Case Study 4

Fluidized Bed Material Mitigates Acidic Mine Drainage

Since 1992, Headwaters Resources has used fluidized bed combustion products from the AES Thames Cogeneration Facility in Connecticut to improve the pH of groundwater at an active surface coal mine in Pennsylvania, and for ground contour restoration.

The Thames Cogeneration Facility is a large fluidized bed coal combustion power facility in Uncasville, Connecticut. The facility produces 132,000 to 157,000 tons of fluidized bed combustion products annually. The challenge in marketing the fluidized bed combustion products was in linking its unique chemistry to a specific application.

Using fluidized bed material can help neutralize the acidity of groundwater in coal mine sites and restore the land to its natural state.

Fluidized bed material is derived from a combustion process that utilizes a bed of finely ground limestone to control the release of gases to the atmosphere. During the combustion process, the fluidized bed material — a combination of spent limestone and the coal combustion products — takes on a higher alkaline pH in the form of calcium oxide. The key to utilizing the Thames combustion products was in recognizing that the higher pH and higher calcium oxide levels of the fluidized bed combustion products has been found to be beneficial in mitigating the low pH of acidic mine groundwater.

With the fluidized bed material properly characterized, Headwaters sought out, and found, an anthracite coal mine in Pennsylvania faced with contour restoration while mitigating acidic mine drainage. The acidic, low pH groundwater is continuously generated by the geology of the region. Pyrites present in the surrounding earth become concentrated in the mining spoils (material that is left over in the mine after coal has been extracted) and react with rainwater to lower the pH of the water as it flows through the spoils. Headwaters teamed with the mine owner to supply, blend and place the alkaline, high pH Thames fluidized bed material with the mine spoils to act as a buffer. This is an established permitted activity with a good history with the Pennsylvania Department of Environmental Protection. Furthermore, the Headwaters engineering division met the challenge of conditioning high calcium fluidized bed combustion products. Normally, high calcium combustion products can react with the water in the conditioning process, stiffening and clogging conventional machinery, rendering it useless. Headwaters designed and manufactured a one-of-a-kind pug mill to condition, on site, the fluidized bed combustion products from the Thames Cogeneration facility, for use at the Pennsylvania mining operation.

Coal combustion products can be effectively recycled at coal mine sites; for instance, in the construction of this haul road.

The goal of coal mine restoration projects is to return land to a natural state.

For more information or answers to questions about the use of fly ash in specific applications, contact your nearest Headwaters Resources Technical Sales Representative or call 1-888-236-6236.

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