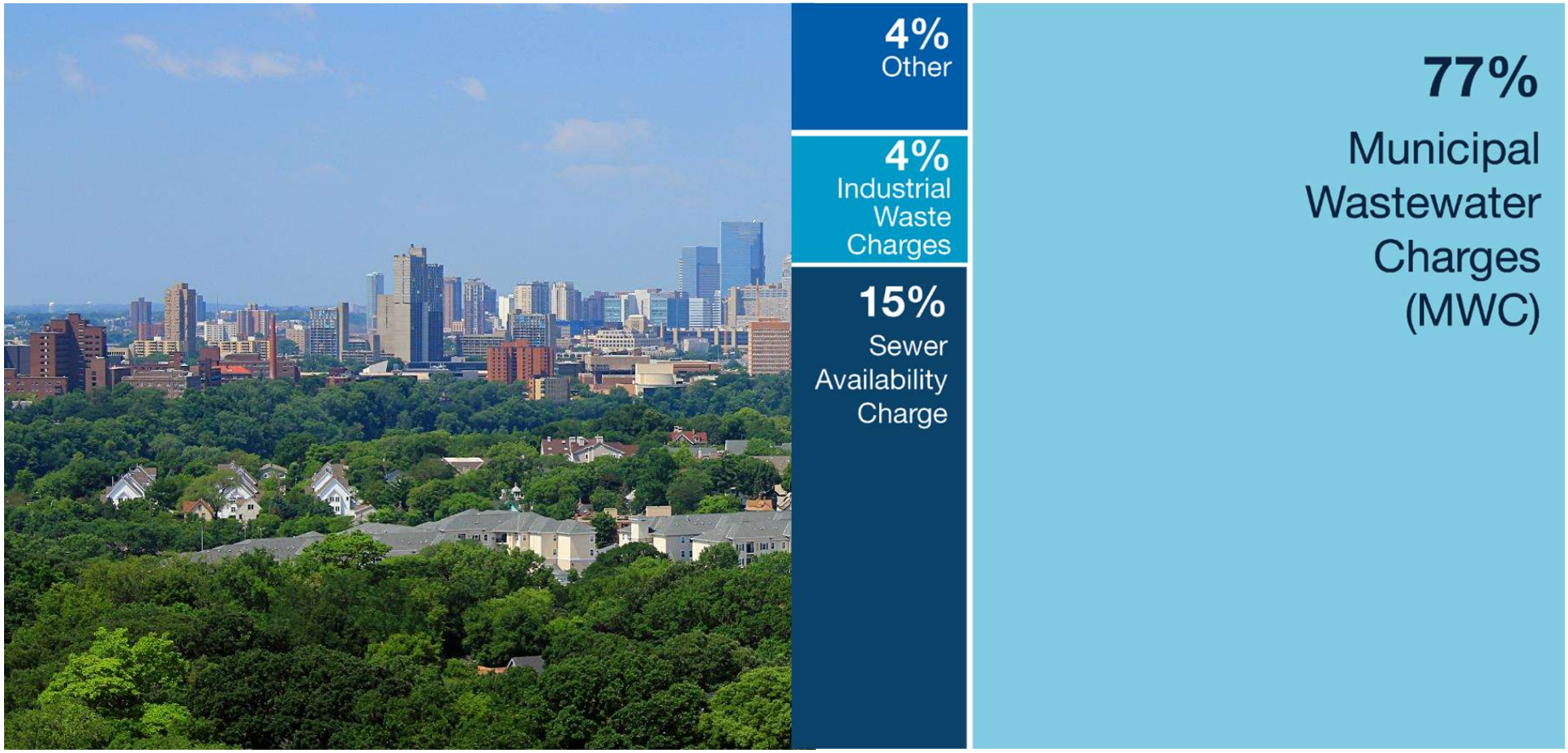
OUR FACILITIES

8 wastewater treatment plants
610 miles of interceptors
61 pump stations
222 flow meters
250 million gallons per day (avg)

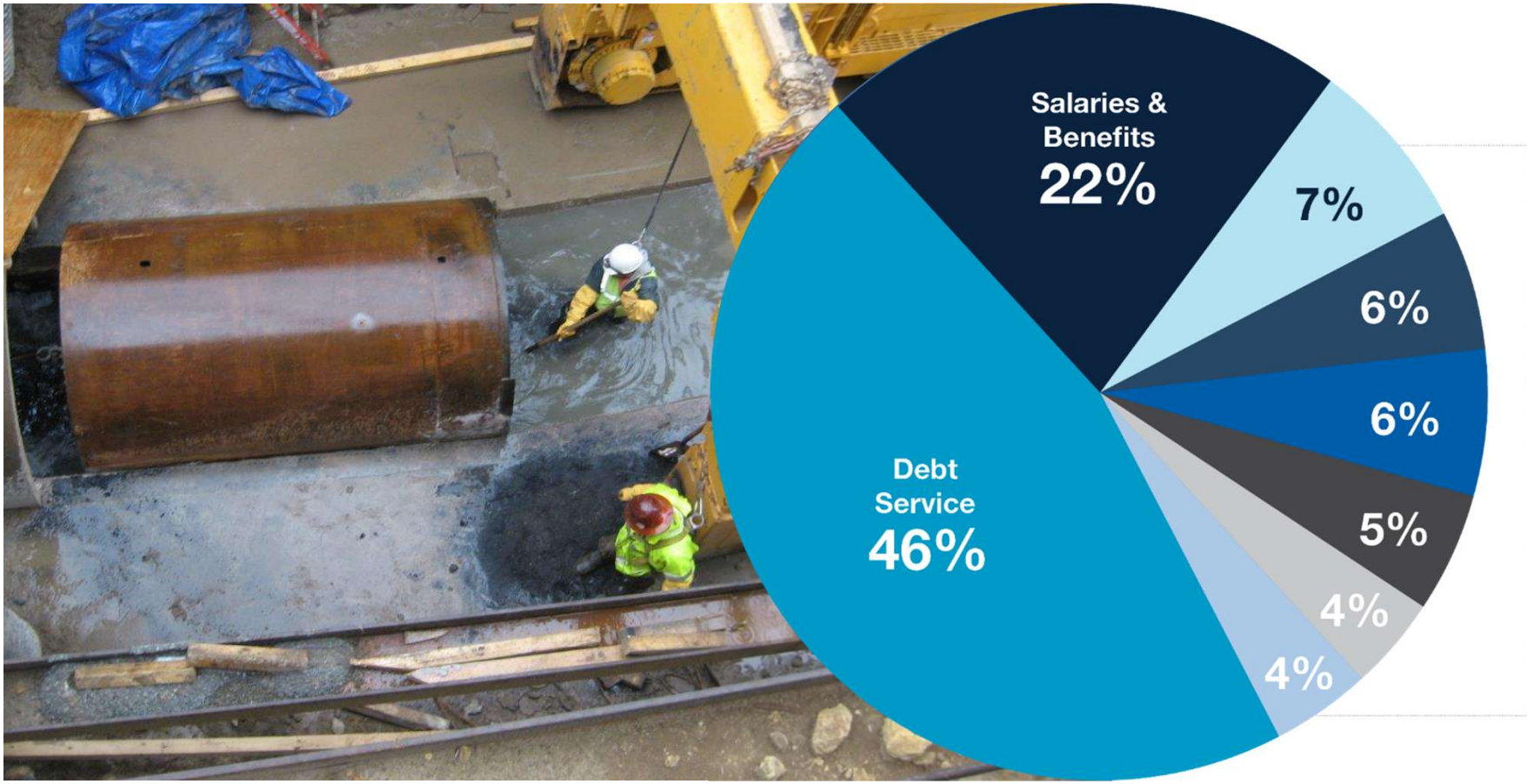
OUR ORGANIZATION

600+ employees
$7 billion in valued assets
$140 million per year capital program

2019 Revenue Sources by Category: $300M



2019 Revenue Uses by Category: $300M



Revenue Sources

Sewer Availability Charge (SAC)

MCES charges a one-time fee to local governments when a residence or business connects to the regional wastewater system for the first time or when the business increases capacity demand. Future users – Debt Service

Strength Charges

- Strength charges are collected via permits from 894 industries.
- This includes high-strength waste (pH, COD, BOD, metals, solids, etc.)
- Industries charged for added cost to treat. Customer communities **not** charged.

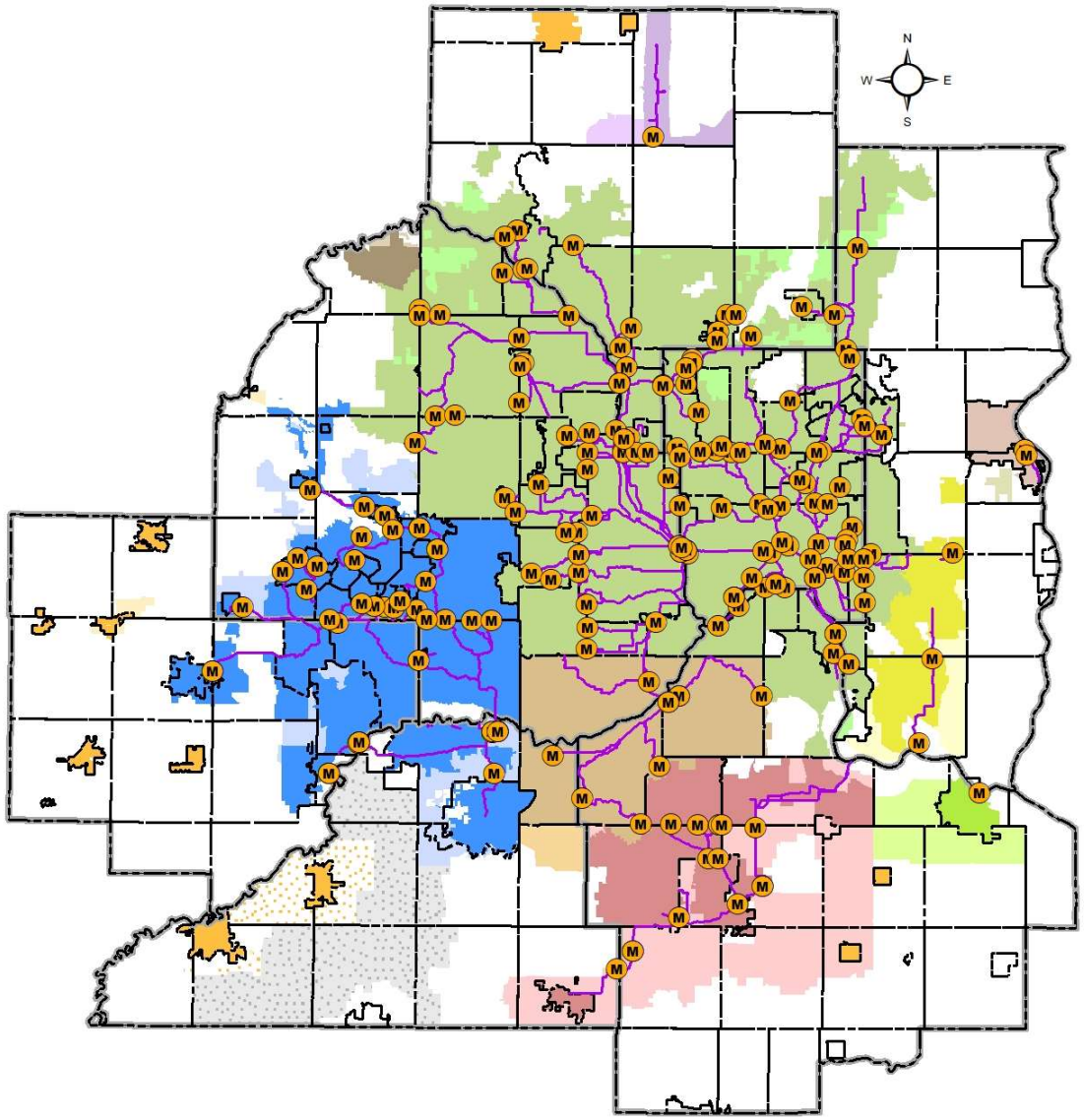
Municipal Wastewater Charge (MWC)

Municipal Wastewater Charges are based on the Regional Flow Volume, the Community Flow Volume, and the Regional MWC budget. Current users – operational & maintenance.

Metering System

Parshall flume with bubbler tube and stilling well on the right

Magnetic flow meter on 36 inch force main



Inter-Community Adjustments

- Intercommunity unmetered flow exchanges
- Some covered by agreements, adjusted locally
- Some require adjustment by Environmental Services
  - Water use
  - Connections
  - LS data
  - Temp flow monitoring

MWC Methodology Evolution: 1972-1998

Develop RWC budget needs

Estimate Community & Regional flow for upcoming year

Invoice communities based on estimate

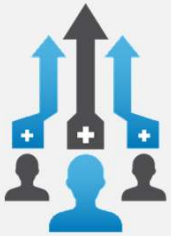
Measure flow (12 months)

Apply differences in estimate vs. payment the following year

Outcomes

- ⊕ Known annual costs
- ⊖ Attempting to predict weather year in advance
- ⊖ Variation in regional and community wastewater volumes
- ⊖ Unpredictable costs due to volume fluctuation and +/- balance carry-over
- ⊖ Variations in year-end RWC budget pool

MWC Methodology Evolution: 1999-2004



Develop RWC budget needs

Estimate Regional flow for upcoming year

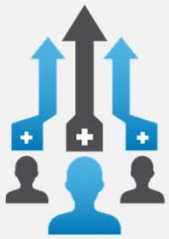
Measure flow quarterly, bill 6 months later (3rd Q flow – 1st Q bill)

Outcomes

- Attempting to predict weather year in advance
- Variation in regional and community wastewater volumes
- Variation in community wastewater charges
- Unpredictable costs. Different each quarter
- Variations in year-end RWC budget
- Unknown annual costs for communities

MWC Methodology Evolution: 2005-2015

Firm Flow Method (Proportional)



Develop RWC budget needs

Measure flow annually (3rd, 4th, 1st, and 2nd Q's)

Following year bill based on proportion of Community flow to Regional flow multiplied by RWC Budget

Outcomes

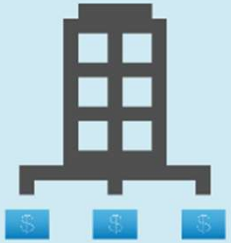
- ⊕ Billed on actual flow (Regional and community)
- ⊕ Predictable and consistent monthly costs.
- ⊕ Costs available to communities 4-5 months in advance
- ⊕ Balanced revenue with RWC budget
- ⊖ Variation in regional and community wastewater volumes/costs

Current MWC Methodology: 2016-present

A community's
percentage of the total system flow
Determines their share of the total RWC.

EXAMPLE

Current MWC Methodology: 2016-present



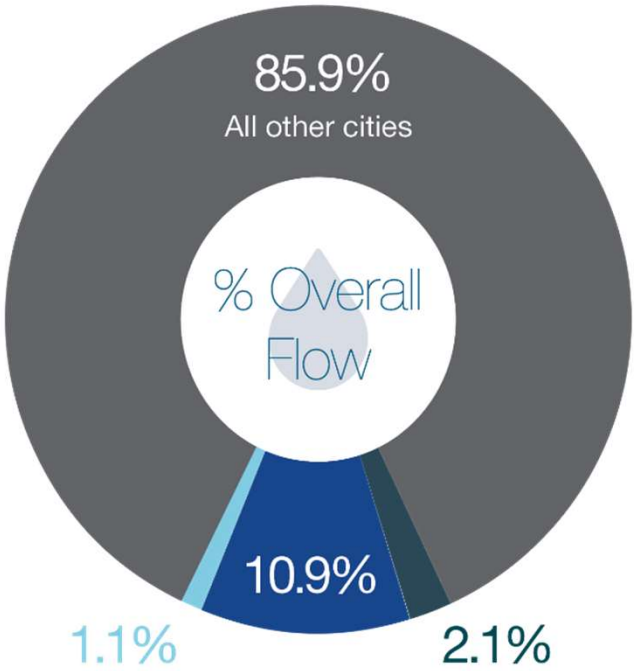
2019 REGIONAL WASTEWATER CHARGE (RWC)

$227,440,997

+3.5% from 2018

Current MWC Methodology: 2016-present

For a RWC budget of $227.4M, then...



CITY A

1.1% of flow → 1.1% RWC

$227.4M x 0.011 = $2.53M

CITY B

10.9% of flow → 10.9% RWC

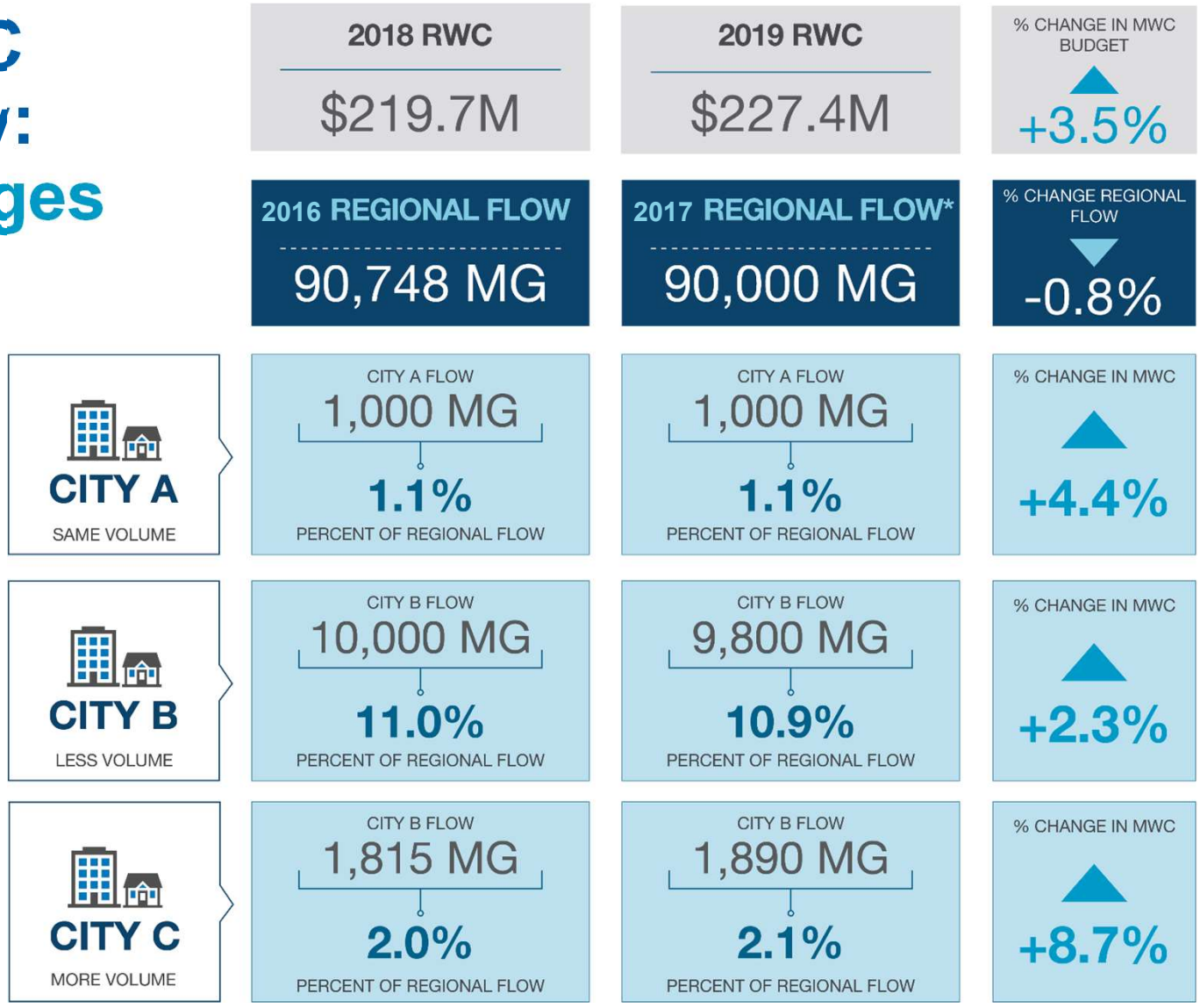
$227.4M x 0.109 = $24.76M

CITY C

2.1% of flow → 2.1% RWC

$227.4M x 0.021 = $4.78M

Current MWC Methodology: Flow & Charges Year to Year



3 primary factors impact a community's MWC:

- Regional flow volume
- Community flow volume
- Regional MWC budget

Charge Methodology: Benefits/Negatives

Benefits

- Billed on actual flow (Regional and Community)
- Balanced revenue with MWC budget
- Predictable and consistent monthly costs
- Costs available to communities 8-9 months in advance

Negatives

- Variation in regional and community wastewater volumes creates year to year variations

Summary

- Regional approach provides uniform cost methodology for every community connected to regional system.
- Community's cost is determined by their proportionate share of the regional wastewater treatment service costs.
- Challenging for some to shift cost allocation paradigm from rate based to proportional share concept.
- A community's proportionate share is in large part driven by their flow contribution which they have some control over. *Can be difficult to understand lower flow can still result in higher $.*
- Strength charges addressed at sources (Industries) versus community wide thus eliminating need for complicated MWC adjustments.
- Potential opportunity to address fluctuating year to year flow/costs by averaging rolling multiple year periods. *Disincentive for I/I mitigation work and flow from growth adjusted down by average*.

Kyle L. Colvin, PE
Manager, Engineering Programs
Metropolitan Council Environmental Services
Kyle.colvin@metc.state.mn.us
Ph. 651.602.1151

METROPOLITAN COUNCIL

QUESTIONS

ENVIRONMENTAL SERVICES OVERVIEW

MCES owns, operates and maintains **$7 billion** in wastewater system assets.

