

# Sustainable Growth

# Coal Ash Beneficiation



One Source

# BIO

## James Ballan

- **Position:**
  - FLSmidth Inc. – Bethlehem, PA
  - Manager, SCM Group
- **Education:**
  - Mechanical Engineer
  - Lehigh University
  - 12+ Years with FLS in Customer Services
- **Experience:**
  - 13 years in the cement industry for FLSmidth Inc.
  - 6 years commissioning and troubleshooting industrial plants worldwide
  - 3 years Managing Mechanical and Electrical Field Engineers
  - 3 years implementing a Modernization and Optimization group in Brazil
  - In current position since January 2011



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# Agenda

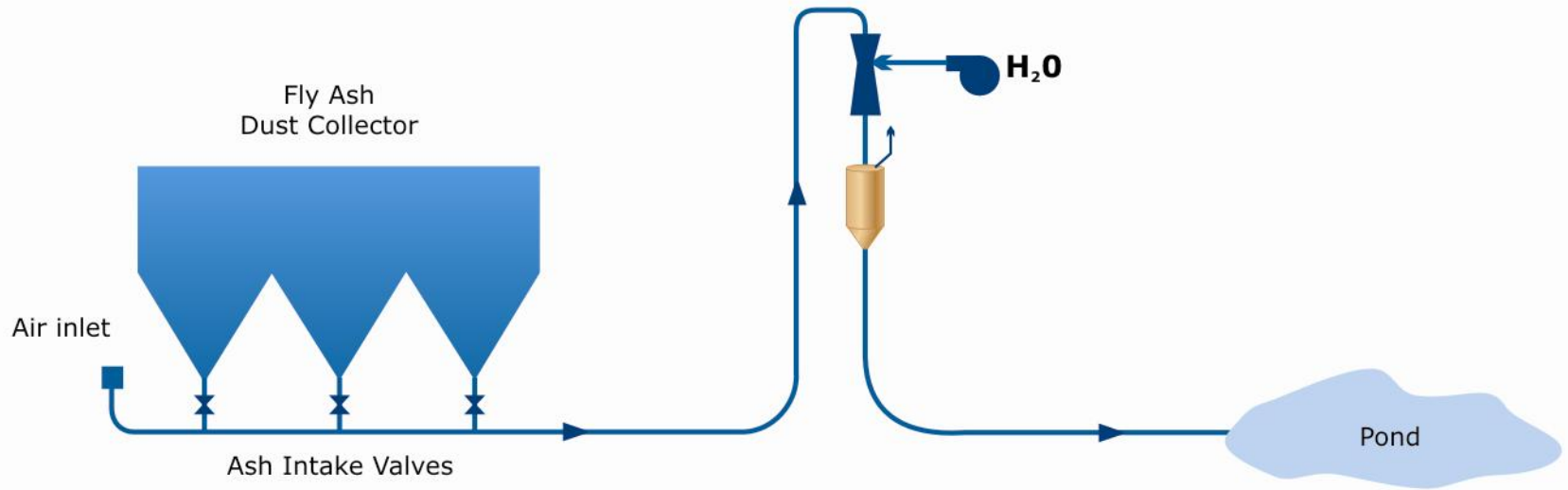
- CCR Components
- The Processes
  - Wet-to-Dry Conversion
  - Ash Cleaning

