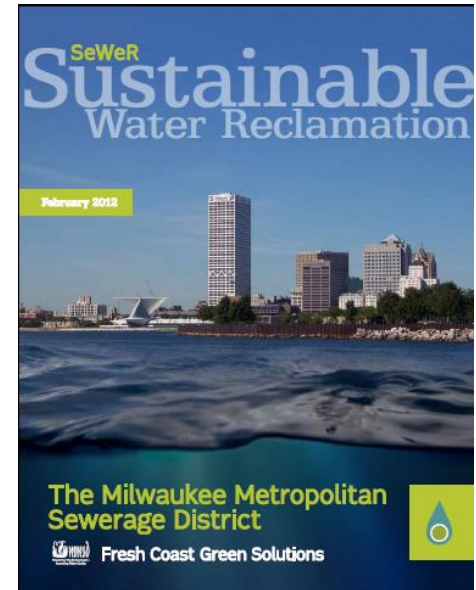
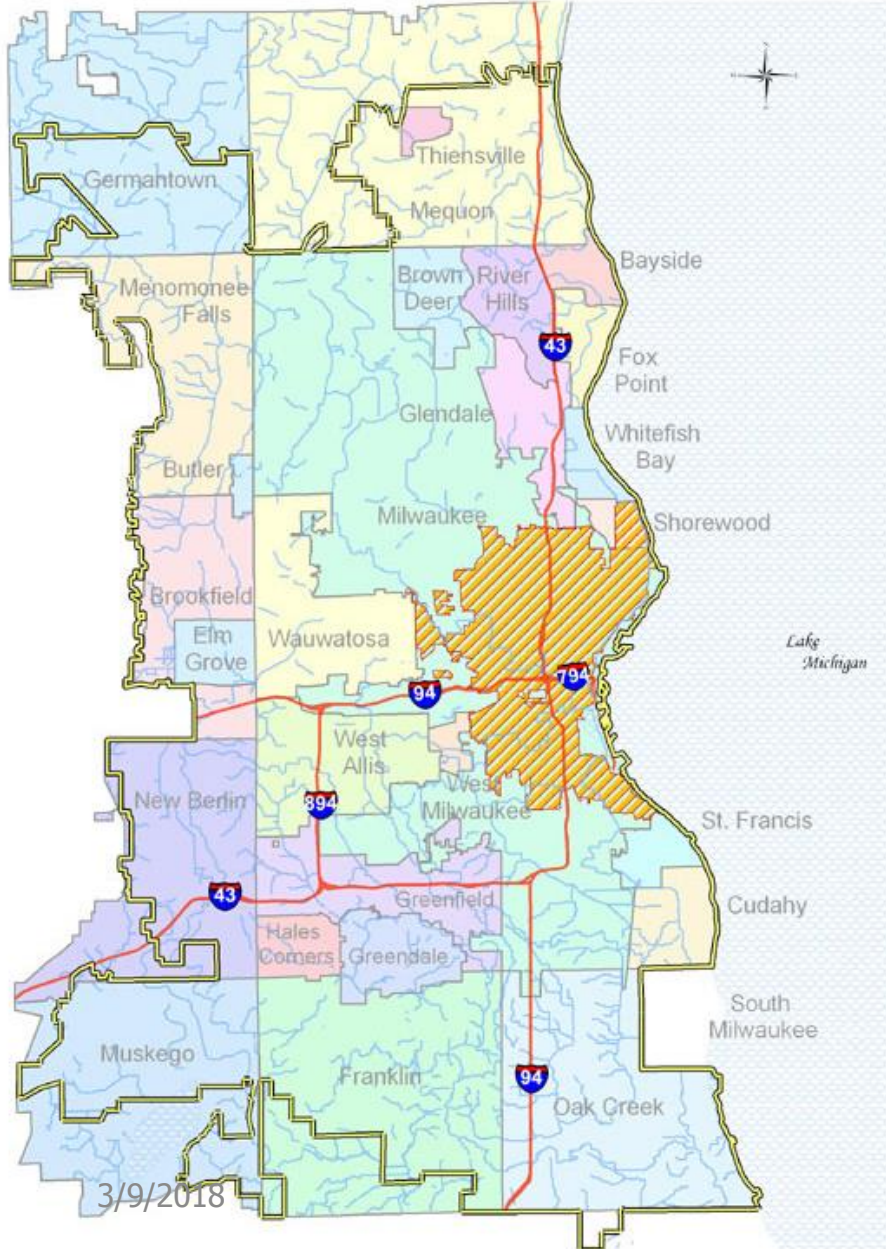