Who We Serve

- 7-county Twin Cities Metro Area
- 109 communities
- 2,600,000 people

Our organization

- 600+ employees
- $7 billion in assets (estimated replacement cost)
- $140 million/year capital program

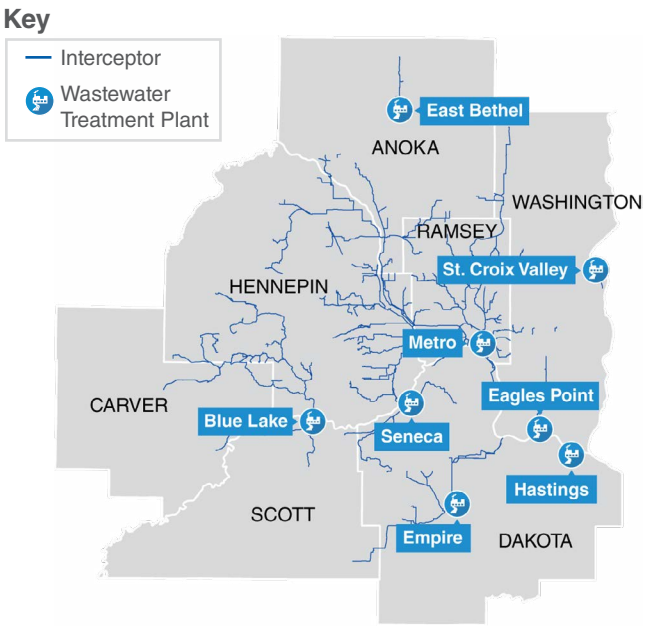
WASTEWATER INFRASTRUCTURE

WHY IS IT IMPORTANT TO KEEP OUR WASTEWATER SYSTEM IN GOOD REPAIR?

- Protect public health
- Protect the environment
- Protect other infrastructure

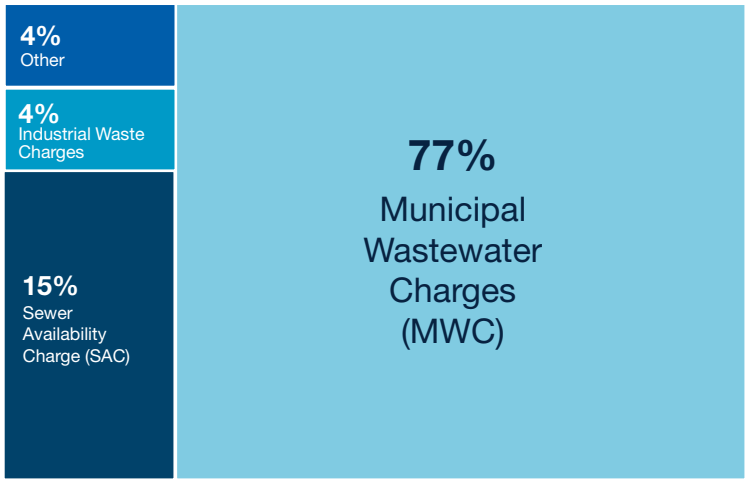
MCES WASTEWATER ASSETS

- 610 MILES OF SEWER PIPE
- 62 LIFT STATIONS
- 8 WASTEWATER TREATMENT PLANTS
- 213 METERS



2019 PROPOSED REVENUE SOURCES

$300M



Sewer Availability Charge (SAC) pays for reserve capacity

MCES charges a one-time fee to local governments when a residence or business connects to the regional wastewater system for the first time or when the business increases capacity demand.

3 Primary Factors Impact a Community's Municipal Wastewater Charge:

- Regional flow volume
- Community flow volume
- Regional MWC budget

2018-2022 Goals for Regional Wastewater Charge Increases

<4% per year

MCES 2019 Proposed Regional Rate Increases

Regional Wastewater Charge: 3.5%

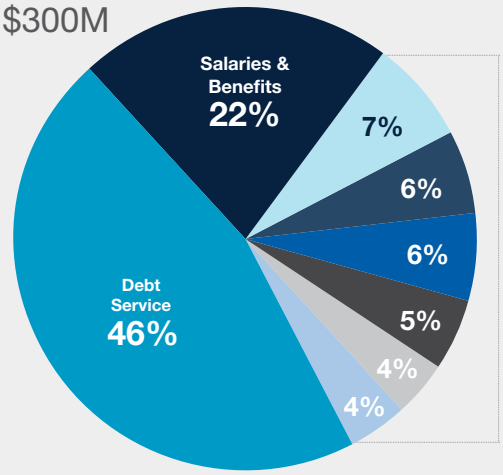
Sewer Availability Charge: No Increase

Industrial Strength Charge: 3.4%

Industrial Permit Fee: 3.5%

2019 PROPOSED REVENUE USES

$300M



- Consulting & Contractual (7%)
- Materials, Supplies & Chemicals (6%)
- Interdivisional Services (6%)
- Rent & Utilities (5%)
- PAYGO (4%)
- Other (4%)

KEY 2018 CAPITAL PROJECTS

TOTAL CAPITAL PROGRAM

$876M
2018-2023

- Minneapolis & St. Paul Interceptor System Improvements
- Blue Lake Interceptor System Improvements
- Solids Improvements at Metro, Seneca, and Empire WWTPs
- System Metering Improvements

Customer Service Goals

- Deliver predictable & justifiable rates
- Provide fair, equitable, and transparent cost allocation
- Invest in the system to insure well-maintained assets
- Protect the public health, safety and environment
- Be a good neighbor
- Provide planned capacity
- Engage customers

Budget Process Timeline

- Jan-Apr: Operating Budget Developed
- Mar/Apr: Industrial Workshops
- May: Environment Committee Direction for Public Meetings
- May/Jun: MCES Budget Workshops & Open House
- Jul: Environment Committee Review of Customer Input and 2019 Rate Adoption Recommendation
- Jul: Council Rate Adoption
- Aug: Council Preliminary Operating Budget Adoption
- Dec: Council Budget Approval

MCES also provides the following services for the region:

INDUSTRIAL WASTE

MCES regulates and monitors approximately 900 industrial dischargers into the sewer system to ensure compliance with local and federal regulations to protect public health and the environment.

WATER RESOURCES ASSESSMENT & PLANNING

MCES provides leadership and information to empower Council and local actions that ensure clean, healthy and sustainable water resources for the region. Services include planning & collaboration, monitoring, and assessment & technical assistance.

WATER SUPPLY PLANNING

The role of the Metropolitan Council in water supply planning is to collaboratively develop a regional plan, maintain a database of technical information, assist communities in developing their water supply plans, and identify approaches for emerging issues.

Water Supply Planning is funded by the Council property tax levy and Clean Water Legacy Funds.

Learn more

metrocouncil.org/Wastewater-Water.aspx

MCES Mission

Provide wastewater services and integrated planning to ensure sustainable water quality and water supply for the region.

METROPOLITAN COUNCIL

MCES REGIONAL MUNICIPAL WASTEWATER CHARGE

MCES protects public health and the environment

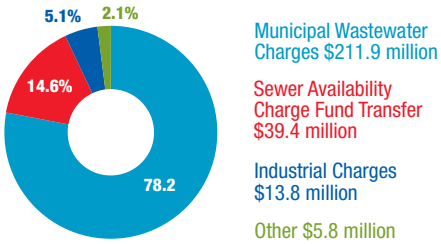
Metropolitan Council Environmental Services (MCES) operates the metropolitan disposal system (regional wastewater collection and treatment system), serving 109 communities and 2.6 million people in the seven-county metro area. The system includes:

- More than 600 miles of regional interceptor sewers that collect wastewater from more than 5,000 miles of locally owned sewers.
- 8 regional wastewater treatment plants.
- 61 lift stations to pump the wastewater as needed.
- 206 metering stations to measure wastewater flow. The flow data is combined with other data to determine each community's share of MCES's annual municipal wastewater charge.

What is the Municipal Wastewater Charge (MWC)?

This fee is billed to each community served by the metropolitan disposal system for its portion of regional wastewater operation costs. The MWC is approximately 78% of the total annual MCES operating budget. Approximately 15% of the budget comes from a transfer from the Sewer Availability Charge (SAC) Fund; about 7% comes from industrial waste charges and other revenue.

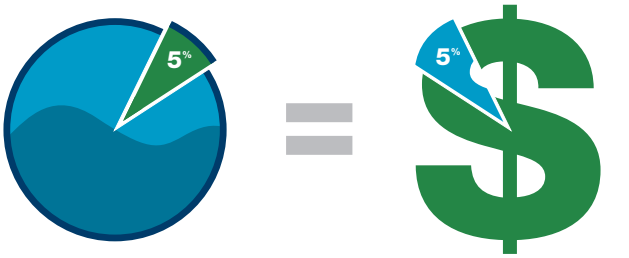
MCES Wastewater Revenue, 2017



How does MCES determine each community's share of the annual MWC?

After we develop our annual operating budget, we allocate to each of our 109 customer communities a portion of the total regional municipal wastewater charge based on the volume of wastewater that we collect and treat from each community. For the 2018 operating budget, we calculate each community's percentage of the region's total wastewater flow from the year 2016, and that percentage will determine the community's share of the 2018 MWC.

For example, if a community contributed 5% of the total regional wastewater flow in 2016, it will pay 5% of the 2018 total regional MWC. All communities pay for a percentage of the MWC that is equal to their percentage of the total regional wastewater flow. MCES collects this municipal wastewater charge through 12 equal monthly invoices.



Community Share of Total Regional Wastewater Flow

Community Share of MCES Municipal Wastewater Charge

What is influencing MCES's budget and annual increases?

Our biggest budget driver is debt service, which accounts for 46% of the budget. We continue to pay off bonds that financed wastewater system upgrades and capacity improvements over the last 20 years. Moving forward, we will invest approximately 90% of the current capital improvement program in asset preservation, primarily to address aging infrastructure in the wastewater collection system and the treatment plants.

METROPOLITAN COUNCIL

We take a comprehensive approach for evaluating the condition of the system, and a purposeful, rational plan over multiple years to rehabilitate or replace the most-deteriorated facilities first. This long-range planning is aimed at maintaining consistent and predictable wastewater rates, so communities can plan for their share of costs.

While debt service, labor, and operation and maintenance costs continue to put pressure on the budget, MCES remains a national model among large regional wastewater systems. Our rates are well below the national average for large agencies that treat more than 100 million gallons per day.

What impacts a community's total MWC from year to year?

- Overall MCES budget
- Community's total flow volume
- Total regional flow volume and community's relative share of the total

How do wet-weather cycles impact a community's MWC?

Communities with high inflow and infiltration (I/I) of clear water into sanitary sewers will have increased wastewater flows, which could result in paying a greater portion of the MWC. As communities act to reduce I/I, their share of the region's total wastewater flow will shift. Even a community that does not contribute excessive I/I and has stable flow from year to year may see a shift in its share of the MWC as other communities reduce their share of the overall flow.

What is the annual budget schedule?

January-April:	Operating budget is developed and rates and charges are proposed
Early May:	Metropolitan Council Environment Committee direction for public meetings
Late May/June:	Municipal customer forums
Early July:	Environment Committee review of customer input and recommended rates and charges
Late July:	Council approval of municipal wastewater charge and other rates
Late August:	Council adoption of preliminary operating budget
December:	Council adoption of final budget and levies

For more information about the MCES budgeting process, contact Ned Smith, Finance & Revenue Director, at *Ned.Smith@metc.state.mn.us*, or visit the following links:

2017 Municipal Wastewater Charges (by community): *https://metrocouncil.org/Wastewater-Water/Funding-Finance/Finance-Pubs/2017-Municipal-Wastewater-Charges.aspx*

Wastewater Finance Facts: *https://metrocouncil.org/About-Us/Facts/Wastewater-WaterF/Wastewater-Finance-Facts.aspx*

MCES Funding & Finance Overview: *https://metrocouncil.org/Wastewater-Water/Funding-Finance.aspx*

Our wastewater collection and treatment rates are well below the national average for large agencies that treat more than 100 million gallons per day.

Metropolitan Council
390 Robert Street North
Saint Paul, MN 55101
Main: 651.602.1000
TTY: 651.291.0904
Public Information: 651.602.1500
public.info@metc.state.mn.us

August 17, 2016

To: **City Finance & Other Interested Officials**

Re: **2017 Municipal Wastewater Charges**

Attachment: Metropolitan Disposal System Flows and Charges

The Metropolitan Council adopted a Metropolitan Wastewater Charge for 2017 of $211.9 million. This is an increase of 5.4% from the 2016 charge of $201.0 million.

MCES continues to utilize the "firm flow" allocation method, which uses the most recent 12-month flow values to allocate the $211.9 million of total metropolitan charges to customer communities. However, beginning this year we will use the prior calendar year (2015) instead of a July 1-June 30 flow period to allocate sewer charges.

Your municipality's percentage of the overall system flow during that period is the percentage of the Metropolitan Wastewater Charge that will be charged to your community in 2017. We have included the calculation on the attached table and will bill your municipality in equal monthly amounts in 2017.

MCES community rate survey is available here:

http://metrocouncil.org/Wastewater-Water/Funding-Finance/Finance-Pubs/2016-Survey-of-Municipal-Residential-Wastewater-Ra.aspx

Additional information regarding our rates and billings is available here:
http://metrocouncil.org/Council-Meetings/Committees/Environment-Committee/2016/July-12,-2016/2016-141-Rates-Charges-Review_Recommendation.aspx

Note that the numbers in the table below DO NOT include any I/I Surcharges. Those communities that have a preliminary 2017 I/I obligation have received a separate letter from Bryce Pickart.

As always, MCES welcomes your comments, questions and suggestions on our services. Feel free to contact me any time at (651) 602-1162 or e-mail me at ned.smith@metc.state.mn.us. Please contact Kyle Colvin with questions about your community's wastewater flows at (651) 602-1151 or kyle.colvin@metc.state.mn.us.

Sincerely,

Ned Smith
Director, MCES Finance

2017 Metropolitan Disposal System Flows and Charges

2017 Metropolitan Wastewater Charge to be allocated: **$211,941,538**

Community	Flow (Mill. Gall.)	% of Total	2017 Annual Charge	2017 Monthly Charge
ANDOVER	469.40	0.550304%	$1,166,322.05	$97,193.50
ANOKA	573.70	0.672580%	$1,425,477.12	$118,789.76
APPLE VALLEY	1,167.70	1.368959%	$2,901,393.81	$241,782.82
ARDEN HILLS	297.99	0.349350%	$740,418.21	$61,701.52
BAYPORT	177.00	0.207507%	$439,793.36	$36,649.45
BIRCHWOOD	20.65	0.024209%	$51,309.23	$4,275.77
BLAINE	1,475.54	1.729857%	$3,666,286.40	$305,523.87
BLOOMINGTON	2,890.93	3.389198%	$7,183,117.59	$598,593.13
BROOKLYN CENTER	933.76	1.094699%	$2,320,121.17	$193,343.43
BROOKLYN PARK	1,982.78	2.324523%	$4,926,629.81	$410,552.48
BURNSVILLE	1,872.17	2.194849%	$4,651,796.23	$387,649.69
CARVER	90.10	0.105629%	$223,872.21	$18,656.02
CENTERVILLE	92.19	0.108079%	$229,065.25	$19,088.77
CHAMPLIN	538.90	0.631782%	$1,339,009.27	$111,584.11
CHANHASSEN	620.15	0.727036%	$1,540,891.82	$128,407.65
CHASKA	878.10	1.029445%	$2,181,822.31	$181,818.53
CIRCLE PINES	119.30	0.139862%	$296,425.69	$24,702.14
COLUMBIA HEIGHTS	423.92	0.496985%	$1,053,317.52	$87,776.46
COLUMBUS	8.62	0.010106%	$21,418.19	$1,784.85
COON RAPIDS	1,813.00	2.125480%	$4,504,776.04	$375,398.00
CORCORAN	2.14	0.002509%	$5,317.28	$443.11
COTTAGE GROVE	742.80	0.870826%	$1,845,641.28	$153,803.44
CRYSTAL	565.20	0.662615%	$1,404,357.10	$117,029.76
DAYTON	60.70	0.071162%	$150,821.79	$12,568.48
DEEPHAVEN	161.58	0.189429%	$401,479.16	$33,456.60
EAGAN	2,092.06	2.452638%	$5,198,158.72	$433,179.89
EAST BETHEL	9.97	0.011688%	$24,772.54	$2,064.38
EDEN PRAIRIE	1,608.59	1.885839%	$3,996,876.83	$333,073.07
EDINA	2,108.02	2.471349%	$5,237,814.67	$436,484.56
ELKO NEW MARKET	100.60	0.117939%	$249,961.65	$20,830.14
EMPIRE TOWNSHIP	58.14	0.068161%	$144,460.94	$12,038.41
EXCELSIOR	71.47	0.083788%	$177,582.10	$14,798.51
FALCON HEIGHTS	205.01	0.240345%	$509,390.04	$42,449.17
FARMINGTON	538.58	0.631407%	$1,338,214.16	$111,517.85
FOREST LAKE CITY	556.98	0.652979%	$1,383,932.80	$115,327.73
FRIDLEY*	1,662.58	1.949135%	$4,131,026.23	$344,252.19
GEM LAKE	11.19	0.013119%	$27,803.89	$2,316.99
GOLDEN VALLEY	782.01	0.916794%	$1,943,066.69	$161,922.22
GREENFIELD	2.57	0.003013%	$6,385.70	$532.14

Community	Flow (Mill. Gall.)	% of Total	2017 Annual Charge	2017 Monthly Charge
GREENWOOD	12.52	0.014678%	$31,108.55	$2,592.38
HASTINGS	519.70	0.609273%	$1,291,302.87	$107,608.57
HILLTOP	29.13	0.034151%	$72,379.55	$6,031.63
HOPKINS	598.49	0.701643%	$1,487,073.03	$123,922.75
HUGO	220.20	0.258153%	$547,132.75	$45,594.40
INDEPENDENCE	14.58	0.017093%	$36,227.05	$3,018.92
INVER GROVE HEIGHTS	758.50	0.889232%	$1,884,651.20	$157,054.27
LAKETOWN TOWNSHIP	15.94	0.018687%	$39,606.25	$3,300.52
LAKEVILLE	1,412.47	1.655917%	$3,509,575.85	$292,464.65
LANDFALL	19.96	0.023400%	$49,594.78	$4,132.90
LAUDERDALE	55.19	0.064702%	$137,131.05	$11,427.59
LAKE ELMO	17.99	0.021091%	$44,699.90	$3,724.99
LEXINGTON	35.36	0.041454%	$87,859.28	$7,321.61
LILYDALE	25.64	0.030059%	$63,707.92	$5,308.99
LINO LAKES	379.51	0.444921%	$942,971.62	$78,580.97
LITTLE CANADA	331.95	0.389163%	$824,798.90	$68,733.24
LONG LAKE	86.88	0.101854%	$215,871.45	$17,989.29
MAHTOMEDI	163.37	0.191528%	$405,926.79	$33,827.23
MAPLE GROVE	1,869.62	2.191859%	$4,645,460.22	$387,121.69
MAPLE PLAIN	80.20	0.094023%	$199,273.60	$16,606.13
MAPLEWOOD	1,269.56	1.488376%	$3,154,486.19	$262,873.85
MEDICINE LAKE	9.49	0.011126%	$23,579.88	$1,964.99
MEDINA	122.67	0.143813%	$304,799.16	$25,399.93
MENDOTA	7.50	0.008793%	$18,635.31	$1,552.94
MENDOTA HEIGHTS	491.96	0.576752%	$1,222,377.07	$101,864.76
MINNEAPOLIS	16,374.75	19.197028%	$40,686,476.26	$3,390,539.69
MINNETONKA	1,694.96	1.987096%	$4,211,481.08	$350,956.76
MINNETONKA BEACH	19.70	0.023095%	$48,948.75	$4,079.06
MINNETRISTA	110.66	0.129733%	$274,957.81	$22,913.15
MOUND	292.92	0.343406%	$727,820.74	$60,651.73
MOUNDS VIEW	367.10	0.430372%	$912,136.40	$76,011.37
NEW BRIGHTON	604.41	0.708583%	$1,501,782.51	$125,148.54
NEW HOPE	609.90	0.715020%	$1,515,423.56	$126,285.30
NEWPORT	88.78	0.104082%	$220,592.40	$18,382.70
NORTH OAKS	25.48	0.029872%	$63,310.37	$5,275.86
NORTH ST PAUL	369.06	0.432670%	$917,006.42	$76,417.20
OAKDALE	913.77	1.071263%	$2,270,451.85	$189,204.32
OAK PARK HEIGHTS	200.80	0.235409%	$498,929.41	$41,577.45
ORONO	173.84	0.203802%	$431,941.68	$35,995.14
OSSEO	66.30	0.077727%	$164,736.16	$13,728.01
PLYMOUTH	2,278.56	2.671282%	$5,661,556.81	$471,796.40
PRIOR LAKE	559.60	0.656050%	$1,390,442.73	$115,870.23
RAMSEY	304.10	0.356513%	$755,599.78	$62,966.65

Community	Flow (Mill. Gall.)	% of Total	2017 Annual Charge	2017 Monthly Charge
RICHFIELD	1,109.08	1.300236%	$2,755,740.22	$229,645.02
ROBBINSDALE	347.89	0.407851%	$864,405.15	$72,033.76
ROSEMOUNT	516.98	0.606084%	$1,284,544.47	$107,045.37
ROSEVILLE	1,133.42	1.328771%	$2,816,218.01	$234,684.83
ST ANTHONY	258.94	0.303570%	$643,390.35	$53,615.86
ST BONIFACIUS	91.18	0.106895%	$226,555.70	$18,879.64
ST LOUIS PARK	1,715.94	2.011692%	$4,263,610.26	$355,300.85
ST PAUL	8,816.57	10.336154%	$21,906,604.13	$1,825,550.34
ST PAUL PARK	112.00	0.131304%	$278,287.32	$23,190.61
SAVAGE	742.10	0.870005%	$1,843,901.99	$153,658.50
SHAKOPEE	1,037.60	1.216436%	$2,578,133.27	$214,844.44
SHOREVIEW	762.80	0.894273%	$1,895,335.45	$157,944.62
SHOREWOOD	277.98	0.325891%	$690,699.20	$57,558.27
SOUTH ST PAUL	1,104.00	1.294280%	$2,743,117.90	$228,593.16
SPRING LAKE PARK	200.88	0.235503%	$499,128.19	$41,594.02
SPRING PARK	82.70	0.096954%	$205,485.37	$17,123.78
STILLWATER	687.20	0.805643%	$1,707,491.50	$142,290.96
TONKA BAY	73.70	0.086403%	$183,123.00	$15,260.25
VADNAIS HEIGHTS	448.69	0.526024%	$1,114,863.74	$92,905.31
VICTORIA	202.74	0.237683%	$503,749.75	$41,979.15
WACONIA	344.50	0.403876%	$855,981.99	$71,331.83
WAYZATA	206.74	0.242373%	$513,688.58	$42,807.38
WEST ST PAUL	747.50	0.876336%	$1,857,319.41	$154,776.62
WHITE BEAR LAKE	836.71	0.980922%	$2,078,980.23	$173,248.35
WHITE BEAR TOWNSHIP	337.88	0.396115%	$839,533.22	$69,961.10
WILLERNIE	19.12	0.022415%	$47,507.62	$3,958.97
WOODBURY	1,694.36	1.986392%	$4,209,990.25	$350,832.52
Total	**85,298.36**	**100.000000%**	**$211,941,538.00**	**$17,661,794.83**

*Fridley's annual charge will be reduced to $4,117,087.01 ($13,939.22 less than shown above) due to an unmetered flow correction. This adjustment will not affect any other community charges.