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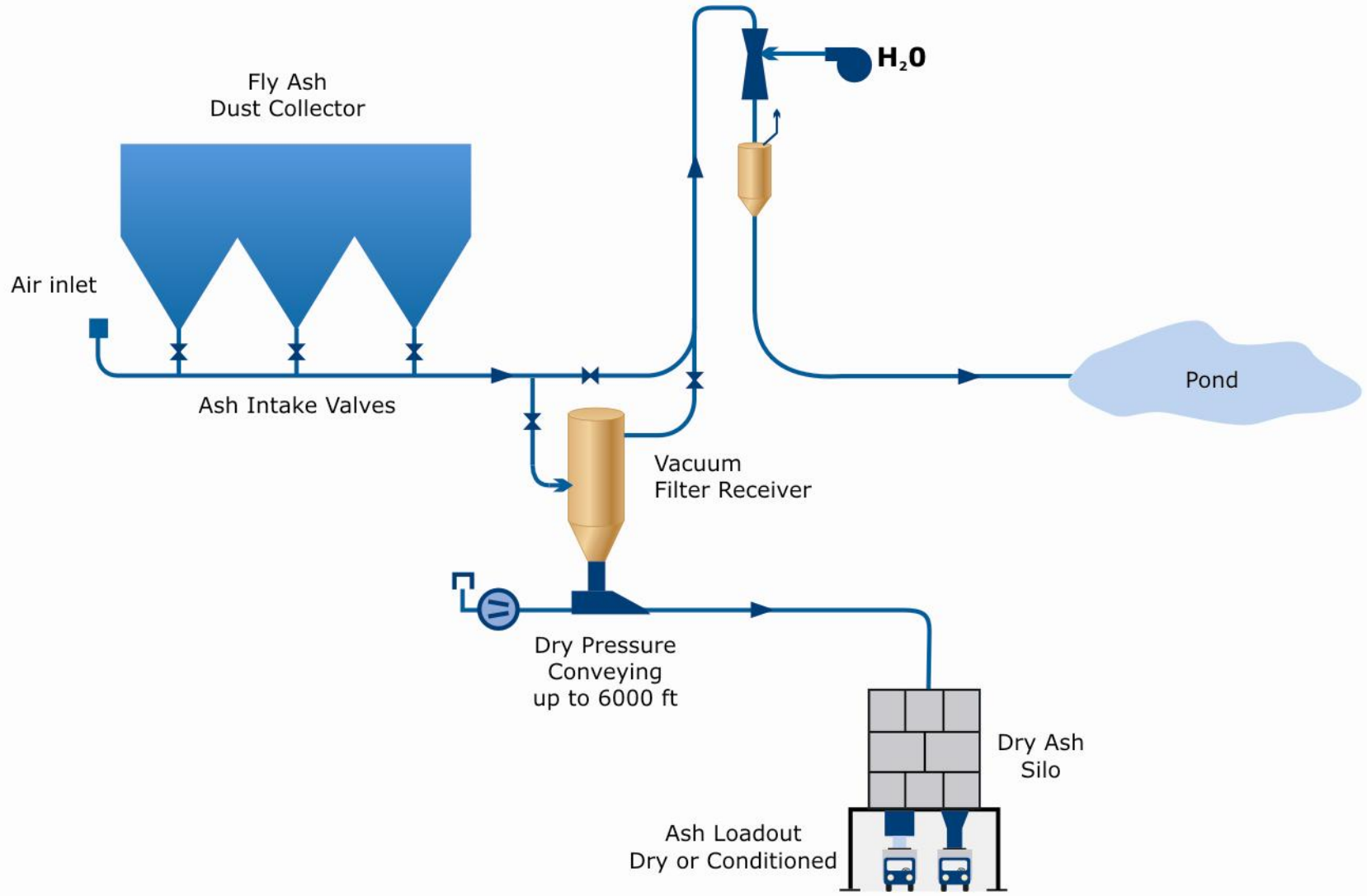
## “Hazardous” Components

- Many CCRs are being classified as “Hazardous” and/or “Unusable” due to
  - Ponds
  - Dusty Emissions
  - Heavy Metals such as Mercury and Cadmium
  - Ammonia
  - Sulphur
  - Unburnt Carbon

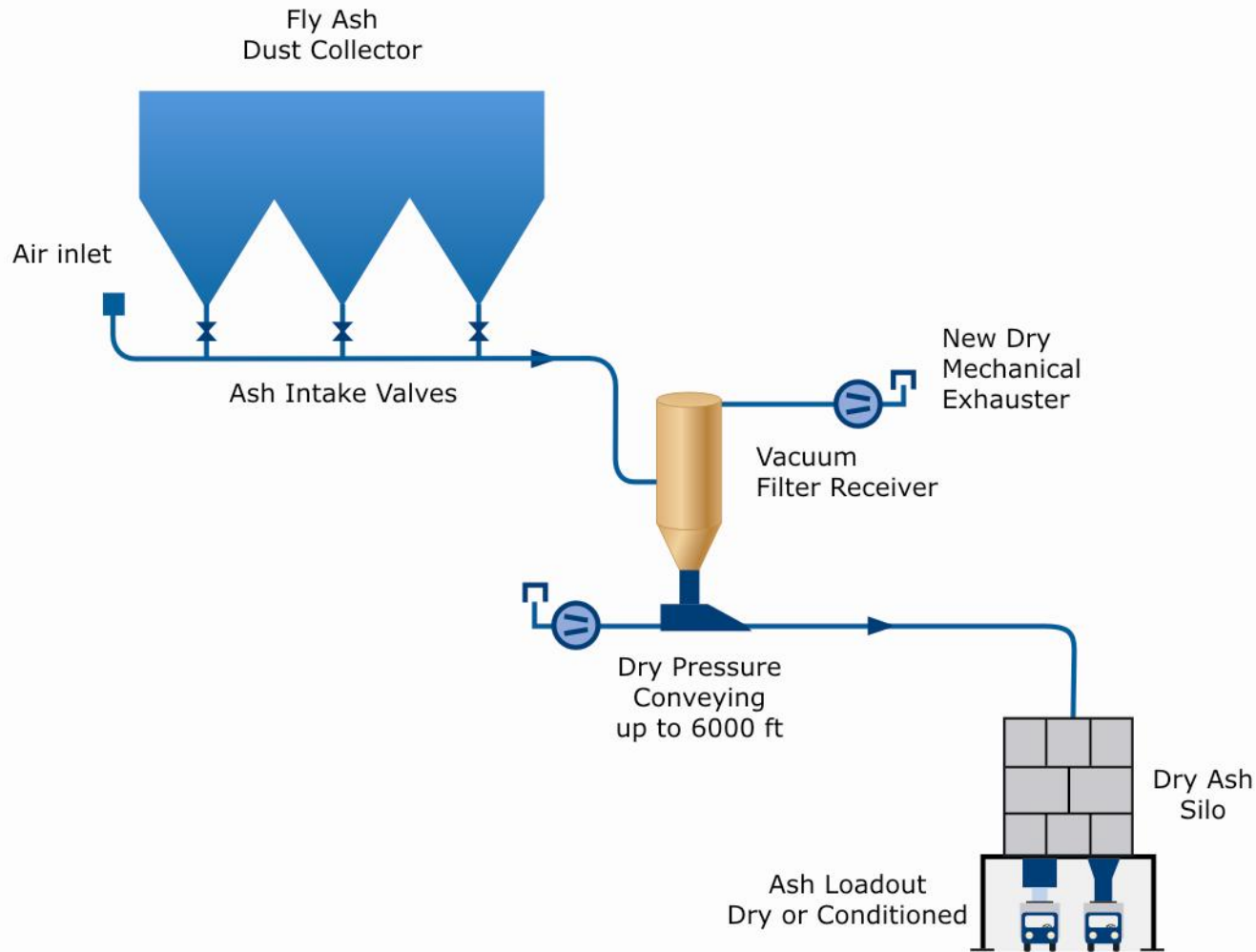
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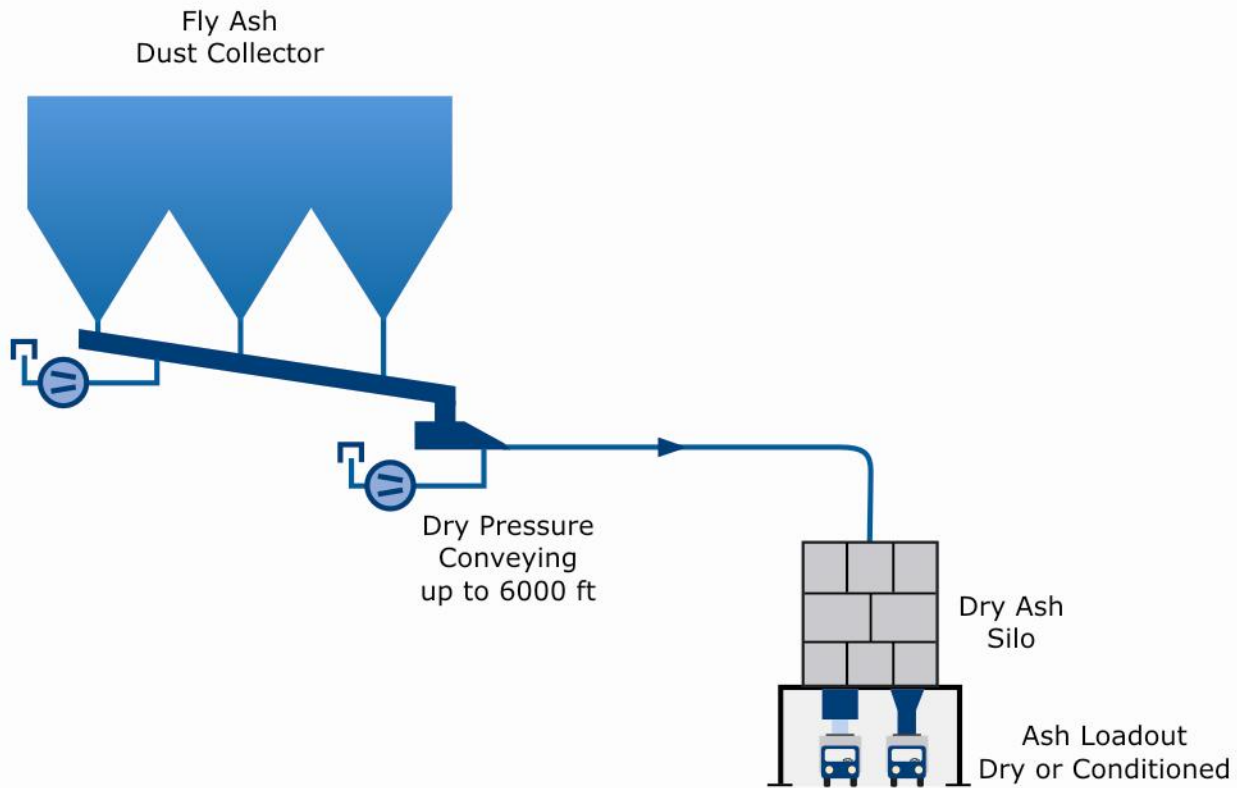
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