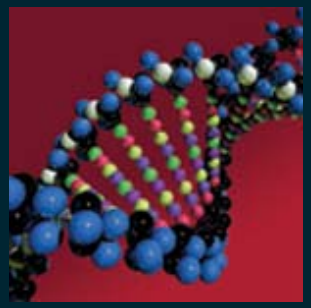
Environmentally Sound Recycling of Spent Lead-Acid Batteries

Air Pollution Control Best Practices



Russell S. Kemp, P.E.

ENVIRON International Corporation

Atlanta, Georgia, USA

678-388-1654

rkemp@environcorp.com

ENVIRON

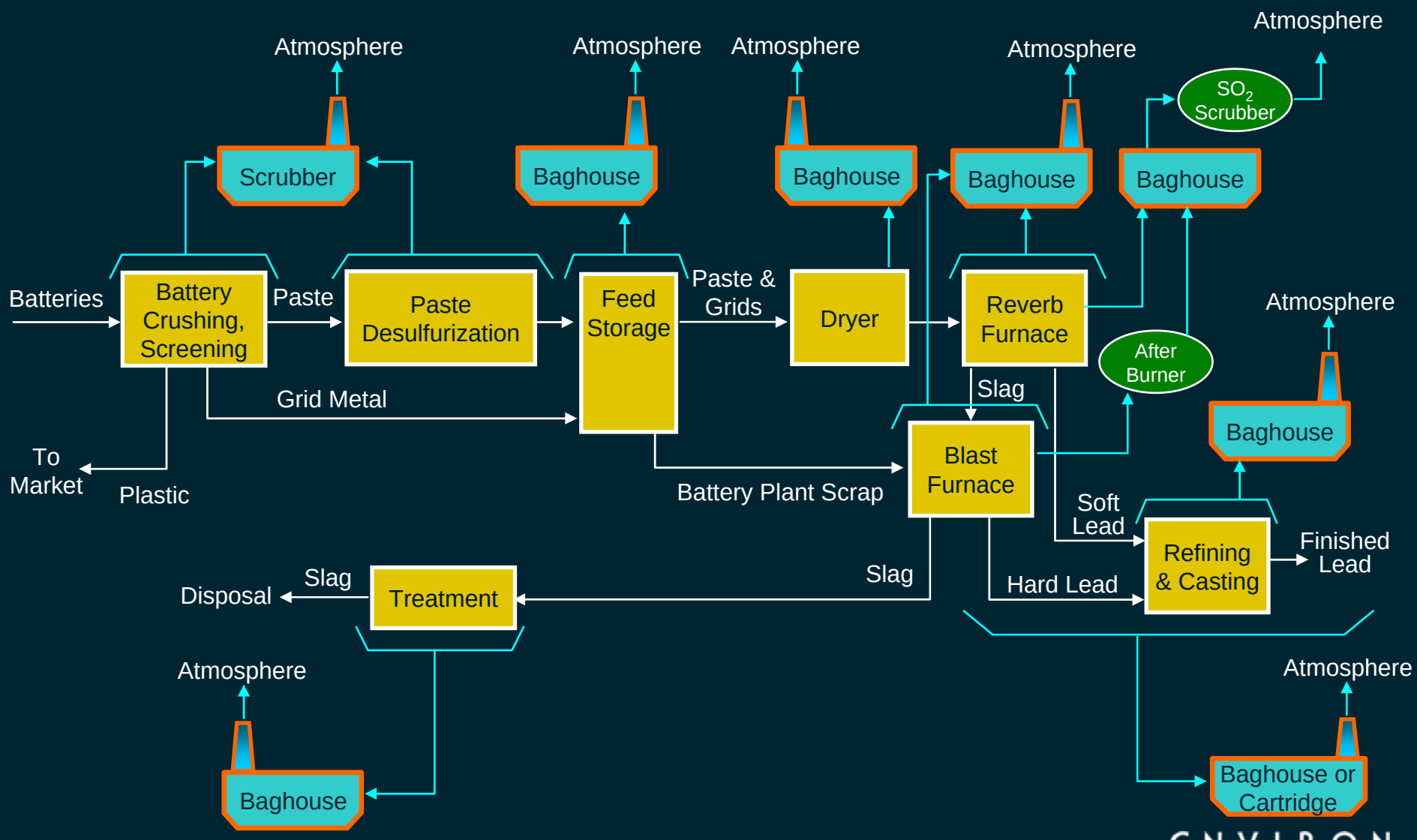
Environmentally Sound Recycling Multimedia Considerations

- Minimization of Land Impacts
  - Storage of batteries
  - Storage of intermediate materials (paste, acid, etc.)
  - Construction of surfaces and floors
- Minimization of Water Impacts
  - Acid Management – reclamation, treatment
  - Wastewater treatment – reuse
  - Stormwater management – runoff control, treatment
- Minimization of Air Impacts
  - Lead AND other constituents (SO_2, NOx, etc.)

Air Pollution Control: Motivations and Regulations

- Emission limiting standards at point of release:
  - Allowable lead concentration in stack (e.g., 2 mg/dscm)
- Ambient air quality standards:
  - Current U.S. and Mexico standard 1.5 ug/m^3 quarterly
  - Ozone, particulate, and other ambient standards
- Risk management and air toxics considerations
  - Community health risks
  - Litigation from neighbors
  - Accumulation of deposited dust in surface soil

Lead Recycling Process Flow and Emission Control



ENVIRON

Control of Ambient Impacts

- Control of fugitive emissions is key
  - Enclosure of lead-processing operations in buildings with controlled exhaust
  - Elimination of outdoor transfers
  - Control of tracking of dust onto road and yard surfaces
  - Pavement of road and yard surfaces
  - Regular cleaning and/or wetting of paved road and yard surfaces

Monitoring and Instrumentation

- Continuous Emission Monitor (CEMs):
  - Common for sulfur dioxide
  - Nitrogen oxides sometimes monitored
- Parameter monitoring:
  - Afterburner temperatures
  - Baghouse pressure drops
  - Broken bag detection systems
- Ambient air monitoring: Primarily for lead

Future Considerations

- Revised National Ambient Air Quality Standard (NAAQS) in United States:
  - To be promulgated in September 2008
  - Revised level expected to be approximately an order of magnitude lower than 1.5 $\mu g/m^3$, and on a monthly average.

- Climate Change and Greenhouse Gases:
  - California requirements encompass secondary lead operations as a large stationary source
  - Focus on energy efficiency

Information Resources

- U.S. OSHA's "e-tool" site has good information on best practices for hooding designs:

  www.osha.gov/SLTC/etools/leadsmelter/index.html

- Specifications for best practice emission levels in U.S. National Emission Standard for Hazardous Air Pollutants for Secondary Lead. Link to info page:

  www.epa.gov/ttn/atw/lead2nd/lead2pg.html