METRO WASTEWATER RECLAMATION DISTRICT

Annual Charges for Service

June 19, 2018

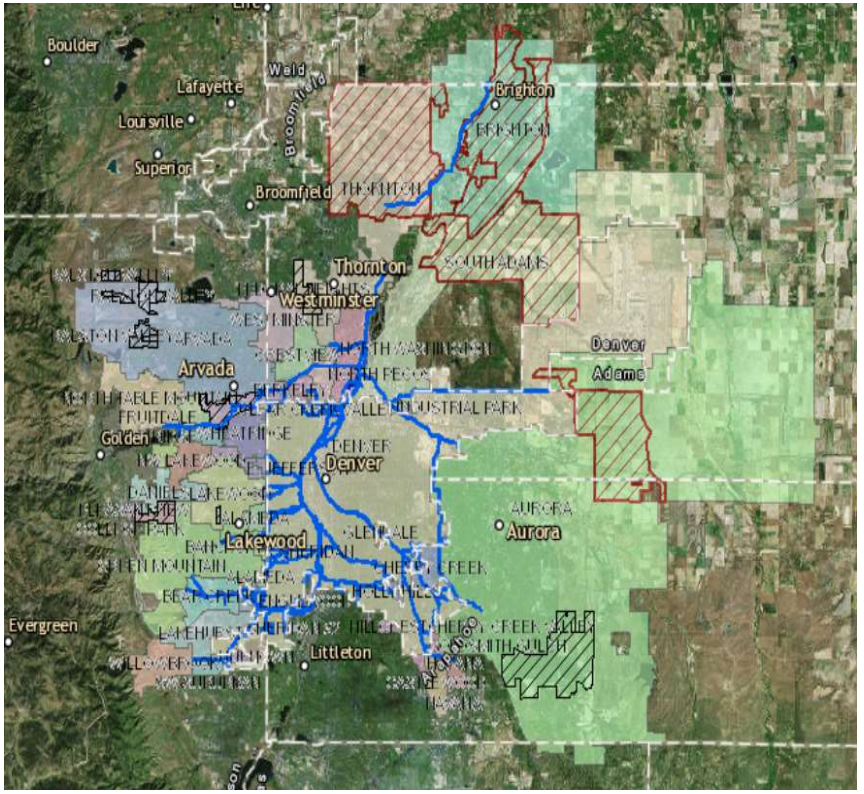
Aleah Menefee
Governmental/Public Utility Programs Administrator

KEY MESSAGES

- METRO DISTRICT OVERVIEW
- ANNUAL CHARGES FOR SERVICE METHODOLOGY
- REASONS FOR METHODOLOGY
- LIMITATIONS
- FUTURE CONSIDERATIONS

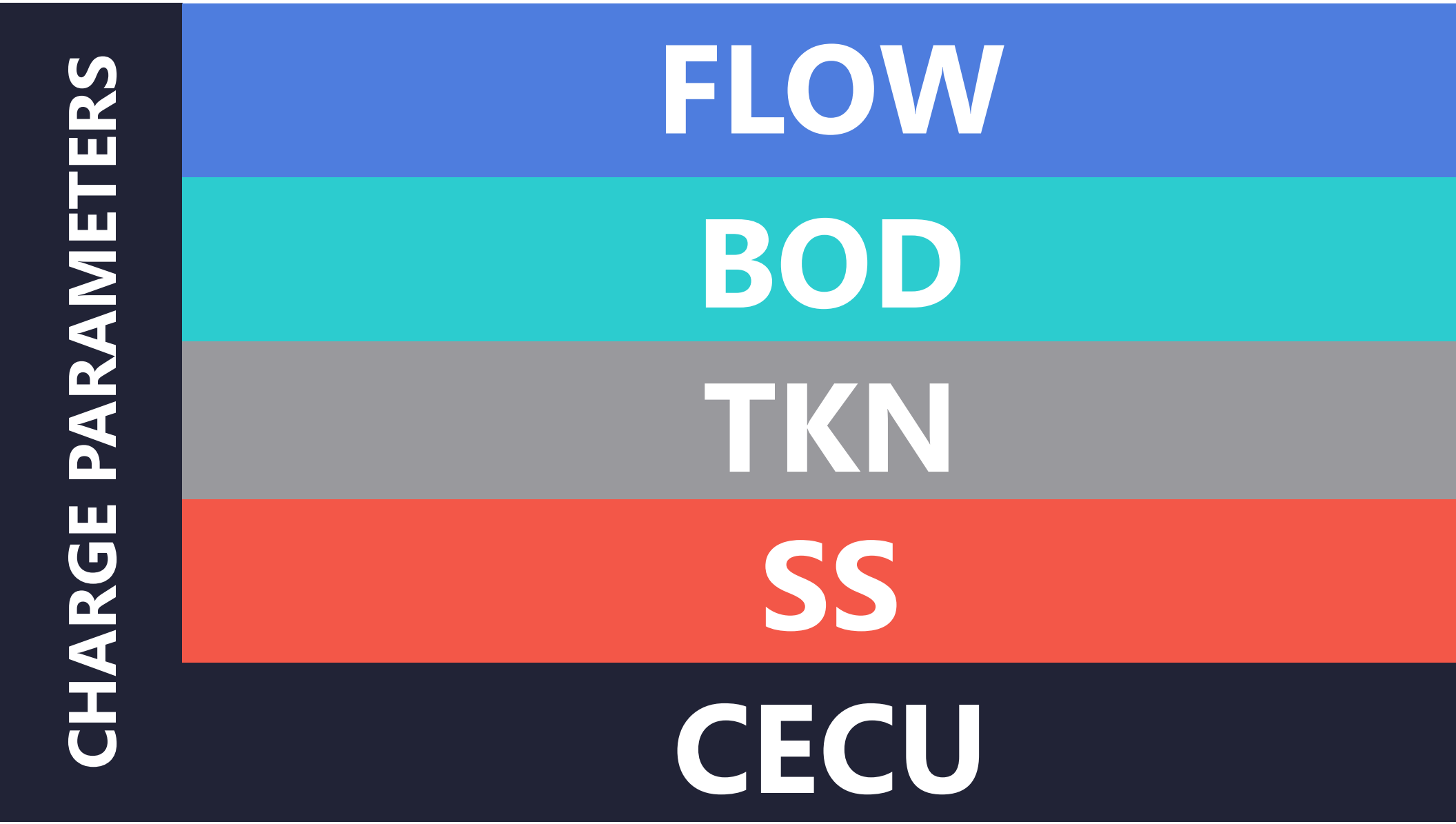
METRO DISTRICT AT A GLANCE

- **CREATED IN 1961**
- **SERVES MORE THAN 1.8 MILLION PEOPLE IN THE DENVER METRO AREA**
- **715 SQUARE MILES**
- **50 WHOLESALE CUSTOMERS**



ANNUAL CHARGES FOR SERVICE METHODOLOGY

EVERY JUNE THE METRO DISTRICT BOARD OF DIRECTORS APPROVES THE TOTAL AMOUNT OF ANNUAL CHARGES THAT MUST BE COLLECTED


CHARGE PARAMETERS
FLOW
BOD
TKN
SS
CECU

2018 PARAMETER ALLOCATIONS

Parameter	Percentage	Dollar Amount	Unit Charges
Flow	34.36	$44,512,164	$880.93/MG
BOD	23.15	$29,990,006	$558.19/Ton
TKN	32.65	$42,296,917	$772.78/Ton
SS	8.71	$11,283,496	$1,176.78/Ton
CECU	1.13	$ 1,463,877	$27,004/CECU
TOTAL	100	$129,546,460	

2018 SAMPLE ANNUAL CHARGE

Parameter	Estimates	Unit Charge	Annual Charge
Flow	444 MG	$880.93/MG	$391,131.01
BOD	352 Tons	$558.19/Ton	$196,481.63
TKN	322 Tons	$772.78/Ton	$245,835.77
SS	42 Tons	$1,176.78/Ton	$49,424.55
CECU	.83	$27,0044/CECU	$22,413.14
TOTAL			**$908,286.09**

THREE YEAR PROCESS

THREE YEAR PROCESS

2018 ANNUAL CHARGES FOR SERVICE PAYMENTS

CITY OF ARVADA

Payment Calculation

Certified Estimate of 2018 Charges
- Decrease in 2017 Revised Estimate from Certified Estimate
- Decrease in 2016 Final Adjustment from Revised Estimate

* 2018 Annual Charges for Service Payment

2018

	August 2017 Certified Estimate MG/ Tons	Total Charge
Flow	3,814	$ 3,360,256
BOD	2,894	1,615,565
SS	3,181	2,457,833
TKN	599	704,912
Customer Equivalent Units	2.54	68,590
Total		$ 8,207,166

2017

	August 2016 Certified Estimate MG/ Tons	Total Charge	August 2017 Revised Estimate MG/ Tons	Total Charge	
Flow	3,973	$ 3,371,042	3,814	$ 3,409,749	Less Decrease in
BOD	3,145	1,617,724	2,894	1,550,863	2017 Revised Estimate
SS	3,324	2,474,066	3,181	2,391,948	from
TKN	623	750,360	599	716,046	2017 Certified Estimate
Customer Equivalent Units	2.54	64,344	2.54	63,266	
Total		$ 8,277,536		$ 8,131,872	$ (145,664)

2016

	August 2016 Revised Estimate MG/ Tons	Total Charge	June 2017 Final Adjustment MG/ Tons	Total Charge	
Flow	4,173	$ 3,329,199	3,814.46	$ 3,242,710	Less Decrease in
BOD	3,025	1,567,286	2,894.31	1,557,493	2016 Revised Estimate
SS	3,359	2,463,114	3,180.50	2,360,211	from
TKN	621	762,099	599.02	730,077	2016 Certified Estimate
Customer Equivalent Units	2.54	63,083	2.54	63,046	
Total		$ 8,184,781		$ 7,953,537	$ (231,244)

2018 Annual Charges for Service Payment * **$ 7,830,248**

METERING AND SAMPLING

Category	Flow	Flow Monitoring	Sampling	CECU
A	>100 mgy	Continuous	11-13 weeks/yr	1.00
B	>100 mgy	Continuous	5-7 weeks/yr	.77
C	50-100 mgy OR <50 but high loads	5-7 weeks/yr	5-7 weeks/yr	.52
D1	25-50 mgy Variable flow	Continuous	Loadings Est.	.50
D2	25-50 mgy Stable flow	4 weeks/yr	Loadings Est.	.17
E	< 25 mgy	Flow Estimated	Loadings Est.	.03 for each 25mgy or part thereof

SAMPLING REPORT

METRO WASTEWATER RECLAMATION DISTRICT

PRELIMINARY DETERMINATION OF FLOWS AND LOADINGS

CONNECTION : Arvada - 54th Avenue
PERIOD SAMPLED: 11/02/2017 **THROUGH** 11/08/2017
REPRESENTATIVE PERIOD: 10/11/2017 **THROUGH** 12/31/2017
NUMBER OF DAYS: 82

RECORD OF MEASUREMENTS AND ANALYSES DURING THE PERIOD SAMPLED:

DATE	BOD MG/L	SS MG/L	TKN MG/L	FLOW MGD	BOD LBS/DAY	SS LBS/DAY	TKN LBS/DAY
11/02/2017	187	223	39.0	1.42	2215	2641	462
11/03/2017	234	201	40.4	1.39	2713	2330	468
11/04/2017	234	208	38.4	1.39	2713	2411	445
11/05/2017	229	197	39.4	1.43	2731	2349	470
11/06/2017	119	218	39.7	1.36	1350	2473	450
11/07/2017	211	216	38.1	1.35	2376	2432	429
11/08/2017	204	249	40.2	1.37	2331	2845	459
TOTAL	-	-	-	9.71	16429	17481	3183
AVERAGE	202	215	39.2	1.39	2347	2497	455

FLOWS AND LOADINGS FOR THE REPRESENTATIVE PERIOD:

AVERAGE DAILY FLOW:	1.36	MG/DAY	TOTAL FLOW:	111.52	MG
AVERAGE BOD:	2296	LBS/DAY	TOTAL BOD:	94.14	TONS
AVERAGE SS:	2443	LBS/DAY	TOTAL SS:	100.16	TONS
AVERAGE TKN:	445	LBS/DAY	TOTAL TKN:	18.24	TONS

METHODOLOGY LIMITATIONS

- DENVER METRO AREA IS GROWING RAPIDLY AND IN SOME CASES IT CAN BE DIFFICULT TO PREDICT FLOW AND LOADINGS
- TOTAL ANNUAL CHARGES FOR SERVICE INCREASE BETWEEN 2-3 PERCENT PER YEAR, BUT SOME CUSTOMERS MIGHT HAVE LARGER FLUCTUATIONS

FUTURE CONSIDERATIONS

- METER AUDIT WITH THE RESULT OF GREATER TRANSPARENCY
- ADDITIONAL CHARGE PARAMETERS
- ENHANCED COMMUNICATION

CONTACT INFORMATION

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303.286.3467

Metro Wastewater Reclamation District

Profile

Metro Wastewater Reclamation District (Metro District or District) is a wholesale wastewater utility located near Denver, Colorado. Created in 1961, the Metro District currently encompasses about 715 square miles and serves more than 1.8 million people.

Map of MWRD Service Area

System Overview

The District provides wholesale wastewater services to 60 communities and two corporate connectors, via 50 service contracts.

- 2 treatment plants that process more than 134 million gallons per day of sanitary sewage
    - Robert W. Hite Treatment Facility commissioned in 1966 with a hydraulic capacity of 220 million gallons per day
    - Northern Treatment Plant opened in 2016 with a hydraulic capacity of 29 million gallons of wastewater per day
- Separated system
- 3 pump stations
- 234 miles of interceptors, with the oldest interceptor dating back to 1890
- Generate approximately 84 dry tons of biosolids per day
    - METROGRO Farm is a 52,000-acre farm used for the application of biosolids
    - In 2017, biosolids were applied to 57 private farm sites in eastern Colorado

Metro Wastewater Reclamation District

Annual Charges for Service Methodology

Annual Charges for Service are governed by Colorado State Statutes, the Metro District Rules and Regulations, and the Service Contract. The District is contracted with 50 wholesale customers/connectors, that serve 62 entities.

The District applies the same methodology for calculating Annual Charges for Service to all 50 customers. Each customer is charged based on five parameters:

- **Flow** How much wastewater comes into the Treatment Facility from any source
- **BOD** (Biochemical Oxygen Demand) = Amount of oxygen used up by the bacteria and other microorganisms as they "eat" the organic pollutants in the wastewater
- **SS** (Suspended Solids) = Solids that either float on the surface of, or are in suspension in wastewater and which are largely removable by settling
- **TKN** (Total Kjeldahl Nitrogen) The amount of ammonia nitrogen plus organic nitrogen
- **CECU** (Customer Equivalent Connection Units) A charge based upon the amount of metering and sampling necessary for a connection.

Each August, the Board adopts the percentage allocations for the next year's Annual Charges.

Once the dollar amount for each parameter is known, the dollar amount is divided by the total gallons of flow, tons of BOD, TKN, and SS, and CECUs the District anticipates to receive. The result is a unit charge for each parameter.

Parameter	**Percentage**	**Dollar Amount**	**Unit Charges**
Flow	33.69	$44,524,506	$908.57/MG
BOD	23.54	$31,105,045	$576.48/Ton
TKN	32.99	$43,587,108	$806.52/Ton
SS	6.3	$11,406,563	$1,173.17/Ton
CECU	1.15	$1,514,167	$28,016/CECU
TOTAL	**100**	**$132,137,389**	

Metro Wastewater Reclamation District

Once the unit charges are established, staff calculates the Annual Charges for each parameter using a Connector's individual estimates for Flow, BOD, TKN, SS, and CECU. An example of an annual charge calculation is shown below.

ABC Water and Sanitation District 2019 Estimated Annual Charges for Service

Parameter	ABC W&S Dist. Estimates	Unit Charge	Annual Charge
Flow	444 MG	$908.57/MG	$403,405.08
BOD	352 Tons	$576.48/Ton	$202,920.96
TKN	322 Tons	$806.52/Ton	$259,699.44
SS	42 Tons	$1,173.17/Ton	$49,273.14
CECU	.83	$28,016/CECU	$23,253.28
TOTAL			**$938,551.90**

The District uses a 3-year process to determine Annual Charges for Service. It includes a Certified Estimate, a Revised Estimate and a Final Adjustment. The purpose for the 3 year process is to reduce the volatility of the payments.

Certified Estimate

- Based on projections of connector flows and loadings
- Adopted each August for following year

Revised Estimate ("Mid-Year Revision")

- Based on mid-year projections of connector flows and loadings
- Adopted each August for current year

Final Adjustment

- Based on actual connector flows and loadings
- Adopted no later than last day of June each year for the previous year

King County Wastewater Treatment Division
Rate Setting and Revenue Requirement Distribution

Tom Lienesch, Economist
King County Wastewater Treatment Division (WTD)

June 19, 2018

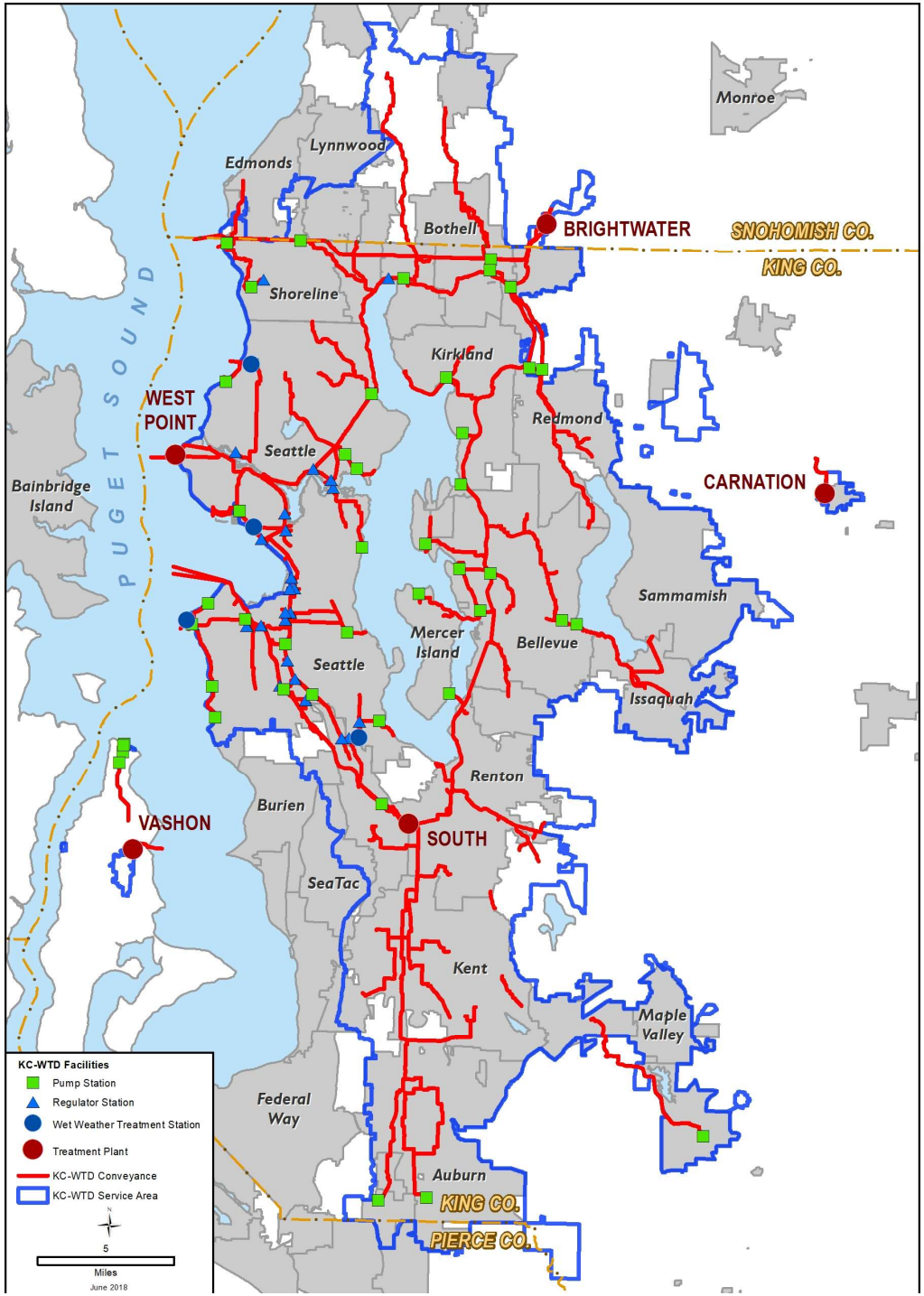
King County

Today's Presentation

- Introduction and Overview
- King County's Monthly Sewer Rate
- King County's Capacity Charge

