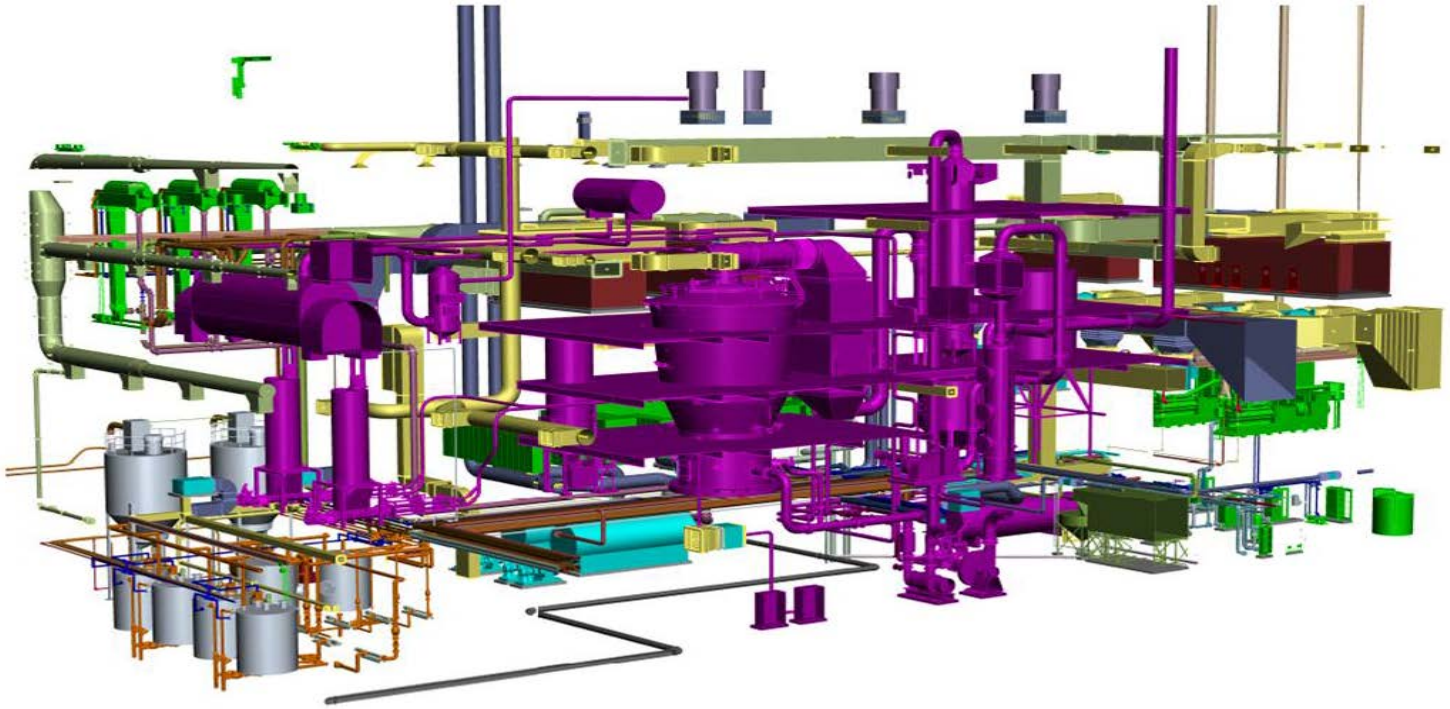
Welcome!

R2E2 Open House



Tom Sigmund

Executive Director

NEW Water

October 20, 2014

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

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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

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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

