Analysis of How Carbon-Based Sorbents Will Impact Fly Ash Utilization and Disposal

Debra F. Pflughoeft-Hassett,[1] David J. Hassett,[1] Tera D. Buckley,[1] Loreal V. Heebink,[1] and Erick J. Zacher[1]

[1]University of North Dakota Energy & Environmental Research Center (EERC), 15 North 23rd Street, Stop 9018, Grand Forks, ND 58202-9018

KEYWORDS: carbon, mercury, fly ash

ABSTRACT

As more utilities begin to use activated carbon injection (ACI) for mercury control, the potential for the presence of elevated concentrations of mercury, other air toxic elements, and activated carbon to impact fly ash management needs to be evaluated. Several EERC projects have allowed the collection of comparative baseline fly ash samples and associated fly ash-AC (activated carbon) samples from full-scale demonstrations of ACI for mercury emission control. These samples were evaluated for mercury and air toxic element content and mobility and for performance criteria to facilitate a better understanding of the impact of these components to specific utilization applications, including use as a mineral admixture in concrete. These data are compared with published data from samples collected at similar large-scale mercury emission control tests.

The data presented are in agreement with previous results from the EERC, the U.S. Environmental Protection Agency, and elsewhere that mercury associated with fly ash is stable and highly unlikely to be released under most management conditions. Additionally, the EERC will report on the potential for fly ash-AC samples to be used as a mineral admixture in concrete and the range of performance utilizing various air-entraining admixtures with and without treatment to deactivate or separate the activated carbon. A review of U.S. and Canadian regulations, standards, and industry practices that need to be considered in marketing fly ash-AC will also be presented.

Submitted for consideration in the 2007 World of Coal Ash Conference, May 7–10, 2007.