Our Service Area

- 424 square miles
- 1.7 million people
- Collects and treats wastewater from 34 local agencies including 30 cities.
- Largest are Seattle (39%) and Bellevue (8%)
- Most of King County and parts of southern Snohomish and northern Pierce Counties



The Wastewater Treatment Division (KC-WTD)

History

- Metro was created in 1958 to provide regional wastewater services
- Wastewater provides for a regional conveyance and treatment system – completely wholesale
- Merged with King County in 1994

The Wastewater Treatment Division (KC-WTD)

Organization and Governance

- Division within King County's Department of Natural Resources and Parks (DNRP)
- King County Executive proposes rates
- King County Council adopts
  - Sewer Rates with review and, at times, modification (annually)
  - Operating and Capital budgets (biennially)
  - Financial Policies

The Wastewater Treatment Division (KC-WTD)

Customers

- Long-term contracts with 34 cities, utility districts and tribe
- Contracts specify rate and capacity charge elements
- Currently in negotiation to extend from 2035 to 2055.
- Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC)– an advisory group comprised of component agency representatives

Sewer Rate Overview and Process

Revenue Requirement

- Debt service
- Operating expenses
- Capital expenditures
- Reserve contribution

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RCE

750 cubic feet/month water consumption
(net of water not entering the system)

Key Rate Setting Policies and Practices

Financial policies and practices:

- Debt service coverage ratio minimum of 1.15x on all debt
- 40% cash funding of capital expenditures on average over the 6 year financial plan. Added in 2017 to support reducing future debt
- 20% limit on variable rate debt
- Stable rate patterns – rate held for 2 years and
- Potential use or contribution to the rate stabilization reserve

WTD Financial Plan - Operations

King County Wastewater Treatment Division Financial Plan

	2017 Unaudited	2018 Estimate	2019 Forecast	2020 Forecast
Rates and RCEs				
Residential Customer Equivalents (RCEs)	757,243	761,786	765,976	770,725
RCE % Growth	0.60%	0.60%	0.55%	0.62%
Monthly Sewer Rate (per RCE)	$44.22	$44.22	$45.33	$45.33
% Change	5.2%	0.0%	2.5%	0.0%
Capacity Charge (per RCE)	$60.80	$62.60	$64.50	$66.44
Operating Fund				
Beginning Operating Fund Balance	59,882	61,055	62,212	62,800
Operating Fund Revenues	507,280	501,035	520,403	528,207
Monthly Rate Revenue	401,650	404,234	416,660	419,277
Capacity Charge Revenue	82,630	75,623	81,204	87,187
Operating Expenses	(148,052)	(159,620)	(165,500)	(170,000)
% Change	8.6%	7.8%	3.7%	2.7%
Debt Service				
Total Debt Service Requirements	(239,838)	(267,717)	(266,928)	(271,307)
DSC Ratio, Parity Bonds	2.25	2.08	2.06	2.12
DSC Ratio, Total Debt Service	1.50	1.28	1.33	1.32
Fund Transfers				
Liquidity Reserve Contribution	(1,173)	(1,157)	(588)	(450)
Transfers to Capital	(118,558)	(87,681)	(98,155)	(95,042)

Proposed Sewer Rate (2 year)

Debt Service Coverage minimum of 1.15

Funds from coverage go to capital

WTD Financial Plan - Capital

Construction Fund	2017 Unaudited	2018 Estimate	2019 Forecast	2020 Forecast
Beginning Construction Fund Balance	92,978	76,525	2,395	616
Construction Fund Revenues				
Parity Bonds	0	0	0	15,552
Variable Debt Bonds	50,000	0	0	0
SRF, PWTF & WIFIA Loans	26,471	28,190	0	134,500
Other Non-Operating Income	500	19,779	112,576	14,084
Transfers from Operating Fund	118,558	87,681	98,155	95,042
Total Construction Fund Revenues	195,529	135,650	210,731	259,177
Capital Expenditures				
Total Capital Expenditures	(192,197)	(208,020)	(219,708)	(263,490)
% Growth	14.7%	8.2%	5.6%	19.9%
Capital Expenditures Cash Funding	62%	52%	96%	41%

Financing Decisions

40% average over 6 year period

Sewer Rate Revenue Distribution and Collection

Revenue is collected monthly from each component agency based on quarterly reported customer counts. Total customers are the sum of:

1. Single family residence (SFR) customers comprised of single family detached dwellings - 55% of customer base

2. Residential customer equivalents (RCEs) - 45% of customer base

3. Component agencies are responsible for billing customers for our wholesale rate and their local charges.

Revenue Distribution and Collection

- Reporting: Quarterly, each agency provides:
  a) the number of single detached households (SFRs) and
  b) aggregate water consumption, less deductions (irrigation and process uses) for multi-family, commercial and industrial establishments
  c) Quarterly consumption is converted to RCEs at a rate of 750 cf/month

Revenue Distribution and Collection

- Revenue collection: Is based on the quarterly reporting:
  a) Reported SFRs with a 2-quarter lag and
  b) A 4-quarter moving average of RCEs (with a 2-quarter lag)
  c) Invoices are sent monthly for 1/3 of the quarterly billing amount
     For example: Invoices sent during 2018:Q3, cover an agency's reported customers:
     - reported SFR's as of 2018:Q1 and
     - an average of residential equivalents for 2018:Q1 to 2017:Q2

Agency Customers

Sewer System Participants as of December 31, 2017

Municipal Participants-Cities	Single Family Residential Customers	RCEs*	Total Customers	Percentage of System (%)
Seattle Public Utilities	146,647	150,259	296,906	39.3%
Bellevue	32,580	27,195	59,775	7.9%
Alderwood	32,159	14,440	46,599	6.2%
Soos Creek	31,416	7,081	38,497	5.1%
Kent	12,811	21,781	34,592	4.6%
North Shore UD	19,629	12,735	32,364	4.3%
Auburn	13,104	17,795	30,899	4.1%
Redmond	14,875	17,034	31,909	4.2%
Renton	15,751	14,838	30,589	4.1%
Shoreline (Ronald)	15,123	4,561	19,684	2.6%
Total 10 Largest	**334,095**	**287,719**	**621,814**	**82.4%**
Remaining Participants	76,874	56,001	132,875	17.6%
Total System	410,969	343,720	754,689	100.0%

Revenue = Rate x 1 per SFR

Revenue = (Water consumption /750 cf) x Rate

Sewer Rate: Considerations and Experience

- Overall the rate is relatively simple to calculate and distribute, predictable and manageable.
- Rate setting focus is on revenue requirements and financing choices
- Creates a stable revenue stream with effectively 55% of revenues derived from fixed charges (SFRs)
- Seasonal variations are smoothed by quarterly averaging
- The approach reflects a “one-for-all” approach in which below-average cost agencies pay somewhat more and above-average cost agencies pay somewhat less than cost of service

Sewer Rate: Considerations and Experience

- The sewer rate is not efficient by certain economic standards
- Certain items bring controversy – CSOs, I/I
- Billing can get out of synch with current local agency revenues.

Special Topic: Inflow and Infiltration (I/I)

We do not have agency-level metering of flows.

a. There are few single-points of entry to the regional system to allow identifying individual agency flows;
b. Early versions of the contracts exempted I/I flows from pre-1960 reaches which are difficult to identify
c. Basically rendered impossible to directly identify chargeable I/I flows

Special Topic: Inflow and Infiltration (I/I)

In the absence of metering:

a. I/I flows are not separately identified by agency.
b. Costs related to I/I enter the rate calculations as an overhead through their aggregate impact on treatment and conveyance costs – all pay a share.

Effectively, the resulting incentives can turn a largely local issue into a regional issue -- trade off between local solutions versus simply building larger regional facilities to address the flows.

Capacity Charge: Overview and Process

- The capacity charge is a separate charge assessed on new development and redevelopment
- Expected to generate $75 - $80 million in 2018
- The capacity charge is designed to ensure those establishing new connections to the system are contributing to paying the cost of providing capacity to serve them.

Capacity Charge: Overview and Process

- The charge has elements of a buy-in charge and also includes a prospective element reflecting capacity expansion in the future.
- It is paid in addition to the regular monthly sewer rate.
- Current methodology developed in 2001 to accommodate financing throughout the Comprehensive Plan including a $1.8 billion treatment plant

Capacity Charge: Rate Setting

Key elements of the capacity charge calculation include:

1. Period of calculation: January 1, 2003 to December 31, 2030.

2. Cost allocations: Costs are allocated between existing and “growth” customers

3. The underlying data for calculating the charge are updated every three years maintaining the same 2003-2030 calculation period.

4. This leads to a more stable charge as information that was initially a forecast is incrementally replaced with actual data

Capacity Charge: Cost Allocations

- Allocations of costs incurred during the 2003-2030 period are made at the facility level using actual and modelled consumption by the two customer groups

- Existing Excess Capacity: Costs associated with available capacity in place before 2003 that will be consumed by customers connecting through 2030 are allocated to the growth customers

Capacity Charge: Cost Allocations

- Costs associated with capacity that will be consumed by customers connecting to the system after 2030 are allocated in proportion to relative size of existing and new connections customer groups.

- Policy driven allocations:
  1. CSO costs are allocated proportionally across all customers.
  2. Brightwater Treatment Plant is allocated to growth

Capacity Charge Revenue Distribution

Unlike the monthly sewer rate, WTD directly bills the capacity charge customer. The basis of allocating the charge to specific structures is also different than with the sewer rate

Reporting: Permitting agencies in the service area report sewer permits to WTD and the charge commences with actual connection to the system

Capacity Charge Revenue Distribution

Assessing Charges*: Capacity Charges are assessed as a uniform charge ($62.60/month) applied to:

- Single family detached houses as 1 RCE;
- Multi-family dwellings based on total number of units, e.g., a quadraplex is counted at .82 RCEs per unit; Larger multi-family buildings are assessed at .62 RCEs per unit;
- Commercial and Industrial new connections are assessed based on fixture count or estimated flow

---

*The method by which charges are accessed across building type is under study

Capacity Charge: Considerations and Experience

The illusion of accuracy and precision:

- Key allocators are subject to change – bond refinancing, consumption and use of capacity, various limitations by law, no ability to change once assessed, controversial policy allocations – CSOs, Brightwater Treatment Plant

Capacity Charge: Considerations and Experience

Not economically efficient:

- wrong party is often paying, i.e., the first owner of a dwelling instead of the developer
- Not used to support targeted growth policies
- Lacking transparency and ease in explanation – subject to regional debate
- Uniform across agency regardless of cost of service
- A mix of upfront and over-time payment injects revenue volatility

Thank you. Please contact:

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Wastewater Treatment Division
Department of Natural Resources and Parks
KSC-NR-0502
201 S. Jackson ST
Seattle, WA 98104-3855

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

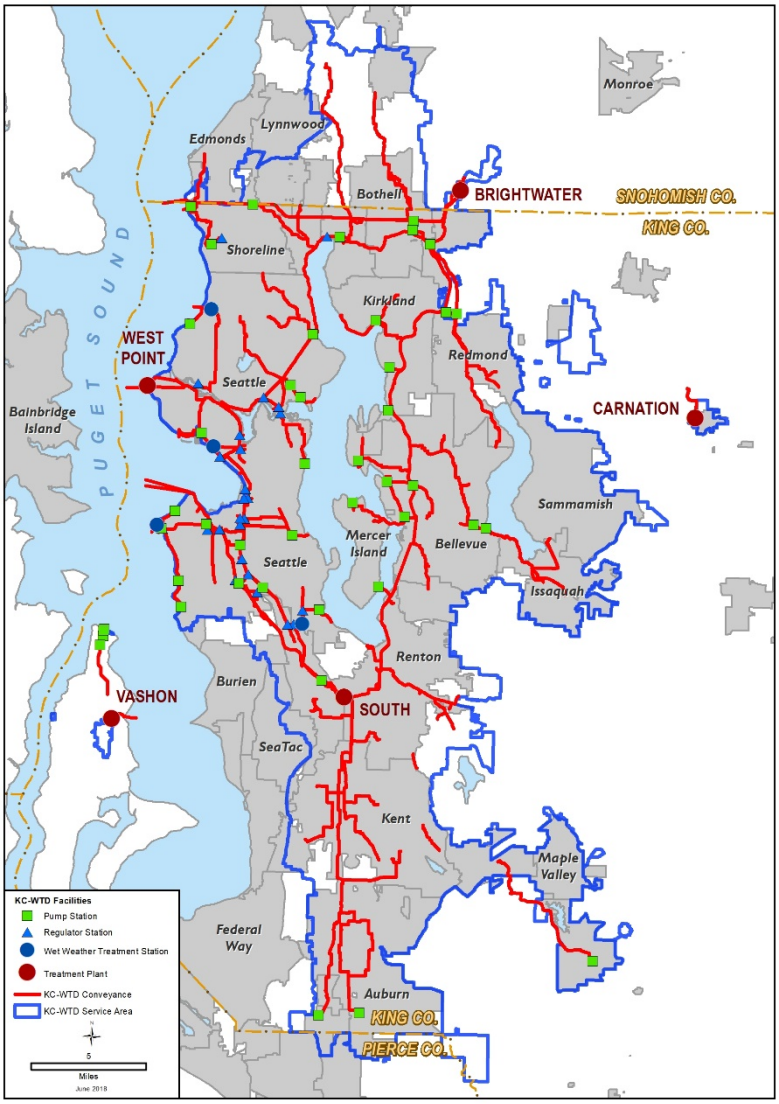
King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Profile

In the 1950s, wastewater flowed into Lake Washington, Puget Sound and many rivers and smaller lakes without enough treatment, fouling water and making a sullied mess of local beaches. In 1958 the voters created Metro and developed a regional wastewater treatment system based on watersheds as opposed to political boundaries. In 1994, Metro merged with King County and the King County Wastewater Treatment Division (WTD) was created.

WTD is committed to protecting and improving water quality by providing wholesale wastewater collection and treatment services for 17 cities, 17 local sewer districts and the Muckleshoot Indian Tribe– which we've been doing for over 50 years. We serve approximately 1.7 million people within a 424-square-mile service area which includes most of King County and parts of south Snohomish County and northeast Pierce County.

WTD is a Division of the Department of Natural Resources and Parks under the King County Executive. Our agency employs almost 650 people who plan, design, build, and operate treatment facilities. They also enforce regulations to reduce harmful waste from entering the system and educate the public and businesses on ways to protect water quality.



System Overview

WTD's regional system treated 197 mgd in 2017 through:

- Three larger treatment plants West Point (103 mgd) in Seattle; South Plant (76 mgd) in Renton; and Brightwater (18 mgd) in Woodinville;
- Two smaller wastewater treatment plants (Vashon Island and City of Carnation) and a community septic system.
- 47 pump stations, 25 regulator stations, and over 391 miles of sewer pipelines
- Regional combined sewer overflow facilities include 38 discharge sites, 4 wet weather treatment facilities with a 5th in construction plus 4 storage facilities.

Local agencies own and operate facilities for collecting wastewater from residences and businesses with combined facilities including 5,100 miles of collection pipes and numerous pump and regulator stations and local CSO facilities (Seattle).

Visit WTD's website for more information: http://www.kingcounty.gov/environment/wtd.aspx.

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Charges Methodology

Overview

Almost the entirety of WTD operating revenues are generated by two customer charges – the monthly sewer rate (80.7%) and the capacity charge (15.1%). Miscellaneous other revenues include fees for septage, Industrial Waste Surcharge and RIN's (methane sales) and interest income but amount to approximately 4.2 percent of total revenues. WTD does not collect or use tax revenues. The methods, conditions and constraints for setting these charges are specified in long-term contracts with each municipality, agency or tribe and Financial Policies embedded in King County Code and legislation.

Dating to the original contracts executed in the early 1960's, the approach to rate setting methodology has been one of a uniform rate across the various agencies applied as a function of residential customer equivalency (RCE). This philosophy has continued through the various contract renewals and updates. Currently, extension of the contracts from 2035 to 2056 is under negotiation.

The general process of setting rates includes an annual proposal to the King County Council in April of each year for a rate to take effect the subsequent January. The proposal is reviewed and subject to change by the Council with final adoption by June 30th. Although annual rate adoption is required by contract the practice has been to hold rates at a given level for a two-year period.

WTD Summary (2018 estimates)		
Customers (RCEs)	757,230	
Wholesale Sewer Rate	$44.22/month	$404.2 million 80.7% of operating revenues
Capacity Charge	$62.60/month $9,230/one-time	$75.6 million 15.1% of operating revenue
Non-rate related revenues	Septage, industrial waste, interest earnings, methane sales	$21.1 million 4.2% of operating revenues
Total Operating Revenues		$501.4 million
Rate Stabilization Reserve		$46.3 million
Operating Expense		$159.6 million
Capital Expenditure (year)		$208 million
Capital expenditure (6 year)		$1,495 million
Debt Service		$267.7 million
Debt Service Coverage		2.08x (parity) 1.28x (all)

Sewer Rate

The monthly sewer rate is a uniform charge applied to single family detached dwellings as a single residential customer and to multi-family, commercial and industrial based on residential equivalency (RCE) as defined by 750 cubic feet a month water consumption. To the degree possible water consumption is net of water use that does not enter the sewer system.

Sewer Rate Calculation

At its most basic, the sewer rate is the quotient of the estimated revenue requirements for a future year divided by the estimate of RCEs for that year expressed as a monthly amount. The aggregate revenue requirement includes operating expenses, debt service and capital expenditures and reserve contributions. Generally, the rate reflects the lowest amount that will meet the revenue requirement and financial policies and practices largely focused on the mix of debt and cash financing.

Financial policies and practices specify a 1) debt service coverage ratio minimum of 1.15x on all debt; 2) 40% cash funding of capital expenditures on average over the 6 year financial plan; 3) 20% limit of variable rate debt; 4) stable rate patterns (2 year rate); and 5) potential use or contribution to the rate stabilization reserve.

Revenue Collection and Billing

Revenue is collected through WTD billing each component agency quarterly based on reported total customer counts. Total customers are the sum of:

- Residential customers comprised of single family detached dwellings (55% of total) and
- Residential customer equivalents, including multi-family, commercial and industrial establishments based on water consumption (750 cubic feet/month).
- Each agency reports the number of single detached households and the aggregate water consumption, less deductions (irrigation and process uses), to determine the total customers served
- An on-going internal auditing process checks for consistency and compliance

Agency-level metering of flows does not enter into determining the denominator of the rate calculus. As such, flows associated with Inflow and Infiltration (I/I) are not separately accounted for other than through their aggregate impact on treatment and conveyance costs.

Component agencies are responsible for billing the end-user for the sewer rate and submit payment for the wholesale services to King County on a quarterly basis. Agencies can distribute the wholesale costs to the end-users according to their own policies. For example, although King County charges a flat charge for a single-family detached household regardless of size or water consumption, some agencies will spread that cost to their customers based on water consumption or some other allocator.

Capacity Charge

The capacity charge is a separate charge assessed on new development and redevelopment (residential and non-residential) resulting in new connections to the sewer system. It is paid in addition to the regular monthly sewer rate. The charge remains in effect for 15 years if paid quarterly or can be paid in a lump sum with a discounting of 3 percent

- The capacity charge is designed to ensure those establishing new connections to the system are contributing to paying the cost of providing capacity to serve them.

- The charge has elements of a buy-in charge but also includes a prospective element reflecting costs to be incurred in the future.
- A significant change in methodology was adopted in 2001 reflecting the updated Comprehensive Plan which called for the construction of the Brightwater Treatment Plant which was completed in 2013.

Capacity Charge Calculation

Key elements of the capacity charge calculation include:

- Period of calculation: In order to spread costs over a significant pool of customers, the capacity charge (largely) reflects costs and projected new connections to the system from January 1, 2003 to December 31, 2030.
- Cost allocations: Costs are allocated between two groups of customers – existing customers with established connections to the system prior to 2003 and actual and projected "growth" customers establishing connections to the system within the 2003-2030 period.
- Post period-costs: Costs associated with capacity that will be consumed by customers connecting to the system after 2030. These are allocated in proportion to relative size of existing and new connections customer groups.
- Existing Excess Capacity: Costs associated with capacity existing before the period of calculation and will be consumed by customers connecting during the period are allocated to the growth customers.
- CSO costs are allocated proportionally across all customers.

The underlying data for calculating the charge is updated every three years while the period of calculation remains fixed. In this way, information that was initially a forecast is incrementally replaced with actual data. This tends to provide a ballast effect leading to a more stable charge. Between updates the charge increases at a 3 percent annual rate.

Revenue Collection and Billing

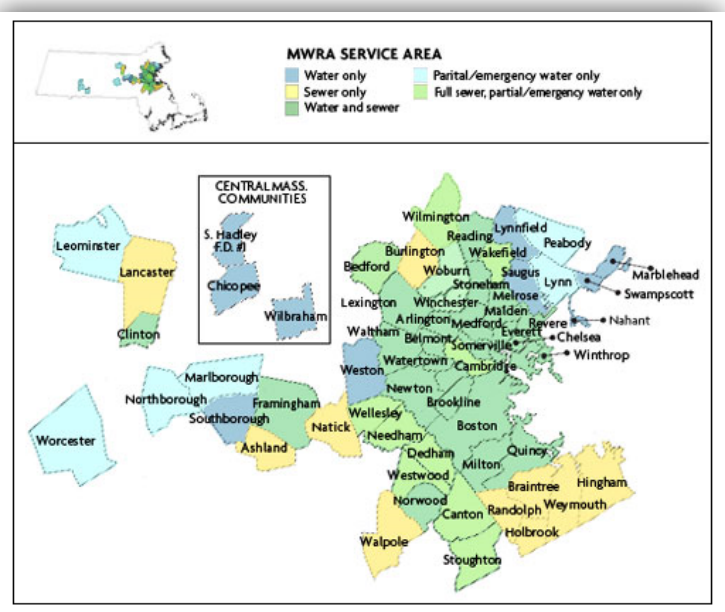
Unlike the monthly sewer rate, WTD directly bills the capacity charge end-user. The basis of allocating the charge to specific structures is also different than with the sewer rate.

