

PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Power Plant Improvement
Initiative (PPII)

02/2008



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PARTNER

Universal Aggregates, LLC
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ADDITIONAL TEAM MEMBERS

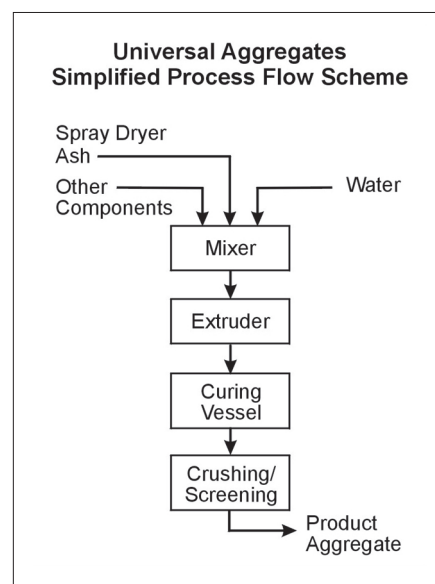
P.J. Dick, Inc.
SynAggs, LLC

COMMERCIAL DEMONSTRATION OF THE MANUFACTURED AGGREGATE PROCESSING TECHNOLOGY UTILIZING SPRAY DRYER ASH

Universal Aggregates, LLC, of West Mifflin, PA, has designed, constructed, and is currently operating a manufacturing plant at the Birchwood Power Facility in King George County, VA that will turn ash into lightweight aggregate, which can be used to make a variety of construction materials from masonry blocks and concrete to asphalt paving material.

The project could pave the way for a new type of recycling technology for coal-burning power plants. Ash for the Universal Aggregates project is produced as a by-product of the power plant's spray dryer scrubber system. Scrubbers are used on many coal-fired power plants in the United States to reduce sulfur pollutants, but only about 30 percent of the 28 million tons of residue produced annually by these scrubbers is reused, most of which is from wet scrubbers.

In the process, ash from the spray dryer and other solid wastes from the power plant are blended in a mixer to produce a uniform granular material. The loose, moist material is then fed to an extruder that further mixes the material then forces it through the holes of a metal die to form wet "green" pellets. The soft pellets are dried and hardened in a curing vessel specially designed to allow the solids to flow continuously without hanging up. After curing, the hardened pellets are crushed and screened to specification, then stockpiled for sale as manufactured aggregates. Once in full-capacity operation, the project will produce 167,000 tons of aggregate a year. The construction aggregate market in the United States is estimated to be about two billion tons annually.



Benefits

LOCATION

Birchwood Power Partners
King George County, VA

COST

Total Project Value
\$19,581,734

DOE/Non-DOE Share
\$7,224,000 / \$12,357,734

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As new environmental standards take effect, power companies are expected to install more scrubbers, including the spray dryer technology used at the Birchwood Power Facility which produces a dry by-product rather than a wet residue. While air quality will improve, scrubber waste tonnage will inevitably increase, placing greater burdens on landfills and adding increasing waste disposal costs to consumers' electric bills. The Universal Aggregates process is designed to recycle the by-products from either wet or dry scrubbers, thereby lowering the costs of waste disposal while reducing the environmental drawbacks of landfilling.

Each year Birchwood Power Facility pays to have more than 100,000 tons of coal combustion ash disposed of in a municipal landfill. This project may soon demonstrate that this ash has significantly more value than as the daily cover material for a community's solid waste.

The Birchwood Power Facility project will be the final step to verify that the aggregate manufacturing process and equipment is ready for future commercial use. Currently there are 21 spray dryer facilities in the United States that produce an adequate amount of by-product to economically justify the installation of similar aggregate manufacturing facilities.



Aerial View of the Universal Aggregates Manufacturing Plant in King George, VA