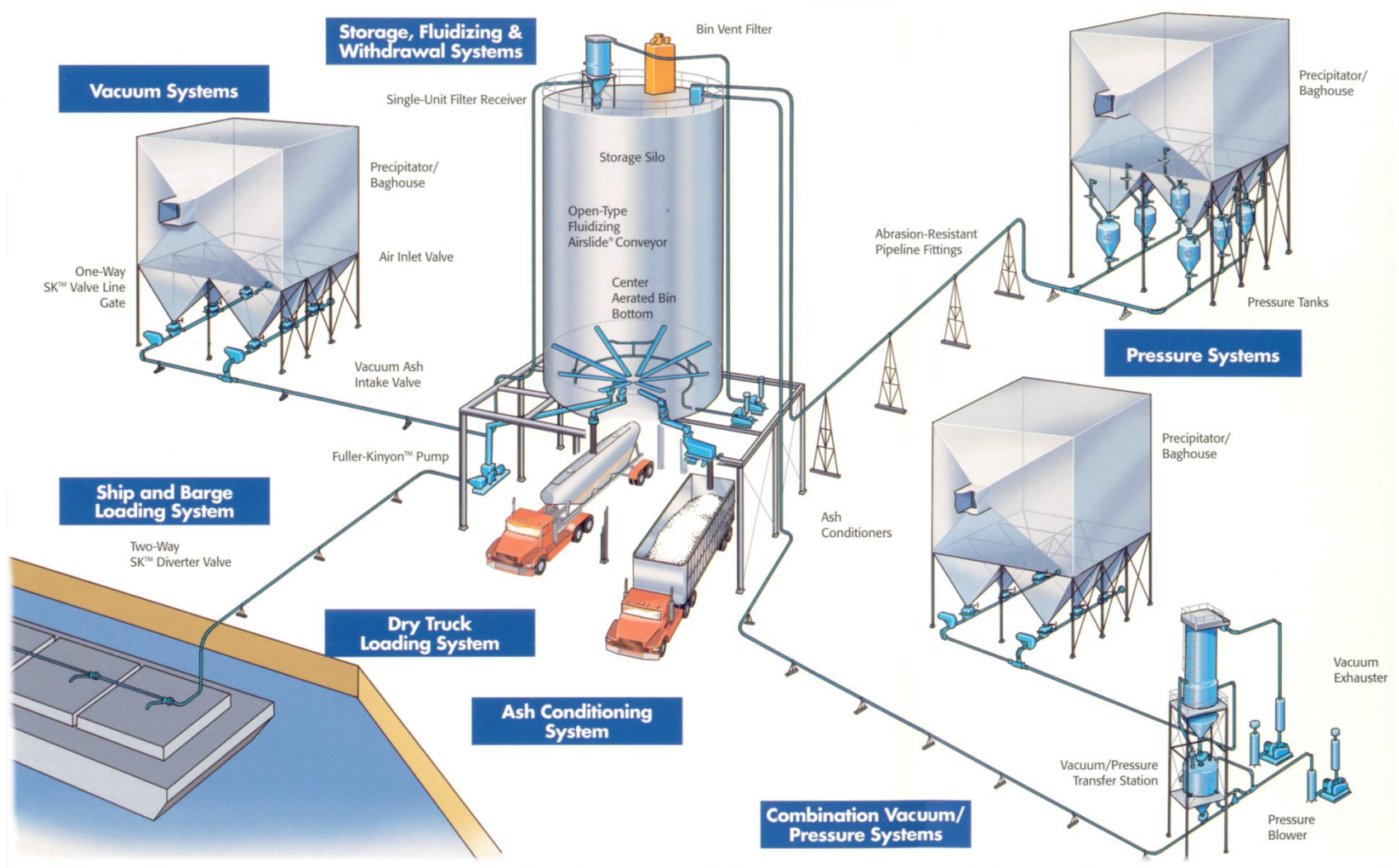
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# Traditional Fly Ash Handling Systems