One Water, Infinite Possibilities

*Kevin L. Shafer, P.E.
Executive Director*



Milwaukee Metropolitan Sewerage District



We Serve:

- 1.1 Million Customers
- 28 Municipalities
- 411 Square Miles

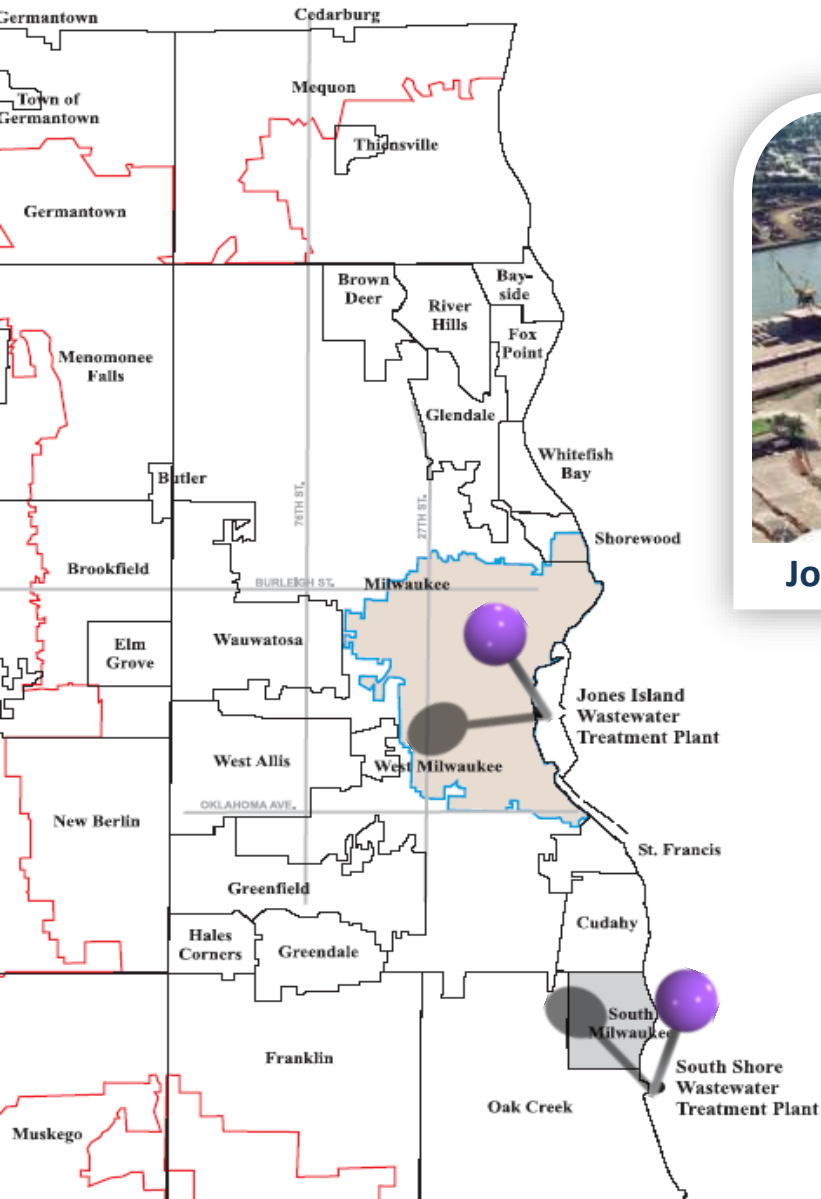
We Protect the Public & Lake Michigan:

- 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

MMSD's Water Reclamation Facilities (WRFs)



Jones Island



South Shore

Deep Tunnels

A photograph of a large, circular tunnel under construction. The tunnel's interior is lined with blue corrugated metal. In the distance, a concrete structure is visible, and a bright light source illuminates the scene. The tunnel walls show signs of excavation and construction activity.


300 Feet
Below ground

521 Million
Gallons of Storage

28.5 Miles
Long

17- to 32-feet
In Diameter

Designed to
minimize basement
backups and for 1-2
overflows per year.



98.4%

Capture & Clean

Since 1993

Photo by: David Stefanik



MMSD's 2035 Vision

(<http://v3.mmsd.com/NewsDetails.aspx>)

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 gallons 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

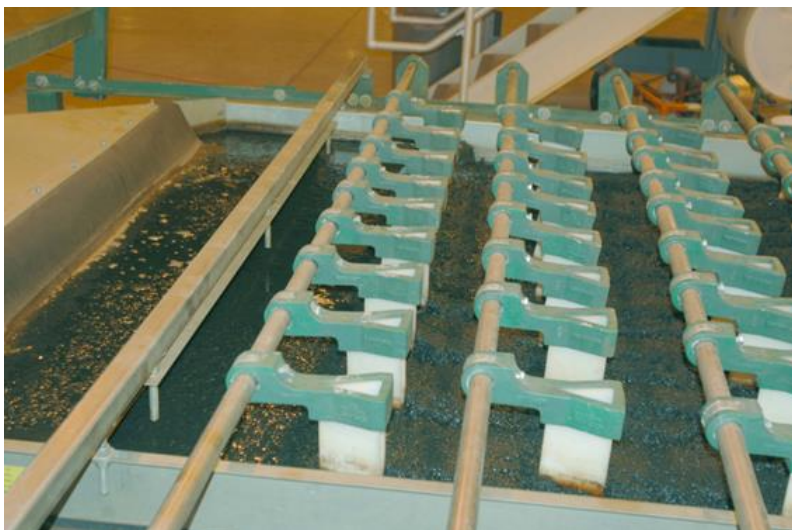
Milwaukee's Resource Recovery Plant



Nutrient Recovery: Milorganite®



98% of all biosolids produced is used to make Milorganite®

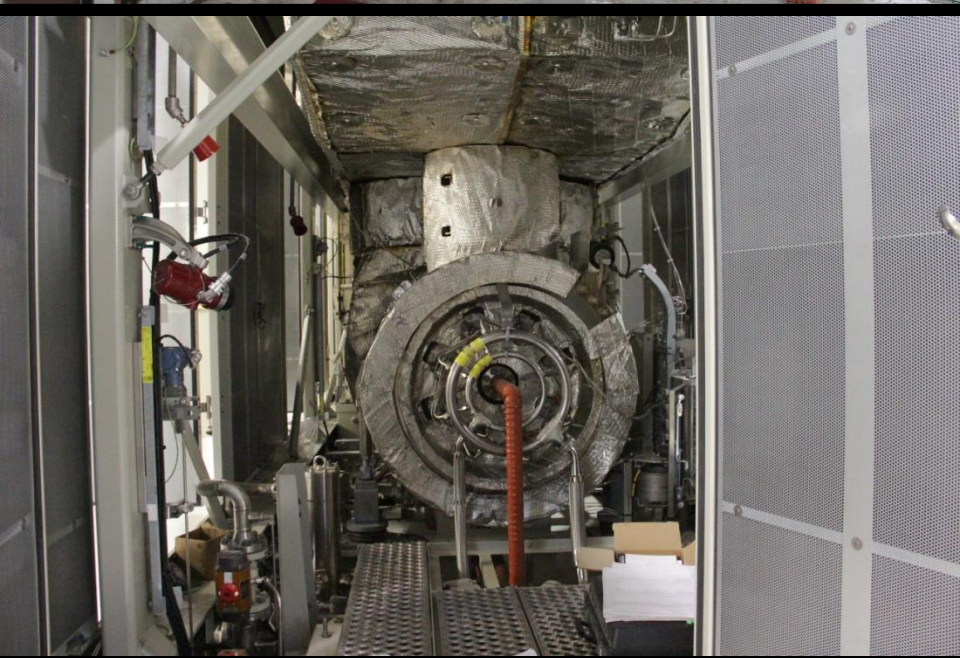


MMSD Landfill Gas Project

While not recovered from WRF process, recovered from a **landfill** and used in the process...

