

# Reinhold Environmental Ltd.



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# Improving Aging Scrubbers' Performance

## Topics:

1. Increasing Particulate Capture
2. By-products and By-product Quality

Bill DePriest  
Director Environmental Services  
Sargent & Lundy<sup>LLC</sup>

# Improving Aging Scrubber Performance

## **DRIVERS**

### **Particulate Control**

- Pressure From NSR Actions
- Visible Plume

### **By-Products**

- Increasing Landfill Costs
- Environmental Stewardship

# Improving Aging Scrubber Performance

## Options for Increasing Particulate Control

### Fly Ash

- Increase Liquid/Gas Contact
  - Anti Sneakage Baffles
  - Absorber Tray
- Decrease Spray Droplet Size
- Modify Mist Eliminator

### Condensibles (e.g. $\text{SO}_3/\text{H}_2\text{SO}_4$ )

- Same as Fly Ash +
- Controlled Condensation
  - Particle Growth w/Residence Time
  - “Seed” Particulate

Performance Expectations Very Limited and Highly Dependent on:

- Inlet Loading (Fly Ash +  $\text{SO}_3$ )
- Particle Size

# Improving Aging Scrubber Performance

## Options & Issues: By-Product Production

- Convert to Forced Oxidation
- Potential By-Products
  - Wallboard Feedstock
  - Cement Additive
  - Soil Amendment
  - Light Weight Aggregates
- Design Issues
  - Fly Ash Loading
  - Reagent Quality
  - Fuel Chemistry (e.g. chlorine)
  - Liquids/Solids Residence time (particle growth)
  - Process Operation (pH control)
  - Dewatering System Components
  - Impacts of Performance Additives (e.g. DBA)

# Improving Aging Scrubber Performance

## Options for By-Product Quality Improvement

### Using The Forced Oxidation Gypsum Example:

- Increase Gypsum Particle Size/Shape
  - Liquids/Solids Residence Time
  - Cascade Reaction Tank
  - Process Controls (e.g. pH)
- Contaminant Removal
  - Increase  $\text{SO}_3$  to  $\text{SO}_4$  Conversion ( $\text{O}_2$  stoich, pH, etc.)
  - Fines Purge (Fly Ash, etc.)
  - Chloride Washing
  - Hg Washing
  - Reagent Quality
- Decrease Water Content
  - Improve Particle Size/Shape
  - Fines Purge (Filter Cloth Blinding)
  - Heated Wash Water