

US DOE Better Plants Summit

Resource Recovery Electrical Energy (R2E2)

May 16, 2017

Bruce Bartel – NEW Water
Treatment Manager



Who or What is NEW Water?



- Brand of Green Bay Metropolitan Sewerage District
- Wastewater treatment services for 18 municipalities
- Two treatment facilities serving NE Wisconsin 24/7/365



NEW Water
The brand of the Green Bay
Metropolitan Sewerage District

*Protecting our
most valuable
resource,
water*



WISCONSIN

Superior

St. Croix

Rhineland

Eau Claire

Wausau

Stevens Point

Green Bay

Black

Lake Winnebago

Appleton

La Crosse

Oshkosh

Mississippi

Fond du Lac

Wisconsin Dells

Menomonee Falls

MADISON

Waukesha

Milwaukee

Janesville

Beloit

Racine

West Allis

Kenosha

MINNESOTA

IOWA

ILLINOIS

MICHIGAN

MICHIGAN

Lake Superior

Apostle Is.

Lake Superior

Lake Michigan

Green Bay Facility

32 mgd





De Pere Facility
8 mgd

De Pere Solids Handling

- Sent to the Green Bay Facility
 - 7 mile force main
 - Processed and disposed at the GBF



R2E2

Resource Recovery Electrical Energy Project

Most cost-effective solution to replace solids handling at the Green Bay Facility

Tools to treat wastewater as a resource





Background Information

Three main drivers:

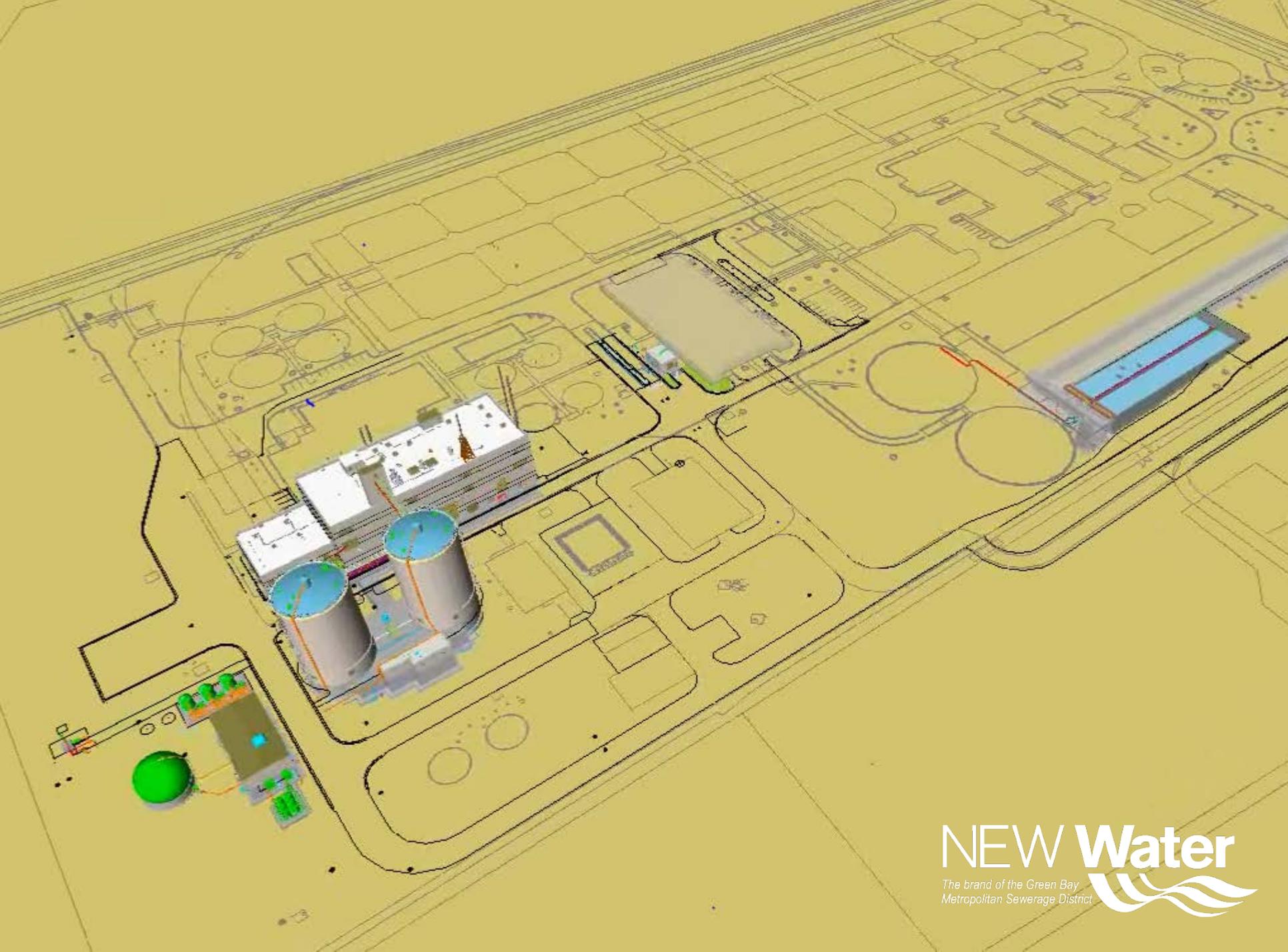
- Aging infrastructure
- Environmental regulations
- Increased capacity needs





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Green Bay Facility Solids Handling Upgrade - R2E2





R2E2

- R2E2: Solids & Digestion Facilities
 - Includes:
 - Anaerobic Digestion
 - New Solids Building
 - Centrifuge Dewatering
 - Dryer
 - Biogas Storage
 - Electrical Energy Generation
 - Nutrient Recovery
 - Ash Dewatering and Storage
 - Installation of Fluid Bed Incinerator Equipment