- 19-mile, 16" LFG Pipeline
- Install new turbines capable of burning LFG
- Modify 8 dryer burners to burn LFG
- Save \$ & Reduce Carbon Footprint

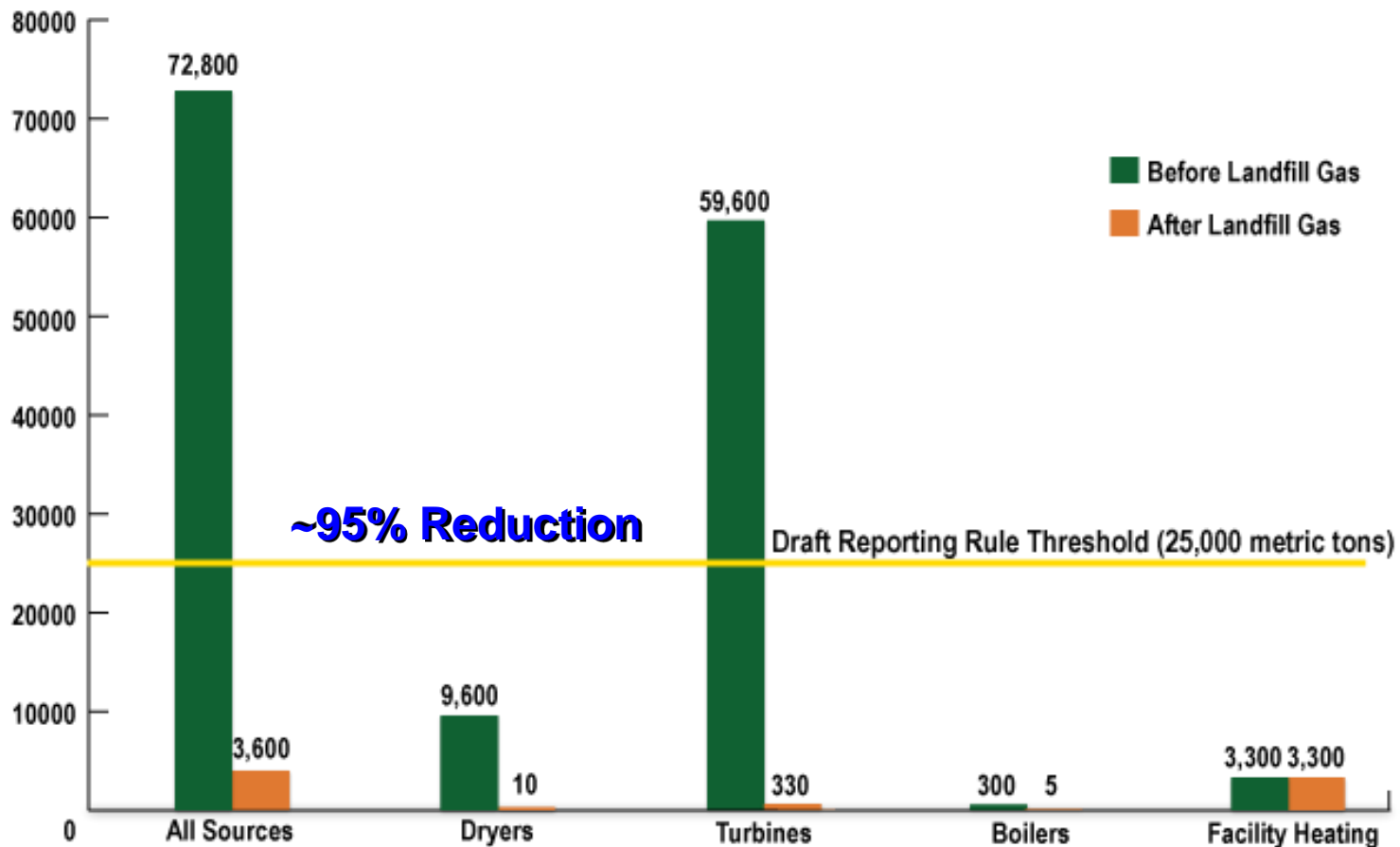




Jones Island Stationary Combustion Sources

Before and After Landfill Gas Project (based on 2007 fuel usage data)