- Permitting agencies in the service area report sewer permits to WTD and the charge commences with actual connection to the system.
- Capacity Charges are assessed as a uniform charge ($62.60/month) applied to:
    - Single family detached houses as 1 RCE;
    - Multi-family dwellings based on total number of units, e.g., a quadraplex is counted at .82 RCEs per unit; Larger multi-family buildings are assessed at .62 RCEs per unit;
    - Commercial and Industrial new connections are assessed based on fixture count or estimated flow.
- The capacity charge is a monthly charge but can be paid off-in-full with a 3.0 percent discount.

MASSACHUSETTS WATER RESOURCES AUTHORITY

Profile

MWRA is a public authority established by an act of the Legislature in 1984 to provide wholesale water and sewer services to 3.1 million people and more than 5,500 large industrial users in 61 communities in eastern and central Massachusetts.



System Overview

MWRA assets are located in an area of more than 800 square miles, spanning from the Chicopee Valley to Boston Harbor. MWRA's water system has more than 200 separate facilities, including the John J. Carroll Water Treatment Plant, with a capacity of 405 million gallons per day (mgd), the William A. Brutsch Water Treatment Facility, with a capacity of 16 mgd, 11 pump stations, and 14 below- or above-ground storage tanks. The water transmission system has 105 miles of active tunnels and aqueducts (mostly 10 to 14 feet in diameter) and 39 miles of standby aqueducts.

MWRA's wastewater system has 65 facilities, including two treatment plants, the Deer Island Treatment Plant, with a capacity of 1.27 billion gallons per day, and the Clinton Advanced Wastewater Treatment Plant, with a capacity of 12 million gallons per day. There are 13 pumping stations, a screen house and four remote head works, four Combined Sewer Overflow (CSO) facilities, and two CSO storage facilities.


Quabbin Reservoir


Deer Island Treatment Plant

Since its creation in 1985, MWRA has invested more than $6 billion in essential new facilities. In addition to the clean-up of Boston Harbor and the modernization of the region's water system, MWRA maintains hundreds of miles of water and sewer pipes, and dozens of other facilities that regularly require either upgrades or replacements. MWRA has also established aggressive maintenance programs to ensure that these facilities never fall back into a cycle of disrepair.

MWRA COMMUNITY CHARGE DETERMINATION

Basis of MWRA Rates

MWRA is required by its Enabling Act to establish charges which, with other revenues, provide sufficient funds each year to pay all current expenses, debt service and obligations to the Commonwealth; to pay all costs of maintenance, replacement, improvements, extension and enlargement of the sewer and waterworks systems; and to create and maintain reserve funds. Those charges or rates are adopted by MWRA based on the rate revenue requirements set forth in the Current Expense Budget.

Rate-Making Objectives

In 1988 the MWRA Board of Directors adopted the following rate-making objectives with the main goal of ensuring multi-year, predictable and sustainable rates:

1. To minimize total costs, consistent with MWRA's statutory responsibilities to provide effective, environmentally sound, wholesale water delivery and wastewater collection and treatment services;

2. To minimize the cost of debt by strengthening MWRA's position in financial markets;

3. To avoid single year rate spikes by prudent management of costs and rate increases; and

4. To support inter-generational equity by avoiding unfair rate burdens on either current or future ratepayers.

Allocation of Costs and Revenue to Utilities

The majority of current expenses and revenues are collected and identified by the either water or sewer utilities. The rest of expenses which support both utilities are allocated to each based on generally accepted cost allocation principals. The resulting net cost of water and sewerage services is the amount to be recovered through water and sewer assessments to our member communities.

Allocation of Rate Revenue Requirements to User Charges

Users of wholesale water and sewer services provided by MWRA are charged for those services in accordance with MWRA's water and sewer assessment methodologies. The methodologies were developed by the MWRA in close cooperation, and as a result of a specific recommendation by the MWRA Advisory Board which is statutorily created to represent the served communities. The Advisory Board is made up of the CEO (or designee) of each served community, and has the statutory responsibility of reviewing and commenting on MWRA's budgets.

MWRA Water Utility Assessment Methodology

MWRA's water assessment methodology has been in place since FY86. The water rate revenue requirement is allocated to member communities based on the volume of water used during the most recent calendar year preceding the Authority's current fiscal year, as measured by MWRA's wholesale meters. For example, a community that used 1% of the total water supplied in calendar year 2017 will be assessed 1% of the water utility rate revenue requirement in fiscal year 2019.

MWRA Sewer Utility Assessment Methodology

MWRA's Sewer Assessment Methodology was developed by a 13-member community-based committee, assisted by MWRA staff, the MWRA Advisory Board and independent rate consultants, and has been in place since FY96. The approved methodology is based on flow, strength of flow, and population. Operating and maintenance expenses are allocated based on total wastewater flow with strength parameters. Twenty-five percent of capital expenses are allocated based on maximum-monthly wastewater flow and strength of flow parameters. Seventy-five percent of capital expenses are allocated based on population divided equally between total population and contributing/sewered population.

Sewer Utility Operating Assessment

Sewer utility Operation and Maintenance (O&M) charges are allocated to each member community based on shares of annual metered wastewater flow, and total annual average strength, septage and high strength flow loads.

The sewer rate methodology incorporates an average of the three most recent calendar year's metered wastewater flow as to determine average flow shares. Three-year averaging smooth's the impact of year-to-year changes in each community's share of total system flow, but does not eliminate the long-term impact of changes in each community's relative contribution to total flow. For fiscal year 2019, sewer utility operating assessments will be allocated based on the average wastewater flows for calendar year's 2015, 2016 and 2017.

Wastewater flow from each community is measured by the MWRA's wholesale wastewater meters (for at least 85% of total flow) or estimated for smaller unmetered portions of communities based on ratios with metered areas.

Strength of flow includes Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS). Both BOD and TSS are measured at the Deer Island Wastewater Treatment Plant. For those communities without a septage disposal site and/or other high strength customers, it is assumed that the strength of flow is uniform. For those communities with septage and/or other high strength customers, the community's assessment will include a charge based on the actual flows and loads for those customers. Septage and high strength charges are discussed in more detail below.

Sewer Utility Capital Assessment

Capital (including debt service) charges are allocated to member communities based on a combination of metered wastewater flows and loads, and population. One quarter of capital charges are allocated based on each community's share of maximum month flow, and total annual average strength, septage and high strength flow loads. Maximum month flow shares are also determined using an average of metered wastewater flows for the most recent three calendar years.

The remaining three-quarters of sewer utility capital charges are allocated equally based on each community's share of contributing/sewered population and total population. Sewered population is reported by each community, and total population is based on the most recent estimate from the U.S. Census Bureau.

High Strength Charges

High strength users in the sewer rate methodology are defined as entities whose average wastewater process flows exceed 25,000 gallons per day (gpd), and have an average wastewater total suspended solids (TSS) and/or biochemical oxygen demand (BOD) concentration in excess of 400 milligrams per liter (mg/l). These entities are permitted, sampled, and monitored by MWRA's Toxic Reduction and Control Department (TRAC). A per unit charge is applied to the flows and loads that exceed the thresholds listed above, and that charge is added to the host community's annual assessment.

Septage Charges

Septage volume data used in the methodology is drawn from manifest information submitted by municipalities to the MWRA. Septage loadings are based on the US EPA Guide to Septage Treatment and Disposal. A per unit

charge is applied to the flows and loads (TSS and BOD), and that charge is added to the host community's annual assessment.

Sewer Utility Unit Costs

Unit costs are based on sewer utility flows and loads, and on the budget for each component of transporting and treating wastewater flows and loads. The budget for each component is allocated to "Base Flow", "Peak Flow", "TSS" and "BOD". The original allocation of unit costs to each category was conducted by an external team of engineers and accountants in 1994.

Combined Sewer Overflow Control Program

The MWRA Board of Directors made a policy decision to allocate the costs associated with CSO issues of five member communities (with over 40% of the region's population) across the whole sewer district. This decision was based on the historical design of the collection system and a desire for a regional approach to environmental improvements.

Chicopee Valley Water System

MWRA also operates a separate water system serving three communities in central Massachusetts. This system has its own treatment plant and transmission system and cost's to support this system are tracked separately. The communities served are assessed based on flow share, using the same approach as our metropolitan water system. This system accounts for less than 5% of all water provided by MWRA.

Clinton Wastewater Treatment Plant

MWRA also has a small wastewater system treating flow from two communities affected by the creation of our Wachusett Reservoir. Costs are separately allocated to those communities (and treated as a cost to the water system). This system treats about 1 percent of total wastewater flows.

Click here to be taken to the MRWA charges video on the web:

Video – Massachusetts Water Resources Authority Charges Structure

GLWA Great Lakes Water Authority

Pricing wastewater

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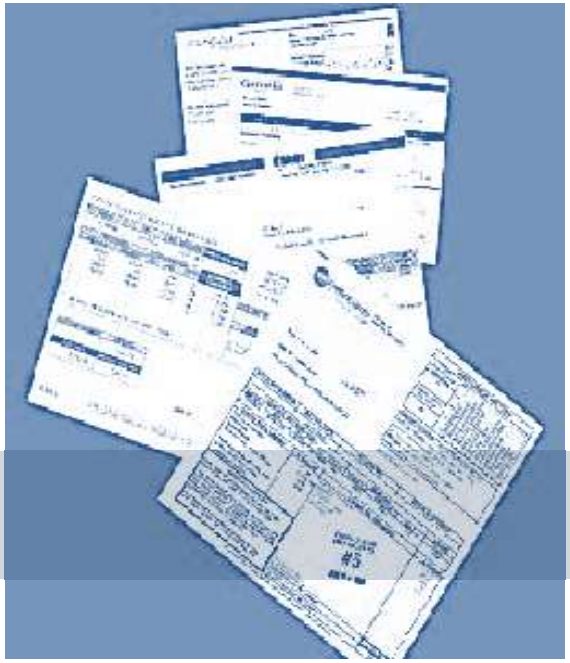
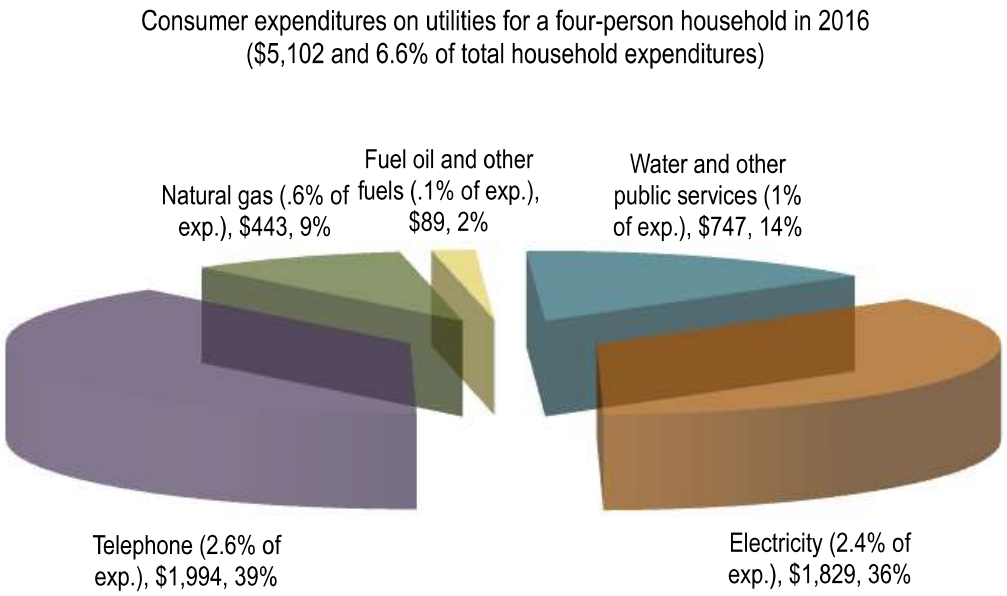
Revised 6/18/18

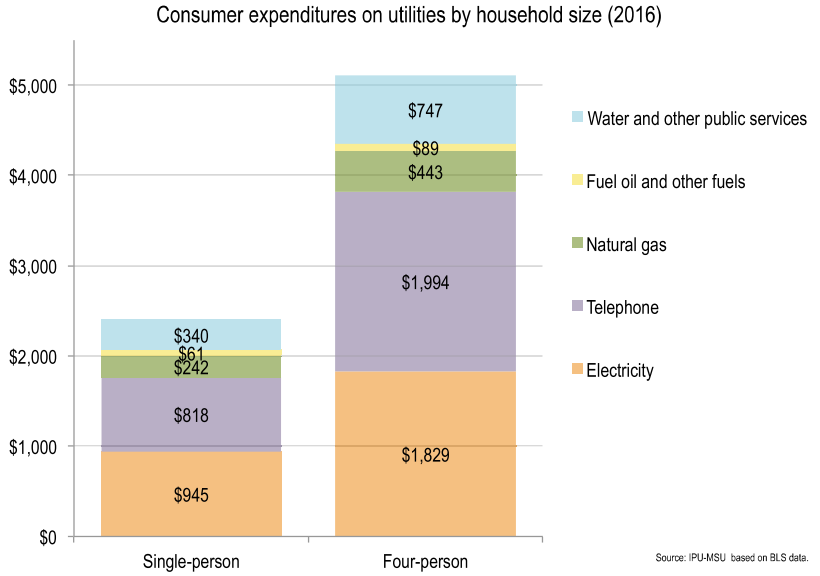


MICHIGAN STATE UNIVERSITY

Household expenditures on utilities in the U.S.

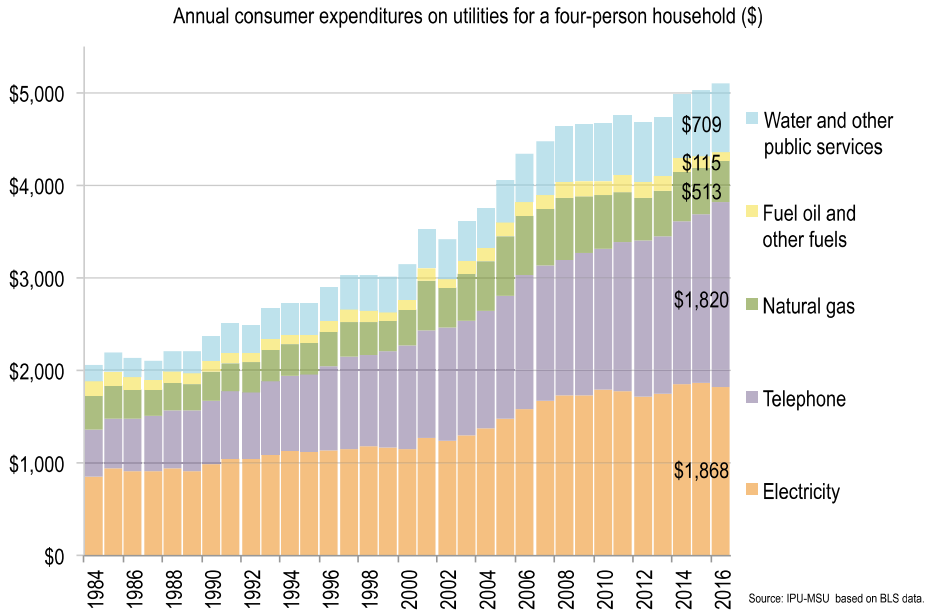


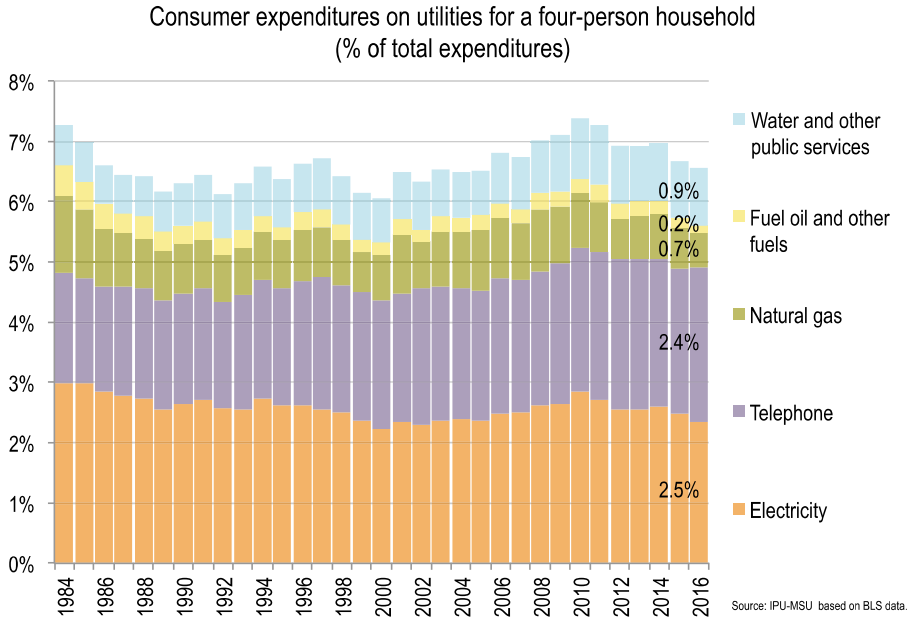
Source: IPU-MSU based on BLS data.



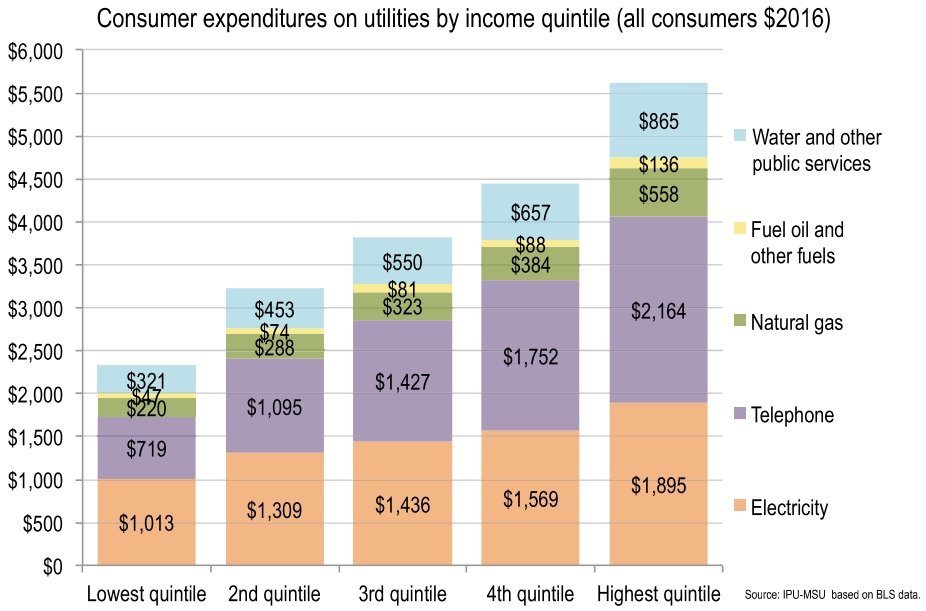
Source: IPU-MSU based on BLS data.