R2E2

- R2E2: Solids & Digestion Facilities
 - Energy Recovery:
 - Biogas to run two – 2.2 MGW I.C. Engines
 - Heat from the I.C. engines to heat the anaerobic digesters
 - Heat recovery from the fluid bed incinerator to run dryer
 - Autogenous incinerator operation
 - Nutrient harvesting to produce fertilizer product









BLDG
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R2E2 Timeline

- Planning Stage (2008-2011) **Complete**
- Design Stage (2012-2015) **Complete**
- Equipment Procurement (2013-2014) **Complete**
- Construction Project #1 (2014) **Complete**
- Construction Project #2 (2015-2018) **Underway**
- Implementation (2018)
- Construction Project #3 (2019)



R2E2 Costs

Project Phase	Approximate Costs
Engineering Services	\$25,000,000
Fluidized Bed Incinerator Equipment	\$21,200,000
Construction Project #1	\$6,300,000
Construction Project #2	\$114,000,000
Construction Project #3	\$2,500,000
Total	\$169,000,000



R2E2 Benefits

- Addresses the original project drivers:
 - Aging infrastructure
 - Environmental regulations
 - Increased capacity needs
- Lowest cost plan over a 20-year planning period
- Generate about 50% of NEW Water's energy needs



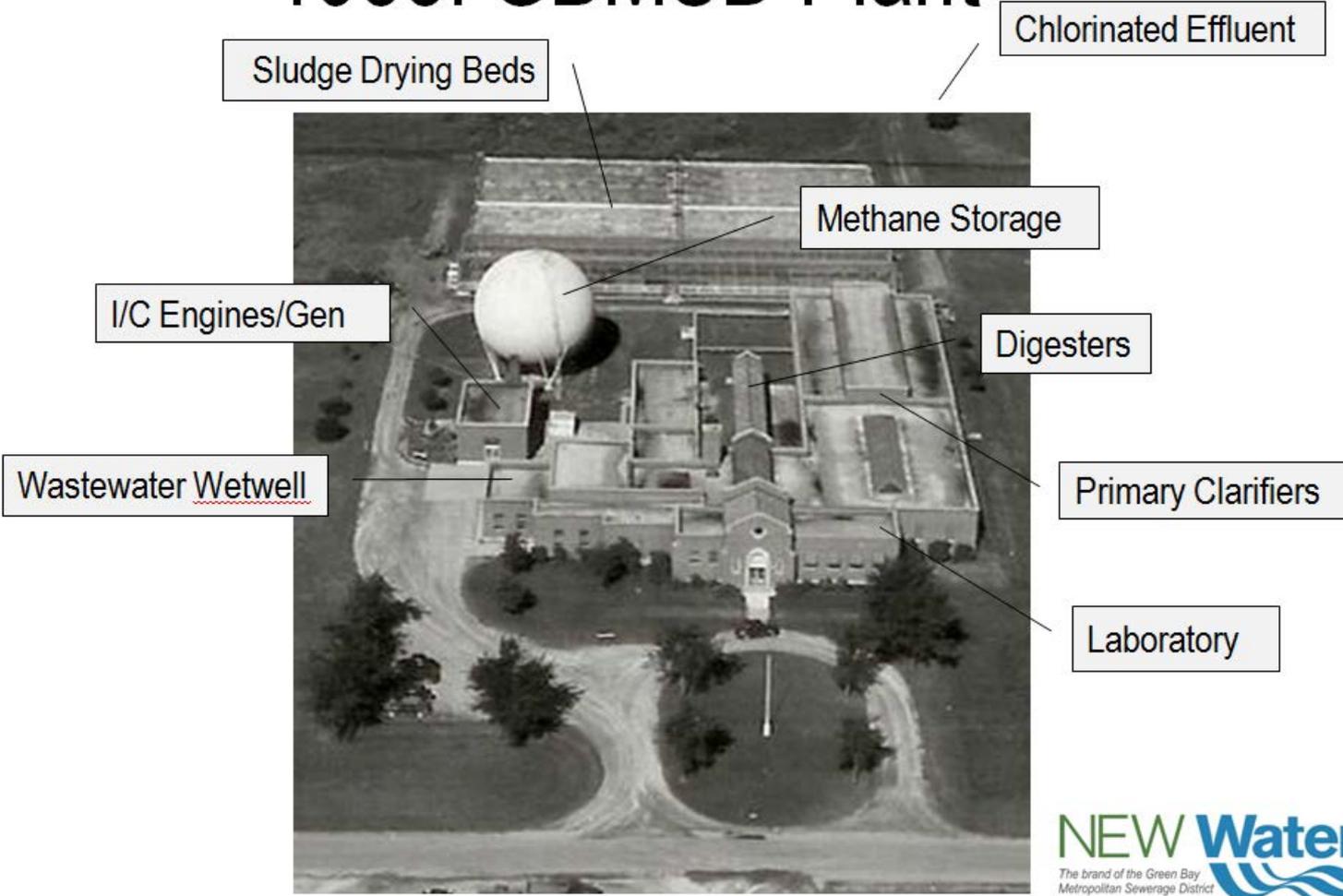
R2E2 Benefits

- Accept different wastes (i.e. dairy, sugar, and food processing) that can boost energy production
- Use approx. 90% less natural gas than current system
- Struvite is a slow release fertilizer; \$400,000/year revenue



*Back to the Future:
Resource Recovery and Electrical Energy (R2E2)*

1935: GBMSD Plant



Thank You!

Questions / Comments?

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Stay connected with us:

