SO$_2$ Scrubber System
Implementation at WSACC’s Solids Incineration Facility

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Agenda

• Facility Background
• Project Drivers / Regulations
• Design
• Construction
• Testing
Facility Background

• Built in 1978
• Located in Concord, NC
• 26.5 MGD capacity
• Serves Cabarrus County, also receives some flow from Mecklenburg County
Solids Handling and Incineration

- Incinerator original to plant (built 1978)
- Imported Biosolids Handling Facility completed in 2013
- Liquid sludge and cake sludge imports from other utilities
Incineration Air Quality Regulations

- WSACC received notice of changes
- Incinerator performance before the scrubber
  - 120 ppm per 2014 stack testing
- Old regulations Vs. New regulations
- Air quality devices that were in place prior to the scrubber (conditioner, Wet Electrostatic Precipitator, etc.)

<table>
<thead>
<tr>
<th>Old SO₂ Requirement</th>
<th>New SO₂ Requirement</th>
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<tbody>
<tr>
<td>250 tons/year</td>
<td>&lt;26 ppm</td>
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<tr>
<td>Year</td>
<td>Event Description</td>
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**Timeline**

- **2010**: WSACC SO₂ emissions were tested and were in excess of pending EPA regs.
- **2011**: New EPA regs on SO₂ were published.
- **2012**: GHD was contracted to assist WSACC with new regs.
- **2013**: Design for scrubber was initiated.
- **2014**: WESP was tested to see if scrubber was needed.
- **2015**: Notice to proceed was given.
- **2016**: Contractor completely finished with punch list. 
  - Deadline to be SO₂ compliant: March 21, 2016
Schedule

• The incinerator had to be able to operate within the new regulations by March 21, 2016

• All testing had to be completed prior to this date

• Penalty for not being compliant
System Design

- Stan Chilson (In-house expert)
- WESP up-fit option was explored
- Many ideas for scrubber placement
- Design the system to limit system shut downs during the construction
- Use of existing tanks and buildings
- Project had many facets
  - Underground water lines
  - Tanks
  - Electrical
  - Metering pumps and skids
  - Structural supports
Down-flow Scrubber Design

- Installed after the WESP
- Would extend from the first floor to the third floor
- Approximately 16 feet 5 inches tall
- The mist eliminator would have to be horizontal
- This configuration was not used
Up-flow Scrubber Design

- Installed after the WESP
- Outside
- Initially not considered due to freeze concerns
- Self-draining due to configuration
- Recirculation tank would be inside the Incinerator Building
- Cost effective
- Less incinerator downtime during construction
SO$_2$ Scrubber Explained
Bidding/Construction

• Equipment procurement attempted
• Contractor bidding
• Wharton-Smith awarded
• NTP issued on November 2, 2015
• Completion date set for March 31, 2016
Construction (continued)

• Value engineering performed

• Field Changes
  – Unknown duct bank
  – Foundation
  – Valve at water tower
  – Ductwork supports

• Long night with water line
Construction (continued)

New FRP Sections

Housekeeping Pad for Tank

Scrubber Pad Form Work

Structure Assembly

Chemical Feed Skid

Structure Placed on Pad
Construction (continued)

• March 2016 construction neared the end

• Contractor finished in time to do preliminary testing

• More Field Changes
  – Water hammer at recirculation tank
  – Pump head concerns
  – Tank vent
  – Differential pressure gage readings
Final Testing

- Testing was performed by GEL in the presence of GHD, WSACC, and Wharton-Smith

- NCDAQ was on-site to receive results immediately
Deadline Day

- March 21st, 2016

- The stack testing was successfully completed and the preliminary results were given to the EPA

- The official results took approximately 3 weeks

- The final SO₂ result was 10.66 ppm

- We passed!
Successful Project

- The project was officially completed with the construction phase on April 30, 2016
- 3 change orders were completed for a total cost savings of $1,648.81
Thank You!

- WSACC Administration and all Rocky River Regional WWTP Plant Staff

- Wharton-Smith
Questions?

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