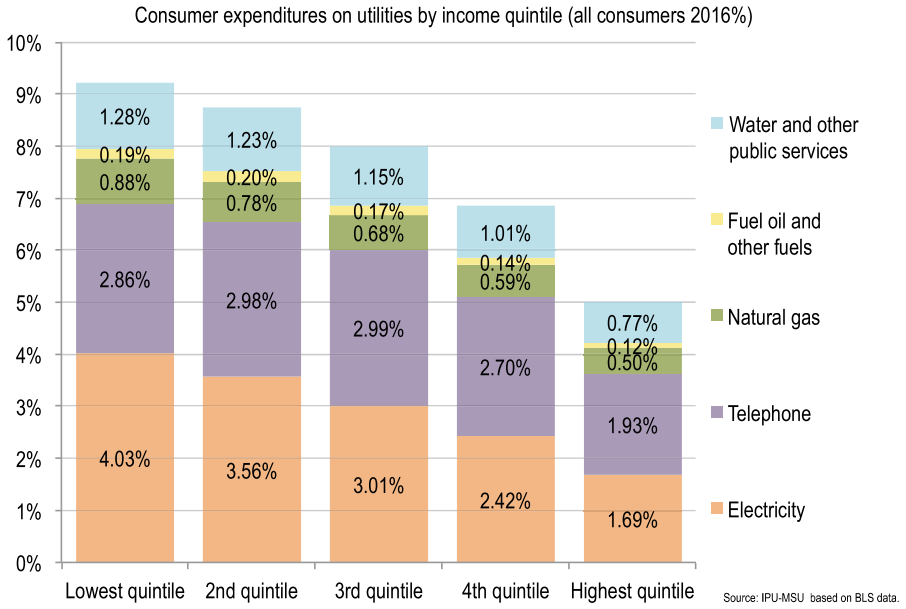
Household expenditures on utilities over time



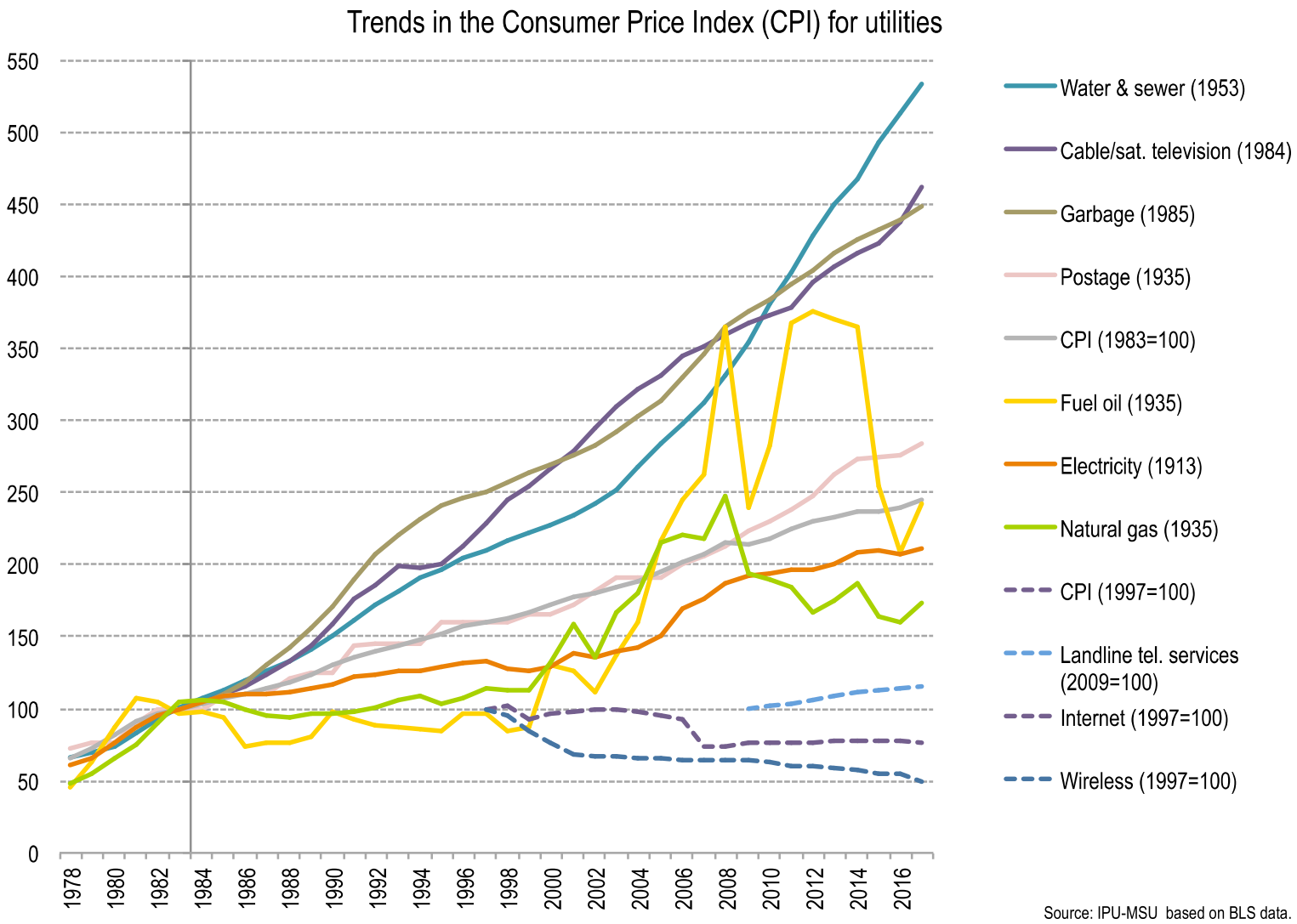


Utilities expenditures by income level and regressivity



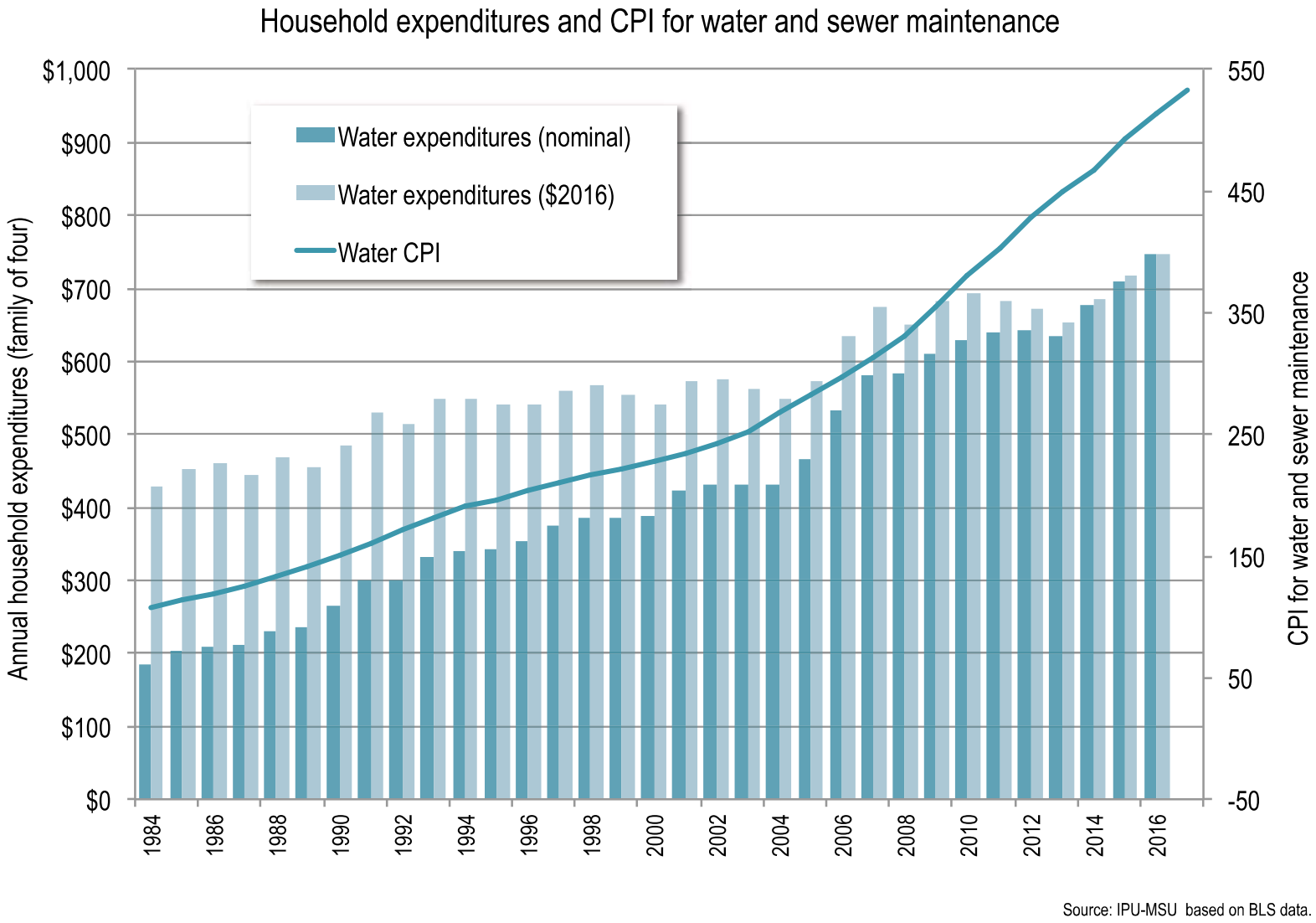


CPI trends for utilities (US)



Source: IPU-MSU based on BLS data.

Expenditure and price trends combined



Source: IPU-MSU based on BLS data.

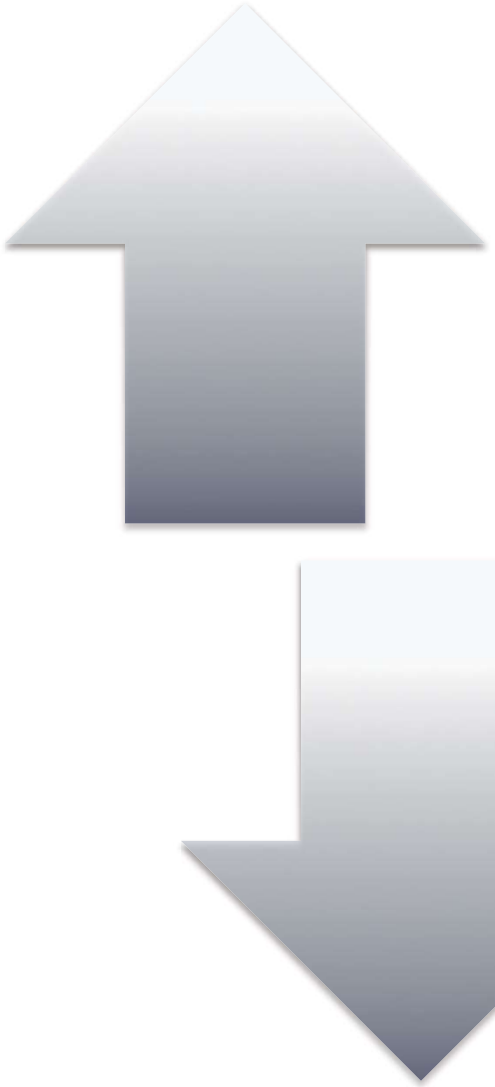
Sustainable enterprises

System revenues relative to expenditures	System expenditures relative to optimized compliant service level		
	< 1 expenditures are below optimum ("cost avoidance")	= 1 expenditures are optimal	> 1 expenditures are above optimum ("gold plating")
< 1 revenues are below expenditures ("price avoidance")	Deficient system	Subsidized system	Budget-deficit system
= 1 revenues are equal to expenditures	Underinvesting system	SELF-SUSTAINING SYSTEM	Overinvesting system
> 1 revenues are above expenditures ("profit seeking")	Revenue-diverting system	Surplus system	Excessive system

The total cost of service and its recovery

<table>
<tr><th colspan="2">Societal level</th><th colspan="3">System level</th><th>Ratepayer level</th></tr>
<tr><th>Full social cost</th><th>Full economic cost</th><th>Full-cost accounting</th><th>Full-cost recovery</th><th>Full-cost pricing</th><th>Fully allocated pricing</th></tr>
<tr><td>Environmental, economic, social externalities (spillovers)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Opportunity costs</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2" rowspan="2">Full accounting cost</td><td rowspan="2">• Capex (debt and equity)
• Opex
• Depreciation
• Taxes
• Reserves</td><td>• Federal and state grants
• Lease and other income
• Property taxes
• General fund transfers</td><td></td><td></td></tr>
<tr><td colspan="2">• Customer rates
• Other user fees and charges
• System development charges (growth)</td><td>• Cost causality based</td></tr>
</table>

Economics of price signals and welfare effects



Prices too high

Extracts rents from essential usage (Ramsey pricing)
Regressive impact (deprivation, endangerment)
Drag on the local economy (income effect)
Excess capacity and stranded investment
High reserves and transfers from system
Revenue loss from bypass and defection

Prices too low

Weakens price signals for discretionary usage
Excessive and wasteful use of resources
Inadequate infrastructure investment
Poor capacity utilization and congestion
Low reserves and subsidies to system
Financial effects of revenue inadequacy

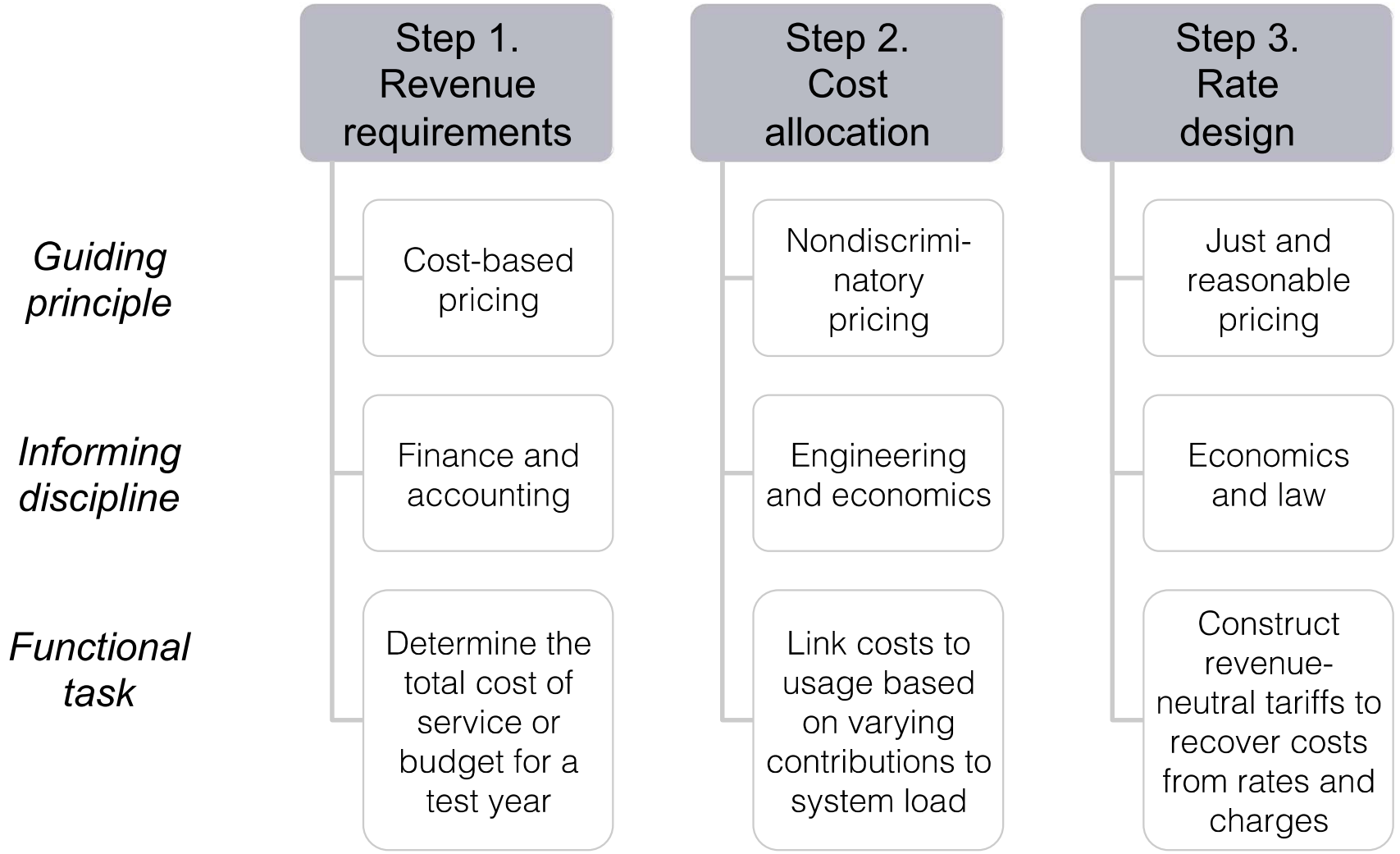
Modern pricing goals for utility services

- Financial viability
  - To recover the utility's capital and operating costs
- Economic efficiency
  - To achieve an equilibrium that maximizes social welfare
- Equitable allocation
  - To allocate costs to usage based on cost causation
- Operational performance
  - To manage load for efficient capacity utilization
- Network optimization
  - To enhance system design and resource integration
- Environmental stewardship *(social equity)*
  - To preserve resources and mitigate adverse outcomes (- externalities)
- Distributive justice *(social equity)*
  - To promote universal service and advance beneficial outcomes (+ externalities)

Constraints and considerations

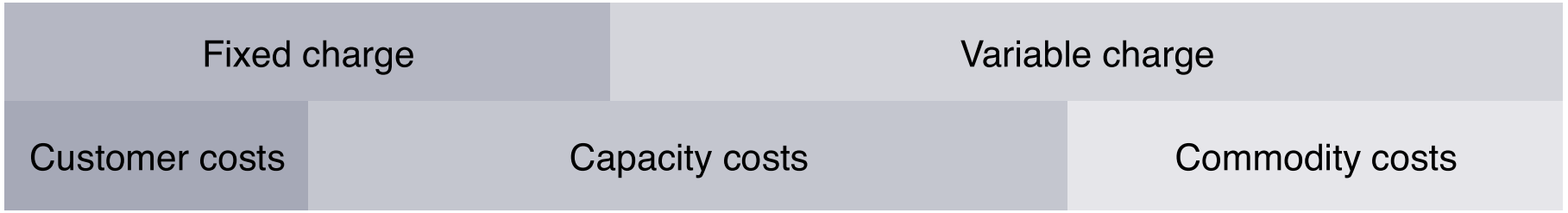
- Design choices are also bound by practical considerations as rates should be
  - Understandable, unambiguous, and transparent
  - Technically feasible and cost effective
  - Legally defensible and politically acceptable
- Ratemaking is a constrained optimization problem
  - Staying within value-defined tolerances over long term
  - Constraints are a function of mandates, rights, and obligations
  - Not limited to economic efficiency (e.g., public health)
- Regulated rates must also serve the public interest
  - Courts have allowed for a choice of rate mechanisms within a “zone of reasonableness” as well as “pragmatic” adjustments
  - Resulting rates and rate structures are subject to the statutory, regulatory, and judicial standard of “just and reasonable” (legal equity) – discretion and judgment
  - Rates can be equitable and still regarded as very unfair based on need or ability to pay (social equity)

Key steps in ratemaking and guiding principles

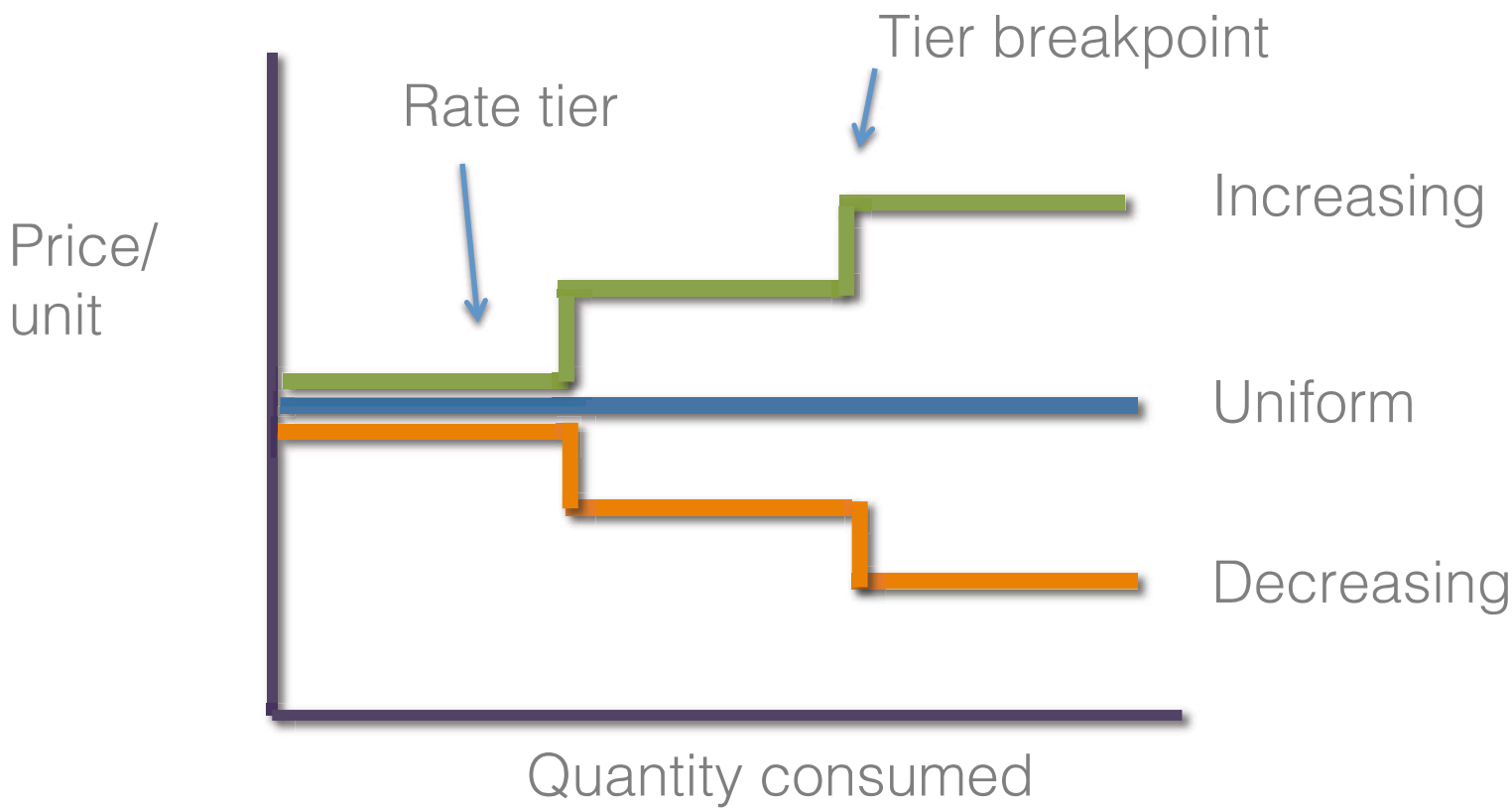


Fixed vs. variable charges: tradeoffs

Recovering more costs from fixed charges (static world view)	Recovering more costs from variable charges (dynamic world view)
Enhances revenue stability (less sales revenue risk)	Reduces revenue stability (more sales revenue risk)
Weakens price signals and customer control (less resource efficiency)	Strengthens price signals and customer control (more resource efficiency)
Less affordable for low-income households (more regressive)	More affordable for low-income households (less regressive)
Encourages self supply and grid defection (more expensive)	Preserves grid supply and participation (less expensive)
Possible advantage for combined households (one customer charge)	Possible stability from first blocks (relatively inelastic usage)



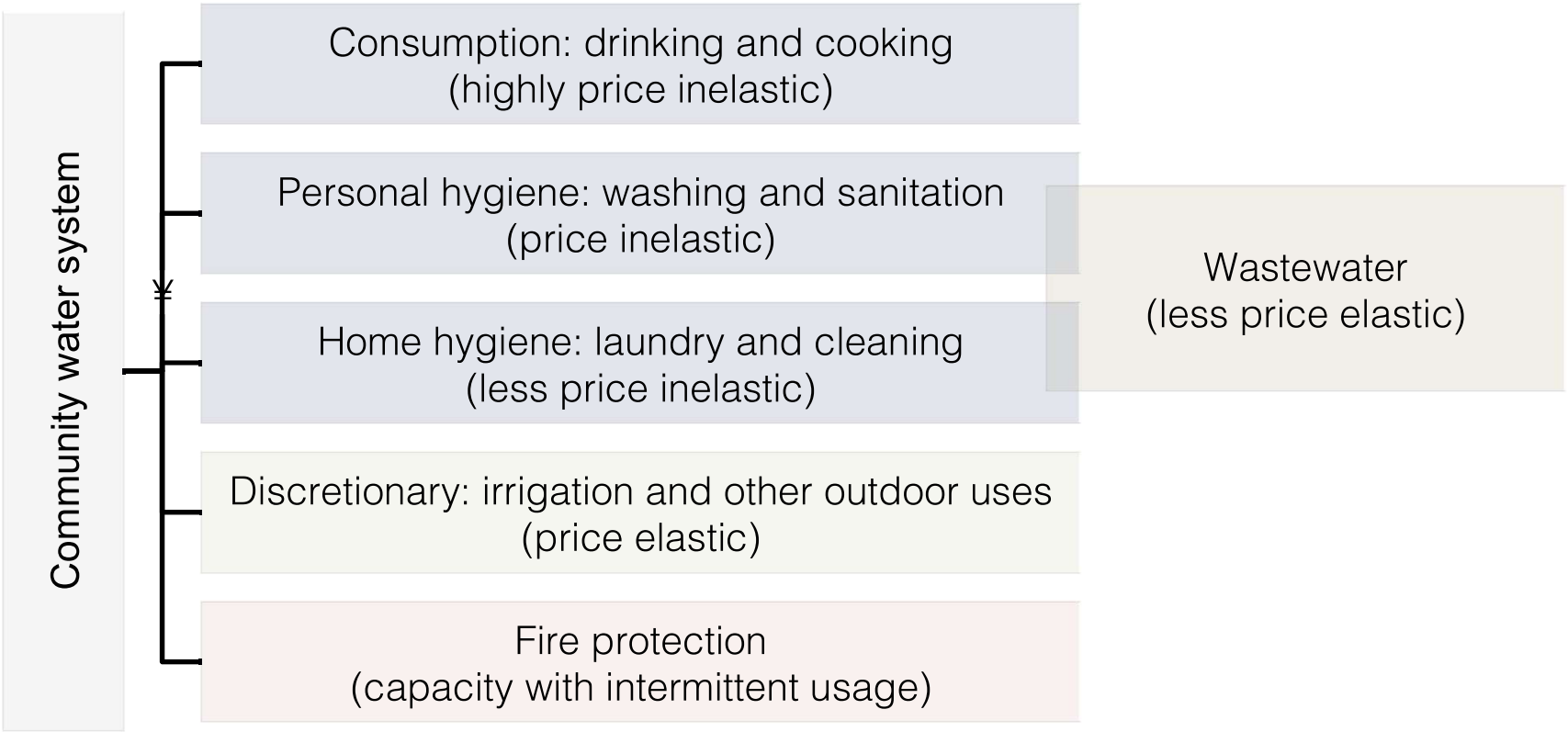
Block rates: decreasing and increasing



Note: rate blocks can be understood like income taxes, that is, rates usually are incremental or marginal and the customer's bill reflects cumulative calculations.