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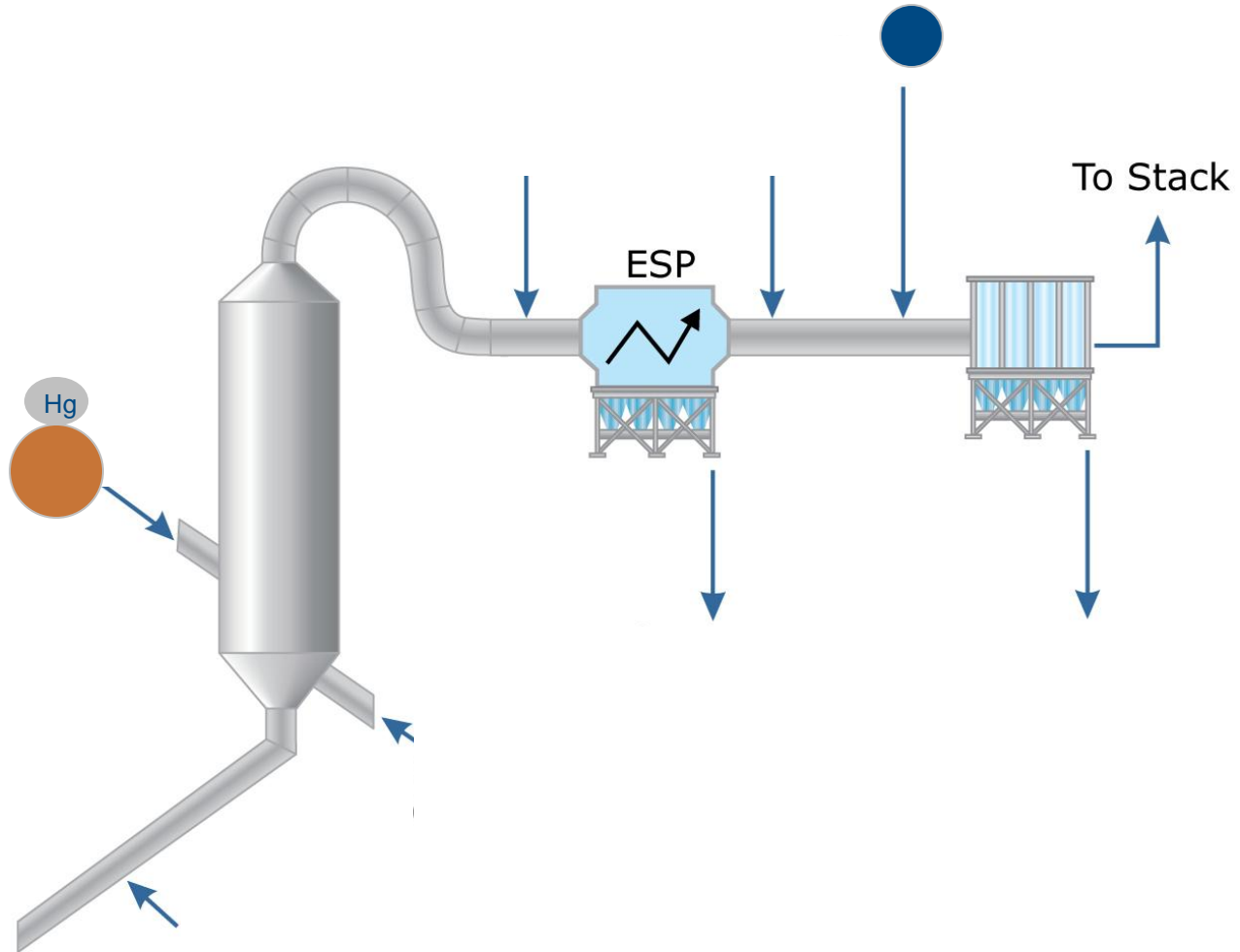
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# PROCESS CLEANING AND COMPLETE BENEFICIATION