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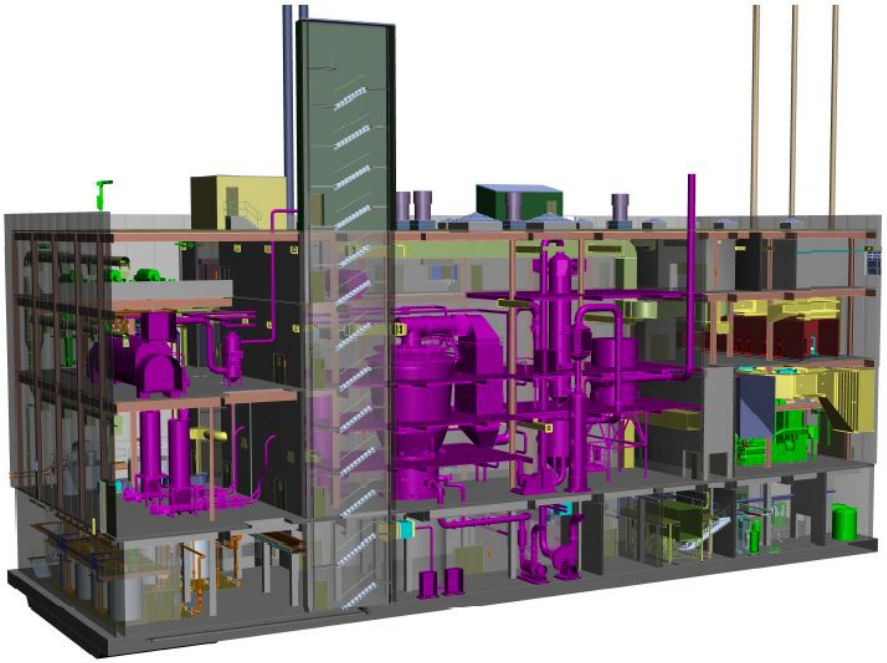
What is R2E2?

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



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Why is R2E2 needed?

- New environmental regulations
- To replace aging infrastructure
- Needs for increased capacity

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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

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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

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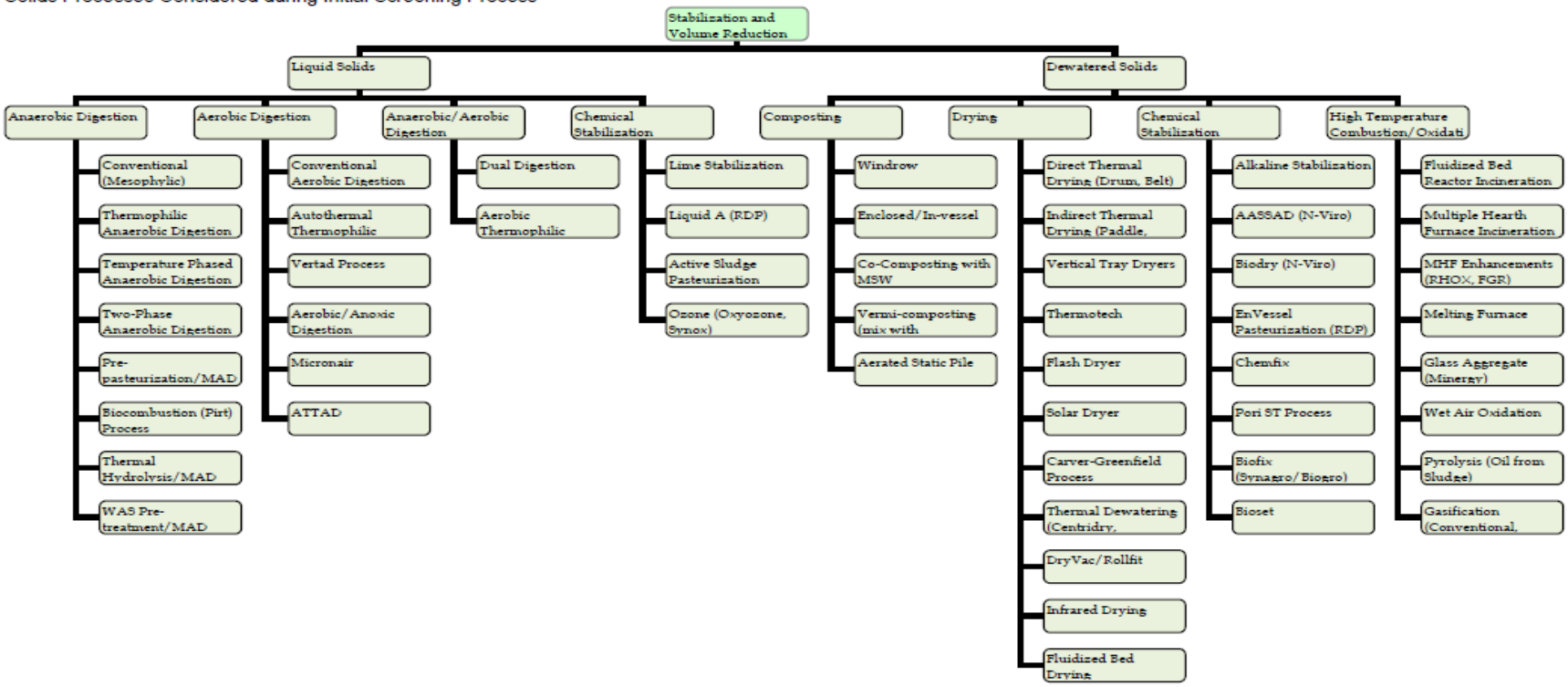
Alternative selection

