BEING A BEER HERO TO ACHIEVE NET ZERO

PRESENTATION BY:
CHUCK SCHROEDER, ASSISTANT ESD MANAGER
CITY OF GRAND RAPIDS
LEXIE BURTT, GRADUATE ENGINEER
HUBBELL, ROTH & CLARK
WATER RESOURCE RECOVERY FACILITY

- Design 61.1 MGD
- Wet Weather Peak 90 MGD
- Avg. Daily 40 MGD
- 270,000 served
- 80,000 retail customers
- 11 Customer Communities
- 1100+ miles of sewer lines
- 400+ miles of storm lines
BEER CITY, USA
2010 VERSUS 2015 LOAD PROJECTIONS
(POPULATION BASED)
**SURCHARGE CUSTOMERS**

- **Residential**
  - 45,000 lbs/day

- **Surcharge Customers**
  - 72,315 lbs/day
    - allocated by permit

- **Safety Allocation**
  - 16,800 lbs/day

- **Remaining BOD Allocation**
  - 29,763 lbs/day
CONSIDERATIONS

- Require Pretreatment
- Expand WRRF – Add third Aeration Basin 90-110 million
- Concentrated Waste
- Digestion
  - Renewable Energy
  - Stabilize Rates
  - Reduce Revenue Requirements
  - Hauled Waste (Liquid Industrial By-Products) - Regional
  - Reduce Solids
  - Minimize Struvite by Capturing Phosphorus
OPTIONS FOR GROWTH

Customers install onsite treatment or haul wastewater offsite
OPTIONS FOR GROWTH

Expand the Water Resource Recovery Facility
OPTIONS FOR GROWTH

- Remove Loadings from main plant
- Equalize Plant Loadings
- Reduce Biochemical Oxygen Demand (BOD) via Digestion
- Carbon recovery through Methane Production
- Combined, Power and Heat
HOW BIODIGESTION WORKS

Recirculation of the liquid fraction and temperature and/or biochemical adjustments

Biodigester with free bacterial strains
FOOD WASTE

Food waste separated from other MSW in RTS → Food waste → To various food waste recycling facilities (e.g., composting plant, swine and fish feed plant, OWTF)

Portion of food waste sent to sewage treatment works and mixed with sewage sludge

Wastewater treatment → Sewage sludge → Anaerobic co-digestion → Biogas to electricity for on-site use
Project Goals
- Deliver separated high strength waste to WRRF
- Initially to equalize for improved treatment during low loading periods
- Future- gas production

High Strength Waste from who?
- Founders (Main Brewery and Tap Room)
- SET Environmental- landfill leachate receiving station
- Potential future connection by Coca Cola or other breweries
DESIGN DETAILS

- **Pipe Material**
  - DIP Class 53
  - C-900 PVC SDR 18 & SDR 25

- **Pipe Size**
  - **Velocity**
  - **Customer discharge flow - 2MGD**
    - Founders
    - SET Environmental

- **Vertical alignment**
  - Air relief valves at high points

- **Isolation valves**
  - 3-10” forcemain
  - 6” SET service
  - 6” bypass
  - 6” Potential Coca Cola

- **Utility Conflicts**
Existing Utility Conflicts

- 84" Force Main
- MARB Flushing Water PS
- Plaster Creek Bridge
- 8'x6' Box and 96" Sewers
- 72" PERB Sewer
- 46" Water Main
- CSX Track, 17"x12' ES Storm Trunk
- Large Gas Transmission Mains
- Live 72" Brick Sewer
- 54" Storm Sewer
- Abandoned 84" Brick Sewer
- Dual 12'x8' MARB Inlet Sewer
- Dual 42" Force Mains
FORCEMAIN PROJECT

- 9,000’ of 10” forcemain installed from Founders Brewery to the Water Resource Recovery Facility (WRRF) to convey concentrated waste separate from influent sanitary flow.

Details

- MDEQ & CSX permits required
- Project duration- May 2017 through August 2018
- Project Bid with 2 Options;
  - Common Route + Route A
  - Common Route + Route B – SELECTED ROUTE
INSTALLATION METHODS

- Open-cut
- Horizontal Directional Drill
- Jack and Bore
- Pipe Ramming
- Bracket Mounting within Conduit
  - Plaster Creek Bridge Conduit
  - Trunk Sewer
PIPE RAMMING
PLASTER CREEK BRIDGE CONDUIT
2,700 LF OF FUSIBLE PVC PULLED INTO APPROXIMATELY 12’X15’ TRUNK SEWER
8 EXPANSION JOINTS SPACED 360' APART WITH ANCHOR SUPPORTS AT MIDPOINT TO ISOLATE MOVEMENT OF EXPANSION JOINT FOR \( \Delta T = 60 \, {\circ} F \)
GVRBA CONTROL BUILDING- CW AT WRRF

- **Original Purpose**
  - 2 storage tanks (Primary Sludge & Waste Activated Sludge)
  - Only the Primary Sludge storage tank was being used
  - 2 pumps to recirculate storage tanks volume
  - 2 pumps to transfer sludge

- **Modifications- After CW Purpose**
  - 1 additional recirculation pump- 100 HP Wemco Chopper Pump
  - Remove aeration diffuser in WAS tank and installed vortex breaker
CW STORAGE TANK
QUESTIONS?
Visit us online at http://www.grcity.us/esd

Contract information;
Chuck Schroeder
cshroeder@grcity.us

Lexie Burtt
aburtt@hrcengr.com