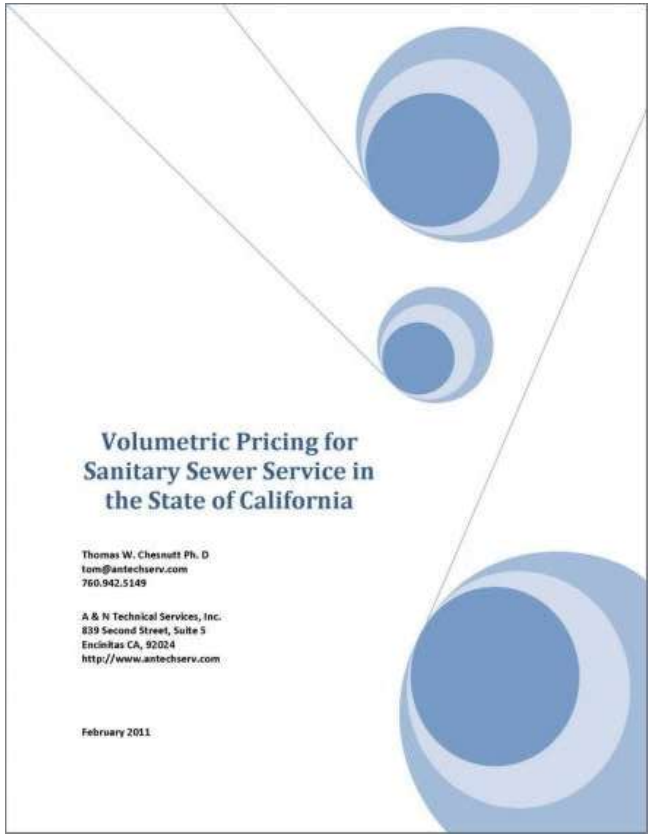
Water systems: five products, one set of pipes

- Water pricing does not reflect product differentiation in terms of cost or value
  - Essential usage is nondiscretionary – not conducive to private model price signals
  - Water systems are actually service "co-generators" and wastewater is a byproduct
  - Essential water and wastewater services are symbiotic and could be bundled



Transferring water pricing to wastewater

- Wastewater pricing has been advocated to encourage water conservation
- Rate policy should be informed by an understanding of how essential water and wastewater services differ
- Will a change in volumetric wastewater rates induce a usage response like that anticipated for a comparable change in water rates?
- Water is a resource input and wastewater is a byproduct of indoor water use that is largely nondiscretionary and likely to be very price-responsive



Pricing theory and practice

- Pricing is a recognized tool for guiding efficient water consumption, primarily through the variable (volumetric) component of the rate structure
- Rate policy should be informed by an understanding of how essential water and wastewater services differ
- Residential wastewater services are not separately metered
  - Volumetric wastewater rates are usually tied to metered water consumption
  - Many utilities base wastewater bills on average off-peak season water use
- Volumetric pricing for wastewater service may be regarded as consistent with the goals of efficiency and equity under cost-based ratemaking
- Higher bills, due to price levels, rate structures, or combined billing, might magnify price signals but they will induce price-responsive behaviors only to the extent that customers are willing and able to respond
- Deploying volumetric wastewater pricing is a blunt instrument that may not be well rationalized or effective in achieving water conservation goals.

Dimensions of water and wastewater services

- The economics of pricing a *resource* versus pricing a *byproduct* (wastewater) are fundamentally different
- Economic analysis should consider the net value of wastewater
  - Wastewater can be views as a renewable and potentially valuable resource to utilities
- Wastewater usage is largely a function of a household's indoor water use.
  - Efficiency water usage should lead to efficient wastewater usage
- Both water and wastewater utilities are capital intensive
  - High fixed capacity costs relative to the variable cost of service
- Residential contributions to wastewater system flows are not metered and must be estimated for the purpose of volumetric pricing
- Wastewater billing may be based on a customer's average off-peak season water usage (or a percentage thereof)
  - Water usage in the off-peak (cooler) months is primarily for indoor purposes while water usage in the peak (warmer) months is for both indoor and outdoor purposes.

Wastewater pricing policy in the U.S.

Table 2
Summary of wastewater financial and ratemaking practices in the United States (2014).
Source: National Association of Clean Water Agencies (2015). Based on a sample of 111 utilities.

	Percentage of systems
Revenues	
User charges	59%
Debt financing (primarily revenue bonds)	18%
Taxes	6%
Federal and state grants and loans	4%
Reserves	4%
Assessments	4%
Hookup fees	3%
Other (including fees, interest, product sales)	2%
Rate structures	
Flat and volumetric charge	54%
Volumetric charge only	21%
Flat charge only	15%
Tax rate with flat or volumetric charge	10%

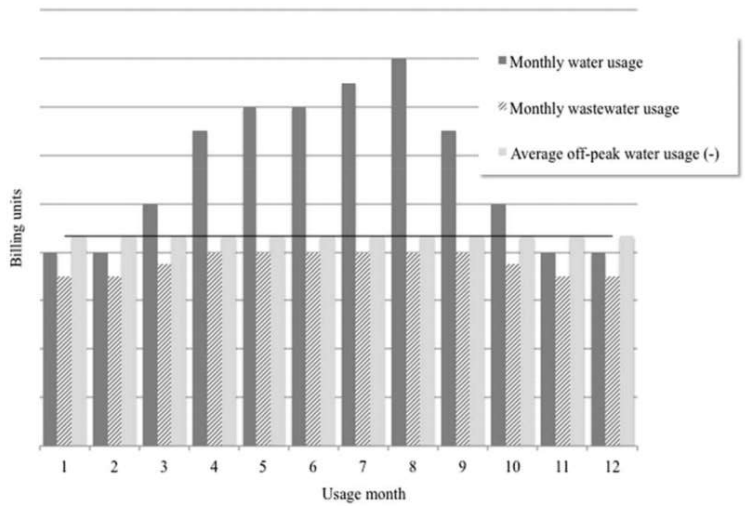
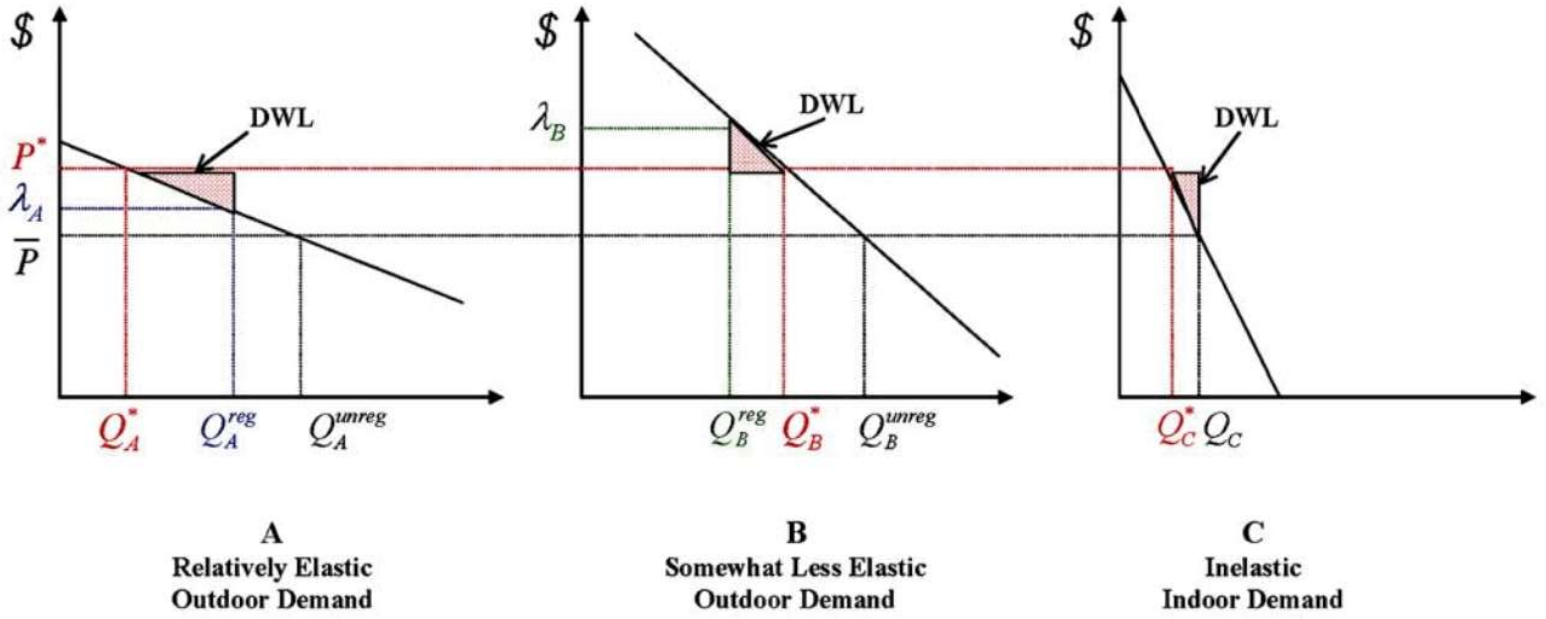


Fig. 1. Hypothetical Illustration of Wastewater Billing Based on Average Off-Peak Season Water Use (first three and last three months).

Price elasticities for water and wastewater services

- User fees are a preferred means of recovering the cost of water service
  - Cost-reflective usage-based prices can be used strategically to mold consumptive behavior, specifically to promote end use efficiency and beneficial conservation
- Price elasticity of water demand
  - In the short term, price elasticity is lower and response is mainly behavioral
  - In the long term, the price elasticity is higher and response may influence investment in more efficient fixtures, appliances, and landscaping
- Water is regarded as a normal good (with consumption rising with income)
  - But researchers have consistently found water demand to be relatively income-inelastic
- If nondiscretionary indoor water usage is price inelastic, it follows that nondiscretionary wastewater usage is also price inelastic, if not more so
- If the policy goal is to promote water efficiency and conservation, wastewater pricing might not be effective in achieving it
  - Deflects attention from price and non-price tools that target discretionary peak-season water usage to save water and avoid system costs

Price elasticity of water demand



(Where P^* is the market-clearing price for $Q_A^{reg} + Q_B^{reg} + Q_C = Q_A^* + Q_B^* + Q_C^*$).

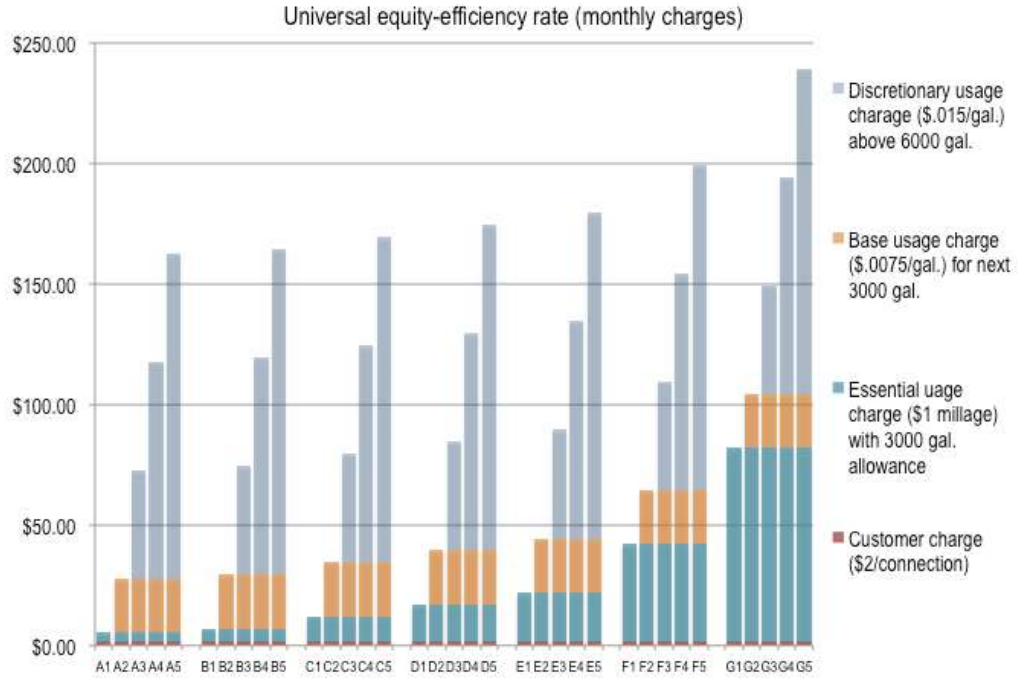
Figure 1. Economic losses from outdoor consumption restrictions with heterogeneous outdoor demand: (a) relatively elastic outdoor demand, (b) somewhat less elastic outdoor demand, and (c) inelastic indoor demand.

Rate design and implementation issues

- Bills for water, wastewater, and other utility services are regressive in impact and high fixed charges are burdensome on low-income households
- Volumetric pricing and progressive rate structures can provide some relief, as well as price signals for discretionary usage
- The fixed charge for water or wastewater can also be designed to provide a usage allowance
- Implementation of volumetric wastewater rates will likely elicit a mixed response
- If alternative methods of cost recovery are revenue neutral, implementation costs should be justified by benefits
- Controversy often centers on whether rates are cost reflective and equitable, based on consistency with accepted ratemaking principles and practices

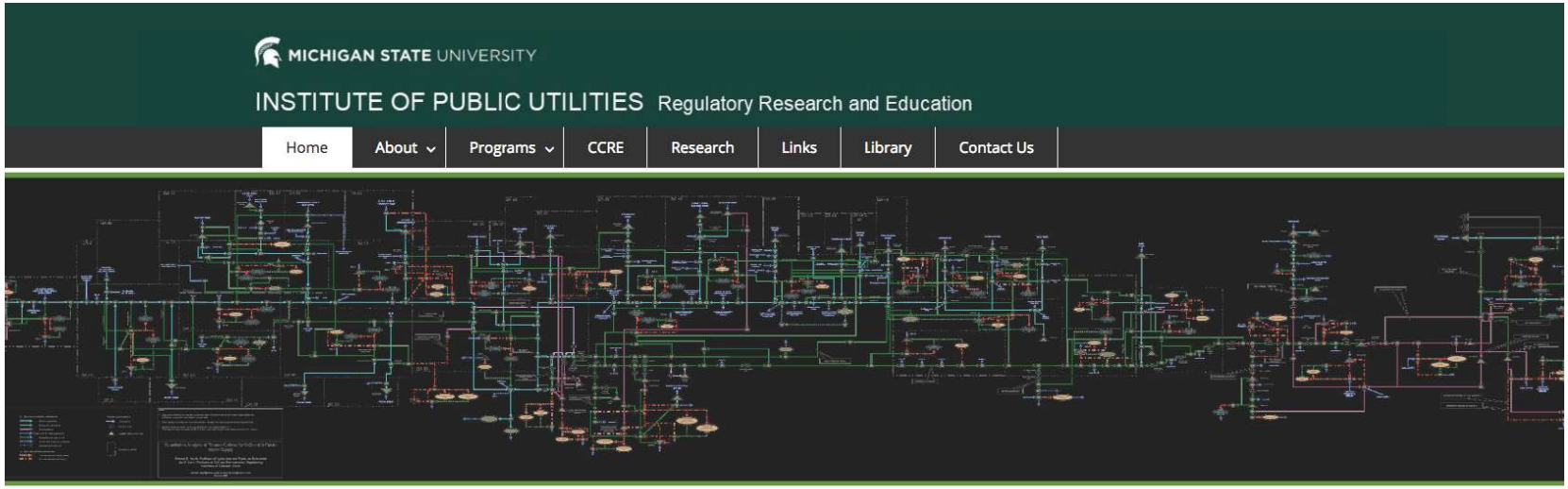
Universal equity-efficiency rate for water (Beecher)

- Nominal monthly customer charge and minimum bill with usage allowance
  - Network capacity charge calibrated to fair value of property (fire insurance rationale)
  - Essential usage included with uniform rate for next block of basic usage
  - Seasonal or increasing-block structure to encourage efficient discretionary usage
- Service limiter as an alternative disconnection (shutoff)
  - To protect water system and public health



Institute of Public Utilities (IPU-MSU)

- Visit ipu.msu.edu for more information about continuing education opportunities for anyone interested in utility policy, regulation, and ratemaking



Wastewater Charges Symposium
Meeting Summary
June 21, 2018

Meeting Highlights and Discussions

Welcome, Agenda Review, Desired Outcomes – Kerry Sheldon, Bridgeport Consulting

- Understand a variety of wastewater charge methodologies developed by national utility leaders
- Coalesce around a few key areas of interest that GLWA and members agree deserve investigation for potential implementation during the 2021 charge season and beyond

Opening Remarks – Sue McCormick, GLWA

- Today is a strong representation of how GLWA is delivering on its brand promise, "Through regional collaboration, GLWA strives to be a provider of choice dedicated to efficiently delivering the nation's best water and sewer services in partnership with our customers."
- The participation of members speaks to the regional collaboration that is the heart and soul of the Partnering Agreement
- Part of that partnership, and an essential element of becoming the region's provider of choice, is making sure services are charged fairly and equitably
- Members, along with GLWA administration, conceived and organized this symposium to bring together leaders from some of the top utilities across the country to learn and share best practices and experiences around wastewater charge methodologies
- To become a utility of the future, you have to be open to new ideas and new approaches
- Certain foundational elements of GLWA's wastewater charge methodology are based on a study that was done in 1979, although the methodology has been substantially refined over time
- Part of being a provider of choice is maintaining a bias toward innovation and continuous improvement
- GLWA comes into the symposium with a completely open mind, to learn alongside members; there are no predetermined outcomes
- On Day 2, June 28, members will work together to more deeply process what was learned and craft next steps together
- A quote by Helen Keller sums up the power of collaboration, "Alone we can do so little; together we can do so much"

Milwaukee, WI - Kevin Shafer, Milwaukee Metropolitan Sewerage District

- See presentation slides and charge methodology overview for details on the information shared; below is a summary of the questions asked and answers provided
- **Question 1**: Are there restrictions on the District paying for private rain barrels?