GHG Emissions in Metric Tons of Equivalent CO₂



Digester Gas at South Shore WRF

8 Primary Digesters:

- 4 - 3.5 Million Gallon Capacity
- 2 – 1.5 Million Gallon Capacity
- 2 – 1.5 Million Gallon Digesters Used for Solids Storage



Input: Approximately 600,000 Gallons Of Sludge From Treatment Process Per Day

Water-Energy Nexus

- Energy potential in WW and biosolids/gases:
 - 10 times greater than energy used to treat it
 - could meet 10% of national energy demand
- Energy Efficiency Projects
- Renewable Energy Projects

High Strength Waste

- 1998 Collaborative Project With Marquette University, GMIA and MMSD
- Co-digested Glycol From Airport Deicing Operations In MMSD Digesters

Heat Recovery

South Shore WRF: Captured from engine generators and reused in digesters, heat buildings

Jones Island WRF: Captured from LFG turbines and used to preheat dryers, heat buildings

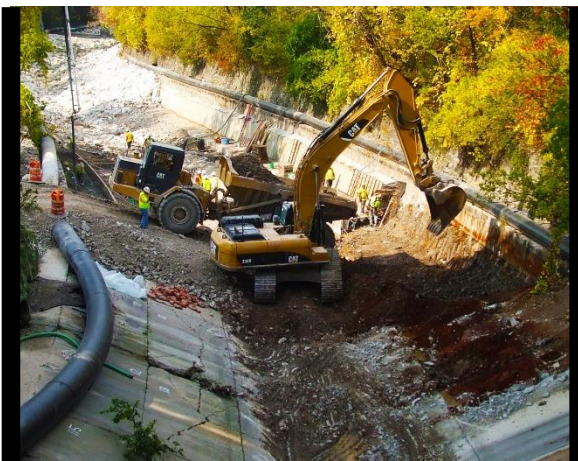


Solar Energy Installations at MMSD



Menomonee River Concrete Removal

COMPLETED



30th STREET CORRIDOR



BEE BUS



EAST BASIN



NORTH BASIN

KK Flood Management Outreach

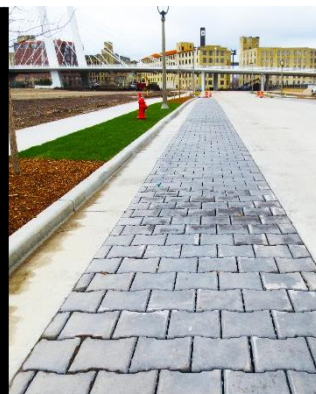


BASEMENTCONNECTION

flood relief for a better night's sleep



	2016	Program to Date
Inspection	205	9,700
Lateral Rehab	1,043	6,000
Foundation Drain Disconnect	69	600



Green Infrastructure
FRESH COAST 740
MILWAUKEE, WISCONSIN

Funded in 2016 = 10,440,000 Gallons
Since 2002 **31.9 Million** Gallons



Green Roofs

FRESH COAST⁷⁴⁰
MILWAUKEE, WISCONSIN



11.63 Acres Funded Since 2003

506,000 Gallons per storm

 Northwestern Mutual®



Rain
Barrels

22,280 since 2004 (Sold & Donated)

= 1,225,400
Gallons

FRESHCOAST 740
MILWAUKEE, WISCONSIN



Green Summer 2016

FRESH COAST 740
MILWAUKEE, WISCONSIN

13,700 Gallons



St. Francis

7,000 Gallons



Greenfield

GREENSEAMS®

3,433

Acres





Questions

A large crowd of triathletes, mostly men, are gathered on a wooden dock and in the water. They are wearing black wetsuits and red swim caps. Some are standing on the dock, while others are in the water, splashing. The background shows a large crowd of spectators on a grassy bank and a bridge in the distance. The word "Questions" is overlaid in large, black, sans-serif font on the left side of the image.

Kevin Shafer
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