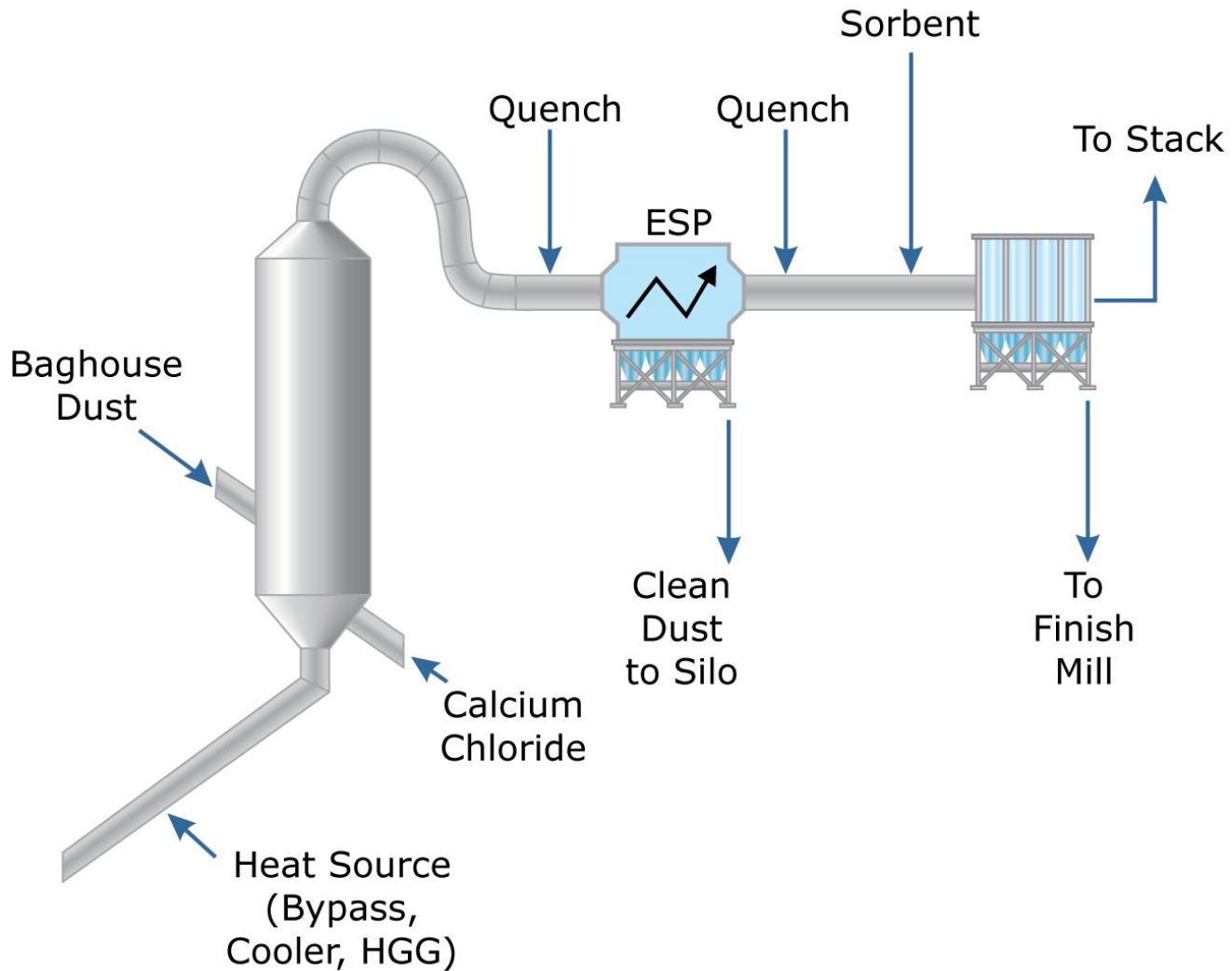


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# FLSmith Mercury Roaster



# FLSmidth Mercury Roaster



## R&D Pilot Testing

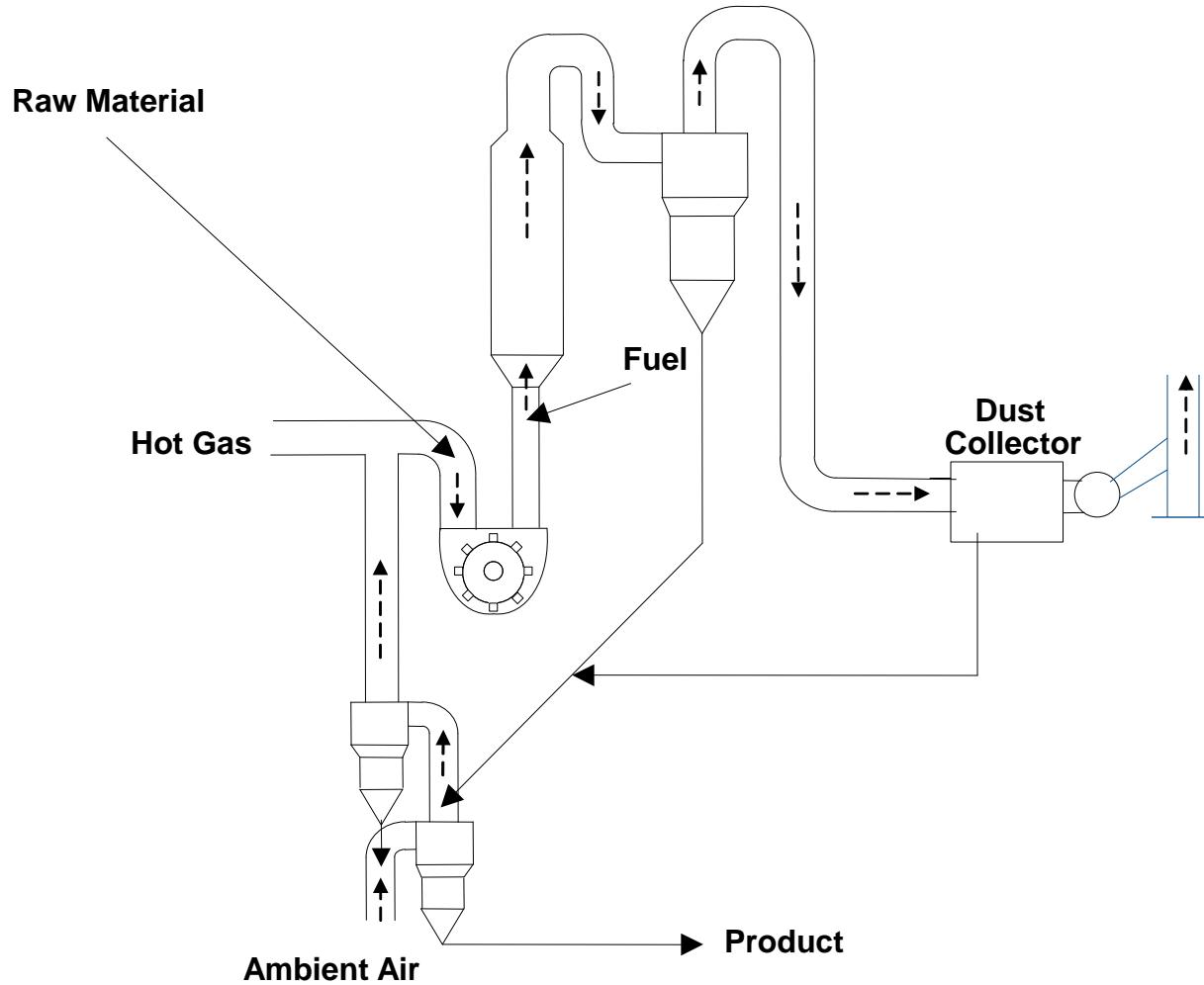
- Testing performed in FLSmidth laboratory proved concept
- Over 95% of mercury removed from baghouse dust
- Allows for up to 75% mercury emission reduction based on mercury cycle simulations
  - Reduction rate depends on mercury capture rate in the main filter