    - Answer: As long as the payment is under $600 than we do not face restrictions. There has been no push back from the public on this topic.
- **Question 2**: Do you charge members one bill per month for Operations & Maintenance (O&M) charges?
    - Answer: Although the District tells the wholesale customers what their retail bills should be, the District only directly bills the 28 municipal wholesale customers, who in turn bill the retail customers via taxes and user charges.
- **Question 3**: Was the decision to put capital charges on property taxes made by the legislature or directly by voters?
    - Answer: There was a court order and then legislation that authorized the capital charges be included on property tax bills. Individuals have the ability to go to the Public Service Commission to complain about bills. No one has taken advantage of this option.
- **Question 4**: How is the flow component of the O&M charge applied over the 28 municipalities without metering?
    - Answer: It is allocated based on the water bill for the individual retail customers.
- **Question 5**: What are you looking at in terms of the prospective wet weather flow charge? How will you develop that?
    - Answer**:** The district has two budgets, an O&M budget and a capital budget. New wet weather projects are needed within each. The revenue requirements for that work would be pulled out of charges and aligned with a new, third charge that would be allocated based on flow. We need to increase metering from about 80% coverage to 95%.
- **Question 6**: Why not use the wholesale meters for charges?
    - Answer**:** The equivalent residential unit (ERU) and the per capita per day approach was started in 1996. Good meter data is needed in order to use it for charges, and the meters have not been in long enough. Meter data would be a more exact approach moving forward.
- **Question 7**: The ERU level of service standard is defined as 52 gallons per capita per day (gpd). Is this both dry and wet weather?
    - Answer**:** Yes, the system is leaky. We are working on private property infiltration.
- **Question 8**: Do tax-exempt entities have to pay the rates that are billed via property tax bills?
    - Answer**:** Because the District is a wholesaler, whether to charge or not is a decision made by each of the 28 wholesale customer municipalities.
- **Question 9**: What incentive is there for the District's wholesale customers to reduce their infiltration/inflow (I/I)?
    - Answer**:** Creating such an incentive is the impetus for the third billing method, the wet weather flow charge.
- **Question 10**: Is the sampling continuous?
    - Answer**:** The sampling is composite; samples are taken at least monthly, more often in some locations.
- **Question 11**: Does the District provide any incentive to address peak flow rate?
    - Answer**:** No
- **Question 12**: Is the green infrastructure in the Greenseams program located to reduce flow or mitigate overflows?

    - Answer**:** The green infrastructure is located mostly along waterways in rural areas to provide flood management. Green infrastructure is part of the District's permit.
- **Question 13**: When the tunnel was originally built, what arguments were there regarding treating the cost as a uniform cost allocation?
    - Answer: There was a debate between upstream and downstream municipalities, rich and poor municipalities. Eighteen of the 28 municipalities are members of the District. The member municipalities are the downstream, poorer communities. The nonmember communities to which Wisconsin State statutes authorize the District to provide service generally have larger, wealthier properties. Nonmembers thought they were being unfairly burdened with the cost of the tunnel; it was not of concern to them that overflows were occurring downstream in Milwaukee. Courts determined that all should pay.

St. Paul, MN - Kyle Colvin, Metropolitan Council Environmental Services

- See presentation slides and charge methodology overview for details on the information shared; below is a summary of the questions asked and answers provided
- **Question 1**: How is the sewer availability charge (SAC) applied when property is being developed?
    - Answer: A review is triggered when there is new development taking place or there is a change in land use. 90% of all new building permits come to MCES for review. The Council employs four staff people to conduct these reviews.
- **Question 2**: In using volume as the basis for the O&M charge, has the difference between the water quality of I/I and the quality of wet weather been considered?
    - Answer: No, the charge is strictly based on volume. The Council has established peak flow thresholds (based on the original design considerations from when the system was built) that if exceeded require a workplan for I/I reduction. The Council does not have a combined sewer overflow (CSO) or peak flow component to charges.
- **Question 3**: How is capacity allocated to members? Is the SAC allocated consistently and supported by some report/calculated?
    - Answer: Every ten years, member municipalities are required to issue plans that address a wide variety of services (e.g. transportation, housing, wastewater). The plans provide population projections and document how growth will be accommodated. The Council's approval of these plans is its commitment to provide that level of service. No agreement or contract reserves capacity within the system.
- **Question 4**: Are member municipalities homogenous in terms of CSOs and separated sewer overflows (SSOs)?
    - Answer: No. Originally there were only three communities with combined sewers, but the Council has virtually eliminated overflows. It has not had an overflow since 2010. They are talking with the U.S. Environmental Protection Agency (EPA) about eliminating their CSO permit.
- **Question 5**: How are you sizing your facilities to meet the needs projected in the approved plans?
    - Answer: The system's forefathers used very conservative assumptions when sizing the CSO facilities, so they are oversized with excess capacity. Moreover, water conservation and I/I mitigation are having a huge impact on the daily

system. The Council looks fifty to eighty years into the future when considering capacity needs.

- **Question 6**: Are you looking at green infrastructure? Is so, how would you recover the costs?
    - Answer: The metropolitan area is comprised of watershed districts. Statutorily, the Council has been given a fairly narrow limit to what it can do. That authority is more coordination of what municipalities are doing. More generally in terms of green, the Council is investigating some solar power generation and it has a biosolids fertilizer program, although it incinerates most of its solids.
- **Question 7**: As you're dealing with the low flow communities, is Capacity, Management, Operation, and Maintenance (CMOM) a requirement of their plan approval?
    - Answer: There are a couple of requirements that relate to the CMOM requirements. A component of the plan needs to include maintenance, particularly as it relates to I/I, and it also needs to include planned capital improvements to coordinate with the Council.
- **Question 8**: What regulatory oversight do you have? How do you go about corrective action?
    - Answer: The Council has not been faced with this. In theory, it could use its authority to deny sewer extension permits.
- **Question 9**: Have you considered a blanket I/I charge to incentive reduction?
    - Answer: The current charge methodology pits municipalities against each other, but there has not been any real concern voiced along these lines. Most of the disagreement is around averaging the flow. The municipalities whose flow does not fluctuate see averaging as subsidizing those who fluctuate.
- **Question 10**: Does your system have a wet weather issue that needs to be addressed?
    - Answer: There is excess flow from some municipalities in the system, but the system has not had an overflow in ten years.
- **Question 11**: How is the SAC derived?
    - Answer: The required debt service is divided by the residential units per year (roughly 20,000-25,000). This approach can be problematic during economic downturns. In 2006, the reserves dropped to less than $10M (prior to the downturn, reserves had been at $80M) and the Council had to borrow from the wastewater charge to meet its debt obligation. Once the economy came back, the Council paid back the loan. It has not had to increase the SAC in 5 years.
- **Question 12**: You recently began serving another municipality; was that new customer charged a SAC?
    - Answer: Yes, every new connection pays a SAC unless it is a municipality with its own wastewater treatment plant, in which case the plant would be decommissioned and the service would become part of the regional system.

Denver, CO – Aleah Menefee, Metro Wastewater Reclamation District

- See presentation slides and charge methodology overview for details on the information shared; below is a summary of the questions asked and answers provided
- **Question 1**: How do you address sampling outliers?
    - Answer: The District continually communicates with its customers. It has the authority to scratch a day and resample based on extreme loadings that do not align with trends.

- **Question 2**: How difficult is it to come up with the cost estimate allocations? Are they strictly for O&M, or are they also for capital?
    - Answer: The cost estimates are for both O&M and capital. It can be arduous to come up with the allocations.
- **Question 3**: Can municipalities fall into more than one metering and sampling category?
    - Answer: Yes. Metering points are selected where the local pipe meets the district interceptor.
- **Question 4**: Is there a charge for access to the system?
    - Answer: Yes, there is a sewer connection charge, with one rate for commercial/multi-family and one rate for single family homes. The charge goes to the wholesale customers not the retail customers. The wholesale customers provide a report using tap size to determine the amount owed.
- **Question 5**: Is the retail customer charge for strength of flow billed monthly or annually?
    - Answer: That is left to the discretion of the municipalities.
- **Question 6**: Are most samples as clean as the example shown?
    - Answer: Yes, samples are typically consistent.
- **Question 7**: How is the cost allocation for Biochemical Oxygen Demand (BOD) derived?
    - Answer: It was derived ten years ago based on the cost to treat BOD.
- **Question 8**: Are you ever catching up with the multiyear lookback?
    - Answer: No.
- **Question 9**: With the lookback, are you truing up both costs and contributions from municipalities?
    - Answer: Yes, both. It is a lot of administrative effort.
- **Question 10**: Do you sample every customer every year?
    - Answer: Yes. They perform composite sampling.
- **Question 11**: How much does that cost?
    - Answer: Aleah will share those costs with GLWA, who will update members with the information.
- **Question 12**: For metering and sampling, roughly what percentage falls in categories A, B, and C as compared to categories D1, D2, and E?
    - Answer: Approximately 70% fall in A, B, and C; it is pretty evenly split among A, B, and C.

Seattle, WA – Tom Lienesch, King County Wastewater Treatment Division

- See presentation slides and charge methodology overview for details on the information shared; below is a summary of the questions asked and answers provided
- **Question 1**: Do you get to count the revenue from the capacity charge toward the required 40% cash funding of capital expenditures averaged over the six-year financial plan?
    - Answer: Indirectly, yes because it is restricted for capital.
- **Question 2**: 40% is a big target. How was that selected?
    - Answer: The idea to have such a policy came from the customers. The exact 40% figure came from Tom. After the plant was built, we appeared to be entering a period of relatively small rate increases. We asked ourselves whether there was something we could do to ease the debt burden, which was high as a result of a previous policy to bond as much as possible for capital. Seattle City Light used 40% over a six-year average.

- **Question 3**: Why did you use a Water Infrastructure Finance and Innovation Act (WIFIA) loan?
    - Answer: The decision was heavily debated. The loan provided $135 million of a $270 million project. Despite the administrative burden, it provided enough savings to try it.
- **Question 4**: What would you change in your methodology?
    - Answer: First, rather than use the existing methodology for computing the capacity charge, I would simplify it to $50 plus inflation. Second, I would have a more deliberate approach to I/I. Some local systems are very leaky and some are very tight, but there is no incentive to do anything different. The result is oversized regional facilities and interceptors. It is not efficient.
- **Question 5**: Are CSO costs allocated proportionally?
    - Answer: Yes, they're spread across everyone equally.
- **Question 6**: What is the share of the overall revenue requirement for CSO costs now versus in the future?
    - Answer: Between now and 2030 (the end of the consent decree), three large projects totaling nearly $1 billion are planned. This has resulted in people asking the question: what are our alternatives? We are pursuing a comprehensive plan to look at alternatives.
- **Question 7**: What's your credit rating?
    - Answer: AA+ and AA1
- **Question 8**: Have you seen commercial retail customers try to use less water?
    - Answer: Yes, Seattle has a strong conservation bias. Conservation is a great substitute for new energy/water generation. The 2001/2002 recession and threat of a drought resulted in permanent water use changes. It took until 2005 to reach pre-recession use levels.
- **Question 9**: Does I/I drive a lot of the discussion about what facilities to build?
    - No. There are three wastewater treatment plants; the City of Seattle takes care of its own. A number of storage projects are in place; they are common-to-all costs.
- **Question 10**: You have a $3B CSO program for King County. Does the City of Seattle have its own CSO program?
    - Answer: Yes, Seattle has a separate judgment; they have more overflow sites, but they are smaller. We are trying to do projects in conjunction as much as possible.

Pricing Wastewater – Jan Beecher, Michigan State University

- See presentation slides for details on the information shared; below are a few key observations shared by the audience
- Jan and Tom Gould of King County co-authored a paper examining whether wastewater prices induced economic efficiency. They concluded that it was unlikely to have that effect.
- Water and wastewater have two different customer bases. I/I is controlled by the wastewater service provider. That is what the municipality is buying.
- Pricing may not impact retail customer behavior, but it impacts wholesale customer behavior.
- The idea that it is easier to address stormwater impacts via property taxes is true administratively, but harder to do so legislatively

- The capital investment/revenue ratios are different with wastewater than many other utilities; with electricity it may be $10/$1, but wastewater is a $40 capital investment for every $1 of revenue.

Panel Discussion – All Presenters

1. What would you change about your charge methodology?
    - **Tom, Seattle:** There is wide disagreement about the capacity charge. Some think it should be doubled; some think it should be abolished. No one can come up with a better idea. We have been spending a lot of time on this topic, which is exacerbated by the lack of affordable housing in the region. To this end, the goal is to make wastewater rates more affordable.
    - **Aleah, Denver**: Eliminate double lookbacks. It is confusing and difficult to communicate to municipalities and their elected officials. I would communicate more with retail customers to help them understand how wholesale rates impact them, taking a more holistic look at our rates.
    - **Kyle, St. Paul**: Smooth the volatility, perhaps using a rolling three-year average or some other mechanism. It is widely recognized that current rates are fair, reasonable, and simple enough to understand. Do see an opportunity to up our game on public outreach and communication; telling our story as a wastewater utility.
    - **Kevin, Milwaukee**: Avoid sewer wars. Even the district that won, lost. Now the District serves both members and nonmembers, so there is a natural conflict.
2. What is the secret to regional collaboration?
    - **Tom, Seattle:** A willingness to work together. King County faced a definable regional problem when the water quality was so poor that people could not swim in the lakes, etc. It affected everyone. From there people were willing to forgive on the margins of accuracy and live with an average.
    - **Aleah, Denver**: Sharing resources with other organizations (e.g. Denver Water's recycle plant). If someone already has the infrastructure, why build new? Avoid capital infrastructure costs.
    - **Kyle, St. Paul**: The foundational premise of regionalism is that what your neighbor does has an impact on you. The wastewater treatment plants are on the lake. The water quality had gotten so bad that they were advising people not even to allow livestock to come into contact with the lake. This developed a sense of environmental stewardship which supported a regional approach. Most residents realize what we do is protect the public health.
    - **Kevin, Milwaukee**: Engage the public in building a vision for the region, and whoever is in charge should have no ego, should look to the higher good.
3. What advice would you give GLWA?
    - Keep talking
    - Make it as simple and easy to understand as possible
    - Be transparent (including goals and compromises)
    - Get away from any sense of a secondary agenda
    - Do not let the perfect be the enemy of the good
    - There is no right answer; maybe the right answer is what you already have
4. Do you include peak flow in your charge methodology? Why or why not?
    - **Kyle, St. Paul**: No, because it adds complexity and that is one of the last things we want to do. The council did a study in 2004 and determined that the region

needed to address excess I/I. This resulted in a program that identifies excessive I/I and develops work plans with the high producing communities. The second phase of the program is a demand charge for municipalities contributing excess flow; it will be used to build infrastructure to store and treat the flow. The demand charge had been scheduled for implementation prior to 2013, but the Council found out that the community work plans are effective at removing flows at the source, revised the policy, and is now just retaining it as a tool to use in the future if needed.
    - **Kevin, Milwaukee**: No, peak flows would come from the CSO part of the district, which is the relatively poorer city of Milwaukee; we thought it would be unfair to penalize the city.
    - **Aleah, Denver**: No, we use our extensive network of meters to charge based off potential capacity not flow; this is a roundabout way to charge for capacity.
    - **Tom, Seattle:** No.
5. How long did it take to implement your capacity charge? Was it difficult to implement?
    - **Tom, Seattle:** Most of the complexity lies in determining the revenue requirement. Now we have our own revenue recovery staff, so we are becoming our own overhead. Administration was the challenge, because land use and dwelling types are quickly evolving and no one anticipated the new development types (e.g. microhousing). Administrative ease is a goal.
    - **Aleah, Denver**: We have had a capacity fee since 1983. Capacity charge is based on water tap size. We have a robust database of housing. We are currently going through a methodology review with stakeholders.
6. After many years of sampling, what variances have you seen and how does it differ from national standards?
    - **Aleah, Denver**: In Denver, the sampling is required to comply with the permit. The frequency varies, depending on the type of industry operations.
7. There are wide variations in terms of how systems charge for strength of flow. Why is that?
    - **Aleah, Denver**: The cost allocation percentages fluctuate every year depending on the capital projects in the pipeline, regulatory burdens, etc.
    - **Tom, Seattle:** There is judgement involved. Costs are different for capital vs. operations and treatment. We tried to allocate those costs to process units.
8. Do you charge for O&M work in local communities (e.g. on a contractual basis)?
    - **Tom, Seattle:** No, but we did regional analysis to determine the 'low hanging' fruit reduce the most I&I for the investment. We did two pilot projects. By the time we got to the third project, the results were still inconclusive. If we can establish economic ROI, it would be something we could continue.
9. Do you see charging for local O&M work as a future of utilities?
    - **Kyle, St. Paul**: We have a few situations where a community is served through the local system. Sometimes the flow/growth does not merit the capital expense of bringing service to the doorstep, and then we may enter into an agreement to reimburse the municipality to operate their system. So it is the reverse: the municipality operates the local system and still a level of regional service is provided.
10. Do you offer low income support programs?

- **Tom, Seattle:** Most municipalities have programs for seniors and low income customers. We do not have the administrative information necessary to identify these retail customers.
- **Kevin, Milwaukee**: As a wholesaler we cannot provide such a program, but individual communities have programs.

11. Are there communities within your authority that have different rates?
    - **Aleah, Denver**: Developers shop around among communities when selecting sites. As the District, we have to have uniform structure, but community charges vary.
12. How do we achieve rate equity for aging infrastructure? Multi-year rates? Does the regional model provide opportunities?
    - **Tom, Seattle:** As a matter of practice, we have two-year rates and a six-year financial plan. It has worked well; people like the predictability. I would rather have annual rates because the data is better. The financial plan is fairly conservative. We also publish a six-year rate pattern.
    - **Aleah, Denver**: The sewer connection charge tries to get at this. We have a request for proposal out to investigate the option of a two- to five-year rate set, including understanding how it would impact operating costs and capital planning.
    - **Kyle, St. Paul**: We have discussed using a the rolling average to set rates, but the idea was not well received.
13. Do you have the ability to adjust for costs like energy that are highly variable?
    - **Tom, Seattle:** Yes, this was the motivation for mid-year corrections, in case something extraordinary happens. In King County, we'll have an adjustment clause in the next contract.
14. How do you verify your meter flows?
    - **Kyle, St. Paul**: The metering program has a rigorous validation of flow being recorded. Each site is visited once every couple of weeks for recalibration; twenty technicians go out on a daily basis.
15. Do you have reserve requirements?
    - **Tom, Seattle:** Reserve requirements are set through bond covenants. We maintain a year's worth of debt service in the bond reserve and have an investment pool with the county. This is separate from the rate stabilization fund which is used for changes in the capital program and to smooth rates.
16. Who sets and approves rates?
    - **Kyle, St. Paul**: Rates and fees get presented to the Council's governing body of sixteen individuals and a chair appointed by the governor. It is the budget that they approve.
17. Who does the Brightwater Treatment Plant serve? Does Seattle pay 40% of the cost [because Seattle is 40% of the customer base]?
    - **Tom, Seattle:** The Brightwater Treatment Plant went online in 2018. The short answer is no, Seattle does not pay 40% of the cost; the plant cost was allocated fully to the growth bucket (i.e. the capacity charge), so it becomes a matter of where growth occurs. A lot of the growth has occurred in downtown Seattle. We are a system, so a new plant frees capacity for other areas.
18. How do you agree to contract capacity with each municipality?
    - **Kyle, St. Paul**: By approving the comprehensive plans, the Council commits to providing the planned level of service .

19. Could you have avoided oversizing of the system?
    - **Tom, Seattle:** Metering is used to size facilities but not for charging purposes. We have not produced clear, definitive results on what should be done locally versus regionally in terms of I/I; it depends on the incentives that exist. There are no zoning requirements that would help.We have conservative modeling and capacity assessments which may result in us being overbuilt.
20. What if anything have you learned today about the future of rate making, about Southeast Michigan, or anything else?
    - **Aleah, Denver**: GLWA does a wonderful job collaborating and engaging members. It would be helpful to get the retail customers' perspective. Look at doing a more standardized rate; is water quality the best way to measure flow?
    - **Kyle, St. Paul**: The entire Great Lakes Region is blessed with a bountiful water supply. Consider the intersection of wastewater and energy. Southeast Michigan has sufficient water to translate municipal waste into fuel. Treated wastewater is a resource rather than a waste.
    - **Tom, Seattle:** There are lots of alternatives in the wastewater process: opportunities to use effluent, solids, etc. to fertilize fields; to reclaim water; to use green stormwater infrastructure, to generate energy; etc. On the rate side, the capital-intensive nature of the service may mean that federal grants are needed again. The National Association of Clean Water Agencies (NACWA) could advocate for it, particularly for extremely expensive environmental controls.

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GLWA: Wastewater Charges National Symposium: Day One
June 19, 2018 ~ 8:30 a.m. to 3:30 p.m.
Summary of Evaluation Results

Introduction

The Great Lakes Water Authority (GLWA) hosted a Wastewater Charges National Symposium on June 19, 2018. Twenty-seven (27) of the seventy-five (75) members who attended completed an event evaluation; this document presents a summary of those results.

Question 1: Day One of the Wastewater Charges Symposium was a good use of my time.

Responses:	27
Average score:	3.0 out of 4.0

Scoring distribution

- Strongly agree — 5 responses
- Agree — 19 responses
- Disagree — 1 responses
- Strongly disagree — 2 responses

Scale: 1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree

Question 2: What is your highest priority discussion topic for Day Two of the Wastewater Charges Symposium?

Responses: 21 out of 27

General (5 comments)

- Rate methodology.
- Understanding rate configuration.
- What changes are necessary to the GLWA charge model to make GLWA best in class in terms of ratemaking.
- What are we looking to get done? We need to figure out what the goals are?
- Getting the herd of cats to agree on the best way to move forward.

Equity (3 comments)

- Equitable funding of GLWA that supports health, prosperity and social justice thru out the region.
- Equity and proportional rates.
- That the charges are distributed fairly to all communities involved. While also taking into consideration, those communities that have equalization basins.

Regional collaboration (2 comments)

- Focus on regional system as opposed to local.
- Regional cost sharing of CSOs rather than Peak Flow allocation focus.

Peaking (2 comments)

- Peaking.
- Integration of peak flow into the current rate methodology.

Cost Causation/Allocation (2 comments)

- Cost causation.
- New approaches to allocating costs.

Environment (2 comments)

- Environmental reusables.
- Green infrastructure.

Strength of Flow

- Strength of Flow.

Metering

- Are there other major municipal wastewater service providers that use flow metering as the basis for their sewer shares?

Accuracy, Simplicity, and Return on Investment

- Accuracy versus Simplicity of various methods and ensuring a reasonable return on investment commensurate with the complexity of methodology.

Other (2 comments)

- The amount of work being done to prevent CSO in GPC and Fox Creek Enclosure and Relief lines in the area.
- Is there any new information customers would like to see included in Charges?