Welcome!
R2E2 Open House

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NEW Water

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Who is NEW Water?

- Brand of the Green Bay Metropolitan Sewerage District, serving the community since 1932
- Treating on average 38 million gallons per day
- Clean water stewards 24/7/365
What does NEW Water do?

- Operates two facilities in Green Bay and De Pere
- Provides wholesale services to 18 municipal customers, 285-square mile service area
- Treats wastewater, nonstop: flows and loads – solids and liquids
What are “solids” in wastewater?

- Wastewater is 99.7% liquid and 0.3% solids
- Organic and inorganic materials found in human, household, and industrial wastewater (e.g. sand, cinders, coffee grounds, seeds, fats, oils, greases, soaps, paper fibers, and animal or vegetable life)
- Pretreatment Program monitors and regulates the wastewater sent from significant industrial users
What is R2E2?

- New solids handling facility
- R2E2 = Resource Recovery and Electrical Energy
- New approach, new attitude: viewing what’s sent as a resource rather than waste
Why is R2E2 needed?

- New environmental regulations
- To replace aging infrastructure
- Needs for increased capacity
Project approach: Collaboration

• Collaborative approach
  ▪ Used three advisory committees external, internal, and Commission

• Meeting objectives:
  ▪ A list of attributes and weighting to decide alternative
  ▪ Input on strengths and weaknesses of the selected alternative
Stakeholder Advisory Committee

• Municipal and industrial customer working group
  ▪ **Communities**: Allouez, Ashwaubenon, Bellevue, De Pere, Green Bay, Hobart, Howard, Lawrence, Ledgeview, and Suamico
  ▪ **Companies**: Fox River Fiber, Georgia-Pacific, JBS, Pioneer Metal, Thilmany, US Paper Mills, Procter & Gamble, and Sanimax
  ▪ **Civic Group**: Green Bay Area Chamber of Commerce
Alternative selection researched 72 possible options
Final six alternatives

- Thoroughly evaluated six alternatives
  - Alternative 2: Incineration with Energy Recovery
  - Alternative 3A: Digestion with Thermal Processing
  - Alternative 3B: Digestion with Thermal Processing and Electrical Generation (known as R2E2 Project)
  - Alternative 11: Composting
  - Alternative 14: Incineration and Drying
  - Alternative 16: Rehabilitate Existing Solids Handling System
Selected alternative

• R2E2 Project Highlights (Main Components)
  • Anaerobic Digestion for biogas production and solids reduction
    o Two Silo Shaped Digesters
    o 110 Feet Tall
    o 2.2 MGD Capacity Each
    o High Strength Waste Receiving
  • Co-generation equipment for electrical energy generation
    o Two Caterpillar I/C Engines
    o 2.0 MW Each
Selected alternative

Silo-Shaped Digesters at Broad Run WRF in Loudoun County, VA, USA
How will R2E2 work?

- Two anaerobic digesters will break down biodegradable material in the absence of oxygen.
- Digesters will produce a methane gas, which will be captured and processed into a biofuel, which will be used to produce electricity.
- Heat will be recovered from an incinerator, which replaces two existing 38-year-old incinerators. The heat will be used for building heat and electrical production.
Main components of R2E2

• R2E2 Project Highlights
  - Dewatering – centrifuges, thickening, and co-thickening
  - Solids Drying
  - Fluid Bed Incineration
  - State of the art air pollution control equipment to reduce air pollutants and meet new standards
Nutrient recovery

- Chemical precipitation of nutrients from wastewater in the form of struvite
- Removes phosphorus and nitrogen from solids processing recycle stream
- Reduces maintenance to manually remove struvite from equipment and piping
- Produces a beneficial re-use product: Commercial fertilizer
What’s going on now with R2E2?

Summary: Design finalization, utility relocates, preparation for next year’s construction
Foundation walls of Switchgear Building showing duct bank penetrations, waterproofing, insulation
Duct Bank E, sloped under storm sewer and existing duct bank
Completed Duct Banks X, Y, and C at EMH-5A
<table>
<thead>
<tr>
<th>Description</th>
<th>Estimated Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract 34 – Bidding</td>
<td>Early 2015</td>
</tr>
<tr>
<td>Contract 34 – Digestion &amp; Solids Facilities Construction</td>
<td>Mid 2015 – Mid 2017</td>
</tr>
<tr>
<td>Contract 34 – Digestion &amp; Solids Facilities Commissioning</td>
<td>Mid 2017 – End 2017</td>
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<tr>
<td>Contract 34 – Digestion &amp; Solids Facilities Operational</td>
<td>End 2017</td>
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<tr>
<td>Contract 34 – Digestion &amp; Solids Facilities Optimization &amp; Emissions Testing</td>
<td>Mid 2017 – Mid 2018</td>
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<tr>
<td>Contract 34 – Existing Solids Facilities Shutdown</td>
<td>End 2017</td>
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<tr>
<td>Contract 35 – Existing Solids Building Demolition &amp; Site Restoration</td>
<td>2018</td>
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Budget summary

- Project Budget Summary
  - $147M capital cost ceiling
  - $146M current engineer’s estimate

- Zero Delta Process
  - Process to maintain the capital cost ceiling
  - Focuses on prioritizing project components
What are the benefits of R2E2?

• Generates about 50% of NEW Water’s energy needs in the first year (about $2.2M in savings)

• Reduces greenhouse gas (CO2) emissions by approx. 22,000 metric tons per year, which is the same as removing about 15,000 vehicles from the road

• Uses about 90% less natural gas

• Harvests a beneficial reuse product for commercial sale: Fertilizer
Why does R2E2 matter?

• Dependable solids handling is crucial to an effective wastewater treatment facility

• NEW Water treats water and returns clean to the environment - nonstop

• Clean water is essential to our economy, environment, quality of life
Cleaning the Bay, 38 million gallons per day
Thank you for coming!

Questions / comments?

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Connect with us:

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