researched 72 possible options

FIGURE 3
Solids Processes Considered during Initial Screening Process



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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

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Selected alternative

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

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Selected alternative

Silo-Shaped Digesters at Broad Run WRF in Loudoun County, VA, USA

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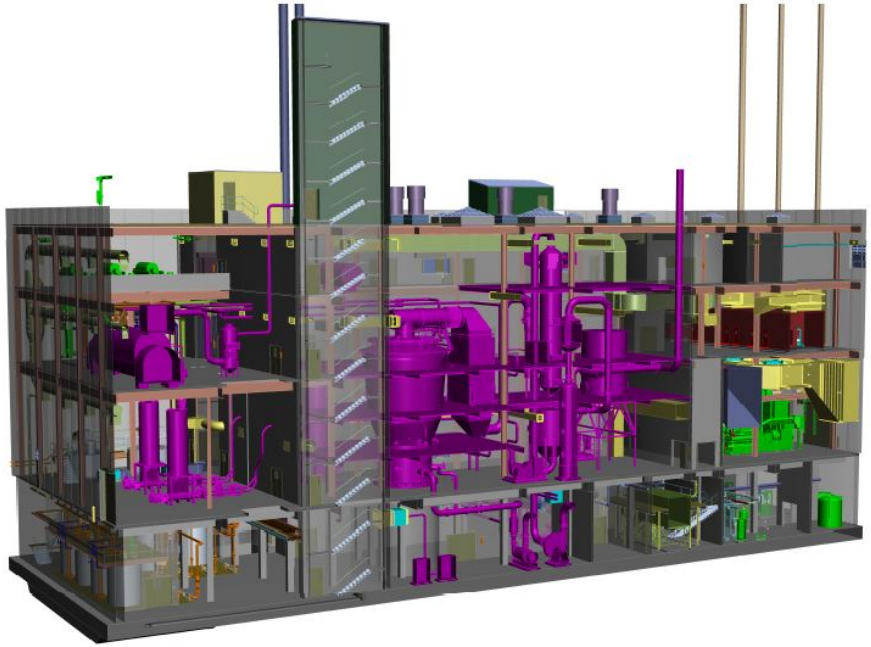
How will R2E2 work?

- 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



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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

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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

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What's going on now with R2E2?

Summary: Design finalization, utility relocates, preparation for next year's construction

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Foundation walls of Switchgear Building showing duct bank penetrations, waterproofing, insulation

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Duct Bank E, sloped under storm sewer and existing duct bank

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Completed Duct Banks X, Y, and C at EMH-5A

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Timeline

Description	Estimated Dates
Contract 34 – Bidding	Early 2015
Contract 34 – Digestion & Solids Facilities Construction	Mid 2015 – Mid 2017
Contract 34 – Digestion & Solids Facilities Commissioning	Mid 2017 – End 2017
Contract 34 – Digestion & Solids Facilities Operational	End 2017
Contract 34 – Digestion & Solids Facilities Optimization & Emissions Testing	Mid 2017 – Mid 2018
Contract 34 – Existing Solids Facilities Shutdown	End 2017
Contract 35 – Existing Solids Building Demolition & Site Restoration	2018

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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

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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 (CO_2) 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

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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

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Cleaning the Bay, 38 million gallons per day

Thank you for coming!

Questions / comments?

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www.newwater.us

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