



R2E2 Update

Stakeholder Committee

May 14, 2013





Agenda

- R2E2 Updates Since Last Meeting
- Value Engineering
- Industrial Discharger Pretreatment
- Schedule – What's next
- Open Discussion





R2E2 Update

- Marquette University study of anaerobic digestion of GBF plant sludge and selected high strength wastes
- Demonstrated that the combined wastes could be readily digested and provided data for sizing the digestion tanks. Proposed design: two 2.5 million gallon capacity tanks
- Pilot test also produced gas samples that were analyzed for heat value and contaminants





Digestion Samples & Centrifuge Pilot Testing

- Samples from the pilot test were distributed to 5 centrifuge vendors
- All vendors reported a lower cake solids concentration than presumed during Facility Plan (FP) —20-23% vs 25% assumed in FP based on other similar plant centrifuge performance
- Cake was also analyzed for caloric value which was also lower than assumed during FP





Digestion & Centrifuge Pilot Testing

- So what does this mean?
- Essentially that the cake will require fuel for combustion using the original concept developed in FP
- Current design: a dryer that uses the recovered incinerator exhaust heat to dry the cake from 20% to between 37 and 40% solids
- Resulting dried cake will be autogenous using a cold wind-box reactor design





Basis of Design Report

- Team completed the Basis of Design Report (BODR) with significant input from NEW Water staff
- After providing training for staff in each new unit process, NEW Water participated in design workshops
- Cost reduction began in FP and the team continued to propose ideas to improve the design and lower construction costs in developing the BODR





Cost Reduction Ideas

- Use existing GBTs to co-thicken primary and secondary sludges ~ \$1,000,000
- Re-use of recently re-tubed boiler ~ \$500,000
- Re-use flood event pumps ~ \$100,000
- Re-use abandoned DAF tankage to receive high strength wastes for co-digestion ~ \$500,000
- Re-use existing dewatering feed tanks ~ \$300,000





Facilities Changes

- Team modified the [original](#) concepts and consolidated the [multiple](#) buildings = decrease
- The digestion tanks were reconfigured into deep cone silos to reduce operating costs and reduce footprint = no change
- Will re-use a section of existing building basement as a service tunnel and pump room = decrease





Project Scope Adjustments

- As usual, changes are accompanied by increases and decreases in construction costs
- Changing from steam boiler and steam turbine on hot wind-box incinerator exhaust to a dryer on a cold wind-box incinerator exhaust = decrease
- Using existing GBT for co-thickening PS and WAS, eliminated GT upgrade and improved process performance = decrease





Project Scope Adjustments

- Changing from mechanical ash dewatering to ash decant cells = decrease
- Changing to higher capacity cogeneration units to better utilize available biogas and reduce more purchased electricity = increase





Cost Estimate

- Team updated the cost estimate in BODR
 - Facility Plan = \$147,000,000 in 2011 dollars
 - BODR = \$136,000,000 in 2013 dollars
 - = \$128,000,000 in 2011 dollars
 - = \$149,000,000 in 2016 dollars (midpoint of construction)
- Recognize that BODR estimate is a level 4 cost estimate





Value Engineering

- The Value Engineering draft report is being reviewed by NEW Water and the design team to confirm suggested potential savings identified
- Findings will be incorporated into final VE report in late May
- Design team will implement recommendations accepted by NEW Water in the next phase of design





Value Engineering

- A recommendation that the design team plans to accept is to bid a separate early contract for the new primary electrical substation
- This will allow all service relocations and all power restored to the existing operation and this will not be interrupted during subsequent construction
- Also clears the location for new facilities so that GC can start excavation on day one





Industrial Discharger Pretreatment

- A major industrial contributor, Fox River Fiber (FRF), has advised NEW Water that they will pre-treat beginning in 2014
- No comment from Thilmany for pretreatment
- Design team determined that this would reduce sludge loads by ~ 8%
- Because of available sizes the cost for:
 - centrifuges, cogeneration units, incineration, and dryer would not change





Industrial Discharger Pretreatment

- The following can be reduced in size:
 - Digester vessels and associated ancillary equipment, including mixing pumps, heat exchangers, biogas storage, conditioning, and flares, but not the Control Building
 - Centrifuge feed pumps and cake pumps
 - Polymer system
 - Ash thickening system





Industrial Discharger Pretreatment

- The following would not be reduced in size:
 - Odor control system
 - Storm water treatment system
 - Septage and co-digestion receiving
 - Nonprocess spaces: Control Room, locker rooms, etc.
 - Demolition scope
 - Modifications required for co-thickening
 - Plant heating boilers
 - Rehabilitation of dewatering feed sludge storage tanks
 - Rehabilitation of existing solids building as a tunnel





Industrial Discharger Pretreatment

- The estimated construction cost reduction as a result of FRF pre-treatment is \$2,500,000 to \$3,000,000 (2%)





Design Schedule

- Revise the BODR to account for VE recommendations and the major user pretreatment May/June 2013
- Issue pre-purchase bids to qualified vendors :
 - Incinerator and dryer package June 2013; award August 2013
 - Centrifuges package June 2013; award August 2013
 - Co-generators package September 2013 award November 2013
 - Primary Switchgear September 2013 award November 2013





Design Schedule

- 30% Design review workshop including estimate update August – September 2013
- Process Hazard Analysis November 2013
- 60% Design review workshop including estimate update January/February 2014
- Begin construction in late 2014, substation would begin in spring 2014?





Open Discussion





Next Stakeholder Meeting

- Mid – September 2013





R2E2 Update

Thank you for coming!