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# Flash Calciner System

Patent Pending

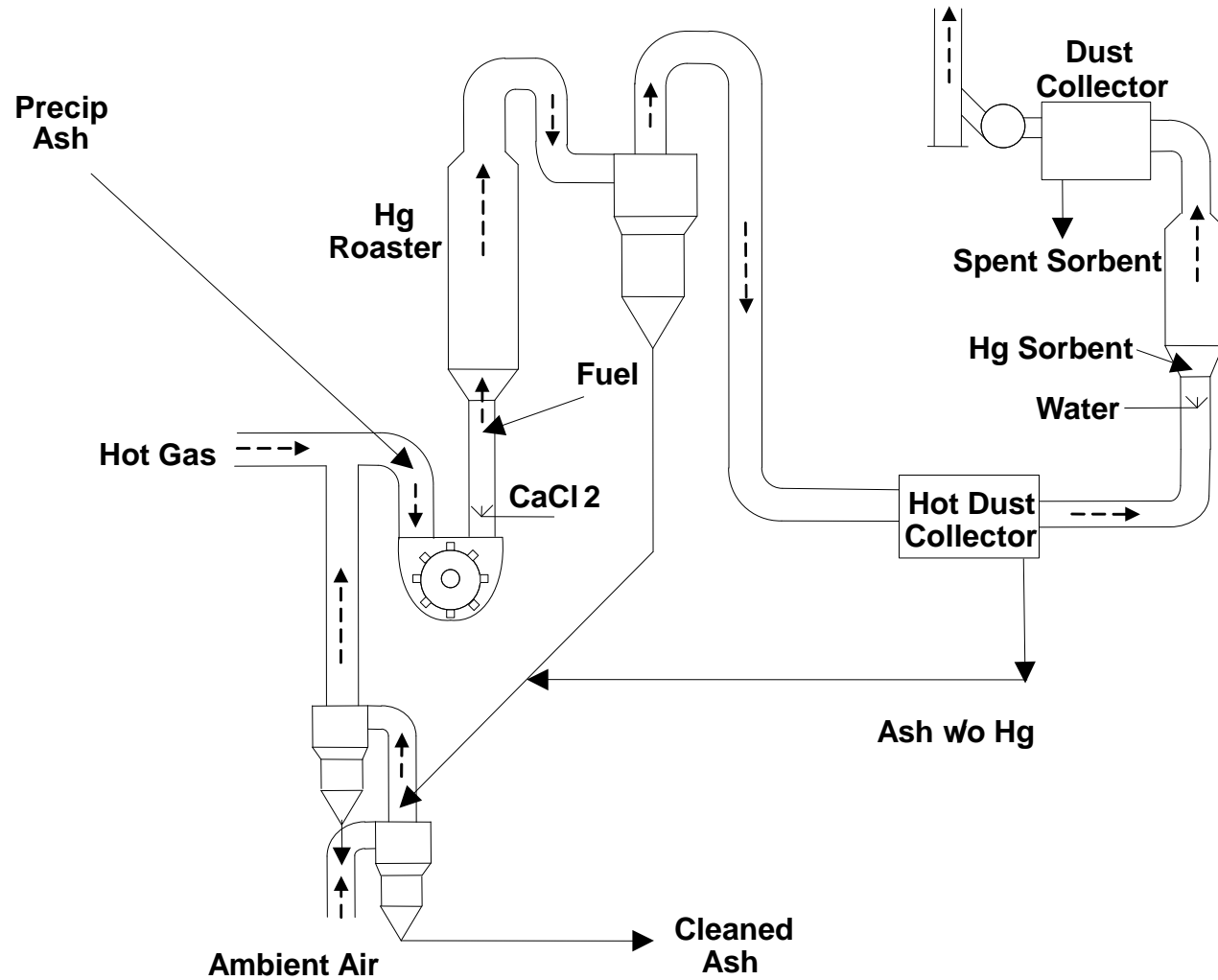


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# Ash Cleaning System – Mercury

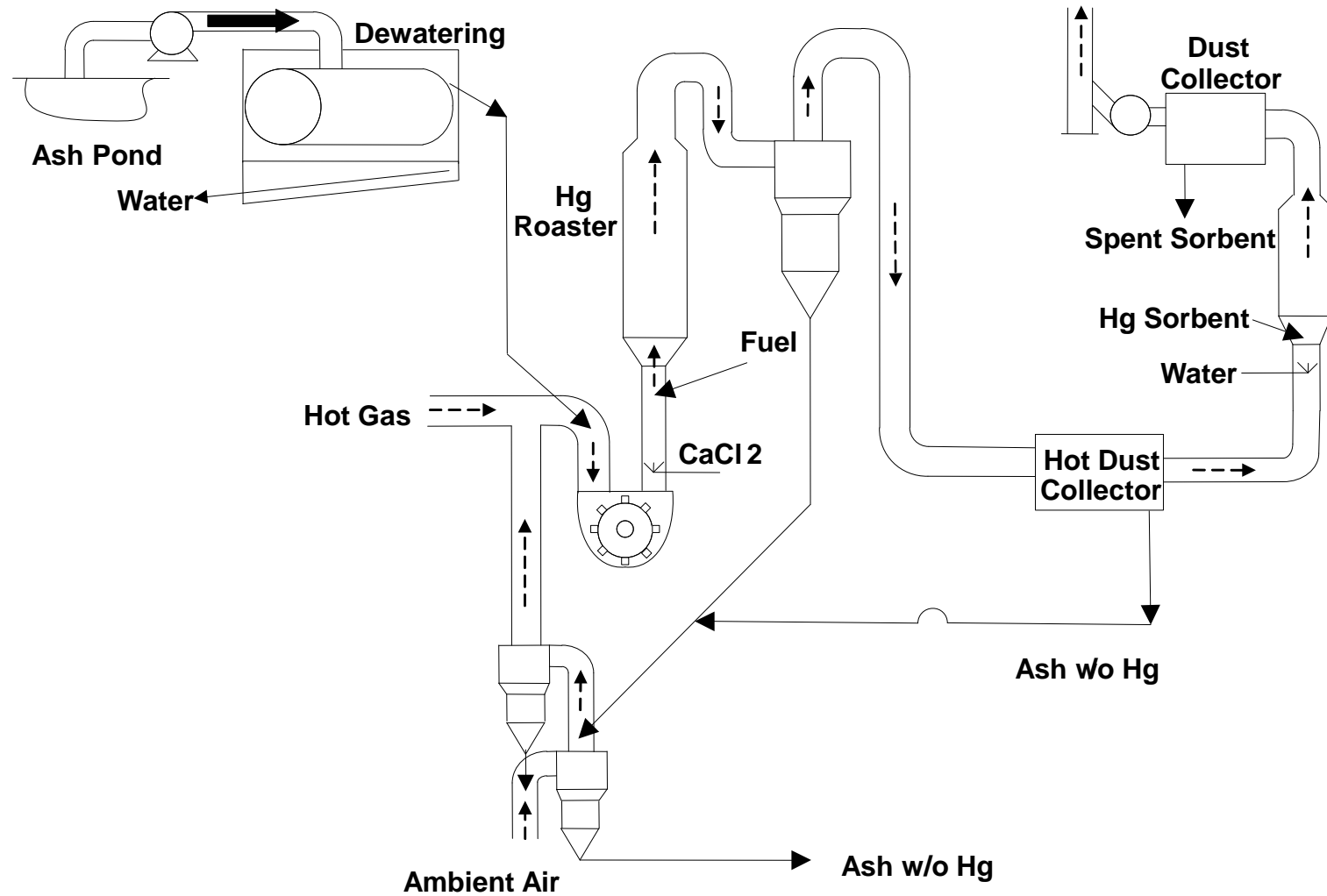
Patent Pending



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# Ash Cleaning System – Upgraded

Patent Pending



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# Thank You



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