

Use of Paper Mill Byproducts as Soil Amendments

Sustainable Soils Forum
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A global packaging leader

\$5.4 billion
total revenue in 2013

100
nations where we market our products

30%
revenue from emerging markets

16,000
employees in 30 countries around the world

since **2004**
Dow Jones Sustainability World Index



| Category | Percentage |
|---------------------------------|------------|
| Packaging | 82% |
| Food & Beverage Packaging | 58% |
| Specialty Chemicals | 18% |
| Industrial Packaging | 10% |
| Home, Health & Beauty Packaging | 14% |



We believe packaging matters

from the manufacturing floor to the store shelf to the kitchen pantry




Our daily actions build toward long-term goals

We have made an everyday commitment to ...

- Reduce our use of fossil fuels by 25% by 2015
- Reduce our CO2 emissions by 25% by 2015
- Reduce our water use by 15% per net ton of paperboard by 2015
- Ship 90% of our U.S. freight with EPA SmartWay carriers by 2015
- Involve 100% of our suppliers in a Principles of Conduct program by 2015
- Reuse 70% of our solid waste for beneficial purposes by 2020
- Maintain our commitment to get 100% of our paperboard fiber from responsible sources, and get 50% from certified sources by 2020


We are building together with customers by ...

- Becoming an industry-leading source of consumer insights about sustainable packaging
- Playing a leading role in relevant advocacy organizations and associations
- Developing renewable and recyclable materials, including our 100% renewable position for paperboard packaging and the exploration of biopolymers as a material for plastic packaging
- Creating innovative packaging solutions that reduce waste through recycled raw materials, light-weighting, recyclability, composting, and other "end-of-life" alternatives
- Designing packaging that engages consumers in sustainable practices, such as recycling








MGro™ Residuals

- Solid residuals produced by the treatment of paper mill and carbon plant wastewater
- Produce 400 wtpd (146,000 wtpy) at 45% solids content
- Dewatered on screw presses
- Primary – 85%
 - Solids from primary clarification of mill wastewater including wood fiber, carbon, boiler ash, PRS precipitate (Ca₃PO₄), lime and mineral matter additives (clay, calcium carbonate, titanium dioxide)
- Secondary – 15%
 - Microbial biomass from biological wastewater treatment



MGro™ Residuals

- Current Use
 - Infiltration & Erosion Layers in final cover system for on-site landfill
- Potential Uses
 - Burn for fuel in No. 1 Power Boiler
 - Silvicultural land application 
 - Agricultural land application 
 - Mine reclamation 
 - Composting



Coal/Wood Boiler Ash

- Previously produced from burning coal and wood (bark, wood chips) in four power boilers
- Ash was combined, mixed with water for transport and dewatered in clarifiers and belt presses to 55% solids content
- Potential Uses Evaluated
 - Silvicultural land application **VT**
 - Agricultural land application **VT**
 - Mine reclamation **VT**
- Two of these boilers have been idled. Remaining two boilers burn coal as primary fuel.
 - Potential Uses: cement production, concrete production



Lime Mud

- Produce 10,000 wtpy at 23% moisture content
- Precipitate from lime treatment of green liquor in the chemical recovery cycle of the Kraft pulping process
- Potential Uses Evaluated
 - Silvicultural land application **VT**
 - Agricultural land application **VT**
 - Mine reclamation **VT**



MGro™ Biofuel Ash

- Produce 132 tpd (48,000 tpy) at 10% moisture content
- Produced by new 74 MW_e biomass cogeneration plant
- Bubbling, fluidized bed boiler burning 2,400 tpd of biomass fuels including logging residuals, sawdust and tree bark
- Evaluated for use as a soil liming material **VT**



Thank you.

